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The new technology frontier for developing economies

Digital transformation to achieve the Sustainable Development Goals

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Foreword

Over the course of the last two years, the COVID-19 crisis has presented a significant challenge to the world as a whole. However, through access to things like telemedicine, online education, and working from home, it has also demonstrated the positive impact of technology. The world is seeing what is possible through technology and how the solutions that it presents can contribute to the United Nations' 17 Sustainable Development Goals (SDGs), improving the lives of billions.

KPMG is committed to the SDGs as is made clear by the establishment of the global initiative, KPMG IMPACT, as well as the announcement of our multiyear, multibillion-dollar strategy around environmental, social, and governance (ESG) in 2021. KPMG has also greatly invested in technology and has the capability to push this agenda forward. Through joining forces with technology leaders, we are working to navigate some of today's most pressing issues such as expanding the reach of platforms, digital labor, addressing carbon emissions with autonomous vehicles, data, analytics, blockchain, and more. An example of this is our work with Microsoft in the public sector using a deep understanding of industries and advanced technologies to develop technology solutions for learning, infrastructure, and higher education, among others.

This paper is the first in a series and explores the intersection of development and technology within specific areas that have been identified and where we see strong potential for technology to enable faster, more effective, and more efficient achievement of the SDGs. Subsequent pieces will be released taking a deeper look at the sectors where promising opportunities and technology solutions can be scaled up to create a larger global impact. We hope that through this exploration we can inspire others to identify these areas where technology solutions can be applied making a greater difference toward the SDGs and a better world for all.

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Introduction

The COVID-19 pandemic has shown how fast new technologies can change the world. Scientists used vast computational power for genomic sequencing that tracked the virus as it mutated. Digital technology was key in modifying messenger RNA to create successful vaccines. Within a year of the virus' formal identification at the end of 2019, several countries had launched population-wide vaccination campaigns, although many poorer countries struggled with limited access.

The lessons from COVID-19 highlight some of the major challenges societies face in the coming decades. First, how to harness Industry 4.0 technologies including biotechnology, artificial intelligence, the internet of things, and robotics to address pressing global challenges that require immediate and effective approaches. Second, how to help ensure that the expected benefits of those advances are more evenly distributed and do not leave the developing world behind.

Success can be measured against the United Nations' 17 Sustainable Development Goals (SDGs) agreed by 193 countries in 2015 as tangible targets for social, environmental, and governance outcomes for a more prosperous and inclusive world. The SDGs target poverty, income inequality, education access and attainment, a more sustainable environment, and gender equality, among other goals.

Reaching the SDGs by 2030, as originally proposed, requires vast new investments by governments and the private sector. It is also evident that technology plays a decisive role.

Success for developing economies depends on taking advantage of technology advances that have massively reduced the costs of storing information, increased data processing speeds, made connectivity more ubiquitous, and extended the capabilities of data analytics. These advances when combined with frontier digital technologies such as the industrial internet of things—which involves using multiple interconnected devices to transform the operations of factories, farms, and transport—can improve productivity and help reduce environmental impact. Artificial intelligence, robotics, and 5G networks offer similar potential to enhance well-being, expand the 'circular economy' in consumption and production, and make cities more livable.

Underlying the link between digital transformation and the SDGs is a recognition that technology has been at the heart of economic growth and broader human development for centuries. But less attention has been given to how developing countries can adopt and use it most effectively.

This paper is the first in a series of reports that will examine the role of technology in developing economies in reaching the SDGs and the challenges this poses. The report identifies the digital transformation underway including online education with an uptick in new users since COVID-19 impacted school attendance, new distribution models for home food delivery based on local farm supply chains, and the adoption of drone technologies and geo-spatial data for farming.

As well as these successes, there are barriers to technology advancement in developing countries and a renewed focus on the transformative impact of technology is needed, which this report aims to provide. Future reports will expand the survey to other areas that underpin the new technology frontier for developing economies.

Each of these is discussed in the following sections.

Digital transformations to achieve the Sustainable Development Goals

Digitalization will likely have profound effects on societies and economies and is expected to be an essential precondition for six major transformations needed to reach the SDG targets by 2030: improved human capital; responsible consumption and production; a decarbonized energy system; healthy, affordable food and clean water; sustainable cities and communities; and a digital government.[1] This section details how each of these six transformations can be addressed by applying a digital eliminate.

[1] TWI2050: International Institute for Applied Systems Analysis. 2018. "The World in 2050 - Transformations to Achieve the Sustainable Development Goals." **https://iiasa.ac.at/web/home/ research/twi/Report2018.html** (accessed July 8, 2021)

Human capital:

Advances in education and healthcare that enable people to live self-determined, healthy lives, find decent work, and generate income to sustain themselves, but also to strengthen resilience and undertake climate change mitigation and adaptation.

Smart industry:

Responsible consumption and production through initiatives that facilitate the uptake of more service- and circular-economy business models including mobility as a service and recycling in the production cycle.

Decarbonized and renewable energy:

An integrated network with clean, affordable energy for all through efficiency, renewables, electrification, and carbon capture by 2050.

Digital agriculture:

Achieving access to healthy, affordable food and clean water while protecting the biosphere through investments in more technologically-advanced sustainable food systems.

Smart cities:

Sustainable cities and communities with high-quality services with low environmental footprint thanks to high connectivity and 'smart' infrastructure to meet the demands of growing urban populations.

Digital government:

A digital revolution with the convergence of innovative technologies harnessed to support the SDGs while mitigating negative impacts on work, social cohesion, and human dignity.

Human capital

COVID-19 has dramatically worsened the human capital outlook for many developing economies, compounded by widespread job losses and an increase in poverty and insecurity for vulnerable groups. This has placed new hurdles to meeting SDG targets for poverty reduction, health, education, and work, among others. The technology revolution is an opportunity to reimagine the delivery of services, aiming for greater effectiveness through targeting, personalization, and efficiency.

There is evidence of converging technologies in medicine and healthcare which includes new applications for disease surveillance, drug discovery, clinical diagnostics, patient care, and health-system management. For example, during the COVID-19 pandemic Microsoft and Welthungerhilfe, a large nonprofit aid organization in Germany, piloted a 'Child Growth Monitor' in three Indian states. This AI-powered smartphone app uses facial, video, and body-recognition technology equipped with a set of infrared sensors to capture 3D measurements of a child to diagnose stunting.

Technology adoption in education is advancing rapidly, in part due to close collaboration between the public and private sector. Motivated by COVID-19, Cambodia's Ministry of Education collaborated with private-sector companies and teachers to prerecord lessons for school pupils of all ages and make them available on YouTube and Facebook. However, barriers to reaching scale include poor digital infrastructure and digital literacy that left unattended may exacerbate existing "digital divides" within countries.

Digitalization also impacts countries' efforts to build future workforces. The absence of digitally skilled labor will likely constrain growth as companies may turn to talent abroad, heightening the challenge of finding work for expanding working-age populations in many developing economies. At the same time, innovation is needed to deliver training whether by governments or the private sector. Initial findings are that short courses are ideal, typically 3 to 12 months long, with a mix of instructional methods geared toward practical learning. Among those organizations providing such courses, U.S.-Indian nonprofit Anudip's basic skills lessons have reached 85,000 participants since 2007[2] while British charity Good Things Foundation has used a network of online centers to teach basic digital skills to over 3.5 million people to date.[3]

Digital labor platforms in South Asia: Bane or boon?

The growth of a digital labor force was a trend before COVID-19 and is now part of the new 'business as usual' for organizations. Today, India accounts for an estimated 20[4] percent of the world's online work as companies use digital platforms to outsource tasks to a global pool of workers. Cloud-based tools break workstreams into smaller chunks and distribute them via the internet and then reassemble them for faster delivery. Tapping lower-cost labor is a key driver as is the need to hire those with highly specialized skills without being limited by geography or time zones. A second type of labor platform is location-based and introduces a new level of convenience for delivery of goods and services for gig-economy workers providing taxis, food deliveries, and other services.

There are also risks. Given the ability of these platforms to tap into larger labor pools, the supply of workers in most cases far exceeds demand, potentially triggering a race to the bottom. The algorithms that assign work often are opaque and the ratings given to workers can be highly judgmental and biased. Income from platforms can fluctuate widely, and social security and safety nets are largely absent, leaving workers unprotected.

Despite this, labor from digital labor platforms is expected to continue to grow in importance for companies. Policymakers should take a long view in addressing the emerging future of work insofar as it relates to platform workers and worker displacement by technology. According to estimates, the application of artificial intelligence and next-level automation may eliminate 14 percent of existing jobs—equivalent to 460 million of a global workforce of 3.3 billion—over the next 15-20 years, while another 32 percent of jobs will likely change because of automation.[5] A first step towards assessing the impact of this transformation on the labor force is to increase transparency on employment data in digital labor platforms. To this end, India and Bangladesh are setting up portals to capture data on platform workers, which could be complemented with data on digital credentials, learning opportunities, and social security benefits.

[2] IFC: "Digital Skills in Sub-Saharan Africa: Spotlight on Ghana, Appendix C: Case Studies - Anudip." 2019. https://www.ifc.org/wps/wcm/connect/1988302b-65f7-49c4-8132-403f573e9a57/Digital+Skills_Final_WEB_Anudip.pdf?MOD=AJPERES

[3] Good Things Foundation: "What We Do." 2021. https://www.goodthingsfoundation.org/what-we-do/

[4] OECD: "Online Work in OECD Countries." November 2018. https://www.oecd.org/future-of-work/Online_Gig_Work.pdf

[5] OECD: "The Future of Work." 2019. https://www.oecd-ilibrary.org/employment/oecd-employment- outlook-2019_9ee00155-en (accessed July 3, 2021).

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Smart industry

Changing patterns of consumption and production to promote reuse, recycling, and a circular economy, is an aim of one of the 17 core SDGs. The digital revolution offers huge potential to make many services accessible in a more efficient manner. This includes substituting resource-intensive physical products and services with virtual services and using digital platforms to match supply and demand in real time for better asset utilization and improved quality of service.

Digitalization in the services sector has helped to create new jobs and expand access for underserved communities. M-Pesa, the Kenyan mobile-based transfer facility established in 2007, has revolutionized the financial services industry in Africa and developing economies elsewhere, promoting financial inclusion that helps to bring many of the SDGs within reach. As a testimony to the growing impact of digital payments, during COVID-19 these were used to provide needed cash transfers to vulnerable groups in some African countries, with Togo's government selecting those who would benefit from an International Development Association program using machine learning, geospatial analysis, and data from mobile telephony networks, and Nigeria following suit.[6] Digitalization has also helped to increase labor productivity in the agriculture and manufacturing sectors of developing countries.

However, the risks of a persistent and growing digital divide remain. The biggest acceleration of technology and digital solutions during the COVID-19 crisis occurred in countries with developed digital ecosystems, for example China, India, Kenya, and Nigeria,-while within developed countries, a digital divide separates the urban and rural areas. New technology solutions, especially those focusing on last-mile delivery, e-commerce, and e-payment, favor the rise of the digital urban consumer.

Against this background, developing economies have often been bypassed by the industrial and digital transformations needed for growth. Lower incomes, weak policy frameworks and institutions, and a lack of digital connectivity and skills mean governments and the private sector need to take proactive steps, such as the following:

— Establishing public-private partnerships where private technology companies manage specific public services,

— Aligning taxation between online and offline services,

— Undertaking a fundamental rethink of competition and innovation policies,

— Enabling digital pillars including a digital identity system, connecting schools and universities to the internet, and enhancing digital education, and

— Ensuring cybersecurity and personal data protection.

[6] World Bank: "Rapid Cash Assistance to Get Through the Crisis". July 13, 2021. https:// www.worldbank.org/en/results/2021/07/13/rapid-cash-assistance-to-get-through-the-crisis (accessed September 16, 2021).

Decarbonization and renewable energy

The adoption of renewable energy is one of the best ways for countries to decarbonize, allowing them to generate electricity and heat without using fossil fuels. If undertaken with the adoption of electric vehicles, renewable energy can also support transport's decarbonization.

But for many developing economies, the priority is access to electricity, not how it is generated. In 2019, 770 million people lacked access to electricity. According to the International Energy Agency, 770 million people lacked access to electricity in 2019, and while this figure has dropped over recent years, the agency expects it to increase again as a result of COVID-19.[7] Access to electricity is itself covered by an SDG, but lack of it frustrates meeting others, including those concerning food production, education, health, and migration.

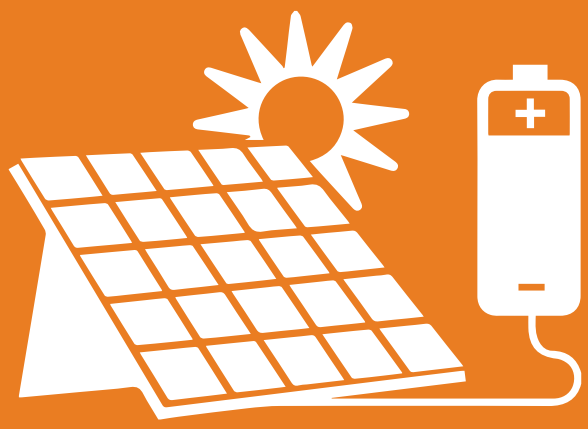
Digital technologies can help connect people in developing economies to renewable energy, such as supporting decentralized power generation by managing microgrids and local energy grids with control systems that can operate with or without a connection to a national system. They can also make renewable energy generation more efficient, including through use of smart meters or blockchain to track sales of power from household solar panels back to a grid. Digital billing through mobile payment systems has already been adopted by many African countries.

Digital systems can also bolster the use of carbon credits, a key element in decarbonization which can benefit developing economies such as by paying landowners to leave sections of forest standing. Carbon credits require transparent accounting and tracking to avoid double counting and fraud. Technologies such as satellite and drone imagery analyzed by machine learning can be used to verify that areas claimed actually are forested, while blockchain systems can be used to protect against double counting, particularly in countries that lack reliable land registries and strong legal systems.

Paying by mobile for solar energy in Nigeria

Nigeria expects to see its population of 210 million double over the next two decades, but at present more than 90 million people have no access to electricity and tens of millions more have unreliable connections. While the country has set targets to reduce greenhouse gas emissions, energy access is its priority.[8] But this provides opportunities for consumers to leapfrog straight to decentralized energy, as much of Africa has done in adopting mobile telephony without building extensive fixed networks.

The energy equivalent of a cellphone could be a solar panel and battery pack which provides renewable energy without the need for a grid connection. Lumos, a Netherlands-based company, supplies homes and small businesses in Nigeria with such equipment and takes payments by text message through a local mobile network. The Nigerian government has introduced Solar Naija, a program to provide cheap credit for five million off-grid homes to install solar, as part of its COVID-19 recovery efforts.



[7] IEA: International Energy Agency. "Access to Energy". https://www.iea.org/reports/sdg7-data-and- projections/access-to-electricity (accessed September 16, 2021).

[8] KPMG: "Net Zero Readiness Index 2021." October 2021. https://home.kpmg/xx/en/home/ insights/2021/09/net-zero-readiness-index.html (accessed October 14, 2021).

Digital agriculture

The digital transformation of agriculture faces high hurdles that make it challenging to reach related SDG targets including ending hunger. Today's land-use and food systems contribute to the extremes of persistent malnutrition and obesity. Agriculture, land use, land use change and forestry together generate a quarter of greenhouse gas emissions, over 90 percent of scarcity-weighted water use, and most losses of biodiversity, while themselves being highly vulnerable to climate change and land degradation.[9] Pressure to expand agriculture to feed growing populations risks exacerbating biodiversity loss and water scarcity.

The food system in Sub-Saharan Africa provides a powerful case for an integrated approach to agriculture and digital technology with the help of disruptive agricultural technologies (DATs). These can enable farmers and agro-entrepreneurs to leapfrog current methods to increase productivity, efficiency, and competitiveness. By improving access to internal markets these gains can boost nutritional outcomes and enhance resilience to climate change. DATs offer an innovative approach to address system-wide challenges, with three pathways of special significance:

- Reducing the costs of linking those in the agri-food system by providing, processing, and analyzing increasing amounts of data faster.
- Helping farmers make more precise decisions about resource management through accurate, timely, and location-specific price, weather, and agronomic data and information.
- Using offline digital agricultural technologies that can help poor and illiterate farmers, even in poorly connected communities.

Bundled services, such as digital platforms that combine input supply with extension services or linking farmers to buyers complemented by credit, may help increase adoption of DATs. Kenya's Twiga Foods illustrates the untapped market possibilities. The company, founded in 2014, uses a technology platform to improve the supply chain between farmers and markets, serving about 2,000 outlets a day through a network of 13,000 famers and 7,000 vendors.[10] It has reduced typical post-harvest losses for produce in Kenya from 30 percent to 4 percent.[11]

[9] Sachs, Jeffery D.; Schmidt-Traub, Guido; Mazzucato, Mariana; Messner, Dirk; Nkicenovic, Nebojsa; and Rockström, Johan. August 26, 2019 "Six Transformations to achieve the Sustainable Development Goals." Nature Sustainability. https://doi.org/10.1038/s41893-019-0352-9

[10] Wilcox, Stacey. July 2019. "Kenyan Produce Company Connects 13,000 Farmers to Vendors." Foodtank. https://foodtank.com/news/2019/07/kenyan-produce-company-connects-13000-farmers-to-vendors/

[11] Lincoln. November 1, 2021 "How Twiga Foods Reduces the Price of Food in Nairobi Using Technology." Twiga Foods Blog. https://twiga.com/?p=3546

Smart cities

Cities are home to around 55 percent of the world's population and 70 percent of global economic output,[12] shares that are predicted to increase to 70 percent of people and 85 percent of output by 2050.[13] Most cities are far from meeting the triple objective of being economically productive, socially inclusive, and environmentally sustainable. In the context of the SDGs a first focus area is to help ensure access to essential public services, followed by sustainable and efficient mobility. Cities also need to include more compact, safe, and healthy new developments to accommodate rising urban populations. They should also enhance resilience against climate change and disease transmission as evidenced by recent events.

A smart cities approach can address urbanization challenges by leveraging technologies and utilizing greater amounts of data to connect more directly to citizens, improve cities' livability and equality, and capitalize on the competitive aspects of growing urban density. There are several specific types of smart city technology:

- Urban analytics that use data sources and digital technologies including remote sensing, location-based services, daily activities on the internet, and internet of things sensors to gain a more granular and faster understanding of urban issues.
- Urban service delivery that lets local governments use disruptive technologies, including digital identities, big data, cloud computing, and artificial intelligence to improve efficiency and coverage.
- Local economic development, improved livability, and competitiveness that cities can catalyze by leveraging analytics and providing better urban services.

An example of a smart cities solution is transit-related analytics. Data on ridership, traffic density, and road safety can be used to increase the use of public transit services, enhance access to jobs, and can help reduce carbon emissions. More generally, cities can deploy sensors to collect data in real-time on air quality and electricity consumption in buildings. In Buenos Aires, Argentina, a cloud-based management system has reduced energy use for its high-quality LED-based city lighting system, which is more efficient, cheaper to operate, and makes the city safer for pedestrians and vehicles.

Digital twins for smart cities

A smart city's digital twin is a virtual replica of that city. Based on an approach pioneered in the manufacturing sector, it is constructed based on real-time data collected through sensors and other internet of things devices that can monitor buildings, public infrastructure, utilities, and the movement of people and vehicles. Singapore and Amaravati in India are among cities using such replicas.

A digital twin can illustrate the overall functioning and performance of the city, offering valuable insights on issues of public health, transportation, safety, energy, environmental, and natural disasters. It can also test and simulate changes to cities virtually before implementation, lowering the costs and the chances of failing. It is also an engagement tool that can help promote more resilient city development.[14]

By leveraging the big data environment, digital twins can also be used in city governance for a range of functions including collaboration and decision-making, communication, urban planning, and life-cycle asset management.

[12] World Bank: "Understanding Poverty: Topics: Urban Development." April 20, 2020. https://www.worldbank.org/en/topic/urbandevelopment/overview#1

[13] European Commission: "Knowledge for Policy: Secondary Cities as Catalysts for Nutritious Diets in Low- and Middle-Income Countries." June 1, 2021. https://knowledge4policy.ec.europa.eu/publication/secondary-cities-catalysts-nutritious-diets-low-middle-income-countries_en

[14] Porteiro, Amaia. November 29, 2019. "Digital Twins and Urban Planning: How to Use Replicas to Building the Cities of Tomorrow." Tomorrow.Mag. https://tomorrow.city/a/digital-twins-made-with-minecraft-and-open-street-map (accessed July 7, 2021).

Digital government

The digital transformation of the public sector is a key method for countries to use in reaching the SDGs. Digital government involves a comprehensive set of regulatory standards, infrastructure, and digital systems that are necessary to capture the expected benefits of technology while avoiding potential pitfalls. The readiness of governments to deploy digital solutions is critical for building effective, accountable, and inclusive institutions at all levels. Digital readiness encompasses the following foundational elements:

- Affordable, universal digital access to government services by citizens and the use of secure digital identity systems.
- Promotion of digital inclusion, enhanced digital skills, and strengthened privacy protection and security.
- Design of tax and regulatory systems that expand competition in data and e-services.
- Establishment of standards for data governance and interoperability provisions for government systems, and oversight of emerging technologies like artificial intelligence.
- Strengthening public institutions to govern and shape digital innovations.

Not surprisingly, the leaders of the World Bank's GovTech Maturity Index, a composite index based on 48 indicators covering 198 countries in four areas, are high-income economies. About half the countries in the East Asia, Middle East and North Africa, and South Asia regions follow some good practices in GovTech but only 8 out of 48 countries in Africa have invested significantly in this area.[15] Globally, the GovTech agenda has not been fully embraced by most low-income countries.

The digital transformation of the public sector should start with the acknowledgment that trust and confidence in government institutions in most countries is low. Increased transparency and stakeholder engagement is needed to frame and implement whole-of-government digital strategies. Ultimately, comprehensive public sector reforms like this will likely take concerted effort and require substantial investments.

Most countries can lay strong foundations by creating dedicated institutions and regulations covering cybersecurity, data protection, and privacy as a first step to increased public trust and digital adoption. Further, improved business regulations, upgraded technical skills, increased innovation, and greater institutional accountability are needed. Finally, to avoid worsening the existing digital divides, proactive measures are needed to help ensure access and affordability to public services among different populations and regions within a country.

Regulatory sandboxes: What has been learnt

The risks, speed, and complexity characterizing technological development contribute to unique policy and regulatory challenges. For example, governments may have insufficient resources, expertise, and capacity to fully access and utilize the vast amount of government data collected. In addition, public servants may not have the up-to-date knowledge needed to keep up with rapidly evolving technology-enabled innovations. This can result in either under-regulation, translating into missed opportunities or regulatory overreaction, which stifles innovation and exacerbates digital exclusion.

Regulatory sandboxes first appeared in 2016 so regulators could allow financial technology (fintech) startups to conduct live experiments in a controlled environment under a regulator's supervision. Since then, sandboxes have become synonymous with fintech innovations. One study suggests that about 60 percent of sandboxes are focused on general fintech innovations, while others have encouraged particular technologies or products to come to market such as blockchain technology, innovations in insurance or payment systems, or digital authentication technologies.[16]

Are they worth it? Success in terms of establishing a fintech market requires approaches that are adapted to each country's context, with their direct and indirect potential benefits subjected to meaningful progress indicators. This innovative and catalytic approach can help accelerate progress towards achieving the vision of sustainable development embodied by the SDG 2030 Agenda.

[15] Dener, Cem; Nii-Aponsah, Hubert; Ghunney, Love E.; and Johns, Kimberly D.. September 15, 2021. "The World Bank GovTech Maturity Index: The State of Public Sector Digital Transformation." https://openknowledge.worldbank.org/handle/10986/36233

[16] Appaya, Sharmista, and Haji, Mahjabeen. November 18, 2020. "Four Years and Counting: What We've Learned from Regulatory Sandboxes." World Bank Blogs. https://blogs.worldbank.org/psd/four- years-and-counting-what-weve-learned-regulatory-sandboxes (accessed July 2, 2021).

Conclusion

In the journey of digital transformation, developing economies have some advantages over developed ones. Widespread use of cellphones and a willingness to adopt mobile payments and fintech models mean that older, legacy technologies and infrastructure have been surpassed. This provides developing economies with opportunities to leap-frog to new digital technologies, avoiding the need to implement fixed-line telephone systems or branch-based banking. Adding to this, younger populations, capable of acquiring new skills and inherent labor cost advantages, allow developing economies to compete for digitally delivered work for clients around the world—creating new markets and well-paid work opportunities.

To potentially benefit from the digital transformation and achieve the SDGs requires addressing existing challenges. Large-scale investments are needed to overcome the lack of digital connectivity in developing economies, which is the stepping stone to achieving real, sustained impact. Equally, innovation in program design can help build digital skills among workers and expand access to relevant digital material—including in local languages. New business models can help lower the cost and operational barriers facing small, informal businesses that limit their use of digital marketing, e-commerce, and local supply chains. Finally, collaboration among governments, businesses, and the international community is crucial to address unreliable energy access, poor transport networks, and limited access to business funding.

Countries need high levels of technology adoption and digital maturity to achieve the SDGs as described in this report. Currently, most developing economies are just beginning this journey, both in terms of implementing technology and introducing regulatory and institutional reforms to support their digital transformation. The private sector is a key partner in this transformation by providing know-how, delivering new digitally enabled services, upgrading infrastructure, and providing needed capital. While the technology solutions and rate of transformation will vary by country according to the capabilities of governments, private sector, and civil society, there is no doubt about the direction of travel and the desirability of using digital technology to hasten achieving the SDGs.

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Where to start using digital transformation for SDGs

There is no formulaic approach to the journey developing economies are now embarking on to embed digital solutions. However, experience across a range of countries with differing capabilities highlights the following recommendations for policymakers, the private sector and civil society.

Strategy setting:

— Update national digital strategies and plans with key performance indicators for delivery of key outcomes across strategic issue areas while involving the private sector and civil society in the discussion.

— Take advantage of technologies that already exist, make effective use of the potential offered by new emerging technologies, and mitigate emerging risks.

Operational environment:

— Governments and the private sector need to provide digital leadership, backed up by an organizational culture that demonstrates and follows through with a credible commitment to transparency, user engagement, and adequate consumer protection.

— Develop and institutionalize clear change management procedures and policies to help ensure political will and coordinated implementation of digital transformation plans, as well as the further development of digital government.

— Improve alignment across government entities by synchronizing investments in digital technologies and data systems across agencies.

— Identify private sector partners to support the transformation through open and competitive procurement processes that emphasize affordability and maintenance of digital infrastructure, applications, and services over time.

Policy and governance arrangements:

— Implement a dynamic regulatory framework that anticipates and responds to constant technological change, new services being offered, data management, and privacy-related issues. Listen to practitioners who can identify the bottlenecks to adoption and needed regulatory reforms.

— Erosion of trust is a global leitmotif of the digital age and rebuilding it requires a multipronged effort. Trust is central to the use of technology, and it extends beyond concerns about data or privacy.

— Converging technologies pose special governance challenges, reflecting dual-use properties that could be both beneficial or harmful; heavy reliance on large, combined datasets; and frequent use of artificial intelligence analytics.

Capacity building:

— Prioritize strengthening digital skills and values of citizens by committing to policies that promote connectivity, inclusion, and digital literacy to narrow in-country digital divides.

— Public digital platforms for education and healthcare can serve an important equalizing function and broaden access to technology applications and services.

— Firms can support governments with technology adoption and technology generation by providing services, and technical assistance to public entities and private firms that need upskilling and upgrading.

— Technology centers offer scale for a range of technological and innovation services to firms, support sector-specific research and development programs and demonstration pilots, and adapt existing market technologies to local needs.

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