

Driving development

The impact of ICT investments
on the digital economy

About the report

Driving development: the impact of ICT investments on the digital economy is a white paper supported by GSMA Intelligence and Huawei, and produced by EI Studios, a custom division of Economist Impact, which operates separately from the editorial and research staff of The Economist and Economist Impact.

This paper explores the impact of information communication technology (ICT) investments on the global digital economy.

For well over two decades, studies have been produced that highlight the linkages between ICT investments and a number of key indicators, such as economic growth, employment, productivity, and even social indicators such as mortality rates and income levels. An illustrative example is the *Mobile technology: two decades driving economic growth* report by GSMA Intelligence, which shows that the adoption of mobile technology—and its advances—directly result in GDP growth.¹



¹ Source: 'Mobile technology: two decades driving economic growth', Working Paper, GSMA Intelligence, 2020.

Post-covid, the global economy is experiencing a moment of transition as companies, governments and whole societies reorganise around the growing importance of digital technologies to everyday life. As such, a new reassessment of the importance of ICT investments to the global digital economy is not just relevant, but necessary.

The report draws on a global survey of 500 individuals, conducted in December 2022, of which 400 are company executives, 50 are policy makers and another 50 are institutional investors. Also included are insights gleaned from in-depth interviews and desk research. EI Studios wishes to thank the following experts for their participation in the programme:

- Kushe Bahl, partner at McKinsey & Company
- Enrique Blanco, global chief technology officer, Telefonica
- Blair Chalmers, managing director of infrastructure innovations at Marsh McLennan;
- Peter Jarich, head of GSMA Intelligence at GSMA
- Tay Yeow Lian, managing director, Networks, Consumer Singapore at Singtel
- Atusuko Okada, regional director for Asia and the Pacific at the International Telecommunication Union (ITU)
- Audrey Plonk, head of the Digital Economy Policy Division at the Organisation for Economic Co-operation and Development (OECD)



Key takeaways

Investment in ICT infrastructure and resulting digitalisation will drive the fourth industrial revolution. Much as steam power and the mechanisation of production drove the industrial revolution three centuries ago, ICT infrastructure will drive the fourth industrial revolution through gains from digitalisation. A 10% increase in mobile adoption, for example, can result in a GDP increase of 1%, while 5G alone is expected to result in additional global GDP value-add of US\$960 billion, or about 0.7% of global GDP.² Investment in ICT infrastructure must be a priority for all governments for the socio-economic development of their peoples.

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Telcos are at a tipping point. Telcos have a pivotal role to play as enablers of the digital economy. They have been instrumental in providing necessary connectivity infrastructure and improvements in connectivity. So far, they've borne the burden of ICT infrastructure investment—partly in keeping with their role as public utilities. However, this is not sustainable, given the pace at which infrastructure requirements are changing and the ultimately limited resources telcos have. If ICT infrastructure is a “public good”, others in the ecosystem—such as other enterprises and the public sector—must play a bigger role in financing ICT infrastructure development.

Advanced 5G connectivity is the undercurrent enabling technology adoption and its benefits. There is a sharp focus on technology adoption and implementation, such as the greater use of AI, machine learning, and cloud and edge computing. However, the base requirement for all of this is the availability of and advancements in high-speed, reliable 5G network connectivity to 5.5G and eventually 6G. Without investment in networks, the gains from technological developments will be stunted.

2 Source: 'The socio-economic benefits of mid-band 5G services', GSMA Intelligence, 2022.

Public and private sector collaboration are “crucial levers for growth”. Policy makers and governments play an important role in facilitating investment in ICT infrastructure and in facilitating the digital economy. Doing this effectively requires collaboration and dialogue with the private sector to put in place supportive regulatory frameworks and incentivise innovation in ICT, both of which are essential to boost the digital economy of the future.

Investment in ICT unlocks value for the planet and communities. New and emerging ICT technologies are proving to be instrumental in energy use management, reduction in carbon emissions, in improvements in SDG benchmarks and contributing to community resilience. Traditional Investment in ICT mainly focuses on connectivity and computing. Green technologies will be the third new dimension to maintain long-term vitality of the whole digital economy, improving sustainability and resilience, while unlocking value for communities and the planet.

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GSMA Intelligence



GSMA Intelligence Perspective

The strong linkages that exist between ICT investments and the digital economy are well established at this point. [GSMA Intelligence](#) economic research finds that, over the period 2000–2017, a 10% increase in mobile adoption increased GDP by 1% on average, with the effect increasing by approximately 15% when connections were upgraded from one mobile network technology to another (from 2G to 3G and from 3G to 4G).

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However, with a new wave of digitisation – which includes artificial intelligence, cybersecurity solutions, IoT and cloud computing – a reassessment of the importance of ICT investments to the global digital economy is now necessary.

Fundamental to the growth of the digital economy will of course be the continued development of a strong ICT backbone, including fibre networks, cloud and especially 5G and next-generation connectivity.

In this study, we look at the role of infrastructure today and analyse the key challenges and opportunities ahead. Key strategic issues include disentangling which digital technologies are going to be most in demand and the network transformations required by telecoms providers. It also includes the question of the extent to which operators can capitalise on the new wave of growth and business opportunities that are appearing in the market, from new mass-market consumer applications (e.g. metaverse and XR) to new enterprise services (e.g. advanced connectivity, cloud and storage, analytics and management applications).

Our analysis indicates the following:

5G mobile technology is no doubt a global trend now. Globally, there will be 9.8 billion mobile connections in 2030, of which 5.3 billion will be 5G. 2G, 3G and 4G mobile connections will all decline, freeing space for 5G spectrum and networks. However, 4G networks will continue to grow in many regions, such as Latin America, the Middle East and North Africa, and Sub-Saharan Africa, where investments in 5G technology still need to accelerate.

5G and fibre deployments will be vital to support the network of the future. Future networks will comprise traditional cloud data centres and a variety of computational capacities moving out from the cloud to the edge nodes closer to end users. A survey conducted by GSMA Intelligence in 2022³ shows that the cloud and IT transformation of the network are among the favoured technologies used by operators for reducing opex. Edge computing is at the core of IoT and enterprise digital transformation.

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Edge computing is key in the 5G era.

Edge computers can be deployed with any IoT device and have an infinitely wide range of uses. Among their benefits is the ability to operate in places that require intermittent connectivity to the cloud and to safely process, make sense of and locally store data.⁴

Enhanced connectivity and the deployment of massive IoT will drive the digitisation of enterprise verticals. Enterprises are seizing the long-term benefits of 5G, edge computing and IoT in terms of improved operations efficiency, cost reductions and new revenue opportunities. As a result, enterprise IoT connections will account for nearly two thirds of total IoT connections by 2030. According to a global operator survey conducted by GSMA Intelligence in 2022, 91% of respondents indicated 5G connectivity services (such as mobile and fixed-wireless) is a top priority for enterprises, while 75% pointed to IoT services and 55% highlighted cloud services.

The emerging enterprise metaverse relies on 5G connectivity. The enterprise metaverse involves applications that enable enterprises to offer new products and services or to transform their current ways of working. In industrial settings, enterprise metaverse applications could allow safety and risk analysis simulations to take into consideration machines, people and current conditions such as temperature and lighting.

Energy efficiency and sustainability are taking centre stage. A survey conducted by GSMA Intelligence of 100 operators worldwide in mid-2022 found that energy efficiency and sustainability are top network investment priorities. Mobile operators are committed to upgrading their network equipment to improve energy efficiency of the RAN and core networks to save on opex and capex while improving sustainability.

³ Source: 'Operators in Focus: Network Transformation Survey Dashboard 2022', GSMA Intelligence, 2022.

⁴ Source: 'technology trends outlook 2022', McKinsey, 2022; 'Digital transformation in a post-pandemic future', GSMA Intelligence, 2022.



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