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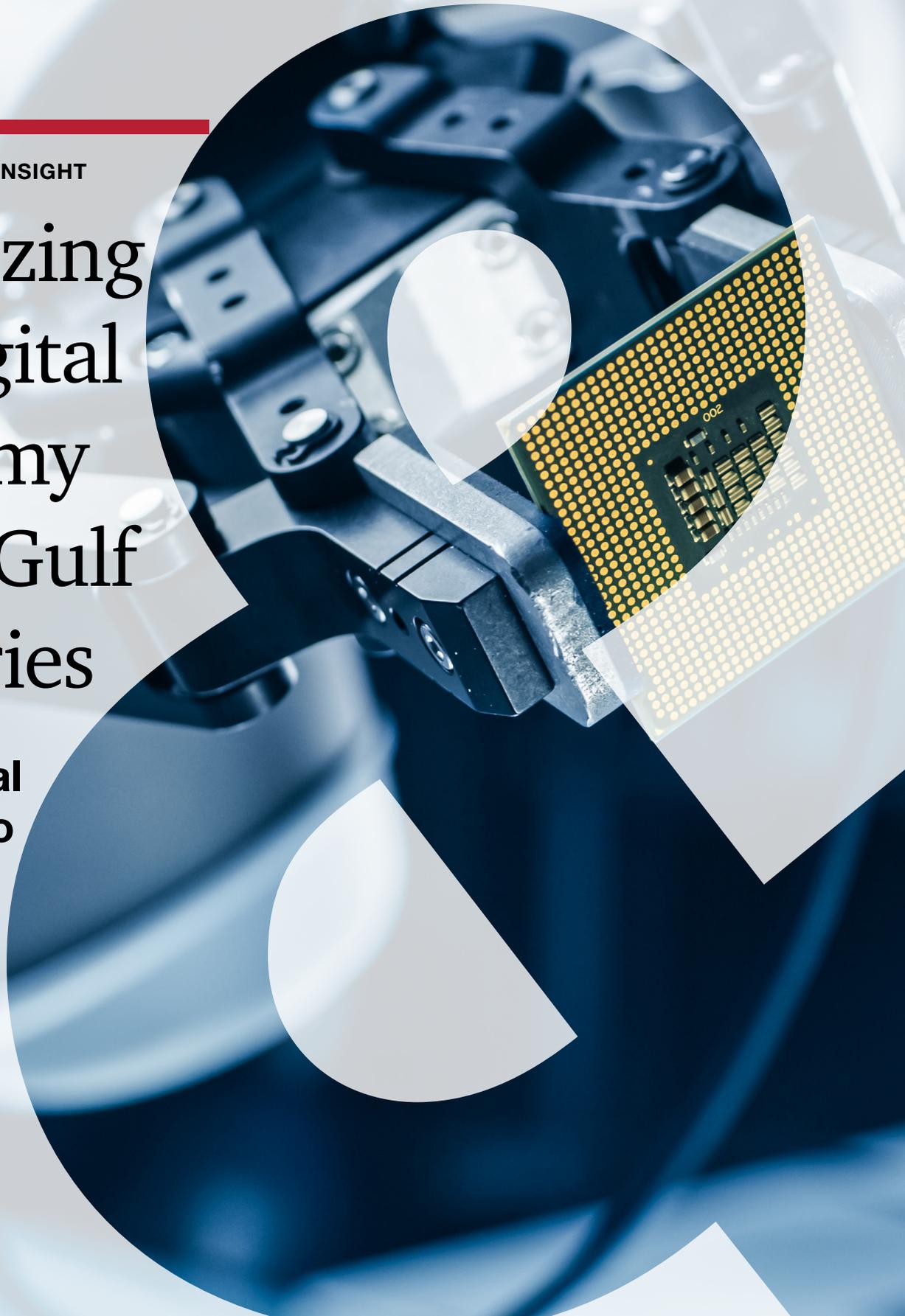
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IDEATION CENTER INSIGHT

# Energizing the digital economy in the Gulf countries

**From digital  
adopters to  
digital  
disruptors**



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## The Ideation Center

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Please note that this report has been updated with new information on pages 3, 7-10.

## EXECUTIVE SUMMARY

**The Gulf Cooperation Council (GCC) countries<sup>1</sup> have recorded strong digital sector growth over the last decade. GCC countries now need to take vigorous policy actions if they are to move from being mostly adopters of digital technologies to becoming disruptors hosting powerful local companies, institutions, and talent.**

We measured where the GCC countries stand using our Digital Economy Index (DEI), an evidence-based tool that provides a comprehensive view of the digital maturity of 109 countries between 2010 and 2020. The DEI has five pillars: foundations, talent, innovation, adoption, and local production. Our econometric models demonstrate that a 10 percentage point increase in any country's DEI score would lead to a 2.6 percent increase in GDP per capita growth and 1.1 percent growth in employment.

According to the DEI, GCC countries need more digital talent, innovation, and domestically produced digital products and services if they are to play a role in global digital markets over the medium term. Similarly, the GCC needs more digital activity in terms of patents, disruptive business models, and venture capital availability to keep up with the activity of advanced economies. However, the right policies and initiatives can help the region's digital economy approach the level of maturity of Organisation for Economic Co-operation and Development (OECD) countries within five years. If regional countries went from being digital adopters to being digital disruptors, they could add between US\$138 billion and \$255 billion to regional GDP depending upon how far they advanced.

Participating in the digital economy is not a choice but a requirement that conveys economic vibrancy and resilience, and that protects sovereignty. To develop their digital economy, GCC countries must build adaptive regulatory frameworks, aggressively develop talent, expand innovation capacity, and increase local production of digital goods and services. Policymakers need to accelerate digital economy development — and act now to transition toward becoming digital disruptors.

## THE DIGITAL ECONOMY OFFERS A CONSTRUCT FOR GROWTH

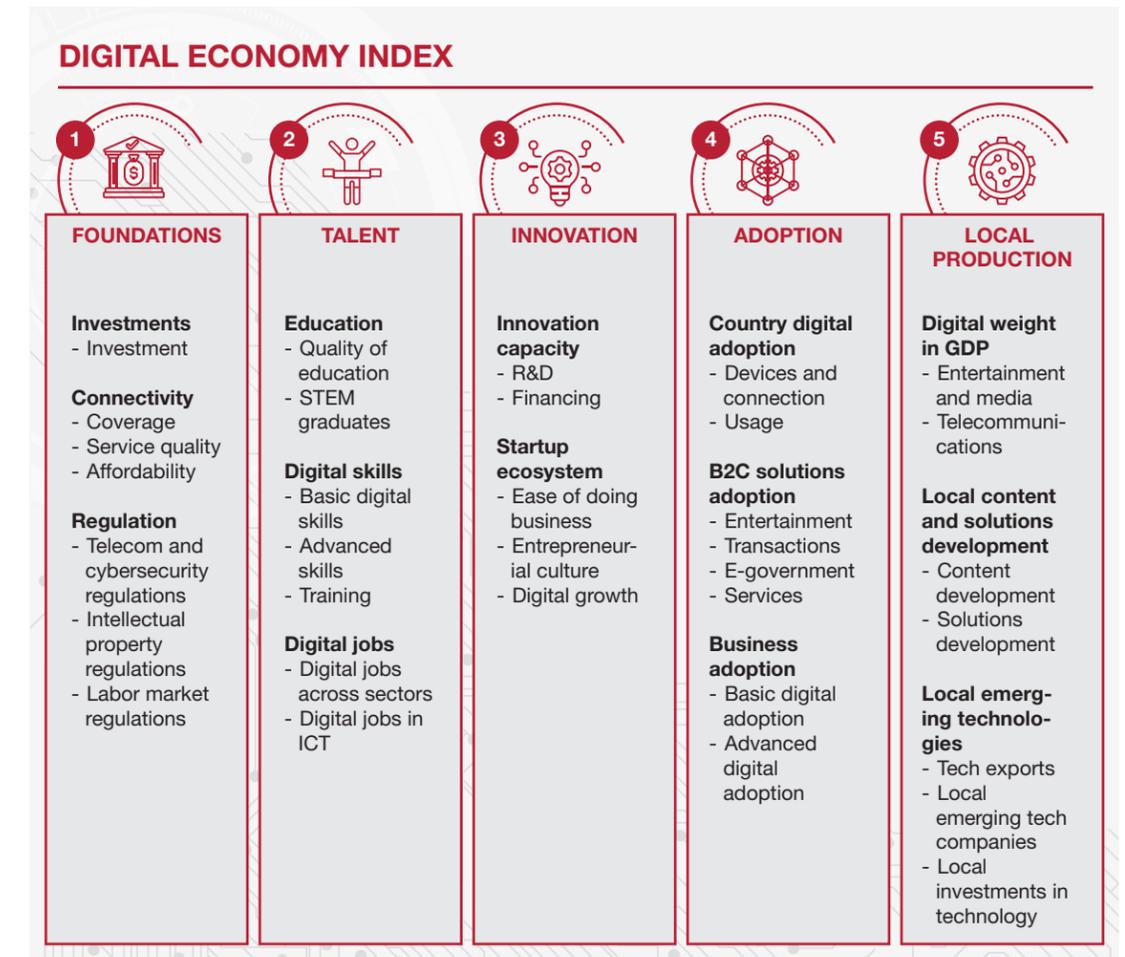
As the digital economy continues to rewrite how countries grow and prosper, GCC countries have the opportunity to leap forward as disruptors. They have expanded their digital sectors over the last decade, investing in digital infrastructure, adopting e-government platforms, and launching technology parks and business incubators. The COVID-19 pandemic has only underscored the importance of furthering the growth of the digital economy, making it a requirement for economic resilience and the development and advancement of every sector of the economy.

What do we mean by *the digital economy*? It is a broad concept. It encompasses the acquisition and adoption of technologies and services, as well as the output generated by industries in the digital ecosystem, which includes telecommunications, IT, content industries, online platforms, electronic commerce, and collaborative/sharing platforms. The digital economy also includes the technology solutions that are used by those same producers and by consumers, businesses, organizations, and governments.

Strategy& developed the Digital Economy Index (DEI), a comprehensive composite measure that seeks to capture all of these aspects. It aims to inform policymakers of their country's level of digital development and maturity. The index is based on 86 indicators grouped into five pillars: foundations, talent, innovation, adoption, and local production (see *Exhibit 1*).

### EXHIBIT 1

The Digital Economy Index is composed of five pillars



Note: B2C = business to consumer. ICT = information and communications technology. R&D = research and development. STEM = science, technology, engineering, and mathematics.  
Source: Strategy&

- **Foundations** consist of investments in information and communications technology (ICT) infrastructure that increase connectivity to provide digital coverage, that raise broadband service quality, and that improve affordability, along with regulations that enable the digital economy. Digital spending is increasing globally. Investments are shifting toward 5G network infrastructure, reaching \$2.3 billion globally. 5G promises to increase broadband connection speeds by 100 times compared with 4G networks, reduce energy usage by 90 percent, and support 250 times as many connected devices per square kilometer. These investments enable deployment of more efficient real-time and virtual solutions.<sup>2</sup>
- **Talent** is the human capital that develops, operates, and maintains technologies and creates innovation resulting in new products and services — a factor of production that is lacking in many economies. Governments, educational institutions, and enterprises need to develop human capital with technical skills that match the constantly changing needs of the digital sector. New skills are in high demand globally. Jobs for data scientists, artificial intelligence (AI) practitioners, specialist engineers, and user experience designers grew at nearly 46 percent, 32 percent, 25 percent, and 20 percent between 2019 and 2020, respectively.<sup>3</sup>
- **Innovation** relates to the scale and speed of research and development (R&D), indicated by the prevalence of successful startups and incubation ecosystems that provide readily available funding sources, mentoring, and scalability support. Advanced manufacturing and robotics, cybersecurity, and other emerging technologies are among the fastest-growing subsectors. The global startup economy has expanded greatly in recent years, creating \$2.8 trillion in value between 2016 and 2018, more than double what it was five years previously.<sup>4</sup> However, this activity is concentrated in a handful of countries.
- **Adoption** measures the degree to which services, devices, and online platforms are used by individuals, enterprises, and governments. For example, beyond broadband, a critical indicator in this pillar is the spread of e-commerce, a burgeoning global market whose growth has been further accelerated by the COVID-19 pandemic. Global revenues from online sales in the second quarter of 2020 increased by 71 percent in comparison with the equivalent period of the previous year.<sup>5</sup>
- **Local production** refers to the level of domestically generated digital products and services, as well as digital content and software apps. The DEI measures the success of locally developed internet platforms and content, and the export of digital goods and services. Some e-commerce platforms have emerged to complement the services offered by the global giants. Such local e-commerce platforms include Flipkart in India and Lazada in Singapore. These platforms can build competitive advantage based on faster shipping, more flexible payment models, and non-English language interfaces. Increased linkage to local suppliers provides another important positive result: reduced reliance on imports.<sup>6</sup>

## GCC COUNTRIES HAVE THE POTENTIAL TO DISRUPT

The DEI allows policymakers to grasp where their country stands in terms of digital economy development and where they need to focus their efforts. Although GCC countries have enjoyed rapid digital economy growth, they remain behind advanced economies.

### The state of the global digital economy

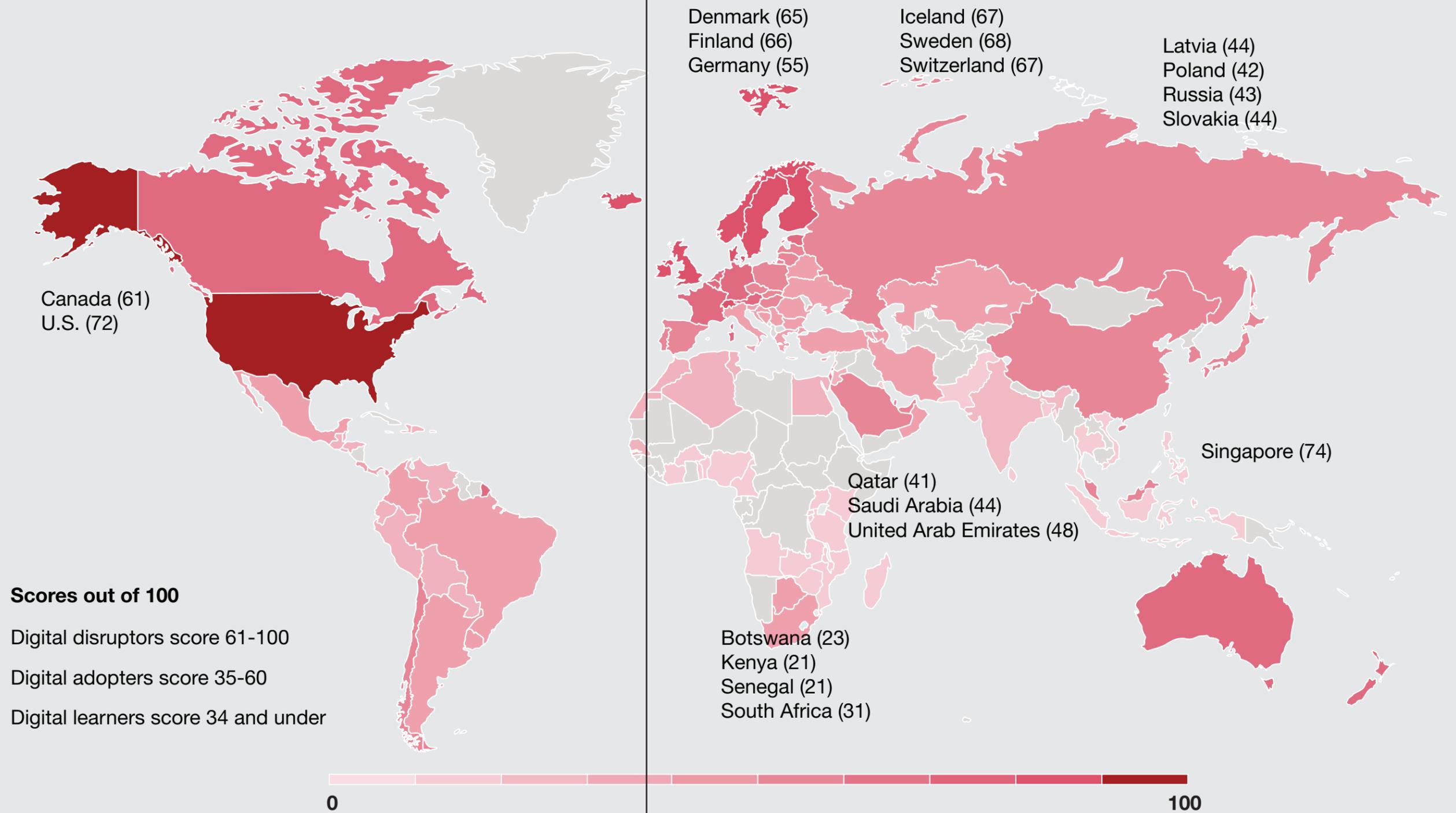
We used the DEI to score 109 countries over the period 2010–20. Despite continuous growth globally in the last year, there is a continuing divide between advanced economies and the economies of the developing world. Ranked by level of the DEI, countries can be grouped into three categories (see *Exhibit 2*):

*Digital learners:* Countries that are prioritizing the development of basic connectivity and adoption. Their score is lower than 35 (on the DEI's scale of 1 to 100). Learners are not yet in the stage of setting plans and strategies to develop the digital sector. Instead, they are enhancing their digital infrastructure to gain the benefits of digital solutions.

*Digital adopters:* Countries that have met connectivity requirements, which in turn promote higher demand for digital outputs. This category includes the GCC countries. Their scores range between 35 and 60. Adopters often are seeking to develop talent, enable digital innovation, and localize digital services. They enable the sector through putting in place policies and regulations, establishing capability development programs, and formalizing partnerships with the private sector.

*Digital disruptors:* Countries that have developed a vibrant, enabling digital ecosystem and are leaders in adopting and producing digital outputs. They score higher than 60. They tend to be net exporters of technology solutions, foster innovation, and sponsor vibrant startup ecosystems, and they are home to best-in-class digital talent. Singapore scores highest in the world with a DEI of 74. The country's strengths are well developed connectivity, high national and government levels of digital adoption, and local emerging technologies.

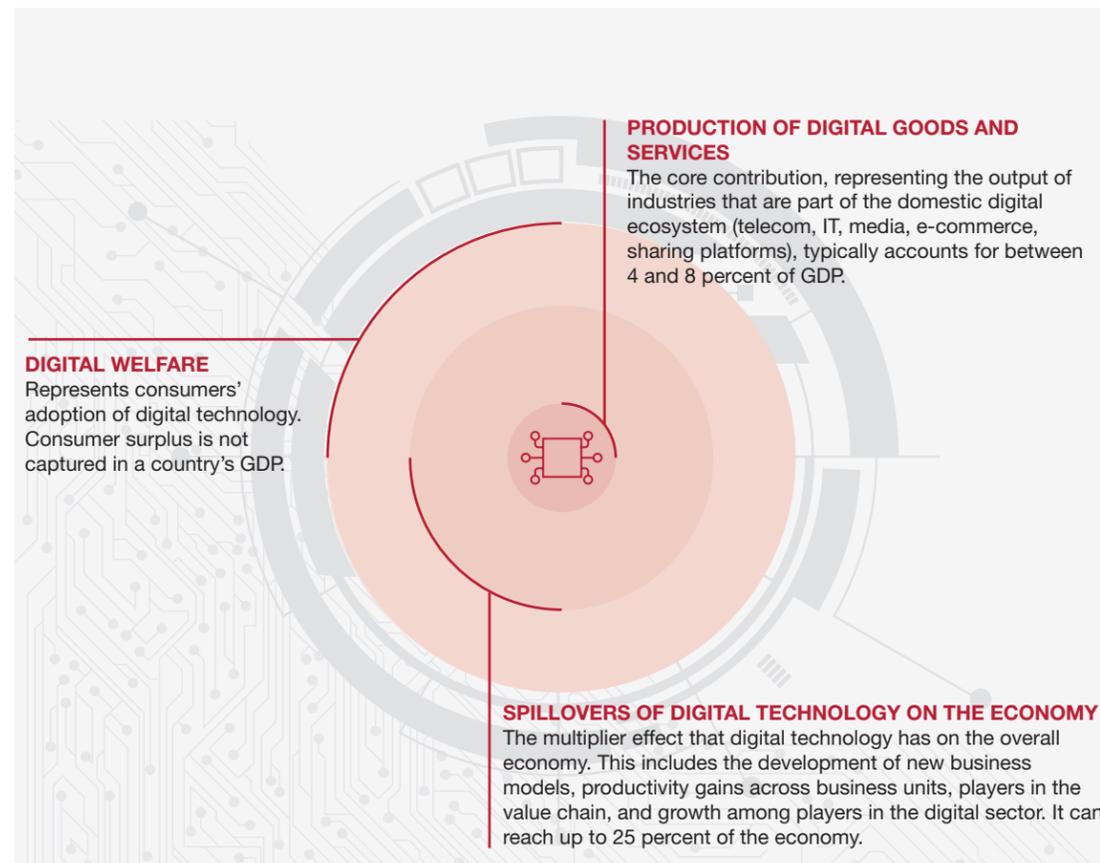
# Countries ranked by the Digital Economy Index



**The potential for economic growth**

Digital products and services are strong engines of economic growth (see *Exhibit 3*). Globally, the DEI grew by 4.6 percent between 2010 and 2020, which means that the digital economy contributed an average of 1.2 percent to global GDP per capita. Our econometric models demonstrate that a 10 percentage point gain in the DEI increases GDP per capita by 2.6 percent. For example, if Saudi Arabia were to increase its current score from 44.47 to 54.72 (Germany's level), its GDP per capita would increase from \$19,587 to \$20,779. For comparison, were Saudi Arabia to move to the level of Singapore, the country with the highest DEI score, then GDP per capita would rise from \$19,587 to \$23,005. For the GCC as a whole attaining Singapore's DEI score would increase the region's aggregate GDP by 18.4 percent, equivalent to \$255 billion. The greatest impact would be in Saudi Arabia, where GDP would grow by \$119 billion.

**EXHIBIT 3  
How digital contributes to the economy**

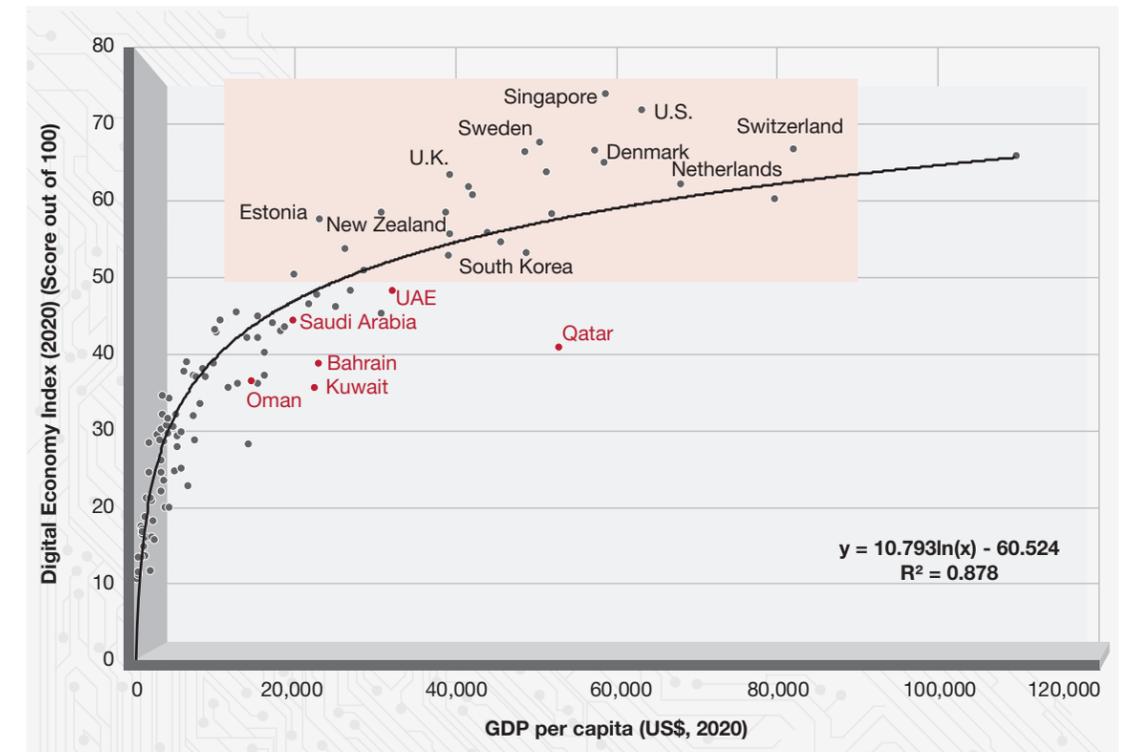


Note: Digital welfare does not account for the consumer surplus that results from the higher standard of living that comes with technology through enhanced empowerment and participation, equal availability of information and services, better inclusion of the socially excluded, and more equal availability of social opportunities.  
Source: Strategy&

These gains were not shared evenly, because the greater the DEI score, the larger the boost to GDP per capita. Our analysis of the 109 countries confirms a strong correlation between a country's DEI score and national economic development (see *Exhibit 4*).

**EXHIBIT 4  
Higher Digital Economy Index scores signal greater GDP per capita gain**

Correlation between the digital economy and GDP growth



Source: World Bank, Strategy& analysis



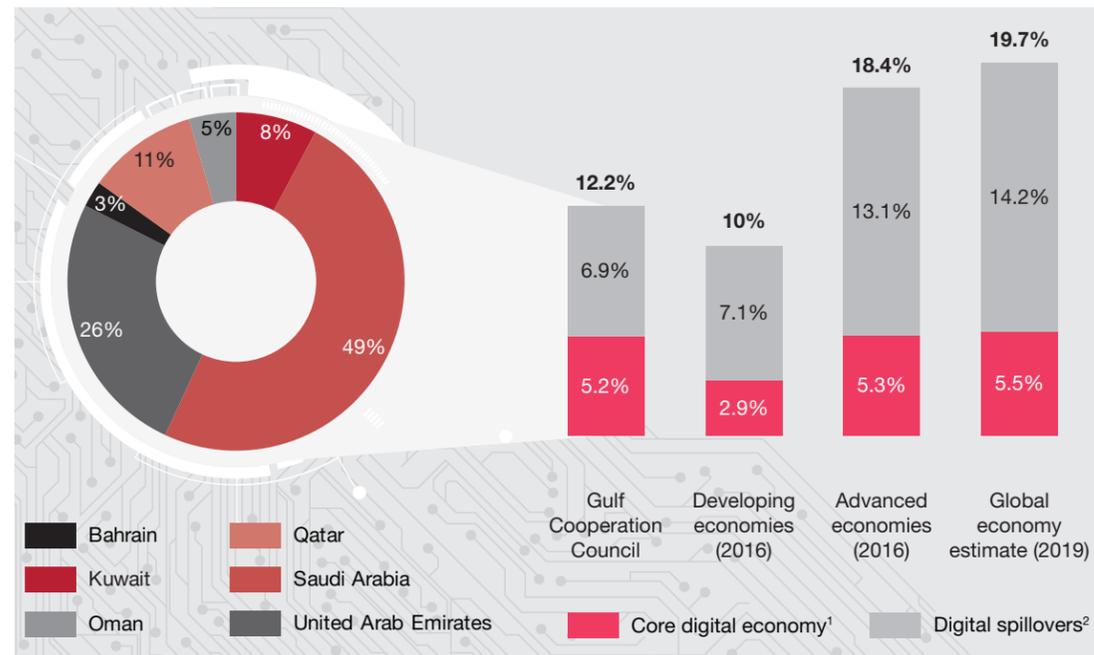
If Saudi Arabia were to increase its current score from 44.47 to 54.72 (Germany's level), its GDP per capita would increase from \$19,587 to \$20,779.

The core contribution of digital production to the economy varies among GCC countries, all of which fall into the category of digital adopters, ranging between 3 percent and almost 11 percent of GDP — which is in line with estimates for developing and advanced economies (see Exhibit 5). However, the amount of spillover benefits for GCC economies is less than the global average because digital assets are not yet fully integrated across economic sectors. Ultimately, infrastructures, solutions, and data should be interconnected and interchangeable to allow for knowledge transfer and solutions exchange among different ecosystems, areas, or sectors. If GCC countries were to move from being adopters to being disruptors, the contribution of the digital economy to the overall economy would grow from 12.2 percent to 13.4 percent. In dollar terms, the percentage increase in the impact of the digital economy implies GDP growth of an additional \$138.2 billion.

Beyond its impact on economic growth, the digital economy promotes employment. An increase in a country's DEI score from 50 to 55 would push up employment growth by 1.1 percent, according to our econometric models. For example, if Saudi Arabia were to reach Germany's current DEI level, that would increase overall employment from 13.39 million to 13.73 million, a net gain of around 340,000 jobs. The job creation effect is higher in countries that are digital learners and adopters than in countries that are digital disruptors. This effect occurs because in learner and adopter countries, where labor costs are lower, digitization does not, in the short term, result in job losses from automation.

**EXHIBIT 5**  
**GCC countries lag behind advanced economies in the contribution of their digital economy to GDP**

Digital economy contribution to GDP (%)



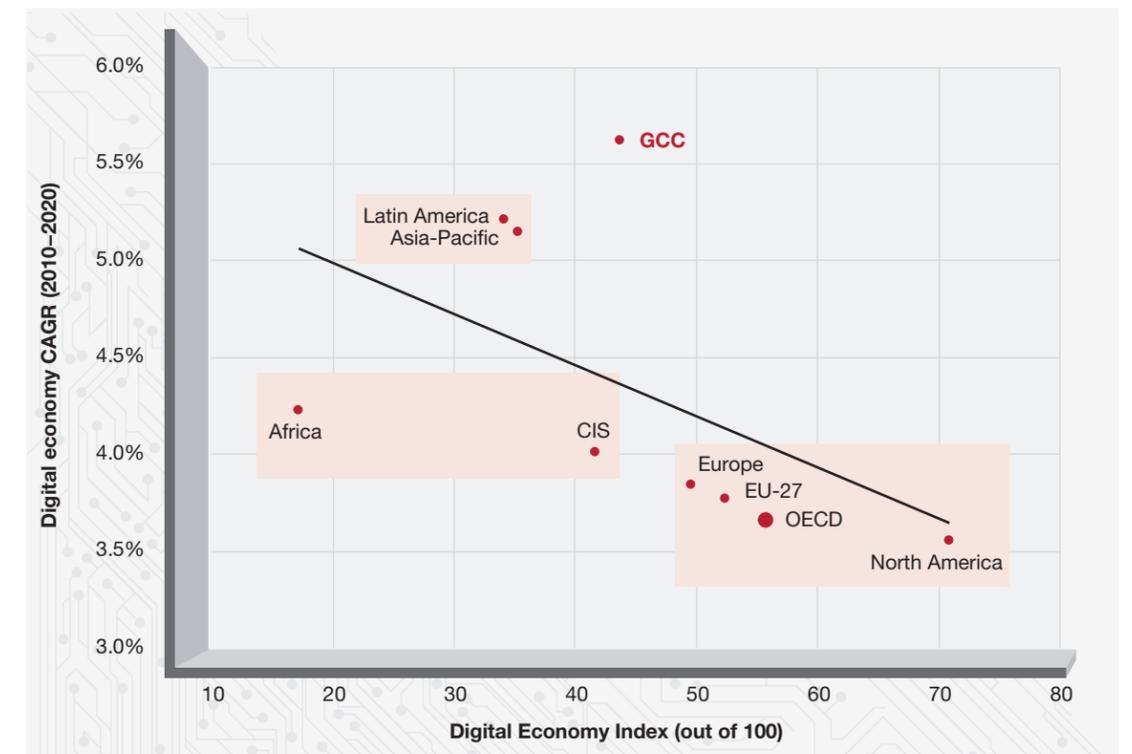
<sup>1</sup> Represents the output of industries that are part of the domestic digital ecosystem (telecom, IT, media, e-commerce, sharing platforms).  
<sup>2</sup> These are the multiplier effect that digital technology has on the overall economy. These include the development of new business models, productivity gains across business units, players in the value chain, and growth among players in the digital sector.  
 Note: Figures may not sum due to rounding.  
 Source: Strategy& analysis, Oxford Economics and Huawei analysis

**The GCC is ripe for disruption**

Although there has been a steady advance in digital development globally since 2010, with rapid progress in some regions, such as Latin America and the GCC, those areas remain appreciably behind digitally advanced economies (see Exhibit 6). The GCC region's DEI score grew the fastest of any part of the world, at twice the speed of the OECD countries over the last decade. To maintain that long-term trajectory, GCC policymakers need to take vigorous action to implement the correct policies, which will turn their countries from digital adopters to digital disruptors.

**EXHIBIT 6**  
**The GCC digital economy is growing fast**

Digital Economy Index 2020 score versus 2010–20 growth



Note: CAGR = compound annual growth rate; CIS = Commonwealth of Independent States.

# The digital economy played a critical role during the pandemic

The digital economy played a major role in mitigating some of the challenges brought on by the COVID-19 pandemic. Technology allowed the world to change the way people live, work, and consume. Even as the pandemic interrupted economic activity, and caused a recession, the DEI continued to grow globally, albeit at a slower rate than previously.

Such continued DEI growth is a result of numerous factors:

- **Industry 4.0 (connected, intelligent manufacturing) and digital transformation.** These are finding fertile soil and driving growth across sectors (e.g., additive manufacturing, healthcare, education), localization of supply chain, and components (e.g., robotics, automation, nano and smart technology). Tech providers are also gaining further relevance as key enablers of enterprises' transformation and technology adoption.
- **AI and machine learning.** There are pervasive applications of AI and machine learning across industries, fueled by massive flows of real-time data from the Internet of Things (IoT, the network of connected devices). 5G, especially private networks, is further enabling new use cases, and expediting the move of data to the "edge," meaning the furthest limits of networks.
- **Emerging and pre-market-entry-stage technologies.** These are also rapidly advancing and attracting most venture capital. Adoption of emerging technologies (e.g., blockchain, additive manufacturing, augmented reality/virtual reality) is on the rise, transforming some sectors and changing supply chains. Pre-market-entry tech, such as quantum computing, next-generation materials, and biotechnology, stands to disrupt industries or render some existing technologies obsolete (e.g., traditional encryption and cyber protection).
- **Greater use of internet platforms.** E-commerce increased in the OECD from an average of 11 percent of total retail trade in 2019 to 15 percent in 2020.<sup>7</sup> Among the GCC countries, this ratio

almost doubled, reaching 5.9 percent in 2020. Overall, internet traffic increased by approximately 30 percent in the GCC between 2019 and 2020.<sup>8</sup>

- **Increased downloads of applications.** Smartphone users have been prolific app downloaders, especially of programs related to education, health, and retail. The global average of annual downloads of health apps increased per 100 people from 6.1 in 2019 to 9.1 in 2020, and in the OECD from 15.1 in 2019 to 25 in 2020. This ratio almost doubled in GCC countries: It rose from 14.4 to 27.3.<sup>9</sup> Specifically, stc (Saudi Telecom Company) reported an immediate 1,000 percent surge in traffic on education portals, a 177 percent increase in visits to health portals, and a 70 percent increase in mobile app downloads.<sup>10</sup>
- **Increased telecommunications capital investment.** Between 2019 and 2020, telecommunications investment per capita grew an average 3.6 percent in OECD countries because of the deployment of 5G and fiber optics infrastructure. Although telecommunications investment in GCC countries declined 2.3 percent in 2020, it was still at the highest level among developing economies.<sup>11</sup>
- **Continued growth of broadband adoption.** Adoption of fixed broadband has increased everywhere. The rate of adoption has varied according to the need to accommodate teleworking, distance learning, remote entertainment, and telemedicine. In the OECD countries, fixed broadband grew from 88 percent of households in 2019 to 91 percent in 2020. In contrast, fixed broadband was already at a saturation point in the GCC, at 153.7 percent of households.<sup>12</sup>

Strategy&'s analysis shows that generally, the more developed the digital economy in a given country, the lower its economic repercussions from the pandemic. The pandemic's average negative impact on GDP reached 3.2 percent globally, compared with only 1.2 percent for those countries that were in the top 45 percent scorers in the DEI.<sup>13</sup>

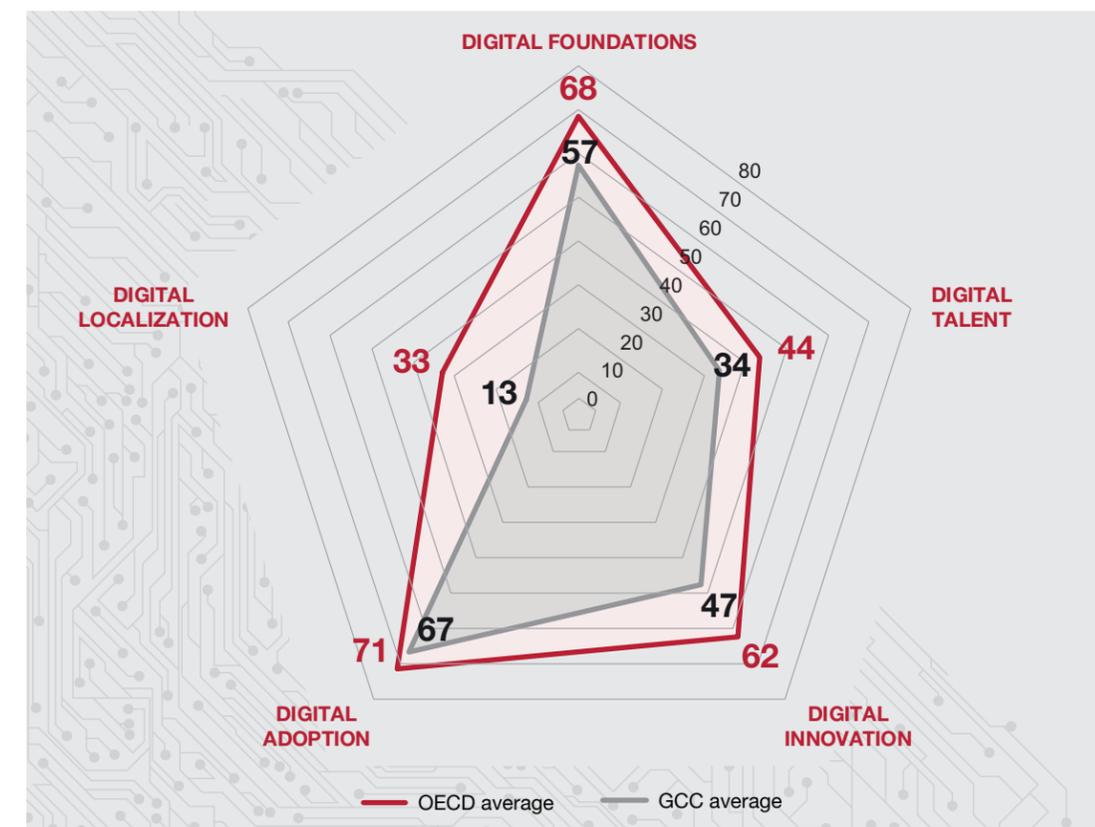
## GCC COUNTRIES NEED TO ADVANCE DIGITALLY

GCC countries need to advance in all areas, notably innovation and local production (see Exhibit 7). Like all other countries, the GCC states need to foster the development of talent. Ensuring the development of all aspects of the digital economy will be vital in making the leap from adopters to disruptors. Although long-term digital economy growth in the GCC has been strong, it has slowed recently. The compound annual growth rate (CAGR) of the DEI of GCC countries declined to 4 percent in 2020 from 5.6 percent in 2010–19. The slowing growth rate was more acute than in advanced economies, in which the CAGR dropped to 3.6 percent from 3.8 percent over the same period.

### EXHIBIT 7

#### GCC countries score lower than advanced economies across all pillars

DEI pillar comparative assessment of GCC versus OECD, 2020 (Aggregate scores out of 100)



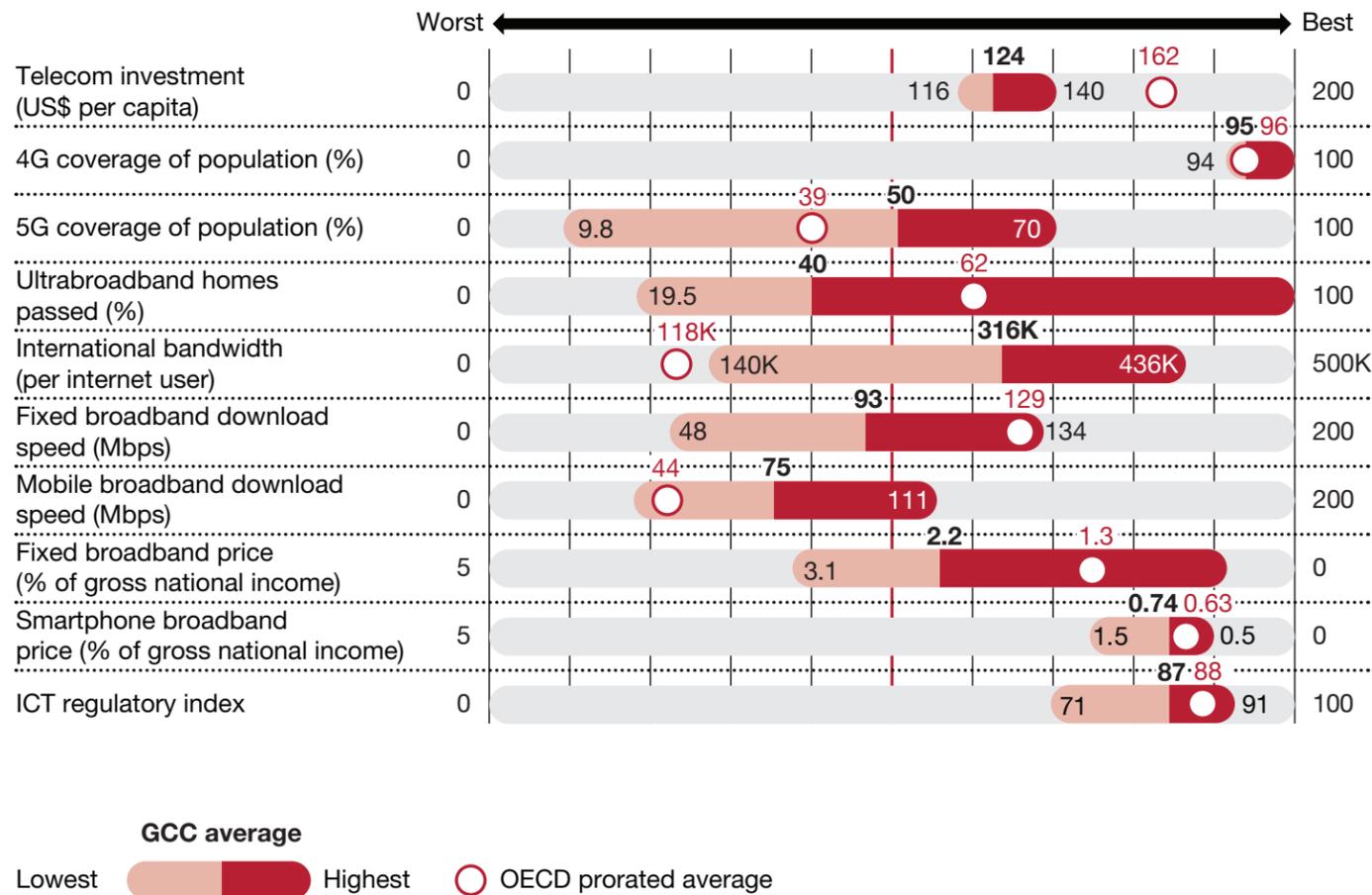
Source: Strategy&

### Foundations

In terms of their foundations, GCC countries are almost at parity with the OECD in the adoption of digital technologies. GCC countries are investing heavily in digital infrastructure; in some areas, investment has put GCC countries at a level above the OECD average. The United Arab Emirates (UAE), for instance, matches or even exceeds OECD performance on several indicators such as homes served by ultra-broadband resources. The UAE also has the fastest mobile broadband speed in the world, at 111 Mbps<sup>14</sup> (see Exhibit 8).

### EXHIBIT 8 GCC countries are at diverse stages of maturity across the different digital foundation elements

Digital foundations: Comparative performance of selected indicators (2020)



Source: International Telecommunications Union, GSMA intelligence, IDATE, Ookla speedtest, Strategy& analysis

### Talent

GCC countries need to do more to reach the level of OECD countries in terms of their talent. The GCC countries' challenges are notable in the education received by secondary school graduates; the production of science, technology, engineering, and math (STEM) graduates; and the availability of AI talent. The region has a prorated average of 2.1 PhDs in AI per million people, compared with the OECD average of 24.9. In terms of tertiary education graduates, the GCC average is 2,964 per million people, while the average for the OECD is 4,225.<sup>15</sup>

GCC countries are not producing enough local digital talent mainly because of limited preparation of high school graduates for university-level STEM disciplines. The average PISA (Programme for International Student Assessment) test score is 386 in Saudi Arabia, 411 in Qatar, and 433 in the UAE. This compares with 525 in Estonia, 556 in Singapore, and 578 in China. Also, there is a paucity of digital specialists in the job market. The proportion of AI specialists in GCC countries is an average of 1.7 percent of the total workforce compared with 5.4 percent in the E.U. and 6.9 percent in Singapore.<sup>16</sup>

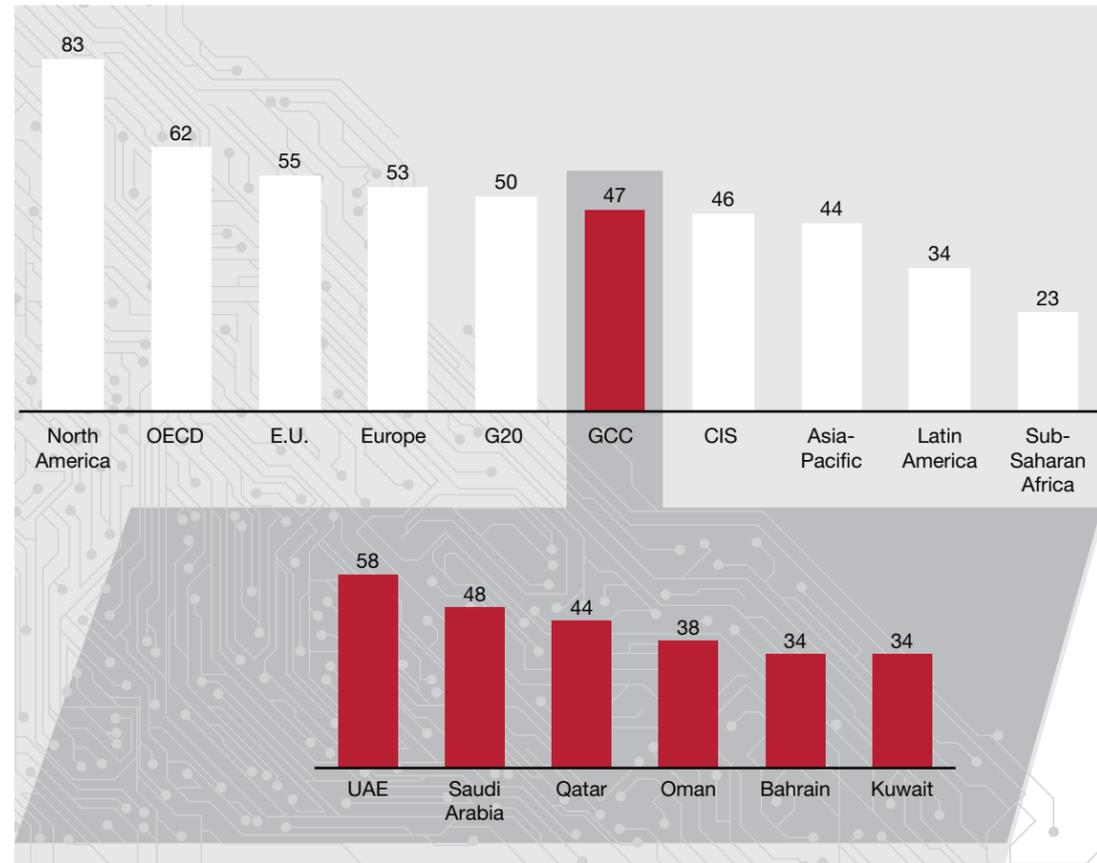


**Innovation**

Most GCC countries need more R&D and financial resources to support innovation. The GCC average score for innovation in the DEI is 47.3, compared with the OECD average of 62.1 (see Exhibit 9).

**EXHIBIT 9**  
**Most GCC countries lag behind on innovation capacity**

Innovation pillar index scores  
(Score out of 100, 2020)



Note: CIS = Commonwealth of Independent States.  
Source: OECD, UNESCO, World Bank, GEM, Strategy& analysis

The presence of startups is also an indicator of digital innovation. Our analysis of Crunchbase data indicates that startup concentration in the region ranges from one startup per million people in Qatar to around 15 per million in the UAE, compared with figures of 150 in Estonia and 173 in Singapore. The number of deals is expanding, with noticeable growth since 2015. By 2019, \$516 million had been invested, according to startup platform provider MAGNiTT (see “The first GCC unicorns are born”).<sup>17</sup>

Some of this growth can be attributed to increasing interest from international investors. Amazon acquired Dubai-based e-commerce company Souq.com in 2017, and Uber purchased Careem, a ride-hailing application in the United Arab Emirates, in 2019. Regional corporates have also stepped up acquisitions of startups: Dubai’s Majid Al Futtaim acquired UAE-based delivery platform Wadi.com in 2019.

**Adoption**

GCC countries’ scores are almost at parity with the OECD score when it comes to the adoption of digital technologies. The rate of mobile broadband and smartphone adoption reached 153 percent and 135 percent, respectively, for the GCC in 2020, compared with 106 and 92 percent for OECD countries.<sup>18</sup> Usage of the internet reached 98 percent of the GCC population compared with 90 percent for the OECD.<sup>19</sup>

These countries rank high on the United Nations’ E-Government Development Index, with a regional average of 0.80 compared with 0.87 for the OECD.<sup>20</sup> The GCC also has high levels of e-banking and app downloads. However, GCC countries would benefit from further boosting online transactions with consumers. We estimate, based on Euromonitor data, that in 2020, internet retail as a percentage of total retail trade reached a GCC average of around 6 percent, compared with 15 percent for the OECD.<sup>21</sup>

# The first GCC unicorns are born

Over the past five years a series of unicorns, startups valued at \$1 billion or more, have emerged in the Gulf region. They include Souq.com, Careem, the Emerging Markets Property Group, and digital wallet provider stc pay. The improving investment climate in the region has attracted investor attention.<sup>22</sup> Saudi Arabia recently witnessed the emergence of another success story: Tamara, a fintech that uses a “buy now, pay later” model to help consumers spread out e-commerce payments. Together with its retail partners, Tamara offers installment plans that comply with Shari’a (Islamic law). This approach to payments provides an alternative to credit cards and cash on delivery. Tamara tested its innovative product through the fintech “sandbox” of the Saudi Central Bank,

which offers a space to explore ideas without being bound by strict regulatory conditions. The company attracted Series A funding of \$110 million, the largest investment of its kind in the region.<sup>23</sup>

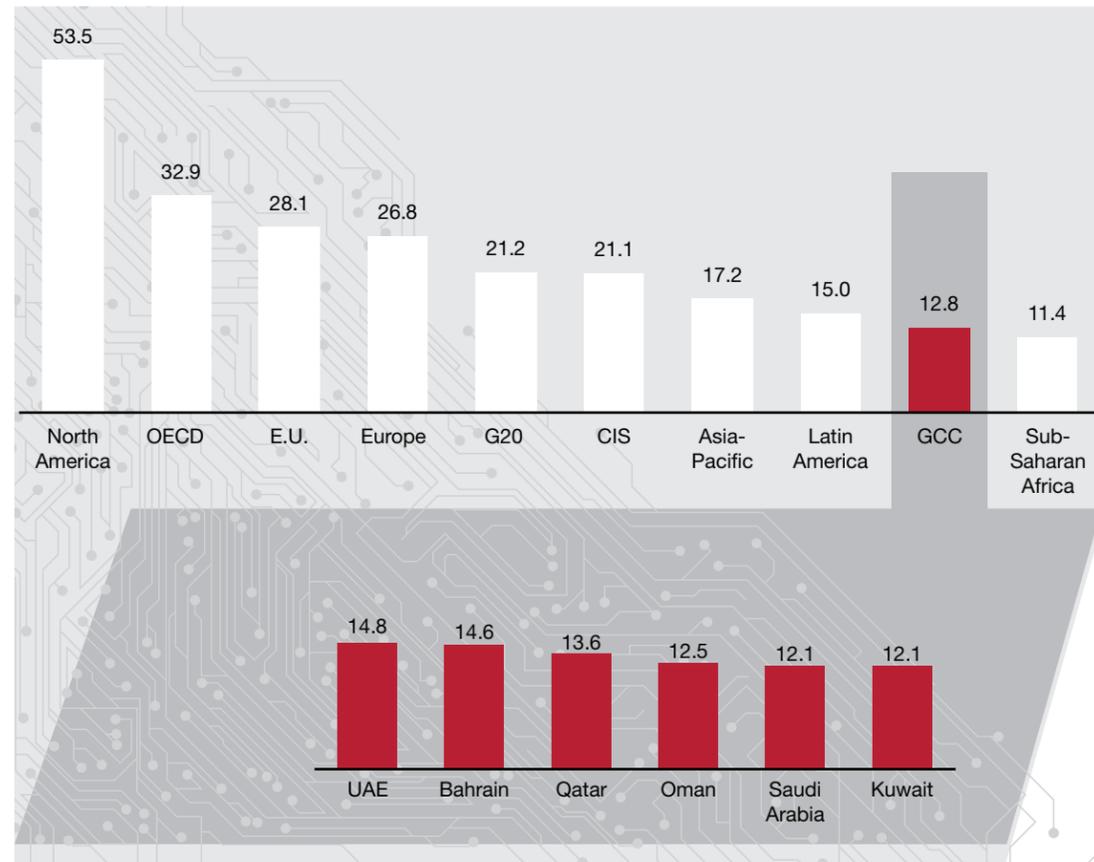
The sandbox concept is widely used throughout the GCC. In efforts to kick-start young companies, all GCC governments foster an entrepreneurship ecosystem featuring regulatory sandboxes. They facilitate funding and institutionalize laws that promote public procurement from local small and medium-sized enterprises (SMEs). Continuing these efforts will create additional benefits and enhance the region’s performance on the innovation and local production pillars.

**Local production**

GCC countries do not have enough local production of digital goods and services because domestic digital industries are at an early stage of development, and because they need to funnel more resources to develop, fund, and support digital entrepreneurs (see Exhibit 10). The shortfall in local production means GCC countries depend on technology and services imported from other countries, which can weaken national resilience. Dependence on foreign suppliers can have implications for sovereignty, particularly when the technology relates to critical systems for infrastructure and security.

**EXHIBIT 10**  
**There is insufficient localization in the GCC**

Local production pillar index scores (score out of 100, 2020)



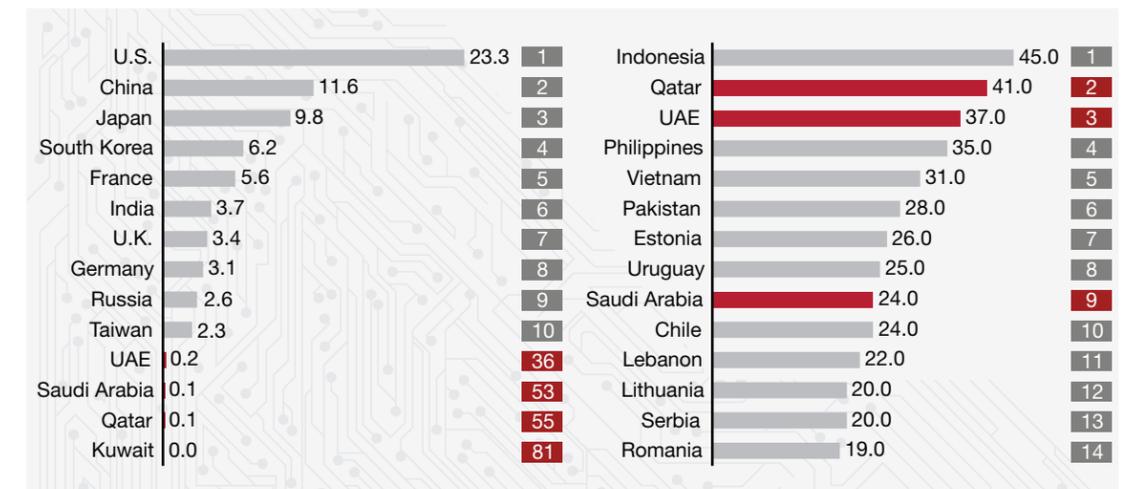
Source: PwC; International Telecommunication Union; GSMA Intelligence; Alexa; INSEAD; World Bank; Crunchbase; Strategy& analysis

Several metrics identify the gaps in local production by digital companies. GCC countries have fewer big data companies per capita than advanced economies. According to our analysis of Crunchbase data, the share of big data companies per million people in GCC countries ranges between 0 and 2.5, compared with an average of 4.4 in the OECD. A shortage of companies that create, manage, and analyze data puts GCC countries at a competitive disadvantage in the digital economy and overall economic performance given the importance of data. There is a similar need to develop AI, which many believe to be the single most important technology influencing economic development in the foreseeable future. The GCC registers a maximum of 6.6 AI companies per million people, against 22 per million in the United States.<sup>24</sup>

Some signs, however, suggest that local output in the region’s digital innovation is increasing rapidly, albeit from a low base. According to App Annie data, three GCC countries — Qatar, the UAE, and Saudi Arabia — are among the top 10 improvers in terms of growth in number of apps published (see Exhibit 11).

**EXHIBIT 11**  
**Some GCC countries have strong local app growth**

Share of apps published by country (% of world total and rank, 2018) | Growth in number of apps published by country (% growth from 2010 to 2018 and rank in 2018)



Source: PwC; International Telecommunication Union; GSMA Intelligence; Alexa; INSEAD; World Bank; Crunchbase; Strategy& analysis



According to App Annie data, three GCC countries — Qatar, the UAE, and Saudi Arabia — are among the top 10 improvers in terms of growth in number of apps published.

## LEAP THE DIGITAL GAP

GCC countries have the opportunity to build on their growth in order to boost their digital economy and move toward becoming digital disruptors. They enjoy well-developed infrastructure and have increased digital investment, particularly in telecommunications. Consequently, affordability, coverage, quality, and service have all improved, reaching a level close to the average performance of advanced economies. The GCC region has also made noteworthy commitments in AI, cybersecurity, and IoT.

However, to leap the digital gap and keep pace with advanced economies, GCC countries need to focus their efforts in three main areas: reforming the regulatory framework, deepening the talent pool, and strengthening innovation and localization.

### 1. Reforming the regulatory framework

GCC governments should adapt their regulatory frameworks to recognize the new market realities of the digital era. These changes should be undertaken by official entities in each country. Regulations need to be adaptive and anticipatory to keep pace with technological and business model changes. Governments also need to build their economic and technical capacity in a way that will allow them to assess continually the impact of specific policies and correct any implementation shortfalls. In particular, careful regulation of financial services, data protection, digital economy policies (e.g., taxation), cybersecurity, and e-commerce transactions can increase the efficiency of financial flows in the region.

Digital-era regulations need to follow four principles:

#### *Collaborate on the regulatory framework*

Governments should consolidate regulation of the digital economy across a number of adjacent sectors, such as media and the internet. Such cross-sectoral regulation avoids fragmentation, acknowledges that digital is erasing sectoral boundaries, and allows the government and regulators to identify opportunities for proactive intervention. However, changes should be implemented only when and where necessary. In that manner, governments and regulators will allow ideas to test and adapt to their environment, learn continuously from changes in the market, and intervene only when needed for the growth of the solutions or sector, to keep the innovation momentum going.

#### *Create outcome-based regulations*

Governments should be clear on the desired outcomes of regulations. They should adopt a bottom-up method that is informed by market developments.

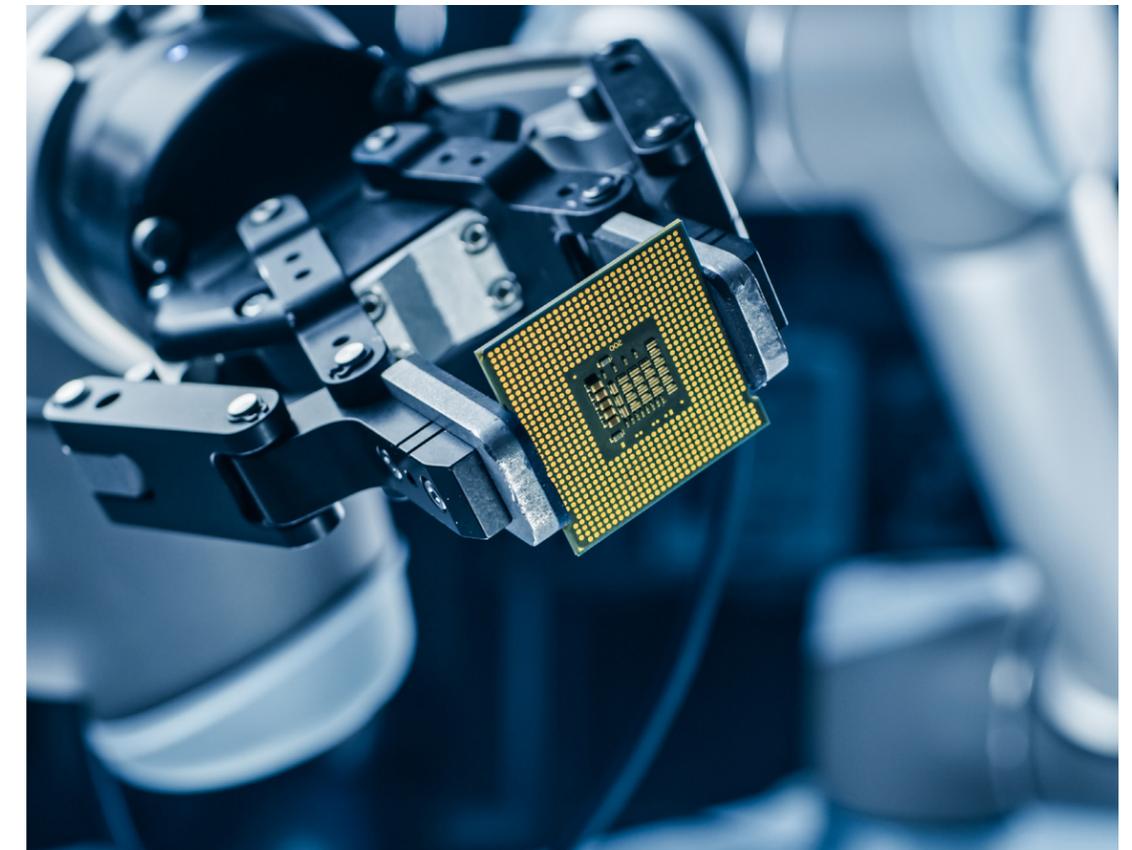
#### *Design an experimental regulatory framework*

To remain relevant in a fast-moving environment, governments should adopt an experimental regulatory process for testing, developing, enforcing, and monitoring interventions. The aim should be to move from a static to an agile process.

#### *Ensure that the regulatory framework develops constantly*

Regulators should continually test whether proposed rules can stand up to the underlying uncertainties of technology and disruptive business models, and to the rapid pace of change. This approach would mark a departure from the traditional method of regulating once and then assuming the job is finished for an extended period. Regional entities already adopting this methodology include, in Saudi Arabia, the Saudi Central Bank, the Communications and Information Technology Commission, the Ministry of Labor, and the Capital Market Authority.

Authorities should also consider a reexamination of the overall governance of regulations. The digital age imposes its own set of rules: Governments should not handle these rules as modifications to existing legislation and policies. One body with overall supervisory control would be better positioned to identify gaps and overlaps, address hurdles to technology adoption, and oversee consumer protection. The U.K., for example, established the Digital Regulation Cooperation Forum in July 2020 to encourage cooperation regarding regulation of online platforms. It includes the U.K.'s Competition and Markets Authority, the Information Commissioner's Office, the Office of Communications, and the Financial Conduct Authority.



## 2. Deepening the talent pool

Countries in the region should develop more digital talent, without which there cannot be a sustainable, thriving digital economy. Digital talent is a combination of the capacity of the education system to produce the knowledgeable graduates required by the economy, upgrade the basic and advanced skills of current workers to operate and innovate digital technology, and increase the current share of the labor force employed in digital occupations.

Governments can consider several interventions to improve this situation. They should start by calculating the market demand for digital jobs to determine which skills should be provided by the educational system in the short term. The Norwegian Labor and Welfare Administration conducts quarterly surveys of public- and private-sector enterprises to learn if they have encountered barriers in recruiting digital workers or if they have been forced to hire less-qualified employees.<sup>25</sup> That knowledge provides the Norwegian government with an up-to-date warning system of capability gaps in the labor force.

Building on that understanding of the demand for digital talent, governments need to ensure a proper supply of skills development in primary, secondary, university, and vocational education. Programs at the primary and secondary levels should focus on digital immersion by incorporating digital technology into the teaching of all subjects, which involves such measures as AI-enabled curriculums, the use of augmented reality, and modular learning. France's digital plan for schools has launched obligatory programming courses at the primary level, defined a baccalaureate specialized in "digital and informatic sciences," and organized digital training for teachers.<sup>26</sup>

### *Complement formal training and education*

Formal training can be complemented by having educational institutions offer massive open online courses (MOOCs) to address gaps in digital disciplines. These should include offerings in English from leading international schools and MOOC productions in local languages. The European MOOC consortium brings together educational institutions and the private sector to ensure that programs are credible and meet labor market needs.<sup>27</sup> Seventy-three percent of employers surveyed across the E.U. stated that they were impressed by applicants who listed MOOC courses on job applications because that reflected curiosity, the ability to work from a distance, and self-discipline.<sup>28</sup>

### *Attract overlooked population segments*

The formal education system needs to be complemented with vocational and targeted training programs aimed at particular social groups, such as the economically disadvantaged, seniors, and women out of the workforce. Women are especially underrepresented among digital workers. A study by LinkedIn and Strategy& found that the percentage of women among digital professionals in GCC countries (14 percent) is significantly lower than that in peer countries (30 percent).<sup>29</sup> Governments need to ensure that the education system, employer training, and flexible employment arrangements cater to women's needs, particularly in offering flexible employment.

Another overlooked population, the young unemployed, has been targeted in Italy by the Unioncamere (the Chamber of Commerce) and the Ministry of Labor and Social Policy. These organizations launched the Crescere in Digitale program in partnership with Google to offer free online training in digital skills required by SMEs to around 500,000 unemployed youth. The top 3,000 performers received a six-month paid internship to work within an SME team on digital projects.<sup>30</sup>

### *Use specialist institutions to improve skills*

Investment in specialist institutions that develop advanced digital skills can help bridge the skills gap faster than traditional educational institutions. The Kerala Blockchain Academy is an initiative backed by the Indian government to build capacity in blockchain technology and support R&D and entrepreneurship.<sup>31</sup> The academy has a target of graduating 20,000 blockchain experts by the end of 2021, offering better capabilities for emerging startups.<sup>32</sup>

### *Set training standards*

Governments should set quality and content standards for qualifications and credentials obtained from training programs. Standards promote consistency and increase trust and commitment among companies and employees. France, for instance, has developed the framework of national certifications, which is sponsored by the Ministry of National Education and covers more than 10,000 certifications.<sup>33</sup>

### *Offer incentives, including e-residency*

Governments should also offer incentives to private-sector enterprises to provide on-the-job digital trainings. Encouraging foreign technology companies to enter the region would boost knowledge dissemination in the wider population when employees leave to establish their own ventures or work for local enterprises.

To address pressing short-term gaps in the supply of essential digital skills, governments can launch e-residency programs that will promote an influx of skilled workers from around the world who do not need to be physically present to perform their jobs. In a post-pandemic world, e-residents will support the region's move toward a knowledge economy.

## 3. Strengthening innovation and localization

Local production and digital innovation are vital because they contribute significantly to the growth of national GDP and jobs, either directly through revenues and direct employment, or indirectly by nurturing an ecosystem of innovative startups and SMEs.

### *Identify strategic sectors*

Governments should begin by identifying and prioritizing strategic sectors that reflect domestic resources and strengths, strategic priorities, and broader economic plans. Accordingly, they should define targets, guidelines, and implementation approaches to move their economies in the direction of supporting the innovation and localization efforts of digital solutions in industries or sectors of focus.

### *Build partnerships*

The public sector should not act alone. Joint initiatives with the private sector could generate road maps to direct companies on their digital transformation journeys, write use cases on how advanced technologies can address particular business problems, and create maturity indices and tool kits that enable companies to assess their own level of digital transformation.

### *Use dedicated funding and government purchasing power*

Governments can also stimulate, through dedicated funding or incubation support, the development of technology firms focused on launching products or services that enhance productivity and efficiency—for example, AI applications or robotics systems. These efforts can be complemented by crafting a national strategy for e-commerce, encouraging development of internet platforms and channels.

Governments can use their purchasing power to boost local technology providers and market development. For example, they could stimulate rapid growth in the app market by collaborating primarily with local developers in targeted sectors. Dubai's Roads and Transport Authority partnered with the ride-hailing application Careem in April 2019 to allow users to book public taxis.<sup>34</sup>

The many examples of leading practices in this domain include Industrie 4.0 (Germany), the Industry Value Chain Initiative (Japan), and Made in China 2025 (China), aiming to boost local production and decrease reliance on imports.

Although assessing the success of these programs is difficult, some clues emerge. The Made in China initiative is a national plan to increase import substitution in high technology, develop a national technology ecosystem, and implement local government strategies to upgrade the industrial system. It led to the emergence of more than 500 smart manufacturing industrial parks focusing on specific technologies (e.g., 21 percent are focused on big data). Green solutions and sustainable development helped China account for 53 percent of global production of electric vehicle batteries in 2017.<sup>35</sup>

#### *Enact data standards*

Data standards are critical for coordinating interorganizational communication. Private-sector consortia can initiate the development of standards, but governments play a key role in defining data norms that facilitate connectivity among distinct devices and company platforms. The Australian government is modernizing its data system and formalizing data-exchange standards and agreements. It is developing a clear framework to support entities in their data-sharing decisions, setting standards for ethical data use, and streamlining data exchange processes.<sup>36</sup> It has also created a data-exchange platform, data.gov.au, that allows entities to access and share data.<sup>37</sup>

Similarly, to enable the digital supply chain and trade — which is intricately supported by interorganizational communications — governments need to ensure they are complying with international standards when it comes to data collection and exchange, taxonomies, emerging technologies (AI, blockchain, etc.), conditions of use, privacy regulations, ethics, identification reporting, and interfaces. Compliance with international standards will enable them to better coordinate with more advanced economies through data sharing, adoption of a global digital ID, e-invoicing/e-payments, and transfer of digital solutions.

#### *Set up technology centers*

Another potential initiative to promote local production, particularly among SMEs, is the creation of a network of technology centers that coordinate public and private investment in emerging advanced digital technologies. Such networks would consist of multiple linked centers for digital innovation with common goals but unique technological concentrations — AI, 3D printing, smart manufacturing — serving as technology hubs. The centers would connect academia, government partners, and industry to exploit existing resources, collaborate, and coinvest to accelerate commercialization, and create a sustainable research-to-production infrastructure. By bridging the gap between applied research and product development, the centers would encourage even more investment and production in strategic technology areas for GCC countries and across the region. Although each center would champion a particular technology focus, the network would be regional, integrated, and dynamic, aiming to foster innovation and deliver new capabilities to stimulate digital innovation. Similar examples can be found in the U.S. (Manufacturing USA), Germany (Fraunhofer Institutes),<sup>38</sup> and Japan (Kohsetsushi Centers).<sup>39</sup>

## CONCLUSION

GCC countries are growing their digital economy almost twice as fast as advanced economies are, but they must move faster in three areas: reforming the regulatory framework, deepening the talent pool, and strengthening innovation and localization. Advancing in these areas will allow them to move from being digital adopters to being digital disruptors — a critical step for ensuring economic growth, creating jobs, and building economic resilience and sovereignty.

Investing in the digital economy holds a promising return. A 10 percentage point increase in the DEI is associated with a 2.6 percent rise in GDP per capita growth. Growing the digital economy is no longer a choice for GCC countries, but an imperative for its economic future.

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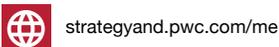
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