



Egypt Digital Economy Country Assessment

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Acronyms and Abbreviations

4G	fourth generation mobile network
AI	artificial intelligence
AML	anti-money laundering
API	application programming interface
ASN	autonomous system number
B2B	business to business
B2C	business to consumer
CAIX	Cairo Internet Exchange Point
CBE	Central Bank of Egypt
CDD	customer due diligence
CDN	content delivery network
CFT	combating the financing of terrorism
DE4A	Digital Economy for Africa
DECA	digital economy country assessment
DFS	digital financial services
EBC	Egyptian Banks Company
EBI	Egyptian Banking Institute
ECA	Egyptian Competition Authority
EG-CERT	Egypt Computer Emergency Response Team
EGDI	E-Government Development Index (United Nations)
EGP	Egyptian pound
e-KYC	electronic know-your-customer
EMLCU	Egyptian Money Laundering Combating Unit
fintech	financial technology
FCP	financial consumer protection
FDI	foreign direct investment
FRA	Financial Regulatory Authority
FTTC	fiber to the curb
FTTH	fiber to the home
FTTX	fiber to the X: All possible optical fiber services from a telecom carrier to its customers
FY	fiscal year
G2P	government-to-person
GB	gigabyte
GCC	Gulf Cooperation Council
GCI	Global Cybersecurity Index
GDP	gross domestic product

GDPR	General Data Protection Regulation
GEM	Global Entrepreneurship Monitor
GIS	geographical information system
GNI	gross national income
GPSS	Global Payments System Survey
GSMA	Groupe Spécial Mobile Association
GTCI	Global Talent Competitiveness Indicators
ICC	International Chamber of Commerce
ICT	information and communication technologies
ID	identification
ILO	International Labor Organization
IoT	internet of things
IP	internet protocol
IP Law	intellectual property law
IPR	intellectual property rights
ISP	internet service provider
IT	information technology
ITI	Information Technology Institute
ITIDA	Information Technology Industry Development Agency
ITM	international technology management
ITU	International Telecommunication Union
IXP	internet exchange points
KYC	know-your-customer
Mbps	megabits per second
MCIT	Ministry of Communications and Information Technology
MENA	Middle East and North Africa
MFI	microfinance institution
MHz	megahertz
MNO	mobile network operator
MOETE	Ministry of Education and Technical Education
MOF	Ministry of Finance
MoHP	Ministry of Health and Population
MoI	Ministry of Interior
MoJ	Ministry of Justice
MoSS	Ministry of Social Solidarity
MSME	micro, small, and medium enterprise
MTO	money transfer operator
NGO	nongovernmental organization
NID	national identification
NTRA	National Telecommunications Regulatory Authority
OECD	Organization for Economic Co-operation and Development

OSI	Online Services Index
OSQ	Online Services Questionnaire
P2P	person-to-person
P-TECH	Pathway in Technology Early College High School
PDPC	Personal Data Protection Centre
PIRLS	Progress in International Reading Literacy Study
POS	point of service
PPP	public-private partnership
PSP	payment service provider
R&D	research and development
RTGS	real time gross settlement system
SCMR	Supreme Council for Media Regulations
SIM	subscriber identification module
SME	small and medium enterprises
SMP	significant market power
SSN	social safety net
TE	Telecom Egypt
TEA	total entrepreneurship activity
TIMSS	Trends in International Mathematics and Science Study
TRA	Telecommunications Regulatory Authority
TVET	technical and vocational education and training
UNCTAD	United Nations Conference on Trade and Development
UN DESA	United Nations Department of Economic and Social Affairs
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNICEF	United Nations Children’s Fund
USSD	unstructured supplementary service data
VC	venture capital
WEF	World Economic Forum
WIPO	World Intellectual Property Organization



Executive Summary

The Egyptian Context

Digital transformation lies at the heart of the Arab Republic of Egypt's economic potential, and the country is currently well placed to emerge as a digital leader in the Middle East and North Africa (MENA) region. Strategically located at the intersection of Africa, the Middle East, and West Asia, Egypt benefits from a growing youth bulge and represents a large national market with a population of 100 million. The country boasts diversified commercial sectors, from agriculture and manufacturing to textile and automotive. In recent years, through the implementation of important fiscal reforms that began in 2016, Egypt has managed to restore confidence in the economy and maintain macroeconomic stability. A set of new laws was passed to address a number of longstanding challenges facing key sectors.² Public investment in roads and infrastructure was expanded to boost connectivity, electricity, and gas supply. In addition, the government of Egypt program for the period 2019–22 is intended to promote further economic growth and the development of human capital (World Bank Group 2019).

Egypt's well-established information and communication technologies (ICT) sector is one of the largest in the region and is poised to accelerate digital transformation across the board, recent Government announcement³ confirm that the development of the ICT sector through reform is a priority. The contribution of ICT to the country's gross domestic product (GDP) was around 4 percent in fiscal year (FY) 2018/19, representing a 16.7 percent year-on-year increase compared with FY2017/18 (MCIT 2020). The government is strongly committed to fostering the emergence of a digital economy and accelerating the country's digital transformation. In 2018, the government adopted the ICT Sustainable Development Strategy 2030 reflecting its ambition to fully embrace the digital economy for growth and job creation (MCIT 2018). Key commitments under this strategy include (a) achieving real GDP growth of 12 percent; (b) becoming a digital hub for the region; (c) scoring among the top 30 nations in the World Economic Forum's Global Competitiveness Index (Schwab 2019); (d) reducing the unemployment rate to 5 percent; (e) increasing female participation in the labor force to 35 percent; and (f) ending extreme poverty. The aim is to accelerate digital transformation through a multi-ministerial effort, leveraging digital technologies as a major driver of change to improve economic performance, business models, productivity, and overall social well-being. Egypt fares relatively well on the Government Artificial Intelligence (AI) Readiness index ranking 56 out of 172 countries⁴.

Although the recent COVID-19 pandemic has intensified many preexisting economic challenges in many countries around the world, it has also highlighted the vital role that digital technologies play in crisis response and recovery. Recent government estimates point to a US\$55 billion public financial gap due to COVID-19 and a public debt-to-GDP ratio of 88 percent for FY2020/21.⁵ Ensuring crisis response and mitigation while preserving the gains of earlier economic reforms remains an important challenge. Special attention is owed to the poor and vulnerable, including women, youth, and informal workers, who are

² Cybercrime, intellectual property, consumer protection, data protection, and e-signature laws have been enacted.

³ President Abdel-Fattah El-Sisi directive during a review meeting of the implementation progress of national projects, in the field of communications and information technology nationwide
<https://english.ahram.org.eg/NewsContent/1/64/409096/Egypt/Politics-/Sisi-directs-to-speed-up-implementation-of-digitis.aspx>

⁴ https://mctit.gov.eg/en/Media_Center/Press_Room/Press_Releases/53006

⁵ Egyptian Finance Minister Mohamed Moeit's statement, Monday, February 11, 2019, outlined his department's strategy to reduce the debt-to-GDP ratio from 93 percent in June 2019 to 88 percent in June 2019 and to 80 percent in June 2022.

disproportionately affected by the crisis and are at risk of job loss and even extreme poverty.⁶ Nevertheless, the nature and urgency of the pandemic have created several opportunities for leapfrogging through digitalization in key sectors such as manufacturing, agribusiness, education, health care, and government services. Digital technologies and enabling digital policies are playing a key role in mitigating the crisis through advanced connectivity and access to indispensable digital services.⁷

For countries to effectively leverage digital technologies to transform the public and private sectors, as well as improve quality of life for their citizens, governments need to build a solid foundation that fosters innovation and fuels the digital economy. This foundation consists of the following key elements:

- An enabling legal and regulatory framework (cross-cutting enabler)
- Affordable and universal broadband connectivity (digital infrastructure)
- Strong human capital and adoption of digital skills (digital skills)
- Digitalization of government services and platforms (digital platforms)
- Availability of digital financial services (digital financial services)
- A sound entrepreneurial ecosystem (digital entrepreneurship)

A. Legal and Regulatory Framework

An effective and transparent legal and regulatory framework is vital for a safe, resilient, innovative, and inclusive digital society.

Egypt has embarked on an ambitious regulatory reform program to accelerate its journey to digital transformation. Currently 55 laws and regulations are in force covering matters such as licensing, intellectual property rights, competition, cyberspace safety, data protection, and financial transactions. However, many of these are outdated or remain incomplete. Competition law, in particular, suffers from a scattered framework hindering market entry and service innovation. The presence of vague and excessive criminal sanctions across different legislative areas (such as telecommunications, media, and cybercrime) further stifle the market. Overall, the framework would benefit from a comprehensive streamlining and modernization exercise to address gaps and eliminate institutional overlap. In addition, greater private sector participation in policy and rulemaking could be encouraged.

Improving the capacity and autonomy of the National Telecommunications Regulatory Authority (NTRA) is a key factor underlying Egypt's ability to accelerate its transformation to a digital economy. Currently, the overlap between the different roles of government as sector regulator (NTRA), policymaker, and operator, creates an inherent conflict of interest within the sector, which poses a high risk of bias towards the incumbent operator TE, which may result in market concentration and failure. Since 2007, limited progress has been made to improve the capacity of the NTRA⁸ to act independently from the Ministry of Communications and Information Technology (MCIT). Key regulatory measures to revive competition in the broadband market are effectively on hold, including measures to address Telecom Egypt's dominance of the fixe market. Telecom Egypt (TE) is the state-owned incumbent operator and the only company providing fixed telecommunications infrastructure across the value chain, including domestic backbone fiber networks

⁶ Lower middle-income poverty rate (US\$3.2 in 2011 purchasing power parity) is estimated to reach 30.5 percent in 2020. Source: World Bank Poverty & Equity and Macroeconomics, Trade & Investment Global Practice.

⁷ There is global recognition that broadband connectivity and digital technologies play a crucial role in addressing the unique challenges the COVID-19 pandemic poses, particularly to developing countries. For instance, G-20 ministers responsible for the digital economy issued a COVID-19 Response Statement that recognized the promising role that digital technologies and relevant digital policies can play to strengthen and accelerate the global collective response to the COVID-19 pandemic (G20 Leaders 2020).

⁸ The ITU ICT Regulatory Tracker indexes countries based on their regulatory environment.

and gateways to international submarine cables. Unified licenses (including fourth generation mobile network [4G] licenses) were issued in 2017 in an attempt to place all four telecom companies on equal terms for the services they provide. Nonetheless, the virtual fixed license remains an insufficient remedy, with trickle-down effects on the development of competition to serve the market, in particular address business needs, and not addressing TE's dominant position over fixed infrastructure, including fiber. According to NTRA, mobile network operators in Egypt are permitted to build their own ICT infrastructure. NTRA further indicates that, to date, the mobile operators have been reluctant to deploy a fixed infrastructure (outside of gated compounds). According to NTRA it is the lack of "business drive" and "economic case" that prevent them from duplicating the fixed infrastructure of Telecom Egypt. This reluctance on the part of the operators to invest in infrastructure has had knock-on effects on the country's digital development as a whole.

Effective and transparent governance of digital transformation is pivotal to achieving Egypt's 2030 Sustainable Development Strategy. A total of 18 government entities are involved in developing and implementing the country's digital regulatory framework. Improved coordination between these agencies is required to avoid overlap and facilitate the achievement of strategic objectives. Moving forward, as initiatives become more complex and require a wide array of technical experts to drive them forward, a whole-of-government approach to rule-making could be favored. This is in line with recent Organization for Economic Co-operation and Development (OECD) recommendations regarding coherence, dialogue, and efficiency among government bodies (OECD 2019). In this context, the articulation of a clear public roadmap or action plan for digital strategy and transformation is recommended.

B. Digital Infrastructure

Universal and affordable access to fast high-quality broadband internet is an important foundation for socioeconomic development and a vibrant digital economy.

Egypt's digital market is well connected to the rest of the world: 17 distinct submarine cables are accessed via landing stations operated by the incumbent operator, Telecom Egypt. Nevertheless, broadband performance in Egypt is not reaching its full potential, mainly due to the primary use of copper in the last mile in all brownfield areas, which currently provides an average download speed of just over 34.88 megabits per second (Mbps).⁹ In terms of mobile coverage, there are four operators in the country: Orange, Etisalat, Vodafone (partially owned by TE), and TE's We. All four companies provide 3G and 4G data communications, along with 2G voice services and virtual fixed services. Mobile broadband coverage in Egypt is around 97.7 percent for 3G and 61.1 percent for 4G.¹⁰ While the international mobile operators present in Egypt have all deployed and activated 5G services in other markets, there is still insufficient information on national rules governing 5G deployment. Furthermore, a large number of Egyptians are still not connected to fixed broadband services, with 8.81 million ADSL users. Mobile devices remain the primary means by which people access the broadband internet in Egypt.¹¹ This is evident with mobile broadband internet subscription of 52.0 million and USB Modem subscriptions of 4.04 million, Egypt has evolved in the Network Readiness Index to rank 84, compared to 92 last year¹².

Expanding the geographical coverage of mobile 4G+ broadband networks and boosting fixed fiber optic broadband access would help achieve territorially balanced availability of broadband services.

⁹ Ookla, "Speedtest Global Index," December 2020, <https://www.speedtest.net/global-index>.

¹⁰ Based on NTRA records, June 2020.

¹¹ MCIT ICT Indicators, December 2020

https://mcit.gov.eg/Upcont/Documents/Publications_2142021000_ICT_Indicators_Quarterly_Bulletin_Q4%202020.pdf

¹² <https://networkreadinessindex.org/countries/egypt/>

Presently, two main bottlenecks stand in the way of better broadband connectivity in Egypt: the reliance on the incumbent TE's legacy copper for fixed broadband in brownfield areas (FTTH is now deployed in all greenfield areas) and the still limited amount of spectrum assigned to mobile operators. Better coverage will promote greater demand, help e-government services scale, ensure business continuity (particularly in crisis situations), and strengthen the overall attractiveness of Egypt's digital market. To seize these opportunities, the government of Egypt could prioritize reforms in a couple of ways. First, through introducing more competition in fixed digital infrastructure by licensing one or more specialized private wholesale carriers to provide fiber alternatives to the incumbent, TE (these carriers could leverage existing fiber networks managed by utility companies or deploy their own fiber, including via the use of TE's duct infrastructure). Second, through developing and implementing a national spectrum plan, in cooperation with industry and government stakeholders, which would specify the timetable for spectrum re-farming and the release of specific bands and set fair spectrum prices in accordance with the relevant market circumstances.

If Egypt is to become a digital hub in the MENA region, a world-class, carrier-neutral, open access data center built by, and for, large international companies, is critical. First, when content is made available locally, there is no longer the need for expensive international capacity, and the cost of access drops dramatically. Second, latency issues will improve because content is physically closer to the end user, with fewer hops and less congestion. In addition, to fully benefit from an internet exchange point (IXP), membership should be extended to allow interconnection and exchange of traffic with content delivery networks (CDNs), enterprises, and private and public entities, including international internet service providers (ISPs), to facilitate connection to the Cairo Internet Exchange Point (CAIX) or new IXPs.

C. Digital Skills

Digital skills in the workforce and among the larger population serve to strengthen innovation, growth, and competitiveness while preparing the economy for the transformational impact of digital development.

Digital skills are essential to innovation, competitiveness, and the development of a robust digital economy. In Egypt, demand for such skills is rapidly growing due to several ICT initiatives put in place by the government. However, the country still falls below the MENA average on the supply of digital skills. The development of advanced digital skills suffers from low student enrollment and completion rates in tertiary education. Technical, vocational, and higher education institutions do not produce graduates with relevant skill sets, especially in math and technical subjects¹³. The gross enrollment ratio¹⁴ in higher education in Egypt is 34 percent overall (compared to a MENA average of 39 percent).¹⁵ To truly benefit from the digital economy, the government could significantly scale up development of intermediate and advanced digital skills. This might be achieved through partnerships with industry to review tertiary and vocational curricula, internship opportunities, and the rapid upskilling of workers and unemployed youth and women. Information on the demand and supply of digital skills should also be made readily available. Recent programs¹⁶ spearheaded by MCIT to improve digital skills need to be further strengthened to meet the very fast evolving demand for human capital to meet the needs of the Digital Egypt.

¹³ INSTEAD 2018; Enterprise Survey 2016.

¹⁴ The gross enrollment ratio is the total enrollment at tertiary education in Egypt, regardless of age, expressed as a percentage of the population in the official age group corresponding to this level of education.

¹⁵ Calculations from World Economic Forum, Global Competitiveness Reports, <https://www.weforum.org/reports/>.

¹⁶ Creativa centers, ITI and AI scholarship, vocational master in CS, AI, robotic and media, Digital Egypt Builders, Egypt University for Informatics, Long Life Learning and African App Launchpad initiatives, amongst others.

The COVID-19 pandemic has amplified the need to accelerate digital skills at all levels and provides a unique opportunity to develop novel approaches to literacy and numeracy. As part of its education reform program, the government of Egypt is now accelerating the digitalization of its school curricula and facilitating the transition to remote or blended learning. The program is ambitious and aims to achieve a fully integrated digital education system, including the online administration of exams for upper secondary to tertiary level students by December 2020. In this context, mechanisms for coordination among key actors and partnerships with the private sector should be further strengthened.

The time is now ripe to rethink the future of work in Egypt. This is particularly true given the young average age of the population and the large number of informal workers. Latest estimates suggest that more than 60 percent of firms and more than 70 percent of workers in the private sector are informal, characterized by low pay, low productivity, and the lack of office premises (for example, street vendors). Basic literacy and numeracy skills remain limited in a large proportion of the population, while rapid changes in technology call for a new set of skills and a greater emphasis on lifelong learning. Tackling this skills gap challenge would help address the country's low rate of innovation and prepare the economy, and society as a whole, for fast evolving technologies such as artificial intelligence (AI), Big Data, Cyber security, Block Chain and the internet of things (IoT) (ECES 2020a).

D. Digital Platforms

The widespread adoption of e-government services together with increased demand for digital private platforms will facilitate the digital transformation journey.

Despite the fast-growing use of digital platforms driven by food delivery, online shopping, ride-hailing services, and advertising, Egypt lands below benchmarked countries in the United Nations Conference on Trade and Development's (UNCTAD) 2019 B2C (business to consumer) E-Commerce Index (UNCTAD 2019), coming out at 102 out of 152 countries. In the absence of official e-commerce statistics, the 2018 market is estimated to be between US\$552 million and US\$878 million. Retail e-commerce sites sold an estimated US\$77 million worth of products in 2018. Although new digital solutions exist for both business-to-business (B2B) and B2C transactions, adoption across firms has not been universal. However, Egyptian startups continue to receive funding from a variety of sources to improve and expand their service offerings across sectors.

Fostering trust is critical for the widespread use of online government platforms and other digital services. To promote government platforms, online payments, e-signatures, and other services, the government will need to go beyond service implementation and actively seek to build trust in digital services by equipping citizens with the necessary capabilities and mindset to take advantage of what the online world has to offer. A comprehensive whole-of-government data policy will be required, not only to foster trustworthiness but also to enable interoperability and provide integrated datasets for enhanced digital solutions.

Accelerating the digitalization of Egypt's government services would promote the position of Egypt as a regional leader. According to the United Nations Department of Economic and Social Affairs (UN DESA) E-Government Global Survey 2020, Egypt ranks 111 out of 193 countries (UN DESA 2020). The government is currently accelerating the development of its digital platforms and services as part of the Digital Egypt initiative¹⁷, working closely with several line ministries to increase online options for citizens. These include

¹⁷ MCIT link to Digital Egypt initiative https://mcit.gov.eg/en/Digital_Government

health insurance automation, improved tax collection systems, online tourism portals, fraud prevention smart cards, and subsidy smart card systems. The government's other target areas for digital government services include driving license renewals, payment of traffic fines, notary activities, and lawsuit filing online. The need to deliver government services online has naturally become more pressing due to the closure of government buildings in response to COVID-19. Egypt has embraced the opportunity to accelerate digital transformation, and this is reflected in their plan to scale up the successful implementation of the e-government pilot in Port Said across other governorates. Such initiatives, which advance the implementation of the government's digital transformation program are based on in-depth readiness assessments and successful pilot programs. The combine defect of digitizing government services would ensure the continuity of public services and promote the position of Egypt as a regional leader.

E. Digital Financial Services

Digital financial services enable greater financial inclusion but can also stimulate economic activity across sectors and accelerate the digital economy as a whole.

A safe, simple and effective system that protects and facilitates electronic transactions would serve to catalyze both e-commerce and e-government services. Recent experience with COVID-19 lockdowns has demonstrated how digital payments can be crucial in facilitating minimum economic activity during periods of crisis. However, only 27 percent of Egyptian adults were considered financially literate in 2014, according to Standard & Poor's Global Financial Literacy Survey.¹⁸ Indeed, most payments in Egypt are still made in cash. According to the 2017 World Bank's Global Findex database, almost 70 percent of Egyptian adults are excluded from the regular finance system.¹⁹ Moreover, there is an important gender gap in the usage of digital financial services: only 27 percent of women age 15 and above had such accounts compared to 39 percent of men. According to the database, approximately two-thirds of wage earners in Egypt working at micro-, small-, and medium-size merchants (66 percent) are paid using paper-based methods rather than electronically, reducing incentives for them, in turn, to use electronic means for their payments for goods at retail stores. At the other end, the acceptance of electronic payments among merchants also remains low, with only 18 percent of retail payments by consumers being carried electronically at micro-, small-, and medium-size merchants in 2016 (World Bank 2016a).

The public sector could stimulate greater demand for digital services through its own use of electronic payment systems for e-government services. The commercial incentive for developing digital financial services could be driven by the expansion of government-to-person (G2P) payments, such as salaries and pensions for civil servants, as well as social safety net payments. To facilitate financial access, streamlined and electronic know-your-customer (e-KYC) procedures could be put into place. Coordination between digital financial services (DFS) actors across sectors (inside and outside the financial system) should also be encouraged.

The legal and regulatory framework for DFS, including consumer protection, could be further consolidated, strengthened, and improved. Despite the government of Egypt's initial steps to improve the e-payment space through a series of mobile payment service regulations and the establishment of the National Payment Council, further coordination and reforms are needed to unlock the potential of DFS in Egypt, including the framework for international remittances. Relevant secondary regulations for payment

¹⁸ Global Financial Literacy Excellence Center (GFLEC), S&P Global Finlit Survey, <https://gflec.org/initiatives/sp-global-finlit-survey/>.

¹⁹ World Bank, Global Findex Database 2017, <https://globalfindex.worldbank.org/>.

systems and services should be implemented as soon as possible. There is also the need to level the playing field for mobile wallets through the wider use of unstructured supplementary service data (USSD). Finally, additional clarity is needed on the roles and responsibilities of the different sector regulators in the financial technology (fintech) ecosystem.

F. Digital Entrepreneurship

A holistic approach to entrepreneurship, as part of a larger ecosystem of innovation, will create new markets, transform the private sector, and help unlock the many benefits of the digital economy.

The government could further support start-ups and foster entrepreneurship to ensure Egypt's readiness for digital investment. The adoption of digital solutions by the private sector would significantly improve information access, service delivery, and productivity. It would also serve to create new opportunities for entrepreneurial activity and innovation. At present, low productivity across the private sector has contributed to low job growth in the country. The government could favor a wider ecosystem approach that facilitates digital business models while safeguarding consumers and workers (through rules on open data, data collection, processing, and transfer). Furthermore, the country would benefit from expanding the reach of its innovation ecosystem to serve regions besides Cairo and Alexandria. The government could also encourage female innovators and entrepreneurs and ensure the availability of risk capital to plug early-stage financing gaps.

The impact of COVID-19 on digital entrepreneurship in Egypt has highlighted some opportunities for reform. Although the pandemic has spurred the growth of digital B2C business models and e-commerce activity overall, it has also discouraged new would-be entrepreneurs from starting their businesses due to economic uncertainty. A number of improvements to the legal and financial environment for conducting business could be made in this regard, for example, the development of a culture of risk-taking that does not punish failure, the elimination of the wage gap between the self-employed and wage-earners, and closer linkages between digital start-ups and Egyptian small and medium enterprises.

The advancement of Egypt's private sector innovation, to reach the level of peer countries, would positively affect competitiveness and job creation²⁰. In this regard, fostering competition for digital platforms should be an urgent priority. Currently, the two biggest B2C platforms in Egypt are regional players Jumia and Amazon-owned Souq. Only around one-third of digital businesses are local, while the rest have foreign owners (51 percent from Sub-Saharan Africa and 5.9 percent from the MENA region).²¹ To enable new players to enter the market and new services to flourish, anticompetitive mergers and practices are to be avoided. In this context, platform consolidation cannot be underestimated (for example, the acquisition of Careem by Uber). The government could aim to create an enabling environment that attracts and maintains foreign investors while encouraging local innovation and discouraging start-ups from moving abroad in search of capital. Forward-looking procompetitive policies can help promote a robust digital economy that can expand firm productivity and innovation through big data, IoT, AI, and other technological developments.

²⁰ World Bank, Enterprise Surveys, <https://www.enterprisesurveys.org/>.

²¹ Statistics based on the World Bank Digital Database that gathers data from three proprietary sources: Pitchbook, CB insights, and Briter Bridges. These sources construct their databases using public financial information, government information, as well as web-scraping techniques. Given this, it is likely that the number of bankruptcy cases is under-reported, since there is less available information on firms that have already shut down.

Recommended Key Actions to Accelerate Digital Transformation in Egypt

This digital economy country assessment (DECA) aims to assess the progress and development of the digital economy in Egypt with a view to identifying the current challenges and opportunities for future growth. Table 1 provides a high-level overview of the cross-cutting recommendations that would bring the country closer to achieving its national commitments. Detailed recommended actions are provided in each section of the five pillar areas of digital infrastructure, digital skills, digital platforms, digital financial services, and digital entrepreneurship. A time span is proposed for each activity including short-term (3–12 months), medium-term (12–24 months) and long-term (24–36 months).

Table 1. High-Level Recommendations for Immediate Attention to Accelerate Digital Transformation in the Arab Republic of Egypt

Recommended Key Actions	Time Frame	Priority
Increasing efforts to achieve universal access to broadband connectivity and cashless payments is key to develop Egypt's digital economy.		
1. Foster competition by NTRA in fixed networks and services by addressing the dominance of larger players, which currently constrains development of the digital infrastructure and economy. Such remedies could include asymmetric regulatory measures following the designation of significant market power.	Short term	High
2. Define the strategic plan for the development of the national payment system in Egypt to clarify and simplify requirements for digital payments.	Short term	High
3. Improve the digital financial services legal, policy, and regulatory environment, such as issue the relevant secondary regulations for payment systems and services and fintech related matters under the new banking law.	Short term	High
4. Have NTRA facilitate competition in the fixed digital infrastructure by licensing of one or several specialized wholesale carriers providing fiber alternatives to the incumbent, TE, by (a) leveraging the existing fiber networks managed by utility companies and (b) facilitating alternative operators deploy their own fiber by the use of TE's duct infrastructure.	Short to medium term	High
5. Have NTRA develop and implement a national spectrum plan in cooperation with industry and government stakeholders. Such a plan would identify Egypt's timetable for spectrum re-farming and the release of specific bands to MNOs, setting fair spectrum prices in accordance with the specific market circumstances.	Medium term	Intermediate
6. Establish the required infrastructure for DFS by strengthening the coordination and dialogue for DFS and financial inclusion among public and private sectors.	Medium term	High
Combining efforts to attract international and regional digital private platforms and to actively foster national entrepreneurship and innovation will propel Egypt into the digital business age.		
7. Create an enabling policy and regulatory environment for digital business models by accelerating adoption and enforcement of enabling legislation for digital transformation and evaluating new policy interventions such as incentives for adoption of digital technologies by firms, supplier protection rules, and taxation of digital services.	Short to medium term	Intermediate
8. Build capacity and support structures for digital entrepreneurship in collaboration with the private sector to address the needs of start-ups in specific industry verticals.	Short term	High
9. Leverage Egypt's international connectivity in licensing one or several open and carrier neutral IXPs and attracting international ISPs and cloud companies to build and fill at least one large data center.	Short term	Intermediate

Recommended Key Actions	Time Frame	Priority
10. Build institutional capacity to support the development of a digital ecosystem and consider alternative government interventions to support adoption of digital technologies by firms and strengthen the digital start-up ecosystem.	Short to medium term	High
11. Improve legal and financial aspects of the business environment such as the following: <ul style="list-style-type: none"> • Improve and modernize IPR and e-signature legislation. • Amend media law and its regulations to ease registration requirements and remove excessive penalties. • Rationalize the scope of the data protection regulator, create streamlined and clear licensing processes, and ensure proportionality in setting penalties (such as limitations on prison sentences) in the Data Protection Law. • Introduce an ex ante merger control framework to preserve competition in digital markets and grant appropriate tools to detect, sanction, and remedy anticompetitive practices in digital markets. 	Short to medium term	High
An ambitious approach to accelerating the development and widespread adoption of e-government services is an opportunity to leapfrog on digital transformation.		
12. Conduct an in-depth digital government readiness assessment.	Medium term	Intermediate
13. Create a body responsible for the government digital transformation to do the following: <ul style="list-style-type: none"> • Prepare a comprehensive legal strategy, and continuously update it. • Establish regulatory impact assessments and take corrective action accordingly. • Establish more regulatory sandboxes to test new solutions. • Make available online all digital legislation, together with an easy guide. • Streamline existing laws and regulations covering the digital economy. 	Short term	High
14. Accelerate implementation of the government's digital transformation based on in-depth readiness assessments and the success of pilot programs.	Medium term	Intermediate
Establishing an effective and transparent legal and regulatory framework will guarantee a vibrant, safe, and inclusive digital economy in Egypt.		
15. Review and improve the communications law that has not been amended since its issuance in 2003 and publish the relevant executive regulations and sub-legislations.	Medium term	High
16. Improve and modernize the IPR and e-signature legislation and remove excessive penalties in the cybercrime law and align it with the Budapest Convention on Cybercrime.	Medium to long term	High
17. Further modernize the new Consumer Protection Law to align with international e-commerce.	Medium to long term	High
Rapidly scaling up the availability of digital skills is a prerequisite for Egypt to become a regional digital leader.		
18. Improve the quality and relevance of tertiary education and technical and vocational education and training to better respond to fast-growing demand for digital skills in a sustainable manner.	Medium to long term	High
19. Strengthen mechanisms to provide timely and high-quality data on the demand for and supply of digital skills to facilitate matching supply with demand.	Medium to long term	High
20. Expand rapid upskilling for digital skills and delivery mechanisms through partnering with the private sector and capitalizing on the ongoing education reform and MCIT capacity building initiatives for the digital economy.	Short term	High

Note: Short term = 3–12 months, medium term = 12–24 months, and long term = 24–36 months.

1. Introduction and Background

1.1. The Egyptian Economic Climate

The Arab Republic of Egypt aspires to be a digital leader in the Middle East and Africa. Strategically located at the intersection of Africa, the Middle East, and West Asia, with a population of over 100 million, the country has embarked on an ambitious set of reforms to promote inclusive growth and job creation. From 2019 to 2022, the government instituted a program to achieve an accelerated inclusive and vibrant economic growth and develop human capital (World Bank 2019b). In 2018, the government also adopted the new Information and Communication Technologies (ICT) Strategy 2030, reflecting Egypt's ambition for accelerating digital transformation and embracing the digital economy as the new driver of growth and job creation (MCIT 2018). However, Egypt was still ranked 93rd (out of 121 countries) in the World Economic Forum (WEF) Networked Readiness Index for 2019. The index measures countries' propensity to exploit the opportunities offered by ICT. In addition, Egypt ranked 103rd (out of 176 countries) in the International Telecommunication Union (ITU) ICT Development Index (IDI) for 2017, based on 11 different sub indicators that cover ICT access, ICT usage, and digital skills.

Egypt has an established ICT sector, which has recovered and experienced growth in recent years. The contribution of ICT to the gross domestic product (GDP) grew 16.7 percent year-on-year in fiscal year (FY) 2018/19 compared with FY2017/18 (MCIT 2020). With a renewed focus on economic leapfrogging through greater digital transformation, the government is facilitating a multi-ministerial effort to leverage digital technology as a major driver of change and progress toward a digital economy. The aim is to improve economic performance, productivity, and social well-being, as well as reshape existing business models.

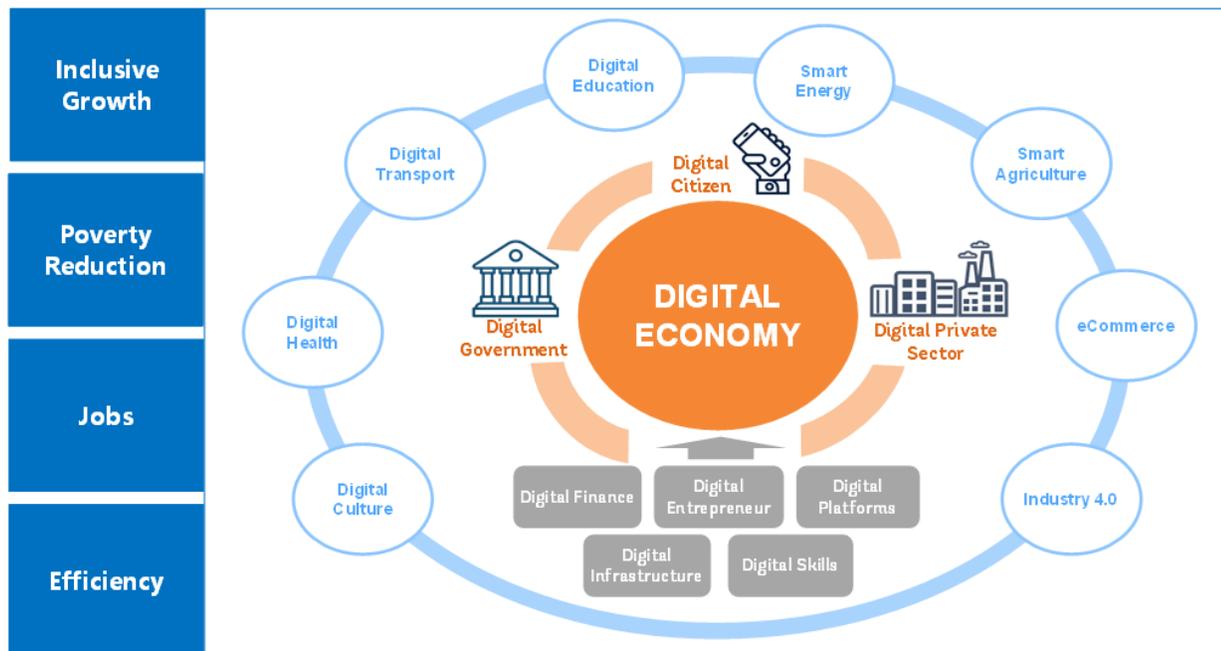
1.2. About the Digital Economy Country Assessment (DECA)

This DECA report is intended to assess the level of digital economy development in Egypt, mapping the current strengths and weaknesses that characterize the national digital economy ecosystem (see figure 1), as well as identifying opportunities for future growth. It leverages the diagnostic framework developed by the World Bank in the context of the Digital Economy for Africa (DE4A) initiative, which analyses digital economies using an ecosystem approach with five key foundations:

- **Digital infrastructure:** the availability of affordable and high-quality internet, which is instrumental to bringing more people online
- **Digital skills:** the development of digitally literate citizens and a tech-savvy workforce with both the basic and advanced digital skills that can support increased technology adoption, innovation, and application
- **Digital platforms:** the presence and use of digital platforms that can support greater digital exchange, transactions, and access to public and private services online
- **Digital financial services:** the ability to pay, save, borrow, and invest through digital means, which is key to accessing digital services and increasing the rate of online transactions
- **Digital entrepreneurship:** the presence of an ecosystem that supports firms in generating new products and services leveraging new technologies and business models

The conceptual approach of the DECA makes full use of the Middle East and North Africa (MENA) Tech 3.0 initiative Rapid Digital Economy Assessment Dataset and Analysis (box 1).

Figure 1. Impact Ecosystem of Digital Economy



Source: World Bank 2018a.

Box 1

MNA Tech 3.0 Rapid Digital Economy Assessment Dataset and Analysis

This DECA benefits from the MNA Tech 3.0 Rapid Digital Economy Assessment Dataset and Analysis. The MNA Tech benchmarking provides a snapshot of the digital economy conditions in each of 19 countries and displays the countries’ performances across the five pillars of the digital economy with a selected set of benchmark indicators. Within each pillar, countries are designated as “nascent,” “emerging,” “advanced,” and “very advanced,” depending on their performance. This analysis is completed with the country’s standardized results across the datasets and compares them to the regional averages in each dataset. The number of indicators relevant for each digital economic pillar are 16 for digital infrastructure, 22 for digital platforms, 11 for digital financial services, 7 for entrepreneurship, and 9 for digital skills. The data include the following areas: Bahrain, Djibouti, the Arab Republic of Egypt, Islamic Republic of Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia, United Arab Emirates, West Bank and Gaza, and the Yemen Republic, and covers the period 2014 to 2019.

The analysis provides benchmark information across each pillar presented in table and graph formats over a scale ranging from 0 to 10 under the following key values and respective color code:

Value: 7.5–10.0	Very Advanced	
Value: 5.0–7.4	Advanced	
Value: 2.5–4.9	Emerging	
Value: 0–2.4	Nascent	

The Egypt DECA was conducted as part of the World Bank’s programmatic ASA Egypt Digital Economy Strategy and Action Plan, 2025 (P168557). The activity was launched during a high-level stakeholder outreach conference, Unleashing Digital Development in Egypt, on February 5, 2019, and benefitted from the interaction with sector stakeholders during meetings and workshops in Cairo.²² On the public sector side, stakeholders interviewed included government ministries, departments, and agencies involved in digital infrastructure, digital skills and education, the provision of government ICT services, and promotion of investment and entrepreneurship. On the private sector side, business associations were consulted, alongside established technology companies and ICT service providers, as well as more recent technology start-ups. Finally, the analysis presented in this report also draws on regional and global benchmarking, based on standardized indicators.

The report begins with an overview of the legal, regulatory, and institutional context. This is followed by five sections which each cover one of the five pillars of the DE4A framework:

- Section 4 discusses the current access, quality, and resilience of digital infrastructure, as well as the availability and affordability of connectivity and related challenges.
- Section 5 looks at the current efforts to grow digital skills and literacy to support service adoption, innovation, and the application of digitally enabled solutions.
- Section 6 explores the prospect for expanding digital government platforms and touches on private platforms.
- Section 7 examines the current state of digital financial services.
- Section 8 provides a critical analysis of the digital entrepreneurship ecosystem.

The final section provides conclusions and proposes a way forward.

²² The workshop was held on February 5 in Cairo “under the supervision of H.E. Minister of Communications and Information Technology, in collaboration with World Bank, <https://egyptinnovate.com/en/events/digital-economy-egypt>. Please see “Acknowledgements” for a comprehensive list of stakeholders consulted.

2. Legal, Regulatory, and Institutional Framework

This section highlights the importance of the legal and regulatory framework for driving the digital economy in the Arab Republic of Egypt, analyzes the current situation and provides recommendations. A more comprehensive analysis of the legal and regulatory framework is provided in appendix A.

The new digital economy is bringing fundamental changes to the business landscape, in Egypt and around the world. There is significant growth and flexibility in the availability and access to online services. Businesses, platforms, services, and technologies are growing well beyond national borders. The private sector is now a super player in digital transformation as it innovates and delivers new solutions at a staggeringly rapid pace. More than ever, transparency, inclusion, and sustainability are vital to an enabling regulatory framework for the digital economy. A single digital transaction has now become subject to a number of different laws and different regulators.

In this context, an enabling legal and regulatory framework is crucial to supporting the development of the digital economy. An inadequate, fragmented legal framework or ill-equipped institutions can result in significant market distortion and slow innovation and deprive citizens of the benefits of technological progress (Eisenach and Sori 2016). Laggard countries simply miss opportunities to attract investments and innovative solutions, and the missed opportunity costs are high, particularly in a globalized marketplace. Various international benchmark indicators, as analyzed in the sections that follow, demonstrate that Egypt is not making full use of its potential.

Modernizing the legal and regulatory framework is no easy task. The International Chamber of Commerce (ICC) puts it as follows:

The rapid growth and pace of innovation both of new technologies and also convergence with existing ones have sometimes outpaced traditional regulatory models, which were often organized decades ago around silos for previously separate industries. As a result, public policies may not fully take into account the increased competition across former silos, which can now warrant a reduction of traditional regulation. Similarly, consumer protection going forward would become more relevant and easier to understand for the consumer when harmonized to apply consistently to services from former silos that are now similar, competing and substitutable for users. This would reduce the confusion experienced by consumers that exists when similar services are not governed by similar rules. (ICC Commission on the Digital Economy 2016)

2.1. Current State of the Egyptian Framework

Egypt has embarked on an ambitious regulatory reform program to introduce much-needed legislation to support digital transformation. In total, 55 laws and regulations were found relevant to the digital economy. These cover matters such as licensing, intellectual protection rights, cybersecurity and cybercrime, data protection, and financial transactions. A full list is provided in appendix A. In parallel, Egypt is also modernizing and improving legislation governing its investment climate, which in turn aims to encourage more entrepreneurship and innovation.

There are four main observations to be made in relation to the digital legal and regulatory framework:

- The absence of a publicly available detailed government implementation plan that aims to align the regulatory framework with the realities of the digital economy;
- The existence of a fragmented legal regime with overlapping laws, unregulated domains, and a number of outdated pieces of legislation;
- A multitude of government players (18 government entities in total) involved with overseeing, drafting, or implementing the regulatory framework pertaining to the digital economy without a robust coordination mechanism to avoid overlap; and
- The existence of criminal sanctions in certain pieces of legislation, which appear to be excessive and can have the effect of deterring local and international businesses from investing and working in Egypt.

Underpinning the success of the legal and regulatory framework needs to be a high-level political commitment with effective institutional leadership and coordination across government and the wider ecosystem. Egypt's institutional and strategic framework for digitalization is just as important to the success of digital initiatives as the many technical aspects presented in subsequent sections. However, there is currently no common, clearly articulated vision for supporting digital transformation that defines the roles and responsibilities of different institutions responsible for the digital agenda. By way of example, there is very little clarity on the roles and responsibilities of the different financial sector regulators: the Central Bank of Egypt (CBE), the Financial Regulatory Authority (FRA), the National Telecommunications Regulatory Authority (NTRA), and the Egyptian Money Laundering Combating Unit (EMLCU). This creates confusion, uncertainty, and unpredictability for market participants and hinders the development of digital financial services. Additionally, some central functions suffer from fragmented leadership such as the ICT function in the public sector. This is often one of the key obstacles to successful implementation of a whole-of-government approach to digital transformation

The Telecommunications Regulation Law 10 of 2003 (Telecom Law) sets out the framework for licensing, access to equipment, and encryption. However, it does not provide standard definitions for licensed activities, nor any clear criteria on the requirements thereof. Access to equipment and encryption is restrictive and characterized by heavy approvals. The sanction regime, too, is vague and would require updating.

In addition, the Telecom Law subordinates the NTRA to the Ministry of Communications and Information Technologies (MCIT), which creates a number of challenges further highlighted under the digital infrastructure section of the present report.

Egypt has issued several laws to regulate digital platforms and ensure cyberspace safety. This began with intellectual property rights in 2002, e-signatures in 2004, and was followed by a proliferation of legislation in 2018 relating to cybercrime, media, and consumer protection. Finally, a data protection law was enacted in July 2020.

Both the intellectual property rights and e-signature laws require urgent modernization to respond to business practicalities and offer adequate protection. These are cross-cutting matters highlighted in the sections that follow.

The cybercrime law is likely to represent a significant barrier to investment in the Egyptian digital economy, as it presents legal risks for both domestic and foreign investors. Similarly, the media law heavily regulates and penalizes websites and electronic media outlets, which may hinder business and deter market entry. The recent Data Protection Law (see box 2) offers guarantees on data protection, but it is

Box 2 Highlights on the Data Protection Law, 151 of 2020

The Arab Republic of Egypt's Data Protection (DP) Law offers some important guarantees on data protection. The long-awaited law on the protection of personal data was finally issued on July 13, 2020. It went into effect on October 14, 2020. The executive regulations are expected by April 14, 2021. There is a one-year transitional period from the date of issuance to allow various entities to comply with the new obligations imposed by the law. The law is largely based on the provisions of the General Data Protection Regulation, but it, unlike the Data Protection Law, leaves many issues for the executive regulations. It is therefore too early to properly assess the extent of the digital data protection regime in Egypt. The Data Protection Law protects individuals' digital personal data but excludes certain entities from its scope, such as the media, the Central Bank of Egypt and the entities it regulates. It includes the important measure of making the consent of data subjects mandatory and introduces new business functions and obligations such as data controllers. The Data Protection Law further creates the Personal Data Protection Center, giving it an extensive mandate.

premature to fully assess it without the executive regulations, which are still expected by May, 2021²³. Nevertheless, it is important to recognize a number of areas for improvement in the Data Protection Law, such as widening its scope of application, reducing the extensive powers of the regulator, and ensuring that the licensing regime does not become an avenue for red tape. It is to be noted that the new Consumer Protection Law introduces the concept of remote contracting but excludes several activities from its scope, leading to further fragmentation of the legal regime. Certain provisions for remote contracting even clash with the very nature of international transactions.

To keep up with current digital financial services trends, the CBE has provided guidelines for mobile payments, e-payments, and prepaid cards. For its part, the FRA has issued a number of decisions to enable digital payments, such as prerequisites and regulations for electronic payments in funding and collection transactions, e-issuance, and payment of insurance policy premiums. The newly issued Consumer Finance Law allows the processing of certain payments through nonbanking commercial cards and other methods approved by the CBE. The government has also issued a number of laws, regulations, and decisions to encourage cashless transformation, namely the establishment of the National Council for Payments, the Cashless Payments Law, and executive regulations.

To foster and encourage digital entrepreneurship, Egypt's Investment Law provides tech companies with a number of investment guarantees and general incentives, but there is no legal certainty as to the conditions under which tech companies are eligible to access and benefit from these special incentives. Although fostering competition and reducing anticompetitive practices is crucial to encouraging access, innovation, and entrepreneurship, the legal and policy frameworks for competition in digital markets remain scattered among different laws and regulators and certain gaps remain, for example, in merger control.

2.2. Toward Enhanced Regulatory Governance: Areas for Action

To enhance regulatory governance for digital transformation, areas for action are proposed in three areas: (a) establish a shared, collaborative, and strategic regulatory framework; (b) facilitate effective institutional

²³ The Ministry of Communications and Information Technology (MCIT) has held community dialogues with local and international stakeholders concerned with implementing the provisions of the Personal Data Protection Law, such as: Companies, Mobile Network Operators (MNOs), Small and Medium enterprises (SMEs), Medical sectors, Law firms, etc. to raise awareness and hold discussions on the provisions of the Law and ways to implement them through simple procedures.
https://www.mcit.gov.eg/en/Media_Center/Latest_News/News/63220

governance to support digital transformation; and (c) foster an enabling legal and regulatory environment that is informed by evolving technologies. These proposed actions areas are described in greater detail below.

Establish a shared, collaborative, and strategic regulatory framework

It is important that in the transition to a digital economy, the regulatory strategy development process in Egypt is fully inclusive. This will help ensure wider buy-in and thus maximize the impact of the strategy, as well as the chances for successful implementation. The government’s strategy could be developed in consultation with key government agencies, industry players, civil society, and development partners. This will ensure that the strategy is sensitive to government-wide priorities, as well as industry needs. Moreover, by engaging partners in the development of the strategy, government can ensure that key initiatives are adequately financed and have the best chance of being implemented. Too often, digital strategies are merely aspirational and lack an effective framework for implementation. In this context, the present diagnostic could serve as a key input into the revision of the government’s strategy.

The government could set out its digital strategy in a clear, public roadmap and action plan, with transparent and centralized monitoring and an evaluation framework. This will ensure that the implementation of key priorities is effectively mapped out and that roles and responsibilities for key actions are clearly defined. Progress could thus be tracked using measurable metrics and milestones that allow key parties to be held accountable.

Facilitate effective institutional governance to support digital transformation

To ensure the effectiveness of the strategic framework outlined above, we recommended establishing an institutional framework where leadership is entrusted to a single agency. While interagency coordination and collaboration will continue to be important, leadership by committee is unlikely to be an effective institutional framework moving forward—particularly, as initiatives become more complex and require a cadre of technical experts to drive them forward. This setup also makes it more difficult to hold key stakeholders accountable. An integrated and holistic approach is required, whereby roles and responsibilities are clearly defined, with leadership conferred to a single entity that should be given a solid mandate to provide strategic leadership, support policy development, and coordinate key digital initiatives.

Egypt could benefit from the creation of a body responsible for the government’s digital transformation. In light of the recommendation of the Organization for Economic Co-operation and Development (OECD) favoring the “whole-of-government approach to rule making,” increased dialogue and coherence among governmental bodies is required to do the following:

- Prepare a comprehensive legal strategy and continuously update it;
- Establish regulatory impact assessments and take corrective action accordingly;
- Establish additional regulatory sandboxes to test new solutions;
- Make available online all digital legislation, accompanied by an easy-to-use guide for users; and
- Streamline existing laws and regulations covering the digital economy.

Foster an enabling legal and regulatory environment that is informed by evolving technologies

To establish an environment conducive to digital transformation, several important laws and regulations in Egypt require updating. These are set out below:

- **Update and improve the Telecom Law, which has not been amended since its issuance in 2003 and which remains without executive regulations.** In this vein, the law could be amended to provide regulatory transparency and certainty for existing and future licensed operators' investments, the regulation of competitive markets, and the treatment of dominance. It should also allow for the regulated use of encryption technologies and limit surveillance and interception to predefined cases of absolute necessity. The licensing scheme needs to be limited to cases such as the regulation of the frequency spectrum or the regulation of public works necessary to set up a telecommunication network. A licensing scheme could be included for all telecommunications activities. Restrictions on the import, manufacture, and commerce of communication equipment could be limited to the setting of technical standards required to ensure an efficient operation of the networks.
- **Update the competition framework to cover ex ante merger control and enable the Egyptian Competition Authority (ECA) to issue fines.** Currently, ECA utilizes a notification process for mergers, whereby potential anticompetitive effects are addressed after a transaction has been concluded, not before. Additionally, ECA has no power to directly fine violators and must instead seek recourse to an economic court, which may issue large fines in proportion to the value of the transaction or arrangements.²⁴
- **Enhance cooperation, including by creating a network of authorities with competition powers responsible for ex post competition law enforcement.** While various regulators continue carrying their mandate to promote competition in the sectors their oversight, enhanced coordination mechanisms can continue to exist with other authorities such as the NTRA, CBE or FRA for competition law enforcement to fight anticompetitive practices. ECA is also encouraged to adopt the 2014 OECD Recommendation concerning International Co-Operation on Competition Investigations and Proceedings to catch-up with the cross-border nature of internet-based services.
- **Improve the role of intellectual property in protecting internet users.** The following actions are encouraged in this regard:
 - Sign and adopt the World Intellectual Property Organization (WIPO) Internet Treaties, the Singapore Treaty on the Law of Trademarks, and the Patent Law Treaty;
 - Amend the Commercial Code's (promulgated by Law No 17 of 1999) section on technology transfer agreements to eliminate domestic hiring and local dispute resolution requirements to encourage intellectual property licensing;
 - Adopt frameworks that promote cooperative action against piracy of online content or software;
 - Enact separate digital rights management legislation needed to control or prevent digital copies from being shared over computer networks or telecommunications networks;
 - Adopt legal measures that provide necessary exclusive rights preventing the infringement of copyright and other related rights (including Web hosting, streaming, and linking);
 - Make available injunctive relief and disabling of infringing content online; and
 - Recognize intellectual property as an economic asset.
- **Modernize the e-signature legislation.** The legislation could allow for issuance of licenses to international e-signature providers and reduce authentication requirements.
- **Remove excessive penalties in the cybercrime law.** The law could be aligned with the Budapest Convention on Cybercrime.
- **Provide legal certainty on the eligibility to special business incentives.**
- **Amend the Media Law and the Supreme Council for Media Regulation (SCMR).**
- This is with a view to ease requirements of registration, remove the excessive punishable acts and exorbitant offenses, and limit provisions to media-related outlets (rather than expand to social and commercial activities).

²⁴ Thebes Consultancy report on the Legal and Regulatory Framework for Digitizing the Egyptian Economy, <https://thebesconsult.com/services/regulatory-reform/>.

- **Reduce the scope of the Personal Data Protection Centre (PDPC).** Create streamlined and clear licensing processes akin to certifications under the General Data Protection Regulation (GDPR). Prison sentences could be removed from the Data Protection Law.

The following additional measures are also recommended:

- **Enhance the regulatory framework for e-commerce.** Although it is not necessary to have a law that tackles e-commerce in particular, it is highly recommended that all laws and decrees that may affect e-commerce be reviewed in light of the special nature of e-commerce. This includes in particular dispute resolution for online transactions, consumer protection, and e-signatures. This could cover, for example, the modernization of the new Consumer Protection Law by regulating the international online contracting dimension to encourage international online commerce in Egypt. This requires making the Consumer Protection Authority the coordinating authority for all consumer-related issues except for banking and financial instruments and adopting the relevant OECD Recommendations on Consumer Protection in e-Commerce (2016), in relation to, among others, free services in exchange for consumer data; new payment mechanisms such as services being charged to mobile phone bills; international cooperation toward consumer safety; protection of persons with disabilities; product safety issues raised by ordering goods internationally; and liabilities of platforms that facilitate consumer-to-consumer transactions.
- **Improve existing dispute resolution mechanisms in bodies involved in the digital economy.** The entities discussed above have internal dispute resolution mechanisms that, for the most part, consist of a committee to whom applicants must pay a certain fee for the issuance of a decision, which may be reviewed by a court. Alternative dispute resolution and online dispute resolution mechanisms could be considered to reduce time and increase efficiency and certainty of decisions. A tracking mechanism for the types of complaints and resolutions can help monitor the implementation of digitization efforts and ensure consistency to the extent possible.

The following presents a summary of the situation:

- Egypt has demonstrated a strong commitment to accelerating the digital economy agenda by introducing much-needed legislation to support digital transformation. Currently, a total of 55 laws and regulations were found relevant to the digital economy, and these cover key areas such as licensing, intellectual protection rights, cyberspace safety, data protection, and financial transactions.
- However, a total of 18 government entities are involved with overseeing, drafting, or implementing the regulatory framework pertaining to the digital economy, which calls for a robust coordination mechanism that ensures the absence of overlap and facilitates strategic objectives.
- The current legal and regulatory framework is characterized by outdated and overlapping laws and regulations, vague and discretionary licensing frameworks, heavy approval schemes for access to equipment, and areas that still remain unregulated. There are therefore significant opportunities for reforms to enable Egypt's digital transformation.
- Excessive criminal sanctions under certain provisions, such as those in the Cybercrime and Media Laws, is yet another obstacle that might deter local and international businesses from investing and working in Egypt.

Table 2 illustrates the key recommendations and suggested activities to improve the legal and regulatory framework for the digital economy in Egypt. A time span is proposed for each activity including short-term (3–12 months), medium-term (12–24 months), and long-term (24–36 months).

Table 2. Key Recommendations and Suggested Activities for Digital Legislation and Regulation

Recommended Actions	Time Frame	Priority
Digital infrastructure		
<ul style="list-style-type: none"> Update and improve the Telecom Law and issue its executive regulations. 	Medium term	High
Digital platforms		
<ul style="list-style-type: none"> Improve and modernize IPR and e-signature legislation. Remove excessive penalties in the cybercrime law and align it with the Budapest Convention on Cybercrime. Amend the Media Law and its regulations to ease registration requirements and remove excessive penalties. Reduce the scope of the data protection regulator and create streamlined and clear licensing processes and remove prison sentences in the Data Protection Law. Further modernize the new Consumer Protection Law to align with international e-commerce. 	Short to medium term	High
Digital financial services		
<ul style="list-style-type: none"> Issue the relevant secondary regulations for payment systems and services and fintech related-matters under the new Banking Law. 	Short term	High
Digital entrepreneurship		
<ul style="list-style-type: none"> Update the competition framework to preserve competition in online markets, prevent anticompetitive mergers, and provide necessary tools to deal with such practices in digital markets. Issue a law allowing investment-based crowdfunding platforms to be established in the Arab Republic of Egypt. Provide legal certainty on the eligibility of the tech sector to special incentives. 	Medium to long term	High
	Short term	Intermediate
Overarching recommendations		
<ul style="list-style-type: none"> Create a government body responsible for the digital transformation to do the following: <ul style="list-style-type: none"> Prepare a comprehensive legal strategy, and continuously update it. Establish regulatory impact assessments and take corrective action accordingly. Establish more regulatory sandboxes to test new solutions. Make available online all digital legislation, together with an easy guide. Streamline existing laws and regulations covering digital economy. Enhance cooperation, including by creating a network of authorities with competition powers responsible for ex post competition enforcement across sectors. Improve the existing dispute resolution mechanism in bodies involved in the digital economy through alternative dispute resolution and online dispute resolution. 	Short term	High
	Medium term	High

Note: Short term = 3–12 months, medium term = 12–24 months, and long term = 24–36 months; fintech = financial technology; IPR = intellectual property rights.

3. Response to COVID-19: Relevant National Measures

The outbreak of COVID-19 in Egypt has underscored the importance of digital infrastructure and services in supporting health care and delivery to combat the pandemic. This goes above and beyond the immediate need to support distance education and teleworking due to the introduction of social distancing. Like many countries, Egypt has been adversely affected by COVID-19. The pandemic poses significant challenges to Egypt's growth prospects: Indeed, the recent episode of robust economic activity has been interrupted since the onset of COVID-19, with growth declining from 5.6 percent in FY2018/19 to 3.6 percent in FY2019/20. The World Bank forecasts a further decline in growth to 2.3 percent in FY2020/21 before economic activity gradually starts resuming and may not reach pre-pandemic growth rates before FY2022/23. Nonetheless, the recent series of successful reforms has placed Egypt as one of the few countries to see real GDP growth amid the crisis and also avoid recession in 2020 calendar year as forecasted by the European Bank for Reconstruction and Development²⁵.

To monitor the impact of COVID-19, the NTRA published the first report on changes in data usage on April 20, 2020. The report provides a comparison of data usage between the second week of April and the second week of March as a result of COVID-19. It shows an increase in international voice calls by 15 percent, local voice calls by 3 percent, home internet usage by 87 percent (which later increased to 100 percent), and mobile internet usage by 18 percent.

As a result, a number of decisions were taken to support and facilitate the usage of broadband internet, including those set out below:

In the telecom sector

- MCIT mandated the increase of home internet data packages by 20 percent and offered free browsing (zero-rating) of the Egyptian Knowledge Bank as well as other educational platforms and websites. This made services much more affordable during the crisis.
- For usage of e-payment methods, the NTRA, in collaboration with mobile operators, granted citizens 30 times the charged balance, as free minutes and units.
- The NTRA instructed the four telecom operators to unify the working hours at their stores for serving citizens nationwide, from 08:30 to 16:30.

In the health sector

- Citizens were given free access to hotlines dedicated to the Ministry of Health and Population (MoHP), numbers 105 and 15335, from any landline or mobile service. Telecom Egypt (TE), which operates the MoHP hotline center, also added 200 additional agents to accommodate the increasing number of calls received.
- A free hotline (16445) to contact doctors for remote check-ups and inquiries about COVID-19 was set up.
- The government launched a mobile health tracking application on Google Store and iOS on April 8. The system tracks reports on infections; facilitates communication between doctors and citizens; and

²⁵ <https://www.ebrd.com/news/2020/ebrd-revises-down-economic-forecasts-amid-continuing-coronavirus-uncertainty.html>

provides access to relevant articles, infographics, safe shopping instructions, and answers to frequently asked questions. This complements the government's COVID-19 information website at <https://care.gov.eg>.

In the education sector

- To enable access to learning platforms, SIM cards were made available at no cost for students who already owned a device (computer, tablet, or smartphone). Free SIM cards were also made available for doctors working in quarantined hospitals.
- The Minister of Education announced the implementation of distance learning and assessment during school suspension (as of March 15, 2020, for two weeks) (box 3).²⁶

Financial measures to support several sectors

- Through circulars, the CBE facilitated free registration for e-wallets and removed the administrative fees for e-payment transactions to meet citizens' needs, which led to 2.5 million e-wallets created and a 30 percent transaction increase the following month. The CBE currently estimates that 13.5 million e-wallet mobile phone accounts are registered in the country.
- The government introduced a one-year COVID-19 salary tax of 1 percent to support health care and the social safety net, starting July 2020.
- The country's real estate law was amended, providing a three-month exemption for companies in industrial and tourism sectors and a six-month period for paying existing liabilities.
- The CBE provided an EGP 3 billion loan to help tourism companies cover salaries and other commitments.
- Businesses received a reduction of electricity for EGP 0.10/kilowatt-hour beginning in August 2020.
- Egypt Post accelerated the development of digital payments with the objective to improve financial inclusion²⁷: further intervention included providing saving accounts with the highest interest rates for cash in Egypt, current accounts (golden and silver) with daily interest and the enabling of payments for government and utility bills, with plans for the possible international remittance, ATM and the Egypt Post Super App (also scheduled to be launched in Q2 2021).

²⁶ Tarek Shawki, Minister of Education, March 19, 2020, <https://www.facebook.com/tshawki/videos/10222860204678325/>.

²⁷ MCIT data May 2021

Box 3**The Education System's Post-COVID-19 Prospects in Egypt**

In comparison to other countries in the Middle East and North Africa region, the disruption to learning in the Arab Republic of Egypt has been relatively mitigated during the COVID-19 school closure, thanks to the Ministry of Education and Technical Education (MOETE) reform program that established the connectivity, e-learning material, and computer-based assessment system unique in the region. Telecom Egypt has already connected 2,600 public secondary schools with fiber optic and MOETE provided tablets for students and teachers in secondary schools. The digital learning platform enabled the MOETE to respond quickly to school closures in March 2020, for the creation and roll-out of digital content to all school grades through the Egyptian Knowledge Bank. Live streaming was made available as well as national distance education TV channels for those with no access to digital devices. This may have further stimulated public acceptance of technology and accelerated the ministry's transition to a blended learning approach for over 20 million students. It assures preparedness for future disruptions to schooling. The teachers' role in all this continues to be critical: a survey conducted in May 2020 found that, on average, 29 percent of secondary school teachers do not have an internet connection, and this constrained their interaction with students. Jointly with the United Nations Children's Fund (UNICEF), the United Nations Educational, Scientific, and Cultural Organization (UNESCO), and the World Food Programme, the World Bank developed a framework to guide the reopening of schools.

Source: Reporting from "Blackboard," Enterprise Press, <https://enterprise.press/blackboard/>.

4. Digital Infrastructure

This section highlights the importance of digital infrastructure as a fundamental element for developing the digital economy in Egypt, analyzes the current situation, and provides recommendations.

Key Messages

- With 17 distinct submarine cables²⁸ and an ideal geographical location at the crossroads between Europe, Africa and Asia, Egypt has a solid foundation for becoming a digital hub in the region.
- The regulatory environment has not made much progress since 2007 and is thus hampering the accelerated transformation of the country into a digital economy.
- Mobile broadband service offerings are competitive, however, there is room for improving the coverage and quality of fourth generation mobile network (4G) service by licensing more spectrum at affordable prices, facilitating mobile site acquisition, and increasing usage of fiber to the tower.
- Fixed broadband service offerings are dominated by state-owned TE, which preserves its monopoly over most fixed infrastructures in and to the country.
- A number of options are available to the government to accelerate fiber deployment:
 - Investments in fixed infrastructure made by the government through TE could be complemented by private sector investments in areas that are commercially viable.
 - There is untapped fiber capacity in alternative infrastructure such as utility providers (water, electricity, or national rail), and using right of ways along main roads.

Addressing the constraints of market competition and promoting sector regulations which increases private sector participation is crucial for Egypt to fully embrace a successful digital economy in Egypt.

4.1. The Importance of Digital Infrastructure

Fast, high-quality, universal, and affordable broadband internet is a key foundation to unleash the potential of the digital economy and accelerate Egypt's socioeconomic development. Increased connectivity positively affects economic growth, productivity, firm performance and efficiency, and the quality of public institutions and services. The effect of increased broadband access on economic growth and employment has been well documented. (For a review of the latest evidence see Katz and Callorda [2018]; for employment effects, see Hjort and Poulsen [2018].) Connectivity can shape countries' development path through several interrelated channels: (a) it can bridge the information gap, alleviate asymmetry problems, and improve communication; (b) it is the most cost-effective and fastest means of connecting all citizens to markets and public and business services—especially those living in remote areas; and (c) it increases productivity, lowers transaction costs, and optimizes supply chains. (Aker and Blumenstock 2015).

Digital infrastructure underpins the digital economy. According to a McKinsey report (Cabral, Moodley, and Yeboah-Amankwah 2014), the internet could contribute some US\$300 billion to Africa's GDP by 2025, with the largest potential impact in six key sectors: education, health, agriculture, financial services, retail, and

²⁸ Source Telegeography: FLAG and Aletar (1997), Taba-Aqaba (1998), SeMeWe3 (1998), SeMeWe-4 (2005), Falcon (2006), SEACOM-Tata (2009), IMEWE (2010), Hawk, EIG and TE North/TGN (2011), MENA/GBI (2014), SeMeWe-5 (2016), AAE1 (2017), PEACE cable (2021), 2Africa and Africa-1 are planned to be ready for service in 2023.

government. In 2019, the ICT sector contributed EGP 93.4 billion to the Egyptian GDP (approximately 4 percent of the total GDP).²⁹

According to the Network Readiness Index of the WEF Global Information Technology Report from 2020³⁰, Egypt is ranked 84th out of 121 economies, showing improvement as compared to the 2019 result of 93rd and the 2016 result of 96th. The country has outperformed the other North African countries in the benchmark and further reduced the gap with South Africa's position of 76th (down from 60th in 2019).

Egypt's ranking on Broadband speed progressed recently, however further evolution will request addressing two main bottlenecks: (a) the reliance on TE legacy copper for fixed broadband in brownfield areas and (b) the continued limited amount of spectrum assigned to MNOs for mobile broadband (following the recent spectrum assignment), both of which limit Egypt's ability to significantly achieve higher broadband speed connectivity.

In its Sustainable Development Strategy—Egypt Vision 2030, the government of Egypt recognized the importance of high-speed broadband connectivity to drive productivity, innovation, and growth. It noted that digital infrastructure was essential for a modern economy and society and that as such, Egypt required a National Project for High Speed Internet. To achieve this engagement, the MCIT Egypt's ICT 2030 Strategy sets out the high-level objective of “developing the ICT infrastructure and fostering digital inclusion” (MCIT 2018). Box 4 shares the views of young entrepreneurs on these issues.

Box 4

Feedback from Young Entrepreneurs—World Bank Workshop, February 27, 2020, Cairo

Startups at the workshop explained that their platforms were hosted outside of the country for a number of reasons including the limited service and scalability and noncompetitive pricing offered by local data centers compared with hosting services and cloud packages which are available with the top five international leaders (such as Amazon). Participant also reinforced the importance of them having high quality internet in order to ensure local developers' productivity.

Egypt's ICT 2030 Strategy and Action Plan involves the three strategic pillars detailed in figure 2.

4.2. Diagnostic Findings: Current State of Digital Infrastructure Development

Access, Availability, and Affordability of Broadband

Broadband internet penetration in Egypt is around 57.3³¹ percent, with mobile devices remains the primary means by which people access the broadband internet with 52.40 million users (and 4.04 USB Modem).³² By comparison, fixed broadband internet connections (8.81 million users) to homes and offices are mostly limited to the capital and larger cities, as urban areas make up almost 70 percent of the connected population. The largest share of Egypt's corporate market for fixed broadband is found in the

²⁹ NTRA Telecom Market Indicators 2019.

³⁰ <https://networkreadinessindex.org/#nri>

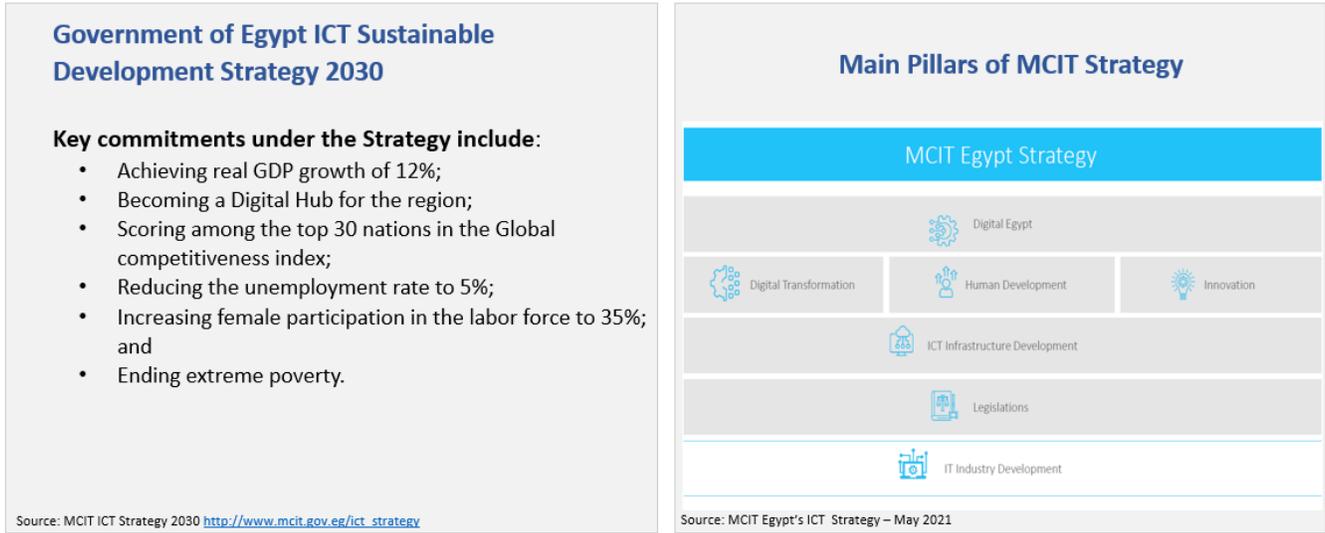
³¹ International Telecommunication Union (ITU) World Telecommunication/ICT Indicators Database 2019
<https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=EG>

³² MCIT ICT Indicators December 2020,

https://mcit.gov.eg/Upcont/Documents/Publications_2142021000_ICT_Indicators_Quarterly_Bulletin_Q4%202020.pdf

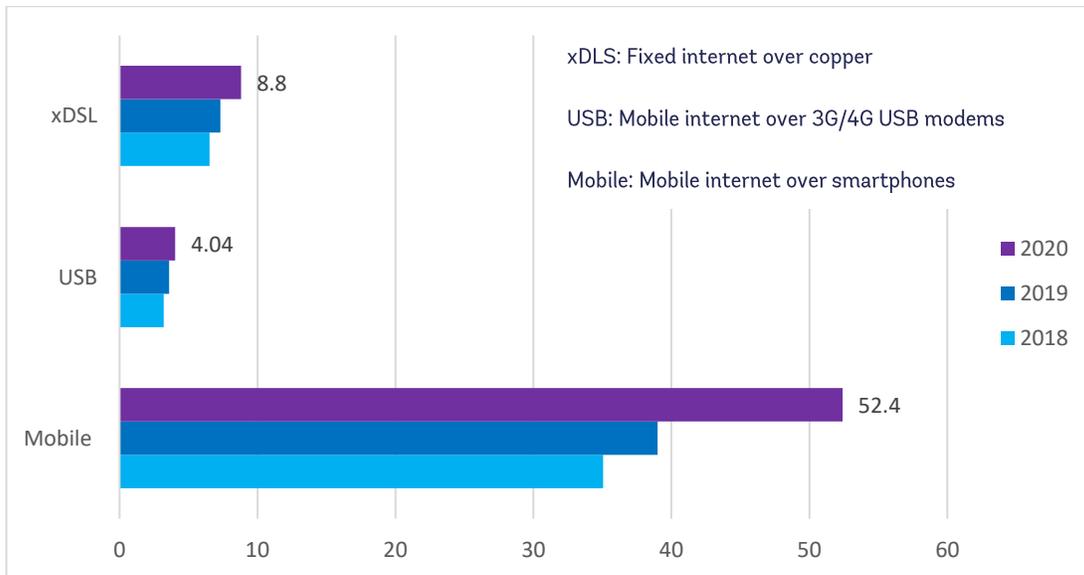
major cities of Cairo and Alexandria. Most critically, dependence on mobile rather than fixed-line broadband means that unmetered pricing or unlimited data use is rare and more expensive. Thus, the availability of sufficient, unlimited, and high-speed broadband internet across the territory remains a significant problem for the development of the digital economy in Egypt, as was acknowledged with the Presidential "Decent Life" Initiative, that aims to improve and increase internet connectivity across the country.

Figure 2. Egypt Strategic Pillars and Targets by 2030



Source: MCIT 2021.

Figure 3. Number of Active Broadband Subscribers per Technology (Millions)



Source: MCIT ICT Indicators, December 2020.

The population in Egypt benefits from mobile broadband coverage of around 97.7 percent for 3G, and 61.1 percent for 4G (figure 4).³³ While geographic coverage of mobile infrastructure is expanding, the mobile penetration rate in rural areas remains well below the national average. Egypt is lagging behind its potential in terms of the number of towers as a result of two factors: (a) the towers' construction authorization process remains complex³⁴, and (b) alternative mobile network operators are not afforded an enabling environment to deploy their own fiber infrastructure to provide backhaul between the towers and their core networks.

Figure 4. Mobile Coverage

2G mobile share	24.77%
3G mobile share	54.71%
4G mobile share	20.51%
<hr/>	
2G population coverage	98.60%
3G population coverage	97.70%
4G population coverage	61.10%

Sources: GSMA and NTRA data, June 2020.

Egypt was classified among the three cheapest countries for the price of residential fixed and mobile services (voice and data) in the 2019 Arab Regulators Network (AREGNET) study that covers the 22 member countries (Teligen, Strategy Analytics 2019) (figure 5). Mobile broadband prices for one gigabyte (GB) of data as a percentage of the gross national income (GNI) per capita is 0.2 percent (compared to the Middle East and North Africa average of 3 percent), and the entry-level fixed broadband basket price as a percentage of GDP per capita is 3.3 percent (compared to the middle east and north Africa average of 8 percent) (figure 6). Similarly, the ITU ranked Egypt 65th³⁵ for data-only mobile broadband (1.5Gb) and Egypt also met the GNI target below 2% set by Broadband Commission. The NTRA just approve the tariffs offered by market players.

Figure 5. Broadband Prices, Arab Republic of Egypt

Smartphone cost (100 = most affordable)	77.8
Mobile prepaid (percent of income)	0.34
Fixed-line broadband (percent of income)	1.28

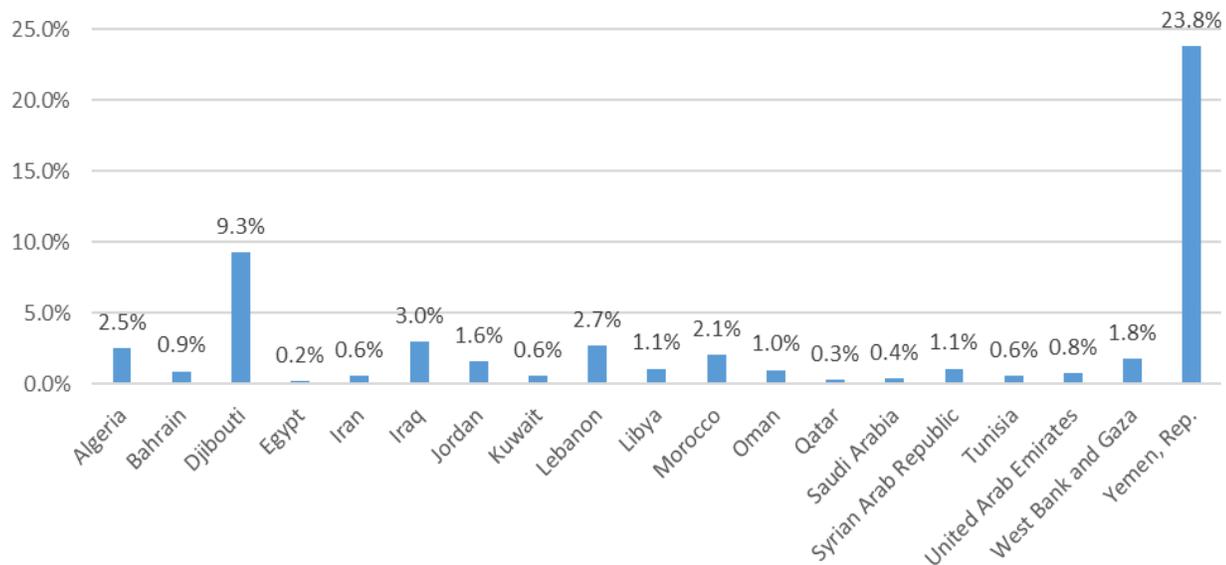
Sources: Economist Intelligence Unit 2019, ITU, and GSMA data.

³³ Based on NTRA records communicated in June 2020.

³⁴ NTRA indicated the government has initiated a process to improve tower deployment procedures and some reduction in time has been achieved.

³⁵ ICT Price Tables of 2019

Figure 6. Mobile Broadband Prices: Price of One Gigabyte of Data as the Percentage of GNI per Capita



Note: GNI = Gross National Income.

Source: MNA Tech calculated from ITU dataset 2019.

International Connectivity, Capacity, and Access

TE has full control of all international gateways in Egypt³⁶, operating the five landing stations (figure 7), two on the Mediterranean (Alexandria and Abu Talat) and three on the Red Sea (Suez, Sukhana, and Zafarana). For cutting across Egypt's terrestrial path, TE has developed and implemented a redundant network known as One Mesh, based on dense wavelength division multiplexing (DWDM) technology (figure 8). The transiting capacity is paid to TE per lambda with a price discount based on volume purchased and time commitment in either lease or indefeasible rights of use (IRU) contracts. The Egyptian government had spent EGP 30 billion to expand the international internet corridors coming to Egypt at the end of 2019 and increased Egypt's internet capacities by about 30 percent in 2020. In a recent move, Google has deployed a submarine cable that avoids Egypt with a new Israel-Saudi fiber connection (Enterprise 2020a). However, Facebook through a consortium with TE, Vodafone and China Mobile is building a new submarine cable "2Africa" that **will use two new landing stations and a new path parallel to Suez Canal.** TE further owns 50 percent of the Egyptian International Submarine Cables Company. In addition, TE's fixed network is the only available choice for licensed operators to deliver the purchased capacity between the international gateway and their core network in Egypt.

³⁶ MCIT indicates the possibility to apply for an international voice gateway license, that has been obtained by Etisalat Misr, but that all other MNOs are using TE gateway for economic reasons.

Figure 7. International Bandwidth Capacity

	Egypt
Bandwidth capacity (bit/s per internet user, 2020)	25,315
GigE (price/Mbps/month, 3/18)	74.26
10 GigE (price/Mbps/month, 3/19)	66.38

Note: GigE = gigabit Ethernet; Mbps = megabits per second.

Source: MCIT ICT Indicators Bulletin December 2020, Telegeography.

Figure 8. Submarine Cables Crossing, Arab Republic of Egypt



Source: International Telecommunication Union, Interactive Transmission Map.

National Infrastructure

TE fixed-fiber infrastructure connects nearly all populated areas of Egypt from TE telecom hubs in the cities. In addition, TE has invested and deployed fiber to the curb (FTTC) since 2013 (NTRA 2017) with more than 100,000 km of fiber length³⁷. This however means most last-mile connections still rely on the historical copper network in brownfield areas to reach customer premises in Egypt. As shown in figure 9, Egypt has significantly developed its national transmission network and the latest government plan is to connect 1 million new homes to the fiber optic network in 2020. Telecom Egypt data also offers fiber to the home (FTTH) to subscribers in limited areas (Cairo, Alexandria, Hurghada, Luxor, and Aswan), however

³⁷ MCIT information May 2021

FTTH is now deployed in all greenfield areas. From World Bank MNATech's estimate, the replacement of copper cables would entail an investment of EGP 2 billion (US\$255.4 million).

Figure 9. National Infrastructure Network for Egypt and Benchmark Countries

	Egypt, Arab Rep.	Kenya	Nigeria	South Africa
Length of national transmission network (km)	61,000	13,917	30,688	42,152
Geographical area (sq. km)	1,002,450	580,367	923,768	1,219,602
Population density (sq. km)	103.00	94.00	226.00	49.00
National transmission network (km per sq. km)	0.06	0.0240	0.0332	0.0346

Note: km = kilometer; sq km = square kilometer.

Source: NSRC 2019—Publicly available data on national transmission networks and MCIT 2020

The primary reliance on Telecom Egypt's fixed infrastructure to provide backhaul, leased lines, last-mile fixed access, and access to international capacity is eliminating private sector investment in fixed infrastructure. This includes commercially viable areas where the private sector could bring in more resources, invest in infrastructure, and complement the government's efforts. For example, the government is investing EGP 6 billion to deploy fiber to connect 32,000 government buildings nationwide and EGP 40 billion for phase one on the New Capital City telecom infrastructure, even though this could be equally done by the private sector (Ahram Online 2020). In an effective competitive market, government funding is usually reserved for connecting remote areas that would be less attractive to private market players. The lack of supportive regulatory environment to leverage licensed operators to invest in fiber has resulted in suboptimal last mile coverage, less resilient national fiber optic backbone networks, and total reliance on government funding in infrastructure deployments. The government could study options for using alternative infrastructure such as fiber deployed by utility providers (water, electricity, or national rail) or rights of way along main roads. The biggest infrastructure challenge is to improve metro rings, network diversity, and last-mile fiber access, including for mobile backhaul. (See box 5 for South Africa's experience.) As part of the "Decent Life" Presidential initiative, which the state began implementing in 2019, MCIT is mandated to connect remote villages with fiber optic cables to connect one million homes, in addition to improving the quality of mobile telecommunication services through providing the villages with 1,000 cell towers.

Box 5**The Successful Experience of South Africa with Competitive Fiber Optic Markets**

South Africa is one of the digital-economy leaders on the African continent, outperforming several sectors. Digital contributes around 17 percent of service exports and close to 3 percent of GDP (more than the contribution of agriculture in 2019). With a purchasing power parity-adjusted GDP per capita of US\$13,000, it is also among the few countries in Africa with upper-middle income status. South Africa leads the region in internet usage (54 percent), mobile phone penetration (80 percent), and broadband coverage (99 percent) and is ranked 46 out of 140 countries in the World Economic Forum Global Competitiveness Index.

South Africa's digital infrastructure is relatively robust and has enabled progressively better market outcomes for consumers. In the past 10 years, the country has moved to an open, competitive regime in terms of its international connectivity, resulting in the fast growth of international bandwidth usage. Mobile network operators have played an important part in providing infrastructure, resulting in impressive 3G and 4G national network coverage. South Africa has nearly reached the Digital Economy for Africa target of 100 percent of population covered by mobile broadband networks. Fixed-line internet and especially fiber-optic connections to homes and businesses (FTTX) have experienced rapid growth in recent years, with the most extensive backbone infrastructure on the continent, around 200,000 kilometers of fiber deployed that can largely be attributed to commercial fiber operators.

The private sector is playing an increasing role in South Africa's digital economy, highlighting the importance of improved dialogue between the government and private sector on existing digital challenges, as shown in the recent spectrum auction process.

Source: ICASA 2020.

The heavy reliance on TE's lone fixed infrastructure represents a textbook single point of failure for the whole telecommunication market in Egypt. Should TE's network fail, the current setup could have a significant impact on the capacity of other internet service providers (ISPs) and MNOs to maintain their operations. Reducing dependency on TE's network and enabling alternative operators to access, deploy, and use other fiber routes (to build their backbones on redundant architecture and services) would be ideal to increase the resilience of the telecom networks and services in Egypt.

TE's wholesale services are an important source of revenue, both from international operators and national operators, as shown in figure 10.³⁸ TE provides services to licensed operators based on commercial agreements, validated by the NTRA. On this basis, TE has a three-year contract with Orange (formerly Mobinil) and a three-year contract with Vodafone Egypt, both renewed in 2018. TE signed new transmission and interconnection agreements with Etisalat in June 2020. Based on TE's 2018 annual report, the revenue consisted of 49 percent retail (residential 35 percent and enterprise 14 percent), and 51 percent wholesale (domestic 16 percent, international carriers' 20 percent, and international cables and networks 15 percent). TE announced a 20 percent year-on-year increase in consolidated revenue in the quarter ended June 30, 2020, with turnover rising to EGP 7.94 billion (US\$497 million). It attributed this level of growth to a spike in retail revenue, which rose by 43 percent year-on-year to EGP 3.63 billion. Turnover from the company's domestic wholesale division recorded notable gains, rising 40 percent to EGP 1.31 billion.

Figure 10. Telecom Egypt Operational Revenues

³⁸ Telecom Egypt Wholesale, <https://www.te.eg/wps/portal/te/Business/Wholesale/#TE-Wholesale>.

	31/12/2018 L.E. (000)	31/12/2017 L.E. (000)
Home and personal communications	8 064 282	5 662 272
Enterprise	3 215 287	2 627 235
Domestic wholesale	3 570 733	3 303 833
International carriers	4 424 255	4 868 176
International cables and networks	3 496 025	2 105 766
	22 770 582	18 567 282

Note: LE = Egyptian pound.

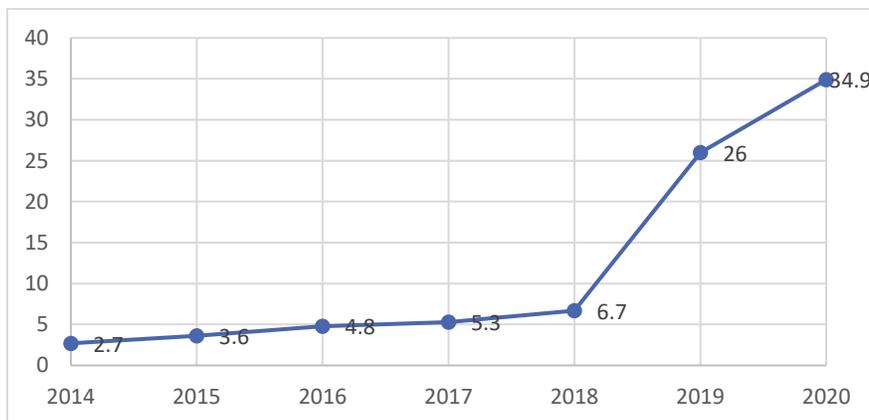
Source: TE 2018.

The NTRA could consider performing a market study to identify any potential wholesale bottlenecks and address them. Such a study would inform its efforts to foster competition, safeguard a level playing field for the sector, and avoid distortion of market outcomes, all of which could affect the welfare of end users.

Quality of Broadband Networks

Broadband performance in Egypt is not reaching its full potential. Recent improvements of fixed broadband services started during the second half of 2019, related to TE's investments in FTTC and access network upgraded to very high-speed digital subscriber line (VDSL) technology, are shown in figures 11 and 13, blended with some first fiber services. Nonetheless fixed broadband performance remains limited by the primary usage of copper in the last mile, of 34.88 megabits per second (Mbps) average download speed, which could be significantly improved, compared to the world average of 94.91 Mbps. Still Telecom Egypt's (WE) fixed network was named the fastest fixed network in North Africa for the third and fourth quarters of 2020³⁹.

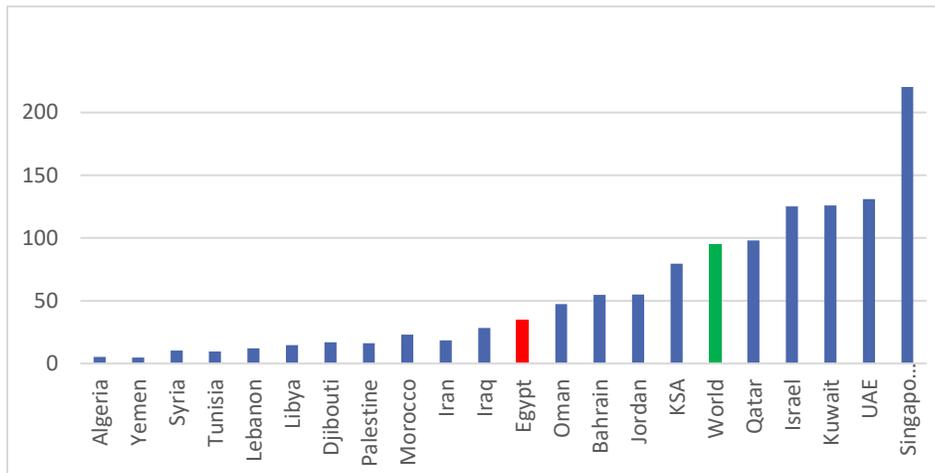
Figure 11. Growth in Fixed Broadband Download Speed (Mbps)



Note: Mbps = megabits per second.

Source: Ookla, "Speedtest Global Index," December 2014-2020, <https://www.speedtest.net/global-index>.

³⁹ <https://ir.te.eg/en/CorporateNews/PressRelease/139/Telecom-Egypt-wins-the-award-for-the-fastest-fixed-network-in-North-Africa-by-Ookla>

Figure 12. Fixed Broadband Download Speed in Benchmarked Countries (Mbps)

Note: Mbps = megabits per second.

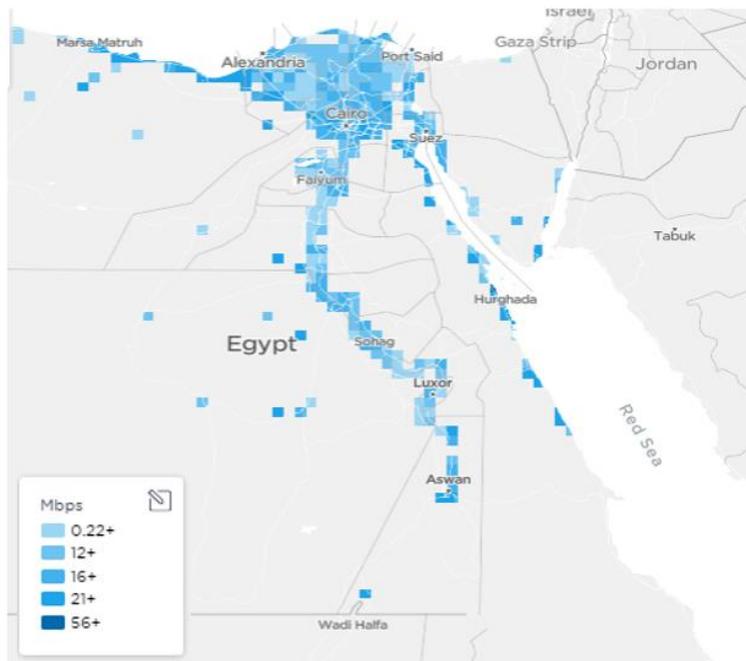
Source: Ookla, "Speedtest Global Index," December 2020, <https://www.speedtest.net/global-index>.

The average mobile data download speed of 20.42 Mbps has increased from 4.45 Mbps in 2016. However, it has not significantly improved over the past 12 months, while data usage has steadily increased since the MNOs launched 4G services in 2017. Data usage further increased by 35 percent due to COVID-19 mitigation measures. Egypt compares unfavorably with the world average download speed of 47.20 Mbps (figure 13). This can be explained by two main factors:

- The limited amount of spectrum assigned by the government to mobile service operators. Egypt has assigned spectrum in only 5 of the 11 bands identified for mobile services, and within those bands, it has assigned less spectrum than most other countries, however this may be adjusted based on spectrum re-farming with other agencies.
- The limited fiber infrastructure, other than TE's own network, for alternative operators to bring back the traffic from telecom towers to their core networks and subsequent reliance of alternative operators on TE's quality of wholesale service⁴⁰ and commercial contracts terms and conditions.

⁴⁰ This relates to the importance for MNOs to have SLAs and QoS targets in their commercial contracts for the wholesale services provided by TE.

Figure 13. Mobile Broadband Quality of Service Map



Source: Based on Ookla® Speedtest Intelligence® data for August 2020.

Market Structure and Competition

Public Licensed Operators

The Egyptian market is heavily concentrated, as most ISPs are owned by the four major operators namely TE, Vodafone, Orange and Etisalat. Established in 1999, Noor is noticeably the only independent ISP that has carved out a niche serving the enterprise market. MNOs have been granted nominal virtual-fixed licenses; however, these companies are unable to duplicate TE's infrastructure to deploy fiber themselves and primarily resell TE's capacity to their own ISPs.

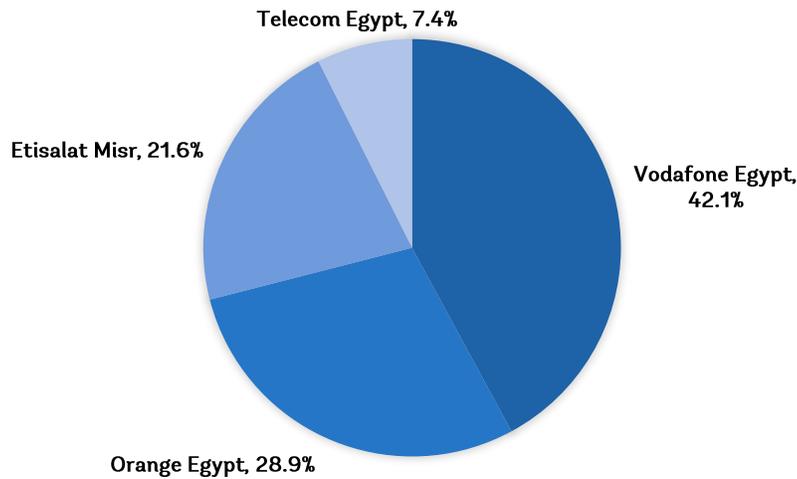
Egypt has managed to attract large international MNOs: Etisalat Misr, Orange Egypt, and Vodafone Egypt (figures 15 and 16). The MNOs offer 2G/3G services and since September 2017, 4G services. Telecom Egypt, via its subsidiary We, became Egypt's fourth mobile operator after securing a 4G license in August 2017. We has roaming agreements on Orange and Etisalat's mobile networks to mitigate its limited footprint to provide services nationwide. In January 2020, Saudi Telecom Company signed a nonbinding agreement for a possible acquisition of Vodafone's 55 percent stake for US\$2.4 billion. However, in December Vodafone ended talks to sell its Egyptian stake to Saudi Telecom Company.⁴¹ The current mobile market concentration index (Herfindahl-Hirschmann Index [HHI]) in Egypt is 3,277, compared to the Middle East and North Africa average of 4,491, and the fixed broadband market concentration index is 6,552 compared to the Middle East and North Africa average of 6,804.⁴² This means that Egypt has less concentrated markets than the average

⁴¹ The confirmation that Vodafone will stay and invest in Egypt was made following a meeting between President Abdel-Fattah El-Sisi, Vodafone Group's Chief Executive Officer Nick Read, and MCIT's Minister Amr Talaat in Cairo in December 2020 (Mathew and Seal 2020).

⁴² In the Herfindahl-Hirschmann Index, the stronger the HHI is in a sector (a number ranging between 0 and 10,000), the more concentrated is the market.

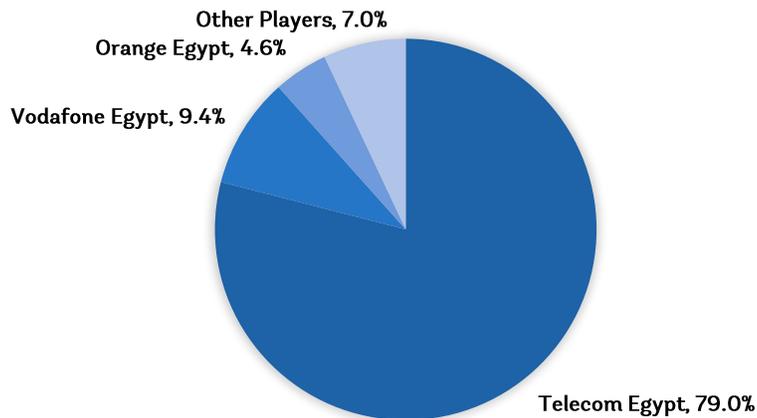
of MENA countries, more significantly in mobile. As part of reform measures, a new Mobile Number Portability (MNP) regulation⁴³ was passed June 2020 by the NTRA the aim to reduce the transfer process for subscribers to a maximum of 24 hours.

Figure 14. Total Subscribers Market Share per Mobile Network



Source: TeleGeography September 2020.

Figure 15. Total Subscribers Market Share per Broadband Network



Source: TeleGeography September 2020.

⁴³ <https://www.tra.gov.eg/en/ict-minister-witnesses-launching-mnp-service-with-new-regulations/>

The mobile market in Egypt is competitive, with four licensed mobile network operators. But customers remain highly dependent on prepaid mobile packages, and there is growing demand for mobile data and value-added services.

The incumbent operator, TE, continues to dominate the fixed market. The issuance of a unified license to Egypt’s mobile operators in 2017 was not sufficient to foster competition in the market. The government could provide regulatory incentives to facilitate deployment of fiber by alternative operators (in particular related to deployment of an operator’s own infrastructure outside of closed user groups and compounds) and take additional steps to address the ongoing dominance of TE in fixed markets.

Promotion of infrastructure sharing, procompetitive open access principles, implementation of transparent wholesale pricing, and determination of regulatory remedies could help the fixed market further grow. The April 2020 FTTH Council Europe report highlights the importance of alternative internet service providers which make up the largest part of fiber to the FTTH players and contribute around 56 percent of the total fiber expansion in Europe (FTTH Council Europe 2020).

Internet Exchange and Data Centers

Egypt’s CAIX was established in 2002 and has six members, consisting of the major ISPs (Etisalat Data, Vodafone Data, TE Data, Noor, Orange, and PCH). TE provides the resources for the operations of CAIX⁴⁴, which is hosted at the TE Ramses central office. Internet exchange points (IXPs) are places where ISPs, content delivery networks (CDNs) and enterprises can interconnect their networks and exchange traffic. However, unlike in other countries, there is no CDN—international or local—directly connected to CAIX (AMS-IX in Amsterdam connects 880+ networks⁴⁵). The same is true of enterprises, businesses, and government entities (with the noticeable exception of the MCIT). As of today, they are not allowed to connect to CAIX, as they would need to have Class A or B licenses from NTRA. Telecom Egypt is partnering with AMS-IX to build a new IXP, EG-IX, with the objective “to attract content and cloud service providers, application developers, and telecommunications companies looking to enhance the digital experience for internet users in Egypt, Africa, and the Middle East” (*Telecom Review* 2020). It would foster competition and improve the quality and reliability of Egypt’s internet if private companies with an autonomous system number (ASN) could connect to this new IXP (box 6). Egypt has only 62 active ASNs.⁴⁶

Box 6

Why Autonomous System Numbers (ASNs) Are Useful

ASNs are used by internet service providers (ISPs) and operators, educational institutions, the financial sector, and key national companies, like EgyptAir. An organization having its own ASN means flexibility to change ISPs as needed, for a better price, contract flexibility, quality of services, and connectivity alternatives, including multihomed (for example, connect via an internet exchange point (IXP) to multiple ISPs for increased reliability, including using alternate fiber routes).

While there are several data center offerings in Egypt, mostly located within Greater Cairo and Alexandria, several of them appear to be carrier data centers and others are Tier III (TE 2020). In January 2020, the Administrative Capital for Urban Development (Opiah 2020) awarded Orange a contract of US\$135 million to create and manage the new administrative capital’s data center and cloud computing platform, with the objective of exploiting smart technologies and providing advanced digital services

⁴⁴ MCIT indicated CAIX infrastructure has recently been upgraded to accommodate increase in local traffic due to COVID-19

⁴⁵ A list of AMS-IX connected networks is at <https://www.ams-ix.net/ams/connected-networks>.

⁴⁶ An active updated list of ASNs is available at <https://bgp.he.net/country/EG>.

including internet-of-things solutions and artificial intelligence. Clearly missing in Egypt are large data centers built for, and by, the large internet companies and carrier-neutral data centers. In early 2021, TE is planning to open a Tier III data center with a 2,000 rack capacity in the Smart Village, leveraging its international connectivity.⁴⁷

Policy and Regulatory Environment

Legal and Regulatory Framework

In 1998 two laws were issued separating the market's regulatory and operational functions for the first time. Law No. 19/1998 that formed Telecom Egypt, previously Egypt National Telecommunications Organization (ARENTO), as a joint-stock company where the government of Egypt still holds 80 percent. And Law No. 101/1998 that formed the Telecommunications Regulatory Authority (TRA) as an independent regulator to replace the Wired and Wireless Communications Regulatory Agency, mandating it among other things to supervise the telecom sector, monitor operator's performance, and issue licenses.

The Telecommunication Regulation Law (Law No. 10/2003), was issued and ratified in February 2003 to oversee the development of the market and introduce competition in the telecom sector. This law established the NTRA, equipping it with powers of oversight and licensing, interconnection, universal service, consumer rights, spectrum management, and other regulatory functions. The NTRA has autonomy in terms of decision making, financing its activities and recruitment. However, it ultimately remains subordinate to the MCIT. As per the law, MCIT is the policymaker for the sector, and the minister is also chairman of the NTRA Board. Several other laws and regulations were passed to help legislate for liberalization. These are further discussed in the detailed review of the legal, regulatory, and institutional framework in appendix A.

The overlap between policymaking, regulation, ownership, and investment in the sector remains a fundamental challenge, which poses a high risk of bias towards the incumbent operator, TE, with corresponding market concentration. Even though the law on competition protection and monopolistic practices provides the legal framework to address significant market power and prevent anticompetitive behavior,⁴⁸ there have not yet been any sanctions imposed on TE. While the NTRA can impose penalties on licensed companies that violate NTRA directives, their directives can, and have been challenged in court, leading to long periods of regulatory uncertainty.⁴⁹

Furthermore, Egypt's regulatory environment has slightly deteriorated compared to 2018. According to the 2019 ITU ICT Tracker index,⁵⁰ it has lost three points on the regulatory mandate and two points on the regulatory authority and the regulatory regime. Since 2007 the regulatory authority dimension has not made progress but lost 3 points. This calls for action by the government to improve the autonomy, governance, and capacity of the NTRA. The regulator could be empowered and resourced to further enable competition, including infrastructure sharing and interconnection regulations. Figure 16 reflects the

⁴⁷ Smart Village is a high-technology business district located in 6th of October's city, West of Cairo, established by Presidential Decree no. 355 in 2000. See <https://www.smart-villages.com/>.

⁴⁸ Law on competition protection and monopolistic practices No. 3 of 2005 amended by No. 190 of 2008.

⁴⁹ In January 2019, Vodafone Egypt was directed by a Cairo arbitration court to pay Etisalat Misr US\$41.9 million in arbitration fees, ending a decade-long dispute.

⁵⁰ The ITU ICT Regulatory Tracker indexes countries based on their regulatory environment. It tracks countries across four clusters containing a total of 50 indicators and then indicates the general level of regulation and ranking against other countries, <https://www.itu.int/net4/itu-d/irt/#/country-card/EGY>.

situation since 2007, highlighting regulatory areas where improvements should take place, including strengthening the regulatory independence.

Figure 16. Arab Republic of Egypt Country Card



Sources: ITU (International Telecommunication Union), ICT Regulatory Tracker, 2019, <https://www.itu.int/net4/itu-d/irt/#/country-card/EGY>.

Spectrum Licensing

The licensing and affordability of spectrum for a timely rollout of mobile technologies are ongoing regulatory challenges for Egypt. The country was late when initiating a 4G licensing process at the end of 2016, and mobile operators have a limited amount of spectrum,⁵¹ at the lower end of developed countries spectrum usage for mobile: 42.5 megahertz (MHz) for Orange and Vodafone, 40 MHz for Etisalat, and 15 MHz for We. Further, 4G licenses in Egypt are more expensive compared to similar benchmarked countries, when adjusted for population size and difference in GDP (GSMA 2020). The circumstances were repeated in 2020 with the decision by the government to allow MNOs to bid for one block of 40 MHz and two blocks of 20 MHz in the 2600 MHz band with a high reserve price⁵² (Enterprise 2020b). Vodafone has been awarded the 40 MHz block for an initial payment of \$270 million and two further payments of \$135 million in 2021 and 2022. Telecom Egypt obtained a block of 20 MHz for \$305 million to be paid 50 percent upfront and with two 25 percent subsequent payments in 2021 and 2022. Etisalat outbid Orange in the second stage bidding for the last 20 MHz block, acquiring it for \$325 million (Comms Update 2020). Orange remained empty handed; a situation that could have been avoided (see box 7). The 2600 MHz band is optimal for increasing broadband speed in dense urban areas but provides limited coverage and weak signal within buildings. In general, a network that uses higher-frequency spectrum requires more base stations to cover the same area as a

⁵¹ Spectrum usage in 2018 country averages. See <http://research.rewheel.fi/networkeconomics/>.

⁵² The GSMA note in its report: The impact of spectrum prices on consumers - figure 6 “The spike between 2014 and 2016 is mostly due to a number of expensive assignments in India, Thailand, Jordan and Egypt, among others”

<https://www.gsma.com/spectrum/wp-content/uploads/2019/09/Impact-of-spectrum-prices-on-consumers.pdf>

network using lower frequencies (GSMA 2019) and mobile site acquisition and fiber backhaul have been ongoing challenges in Egypt.

Box 7 Spectrum Award in France

In December 2019, the French regulator ARCEP launched a procedure to award spectrum for 5G in the main technology band to foster business competition and innovation and support the development of high-performant mobile services. ARCEP allowed all four MNOs in France to benefit from a spectrum block of 50MHz at a set price of €305 million to meet the development objective and held an auction for the remaining 11 blocks of 10 MHz, at a reserved price of €70 million each, allowing MNOs to compete in building differentiated service offerings. Spectrum bands were awarded in November 2020 as follows:



Source: ARCEP.

While the international mobile operators present in Egypt have all deployed and activated 5G services in other markets, there is little information on plans and rules related to deploying the technology in Egypt. The ITU World Radiocommunication Conference 2019 (WRC-19), took place in Sharm el-Sheikh from October 28 to November 22, 2019. However, Egypt is missing a detailed and communicated spectrum plan with clear timelines when specific spectrum bands would be made available, including well-designed 5G pilots, which could help realize synergies that are specific to Egypt, inspire efficient and innovative deployment strategies, and allow MNOs plan their network investments accordingly. See South Africa (box 5) as an example of a spectrum development plan. In order to develop this spectrum plan, coordination will be required between all agencies currently utilizing the various spectrum bands. Spectrum re-farming will need to be considered to repurpose the spectrum bands, and legacy equipment will need to be replaced to correspond with more efficient technologies.

Service and Infrastructure Licensing

The Telecommunications Regulation Law 10 of 2003 (Telecom Law) regulates the framework for licensing and access to equipment and encryption. However, the licensing regime under the Telecom Law is vague and discretionary.⁵³ In 2016, NTRA's Board of Directors approved the regulatory framework of the Egyptian telecom market, with the main objective of enabling all licensed operators to provide similar services to end users with the launch of 4G services and the license award to Etisalat, Vodafone, and Orange

⁵³ The Telecom Law does not set-out the rules and principles applying to the licensing scheme, the conditions or cost for obtaining a license, the period of a license, the reasons for rejection, or possibility of judicial review.

for the provision of “virtual fixed services.” The services consisted only of reselling TE’s fixed capacity on commercial arrangements.

Based on the solo-fixed operator situation, and the absence of viable conditions for other players to replicate TE’s fixed infrastructure, a clear position on wholesale licensing could be developed. Following global best practices, wholesale markets should be subject to regular analysis and review by NTRA. Such regular checks would enable dominance determination and the timely implementation of regulatory remedies provisioned in the Telecom Law, which include interconnecting tariffs and quality of service obligations. The current provision of wholesale services based on commercial agreements concluded between TE and the MNOs and ISPs are insufficient to develop the market and, in particular, to serve business needs.

Infrastructure sharing would also be an effective way to lower the costs of deploying broadband communications networks and to improve connectivity. Sharing also helps protect the environment, reduce resource consumption, and increase energy efficiency. The engagement of utility companies (gas, railway, electricity, water) in infrastructure sharing activities is one way to optimize costs and diversify revenues. Utilities usually have extensive infrastructure in place that they could monetize, including excess fiber optical cables, and privileged rights-of-way for building new infrastructures. This could include the option of setting up one or several wholesale operators, independent of TE, for broadband access, national backhauling, and international backhauling.

Despite several infrastructure licenses, deploying mobile towers in Egypt represents a continuing challenge not only due to the level of investment (around US\$1.7 billion according to the World Bank⁵⁴) but also given the cumbersome process of obtaining the necessary permits and licenses. In response to this issue, MCIT charged the NTRA with issuing a new regulatory framework (Graves 2020) for licensing and lease mobile tower construction via private and international partners, and the NTRA is currently in the implementation phase.

The virtual fixed license remains an insufficient remedy, with trickle-down effects on the development of competition to serve the market, in particular address business needs, and not addressing TE’s dominant position over fixed infrastructure, including fiber. The ISPs are offering broadband services in some gated compounds in Egypt using fiber, however this is currently creating small monopoly islands based on operator’s negotiations with private developers. Outside of those gated compounds, alternate operators lack “business driver” and “economic case” to duplicate the fixed infrastructure of Telecom Egypt.

⁵⁴ Egypt Digital Infrastructure Sector Assessment Appendix D Mobile Tower strategy

Middle East and North Africa Regional Benchmark for Digital Infrastructure

When benchmarked against other members of the MENA region, Egypt is rated as “emerging” in digital infrastructure (figure 17). This is based on the World Bank’s MNA Tech analysis of 16 indicators across areas such as broadband access, quality, affordability, market competition, government ownership, and legal frameworks (figure 18).

Figure 17. Arab Republic of Egypt’s Digital Infrastructure Compared to Other Areas of the Middle East and North Africa



Source: World Bank’s MNA Tech analysis.

Figure 18. Arab Republic of Egypt’s Digital Infrastructure Compared to the Middle East and North Africa Average

Component	Indicator	Egypt	MENA Average	MENA Average - GCC
Pillar 1: Digital Infrastructure		4.74	5.01	4.17
Access	Mobile broadband capable market penetration	51%	45%	34%
	Fixed broadband household penetration	33%	44%	37%
	Fiber to the Premises broadband penetration	0%	15%	1%
	Total used international bandwidth per internet user - Kbps	14.2	146.3	70.6
	% of population covered by 3G networks	99%	93%	89%
Quality	% of population covered by 4G networks	60%	82%	70%
	Mobile broadband download speed (Mbit/s)	17.2	24.9	17.5
Affordability	Fixed broadband download speed (Mbit/s)	6.7	17.4	8.9
	Mobile broadband price - price of 1 GB % GNI per capita	0.2%	3%	4%
Market competition	Entry level Fixed broadband basket price % of GDP per capita	3.3%	8%	12%
	Mobile market concentration index (HHI index)	3,277	4,491	4,632
Government ownership	Fixed broadband concentration index (HHI Index)	6,552	6,804	7,424
	% of government ownership in the mobile market and fixed markets	23%	46%	49%
Legal frameworks	% of government ownership in the Fixed market	67%	59%	67%
	Does the country have a legal framework for data protection / privacy online?	Yes	Draft	Draft
	Does the country have a legal framework for cybercrime prevention?	Yes	Yes	Yes

Note: 3G = third generation mobile network; 4G = fourth generation mobile network; GB = gigabyte; GCC = Gulf Cooperation Council; GDP = gross domestic product; GNI = gross national income; HHI = Herfindahl-Hirschmann Index; Kbps= kilobits per second; MENA = Middle East and North Africa; Mbit/s = megabits per second.

Source: World Bank’s MNA Tech analysis.

4.3. Recommendations and Next Steps

Table 3 analyses Egypt’s digital infrastructure in terms of strengths, weaknesses, opportunities, and threats.

Table 3. Strengths, Weaknesses, Opportunities, and Threats Analysis on Digital Infrastructure

Strengths	Weaknesses
<ul style="list-style-type: none"> Arab Republic of Egypt has a significant national market, with a large and relatively young population. Its geographical location, combined with exceptional international connectivity, is a huge asset for becoming a regional digital hub. Egypt plans to build 14 new smart cities, offering as many greenfield opportunities for FTTH. 	<ul style="list-style-type: none"> The government does not leverage on competition and private investment to build the national fiber infrastructure across the territory. The country’s regulatory approach is failing to address Telecom Egypt’s dominance on fixed networks, which is hampering creating private investment which is necessary to accelerate digital infrastructure development.
Opportunities	Threats
<ul style="list-style-type: none"> The government can move the infrastructure agenda by undertaking clear policy and regulation reforms. The large untapped fiber infrastructure could be made available through utility companies. Egypt has large international MNOs with extensive experience in other markets, including in 5G. 	<ul style="list-style-type: none"> Government overlap between policymaking, regulation, ownership, and investment in the sector continues. Telecom Egypt might want to maintain wholesale revenues from other operators and prevent them from building their own fiber infrastructure.

Note: 5G = fifth-generation mobile network; FTTH = fiber to the home; MNO = mobile network operator.

Recommendations to transform and revitalize Egypt’s digital infrastructure are set out below.

Objective 1: Address policy overlaps and dominance of Telecom Egypt in fixed infrastructure.

By introducing the designation of significant market power (SMP) and appropriate regulatory remedies (in particular asymmetric regulatory measures), the NTRA could address current constraints on the development of the digital infrastructure. The availability of regulated wholesale’s offers, including service level agreements (SLAs), by dominant operators would represent an important step in increasing competitive dynamics in the market and further attracting private sector investments. In addition, regulatory efforts could include opening access to national and international fixed infrastructures via new licenses to promote competition, accelerate the development of the internal market, and promote the interest of citizens. The NTRA, in focusing on key regulatory bottlenecks, could conduct public consultations before making important decisions.

The government could consider the appropriate structural separation of Telecom Egypt to avoid the situation in which its vertical integration poses constraints on access to essential infrastructure and favors certain downstream providers. For example, government could prepare the company for privatization and private sector investment.

The government could review and amend the Communications Law for the first time since its issuance in 2003 and publish relevant executive regulations and sub-legislation for regulatory transparency and certainty in the market. Key areas of focus include the regulation of competitive markets, treatment of dominance, licensing regulations and standard licensing schemes, and a limit on the rules related to the import, manufacture, and commerce of communication equipment to the setting of technical standards.

The government could resolve the overlap in the sector between policy making, regulation, ownership of the incumbent, and investment via structural separation to ensure independence between the ministry in charge of the sector (MCIT) and the regulatory authority (NTRA).

Objective 2: Improve the supply of broadband through fostering competition and allowing private investment in fixed infrastructure.

Introduce competition in the fixed digital infrastructure by allowing one or several wholesale physical alternatives to the incumbent, Telecom Egypt. This can be achieved in two principal ways. First, liberalizing the sector through the use of existing fiber networks managed by utility companies. This would increase the reliability and availability of networks and services using existing assets. Second, alternative operators could be facilitated to deploy their own fiber by avoiding high costs of replicating TE's duct infrastructure. The government of Egypt cannot continue to be the only source of funding for fiber deployment costs in the country.

Support greater alignment in the deployment of linear infrastructure. There is scope to do more to support parallel infrastructure deployment (for example, with transport and energy), given the wide infrastructure gaps faced, by allowing selective private investments and applying dig-once policies for linear infrastructure deployment. This would facilitate the access of licensed operators to important infrastructure (for example, ducts and manholes, poles, international gateways, landing stations), thereby reducing the cost of fiber optic infrastructure deployment for the government.

Develop and implement a national spectrum plan in cooperation with industry and government stakeholders. Such a plan would identify the government's timetable for spectrum re-farming and the release of specific spectrum bands to MNOs. Visibility and certainty are important to allow MNOs and other stakeholders to plan their investments in radio access network infrastructures and enable efficient use of spectrum by the timely introduction of new technologies. Efficient allocation enables long-term economic and social value for mobile services, and this includes setting fair spectrum prices in accordance with the specific market circumstances. The acceleration of this plan would also be part of the government of Egypt's response to the COVID-19 crisis.

Objective 3: Stimulate further demand to catalyze investment.

Build at least one large world-class carrier-neutral and open-access data center in the country. This is critical if Egypt is to become a digital hub in the region. First, by localizing the content, the cost of access goes down significantly as it avoids the need for expensive international capacity. Second, latency issues will improve as the content is physically closer to the end user (fewer hops and congestion). Finally, users respond positively to faster interaction and response and as such, demand is likely to increase.

Amend the CAIX membership rules and align the relevant licensing and regulatory frameworks or license a new IXP. To fully benefit from the potential of having an IXP, membership could be extended to allow the interconnection and exchange of traffic with CDNs, enterprises, and private and public entities registered in Egypt that have an ASN. Important additional steps would be to allow international ISPs to directly connect to the CAIX, or a new IXP.

Implement enabling 5G policies to prepare for the rollout and attract the necessary investments. In this respect, it is crucial that various government and regulatory agencies provide relevant signals to the market by ensuring that any potential regulatory barriers are quickly addressed. Egypt could take a whole-of-government approach, led by an inter-ministerial body, to comprehensively address all aspects and challenges of a 5G era.

Table 4 summarizes the key recommendations for Egypt with regards to digital infrastructure and suggested activities. A time span is proposed for each activity including short-term (3–12 months), medium-term (12–24 months), and long-term (24–36 months).

Table 4. Key Recommendations and Suggested Activities for Arab Republic of Egypt with Regard to Digital Infrastructure

Recommended actions	Time frame	Priority
Objective 1: Address policy overlaps and dominance of Telecom Egypt in fixed infrastructure.		
Foster competition by NTRA in fixed networks and services by addressing the dominance of larger players, which currently constrains development of the digital infrastructure and economy. Such remedies could include asymmetric regulatory measures following the designation of significant market power.	Short term	High
The government could ensure that the vertical integration of TE does not pose constraints on access to essential infrastructure and does not favor any downstream provider of services through an appropriate form of separation of the incumbent.	Medium term	High
The government could review the Communications Law that has not been amended since its issuance in 2003 and publish the relevant executive regulations and sub-legislations.	Long term	High
Objective 2: Improve the supply of broadband through fostering competition and allowing private investment in fixed infrastructure.		
Have NTRA facilitate competition in the fixed digital infrastructure by licensing of one or several specialized wholesale carriers providing fiber alternatives to the incumbent, TE, by (a) leveraging the existing fiber networks managed by utility companies and (b) facilitating alternative operators deploy their own fiber by the use of TE's duct infrastructure.	Short to medium term	High
The NTRA could promote infrastructure sharing, procompetitive open access principles, implementation of transparent wholesale pricing, and determination of regulatory remedies that could help the market further grow.	Medium term	High
The NTRA could develop and implement a national spectrum plan, in cooperation with industry and government stakeholders. Such a plan would identify Egypt's timetable for spectrum re-farming and the release of specific bands to MNOs, setting fair spectrum prices in accordance with the specific market circumstances.	Medium Term	Intermediate
Objective 3: Stimulate further demand to catalyze investment.		
The MCIT could leverage Egypt's international connectivity in the licensing of one or several open and carrier-neutral IXPs and attracting international ISPs and cloud companies to build and fill at least one large data center.	Medium term	High
The MCIT could design an enabling environment for 5G and adopt a whole-of-government approach to address the challenges and opportunities it creates.	Long term	Intermediate

Note: Short term = 3–12 months, medium term = 12–24 months, and long term = 24–36 months. 5G = fifth generation mobile network; ISP = internet service provider; IXP = internet exchange point; MCIT = Ministry of Communications and Information Technology; NTRA = National Telecommunications Regulatory Authority; SMP = significant market power; TE = Telecom Egypt.

5. Digital Skills

This section explores the current state of digital skills and literacy in Egypt and considers what more can be done to support progress.

Key Messages

- The government's strategy for developing Egypt as an electronic and digital hub can only be achieved by developing relevant digital skills.
- Digitization of manufacturing and other key sectors of the economy is contingent upon the availability of a skilled labor force, well-versed in information technology (IT), software, networking, cybersecurity, and big data.
- The low level of basic literacy and numeracy skills in a large proportion of the population constrains digital skills development in Egypt.
- Opportunities for lifelong learning and development in line with rapidly changing technology remain limited and could be further developed to respond to the nature of jobs arising from new technologies.
- The government has initiated bold reforms to modernize the education system, centered on expanding digital infrastructure and digital learning.
- The government has introduced several initiatives to increase the supply of digital skills in support of digital transformation, which now can be further strengthened to match the evolving demand.

5.1. The Importance of Digital Skills

Digitization is changing the nature of jobs and the skills needed to perform these jobs. An increasing number of jobs will require digital skills at various levels of proficiency. These jobs will be in both the traditional ICT sector and across all sectors, as new technologies become more widely available. Digital skills also can boost productivity and lead to the creation of new jobs, in the ICT sector and broadly as a catalyst for innovation across sectors.

Digital skills refer to skills related to the use of technology to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately. Digital skills are the foundation for a digital economy, enabling citizens to enjoy a digital society's benefits. A digitally competent workforce strengthens the foundational pillars of the economy through the installation of digital infrastructure (for example, connectivity and data repositories); the growth of digital entrepreneurship (for example through, innovation, incubators, and e-commerce); and the development and use of digital platforms and financial services. Also, a digitally literate population, comprising a large majority with basic digital skills and a critical mass of skilled personnel and advanced specialists, helps promote the application of digital tools and processes in a variety of sectors, including the informal service sector, agriculture, energy, transportation, commerce, health and education. Basic digital skills are a critical precondition for uptake and therefore reaping the benefits stemming from greater access to connectivity and technology. Digital skills are also a prerequisite for inclusive and effective access to digitally enabled services and platforms (for example, e-government services, digital financial services, e-commerce, online education).

This section draws on existing conceptualization frameworks in examining existing and future demand and supply for digital skills. These frameworks categorize proficiency levels into four broad categories: basic, intermediate, advanced, and highly specialized (box 8). The proficiency levels reflect “the cognitive challenge, the complexity of the tasks, as well as autonomy in completing the tasks” (Carretero, Vuorikari, and Punie 2017). Figure 19 presents a rough mapping of skills based on theoretical and analytical dimension and job-specific competencies (Mikhail 2007). This categorization helps in the analysis of the alignment or lack thereof of the supply of digital skills relative to the demand for such skills in the economy.

Assessment of current demand and supply of digital skills in Egypt is challenging in a context of limited information on key indicators. The next section provides insights to the demand and supply of digital skills.

Box 8 Digital Skills

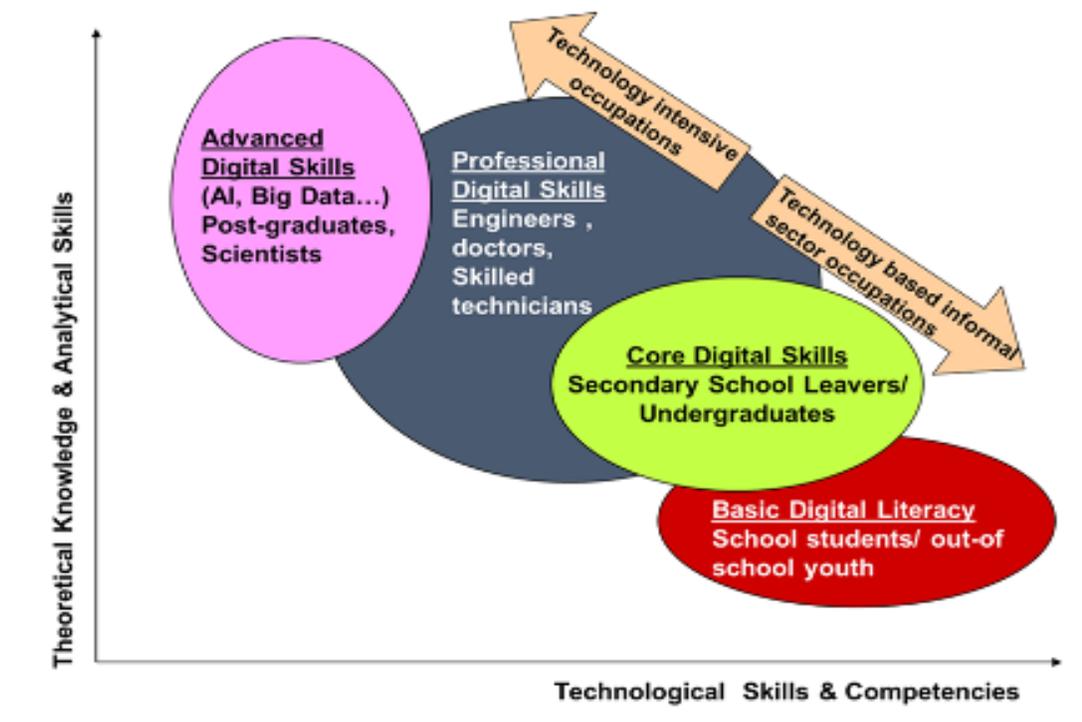
Basic digital skills are needed to use simple digital devices and applications such as computers and smartphones, access and store information from online resources, and use online accounts and profiles. Basic digital skills are typically used in vocational or informal sector occupations and occupations involving routine tasks. Basic digital skills are required by all citizens to ensure inclusion and a growing digital economy.

Intermediate digital skills are job-ready skills that enable individuals to independently use digital tools for more significant task-oriented purposes, which involve a better understanding of content. They are required in mid-level occupations, such as skilled technicians, or in formal small and medium enterprises. Intermediate skills include using professional software for presentations and analytics, digital marketing and social media analytics, and Web and graphic design. Intermediate skills encourage wider and faster use of digital technologies.

Advanced digital skills require greater analytical skills and important theoretical knowledge and are typically required of occupations with a high level of information and communication technologies (ICT) intensity involving applications of digital technologies. ICT specialists, engineers, and increasingly, finance professionals use technology in empowering and transformative ways. Advanced digital skills can be used to develop digital technology, products, and services; programming; big data analytics; cloud computing; Web development; cybersecurity; and search engine optimization. Advanced digital skills are required to diffuse and adopt new digital technologies across sectors and create a flourishing and digital economy.

Highly specialized digital skills are required in scientific and advanced professional occupations and represent the ability to develop new digital technologies, products, and services. They are needed to solve complex problems, guide others, contribute to professional practice, and propose new ideas to the field. These skills are mainly imparted by postgraduate programs in applied mathematics and computer engineering courses of high quality.

Figure 19. Skills Needed for the Digital Economy



Note: AI = artificial intelligence.

Source: World Bank Digital Skills Framework and Programs.

5.2. Diagnostic Findings: Demand and Supply of Digital Skills

Demand Issues

In recent decades, the demand for digital skills has increased as the economy becomes digitized with the spread of digital technologies in many traditional manufacturing and service sectors, and as the government adopts technologies for its operations. With emerging ICT-intensive sectors, such as e-commerce, bioengineering, internet-enabled offshoring, and online work, the economy requires a workforce with a range of digital competencies from intermediate and advanced to highly specialized. Moreover, demand is also set to increase from traditional sectors, which are increasingly using digital technologies (such as agriculture, construction, transportation and logistics, manufacturing, banking and finance, health, education, and government). Basic digital skills are vital to the expansion of e-government services and digital inclusion. Advanced digital skills are also likely to be in demand beyond individual countries to regional and global markets.

Diagnostic Findings: Demand for Digital Skills

Forecasting demand for digital skills is subject to uncertainty due to the fast-changing needs driven by the rapid changes in technology. The following priority sectors and directions for digitization can be good indicators of a future increase in demand for digital skills in Egypt.

Digital skills are essential for the digital economy, and in Egypt, demand continues to grow. Basic digital skills, such as use of a computer or smartphone, email communication, Web research, and online transactions are essential to the future workforce. Nearly all individuals recruited for jobs at most companies in Egypt require at least a basic level of such skills. Basic skills are essential, but Egypt's competitiveness will also depend on the country's services sector's ability to leverage intermediate digital skills, such as using professional software and managing data. The share of employees needing more advanced digital skills will likely increase as sectors become more digitally enabled.

The government of Egypt is intently promoting digital development through ICT manufacturing and various other initiatives, which are likely to increase demand for digital skills. The following factors drive the increasing demand for digital skills in Egypt: (a) increase of automation of manufacturing processes; (b) rise in tasks carried out by robots and artificial intelligence (AI); (c) growth in electronic networking between manufacturers and suppliers across the nation and globally; (d) the growing number of design houses and digitization of design to create faster prototypes; (e) use of smarter products with embedded software; (f) planned development of 20 smart cities; (g) emerging internet of things (IoT) applications, for example, in agriculture and digitization of health services; and (h) the growth of a three-dimensional (3D) ecosystem in Egypt among others.

Egypt's development as an electronic hub through the Egypt Makes Electronics initiative⁵⁵ involves establishing technology parks throughout the country, especially in underprivileged regions. The initiative covers electronics manufacturing and outsourcing, call centers, electronic design and manufacturing, IT design, programming, and IT assembly, among other areas. The vision of this initiative is to reach out to Egypt's talented youth and provide the ecosystem that enables them to create value through innovation and technological advancements.

The rapid growth of electronic exports will in turn increase demand for digital skills. Apart from a large domestic market, the government aims to leverage its strategic location and low cost to promote Egypt as the regional electronics hub for the Gulf countries and Africa. Forecasts suggest that the Egyptian ICT sector value, and the share of ICT manufacturing exports as a percentage of total output, are projected to increase due to improved policy and commercial focus on electronics exports.

An AI ecosystem is starting to emerge in Egypt. Key areas projected to realize a large economic impact from AI by 2030 include trade, food and beverage, hospitality, transport, media, financial technology (fintech), and public sector health and education. These areas are likely to generate a large share of employment and tourism, leading to a further increase in the demand for advanced digital skills.

Digital platforms are growing fast in Egypt. This makes buying goods, hailing rides, and ordering food more convenient. Digital platforms in the country are steadily rising in gross merchandise value (GMV), providing income for online sellers and drivers, generating downstream employment, and already (or potentially) contributing to government tax revenue.

Supply Issues

⁵⁵ "Egypt Makes Electronics (EME)" aims to develop and promote the electronics industry and to make the electronics industry one of the key props for the growth of the Egyptian economy and the main contributor to doubling Egyptian exports, to reduce imports of electronic and electrical appliances for the domestic market, and to provide hundreds of thousands of jobs for researchers, engineers, skilled technicians, and workers (Egypt Makes Electronics website).

Gaining a better understanding of the supply of digital skills is important to help identify any gaps between demand and supply, including disparities due to gender or geographical area. The following background explains the situation in Egypt:

- Digital competences, apart from the most basic, such as using a mobile phone for voice calls or simple messages, cannot be developed without foundational literacy and numeracy skills.
- Basic digital skills can be provided in school (up to high school level) or in rapid skills training (boot camps). Intermediate digital skills at the upper secondary level, in technical and vocational education and training (TVET) institutions, and technology programs in short-cycle tertiary institutions.
- Advanced digital skills require greater theoretical content and would typically be provided in relevant undergraduate courses in universities and other tertiary level institutions through core engineering programs, especially electrical and computer engineering, science programs and mathematics undergraduate courses. Boot camps and rapid skilling or coding courses can also help produce advanced digital skills, especially when there are spikes in demand for specific skills or programming languages. These can be delivered by universities in partnership with private companies or by the latter on their own.

Diagnostic Findings: Supply of Digital Skills

Although Egypt ranks 44 out of 141 countries in the Global Competitiveness Report's assessment of digital skills among the population (4.7 out of 7), it still sits below the MENA average. Egypt scores 54 out of 100, compared with the Middle East and North Africa average of 62.9 (see figure 21). The rapid spread of mobile phones and mobile internet services in Egypt means that a large proportion of the population has some familiarity with devices (mainly phones), has access to some digital services (government services and payments), and uses social media. However, there are several challenges, including low literacy and numeracy levels, low skills set among graduates, and a general decline in the quality of technical and higher education and scientific research. These challenges are likely to affect digital development in all other pillars of the digital economy if they are not addressed in a systematic way. Although ongoing initiatives (new specialized initiatives-Egypt university of Informatics, undergraduates and post-graduates, and life-long learning) are well recognized, efforts are still needed to develop digital skills in alignment with international rankings.

A key challenge to developing digital skills in Egypt is the low level of basic literacy and numeracy skills in a large percentage of the population; basic literacy and numeracy are essential prerequisites for acquiring even the most basic digital skills. In 2013 the United States Agency for International Development (USAID) reported one in five students in grade 3 could not read a single word from a reading passage and enter grade 4 as functionally illiterate. Egypt's results on the 2015 Trends in International Mathematics and Science Study (TIMSS) show that only 47 percent of grade 8 students reached the "low" international benchmark of performance in mathematics, compared to the international average of 84 percent (TIMSS 2015). Also, Egypt's results on the 2015 Progress in International Reading Literacy Study (PIRLS) show that about 70 percent of students did not reach the "low" international benchmark (PIRLS 2016). Learning-adjusted years of school, factoring in what children learn, is only 6.3 years. Similarly, Egypt scores low on the World Economic Forum Global Competitiveness rankings on critical thinking in teaching with a score of 2.7 out of a 7.0. These foundational gaps in basic mathematics and literacy will pose challenges in improving digital skills in Egypt and therefore constrain innovation and the opportunities offered by the digital economy.

Relative to the MENA region, the Global Competitiveness index reveals that Egypt is still lagging behind the region average in terms of both higher education and training, as well as labor market efficiency (ITU 2018, for example). This has been echoed in the Global Talent Competitiveness Indicators

(GTCI). According to the 2018 GTCI report, Egypt is below the income group average in four main pillars: Enable, Attract, Grow, and Vocational Technical Skills with Egypt ranking 104 out of 119 countries globally (INSEAD 2018). More specifically, the relevance of the education system to the economy is decreasing in score but stable in rank. This indicates that there is a skill mismatch between the education system and labor market requirements bringing Egypt's ranking of the relevance of Egypt's education system to 117 out of 119 globally. Making progress in these indicators requires close collaboration with the private sector and other relevant stakeholders. Singapore is an example of where government works closely with the private sector to identify and develop digital skills (box 9).

Box 9

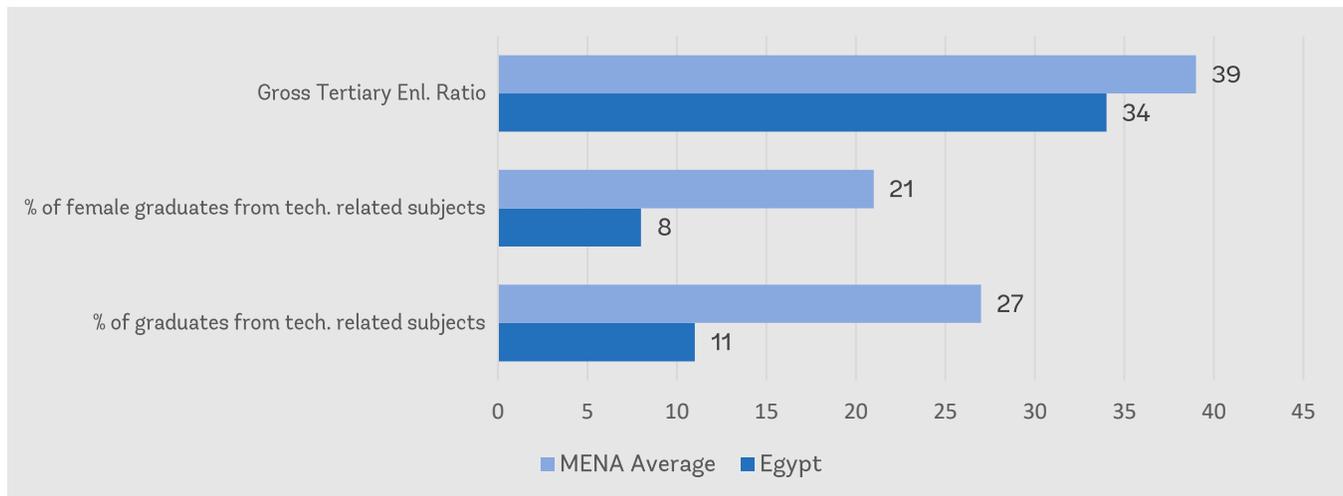
Strengthening Private Sector Collaboration to Identify Skills Needs in Singapore.

While governments are responsible for providing education as a public good, the private sector drives change and digital disruption in the economy. This fact emphasizes the importance of stronger public-private partnerships in defining the skills needs of the digital economy. Singapore provides an example of using public-private partnerships in developing digital skills. In 2016, the government of Singapore identified 23 industries for which "Industry Transformation Maps" (ITMs) would be developed in order to forecast likely trends in those industries, as a way to help define future skills needs, among other policy areas. These ITMs were completed and inform various policy decisions, including on skills development. The process of development of the ITMs involved partnership and systematic consultation between government, the private sector, and other stakeholders. This model represents a positive example of collaboration between the government and private sector to define skills needs. The private sector also has a direct role in supporting skills development by providing either training or internships for industry experience.

Source: World Bank 2019a.

The development of advanced digital skills is constrained by the low enrollment in and completion of technology-related subjects in tertiary education. Egypt's higher education gross enrollment ratio is 34 percent compared to the MENA average of 39 percent (see Figure 20) and 49 percent of the students enrolled in universities (53% in public universities and 45% in private universities) are female. This restricts the pipeline of those who could enroll in technical, professional, mathematics, and science courses in higher education and therefore constrains the development of advanced digital skills. Less than a quarter of the small number of students in higher education (men and women) are enrolled in mathematics and science. Estimates indicate a tertiary education graduation rate of 22.6 percent from technical-related subjects for females⁵⁵ and 11 percent from science, engineering and mathematics programs for both sexes, compared to the MENA average of 27 percent. Many countries are integrating digital skills in the curriculum across the entire education system to strengthen the pipeline for digital skills (see box 10).

Figure 20. Advanced Digital Skills in Arab Republic of Egypt Compared with the Middle East and North Africa Average, Students



Note: Enl. = enrollment; MENA = Middle East and North Africa; tech. = technology.

Source: Calculations from the Global Competitiveness Assessment Report.

Box 10

Integration of Digital Skills in the Curriculum for All Grades.

The integration of coding in school curricula is compulsory in many developed countries, where education authorities around the world are introducing computer programming, coding, and software development into school curricula. For example, United Kingdom schools, colleges, and universities have embedded digital skills across every subject to ensure that all graduates have the right skills for a highly digitized economy, across all roles. The Singaporean “Code@ SG” initiative is another example that aims to establish coding as a “national capability” starting from early-grade education and continuing through secondary school.

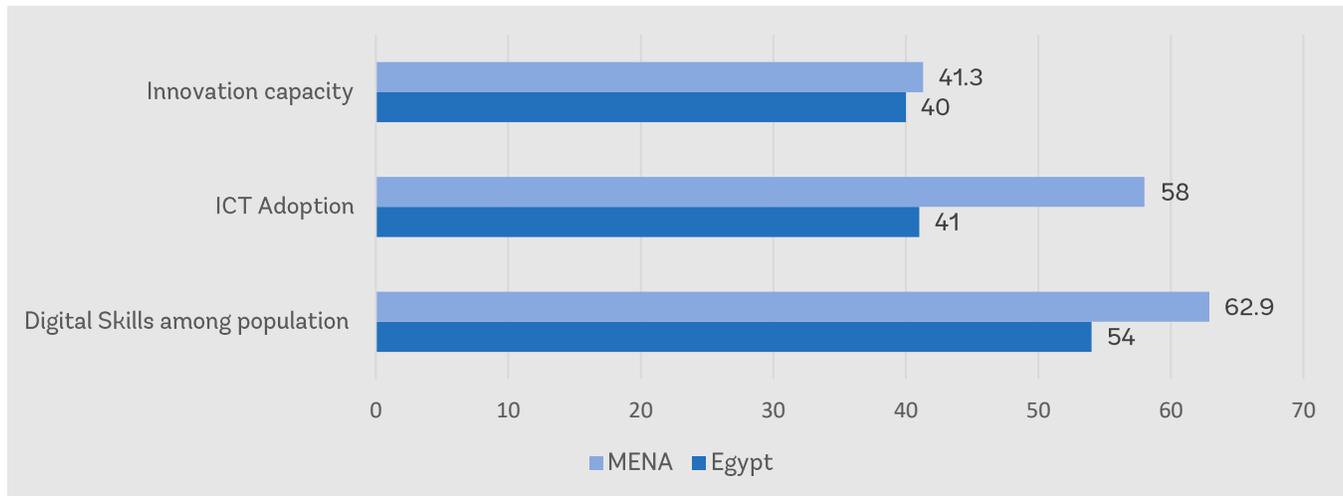
The Netherlands provides an example of integration of digital skills in the curriculum to help build a pipeline for digital skills. In the Netherlands, the National Technology Pact 2016–2020 is an expression of the government’s effort to boost technology-related skills development within schools as well as in vocational education systems. The focus of this strategy, among other areas, is enhancing school- and college-based provision, with an emphasis on ensuring that students enroll in technology-related courses and progress into technology related jobs. This strategy involves enhancing the professional capacities of technology teachers and promoting collaboration between the education system and employers in course development, teacher training, and internships for students.

Source: World Bank compilation.

Technical-vocational and higher education institutions are not producing graduates with the relevant skill set, especially in the technical-professional and mathematics courses, which severely constrains innovation and technology adoption. Egypt scores 54 percent (3.1 out of 7 and ranks 133 out of 141 countries) on the Global Competitiveness report assessment in terms of graduate skill sets compared to the MENA average of 62.9 percent (Schwab 2019). This means that companies miss out on innovation opportunities (which explains the country’s score of 40 percent on innovation capacity [Schwab 2019]). Moreover, about 20 percent of IT, machinery, and electronics firms point to the inadequately educated workforce as a major constraint. This also reflects in Egypt’s score of 41 percent on ICT adoption on the Global Competitiveness ranking assessment compared to the MENA average of 58 percent (Schwab 2019) (figure 21). Most universities have not updated their computer science, electronics, telecommunications, and

information management courses in a long time. Key specializations that are considered necessary for a broad and successful digital economy are also limited in supply: these include cybersecurity, mobile computing, block chain, internet of things (IOT), network and cloud technology, ICT hardware and service infrastructure, IT management (ITM), software development and engineering, big data, data storage and analytics, digital multimedia, cyber security and AI. Even more serious is the lack of industry experience and therefore lack of practical application, which is important in today's fast-changing technological environment. Box 11 provides examples of boot camps for accelerating digital skills.

Figure 21. Specific Digital Skills in Arab Republic of Egypt Compared with the Middle East and North Africa Average, by Skills



Note: ICT = information and communication technologies; MENA = Middle East and North Africa.

Source: Calculations from the Global Competitiveness Assessment Report.

Moreover, training opportunities for those in the workforce or currently out of school are limited, making the adoption of new technologies difficult. Only a few formal sector firms invest in the training of their workforce. The Global Competitiveness assessment of the extent of staff training in Egypt is 3.9 out of 7 with a 48 out of 100 and a global rating of 75 out of 141 countries (Schwab 2019), thus limiting productivity and digital uptake.

Box 11**Boot Camps Have Emerged as Effective Skills Accelerators in Many Countries.**

Boot camps are being used in many countries to address severe shortages of talent in the area of digital skills and are proving to be better equipped to respond in real time to industry needs. Boot camps are intensive three-to-six-month programs that provide the practical foundations of computer programming and related digital skills in a hands-on learning environment by combining traditional vocational training with socioemotional tech skills to prepare individuals for entry-level tech positions. For example, coding boot camps have gained international attention because they tend to target people who are outside the industry and have little or no experience in coding. Providers of boot camps are mainly commercial or social enterprises outside the formal education system of the countries in which they operate. Boot camps focus on rapid upskilling career readiness and on developing applied digital skills for job readiness. They, therefore, help provide relevant digital skills in areas where there is high industry demand and a need for employment for youth.

Some examples of coding boot camps include the following: Learn Tech Labs (San Francisco, United States); Founders & Coders (United Kingdom); Laboratoria and CodeaLab41 (Mexico); Moringa School, eMobilis, SamaSource (Kenya); xPerience, IT Varsity (South Africa); KACE AITI (Ghana); Andela (Nigeria); Ace Hacker and Geek Skool (India); Ruby on the Beach (Indonesia); Desafio Latam (Chile, Colombia, and Mexico); and World Tech Makers (Colombia, Brazil).

The following initiatives support the development of digital skills but need to be ramped up to better respond to the fast-changing labor market needs:

- **Human resources and skills development in digital technologies form part of the national development plan's second pillar which are articulated in the Digital Transformation Strategy, National Artificial Intelligence strategy, and the Egypt Vision 2030.** Egypt has adopted national initiatives to develop knowledge, innovation, scientific research, and business incubation. These efforts could be boosted further through more timely data on the needs of the labor market. Singapore provides an example of using AI to provide real time data on the labor market (see box 12). Current efforts to use AI by MCIT and its affiliates is an encouraging move in the right direction.
- **Egypt recognizes the importance of digital skills in promoting more sustainable and inclusive growth. It is committed to improving learning outcomes and promoting digital skills and has adopted a strategy for digital literacy for primary and secondary education.** The government has initiated bold reforms to modernize the education system and catapult education outcomes toward its Vision 2030 targets. These reforms include establishing an education technology entity with legal standing and governance structure, building a digital infrastructure for the education system, connecting schools to fiber optic cables, providing digital learning resources, mainstreaming education innovation, and addressing gender gaps and stereotypes in enrollment across all levels of education in mathematics and science. Also, the ongoing education reforms aim to shift learning toward higher-order skills, including mainstreaming digital skills into the new curriculum, digital content for K–12, and the new testing approach geared toward testing higher-order skills (for example, critical thinking and analytical skills, rather than rote learning). A study portal and new platform allowing teachers and all students in K–12 to communicate was established in partnership with Edmodo to ensure learning continuity during the COVID-19 pandemic and will continue as a key feature of the education system.
- **MCIT is promoting initiatives to support the development of digital skills in collaboration with the private sector and other local and international partners.** A series of programs have been launched such as Digital Egypt Builders Initiative, learning innovation hubs (for example Creativa), capacity building for AI and various scholarships that are focused on digital skills as well as the establishment of technology universities. All these initiatives reflect growing efforts to prepare citizens for the digital economy. Whilst the impact of these programs are being measured, implementation and

impact of these capacity building initiatives is closely monitored to measure translation into determine whether they result in job creation, employment rate, and gig economy a comprehensive digital strategy is required to determine the skills gaps and private sector market needs.

- **In 2018, the Ministry of Education and Technical Education launched a national initiative for digital literacy for young people in collaboration with the Egypt Knowledge Bank and Technical Education.** The Ministry of Education and IBM launched a Pathway in Technology Early College High School (P-TECH) Egypt initiative that provides students with skills and experience for technology-related jobs, in areas such as cybersecurity, cloud computing, digital design, data analytics, and artificial intelligence. Upon completing the five-year integrated learning curriculum, the students will be qualified for job opportunities in the specific areas of technology study and further college education at computer science faculties in Egypt.
- **In 2017, MCIT and the Information Technology Industry Development Agency (ITIDA) developed a national competency framework and an online platform to provide both training and a skills repository, thereby providing a foundation for digital skills development in Egypt.** Most notably, skills development programs are ongoing via the Information Technology Institute (ITI) training program. ITI is a specialized training program that develops technical and professional capacities for setting up, operating, and maintaining fiber-optic networks and aims to develop the technical capabilities of up to 20 trainers and 1,500 technicians. ITI and Palo Alto Networks, Inc., have signed a memorandum of understanding (MoU) with the objective of training 1,000 young trainers on the latest digital cybersecurity educational technologies through integrative learning tools. The intention is to reach a total of 5,000 young trainers.

Box 12

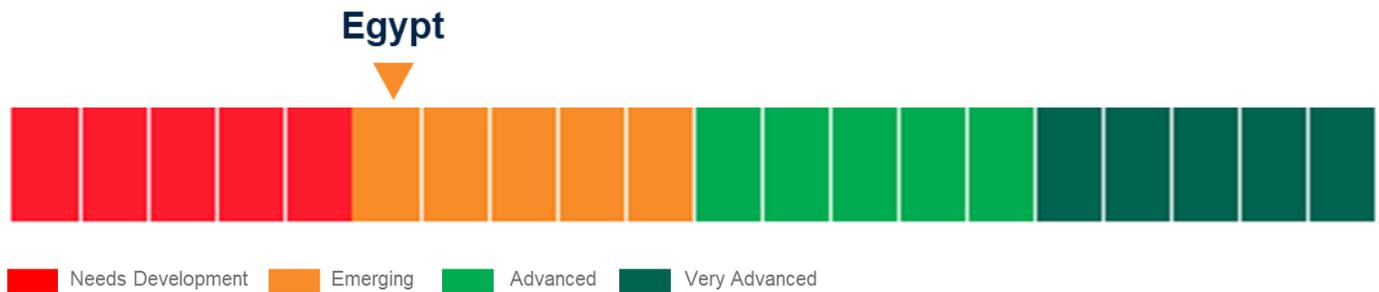
Singapore: The Use of Artificial Intelligence to Secure Real Time Data on the Labor Market

Artificial Intelligence (AI) applications can help quickly pull data from various sources like job postings, social media, and government websites to predict jobs demand. For example, using AI, Singapore's MyCareersFuture, a government-sponsored job-matching platform, analyzes real-time online labor market information from multiple job boards to forecast future jobs and skills requirements. Having access to just-in-time market information can then help education and training institutions to adjust their curriculum to the needs of employers, to guide government policies and investment, and to increase the overall efficiency of the workforce development system.

Middle East and North Africa Regional Benchmark for Digital Skills

When benchmarked against other members of the MENA region, Egypt qualifies as “emerging” in digital skills (figure 22). This is based on the World Bank’s MNA Tech analysis of nine indicators across areas such as internet use, social media, and digital skills (figure 23).

Figure 22. Arab Republic of Egypt’s Digital Skills Compared with Other Areas of the Middle East and North Africa, by Level of Skill



Source: World Bank’s MNA Tech analysis.

Figure 23. Arab Republic of Egypt’s Digital Skills Compared with the Middle East and North Africa Average, by Skills

Component	Indicator	Egypt	MENA Average	MENA Average - GCC
Pillar 5: Digital Skills		3.14	4.68	3.94
Internet Use	Internet users (per 100 people)	36	53	38
Digital Skills	Active mobile social media penetration	33%	46%	36%
Social Media	Active social media users as % of population	40%	59%	47%
	Mobile social media users as % of population	38%	53%	44%
	Use of social networks value	5.77	5.65	5.28
	Digital talent as a share of total full-time employees	1.90	1.73	1.90
Skills	% of graduates from Science, Technology, Engineering and Mathematics (STEM) programmes in tertiary education, both sexes	11%	27%	28%
	% of female graduates from STEM programmes in tertiary education	8%	21%	21%
	Gross enrolment ratio, tertiary, both sexes	34%	39%	38%

Note: GCC = Gulf Cooperation Council; MENA = Middle East and North Africa.

Source: World Bank: MNA Tech Digital Economy Rapid Benchmarking.

5.3. Recommendations and Next Steps

Table 5. Analysis of Digital Skills in Arab Republic of Egypt: Strengths, Weaknesses, Opportunities, and Threats

Strengths	Weaknesses
<ul style="list-style-type: none"> • Solid foundational base to further develop digital skills through by linking the digital skills initiatives to requirements in key strategies for digital transformation, AI and Digital Egypt. • Establishment of national competency framework for digital skills and an education technology entity, as well as a study portal and education technology platform for K-12, are already in place. • Implementation of a plan to connect schools and other education institutions to fiber optic networks is underway. • Shift in the basic education curriculum from memorization to acquisition of foundational skills has started. • Initiatives to strengthen partnerships with private sectors to ensure market relevance of the digital skills. 	<ul style="list-style-type: none"> • Programs for upskilling workers and development of digital skills are limited in scope. • Mechanisms for coordination among key actors and partnerships with the private sector (both employers and training providers) are weak. • A large proportion of the population lacks basic literacy and numeracy skills. • Skills of technical and vocational education and training graduates are lower than other places in the region. • The promotion of a myriad of MCIT initiatives among potential beneficiaries is limited.
Opportunities	Threats
<ul style="list-style-type: none"> • The demand for digital skills is rapidly increasing. • Potential partners in the private sector are readily available. • COVID-19 has led to a new normal of remote work, online education, and blended learning. • Bold education reform focusing on strengthening information and communication technologies in education, building foundational skills, and digital literacy is ongoing. 	<ul style="list-style-type: none"> • Accurate and timely data on the demand and supply of digital skills provided by various agencies are not comprehensive. • Curricula in technical colleges and universities are outdated. • Coordination of different initiatives related to expanding digital skills is limited.

The recommendations set out below could support the further development of digital skills in Egypt:

Objective 1: Improve the quality and relevance of TVET and tertiary education to respond better to demand for digital skills.

Review curriculum for both tertiary education and vocational training in response to technology developments. This could be achieved in partnership with employers to provide practical training opportunities, ensure the relevance of skills, facilitate digital adoption, and foster innovation across sectors. This would provide the advanced digital skills needed to support the various technology initiatives being promoted by the government of Egypt and enhance employment opportunities for graduates.

Strengthen the skills that are the foundation of digital skills, specifically basic literacy and numeracy, through high-quality basic education. The ongoing education reform provides an opportunity to strengthen foundational skills, including extensive use of education technology and integration of basic digital skills (digital literacy) into the new national curriculum.

Expand and strengthen digital skills training for secondary school graduates as part of the ongoing education reform. The ongoing education reform provides an opportunity to develop digital skills for secondary graduates and systematically extend this pipeline to TVET and tertiary level.

Objective 2: Expand digital skills training and improve delivery mechanisms, including through partnerships with the private sector.

Increase the number and quality of graduates, including women, in science, technology, engineering, and mathematics. Higher education plays a critical role in developing advanced and specialized digital skills and should be at the forefront of Egypt's policy to prepare the country for the fourth industrial revolution. Low throughput of students enrolled in mathematics, science, and engineering-related courses may need further investigation to identify the challenges and address them accordingly. This will include the ongoing education reforms to further promote higher order skills (discourage rote learning) and shift away from private tutoring which may have challenged students – including females - from STEM disciplines.

Strengthen partnerships with the private sector and use boot camps for rapid upskilling, including for a large number of vocational education graduates. Developing digital skills at scale is a major undertaking that cannot be accomplished by the government (or one ministry) alone. Successful efforts in developing digital skills calls for strengthening partnerships with the private sector (both employers and training providers). Boot camps have emerged as effective skills accelerators in many countries. They focus on rapid upskilling career readiness and the development of applied digital skills.

Expand and strengthen opportunities for lifelong learning and second-chance reskilling and upskilling of the workforce, in line with the fast-changing needs of the labor market arising from rapid changes in technology. This is critical, given the limited extent of staff training conducted by employers in Egypt. This could be in the form of short courses with a mix of instructional methods geared toward practical rather than theoretical skills.

Objective 3: Establish mechanisms to provide timely and high-quality data on the demand and supply of digital skills.

Undertake a more in-depth assessment of the supply and demand for intermediate and advanced digital skills, including surveys of offerings of relevant courses by TVET and tertiary institutions. This could be achieved by collaborating with key actors in developing digital skills (public and private) and representatives of key employers.

Provide timely information about the supply and demand for digital skills arising from the rapid changes in technology. Developing a digital talent pipeline, upskilling, and reskilling, is key to meeting the skills gap in the digital economy. However, effective development of digital talent to meet industry needs requires an in-depth knowledge of the technological potential and talent gaps that are specific to different industries and sectors of the economy. The use of artificial intelligence could provide real-time granular and predictive guidance on skills gaps and the fast-changing demand for skills. Traditional methods of assessing demand (employer surveys, industry consultations, focus groups) can take a long time, and results can become quickly outdated in a changing job market. There is a tremendous potential in a market information system driven by big data and powered by artificial intelligence to improve training institutions' abilities to acquire the right information at the right time on the skills needs of employers. This can then help guide the design of courses and curriculum.

Use the information from the demand and supply assessment to update policies and strategies to develop digital skills in Egypt.

Table 6 summarizes the key recommendations and suggested activities for digital skills in Egypt. A time span is proposed for each activity, including short-term (3–12 months), medium-term (12–24 months), and long-term (24–36 months).

Table 6. Key Recommendations and Suggested Activities for Digital Skills in Arab Republic of Egypt

Recommended Actions	Time Frame	Priority
Objective 1: Improve the quality and relevance of TVET and tertiary education to respond better to demand for digital skills.		
Strengthen foundational skills, in particular, basic literacy and numeracy.	Short term	High
Review curricula for TVET and tertiary education to better respond to the demand for intermediate and advanced digital skills.	Medium to long term	High
Objective 2: Expand digital skills training and improve delivery mechanisms, including through partnerships with the private sector.		
Strengthen partnerships with the private sector and use boot camps for rapid upskilling.	Medium to long term	High
Increase the number and quality of graduates, including women, in science, technology, engineering, and mathematics.	Medium term	High
Expand and strengthen opportunities for lifelong learning and second-chance reskilling and upskilling of the workforce.	Medium term	Intermediate
Objective 3: Establish mechanisms to provide timely and high-quality data on the demand and supply of digital skills.		
Undertake a more in-depth assessment of the demand and supply of intermediate and advanced digital skills to inform curriculum review and expand digital skills training.	Short term	High
Use innovative approaches for example artificial intelligence and Big Data to generate and disseminate timely information about the supply and demand for digital skills.	Medium to long term	Intermediate

Note: Short term = 3–12 months, medium term = 12–24 months, and long term = 24–36 months. TVET = technical and vocational education and training.

6. Digital Platforms

This section explores the development of private and government digital platforms in Egypt and considers the measures that can be taken to enhance deployment and adoption.

Key Messages

- The development of private sector digital platforms in Egypt is limited. There is a relatively good transport and logistic infrastructure for e-commerce local offerings but that remains nascent in nature, particularly as the economy is primarily cash-based. Early successes have been observed only in niche markets.
- The government provides an increasing number of online services to enterprises and citizens without the support of a shared backend system, streamlined processes, or unified databases.
- The government continues to undertake digital transformation projects, building on the pilot phase in Port Said. The migration of all ministries to the new capital city is an opportunity to accelerate these efforts.
- Further improvements to the legal and regulatory environment are required for the development of digital platforms.

Egypt aspires to be one of the most dynamic and promising digital economies in the MENA region.⁵⁶ Under the government's Vision 2030, the digital transformation of the economy is a major objective. On the verge of this pivotal shift, the emphasis is currently on advancing digital transformation across government entities, businesses, and citizens. Digital platforms (both public and private) represent a foundational element for the success of such transformation, as these will support e-commerce activities and enable Egypt to leapfrog toward a vibrant digital economy.

6.1. The Importance of Digital Platforms

Digital platforms can transform the way people, governments, businesses, and civil society interact with each other in Egypt. They connect people and institutions virtually and facilitate digital transactions, including the exchange of information, goods, and services. This can improve the lives of users in a multitude of areas, as well as increase operational and economic efficiency, improve service quality, and facilitate innovation and economic development. Digital platforms offer products and services through portable devices such as mobile phones, smartphones, and computers, thereby affecting every aspect of daily life.

Two main categories of platforms are relevant to Egypt's digital development:

- **Digital public platforms.** Governments operate digital platforms to offer citizen-facing government services such as issuing birth certificates, renewing a driver's license, or paying taxes online. They also enable information-sharing (through reusable public-sector data or open data offerings), the operation of back-office systems (such as managing government accounts), the management of human resource information, and other types of information systems run by various line ministries. Governments can stimulate usage of digital platforms by digitizing some of their own operations or processes, be it

⁵⁶ The ICT sector represented over 3 percent of GDP in 2017/18 with an aim to double it in three years' time. (See the MCIT website, https://mcit.gov.eg/en/TeleCommunications/Telecommunication_Market.)

procurement, invoicing, or communications. Digital platforms are of course critical to ensuring the continuity of the government of Egypt’s public service during a crisis like COVID-19.

- **Digital private platforms.** Commercial firms also own and operate digital platforms to offer a growing array of products and services (such as social media, digital mapping, data analytics, digital commerce, digital education, digital health, streaming services, gamification, augmented virtual reality, ride-sharing applications). Global connectivity allows users to use services and access information regardless of geographic location. Digital private platforms support the creation of new digital marketplaces that can help foster greater competition and improve market intermediation. They can aggregate supply and demand, create new and inclusive markets, and expand opportunities for new companies in Egypt to scale domestically and across the MENA region.

In Egypt, digital platforms are increasingly spanning every aspect of daily life and are offered by both the government and private companies (for example, local and multinationals).⁵⁷ The government uses digital platforms to provide digitally enabled services in various sectors including health care, education, commerce, and government services.⁵⁸ These public platforms are also connecting government entities and increasing collaboration among them as a whole-of-government ecosystem. Private companies use digital platforms to offer new products and services in various economic verticals including retail services online, e-commerce (Souq, Jumia, Nefsak, Eshtereely), food delivery (Talabat, Uber Eat), or ride-sharing applications (Careem; Uber). These platforms are connecting supply with demand and sellers with buyers.

6.2. Diagnostic Findings: Current State of Digital Platforms

This section provides an analysis of digital platforms, considering significant impact on transforming Egypt’s digital economy, with a focus on public digital platforms. Private digital platforms are covered under sections 6.2, “Digital Business Models” and 8.2, “Markets.” For common elements, see box 13.

Governmental Strategy and Institutions for E-Government

In October 1999, the MCIT was created to facilitate Egypt’s transition into a digital society. The new ministry then prepared the National Plan for Communications and Information Technology and initiated several projects supporting and empowering the information society in Egypt in coordination with other government agencies and the private sector. The focus at the time was on equal access—to create an environment in which all citizens have easy and affordable access to the opportunities offered by new digital technologies. However, progress on e-government has been inconsistent in the last few years, as evidenced by the drop in Egypt’s E-Government Development Index (EGDI) ranking from 86 in 2010 to 111 in 2020.⁵⁹

Recognizing the critical need to reignite digital government progress, the government has embarked on an ambitious digital transformation roadmap in the last two years, guided by Egypt Vision 2030

⁵⁷ Digital platforms provide a place for collecting, sharing, and aggregating data; performing analytics; and delivering new and improved services. In general, digital platforms may help eliminate traditional data-sharing barriers between organizations and transform the way businesses, governments, citizens, and civil society interact (Evans 2013; Korhonen and others 2017).

⁵⁸ Note that for government platforms, “additional applications” include e-procurement, e-health, citizen service centers, and so forth.

⁵⁹ E-Government Development Index (EGDI), United Nations, <https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/53-Egypt>.

Box 13 Common Elements of Digital Platforms

Service delivery: By leveraging digital channels (such as online portals, mobile phones, and social media) to offer client-facing services, organizations can improve cost, efficiency, and convenience.

Shared systems: Setting up shared systems used across enterprises would increase efficiency by removing duplication of resources and redundancy of cost and effort.

Data infrastructure and management: With more data becoming digital, organizations need to use digital facilities to source, store, and share information with all constituents. For example, reusable public-sector data or open data is not only a tool to keep government accountable but also a resource for start-ups and firms to offer innovative products and services.

Interoperability and interconnectivity: To achieve interoperability and interconnectivity across enterprises, organizations require connectivity bus, web services, application-programming interfaces, and use of standards-based equipment and services. These are important for connecting fragmented systems or legacy systems across enterprises cost effectively.

Management and reforms: Digital transformation requires significant changes in the way a government or firm operates, depending on the nature of the platform. It involves examining processes used and data exchanged within an enterprise and with key clients or partners. Digital data (such as those used in registries or transactions) can be strategic assets and require robust safeguards for security and privacy.

Back-office systems: Organizations use digital facilities to manage and operate back-office functions for day-to-day operations. These systems cover all aspects of an organization's functions in its role as a corporate enterprise, including financial accounting, payroll, human resource management, general administration, and procurement.

and reflected in the ICT strategy 2030 framework.⁶⁰ Seeking to optimize the effectiveness of the public sector's digital services provision and efficiency of service delivery, MCIT has led efforts and worked closely with various line ministries by addressing some key foundational elements, namely strengthening the government shared infrastructure, advancing toward the development of a unified national registry, and consolidating databases.⁶¹ An illustrative example of such cross-ministerial collaboration is the process of developing the Egyptian Antiquities Platform that MCIT recently finalized in cooperation with the Ministry of Antiquities.

The government has recently implemented the first phase of a digital transformation project in the governorate of Port Said that aims to automate governmental services in the governorate and to link the same with the unified database of the state in cooperation with its various service sectors. The project further aims to serve as a model to mainstream the digital transformation in all of Egypt's governorates. By way of example, a universal health insurance mechanization project was launched in cooperation with the Ministry of Military Force and the Ministry of Health and Population. The project developed the work systems of three authorities, namely the health care authority, the universal health insurance authority, and the health accreditation and surveillance authority. The project further covers health care units and affiliated hospitals.

⁶⁰ Following the recent political and economic changes of the past few years in Egypt, the last two years witnessed significant efforts to revamp digital government from its legacy e-government (2000–2016) to Egypt Vision 2030 (http://www.mcit.gov.eg/ICT_Strategy). The ministry of Planning, Monitoring, and Administrative Reform is currently in the process of updating the vision in terms of targets to reflect the country's bold aspirations.

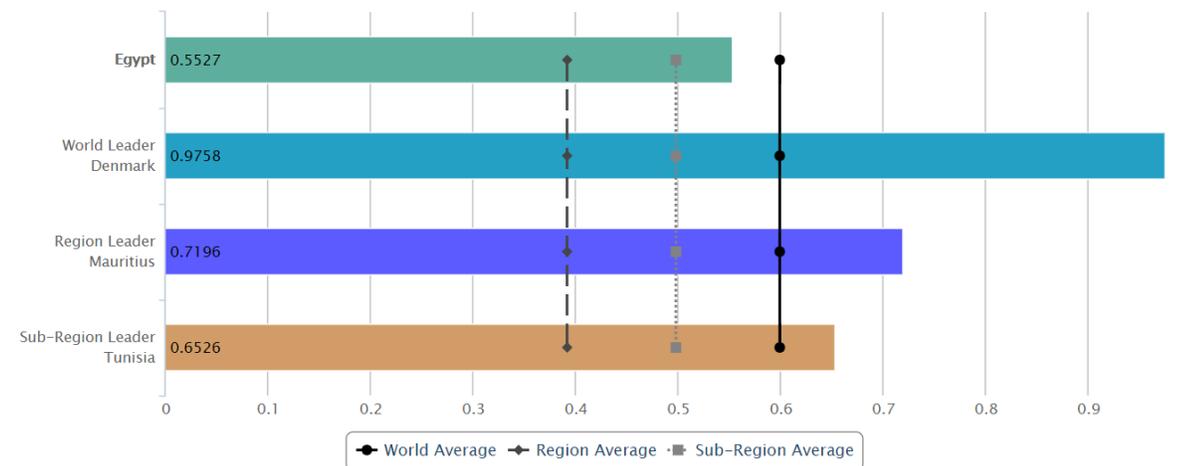
⁶¹ In addition to the health care sector, the electricity sector has benefited, with over 22 million registries currently. To date, 59 national databases have been consolidated according to Eng. Khaled El Attar, Vice ICT Minister for Digital Transformation, Automation and Administrative Development (press interview, February 2019).

Governmental Performance in Developing Online Services

According to the 2020 United Nations EGDI, Egypt ranks 111 (up from 114 in 2018) out of 193 countries. Mauritius had the highest rating class of the high EGDI group and remains the regional frontrunner in e-government development in Africa. It is followed closely by the Seychelles, South Africa, and Tunisia in the North subregion (figure 24). The upward movement in Egypt's 2020 EGDI ranking is driven mainly by the increased investment in digital infrastructure and the provision of online government services. Despite the significant progress made on the e-government agenda over the past few years, Egypt has seen its position declining since the initiation of its e-government program in 2001 compared to its regional counterparts. This calls for accelerating efforts to expedite digital transformation in the public sector to reposition Egypt as regional lead in the field.

Indeed, the country has improved its position in the 2020 EGDI's Online Services Index (OSI) (figure 25). To boost its ranking further, Egypt could first ensure the provision of a minimum of 25 percent of transactional services assessed in the Online Services Questionnaire (OSQ) (UN DESA 2020). The OSQ assesses more than 109 areas relevant to digital governance and services and 20 transactional services. Of these 20 transactional services, many are currently not being offered in Egypt, for example, application for government vacancies online and statements to police. On the other hand, the new areas of assessment relevant to e-justice systems were added in the 2020 edition of the OSQ, and that has helped the country in its online services ranking. By way of example, leading countries like Denmark provide online information, for instance, on how free legal aid can be obtained for marginalized groups.

Figure 24. Arab Republic of Egypt in the United Nations E-Government Development Index, 2020



E-Government Development Index	2020	2018	2016	2014	2012	2010	2008	2005	2004	2003
Egypt (Rank)	111	114	108	80	107	86	79	99	136	140
Egypt (Value)	0.55270	0.48800	0.45941	0.51293	0.46112	0.45180	0.47670	0.37929	0.26530	0.23841

Note: EGDI = E-Government Development Index.

Source: UN DESA 2020.

Figure 25. Key E-Government Global Indicators for Arab Republic of Egypt

Year	EGDI		OSI	HCI	TII	EPI	
	Rank	Value	Value	Value	Value	Rank	Value
2018	114	0.4880	0.5347	0.6072	0.3222	109	0.5393
2020	111	0.5527	0.5706	0.6192	0.4683	106	0.5119
Change in rank/value	+3	0.0647	0.0359	0.0120	0.1461	-3	-0.0274

Note: EGDI = E-Government Development Index; EPI = E-Participation Index; HCI = Human Capital Index; OSI = Online Services Index; TII = Telecommunications Infrastructure Index.

Source: UN DESA 2020.

More recently, MCIT coordinated additional e-government initiatives to promote the development of digital services as one of its key priorities for digital transformation. These initiatives aim to enhance the performance of ministries and other government bodies and to raise the quality, efficiency, and convenience of the services they provide to the public by improving the work environment, providing support for decision making, and finding solutions to concerns in the community. The COVID-19 crisis underscored importance of digital services for government, as seen in Finland (box 14).

Box 14

Finland: Leveraging Digital Infrastructure for a Resilient Digital Government during the COVID-19 Crisis

Since the 1990s, Finland has been a leader in digital transformation. It created its own path to achieving a trusted digital government based on proactive services, data sharing, open government, protection of privacy, and a common vision of an information society. The government has also leveraged digital government to reform the delivery of public services, ensuring both high quality and increased efficiency.

In response to the COVID-19 crisis, the government significantly increased the capacity of its digital systems within a few days. The objective was to facilitate the comprehensive teleworking of almost all civil servants along with the private sector, as well as to increase the usage of digital public services. Government digital services have set new usage records, with 30 percent more users late in 2020 than at the beginning of the year; e-commerce also has increased substantially throughout society.

Leveraging their well-developed digital infrastructure, the government had its public services running almost as normal from the beginning of the crisis. Innovations have been put in practice: doctors at hospitals see patients through video calls instead of visiting their rooms, and remote entrance exams for universities have been organized. Finally, regular communications with citizens and businesses, including remote and vulnerable groups, succeeded well in the country in explaining the COVID-19 situation and the required actions to be taken. In times of crisis, necessary and rapid action can be taken when the government is capable of agile decision-making, enjoys the trust of citizens, and has the digital capacity. Necessary laws can be passed, or decisions made in a few weeks' time when needed, such as when the Finnish government prioritized public information technology systems in case of emergency.

Sources: Government of Finland 2020; Karjalainen 2020.

Current Status of E-Government Services

In 2010 the Ministry of State for Administrative Development, in cooperation with the General Authority for Government Services, launched the government's e-procurement portal. The portal, etenders.gov.eg, is designed to help the government publish tenders and auctions openly over the internet and facilitate and streamline the public procurement process, including application submission and evaluation of bids, to ensure efficiency and transparency of operations. Today, the portal is managed by the Ministry of Finance (MOF) and provides many services to its users of suppliers and purchasers.⁶² Supplier registration is one of the main features. It allows access to all government entities utilizing the portal and submission of technical and financial proposals in secrecy and privacy. In addition, the procurement departments of government entities are able to submit requests and publish tenders and auctions, as well as carry out evaluation and awarding through the portal. For items that cannot be procured centrally, the e-procurement system allows for a decentralized operation (OECD 2008).

The government of Egypt portal (BAWABA),⁶³ available in Arabic and English, provides a centralized access point for most important documents and services. It provides a repository for the 2014 constitution and all major laws and bylaws in effect, although most documents are only available in Arabic. The portal provides citizens with access to the electronic websites of all ministries and governments bodies, support services (like those for the elderly and people with disabilities), tourism information, complaints and enquiries, cultural services, and services to provinces and cities. The portal also contains sections related to residency, business services, and investor services.

2019 saw the launch of additional online services. Building on the lessons learned from the pilot project transforming Port Said into a smart city, MCIT is incrementally scaling up the dissemination of the execution model and digital services to other governorates, with the objective of nationwide coverage. The government has launched 18 new digital government services in the governorate as of July 2019 and was planning to increase them to 174 services by the end of the year (Ahram Online 2019). Examples of these digital services include notarization, renewing driving licenses, utilities and electricity, municipalities, agriculture, and marriage officiants. MCIT has also finalized the first phase of the Immigration and Nationality Services Platform with the Passports Authority, in cooperation with the Ministry of Interior (MoI) in 2019.

The Smart Farmer's Card was launched with the Ministry of Agriculture, applying the Agricultural Possession System in the governorates of Port Said and Gharbeya. The two governorate's infrastructure and processes have been readied for this purpose and Smart Farmer Cards were provided to farmers and landowners. The electronic cards will store information including a farmer's name, identification number, and agricultural land holdings. This will help farmers receive the subsidies they are entitled to and establish a vast database to provide precise information for state agricultural planning and design purposes. The card will also benefit the state because the resulting database will keep track of land holdings and the types of cultivated lands. The project is now being automated in the governorates of Behira, Asuit, Sharkeya, and Sohag and it is expected that it will eventually be extended to all governorates.

The recent cooperation between the Ministry of Justice (MoJ) and MCIT illustrates the government's use of digital platforms in support of the development of key legislative services.⁶⁴ These efforts aim at increasing adoption and usage of the platforms in the Supreme Constitutional Court and Family Courts, foreign ownership of real property office, and the Public Prosecution's information centers in three of the largest governorates in the country (Cairo, Alexandria, and Giza).

⁶² Government procurement portal:

<http://www.egypt.gov.eg/Services/ServicesDetails.aspx?ID=100153§ion=personas&meta=1>.

⁶³ See <https://www.egypt.gov.eg/english/home.aspx>.

⁶⁴ MCIT website on [Development_of_Legislative_Services](#).

Digital government transformation has also been leveraged for deterring corruption.⁶⁵ The MoJ created an integrated system on the government digital platform to detect manipulation and corruption from data available at the notarization and real estate publicity offices. The implementation of the project began in late 2014 as part of a comprehensive framework for the development of anticorruption mechanisms. A unified data warehouse of all available sources of information (the MoJ and the Public Prosecution Office) has been created to mainstream data analysis, saving time and providing rapid detection of fraud and corruption.

Since the preparation of the field work for this report, Egypt has taken significant steps to accelerate the government digital transformation. The COVID-19 crisis created a need for business continuity and to deliver government services online which has naturally become more pressing with the lockdowns. At this stage, the Government is keen on deploying more online services and increasing usability. The digital health insurance services piloted in Port Said is incrementally rolled out in 5 other governorates including: Luxor, Aswan, Ismailia, Suez and South Sinai. MCIT has also embraced a plan to roll out 550 public e-services nationwide by 2023 in cooperation with line ministries through a new Digital Egypt portal which has been launched recently. A trial period included 30+ services availed nationwide on the platform, including driving license renewals, payment of traffic fines, notary activities, and lawsuit filing online. Progress is also taking place to increase online options for citizens in key strategic areas such in health insurance automation, improved tax collection systems, online tourism portals, fraud prevention smart cards, and subsidy smart card systems. Egyptian citizens, anywhere in the country, are able to receive these services in a digital format, through five channels: e-portals, mobile applications, service centers, call centers and ENPO offices and kiosks. Access to these platforms is through the citizen's Digital Identity.

This recent progress and dynamic momentum in digital government are believed to positively be reflected in the upcoming EGD I 2022 survey, particularly the agility in the deployment of online content and services, promotion of digital trust for end-users, and resilience of the digital government infrastructure – all are key characteristics for the short and medium-term. As such, conducting an in-depth digital government readiness assessment that is aligned with EGD I indicators would help in strategically identifying priority areas of intervention to progress current efforts in digital government transformation and boosting Egypt's ranking.

Leadership and Governance Structures

Current government leadership has demonstrated strong support for digital government in the context of the new digital transformation strategy put forward by MCIT. This strategy has two objectives. First, it aims at ensuring citizens' satisfaction through eligible access to high-quality e-services delivery. Second, it intends to create a whole-of-government ecosystem that institutionalizes digital collaboration among government entities and optimizes shared infrastructure. The implementation of this roadmap is currently ongoing in close collaboration with various line ministries. As previously highlighted, MCIT is piloting the use of digital government platforms and e-services development in the city of Port Said, and this is eventually to be scaled nationwide. This nascent implementation has also advanced thinking on the required foundational components for the digital government ecosystem, including a shift toward a data-driven government.

A new and emerging governance structure has injected a sense of urgency to this government's digital transformation. In 2017, a Higher Council for Digital Transformation was established by presidential decree

⁶⁵ Press interview with Eng. Khaled Al Attar, vice minister for digital transformation, MCIT, and Mr. Hossam Ibrahim, head of digital transformation and data, Public Prosecution Office, in November 2018. See <https://www.shorouknews.com/news/view.aspx?cdate=26112018&id=4a86356d-6a34-4ce9-b45c-778a7639e093>.

number 2016, which has given renewed impetus for accelerating digital transformation within the government. The council consists of representatives from more than eight ministries and 12 key governmental entities.

Under the manifesto, the Higher Council is recommending the establishment of two independent bodies, the first for governance and the second for digital transformation. Both new entities are expected to provide comprehensive support to ensure quality control and monitoring of the progress of various ministries involved in the digital economy agenda. The private sector has been highlighted as a main implementation partner for strategic execution.

In May 2019, the president of Egypt led a cabinet meeting dedicated to follow-up on the progress of the government's digital transformation. The meeting included the prime minister along with the ministers of Defense and Military Production, Foreign Affairs, Planning, Finance, Interior Affairs, and Communication and Information Technology in addition to the chairman of the Administrative Control Authority, Director of Military Intelligence, and Director of the Department of Information Systems in the Armed Forces. The presidential meeting also tackled efforts exerted to develop the capabilities of the government via a unified mechanism for digital transformation (*Egypt Today* 2019).

To ensure an adequate and sustained pace of progress, the government would need to go forward with establishing a dedicated permanent entity on digital government transformation, as highlighted in the draft manifesto. The entity's mandate would be to plan, coordinate, manage, and monitor the implementation roadmap for the government's digital transformation based on a clearly articulated multiphase plan. The entity is to be headed by a government chief digital officer (CDO) and will be located within the appropriate governance structure to secure its success.

User-Centric Focus

The emphasis of current e-government efforts is on shifting a mostly product-centric approach to a more user-centric approach by structuring user services into time-based categories (such as life events, business services, employment services) and allowing for direct and intuitive access to e-services on the government portals. Going forward, a new digital government portal and e-services design need to be completed based on shared standards that ensure a common look and feel. It is essential to ensure an adequate user experience for all government digital services. Government entities also need to transition e-service offerings from their own websites or portals to a common digital government portal or final dedicated domain. Finally, the development of a robust government-wide omnichannel access strategy is important. This should be followed by clearly articulated design and implementation phases, with established standards and guidelines for an e-services implementation toolkit.

The country will also need to continue improving the user interface design of government portals to enhance the overall user experience. According to the 2020 EGDI survey, the government will need to keep pace with the latest digital tools to improve the functionality of its platforms by adding a few features that fall under the 109 areas assessed by the OSQ (UN DESA 2020). These features include (a) addition of advanced search engines; (b) accessibility features; (c) features to configure font size, type, and color; (d) live support functionality and further integration of chatbots; (e) sitemaps; and (f) tutorials for using portals. Over the last 12 months, several incremental improvements have been made in the publication of relevant up-to-date information across government portals. Among the areas that are updated or are scheduled to be updated is information sharing related to road safety and traffic accident statistics, schools with accessible facilities, government procurement and bidding processes, user satisfaction of online or mobile services, and public housing.

Business Process Changes

In the past, the government had previously established and populated an e-government portal to serve a key platform access channel.⁶⁶ As highlighted above, the portal covers online services from various ministries and public entities. The site provides the name of the service with a description, the process for completing it, and the forms required. At present, information is limited on the associated fees required and the expected completion timeline. A new digital government portal (<https://www.Misralrakamia.gov.eg>) will be deployed by the end of 2020 and is initially expected to provide access to 70 different online services.⁶⁷ The current efforts are to present an online catalogue that will provide the basis for improving transactions from an “as is” state, toward an agile, simplified, and digitized state—especially for transactions cutting across several government agencies and requiring data, approvals, and authentication from various public sector providers. An example of a robust system can be found in Singapore (box 15).

In January 2020, the cabinet approved a decision to expand the mandate of the MCIT to include all those of the former Ministry of Administrative Reform related to digital transformation (*Daily News Egypt* 2020). This comes as part of the state’s plan to reduce the amount of duplication between ministries. Accordingly, several projects and initiatives for digital transformation were transferred from the Ministry of Planning to MCIT. Among these 20 projects for additional online services are law enforcement, litigation, traffic units and unit systems, real estate registry offices, the commercial registry offices (Economic Establishments), and services of the Ministry of Interior.

Going forward, a services transformation toolkit is to be developed based on the findings of the Port Said pilot. The toolkit will include standards, guidelines, and procedures for simplifying, optimizing, and redesigning services (modernization of services steps) as well as their integration into a common government-wide service bus. Two other priorities are to be addressed and are highly recommended: advancing the work of the government interoperability framework and accelerating the ongoing deployment of a national citizen smart card (electronic identification; ID) to facilitate a single sign-on for conducting digital government services transactions.

⁶⁶ See <http://www.egypt.gov.eg/English/Home.aspx>.

⁶⁷ MCIT 2019. Next after this new platform, citizens will be able to access the online services through a mobile phone application that will be launched soon and through post offices, citizens’ service centers, and call centers.

Box 15**Singapore: Consolidating Online Services around Citizens' Life Journeys**

In 2017, the product development team at Singapore's Government Technology Agency was tasked with developing a tool to consolidate citizen-facing services onto a single digital government platform. These online services were previously delivered by different government agencies. The initiative, called Moments of Life, aimed to make it easier for citizens to discover and access relevant online services during important changes in their lives, such as bringing a baby into the world. This has been facilitated by reducing fragmentation across government entities and being more anticipatory in the delivery of those services. The first attempt for services delivery along a citizen's life journey took the form of a smartphone app focused on easing the access to services for new parents. The app enabled users to register the births of their children, access their immunization records, navigate healthcare and childcare options eligible for benefits, and apply for the Baby Bonus Scheme, which is a government program aimed at alleviating the financial costs of parenthood.

Singapore's Moments of Life program illustrates the case of a whole-of-government approach. Organizing the delivery of services around a citizen's journey, rather than fitting their delivery to existing processes, requires extensive interagency collaboration beyond functional silos and line ministries. A significant degree of interagency collaboration is necessary to ensure their collaboration on the basis of shared outcomes for cross-cutting problems. Adjustment in policies, processes, and operations will be needed to enable life journeys to be realized.

Source: Moments of Life portal, www.tech.gov.sg/scewc2019/mol.

Shared Infrastructure

- **Given both the opportunities and risks of cloud infrastructure, the government developed in 2014 a comprehensive Egypt Government Cloud (EG-Cloud) strategy to support and promote the utilization of cloud computing in the government.**⁶⁸ An incremental usage of a hybrid cloud infrastructure model (private and public cloud) will ensure an upgrade for a secure digital government-wide network that connects all entities (at the national and local levels) to share services and data and be anchored to the national cloud as part of the network design. With an expected increase in provision of digital government services, there are opportunities for further public-private partnerships (PPP) to own, manage, and operate an expanded network of new national data centers.

At this point, government e-services applications and projects are planned and implemented independently and, as such, limited reusability among government entities is possible. To optimize the work, it appears necessary to map a full list of all government entities that have deployed workflow and document management system applications, as well as the projects under preparation or implementation, to ensure their interoperability.

A whole-of-government enterprise architecture covering infrastructure, data, integration, application, presentation, operations, and security dimensions is yet to be developed for Egypt's digital government. The incubation program in Port Said, prior to being scaled, is expected to guide the development of an updated e-government interoperability framework with mandatory standards for each government entity's systems as well as the design and deployment of an enterprise service bus (ESB)

⁶⁸ A taskforce has been formed, representing all the relevant stakeholders from the government, private sector, academia, and nongovernmental organizations (NGOs) to conduct a complete situation analysis to identify the most appropriate strategic directions and initiatives. A roadmap for implementing the EG-Cloud strategy has been proposed along three main strategic directions: developing the ecosystem, developing the governance model, and rolling out the EG-Cloud. Source: MCIT website, http://www.mcit.gov.eg/upcont/documents/eg-cloud-strategy-final31-08-2014_final.pdf.

construct for integrating various data sources to the many services applications. Currently, the MCIT and the Administrative Control Authority (ACA) are coordinating on this front and developing standardized application programming interfaces (APIs) for applications and e-services on the government digital platforms.

As part of the new capital city project, most ministries were scheduled to move into new buildings beginning in June 2019, and this would have been the occasion to adopt a streamlined and flexible digital infrastructure to support massive migration. However, this had to be rescheduled due to the COVID-19 pandemic. Meanwhile, a project linking all government buildings has recently kicked off, whereby the state is installing a secure fiber optic network to connect 35,000 buildings over the next 36 months, at a cost of EGP 6 billion (*Daily News Egypt* 2020).

Data-Driven Government Services

Egypt aims to develop a data-driven government, and the progress is ongoing. There are many basic data registers, for instance, covering diverse registries of staff and citizens, vehicles, land, businesses, and so forth. The construct of some of them is not publicly known, and the databases are not shared. Significant advancement has taken place as the government has created around 60 interconnected databases thus far. The president has described the scheme as a “major national project,” adding that it is a matter of “national security to have comprehensive databases for Egyptian society” (Ahram Online 2019).

The government, in collaboration with the MCIT, Ministry of Planning, and Ministry of Interior, is working on a new national citizen smart ID card, which would lead to an updated Basic Data Register for people. Together with e-signature and SIM registration, the smart ID cards will enable a single authentication for government e-services, providing personalized access, use, and transactions. The first phase is intended to reach over 26 million citizens, starting with public servants, before scaling nationwide. The Egyptian National Post Organization, following its earlier successes, is expected to facilitate further citizen inclusion through access from its broad network of offices.

The national Geographical Information System (GIS) is another key project that is currently being executed in collaboration with the Directorate of Geographic Affairs and the Egyptian Army. The project aims to develop a national spatial data infrastructure clearinghouse with a common GIS master base-map for the entire country to which the MCIT can add thematic data layers at a national scale (figure 26). These data layers would be provided by its respective custodians. This project brings vast opportunities to extract value from the pool of data sets generated.

Going forward, a comprehensive government data management strategy will be commonly adopted. The strategy will cover data standards, operations, data management, data governance, enabling architecture and technology, and integration constructs with links to a national government interoperability framework. As more economic, social, demographic, financial, and development planning data sets are being made available in a structured manner, both the government and private sector can benefit and conduct sector forecasts.

Figure 26. The Key Sector Data Layers in the GIS Project



Note: GIS = geographical information system.

Source: MCIT 2019.

The government has made some efforts over the last decade to open public data and promote its use. Still, Egypt ranks low on the UN E-Government Survey's Open Government Data Index with a score of 0.289 in comparison to a very good score of 1 for the United Arab Emirates (UN DESA 2020, 318). The government is striving to issue new data exchange legislation in addition to having several ministries and governmental agencies sharing related data on their portals and information channels (Talaat 2016). These efforts are amplified by the current Egyptian Open Data initiative that aims to make data sets digitally and publicly available.⁶⁹ An official endorsement and championship by MCIT to expand the initiative will give government entities the required framework to make data accessible to the public and will enable private sector entrepreneurs to create innovative data-based services. In general, open government data can ultimately enhance transparency, improve accountability, and increase citizen participation.

Cybersecurity and Privacy

According to the 2018 Global Cybersecurity Index (GCI 2018), Egypt is among the countries that have demonstrated high commitment to cybersecurity.⁷⁰ The Egyptian Supreme Cybersecurity Council, reporting to the Cabinet of Ministers and chaired by the Minister of Communications and Information Technology, has launched the National Cybersecurity Strategy (2017–2021). The aim is to provide a safe and secure environment that would enable various sectors to deliver integrated e-services, in line with the government's efforts to support national security and develop Egyptian society. Implementation is relatively effective, given that there is shared responsibility among the different stakeholders.

⁶⁹ Egyptian's Government Services Portal, Open_Government_Data_initiative; also CAPMAS-managed Egypt Open Data Portal.

⁷⁰ Egypt ranks 23 out of 183 countries on GCI 2018, ahead of United Arab Emirates (33) and Kenya (44) but remains behind Saudi Arabia (13) and Mauritius (14) (ITU 2018). GCI is published by ITU and covers five measures including legal, technical, organizational, capacity building, and cooperation elements. The next report was to be published by the end of 2020.

The national center housing Egypt's Computer Emergency Response Team (EG-CERT)⁷¹ was established in April 2009 as part of NTRA. EG-CERT provides computer and information security incident response, as well as support, defense, and analysis against cyberattacks. The emphasis is on government-critical information infrastructure and platforms.

Going forward, continued optimization of the EG-CERT operating model and expansion of its mandate are needed to cover people, process, technology, and governance dimensions. This is in addition to an evolving national critical infrastructure protection plan for Egypt that considers digital infrastructure, platforms, services, and other assets, with input from private sector and academia.

Robust data privacy and protection policies and regulations are pivotal to the growth of a data-enabled digital economy, as it builds public trust in online transactions. Data can be an infrastructure and a resource that can provide insights, solutions, and applications. The regulations on data availability, flow, and protection are needed to ensure both access and responsible use of the information. Further details are provided in the analysis of the Legal and Regulatory Framework in appendix A.

The recent issuance of the Personal Data Protection Law (Law 151 of 2020) in Egypt was long awaited and fills a critical gap. The law protects individuals' digital personal data, introduces the concepts of data controller and processor, and imposes several obligations and penalties. It also regulates cross-border data transfer and digital marketing.

Subject to certain exceptions, the law contains a general prohibition on the transfer of personal data to recipients located outside Egypt except with the permission of the (yet to be established) Egyptian Data Protection Centre and where the level of protection provided is not less than what is provided in Egypt pursuant to the Personal Data Protection Law. The executive regulations will specify the policies, standards, guidelines, and rules necessary for transferring personal data across borders.

Digital Capabilities and Culture

Until recently, there was limited understanding as to what capabilities are required to implement digital government at scale. Most national government training (central and local) had been linked to specific digital enablement and modernization programs. Training functions were spread across government organizations, training institutions, and academic facilities. The government has employed capable business and technical people to support specific government solutions, including tax payments, commercial licensing, investment planning, social security benefits, and land and cadaster management. However, there was limited insight on how to build a capability deployment framework that strategically maps and addresses needs in digital capacity development.

Today, the government's strategic emphasis is firmly on capacity development, and this provides an opportunity to strengthen the human capital dimension for digital transformation.⁷² A progressive shift toward a digital mindset is required to ensure the availability of adequate capabilities to design, implement, operate, and manage digital government platforms and services. What is vital as part of the holistic view of required human capital is to identify those capabilities that are best performed or can be outsourced to the private sector, through a private-public partnership mechanism. This would incentivize private sector development and hence national jobs creation in the mid- to long-term. Finally, it is necessary to address the challenge of keeping trained staff in the public sector from leaving for the private sector. The

⁷¹ The EG-CERT website is at <http://egcert.eg/>.

⁷² MCIT has recently articulated a three-pillar Human Capacity Development Framework with an emphasis on legacy training, next technology leaders, and provision of digital platforms for advanced digital skills.

identification of clear career paths for civil servants with advanced digital capabilities may provide the appropriate incentive for retaining such talent and attracting the most innovative.

A third phase of the Professional Governmental Employee training program launched in May 2020 at the National Training Academy is being carried out online through an academy e-platform.⁷³ The intention is to train 1,200 civil servants in Kafr El Sheikh, Beheira, and Sharqia. The Professional Governmental Employee training program aims to develop solid codes and standards for employees' general appearance and behavior. It was designed based on number of fundamental pillars, including public administration, change management, team building, state administrative reform, public relations and the influence of the media, etiquette, and protocols. Other aspects include some modern technological concepts, leadership and communication skills, national awareness, identity, and national security. The overall aim is to improve the quality of services rendered to citizens and implement the social justice pillar of Egypt's Vision 2030.

Digital Business Models

Recent growth in the IT industry reflects the expansion of digital businesses in Egypt across different sectors. Digital businesses are digital solution providers that develop and manufacture digital technology products or provide digital services. These businesses include tech start-ups as well as more established businesses that operate internationally. They serve as a critical foundation to enable traditional offline businesses (both large and micro, small, and medium enterprises; MSMEs) to adopt digital technologies and new digital business models, creating positive spillover effects for the rest of the economy. The IT sector in Egypt was forecast to grow by 21 percent in 2020 (pre-COVID-19), as a result of the ongoing creation and expansion of technology-intensive firms in the IT software and IT services markets. This trend was expected to continue for the next three years for both IT software and services, with average annual growth rates of 25.8 percent and 18.5 percent, respectively. By 2023, IT software and IT services sales were forecasted to be EGP 169.9 billion (1.9 percent of GDP). Among the sectors that are expected to grow the most with the expansion of tech-intensive firms are finance, logistics, and transport industries (Fitch Solutions 2020). These forecasts will have to be adjusted, considering the COVID-19 crisis: given physical distancing measures, there is now an even stronger demand for remote IT software and IT services solutions.

According to the World Bank's Digital Business Global Database there are more than 3,500 digital businesses in Egypt, including digital platforms and data-driven businesses that create an increasing number of direct jobs. Relative to other countries in the Africa and Middle East and North Africa regions, Egypt ranks third in the number of digital businesses after South Africa (~6,400), and United Arab Emirates (~3,700 businesses). However, Egypt has more digital businesses than other large countries and digital hubs in the region such as Israel, Nigeria, Saudi Arabia, and Kenya. More than three-fourths of digital businesses in Egypt reported an active and profitable status, showing that most of these firms have found profitable market niches in which to operate.⁷⁴ Only around one-third of digital businesses are local while the rest have foreign owners (51 percent from Sub-Saharan Africa and 5.9 percent from the Middle East and North Africa region); therefore, the importance of an enabling environment to attract and keep foreign investors.⁷⁵

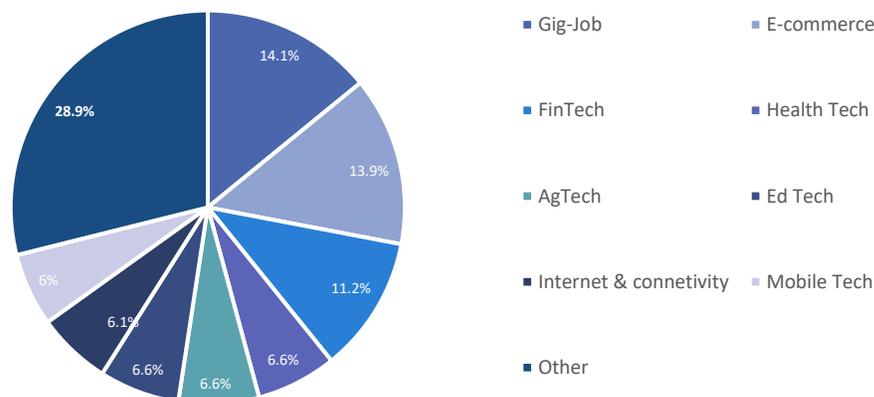
⁷³ For a news release on the program, see https://mciit.gov.eg/en/Media_Center/Press_Room/Press_Releases/45708.

⁷⁴ The World Bank Digital Database gathers data from three proprietary sources: Pitchbook, CB insights, and Briter Bridges. These sources construct their databases using public financial information, government information, as well as web-scraping techniques. Given this, it is likely that the number of bankruptcy cases is underreported, since there is less available information on firms that have already shut down.

⁷⁵ World Bank Digital Business Global Database. Information as of the end of July 2020 based on Pitchbook and Briter Bridges data only. According to Digital Database, 222 digital businesses with reliable employment information account for more than 400,000 direct jobs.

Following recent years' global trends, new digital platforms have begun to operate on a large scale across different sectors in Egypt, as reflected in increased funding for digital businesses since 2015. The share of platforms and data firms in total digital businesses in Egypt is higher relative to the respective share in the Africa and MENA region, by 7.6 percentage points. The main sectors in which these platforms operate are gig-job e-commerce, financial technology, health technology, agriculture technology, education technology, internet and connectivity, and mobility technology (for example, ride-hailing; figure 27). These sectors accounted for more than 70 percent of all digital platforms.⁷⁶

Figure 27. Sectors of Operation of Digital Platforms



Note: $N = 1,414$ digital platforms and data driven businesses. Other includes the following sectors: logistics technology, software, property tech, big data and analytics, marketing technology, professional service technology, artificial intelligence and machinery, clean technology, manufacturing technology, digital media, and telecom technology.

Source: World Bank Digital Business Global Database. Information as of the end of July 2020 based on Pitchbook and Briter Bridges data.

Looking more in-depth at ride-hailing, 6.8 million people used digital platform ride-hailing services in Egypt in 2019. This resulted in an annual revenue per user of \$82. The main ride-hailing platforms in Egypt are Uber, Halan, and Careem (Uber). This market presented a growth of 38 percent of its market value (US\$558 million). With respect to e-commerce, over 45 million people in Egypt purchased consumer goods online in 2019, and various investments in digital business models targeted e-commerce. As a result of this increasing trend in digital transactions, businesses spent over US\$800 million in digital advertising in 2020 (Kemp 2020).

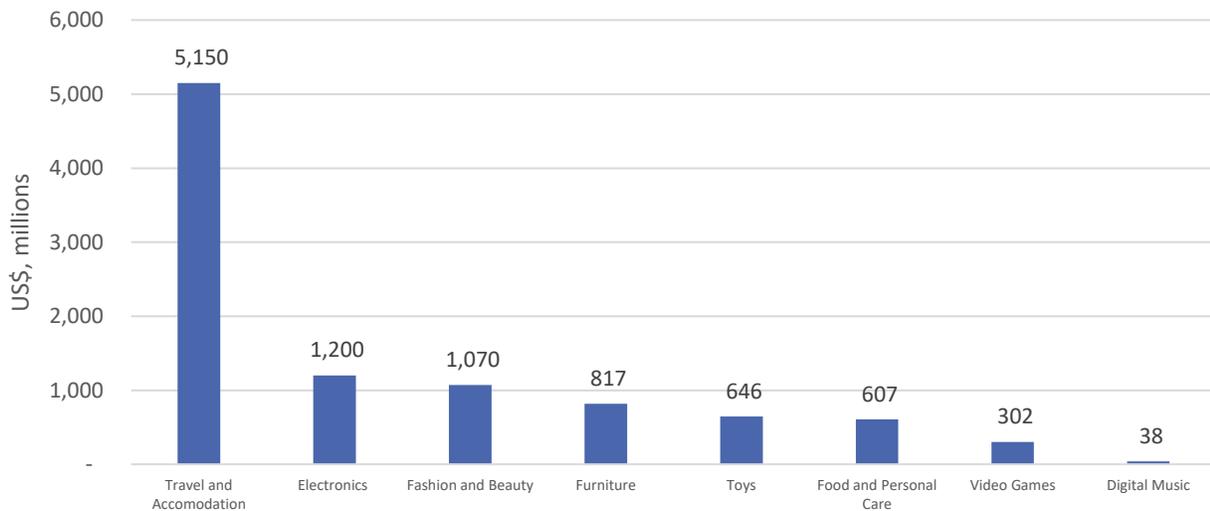
The expansion of the sector and of its leading firms is demonstrated by business diversification and the available funding from external sources. The top 10 companies in the digital sector received more than US\$300 million in Jan. 2015–May. 2020 (CBInsights, 2020). These businesses, which operate in different sectors ranging from e-commerce to mobile phone software, include Swvl, Zezeeta, Halan, Adzily, Wuzzuf, Elmenus, and Instabug. Swvl has raised close to US\$100 million and operates in the transport sector providing bus-hailing services. Halan has expanded its operations from ride-hailing services to logistics. Adzily, Elmenus, and Instabug have expanded their operations to include digital marketing, food service delivery, and IT services, respectively. Since 2018 Egypt has experienced an important increase of funding for startups surpassing US\$140 million in 2020 (Disrupt Africa, 2021), becoming one of the leading countries

⁷⁶ World Bank Digital Business Global Database. Information as of the end of July 2020, based on Pitchbook and Briter Bridges data only. According to Digital Database, 222 digital businesses with reliable employment information account for more than 400,000 direct jobs.

in MENA - together with UEA and Saudi Arabia (MAGNiTT, 2020) and continental Africa - just after Kenya, Nigeria and South Africa (Disrupt Africa, 2021). **E-commerce platforms in Egypt are still in their nascent stages.** There are a growing number of professional digital platforms (for example, Shopify, Jumia Egypt, Souk, Noon) and intermediate platforms (for example, Fawry). Shops are increasingly using social platforms (for example, Facebook and Instagram) to create an online presence. The sector has grown exponentially from a total of 450 different online retailers and marketplaces in 2015 with US\$544 million in revenue to a business to consumer (B2C) e-commerce turnover that reached 22 percent growth in 2017. However, only 2.4 percent of the Egyptian population over age 15 used e-commerce to make a transaction in 2017 (World Bank 2018b), and e-commerce only accounted for 0.4 percent of retail sales in the country at the time (UNCTAD 2017). By 2019, 51 percent of internet users carried out a purchase online, and e-commerce accounted for 1 percent of total B2C retail spending. As a result, Egypt shows only a slight improvement in the United Nations Conference on Trade and Development (UNCTAD) B2C E-Commerce Index 2019, ranking at 102, 11 positions higher than two years before (UNCTAD 2019).

The market value of the B2C e-commerce market in 2019 reached US\$6.2 billion, with an annual growth rate larger than 17 percent in 2019. The e-commerce product/service on which Egyptians spent most was traveling and accommodation, with a total expenditure of US\$5.2 billion (figure 28). Electronic goods (US\$1.2 billion dollars) and fashion and beauty goods/services (US\$1.1 billion dollars) also accounted for a large portion of e-commerce sales (Kemp 2020). In 2017, MCIT collaborated with UNCTAD to develop a new national strategy that aims to increase the current share of e-commerce in GDP to 2.32 percent and double the number of businesses selling online by 2020. Egypt remains a cash-based economy despite the recent efforts to move beyond cash, as 72 percent of customers used cash for their e-commerce purchases in 2018 (UNCTAD 2017).

Figure 28. E-Commerce Spending by Product/Service

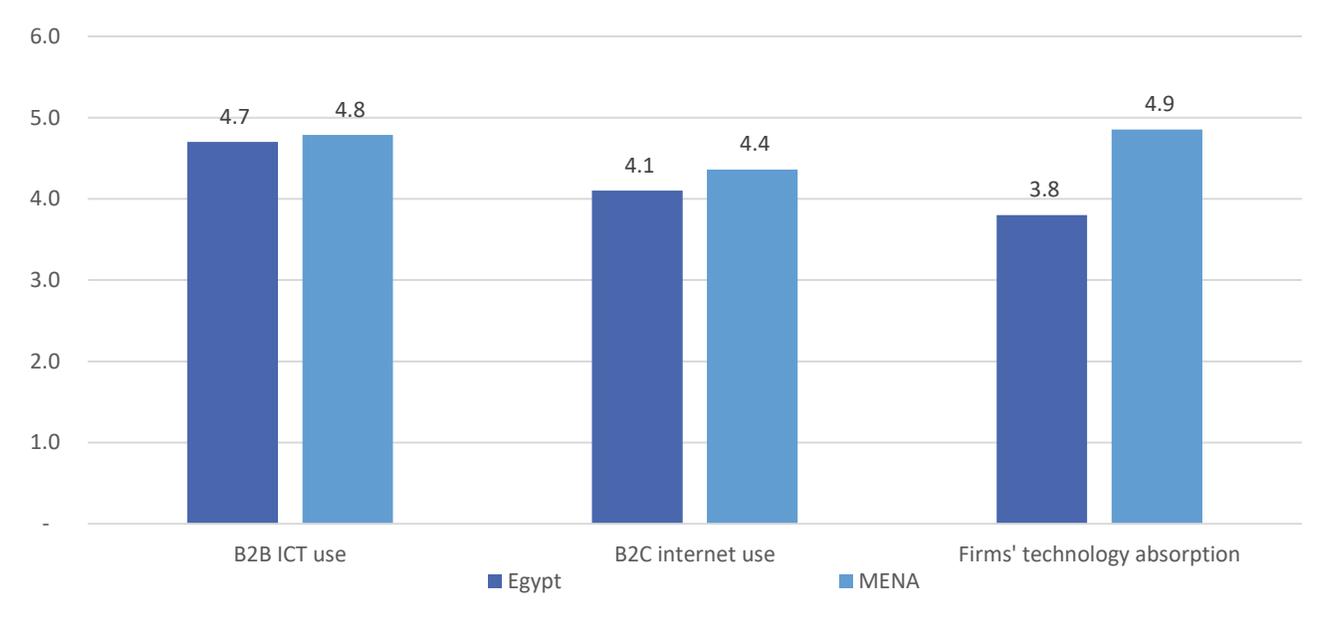


Source: Kemp 2020.

Although new digital solutions are available for both business-to-business (B2B) and B2C transactions, the adoption of this digital technology has not been universal across firms, indicating great potential for digitalization, especially B2B digitalization that creates more and better jobs in the future. In 2016, only 60 percent of businesses used internet for their operations. In addition, the share of businesses that used the internet for banking or delivering products or services or staff training accounted for less than 20 percent (UNCTAD 2019). This pattern is confirmed by other indicators of network readiness, such as B2B ICT use, B2C internet use, and firms' technology absorption (figure 29), which position Egypt

below the average of MENA countries. Furthermore, Egypt ranks 96 out of 139 countries according to the WEF's overall ranking of network readiness (WEF 2016). Policies to encourage the adoption of digital technologies by firms could be considered to support B2B business models and digitalization that increases competitiveness.

Figure 29. Business IT Usage



Note: B2B = business to business; B2C = business to consumer; ICT = information and communication technologies; IT = information technology; MENA = Middle East and North Africa. The B2B indicator captures the extent to which firms in a country use information and communication technology to make transactions with other firms. The B2C indicator captures the extent to which firms in a country use the internet to connect with customers. Firms' technology absorption measures firms' propensity to adopt technology.

Source: WEF 2016.

Egypt is in a good position to grow digital business offerings. With smartphone usage on the rise, progress toward greater connectivity, a large population under 30, and industries that can benefit from B2B services, Egypt has the potential to enable the deployment of digital business models. The local landscape has developed further over recent years and the trend is expected to accelerate, although the limited penetration of digital payment systems poses a challenge. Furthermore, the issuance of the Personal Data Protection Law in July 2020 is a first step to enhance legal certainty regarding the collection, use and transfer of personal data—an essential element for the success of data-driven digital businesses. The development of an enabling environment for digital business calls for a comprehensive set of policies, as the case of Mexico illustrates (box 16).

Box 16**Mexico: Adjusting Regulations to Facilitate the Operation of Digital Business Models**

Mexico is an example of a government that has used both *ex ante* regulation and competition enforcement to allow for an environment where local and smaller players can compete with larger digital platforms and with offline, traditional companies.

Sector-specific rules in sectors such as transportation and finance at the subnational and national level have allowed for growth in digital platforms for urban passenger transportation and fintech services. Since 2015, regulatory debate on transportation platforms has leaned toward allowing for the operation of digital platforms; emphasizing regulatory effort limited to public policy objectives related to safety and protection of users; favoring economic competition and free market access; and ensuring that users reap the benefits brought by these new business models. Similarly, the 2018 fintech law adopted rules to facilitate consumer switching and enable entry of new participants into the market.

At the same time, competition law was enforced to stop anticompetitive mergers. Mergers in retail, digital payments, and finance have been analyzed, and a merger between a traditional retailer and a digital platform was blocked. Investigations of abuse of dominance in the market for electronic commerce platforms have been initiated as well.

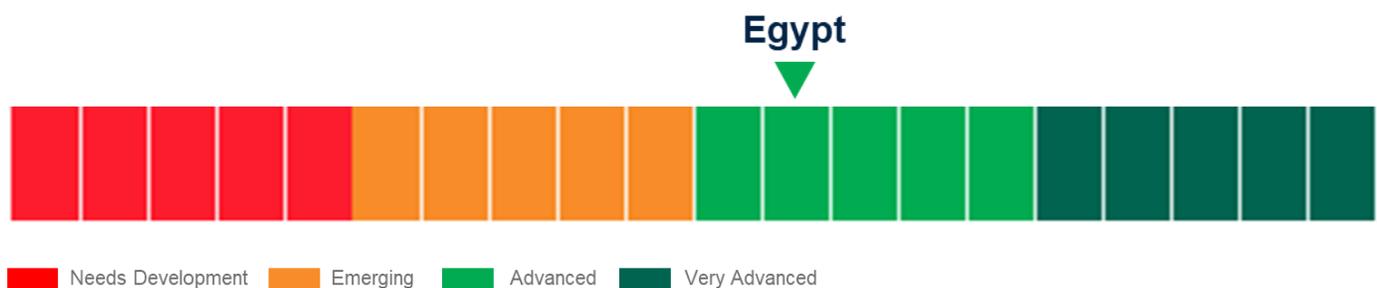
The country has also taken actions to update frameworks on data protection, consumer protection, and taxation of digital services. In 2018, Mexico adopted the Council of Europe Convention 108 of January 28, 1981, for the Protection of Individuals with regard to Automatic Processing of Personal Data and its Additional Protocol to the Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data, regarding supervisory authorities and cross-border data flows. In 2020, regulations on data privacy were included under the consumer protection framework, although greater alignment with the country's general data protection framework is needed. Mexico is also in the process of adjusting rules on taxes on digital services, including on foreign residents.

Source: COFECE Digital Strategy; Raul 2020; Chambers and Partners Data Protection & Privacy; KPMG; Dentons.

Middle East and North Africa Regional Benchmark for Digital Platforms

When benchmarked against other members of the MENA region, Egypt qualifies as “advanced” in digital platforms (figure 30). This is based on the World Bank's MNA Tech analysis of 19 indicators across topics related to government platforms, private sector platforms and logistics (figure 31).

Figure 30. Arab Republic of Egypt's Digital Platforms Compared with Other Areas of the Middle East and North Africa



Source: World Bank's MNA Tech analysis.

Figure 31. Arab Republic of Egypt's Digital Platforms Compared to the Middle East and North Africa Average

Component	Indicator	Egypt	MENA Average	MENA Average - GCC
Pillar 2: Digital Platforms		6.20	5.44	4.81
Gov't Platforms	Under-5 birth registration rate	99%	93%	92%
	National ID coverage (age 18 and above)	98%	97%	97%
	ID database digitized (Y/N)	Yes	Yes	Yes
	Digital authentication enabled (Y/N)	-	Yes	Yes
	e-government Index	0.49	0.54	0.44
	Online Services Index	0.53	0.55	0.41
	e-Participation Index	0.53	0.53	0.54
	Share of population (age 15+) who cite lack of necessary documentation as a reason for not having a financial account (2017)	9%	8%	9%
Logistics	Percent of Population Having Mail Delivered at Home	100%	51%	59%
	Percent of Income Linked to Parcels and Logistics Services	2%	24%	22%
	Postal Reliability Index	80.9	58.7	53.9
	Percent of the Population Without Postal Services	0%	14%	19%
	LPI International shipments score	3.3	2.9	2.6
	LPI Logistics competence score	3.2	2.8	2.5
	LPI Tracing & tracking score	3.2	2.8	2.5
	LPI Timeliness score	3.6	3.2	3.0
Private sector platforms	Burden of customs procedures	3.8	4.1	3.6
	Country value in the UNCTAD B2C E-commerce Index	39.9	49.2	39.2
	B2C Internet Use, 1-7 (best)	4.0	4.2	3.8

Note: B2C = business to consumer; GCC = Gulf Cooperation Council; ID = identification; LPI = Logistics Performance Index; MENA = Middle East and North Africa; UNCTAD = United Nations Conference on Trade and Development.

6.3. Recommendations and Next Steps

While Egypt's digital journey has been noteworthy, the development and use of digital platforms (both governmental and commercial) could be improved to achieve a dynamic, inclusive, and safe digital economy. The country is now at an important turning point for accelerating the government's digital transformation and fueling the growth of e-commerce (table 7).

Table 7. Strengths, Weaknesses, Opportunities, and Threats Analysis on Digital Platforms

Strengths	Weaknesses
<ul style="list-style-type: none"> The successful e-government pilot in Port Said demonstrated practice in interoperability and institutional coordination. There is willingness at the highest level to embrace digital solutions in the Arab Republic of Egypt. Markets for platforms and other digital business models are growing. 	<ul style="list-style-type: none"> The government has been missing a clear plan for public digital platforms and the capacity to fully implement it. Strategic leadership on public platforms and private-led digital business models is unclear. A comprehensive data policy to enable interoperability and database integration is lacking. Egypt's economy remains cash based, affecting digital business models.
Opportunities	Threats
<ul style="list-style-type: none"> Ministries are migrating to the new capital city and could benefit from a new shared government infrastructure. A dynamic entrepreneurship ecosystem that can be built upon is nascent. Leverage on regional common language—for example, chatbot in Arabic. 	<ul style="list-style-type: none"> Institutional capacity for successful government migration to a new environment, including process reengineering, is weak. The legal framework is less conducive to private digital platform development, and coordination between regulatory agencies is limited. A digital skills gap exists.

The following recommendations could support the further development of digital platforms in Egypt:

Objective 1: Accelerate implementation of the government's digital transformation based on in-depth readiness assessments and success of pilot programs.

Adopt a progressive approach to scale up the implementation of the government's digital transformation strategy. The findings of this diagnostic clearly highlight that recent progress has been made to advance the government's digital transformation agenda. This progress was demonstrated by, among other things, the Port Said pilot, the optimization of national databases, service level agreements drafted with various ministries, and the strong support for the digital agenda from the country's leadership. Given the commitments made in the ICT Strategy 2025 and Egypt Vision 2030, now is the time to build on the strategic work undertaken to date, by ensuring that roles and responsibilities are clear, and that coordination and collaboration are facilitated. The whole-of-government approach could become the norm based on best practice standards, designs, and partnerships.

Use the Port Said pilot as a catalyst to create a government that is itself a platform for strategic collaboration, digital experimentation, and public sector innovation. Crowdsourcing public sector intelligence and promoting experimentation can help advance the goals of the digital government agenda for the benefit of citizens and communities of practitioners, within and beyond the public sector.

Conduct an in-depth analysis of the digital government in Egypt (infrastructure, platforms, and services) to identify progress and adjust execution paths. The Digital Government Readiness Assessment (DGRA) strategic planning tool that was recently developed by the World Bank could be leveraged to provide an in-depth assessment across key dimensions such as institutional landscape, user focus and change management, technology and data infrastructure, capabilities, culture and skills, and the enabling national ecosystem.

Objective 2: Create an enabling policy and regulatory environment for digital business models.

Adopt legislation that enables digital transformation and leverages digital platforms in Egypt. The government has conducted several legislative reforms during the last period, including Egypt's consumer

protection law, cybercrime law, intellectual property rights law, and most recently the new data privacy and protection law. Two more steps are recommended: digital signatures could be launched following the 2004 law on the subject, and a new e-commerce law could be enacted. Both are fundamental to achieving meaningful steps toward an enabling regulatory environment and the advancement of digital economy. It would be also important to evaluate government rules to protect suppliers (especially small vendors) in online platforms and complement current antitrust rules on abuse of dominance, as well as rules on taxation of digital services, to create a level playing field.

Define clear and strategic institutional leadership for the digital government agenda, backed by the government’s political support, encompassing various economy-wide and sector-specific policies. This would fit with existing vertical and horizontal structures for policy implementation to avoid conflicting responsibilities and weak accountability. An important policy area of focus could be antitrust, including strengthening merger control, ensuring the application of the law across sectors and firms, and updating the law as needed to provide rules to address anticompetitive practices in digital markets. Additional recommendations for regulatory intervention are set out in the legal section in appendix A.

Develop a national data policy for the public sector. A whole-of-government data policy would help connect elements of the data value chain under a single policy instrument. Current progress on interoperability, datasets, and the adoption of a data privacy and protection law are significant steps toward a comprehensive national data policy. The policy will also enable public sector agencies to define informed policy priorities and pool data commons. It will further enable greater cross-government data integration, as well as more interoperability, maturity, and stewardship. Under an open-data policy, these integrated datasets can also be made available to the private sector to encourage competition as well as the development of new digital solutions relevant to the Egyptian context. This is a foundational element in the preparation of a national AI strategy and will accelerate AI use in the public sector and various social and economic sectors, offering more proactive and personalized services to citizens and businesses. A country AI ecosystem maturity analysis is recommended to identify further opportunities and challenges for leapfrogging with AI adoption and use.

Objective 3: Build institutional capacity to support digital platforms.

Focus and improve digital capacity building within the public sector. There is an opportunity for government to lead the preparation of a forward-looking national capacity development plan that maps the digital skills and competences required for leapfrogging to digital transformation (for example, data science, cybersecurity, AI). Such a plan would be expected to define a roadmap for progressively shifting toward a digital mindset in the public sector that can ensure the availability of adequate capabilities to design, implement, operate, and manage digital government platforms and services. In addition to the human and technical digital skills, the plan can foster partnerships with academia and ICT industry leaders by establishing government accelerators to introduce new digital models.⁷⁷

Conduct a further comprehensive analysis of private platforms in Egypt. Such an assessment could leverage the framework developed for the World Bank’s analytical project on new digital business models.

Table 8 summarizes the key recommendations and suggested activities for digital platforms in Egypt. A time span is proposed for each activity, including short-term (3–12 months), medium-term (12–24 months), and long-term (24–36 months).

⁷⁷ Government Accelerators, first launched in United Arab Emirates in October 2016, is a dynamic learning platform for cross-sectoral government teams together with academia and the private sector to address challenges and achieve ambitious goals in short periods. See <http://www.accelerators.gov.ae>.

Table 8. Key Recommendations and Suggested Activities for Digital Platforms in the Arab Republic of Egypt

Recommended Actions	Time Frame	Priority
Objective 1: Accelerate implementation of the government’s digital transformation based on in-depth readiness assessments and success of pilot programs.		
Conduct an in-depth Digital Government Readiness Assessment.	Medium term	Intermediate
Scale the government pilot in Port Said to other governorates, promote public sector experimentation, and expand the online services catalogue through digital platforms.	Medium term	High
Continue investing in secured modern digital infrastructure, including high-quality broadband and data storage capacity.	Long term	Intermediate
Objective 2: Create an enabling policy and regulatory environment for digital business models.		
Accelerate adoption and enforcement of an enabling legislation for digital transformation and evaluate new policy interventions such as incentives for adoption of digital technologies by firms, supplier protection rules, and taxation of digital services.	Short to medium term	High
Clearly define and strengthen the strategic institutional leadership for the digital government agenda.	Short term	High
Develop an AI-ready national data policy for the public sector to connect all current and future elements of the data value chain under a single policy instrument. A country AI ecosystem maturity analysis should also be taken into consideration for increasing AI adoption and use.	Medium term	Intermediate
Objective 3: Build institutional capacity to support digital platforms.		
Enhance the capacity of civil servants to ensure the availability of adequate capabilities to design, implement, operate, adopt, use, and manage digital government platforms and services.	Medium term	High
Increase access to advanced digital skills for enhancing the usage of data and emerging technologies.	Medium Term	High

Note: Short term = 3–12 months, medium term = 12–24 months, and long term = 24–36 months. AI = artificial intelligence.

7. Digital Financial Services

This section analyses the state of digital financial services in Egypt and the key opportunities and challenges.

Key messages:

- Digital financial services (DFS) have the potential to dramatically expand financial inclusion in Egypt and fuel overall economic activity.
- The commercial incentive for developing such services could be driven by the expansion of government-to-person (G2P) payments.
- Modern regulatory frameworks and infrastructure are needed to support the update of DFS. This includes e-signature, e-contracts, data protection and privacy, data portability and open banking, know-your-customer (KYC) and electronic KYC (e-KYC) registries, and unstructured supplementary service data (USSD) banking.
- Nonbank payment service providers, including microfinance institutions, should be digitally enabled and given access to the clearing and settlement infrastructure on a transparent and equitable basis.

7.1. The Importance of Digital Financial Services

Digital technologies can improve the delivery of financial services and contribute to a broader, more efficient, and more inclusive financial sector. DFS refers to “financial products and services, including payments, transfers, savings, credit, insurance, securities, financial planning and account statements that are delivered via digital/electronic technology such as e-money (initiated either online or mobile phone), payment cards and a regular bank account” (GPII 2016, 3). DFS involves new operating models and a wider range of actors such as nonbank e-money issuers. DFS can have significantly lower costs than traditional financial services that rely on manual and paper processes, including costs of storage, computation, and transmission of data.

DFS has the potential to disrupt the market and reach the underserved and unbanked. For example, mobile technology offers cheaper transaction accounts that act as a gateway to other financial services. Lower search and verification costs have led to the creation of online person-to-person (P2P) platforms or marketplaces that facilitate matching between lenders and borrowers. Moreover, DFS can support women’s financial inclusion. For example, access to financial services for female farmers.

DFS is, however, not without risks, such as higher exposure to cybercrimes and concerns over data privacy. Digital literacy is also a concern, as fewer literate individuals may not feel comfortable using digital platforms, which could further exacerbate financial exclusion. Providers need to become more experienced in managing digital technologies to ensure that the benefits outweigh the costs. Regulators may struggle with new market participants using business models that do not conform to existing supervisory practices. At the same time, cyber-resilience of financial market infrastructures is critical to ensure the stability of the entire financial ecosystem.

As recent experience with COVID-19 lockdowns has shown, digital payments are crucial in facilitating minimum essential economic activity during such periods of stress and crisis. The continuous flow of payments for salaries, goods, and services along with remote delivery of services and product shipping allowed for essential economic activities, along with some nonessential ones, to continue during the COVID-19 lockdowns.

The government of Egypt prioritizes the development of a digital economy with a strong DFS pillar for a less-cash society. The government aims to develop a sound, diverse, competitive, and inclusive financial sector that provides convenient access to appropriate, affordable, and quality financial services.⁷⁸

7.2. Diagnostic Findings: Current State of Digital Financial Services

Transaction Accounts and Payment Services

The level of financial inclusion in Egypt falls short of that in most of its peer economies. As of 2017, just under 70 percent of adults were still excluded from the regulated financial system, lacking the prerequisite for participating in a digital economy: a transaction account. At the same time, as in other MENA countries, there is a significant gender gap in Egypt in transaction account ownership: 12 percentage points in 2017, up from 10 in 2014.⁷⁹

Despite the multiple advantages that a cashless economy could offer, most payments in Egypt are made in cash. According to the Payfort State of Payments Report, 91 percent of retail transactions in Egypt were settled in cash in 2016.⁸⁰ Among cashless payments, bank transfers remained the most popular followed by payment cards and mobile money. The latter is mainly used for P2P transfers rather than purchases. The dominance of cash is illustrated by global companies having to switch to cash-based payments upon entering the Egyptian market. For instance, Cairo was the seventh city in the world where Uber had to accept cash payments in addition to digital payment (Maher 2015).

The use of digital payments by Egyptian adults is significantly lower than in most economies. Overall, only 6 percent of Egyptian adults reported making a digital payment in the past year. This includes using a debit or credit card, using a mobile phone to make a payment from an account, using the internet to pay bills or to buy something online, and paying bills or sending domestic remittances directly from a financial institution account or through a mobile money account (World Bank 2017a). The percentage is much lower than most economies, with the MENA average at 28 percent and the world average at 45 percent. Among those who report paying utility bills in the past year (69 percent of adults), 98 percent report using cash. Only 2 percent of Egyptian adults reported using the internet to pay bills online. Around 66 percent of wage earners report receiving salaries in cash. In the previous year, 22 percent of account holders report having made neither a deposit nor a withdrawal. Similarly, the use of mobile money services in Egypt is low, at only 2 percent of Egyptian adults. The latest data collected from the NTRA suggests that there have been some improvements in the ownership of mobile wallets offered by the MNOs and banks: there were approximately 19.8 million mobile wallets in as of April 2021 however it is not clear how many of these wallets are active.⁸¹

Egyptian adults still prefer paying cash for their online purchases. Payfort reports that 70 percent of online purchasers pay in cash. In addition, anecdotal evidence based on interviews with e-commerce sites and financial service providers suggests that most Egyptians prefer paying cash on delivery for their online purchases. There are three main reasons for this: (a) distrust in the financial sector, that is, facing the potential consequences of having personal or financial information stolen, having an amount debited multiple times, being overcharged, or not being able to receive refunds if the item is defective or never received; (b) distrust in the delivery/courier system, that is, that the product will not be delivered at all, will be delivered but not in usable condition, or will be delayed significantly; (c) distrust of a merchant who is not

⁷⁸ This note does not cover complex financial services, for example, retail investment services, or complex forms of financial assets made possible by digital technology, for example, crypto-assets, given the level of financial sector deepening in Egypt.

⁷⁹ According to Global Findex 2017 (World Bank 2017a), only 33 percent of adults in Egypt have a transaction account that allows for payments and the store of value provided by a regulated financial institution.

⁸⁰ Amazon Payment Services, <https://stateofpayments.payfort.com>.

⁸¹ CBE data is based on the latest World Bank Financial Inclusion Global Initiative (FIGI) mission from November 2019.

met face-to-face, thinking the product will be defective or will not be sent at all, fearing the merchant will overcharge and will not refund in the event of defect, and so on.

Electronic payment acceptance among merchants is also a challenge. A 2016 World Bank study (World Bank, 2016a) indicates that electronic payment acceptance by small merchants in Egypt is low. According to the study, only 18 percent of retail payments by consumers at micro, small, and medium enterprise (MSME) merchants are estimated to be done electronically. Promoting electronic payment acceptance in Egypt represents a particularly large opportunity to improve digital payments, increase formalization, and, in turn, improve financial inclusion.

Fawry and Masary are the two largest bill payment aggregators, each of them maintaining a large agent network and allowing their clients to use both cash and noncash means to pay bills, top up their mobile phone credits, donate to charities, pay school tuition fees, and settle bills for e-commerce orders. Fawry has more than 80 thousand locations and enables payments online, using ATMs, mobile wallets, or retail points. Masary has more than 60 thousand locations enabled with their point-of-service (POS) system.

The current bill aggregation business model is based on an extensive agent network that receives cash payments. This reinforces the cash-centric culture. E-commerce in Egypt relies on these bill aggregators to enable cash payment against delivery of most items, from mobile phones to fridges. Bill aggregators say they have found much resistance from consumers in trying to establish electronic payments.

E-Finance, controlled by the Ministry of Finance, is an important payment gateway, handling electronic payments to and from the government through banking channels. It was set up to provide outsourcing services to the MOF associated with payments and collection (suppliers, employees, pensioners, customs, taxes, and so forth).

Most international remittance services in Egypt are cash-based, with banks offering relatively cheap cash-to-cash services through bilateral arrangements with foreign exchange houses and banks in Gulf Cooperation Council (GCC) countries.⁸² International remittances are an important driver of financial inclusion. Typically, migrants go abroad for the purpose of sending money home regularly. For the families back home, who are predominantly poor and excluded from the financial sector, receiving remittances to an account may serve as a gateway to the regulated financial sector. International remittance receipts represent an opportunity to boost digital payments by reaching unbanked and underbanked populations for the first time with transaction accounts.⁸³

According to the World Bank's Global Payments System Survey (GPSS), the volume of credit transfers has increased sharply since 2012. The Egyptian Banks Company (EBC) introduced the direct debit service in 2012, however, its use is relatively low. In 2015, 17 million direct credits were executed, versus 98,000 executed in 2011. In 2013, 316,000 direct debits were executed. This went up in 2015 but only to about 1.2 million direct debits.

E-money issuance is limited to banks under CBE regulation. Mobile wallets in Egypt have been launched by banks, or as partnerships between banks and MNOs, or in one instance, by Fawry in partnership with several banks. In 2016, a revision of the Mobile Payments Regulation was issued to expand the take up of mobile wallets, as it was estimated that over 90 percent of mobile wallets remained dormant. This might

⁸² Outside GCC remittance corridors, international money transfer operator (MTO) services are more prevalent and remittance services are offered through partnerships with commercial banks in Egypt.

⁸³ International remittances represent a significant source of income and foreign currency for the Egyptian economy. Recent estimates indicate that inward remittances through regulated channels amounted to US\$23.6 billion in 2017, accounting for 10 percent of GDP and making Egypt one of the top five remittance receiving developing countries.

have been caused by the ceiling for mobile wallet balances not having been adequately adjusted for inflation coupled with the lack of interoperability. The new regulation increased transactional limits, enforced interoperability, enabled banks to employ agents for onboarding (including microfinance institutions [MFIs]), and allowed users to receive international transfers directly into their mobile money accounts.⁸⁴ Since then, interoperability has been further facilitated through the Mobile Interbank Switch operated by EBC.

In 2019, in an attempt to push cashless payments, the CBE, EBC, and MCIT launched the national prepaid card scheme, Meeza Card. Several domestic banks issue the Meeza Card, and users can recharge the cards at banks and ATMs. Egyptians over the age of 16 can procure a Meeza Card by presenting their national ID cards in person. The card is free of fees for the first month. Meeza Cards can be used for transactions at POS and online domestically, as well as for withdrawals at ATMs, payments of government bills and services, and some other private sector services.

Barriers to Account Ownership and Use

According to Global Findex 2017, the major self-reported reason for financial exclusion is insufficient funds for opening an account. Eighty-three percent of unbanked Egyptian adults noted that they do not have an account at a regulated institution due to insufficient funds. Other barriers cited include cost of opening and maintaining an account (19 percent), lack of documentation (13 percent), the distance to the nearest access point (7 percent), lack of trust in the financial sector (5 percent), and religion (5 percent). This suggests that a wider range of products should be made available to cater to different needs.

Commercial banks in Egypt offer two main types of accounts: savings and current accounts. Current accounts usually ask for a minimum balance and provide access to their resources through checks, payment cards, and bank branches. Egypt Post also offers postal saving accounts and current accounts, which have no opening or minimum balance fees. Both commercial banks and Egypt Post also offer prepaid cards as payment instruments.

The informal nature of the economy makes account ownership more difficult. Only 29 percent of Global Findex respondents reported receiving employment wages and a large proportion of these likely originate from the informal sector. This means that both employers and employees may be wary of engaging with the regulated financial sector. They could be concerned that making their transaction potentially visible to the authorities will result in imposition of additional taxes or licensing fees. Until recently there were no regulatory upper limits for cash payments, and as such, even large-size firms at times settled substantial obligations, such as loan repayments or payment for property purchases, in cash.⁸⁵

Egypt has a very low penetration of financial sector access points. In 2018, there were only five commercial bank branches per 100,000 adults in Egypt. For every 100,000 adults, there are only 18.72 ATMs in Egypt, compared to 39.47 in Lebanon, 30.72 in Tunisia, 29.44 in Jordan, and 34.64 in West Bank and Gaza. There were 97 POS terminals per 100,000 adults in Egypt in 2015 compared to 465 in Jordan, 610 in Lebanon, 1,000 in Saudi Arabia, 152 in Tunisia, and 1,796 in the United Arab Emirates. There were 20,600 banking agents in Egypt and 22,247 mobile money agent outlets in 2018.⁸⁶ There were also over 140,000 locations of Fawry and Masary. Egypt Post has an extensive branch network: there were almost 4,000 post

⁸⁴ MFIs act as agents for commercial banks in mobile payments services only to serve their customers in loan disbursement and collection.

⁸⁵ Law no. 18 of 2019 was approved, regulating the use of noncash payment methods. Within six months of approval, executive regulations for this law will come into effect, which will specify the upper limits for cash payments.

⁸⁶ See International Monetary Fund's Financial Access Survey (FAS), <https://data.imf.org/?sk=E5DCAB7E-A5CA-4892-A6EA-598B5463A34C>, and World Bank GPSS, <https://www.worldbank.org/en/topic/financialinclusion/brief/gpss>.

offices in the country by the end of 2017. The post offices also have an extensive geographical coverage, which makes them particularly suitable for reaching low-income and remote populations.

Current requirements on merchant onboarding and acquisition, as well as the existing payment infrastructure, make it very costly for merchants to accept electronic payments. There is room for several regulatory and infrastructure improvements as well as innovative product designs, incentives, and value-added services that could make it more attractive for small retailers to accept electronic payments.

Access to Saving and Borrowing

Some 31 percent of Egyptians reported having saved or set aside money in the past year but only 5 percent of Egyptian adults did so through regulated financial institutions. This is significantly lower than most peer economies. Only 16 percent of adults reported using a savings club or a person outside the family to save (World Bank 2017a).

About half the Egyptian adults reported having borrowed money in the past year, the vast majority of which was done outside the regulated financial sector. Just 9 percent of adults reported having borrowed from a regulated financial institution. The main source of borrowing is family and friends, reported by 38 percent of Egyptians. The most commonly reported reason for borrowing was medical purposes, reported by 13 percent of Egyptians (World Bank 2017a).

Microfinance institutions (MFIs) cannot issue payment instruments, nor can they collect deposits or issue loans for purposes other than economic reasons (production, services, commercial). In general, regulations limit the role of MFIs in providing a wide range of responsible financial services to the unbanked and underbanked and in the provision of DFS going forward, despite recent changes, pilot programs, and reforms.⁸⁷ Changes in the regulations in 2019 allowed MFIs to act as agents of banks to support their own borrowers via mobile payment services and prepaid cards.⁸⁸ Other recent regulatory changes allowed MFIs to deliver microcredit and microleasing and to act as microinsurance agents via electronic channels. Since these regulatory reforms came into effect, the FRA has worked with the industry to encourage the development of a variety of DFS products for MFIs, including digital disbursements and e-collection via mobile wallets using the SMART Wallet App (for Android) and messaging (SMS).

Product offerings are not yet sufficiently developed to boost DFS uptake and usage. Financial services other than payments are not currently allowed on mobile platforms. Even with payments, specific products are not designed for different use cases, such as domestic and international remittances. Furthermore, the existing access networks of Egypt Post and Agricultural Bank are underutilized.

⁸⁷ Microfinance Law (Law 141/2014): Companies supervised by the Financial Regulatory Authority can only offer microloans for economic purposes (production, services, commercial) and are subject to a maximum loan amount that cannot exceed EGP 100,000.

⁸⁸ Preliminary results reported by FRA indicate that the largest 20 MFIs initiated digital payment flows amounting to EGP 46 million by 24,048 users on the collection side and EGP 150 million to 7,954 users on the disbursement side.

Access to Financial Services for Firms

Access to finance is the second-most-cited investment climate constraint in Egypt.⁸⁹ Only 7 percent of firms have a bank loan or line of credit in Egypt, compared with an average of 28 percent in the MENA. Account ownership as well as using a loan or line of credit is biased toward formal and large firms at the expense of small and medium enterprises (SMEs) and in favor of metropolitan areas at the expense of lagging regions.

Moreover, other channels of financing—such as capital markets, venture capital, private equity, and leasing—remain shallow. Despite being the largest consumer market in the Middle East and North Africa region, Egypt has very few venture capital or private equity firms and lacks funding for ventures, particularly in the early start-up stages. Egypt's equity capital amounts to a relatively small portion of GDP compared with other countries in the region, and institutional investors (asset managers, insurance companies, and pension funds) account for only 35 percent of trading activities; the rest of the trading is done directly by individuals.

About a quarter of firms in Egypt have declared the need for additional financial products. While loans and lines of credit are the most needed financial products, over 20 percent of small and 12 percent of medium firms declare needing checking and savings accounts. Most Egyptian firms (81 percent) deal with multiple suppliers, and there is therefore potential to make digitization of supplier payments an attractive product.

Government Disbursements and Collections

Major G2P payment initiatives in Egypt include salaries and pensions of civil servants, as well as different social safety net (SSN) payments. As of 2016, over 2.5 million active civil servants were paid their salaries into bank accounts held with six commercial banks. Each of these banks issued 123 network debit cards cobranded with Visa or MasterCard. E-Finance, a government subsidiary, manages the implementation of the payroll system. The Ministry of Social Solidarity (MoSS), through the Nasser Social Banks, has also issued over 6 million debit cards operated on the 123 networks to government pension recipients, which they can use to withdraw funds from Egypt Post branches or ATMs. However, these cards cannot be used for cashless transactions, and this is an important missed opportunity for DFS in Egypt.

The Takaful and Karama Program, MoSS's flagship cash transfer program, disburses small amounts of monthly cash to about 2.5 million households (around 9 million indirect beneficiaries) through a closed-loop debit card issued by E-Finance. This card enables beneficiaries (who mostly live in rural areas) to withdraw small monthly cash amounts from Egypt Post branches and ATMs (123 networks). After the launch of the Meeza card, MoSS has been in the process of replacing all SSN payment instruments with Meeza cards.

Food and fuel subsidy programs, managed by the Ministry of Supply and Internal Trade, are partially digitized. Accounting, clearing, and reconciliation processes remain largely manual. For example, the Baladi bread subsidy program, which allows lower-income Egyptians to purchase five subsidized loaves of bread per person per day, is disbursed through a smart-card voucher system to determine program eligibility and reduce leakages. However, the cards are not interoperable with other systems and the personal identification number (PIN) authorization is merely used to determine eligibility for the subsidy. This is also a missed opportunity for DFS in the country.

⁸⁹ World Bank Enterprise Survey data 2019

At present, tax payments cannot be completed remotely through card payments or transfers. A visit to a bank branch or government office is necessary.⁹⁰

Financial Technology

A number of fintech companies have been emerging in Egypt that have the potential to reach the unbanked, underbanked, and entrepreneurs, in addition to supporting financial institutions in providing DFS. It is estimated that each Egyptian pound invested, fintech contributes EGP 1.6 to the GDP and each job created in fintech supports 5.6 other jobs (CBE 2019). There are three fintech-focused accelerators: AUC Venture Lab, Startupbootcamp, and Falak (government-led). A recent market assessment by IFC found that while fintech is growing in Egypt, a large proportion of start-ups exit the market at an early stage (Gueguen 2018). Most start-ups are confined to the payments space, with limited innovations in other areas such as insurance or credit. Further, while fintech accelerators have been successful, more needs to be done in linking to larger corporations, regulators, and international hubs. Regulations and market access seem to be the major constraints, followed by a lack of mentoring support and experienced talent pools. Lastly, the IFC assessment found other key constraints include a risk-averse culture, low financial literacy, lack of trust in financial services, limited payment and internet infrastructure, and limited media coverage.

In 2019, the CBE launched its fintech and innovation integrated strategy to promote Egypt's ecosystem and position the country as a regionally recognized fintech hub. The FinTech Vision and Strategy was endorsed by the relevant authorities in Egypt. Implementation of the strategy started in the second half of 2019 with critical initiatives targeted for completion by the first half of 2021. Furthermore, the CBE launched a Regulatory Sandbox in June 2019 to keep pace with the developments in the market, to provide a conducive environment to promote innovation and financial inclusion, and to encourage the adoption of innovative products and services in the Egyptian financial sector.⁹¹ The Sandbox is cohort based, and the first application window opened in 2019 with a focus on e-KYC, following the launch of the operating guidelines.

There is very little clarity on the roles and responsibilities of the different financial sector regulators in regulating and supervising fintech. With the approval of the new Banking Law in September 2020, the CBE was granted regulatory powers over certain aspects of the fintech ecosystem. At the same time, the FRA board approved the text for a Fintech Law that would grant FRA regulatory powers over some other aspects. As such, fintech solutions are subject to one or more of the following regulators: the CBE, FRA, NTRA, and Egyptian Money Laundering Combating Unit (EMLCU). This creates confusion and uncertainty on the part of the market, as set out in section 2: "Legal, Regulatory, and Institutional Framework." CBE and FRA will still need to work on the relevant secondary regulations.

Stakeholder Commitment and Coordination for Digital Financial Inclusion

Egyptian authorities consider financial inclusion a priority for financial sector development and have taken several measures to support it. Egypt's financial sector is regulated by two authorities: the CBE supervises and regulates the banking sector, and the FRA supervises and regulates the nonbanking financial sector, which includes microfinance institutions, leasing and factoring companies, mortgage companies, stockbrokers, insurance companies and pension firms. The NTRA regulates the telecommunications sector. The ministries that work on financial inclusion and digital economy related topics include the MCIT, MOF,

⁹⁰ Law No. 18 of 2019, regulating the use of noncash payment methods, mandates the use of noncash payment methods for government disbursements and collections. Executive Regulations of this law went into effect in September 2020.

⁹¹ See Central Bank of Egypt website, in Arabic, Cbe.org.eg.

MoSS, and the Ministry of Supply and Trade. Other relevant public sector entities include Egypt Post, ITIDA, and E-Finance.

There have been several recent achievements in Egypt on financial inclusion via digital channels. In 2017, for instance, the president issued a decree (No. 89) to form the National Payments Council, which is mandated to stimulate a cashless society, encourage the use of electronic payments, and formalize the informal sector. CBE has been working on a number of reforms, including a National Payments System Strategy, an Oversight Policy Framework, and secondary regulations for the new banking law, to strengthen the enabling environment to support a healthy DFS landscape. The most recent completed reforms include finalizing a CBE Fintech Strategy and launching the regulatory sandbox, establishing a centralized financial inclusion data-hub for supply-side data based on unique national IDs, stimulating DFS through issuing simplified KYC requirements for mobile money users, implementing interoperability among mobile money providers, and enforcing electronic payments for suppliers from government entities that exceed a certain threshold. The CBE has also been working on a National Financial Inclusion Strategy.

Governmental authorities have taken several measures to develop the microfinance sector by establishing an enabling regulatory framework through the 2014 Microfinance Law. FRA introduced new products in the microfinancing sector including microinsurance and nano finance.⁹² It also granted licenses to nongovernmental organizations (NGOs) using electronic payment systems upon providing financing and collection activities through payment service providers (PSPs), as well as benefiting from mobile payment systems in financing and collection activities. The authorities further developed financial infrastructure by enabling a credit bureau and a registry for moveable assets.

The Egyptian authorities have also actively participated in financial inclusion international forums. CBE joined the Alliance for Financial Inclusion (AFI) in 2013 and made commitments to improve financial inclusion as part of the Maya Declaration in 2016.

Financial Capability, Financial Education, and the National Financial Education Strategy

According to Standard & Poor's Global Financial Literacy Survey 2014, only 27 percent of Egyptian adults were considered financially literate. According to the survey, the percentage of men that are considered financially literate (30 percent) is higher than that of women (25 percent). More young people between 15 and 34 years old are considered financially literate (31 percent) than their older counterparts (23 percent). Nonetheless, the digital economy and DFS requires not only financial capability, but digital financial literacy as well.

The Egyptian Banking Institute (EBI) spearheads financial education efforts in Egypt. The EBI was established in 1991 by the CBE to act as its official training arm and to apply international best practices in developing the technical and managerial skills of financial sector professionals.

⁹² Nano finance product offered to individuals at no more than EGP 3,000 per person, to be repaid within 90 days. Its due payments may not be carried forward and it is not to take the form of collective borrowing. The Decision No. 142 of 2019 issued by FRA also adds that during the validity period of the nano finance product, nano financing clients must not borrow more than one loan (per client) from any source (including any microfinance institution) for the purpose of financing an economic activity. The new product aims to provide working capital needs and requirements to small farmers, self-employed persons, home-based businesses, day-to-day vendors, and street vendors. Microfinance companies shall update the data and information of their clients and their credit status continuously at the Egyptian Credit Bureau "I-Score" at periodic intervals (every two weeks maximum).

In 2012, EBI designed the Shaping the Future initiative dedicated to the implementation and enhancement of financial literacy in Egypt, in addition to the development of friendly financial products for children and youth. Both the public and private sectors participate actively in the initiative, which has five core pillars: (a) national reform; (b) advocacy; (c) outreach; (d) regional liaison-ship; and, (e) capacity building. In 2013, as part of Shaping the Future, the Egypt National Committee for Drafting a Financial Literacy Strategy was established, composed of diverse stakeholders including financial regulators, ministries, financial institutions, academic institutions and international organizations. More recently, the EBI finalized the draft National Strategy for Financial Education in collaboration with the Ministry of Education and Ministry of Higher Education and Universities.

Enabling Environment: Legal and Regulatory Frameworks

The main piece of legislation regulating payments in Egypt is Law No. 194 of 2020 promulgating the Central Bank and Banking System Law. The new law provides explicit powers to CBE to regulate and supervise banks and regulate and oversee PSPs and payment service operators. It also includes a section on fintech. CBE has thus far adopted a bank-led model for mobile money and introduced regulations in 2012 and 2016 to enable the development of mobile wallets and mobile payment services in Egypt. Fourteen banks offer bank-branded mobile wallets, while three MNOs offer mobile wallets in partnerships with banks. Fawry offers a technology solution for a mobile wallet, partnering with several banks. CBE will need to issue secondary regulations to further provide guidance to the sector.

E-money transactions and customers' funds are only protected under the CBE Regulatory Rules for Mobile Phone Payment Services of November 2016. Consequently, they only apply to mobile payments, and the rules clearly state that only banks are permitted to provide e-money instruments.

The Egyptian financial consumer protection (FCP) system has been fragmented until recently, being based on numerous laws and regulations. There are two different regulatory bodies entrusted with implementation and supervision. The CBE has the jurisdiction over banking institutions and the FRA has the jurisdiction over nonbank financial institutions. Various regulations and guidelines issued by the CBE and the FRA, as well as sectoral regulations, include specific references to FCP procedures—procedures that are not product or provider specific, do not span the entire financial sector, and do not necessarily prescribe the same procedures. The CBE has recently adopted the Regulation on Financial Consumer Protection, applicable to banking services in February 2019, which came into effect in September 2020. The document is highly relevant for the creation of a functional consumer protection framework in Egypt, considering the role of banks in the Egyptian financial sector. FRA has been revising its organization structure as well as establishing legal and regulatory framework on FCP. The World Bank team provided technical assistance to both the CBE and FRA teams on their respective FCP frameworks to build a harmonized FCP framework for banks and nonbank financial institutions in line with the *Good Practices of Financial Consumer Protection* (World Bank 2017c).

Despite the lack of consistent legal requirements, providers may have some types of redress mechanisms in place, but of varying quality. In general, providers claim that they have sufficient mechanisms in place for redress. However, due to the lack of any legal and regulatory standard the degree of formality varies substantially. Both the CBE and FRA handle consumer complaints to inform supervision but do not act as alternative dispute resolution entities. There is no out-of-court dispute resolution mechanism.

The current legal framework governing international remittance services appears to be impeding competition and contestability in the Egyptian market for international remittances. As Egypt is one of the top remittance-receiving developing countries, the digitalization of remittances is an important first step in enabling unbanked remittance receivers in Egypt to access the regulated financial sector and to start using digital payments. This could be an important stepping-stone for further usage of DFS. Commercial

banks in Egypt offer low-cost cash-based international remittance services. Their dominance in the market appears to be impeding the entry of new, digital remittance services, particularly in GCC corridors. This is in part due to the legal and regulatory framework, which fails to create a level playing field between bank and nonbank remittance service providers. Currently, only commercial banks are permitted to pay out international remittances in Egyptian pounds, while nonbank money transfer operators (MTOs) are only permitted to pay out remittances in foreign currencies. MNOs may offer international remittance services (and other payment services) only in partnership with banks. Furthermore, while banks can establish subagents to payout international remittances, nonbank MTOs are not currently allowed to establish subagents. For this reason, most international MTOs have opted not to be licensed in Egypt and instead collaborate with commercial banks to offer their money transfer services through the bank branch network. Moreover, the presence of regional mobile money networks and remittance aggregators in the remittances value chain to Egypt appears to be minimal compared to the rest of the African region.⁹³

Egypt's anti-money laundering (AML)/combating the financing of terrorism (CFT) regime reflects many of the Financial Action Task Force's baseline recommendations, but the application of a risk-based approach is uneven across financial products and services. A risk-based approach to the customer due diligence (CDD) aspects of AML and CFT compliance is largely absent from traditional banking services. Before opening an account with a natural person, banks need to obtain an official identification, proof of address, and proof of employment and ascertain a customer's nationality and the purpose of the account, among other requirements. Identity verification must occur prior to the commencement of a business relationship. The rules further acknowledge that CDD activity should correspond with a customer's risk profile.⁹⁴ A comprehensive CDD framework for bank-led mobile payment services has been established. Like the CDD rules for banks, the CDD procedures for mobile payments require banks to obtain national ID and information related to employment, nationality, and permanent residence, among others. Identification and verification must use original, reliable documents. However, the CDD framework for mobile payments incorporates elements of a proportional, risk-based approach. The regulatory rules for mobile payments set account limits that serve as the basis for simplified due-diligence measures contained in the CDD procedures for mobile payments.

Although the coverage of the National ID (NID) is nearly universal, onerous KYC procedures prevent Egypt from leveraging it for greater financial access. National IDs must be physically verified at bank branches or MNO retail locations; electronic KYC checks are not available, while institutions other than MNOs, MFIs, and the Post Office are not eligible to act as agents of banks for the CDD process. As a result, the number of locations where accounts can be opened is limited, especially in more remote areas. Not only does this impose additional costs and barriers that may prevent Egyptians from accessing the regulated financial system, but this also limits the effectiveness of marketing and outreach efforts. Even filing a formal complaint regarding a financial product or service needs to be done in-person at the branch of the financial service provider or the regulator, or the credit bureau, with the verification of NIDs. Existing customers of financial service providers need to undergo a full KYC process for adding new products. This acts as a barrier to financial inclusion and expansion of DFS.

E-signatures have been recognized in Egypt since 2004 with the passage of the e-signature law. In practice, the implementation of e-signature requires a qualified secure signature creation device. Obtaining

⁹³ In other markets in Africa, alternatives to SWIFT and international MTO systems for money transfers include international card networks (Visa/Mastercard), mobile money operator networks (for example, for cross-border mobile money transfers), and remittance aggregators that integrate multiple cash-based and digital remittance services across multiple corridors (reducing the need for MTOs and remittance service providers to develop multiple bilateral partnerships). Examples of remittance aggregators include MFS Africa, HomeSend, and Thunes. In Egypt, such systems do not appear to be widely used for international remittance services. Visa and Mastercard have recently introduced their VisaDirect and MoneySend (respectively) services in Egypt.

⁹⁴ EMLCU, 2011 Rules for Customer Identification in Banks.

this device is not entirely straightforward and may require several documentations and a couple of in-person visits. The complicated application of e-signature in practice may hamper the widespread use and uptake of DFS in Egypt.

The Egyptian legislation does not have a definition of e-contracts; however, the Civil Code includes all contracts, and the existence of the e-signature law may validate e-contracts, which are similar in nature, except that they do not have a physical existence. However, the issue seems to be that the e-signature law requires the contracts under question to be electronically concluded. In many instances, including some DFS contracts, underlying contracts cannot be electronically concluded, and hence, the absence of e-contracts in the legislation may hamper widespread use and uptake of DFS.

The Data Protection (DP) Law No. 151 of 2020 was recently issued but lacks provisions on data portability and does not apply to the banking sector. The law has a clause that notes the CBE and institutions that fall within the scope of the CBE's supervision and control (with the exception of MTOs and exchange companies) are exempt from the provisions in the law. For these institutions, the CBE is designated as the institution to set the rules for protecting personal data. This, however, creates a nonlevel playing field, because nonbank financial institutions that are under the supervision and control of FRA will need to abide by the DP Law No. 151 of 2020. At the same time, other institutions that are not necessarily financial institutions (for example, Big Tech companies, e-commerce platforms, MNOs, utility companies) have access to personal data which could, when properly regulated, be used to improve the penetration and usage of DFS. Instead of this particular clause, the law could have incorporated appropriate provisions on data portability to enable open banking and competition in DFS in a proper way.

Enabling Environment: The Financial Infrastructure and National ID System

National Payment System

The main elements of a payment system include a real-time gross settlement system (RTGS) system for large-value payments, a national switch for ATM/POS, an automated clearinghouse for direct debit and credit transactions, a check clearinghouse, and a mobile payment switch. CBE has owned and operated an RTGS since 2009, processing over 1 million transactions per year. The RTGS is only used for large value direct credit transactions. Only commercial banks that maintain an account with CBE can access the RTGS. CBE also owns and operates the check clearing house in Egypt.

The EBC is a consortium established in 1995, composed of the central bank, state-owned banks, and commercial banks, and is responsible for operating payment switches. The automated clearinghouse is operated by the EBC and processes credit transfers and direct debits. The EBC also operates the 123 domestic debit, prepaid card, and shared cash networks. The EBC also manages the interbank mobile payment switch. In 2013, EBC, in partnership with MasterCard, launched an interoperable mobile money payment switch. The switch allows all banks and MNOs to interact on the platform over which mobile payment transactions are processed and cleared. MNOs and bill payment aggregators can offer mobile payment services in partnership with banks.

The Arab African International Bank and the National Bank of Egypt are considered to be the largest acquirer banks, and they also provide the most popular gateways for internet card payments. Fawry and Masary are the two largest bill payment nonbank service providers and allow their clients to use cash to pay bills, top up, donate to charities, pay school tuition, and settle bills for their e-commerce orders.

USSD banking is unavailable for mobile wallets provided by banks. USSD enables the use of feature phones to deliver financial services to users and can therefore reach the poorer segments of the population. Mobile wallets offered by MNOs in partnership with banks (for example, Vodafone Cash, Orange Money,

Etisalat Flous) offer wallet owners the opportunity to use ATMs and POS terminals to access their accounts and cash out. These wallets also operate on USSD with a feature phone as well as provide the owner the option of using apps on smartphones. Mobile wallets provided by banks, on the other hand, cannot provide their owners the option of using a feature phone or a smartphone—they can only offer mobile banking on smartphones, given that banks can only access internet over mobile broadband. Therefore, there is a need to level the playing field for mobile wallets offered by MNOs in partnership with banks and those offered by banks to encourage competition and product innovation.

ID System

The national identification registry is fully owned and controlled by the Ministry of Interior. The registry is updated with birth and death records from the Ministry of Health. Access to the registry is limited to the creation of election records and the confirmation of mobile number (SIM) owners. Egypt has a trusted national ID card system that covers almost the entire population. All newborns are assigned an NID number and NID cards are mandatorily issued at age 16. ID cards do not have biometric information and expire every 7 years. Anecdotal evidence suggests that some citizens may not have renewed their ID cards after expiration.

I-Score, the credit bureau, currently offers the service of NID verification to banks. The service allows banks to validate a customer's ID before executing any sensitive transaction by validating with the system using the NID number and comparing the retrieved results with the information on the ID provided by the customer. All inquiries are processed by the NID authority through I-Score's network.

Credit Reporting

The only Egyptian private credit bureau, I-Score, was established in 2005 and became operational in 2008. The bureau's operations are regulated and supervised by the CBE. It is privately owned, by the large Egyptian banks, 25 commercial banks and the Micro, Small and Medium Development Agency.

I-Score maintains a database of credit information for SMEs and individual consumers. I-Score credit reports are open to its members and all data subjects have access to their information through bank branches and bank Web portals, ATMs, and post offices across the country. Data subjects can file a complaint at bank branches, which are channeled to I-Score for processing. The bureau currently collects credit data mostly from banks and microfinance companies, some larger NGO MFIs, and NGOs categories A and B (smaller NGOs lack the management information system capacity to electronically process and report credit info). The I-Score database currently holds almost all of the credit data of individuals and SMEs from commercial banks in Egypt. However, data on the underserved and unserved remains limited.

Since its establishment, I-Score has been expanding its range of services. I-Score has been planning to expand products and services based on harnessing additional (alternative) data and further digitization. The bureau had plans to start collecting data from the national gas supply company in 2018, to add to their credit database information on MNO pre-, and post-payment data as well as data from other utilities. However, the lack of data portability clauses in the new Data Protection Law No. 151 of 2020 creates uncertainties about this. In addition, some utility providers may not be able to offer this data electronically.

Middle East and North Africa Regional Benchmark for Digital Financial Services

When benchmarked against other members of the MENA region, Egypt qualifies as “emerging” in digital financial services (figure 32). This finding is based on The World Bank's MNA Tech analysis of 11 indicators across topics such as payments and legal frameworks (figure 33).

Figure 32. Arab Republic of Egypt’s Digital Financial Services Compared with Other Areas of the Middle East and North Africa



Source: World Bank’s MNA Tech analysis.

Figure 33. Arab Republic of Egypt’s Digital Financial Services Compared to the Middle East and North Africa Average

Component	Indicator	Egypt	MENA Average	MENA Average - GCC
Pillar 3: Digital Financial Service		4.56	5.34	4.39
Payments	Debit card (% age 15+)	10%	34%	19%
	Debit card used in the past year (% age 15+)	4%	24%	12%
	Credit card (% age 15+)	2%	12%	4%
	Credit card used in the past year (% age 15+)	1%	9%	4%
	Cashless retail transactions per capita	3.49	17.3	4.6
	Percentage of adults with an account at a financial institution (% age 15+)	32%	49%	36%
	Mobile money account (% age 15+)	2%	8%	6%
	Made digital payments in the past year (% age 15+)	23%	34%	27%
	Paid utility bills: using an account (% age 15+)	1%	10%	7%
Legal frameworks	Does the country have a legal framework for electronic transactions/e-signature?	Yes	Yes	Yes
	Does the country have a legal framework for consumer protection when purchasing online?	Yes	Draft	Draft

Note: GCC = Gulf Cooperation Council; MENA = Middle East and North Africa.

7.3. Recommendations and Next Steps

Table 9 analyses Egypt’s digital financial services in terms of strengths, weaknesses, opportunities, and threats.

Table 9. Strengths, Weaknesses, Opportunities, and Threats Analysis of Digital Financial Services

Strengths	Weaknesses
<ul style="list-style-type: none"> The government has a vision to become a recognized fintech hub. The existence of mobile money, large bill payment aggregators, and a national prepaid card (Meeza) is a plus. There are a number of experienced international mobile network operators. Egypt Post, with its large network of post offices and its existing customer base, can be instrumental in expanding the penetration of digital financial services in Egypt if significant reforms are applied. 	<ul style="list-style-type: none"> The data protection regime, particularly regarding data portability, and creating a level playing field is incomplete. Multisector coordination is lacking. Enabling legal and regulatory frameworks are needed.
Opportunities	Threats
<ul style="list-style-type: none"> Digital financial services are a vector for financial inclusion. Disclosure, transparency, efficiency, and support-costs reduction compared to cash payments need improvement. International remittances could be digitalized. 	<ul style="list-style-type: none"> Access to finance is the second-most-cited investment climate constraint in Egypt. Critical building blocks, including framework and infrastructure, have gaps. Almost 70 percent of adults are excluded from the regular financing system.

The following recommendations could support the further development of DFS in Egypt:

Objective 1: Establish the required infrastructure for digital financial services.

Strengthen coordination among DFS actors. Coordination and dialogue among public and private sectors within and beyond the financial sector could be encouraged and optimized. DFS is a multisectoral issue that involves concerted efforts by different actors from different sectors including the financial sector and ICT.

Support the expansion of access points, as well as the range of services offered through the access network. Egypt Post and the Agriculture Bank can be better leveraged to extend outreach and for uninterrupted bill payment services and DFS offerings.

Introduce fast payments. A fast payment system could deepen the penetration of digital payments in Egypt and strengthen the foundations of the digital economy.

Objective 2: Improve the legal, policy, and regulatory environment.

Issue the relevant secondary regulations for payment systems and services in a timely manner. It is recommended that the relevant secondary regulations be issued as soon as possible on both payment systems and services, as well as fintech to ensure further clarity and establish standard definitions. The CBE is urged to take the lead in regulating fintech in collaboration with FRA and other relevant authorities.

Ensure much-needed regulatory coordination between the CBE and the FRA, especially in terms of fintech. Both institutions have issued, or are in the process of issuing, their own fintech laws that need to be followed by secondary regulations on fintech, and this needs to be coordinated carefully. Fintech business models generally do not lend themselves to institutional separation, for example, banks versus nonbank financial institutions.

Modernize regulatory frameworks and infrastructure to include e-signatures, e-contracts, open banking, e-KYC and KYC registries, and USSD banking to enable effective penetration of DFS. A revision of the e-signature legislation is recommended to make e-signatures more practical. Legislation on e-contracts is also needed. Supporting infrastructure such as KYC registries could be developed to facilitate the availability and take-up of DFS.

Include provisions on DFS agents in the enabling legislation. No provisions relating to DFS agents currently exist. Their inclusion would go a long way in improving efficiency, flexibility, competition, and non-exclusivity in the DFS market. The ability to engage agents by nonbank e-money issuers could be encouraged in case such providers were to be regulated and licensed in the future. Provisions could be drafted allowing PSPs to use the business model they wish to organize agent networks (for example, multitier agents such as super agents managing a network of subagents or a framework where different categories would be allowed to provide different kinds of services). The market could be left free to choose how to structure the network without leading to higher risk.

Ensure that customers' e-money funds are duly protected. For e-money issuers that are banks, providing deposit insurance or some other similar measure for customer funds is recommended. In the case of nonbank e-money issuers, if these were to be considered in the future, protection mechanisms could be established in the form of a trust or escrow account. This would allow bankruptcy remoteness of the trust or escrow account from the bankruptcy of the e-money issuer (nonbank PSP) and the bank holding such trust or escrow account. Funds protection could also be extended to bill payment aggregators. Customer fund-protection mechanisms should protect customer liability if the issuer declares bankruptcy. For instance, a clear separation must be made between the issuer's customer funds and their operating expense accounts.

Adopt specific regulations to regulate e-money instruments irrespective of the technology used to execute transfers.

Objective 3: Clarify and simplify requirements for digital payments.

Grant access for nonbank PSPs to the clearing and settlement infrastructure on a transparent and equitable basis, once they have met preestablished, risk-based requirements. Access to the automated clearinghouse is restricted to commercial banks and Egypt Post, and access to RTGS to commercial banks. Nonbank PSPs have the potential to cater to the specific needs of disadvantaged population segments and at the same time exert competitive pressures on traditional players for the latter to improve their service offerings.

Adopt a strategic approach to plan for developments in the national payment system. While there have been some recent developments in a number of areas, more attention is needed to enhance the safety and efficiency of the system and to promote financial inclusion.

Issue harmonized and more comprehensive measures on disclosure and transparency through the CBE and FRA. These new measures could replace any existing, limited ones, to allow for easier comparability of fees and charges and transactional products. Disclosure should be done in a standardized easy-to-understand format, cover key issues, and have minimum language requirements.

Introduce a general requirement for all financial service providers to have internal redress mechanisms. There are currently no requirements for redress, and neither the CBE nor FRA can provide out-of-court redress mechanisms. Some forms of redress mechanisms do exist within providers, but in varying degrees. In the immediate term, it is recommended that a general requirement for all providers to have an internal redress mechanism be introduced. Gradually, more specific minimum standards should be included, based on consideration of proportionality issues.

Through the country's financial regulators, conduct a national risk assessment that includes a financial inclusion risk assessment component. This would help regulators more effectively calibrate Egypt's AML/CFT compliance regime. The completion of this assessment would facilitate the risk assessment of financial inclusion products and application of a risk-based approach in developing simplified due diligence procedures. The risk-based approach to simplified due diligence could be expanded beyond mobile payments. A more widespread risk-based approach to simplified due diligence would unlock additional financial inclusion potential in Egypt.

Streamline and simplify KYC measures and make them tiered and risk based. This could apply to all licensed entities regulated by both the CBE and the FRA. It is also important that measures enabling e-KYC are put in place. E-KYC need not require building a digital ID system and could be established based on current national ID credentials. A more comprehensive e-KYC environment can facilitate CDD and uptake of DFS.

Enable and encourage the acceptance of electronic payments by merchants. Wide acceptance of electronic payments by merchants is a precondition for uptake and effective usage of transaction accounts. Generating value for merchants in the form of fiscal incentives, lower merchant discount rates, and asset-light infrastructures such as QR codes are crucial, in addition to encouraging small merchants to make supplier purchases electronically from large suppliers, potentially using supply chain finance as an incentive. In addition, introduction of a fast payment system could deepen the penetration of digital payments.

Ensure that all cards used to disburse social transfers are interoperable and can be used for transactions. This will increase card payments, which in turn will spur the growth of access infrastructure at the merchant level.

Digitalize international remittances and encourage remittance receipts into transaction accounts. Remittances received into transaction accounts can then be used for payments at point-of-sale or online, without the need to cash out.

Mainstream the role of DFS so it can be used if social distancing rules are in effect. Digital payments can enable citizens to adhere to social distancing norms that have been in place for COVID-19. Digital payments can allow G2P payments to be made with ease, without the need of the beneficiaries to cash out.

Leverage DFS and e-KYC to build a sustainable, efficient, and safe digital payments ecosystem that can be made to support the needs of citizens during times of crisis. A remote KYC scheme that enables remote account opening for mobile wallets, which was temporarily facilitated by a CBE circular during the COVID-19 pandemic can be redesigned to be permanent.

Roll out a comprehensive DFS strategy with actionable timelines that involves financial inclusion, payments, and financial education. The DFS strategy could also consider and build upon inputs from the CBE's fintech strategy (CBE 2019). The World Bank has assisted the CBE in drawing up the National Payments System Strategy (in progress) and is also working with CBE on improving the draft National Financial Inclusion Strategy toward mobilizing efforts in national financial education and literacy strategy. Relevant elements from all of these could be merged in an actionable roadmap to form part of a more comprehensive and concerted strategy to facilitate DFS improvement efforts.

Table 10 summarizes the key recommendations and suggested activities for digital financial services in Egypt. A time span is proposed for each activity including short-term (3–12 months), medium-term (12–24 months), and long-term (24–36 months).

Table 10. Key Recommendations and Suggested Activities for Digital Financial Services in the Arab Republic of Egypt

Recommended Actions	Time Frame	Priority
Objective 1: Establish the required infrastructure for digital financial services.		
Strengthen the coordination and dialogue for DFS and financial inclusion among the public and private sectors.	Short term	High
Enable and encourage acceptance of electronic payments by merchants.	Medium term	High
Expand the number of services and access points, leverage the points of presence of existing institutions, and better address the needs of the unserved and underserved.	Long term	Intermediate
Objective 2: Improve the legal, policy, and regulatory environment.		
Issue the relevant secondary regulations for payment systems and services under the new banking law and enable the CBE to take the lead in regulating fintech in coordination with the FRA and other relevant stakeholders.	Short term	High
Facilitate and legislate the use of DFS agents, and further develop specific e-money regulations.	Short term	Intermediate
Facilitate the availability and take-up of DFS by undertaking several actions including legislating for e-contracts, revising the existing e-signature legislation, and developing supporting infrastructure such as KYC registries.	Long term	Intermediate
Objective 3: Clarify and simplify requirements for digital payments.		
Define the strategic plan for the development of a national payment system and consider developing a DFS strategy.	Short term	High
Digitalize international remittances and enable the use of open-loop payment instruments for the disbursement of social cash transfers.	Medium term	High
Improve financial consumer protection and address current gaps such as customer redress mechanisms.	Long term	Intermediate

Note: Short-term = 3–12 months, medium-term = 12–24 months, and long-term = 24–36 months. CBE = Central Bank of Egypt; DFS = digital financial services; fintech = financial technology; FRA = Financial Regulatory Authority; KYC = know-your-customer.

8. Digital Entrepreneurship

This section explores the national entrepreneurship ecosystem in Egypt and what can be done to better support firms and entrepreneurs in their use of new technologies and business models in the digital space.

Key Messages

- Egypt's dynamic entrepreneurship ecosystem holds great potential for becoming an entrepreneurship hub in Africa.
- Although it has had some initial success, the country is still missing several of the foundational attributes associated with more advanced entrepreneur ecosystems, including, among others, a regulatory framework that facilitates conducting business, fintech platforms, healthy early financing, experienced business angels, a skilled workforce, and a barrier-free ecosystem for women.
- In order to take full advantage of the digital economy and the power of digital entrepreneurship, the availability, speed, reliability, and coverage of Egypt's digital infrastructure needs to be improved.

8.1. The Importance of Digital Entrepreneurship

Low productivity across the private sector has contributed to the lack of overall job growth in Egypt. Net job growth in Egypt's formal private sector was only 0.1 percent between 2013 and 2016. International evidence suggests that in a competitive environment, firms are typically born small and grow large over their life cycles. This growth is a key source of productivity-enhancing jobs. By contrast, firms in Egypt hardly grow and barely increase their productivity over time (World Bank 2014).

Improvements in productivity are necessary to create more and better quality jobs and to sustain long-term growth. Total factor productivity in Egypt has declined since the 2000s at 2 percent per annum on average. Egypt must address the productivity challenge in the private sector so as to achieve its goals of creating 700,000 new jobs per year and to accelerate economic inclusion.

Digital technologies can play an important role in helping reduce transaction costs. They speed up information, communication, and idea exchange, improving efficiency and productivity and sparking innovation. The digital economy can provide Egypt's entrepreneurs with new economic opportunities but also seed the emergence of a new digitally enabled private sector that can deliver much-needed growth and jobs. The rate of innovation remains dismally low at 6 percent in 2016, substantially lagging behind the average rate of innovation in MENA, lower middle-income countries, and East Asian Pacific countries (World Bank 2016b).

Entrepreneurs have a key role to play in digitally enabling the private sector, as they are the agents who identify and take advantage of opportunities created by technological advancement in the economy. Entrepreneurial capability is key to a firm's success: the capability to realize opportunities determines firm performance and agility. Digital entrepreneurs can help foster innovation, create new markets by facilitating access to basic goods and services, and help spread the benefits of the digital economy to other sectors like financial services, energy, transport, education, health, manufacturing, and agriculture. For Egypt to capitalize on this changing context, policymakers, intermediaries, and the private sector should strive to nurture an ecosystem that helps unlock the potential of entrepreneurs, harness the potential of disruptive technologies, and transform the wide range of sectors into a full-fledged digital economy.

The COVID-19 pandemic has provided both opportunities and challenges for digital entrepreneurship, as seen in box 17.

Box 17

Impact of COVID-19 on Digital Entrepreneurship

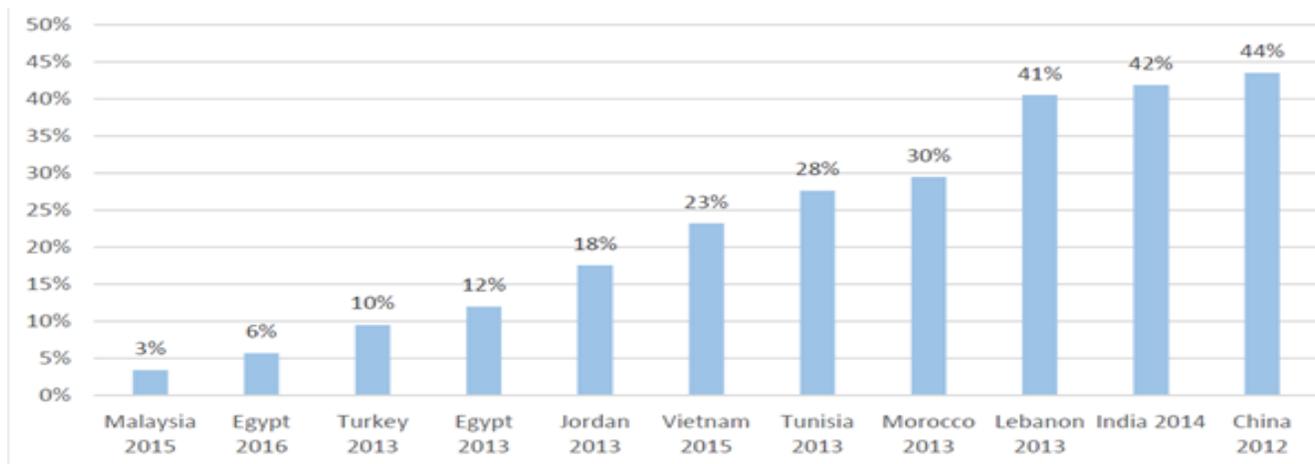
The impact of COVID-19 on digital entrepreneurship in the Arab Republic of Egypt has been mixed. On the one hand, it has given a boost to digital business-to-consumer business models. Egypt has witnessed a rapid increase in e-commerce activity with new consumers now shopping online for the first time, thereby contributing to the acceleration of the overall e-commerce market. COVID-19 has also put a favorable spotlight on the fintech sector, as Egypt is lagging behind the region in financial inclusion. There is increased interest in supporting and developing the fintech space both from the government side (Central Bank of Egypt) and the private sector, where new venture capital (VC) funds are focused on fintech start-ups. The fintech start-up Fawry is the first Egyptian unicorn (a start-up company with a value of over US\$1 billion) and has garnered the attention of investors and entrepreneurs to the vast opportunities in this sector. Similarly, there are indications that other new digital sectors such as education technology and health technology have also received a boost from the short-term demand for virtual consumer activity, which may contribute to accelerated growth in these sectors. On the other hand, COVID-19 has discouraged would-be entrepreneurs from starting new businesses due to the increased uncertainty in economic activity and the perceived assumption that access to funding would be limited. This has only exacerbated an existing trend in Egypt. In reality, access to finance for start-ups has remained the same or may even have increased, when comparing the number of deals in 2020 with previous years. There are currently a number of new VC and angel funds being established targeting Egyptian start-ups at the seed and early growth stage. While the short-term activities of these funds may have been affected, there are no indications that their overall investment plans have changed.

8.2. Diagnostic Findings: Current State of Digital Entrepreneurship

Egyptian industry lags behind in many dimensions of digital technological readiness given its low digital technology adoption rates. Only 5 percent of firms in Egypt are using technology licensed from foreign companies, compared to an average of 7 percent in the MENA region (World Bank 2016b). Egypt ranks 100 out of 140 countries in “ICT adoption,” 100 out of 137 countries in “firm level technology adoption,” and 91 out of 137 countries in “availability of latest technologies” (Schwab 2018).

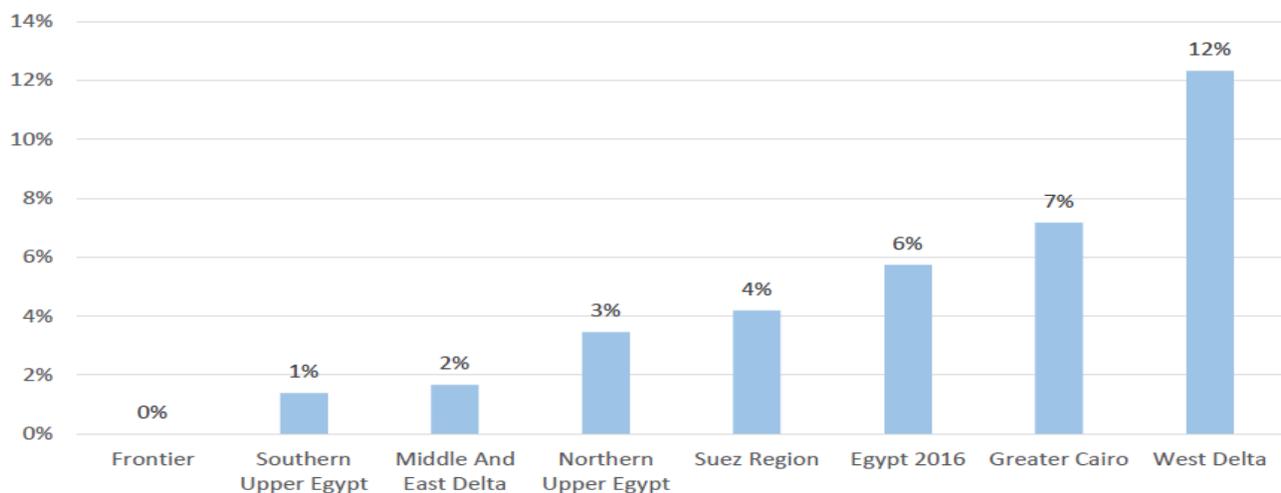
Firm innovation, a key driver of labor and total factor productivity, has been relatively low in the past and experienced a further decline between 2013 and 2016. As such, the country lags significantly behind the average rate of innovation in the MENA region, lower middle-income countries, and East Asian and Pacific countries (World Bank 2016b; figure 34).

Figure 34. Percentage of Firms That Introduced a New Product or Service, by Country



Source: World Bank 2016b.

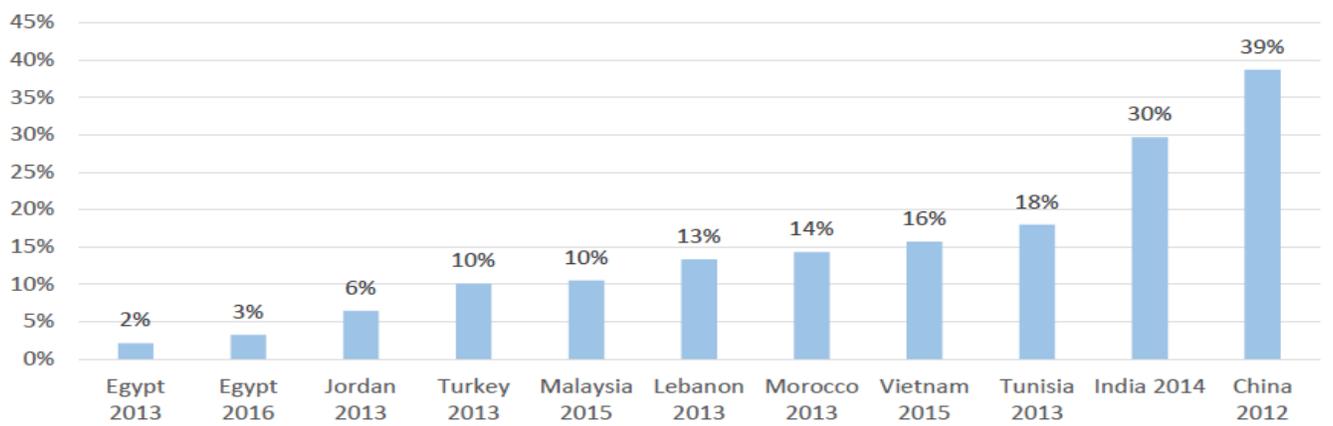
Figure 35. Percentages of Firms in Egypt That Introduced a New Product or Service, by Region



Source: World Bank 2016b.

Innovation rates vary substantially across regions and firm sizes. Firms in Greater Cairo and West Delta appear to be the most innovative, while firms in Southern Upper Egypt and the Frontier region seem not to innovate at all, according to results from the World Bank Enterprise Survey (World Bank 2016b; figure 35).

Spending on research and development (R&D) has also been very low, a situation that can partly explain the low rates of innovation in Egypt's firms. Only 4 percent of firms indicated any spending on R&D in 2016. Egypt significantly falls behind comparator countries in the MENA region as well as lower middle-income countries in general. The share of firms spending on R&D in those groups is four to five times higher than that in Egypt (figure 36).

Figure 36. Percentage of Firms That Spent on Research and Development, by Country

Source: World Bank 2016b

The risk posed by Egypt's low levels of innovation and R&D is that firms will not be able to maintain their competitiveness in a rapidly changing global economy. The massive and disruptive advancement of technological progress and its rapid adoption in production processes by firms in developed and emerging economies imply that without effective support, Egyptian firms will significantly diverge from the pace of innovation of firms in many other comparable countries (Rahman, forthcoming). Consequently, Egypt will not be competitive in international markets, most notably on R&D and skill-intensive products.

The section that follows is structured according to the Babson Entrepreneurship Ecosystem model, which covers six interdependent and complementary domains: policy, culture, human capital, infrastructure and supports, financial capital, and markets. These domains, and the interplay between them, determine entrepreneurial opportunities and drive digital entrepreneurship.

Policy

Young and productive firms are the engines of private sector job creation around the world. An enabling policy and regulatory environment is critical to stimulating the development of innovative and competitive firms. One of the most important factors is the ease with which a business can be created. Complex, time consuming, and costly procedures can deter or constrain an entrepreneur's ability to turn his or her ideas into a formal business. Equally important is the ease of exiting a business since innovative entrepreneurs need to operate in an environment where they can fail fast and fail often to iterate and improve their innovation and product offerings so as to meet market needs. Lengthy, complex, and restrictive insolvency proceedings can prevent an entrepreneur from going through this important iterative process and unlocking capital for new business ideas. Additionally, for innovative entrepreneurs to raise capital from investors, laws that provide appropriate minority investor protection are needed.

Egypt is taking important steps to improve the business environment. The government created a Registry for Movable Collateral, amended the companies' law, issued a new Investment Law in 2017 and a new Bankruptcy Law in 2018. It has also taken the following steps:

- **Made changes to insolvency rules**⁹⁵. The Bankruptcy Law made important changes, including abolishing prison sentences in bankruptcy cases and limiting punishment to a monetary fine. The changes to the law also aim to minimize the need for companies or individuals to resort to the courts and to simplify post-bankruptcy procedures. Egypt also made managing insolvency easier by allowing debtors to initiate the reorganization procedure and granting creditors greater participation in the proceedings

Further protected investors.⁹⁶ Egypt has strengthened minority investor protections by requiring shareholder approval when listed companies issue new shares. **Despite the improvements in regulations supporting businesses, entrepreneurs may still find it difficult to navigate the current regulatory frameworks in nascent digital markets.** For instance, fintech innovations dealing with money deposits need to operate in partnership with a licensed bank, an experience perceived by some stakeholders as stringent and complex. Additionally, it can be difficult for entrepreneurs to interpret laws and requirements or to understand the boundaries of compliance, which can be a deterrent to innovate and further develop the business. The regulatory approach to fintech innovations tends to follow a rule-based rather than a principle-based approach, which means that many fintech innovations do not fit existing regulations and are de facto not allowed. However, the CBE has recently launched initiatives such as the Regulatory Sandbox (June 2019) to promote a conducive environment for financial inclusion and innovation. Further details on digital financial services regulation can be found in the digital financial services section above. From a financing perspective, equity-based and lending-based crowdfunding is not permitted under the framework of the Capital Markets Law no. 95 of 1992. Policymakers could review how existing legislation can affect the emergence of digital entrepreneurs, the markets in which they operate, and the finance they need to access.

Culture

In general, society in Egypt continues to look positively on entrepreneurship, and this optimistic perception remains higher than the regional and global averages. According to 2019/20 Global Entrepreneurship Monitor (GEM) data, 82 percent of Egyptians view successful entrepreneurs as having a high social status, and 75 percent of Egyptians consider starting a business a desirable career choice (figure 37).⁹⁷

Fear of failure continues to hold back entrepreneurs from starting a business, but it is not a primary deterrent: 73 percent of Egyptians believe there are good opportunities for starting a business but over half of these (54 percent) indicate that that fear of failure prevents them from setting one up. Egypt has maintained lower levels of fear of failure, compared to regional or global averages, which is promising.

⁹⁵ Long-awaited bankruptcy law sparks optimism in Egypt, 2018, <https://www.al-monitor.com/originals/2018/02/egypt-bankruptcy-law-foreign-investments-economy.html>

⁹⁶ The Egyptian Exchange, Minority Shareholders' Rights, https://egx.com.eg/getdoc/f88b78ba-4f6b-4333-a7d3-b84599930be5/Minority-Brochure_en.aspx

⁹⁷ The Global Entrepreneurship Monitor (GEM), Entrepreneurial Behavior and Attitudes, Adult Population Survey (APS), <https://www.gemconsortium.org/data/key-aps>.

However, policymakers and intermediaries could consider how stigmas for those who have failed could affect entrepreneurship overall. Encouraging a culture that embraces failure as much as success is important to ensure that the ecosystem maintains a healthy level of experienced entrepreneurs that are willing to re-enter the pipeline.

Figure 37. Cultural Indicators for Entrepreneurship 2019

Economy	Good opportunities to start a new business (%)	Fear of failure despite good opportunities (%)
Brazil	46	35
China	74	45
Egypt, Arab Rep.	73	54
India	84	62
Jordan	40	n/a
Mexico	62	48
Morocco	58	42
Pakistan	62	54
Saudi Arabia	73	42
South Africa	58	45
United Arab Emirates	66	42

Note: n/a = not available.

Source: The Global Entrepreneurship Monitor (GEM), Entrepreneurial Behavior and Attitudes, Adult Population Survey (APS), <https://www.gemconsortium.org/data/key-aps>.

The majority of women entrepreneurs in Egypt are subsistence entrepreneurs, motivated by the necessity to have income, rather than transformational or opportunity-driven entrepreneurship (ILO 2016). Total entrepreneurial activity (TEA)⁹⁸ rates for women are lower than for men. Egypt has a female/male TEA⁹⁹ ratio of 0.4 compared to a female/male opportunity-driven TEA ratio of 0.69 indicating a smaller gender gap for opportunity entrepreneurship than for subsistence entrepreneurship.¹⁰⁰ Women entrepreneurs in Egypt are more likely to be constrained by a lack of the necessary human and financial capital, social norms committing women to family and home responsibilities, a limit on their time availability and ability to travel (ILO 2016). According to the ILO's survey, 56 percent of the women's entrepreneurship survey respondents in Egypt obtain most of their information on business-related matters from family,

⁹⁸ TEA is the percentage of the population age 18 to 64 who are either nascent entrepreneurs or owner-managers of a new business. Female/male TEA is the percentage of the female population ages 18 to 64 who are either nascent entrepreneurs or owner-managers of a new business, divided by the equivalent percentage for their male counterparts.

⁹⁹ GEM defines an opportunity entrepreneur as "a person who aims to create a large, vibrant business that grows far beyond the scope of the individual's subsistence needs and provides jobs and income for others." A subsistence entrepreneur is defined as "a person who engages in entrepreneurial activity chiefly as a means of providing subsistence income to himself/herself."

¹⁰⁰ Female/male opportunity-driven TEA: Percentage of those females involved in TEA (a) who claim to be driven by opportunity as opposed to finding no other option for work and (b) who indicate the main driver for being involved in this opportunity is being independent or increasing their income, rather than just maintaining their income, divided by the equivalent percentage for their male counterparts.

friends, and neighbors, while only 28 percent report obtaining information from other business owners (ILO 2016). The survey also identified the following challenges:

- Women face disadvantages in gaining know-how and experience.
- Financial services do not meet the needs of women entrepreneurs at different stages of the business cycle and don't meet lender collateral conditions.
- Women lack access to business development services, markets, and technology.
- Women lack access to networks of women entrepreneurs.

As a result, Egyptian ecosystem players and policymakers could consider how proximity for entrepreneurs and the markets they operate in could have an impact for women entrepreneurs. In recent years, the Technology Innovation and Entrepreneurship Center has been working with local intermediaries to establish technology hubs outside Cairo to widen their support footprint. The initiative kicked off in greater Alexandria and New Assiut city, with plans for further expansion to up to five other locations across Egypt. However, addressing this challenge is not (and should not be) limited to establishing new technology hubs outside of urban centers.

Human Capital

Launching a successful business requires not only a single entrepreneur that possesses the necessary skills, but also access to a pool of external skills and talent. This is vital for building a team. Evidence from the Global Entrepreneurship Index (GEI) shows Egypt scoring lower than the MENA region and the global average in start-up skills.¹⁰¹

Accessing and retaining talent, however, continues to be a problem for Egyptian digital start-ups. Founders of digital start-ups often do not have the digital and technical skills to transform their ideas into products or services. They need to search for a cofounder with the required skill set or, more often, rely on hiring talent for their team. Identifying and retaining programming talent has been challenging and a significant operational risk to start-ups. A total of 21 percent of firms in the IT and IT services industry indicated an inadequately educated workforce as being a “major” or “severe” constraint (World Bank 2016b).

Ecosystem Infrastructure and Support

The number of entrepreneurship support intermediaries has been growing in Egypt. Incubators and accelerators play an important role in supporting a firm during its start-up phase, providing tailored skills training and mentorship, networking opportunities, as well as organizational support, seed capital, and technical assistance, while raising the overall profile of entrepreneurship in their countries. The number of active intermediaries in Egypt grew to 56 by 2019.¹⁰² According to the analysis, Cairo is home to 68 percent of Egypt's hubs and one of the top three cities by numbers of hubs across Africa.

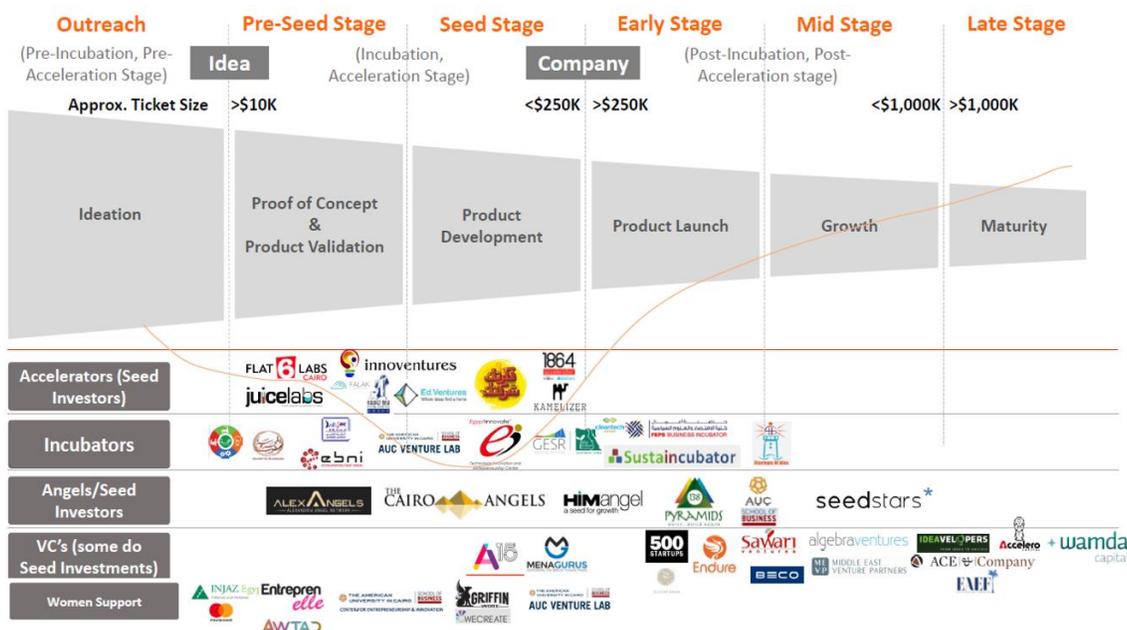
Since 2010, the number of ecosystem intermediaries in Egypt has been growing and offering start-ups additional support opportunities (figure 38). The ecosystem was first stimulated by the establishment of the Technology Innovation and Entrepreneurship Center (TIEC) in 2010 providing incubation program, funding, and working space for approximately 20 start-ups per year. Flat6Labs, a leading regional accelerator and seed investor, launched its original operations in Cairo in 2011 and runs one to two cycles per year over a four-month period and provides seed funding. AUC Venture Lab, Egypt's

¹⁰¹ The Global Entrepreneurship and Development Institute, Global Entrepreneurship Index, <http://thegedi.org/global-entrepreneurship-and-development-index>.

¹⁰² GSMA data.

first university-based incubator and accelerator in Cairo, was launched in 2013 and has two cycles per year. In 2017, Fekretak Shertetak was established as a nationwide initiative to provide training, networking, support, and advisory services to start-ups and aspirational entrepreneurs. The government also established Falak, an accelerator that provides start-ups with support and funding in exchange for equity. Falak is the largest accelerator in Egypt, and its entry into the market has helped improve the overall quality and value proposition of the higher-end accelerators in their investment and support to start-ups. As a complement to tech incubators and accelerators, coworking spaces and networking events—such as the GrEEK Campus and Rise Up Summit in Cairo and the Techne Summit in Alexandria—have served as the glue connecting various components of the start-up and entrepreneurship ecosystem in Egypt. These events and conferences have provided global visibility to Egypt’s young but growing ecosystem, which has among things, contributed to investments by regional and global venture capital (VC) funds in Egyptian start-ups.

Figure 38. Overview of Ecosystem Intermediaries



Note: VC = venture capital.

Source: World Bank 2018c.

Ecosystem intermediaries have also started looking at sector-specific verticals to support groups of entrepreneurs. Both AUC Venture Lab and Flat6Labs are general programs that also launched fintech specific cycles in partnership with banks. EFG-EV (a fintech seed fund backed by EFG Group and Egypt Ventures) and Falak have established a fintech track to support entrepreneurs in the sector. An additional initiative is Startupbootcamp (Fintech Cairo), a six-month program aimed at supporting innovative early-stage fintech start-ups, with a targeted focus on financial inclusion. In the education space, Ed Ventures is an education-focused accelerator established by Nahdet Misr.

Entrepreneurship is a complex activity and the success or failure of entrepreneurs is not limited by their individual capabilities, but equally tied to the quality of the surrounding entrepreneurial ecosystem. Local entrepreneurship ecosystems have emerged and taken shape to support entrepreneurs throughout the country. Increasing the number of ecosystem intermediaries or widening their geographical scope should not come at the expense of quality or effective support. For example, Endeavor carried out a

study on fostering productive entrepreneurship communities, and found that top-performing entrepreneurs were much more likely to receive knowledge, mentorship, or investment from other, more seasoned, entrepreneurs who had led a company to scale (Morris and Török 2018). The study goes on to recommend that decision makers encourage and incentivize people who have led successful companies to share their knowledge, capital, and other resources with up-and-coming entrepreneurs and that intermediaries run by people with no entrepreneurial leadership experience can negatively affect the community. This perspective is shared by the Egyptian start-up community, which believes that only experienced entrepreneurs, who have gone through the complete cycle of creating a company, can provide mentorship for other start-ups (World Bank 2017b).

Much of the focus has been on improving the entrepreneurial ecosystem through specific instruments such as incubation and acceleration. However, firms that have moved beyond the ideation stage and are operating businesses have often outgrown these services. Accordingly, developing the entrepreneurial capability of existing firms, particularly of SMEs, and using alternative instruments to support them, may prove successful, particularly in scaling existing businesses.

Financial Capital

Egyptian entrepreneurs and start-ups have been steadily raising more capital year on year. In 2019, Egyptian entrepreneurs raised US\$211 million compared to US \$67 million in 2018, US \$37 million in 2017, and US \$9.15 million in 2016.¹⁰³ This represents a 215 percent year-on-year growth between 2018 and 2019 and over 2,000 percent growth over a four-year period from 2016 to 2019. In 2019, Egyptian entrepreneurs raised the third largest amount of capital in Africa, after Nigeria and Kenya. Additionally, in 2019, Egypt had the largest number of funded deals in the MENA region, with 142 deals.

The increase in capital has been fueled by interest from international and regional funds and investors in Egyptian start-ups (particularly more mature businesses looking to raise Series A-C), but also by the establishment of Egypt-based VCs and early-stage funds over the past few years. For example, in 2016, Algebra Ventures established a \$40 million Egyptian fund intended to make investments ranging from US\$500,000 to US\$4 million available for start-ups (IFC 2016). Sawari Ventures recently secured US\$35 million in funding for its North Africa fund, which targets investments in Egypt, Tunisia, and Morocco (Digestafrica 2018).

Despite the year-on-year growth in capital raised for Egyptian start-ups, overall entrepreneurial finance in Egypt is still underdeveloped. Egyptian start-ups continue to face the “valley of death” challenge, that is, the gap between when an entrepreneur’s own resources (for example, from family and friends) are depleted and when the company is financially viable to attract later-stage investment. In Egypt, this valley of death exists for start-ups that need to raise seed financing between US\$50,000 and US\$500,000. In advanced ecosystems, this stage of financing is typically covered by angel investors and seed funds. The last few years have seen the emergence of a few pioneering angel groups and syndicates that actively invest in seed stage start-ups in the valley of death. Overall, however, formalized angel investing activity in Egypt falls short of the need to cater for capital requirement of high growth potential start-ups. Young entrepreneurs often feel that traditional investors are still not open to increasing their investments in innovative business models and lack familiarity with the features and approaches of investing in start-ups.

While increasing the supply of equity finance for entrepreneurs across stages is obviously very important, investment activity (particularly for earlier stage start-ups) can also benefit from firms being investment ready. The absence of investment-ready entrepreneurial pipelines could prevent

¹⁰³ Partech data 2016–2019.

available capital from being deployed. Entrepreneurs in the ecosystem can be investment worthy, yet not necessarily deal ready. Lack of readiness can be due to a number of factors: (a) the equity-averseness of entrepreneurs; (b) the fact that the firms may not be investable due to deficiencies in their team structure, strategy, accounts, and other business issues; or (c) presentational failings, meaning that many firms are unable to pitch their ideas successfully to investors (Mason and Kwok 2010).

The Egyptian government has taken important measures over the past couple of years to increase the supply of capital for Egyptian start-ups and SMEs, alongside initiatives to support and stimulate start-up activity. The government has created an investment company, Egypt Ventures, with the purpose of investing in early-stage funds and venture capital funds, as well as in early growth companies. In 2020, to address capital gaps in the ecosystem, the government will be launching an equity fund of funds program—implemented by the Micro, Small, and Medium Enterprise Agency—for seed, early-stage and later-stage VC and SME Funds.¹⁰⁴ Additionally, the CBE’s Fintech Development Strategy includes plans to set up a US\$65 million fund of funds to invest in funds that target fintech start-ups in particular. These measures could help strengthen and stimulate investment activity in Egypt across the start-up value chain.

Markets

Enabling e-commerce, using digital platforms, fostering access to modern digital payment systems, and expanding access to broadband and internet are key elements for developing Egypt’s digital economy. As mentioned earlier, digital platforms can play an important role in improving efficiency and creating markets for entrepreneurs in Egypt. In many cases these digital platforms are developed by the entrepreneurs themselves. Success in using digital platforms to build demand depends most importantly on consumers’ capacity to connect to and engage on those platforms. As customers continue to use their mobile phones for e-commerce to engage and transact, data download speeds and reliability will increase in importance.

Although digital platforms have successfully penetrated market niches, they still face limitations that hinder expansion and further innovation. Scattered, overlapping, and unclear policies and regulations; lack of a regulatory framework for digital activities across sectors; and weak coordination across regulatory agencies affect digital business operations. The implementation of labor market regulations, consumer protection rules, competition law, and data protection rules also create uncertainty. However, as the implementation of these frameworks continues to protect consumers and providers, rules will become more predictable, and additional regulatory gaps will be identified.

Connecting firms to buyer-seller digital platforms can also boost firm profit and support the rise of digital entrepreneurship and the emergence of new business models. Digital platforms reduce search, matching, and transaction costs because costly intermediaries disappear. Such platforms allow firms to tap into spare physical and human capacity by exploiting existing assets to their full extent. They also provide reliable mechanisms to build two-way trust thereby removing informational asymmetries.

Time, predictability, and reliability of imports and exports are increasingly important for highly connected global value chains, as is leveraging e-commerce and logistics platforms to broaden access to new markets and customer segments. According to GSMA’s Industry Report (GSMA 2017), 70 percent of e-commerce payments in emerging markets continue to be on a cash-on-delivery basis, which is costly, time-consuming, and risky for both the buyer and seller. Similarly, regional or global e-commerce opportunities can be hampered by lengthy cross-border customs procedures.

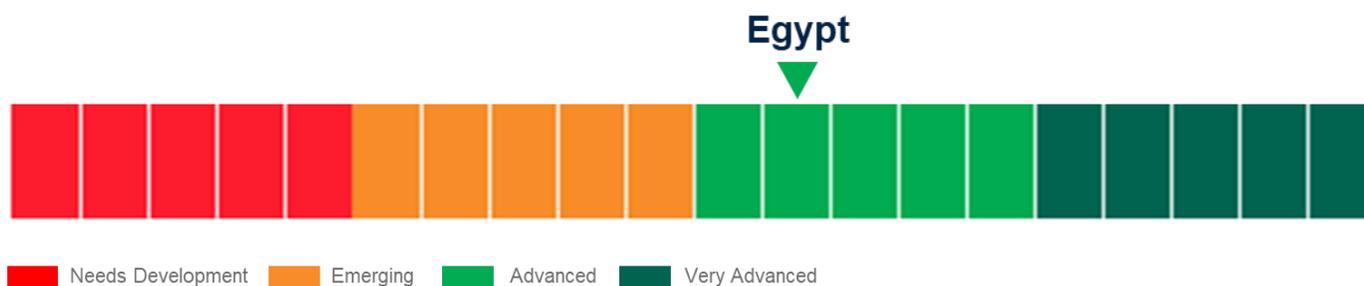
¹⁰⁴ The equity fund of funds program is part of a US\$200 million Catalyzing Entrepreneurship for Jobs project implemented by the Micro, Small, and Medium Enterprise Agency (and financed by the World Bank) to provide funds for start-ups and SMEs in Egypt.

Furthermore, Egypt’s private sector suffers from low rates of innovation, which in turn affects competitiveness and job creation potential. Improving intellectual property rights (IPR) could support innovation. Lack of innovation drives down firm competitiveness, which in turn affects firm growth and job creation. Egypt can improve firm productivity by improving firms’ access and use of the internet, smartphones, big data, the internet of things, artificial intelligence, and other emerging technologies. Although Egypt is signatory to several intellectual property conventions and has made IPR a priority, regulations have not kept pace with the fast changes in the digital sector and with other emerging industry requirements. Key areas for attention include adoption of frameworks to promote coordinated action against piracy of online content or software and the recognition of intellectual property as an economic asset.

Middle East and North Africa Regional Benchmark for Digital Entrepreneurship

When benchmarked against other members of the MENA region, Egypt qualifies as “advanced” in digital entrepreneurship (figure 39). This is based on The World Bank’s MNA Tech analysis of seven indicators across topics such as access to finance, entrepreneurship, and technology adoption (figure 40).

Figure 39. Arab Republic of Egypt’s Digital Entrepreneurship Compared with Other Areas of the Middle East and North Africa



Source: Based on World Bank’s MNA Tech analysis.

Figure 40. Arab Republic of Egypt's Digital Entrepreneurship Compared to the Middle East and North Africa Average

Component	Indicator	Egypt	MENA Average	MENA Average - GCC
Pillar 4: Digital Entrepreneurship		5.88	4.18	3.55
Access to Finance	Number of deals	83	24	18
	Number of deals by industry/sector	17	21	14
	Value of disclosed funding by industry/sector	9	27	9
	Total disclosed funding (\$million)	73	48	15
Entrepreneurship	Number of Startups	145	47	42
	Number of VC Investors	15	15	7
Technology Absorption	Firm-level technology absorption	4	5	4

Note: GCC = Gulf Cooperation Council; MENA = Middle East and North Africa; VC = venture capital.

8.3. Recommendations and Next Steps

Table 11 analyses Egypt's digital entrepreneurship in terms of strengths, weaknesses, opportunities, and threats.

Table 11. Strengths, Weaknesses, Opportunities, and Threats Analysis of Digital Entrepreneurship

Strengths	Weaknesses
<ul style="list-style-type: none"> • Culture of entrepreneurship in the Arab Republic of Egypt • Government-initiated entrepreneurship reform agenda • CBE-implemented regulatory sandbox 	<ul style="list-style-type: none"> • Geographical inequality of the ecosystem • Existing gaps in the regulatory environment, in particular for fintech • Early financial gap on the road to profitability • Lack of digital infrastructure, with improved connectivity, reliability, and speed
Opportunities	Threats
<ul style="list-style-type: none"> • Nascent entrepreneurship hub in Africa • Conclusion of a number of dynamic and successful deals 	<ul style="list-style-type: none"> • Very low level of private R&D investment • Inadequately educated workforce • Difficulty in attracting and retaining talent • Risk-adverse investors in markets they do not understand

Note: CBE = Central Bank of Egypt; R&D = research and development.

The following recommendations could support the further development of digital entrepreneurship in Egypt:

Objective 1: Build capacity and support structures for digital entrepreneurship.

Put in place ecosystems that nurture the development of vibrant start-ups through government action in cooperation with the private sector and intermediaries. Governmental efforts should enable start-ups to grow and compete so that digital entrepreneurs can play an important role in boosting economic growth and job creation in Egypt. A holistic approach could be adopted that establishes an ecosystem supportive of entrepreneurs from the bottom up. While governments have an important role to play, policymakers should be careful to not overly control the development of the ecosystem, but rather provide it with the space to develop organically and build on the strengths and capacity of its key components (WEF 2018).

Foster cooperation between government and the private sector to assess and address the gap in start-up skills. Gaps in start-up support infrastructure and delivery programs across the country are having an adverse impact on the growth of the sector. Incubation, acceleration, and business training programs that help entrepreneurs or their employees improve their managerial, technical, or digital skills, can play an important role in supporting the growth prospects of firms. These programs require governments and entrepreneurs to work together: entrepreneurs are best suited to identify and inform government of the existing demand and gaps for specific skill sets.

Support the development of thematic and sector-focused acceleration programs. There is also a need to improve the quality and availability of entrepreneurship-support programs. Existing accelerators and entrepreneurship support intermediaries that provide higher-quality deliverables¹⁰⁵ and outcomes should be encouraged to collaborate with industry partners and subject matters to introduce content and programming that more specifically addresses the needs of start-ups operating in specific industry verticals.

Include the specific needs of women when designing acceleration programs to fully realize the potential of female entrepreneurs. Supporting intermediaries to design programs to provide women entrepreneurs with skills development, mentorship, and training can play an important role in achieving gender parity. For example, women-only networks may be useful to help familiarize participants with networking and building professional confidence. Women entrepreneurs also need to build linkages with mixed-gender networks as they represent important gateways to the private sector (Qasim, Lu, and Ford 2018). In terms of access to capital, educating local funds and angel investors in gender-lens investing, and piloting women-led angel groups or funds could improve the position of women-led start-ups and SMEs and help raise capital for their further development and growth.

Adopt a holistic approach to supporting entrepreneurship and one that effectively links funding to pipeline development. Fostering the supply-side of the business angel or venture capital ecosystem is not enough to guarantee access to external sources of finance that can support experimentation and innovation. The investment readiness or quality of the pipeline is also crucial. Investment-readiness programs are important for providing individualized training, mentoring, coaching, and other services. Improving the effectiveness of these programs means working closely with investors to understand their requirements, before tailoring investment-readiness programs accordingly.

¹⁰⁵ Some of the thematic acceleration programs in fintech (implemented by Falak in partnership with EFG-EV, as well as those implemented by AUC Venture Lab, Flat6Labs, and Pride Capital) offer a model and approach that can be replicated in other sectors in which technology based innovation is taking place, such as clean technology, agricultural technology, health care, education, transportation, and creative industry.

Objective 2: Improve legal and financial aspects of the business environment.

Create enabling regulatory frameworks for conducting business that complement entrepreneurial policies and instruments and encourage a culture of risk taking. A policy mix that addresses several entrepreneurial barriers simultaneously is required. Examples include fostering a culture that reduces risk aversion and does not punish failure, helping entrepreneurs deal with uncertainty, and reducing experimentation costs. It is also important to eliminate the wage gap between the self-employed and wage-earners, as such gaps can make entrepreneurship less attractive to highly skilled individuals.

Establish a targeted performance-based capability upgrade program for firms with a focus on business management, innovation, and technology adoption. Upgrading capability is crucial if firms are to cope with both domestic and international competition and internalize any knowledge transfers obtained through exports or foreign direct investment (FDI). In ensuring access to new technologies, Egypt's priority could be the diffusion of improved production processes and innovation and R&D to promptly adopt and catch up with emerging technologies at the forefront of innovation. This is a key channel for productivity and jobs. Improving managerial capability is a fundamental backbone for this. Efforts could also be made to deepen linkages between digital start-ups developing enterprise solutions and the Egyptian industry overall, particularly SMEs. This will create new market opportunities for start-ups and contribute to the digitization of the economy as a whole. Furthermore, it would be useful to develop the entrepreneurial capability of existing firms, particularly of entrepreneurs who are well past the start-up phase. Alternative instruments can also be used to support start-ups, such as management consulting and technology adoption programs.

Ensure the availability of early-stage risk capital to address the financing gap, particularly for ticket sizes between US\$50,000 and US\$500,000. This is necessary to fuel the growth of digital entrepreneurs in Egypt. Despite the improvements and momentum in equity finance (particularly with later-stage start-ups), availability of early-stage financing is still uneven and underfunded in Egypt, particularly in the valley of death. Recent initiatives by the Egyptian government in this regard are welcome, but more can be done. In particular, efforts could be made to support the further development of organized and professional angel investors and groups, as they are typically the first kind of third-party capital for start-ups in advanced ecosystems and play a critical role in the start-up finance value chain. Initiatives could include operational funding for these groups, expansion of existing angel groups through co-investment funding, financial incentives and de-risking instruments, and advanced coaching and mentoring to improve the overall investment experience. This could be supplemented with facilitating the development of new angel groups and syndicates, notably through the education and motivation of high net-worth individuals (HNWIs) and family offices. Recognizing that the growth path and journey of each digital start-up and small enterprise may be unique, both entrepreneurs and investors should be educated on a range of issue areas that might be more suited to the needs of start-ups

Table 12 summarizes key recommendations and suggested activities for digital entrepreneurship in Egypt. A time span is proposed for each activity, including short-term (3–12 months), medium-term (12–24 months), and long-term (24–36 months).

Table 12. Key Recommendations and Suggested Activities for Digital Entrepreneurship in the Arab Republic of Egypt

Recommended Actions	Time Frame	Priority
Objective 1: Build capacity and support structures for digital entrepreneurship.		
Establish an ecosystem supportive of entrepreneurs from the bottom up, in collaboration with the private sector, providing options for organic development and building on the strength and capacity of its key components.	Short term	High
Collaborate with industry partners and subject matter experts to introduce content and programming that more specifically addresses the needs of start-ups operating in specific industry verticals.	Long term	Intermediate
Improve the effectiveness of investment-readiness programs by working closely with investors and paying special attention to the needs and challenges of women entrepreneurs.	Short term	High
Objective 2: Improve legal and financial aspects of the business environment		
Develop an entrepreneurial culture that reduces risk aversion and does not punish failure through a mix of enabling policies that address several entrepreneurial barriers simultaneously.	Long term	High
Improve production processes, innovation, and R&D to promptly adopt and catch up with the available technology and deepen linkages between digital start-ups and Egyptian industry (particularly SMEs).	Long term	High
Ensure the availability of early-stage risk capital to address the financing gap necessary to fuel digital entrepreneurship.	Short term	High

Note: Short term = 3–12 months, medium term = 12–24 months, and long term = 24–36 months. R&D = research and development; SME = small and medium enterprises.

9. Conclusion: A Way Forward

In today's fast changing technological climate, and in light of the wide-reaching impact of COVID-19, the Arab Republic of Egypt could leverage its strengths and address current legal and regulatory shortcomings to fully reap the benefits of a vibrant, inclusive, and safe digital economy. The present digital economy diagnostic provides a comprehensive assessment of where Egypt currently stands in areas such as digital infrastructure, digital skills, public and private sector platforms, financial services, and entrepreneurship. Figure 41 provides a summary of the country's digital economy performance in each of these five pillars. While the findings show potential and progress in several areas, there is an immediate need to accelerate implementation on a number of fronts if Egypt is to reach its goal of transforming people's lives for the better and becoming a leading hub for digitally enabled growth and productivity, innovation, and jobs creation and inclusion.

Figure 41. Summary of the Arab Republic of Egypt's Digital Economy Performance per Pillar

Digital Economy Values (0-10)	Digital Economy Performance by Pillar			
	Egypt, Arab Rep.	MENA average	MENA average minus GCC	
Pillar 1: Digital infrastructure	4.74	5.01	4.17	Emerging
Pillar 2: Digital platforms	6.20	5.44	4.81	Advanced
Pillar 3: Digital financial services	4.56	5.34	4.39	Emerging
Pillar 4: Digital entrepreneurship	5.88	4.18	3.55	Advanced
Pillar 5: Digital skills	3.14	4.68	3.94	Emerging

Note: GCC = Gulf Cooperation Council; MENA = Middle East and Northern Africa.

Source: World Bank MNA Tech analysis.

This report has highlighted some key recommendations for Egypt to accelerate its digital transformation:

- **An enabling legal and regulatory framework is crucial to support the development of a digital economy that attracts investment and promotes innovation.** A number of essential laws and regulations need to be updated to better equip, resource, and empower institutions. The implementation of a digital strategy in Egypt requires a clear and public roadmap and action plan, and robust mechanisms for monitoring and evaluation should be entrusted to a single agency.
- **Liberalization and procompetitive reforms are critical for the further development of digital infrastructure, uptake of services, and better addressing of the needs of the business sector.** Given its aspirations to become a digital leader in the region, Egypt needs to provide better incentives for attracting investment to improve broadband connectivity and affordability, including the deployment of next generation networks, such as 5G. The market would benefit from wholesale and high-speed access options other than those provided by Telecom Egypt to improve service innovation, quality, and resilience. The government could also consider releasing additional spectrum for wireless services, promoting infrastructure sharing, ensuring regulation for over-the-top services (OTTs), and addressing

net neutrality. Further, any cybersecurity plan will need to be embedded in a wider critical infrastructure management effort, including the expansion of data centers.

- **The creation of an enabling regulatory environment is needed to stimulate the growth of digital financial services.** Egypt is encouraged to review and amend regulations to create an environment that is more conducive to the growth of digital financial services and related business models. An emphasis on balancing risk with opportunity can create space for innovative products and services. The adoption of modern regulatory frameworks and infrastructure will serve as a catalyst for the effective penetration of digital financial services in the country (for example, e-signature, e-contracts, open banking, e-KYC and so on). To better achieve financial inclusion, the government is encouraged to adopt a strategic approach to the country's national payment system. A national risk assessment that includes a financial inclusion component (for example, financial inclusion risk assessment) will help financial regulators unlock the full potential of digital financial services. To accelerate digital transformation, the government is further urged to ensure the interoperability of all social program benefit cards and to digitalize international remittances.
- **The public sector can do more to actively stimulate greater demand for digital services through government platforms.** By supporting the rollout of end-to-end digital services and electronic payments to support the delivery of its own services to the public, the government will encourage greater uptake of digital services and create new demand in the country. A whole-of-government approach, which includes the interoperability of datasets is critical, as was demonstrated in the Port Said pilot. Scaling up the Port Said pilot is key to accelerating the country's digital transformation. An emphasis on executing a comprehensive capacity-building plan for public servants would sustain such efforts and ensure that they are deployed in a territorially balanced manner. Finally, the development of a forward-looking national data policy for the public sector is necessary to support digital platforms, protect consumers, and stimulate private sector engagement.
- **The government, in close coordination with the private sector, could aim to establish an innovation ecosystem that nurtures the development of start-ups and enables them to grow and compete in the digital economy.** A holistic approach to supporting digital entrepreneurship is needed in Egypt—one that links funding to pipeline development and fosters the growth of the private sector. The government could create a more vibrant digital entrepreneurship ecosystem by divesting its interest in ICT and creating more space for the private sector. Further regulatory reforms on conducting business will encourage start-up activities and a culture of risk taking, where both success and failure are celebrated. A more vibrant private sector can in turn create greater demand for digital skills and services, foster innovation, and enable businesses to drive further growth of digital businesses. Additionally, the diversification of funding instruments remains a cornerstone of a healthy entrepreneurship ecosystem. As such, improvements in early stage financing and equity finance should be encouraged.
- **Investing more widely in digital skills will ensure that all Egyptians have an equal opportunity to participate in the digital economy.** Without widening the digital skills base and broadening prospects for training, parts of the population (particularly youth and women) risk being excluded from new opportunities and missing out on benefits associated with greater use and application of digital technology. For example, without universal basic digital literacy, a hasty push to make public services digital may create early barriers to access and use. At the same time, advanced demand-driven digital skills remain a critical enabler of higher productivity and employment, particularly in data-driven sectors. While strengthening the emphasis on science, technology, engineering, and mathematics (STEM) courses for younger generations is essential to creating opportunities for leapfrogging, the government is encouraged to collaborate with the private sector to provide new programs for upskilling and reskilling the existing labor force.

To conclude, there is an opportunity for Egypt to accelerate operationalization and execution of digital transformation. While there is certainly a strong nationwide commitment to creating a digitally enabled economy, many stakeholders feel that the time is ripe to scale up concrete operational efforts. The

government could leverage this momentum and leap ahead toward a vibrant, inclusive, and safe digital economy. To make this happen, options to consider include appointing a high-level focal point to drive the digital economy agenda. Further steps could be taken to infuse more market competition, maximize usage of existing capacity, and expand backbone fiber networks. A comprehensive plan for developing critical and advanced digital skills is indispensable to fully retain and mobilize Egypt's human capital. Fast tracking digital transformation and scaling up end-to-end e-government services on robust public sector platforms are necessary for improving service delivery and shoring up demand for digital services. Fostering inclusion in financial services, which requires the cooperation of public and private stakeholders, will go a long way in boosting the digital economy. Finally, nurturing a dynamic, competitive, and sufficiently inclusive digital entrepreneurship ecosystem is key to fostering innovation and securing ties with international investors.

It is time for Egypt to play to its strengths, create incentives for investment and innovation, and further reform the regulatory framework for accelerated growth. Only then will the country fully unleash the potential of the digital economy for lasting transformational impact.



References

- Ahram Online. 2019. "Egypt's Sisi Says Digitisation Is Major Step in Ensuring National Security." July 31, 2019. <http://english.ahram.org.eg/NewsContent/1/64/341974/Egypt/Politics-/Egypts-Sisi-says-digitisation-is-major-step-in-ens.aspx>.
- Ahram Online. 2020. "Egypt PM Follows Up on Establishment of Telecom Networks in New Administrative Capital." April 27, 2020. <http://english.ahram.org.eg/NewsContent/1/64/368090/Egypt/Politics-/Egypt-PM-follows-up-on-establishment-of-telecom-ne.aspx>.
- Aker, Jenny C., and Joshua E. Blumenstock. 2015. "The Economic Impacts of New Technologies in Africa." In *The Oxford Handbook of Africa and Economics: Volume 2: Policies and Practices*, edited by Célestin Monga and Justin Yifu Lin. Oxford: Oxford University Press.
- Cabral, Armando, Lohini Moodley, and Safroadu Yeboah-Amankwah. 2014. "Digital Divide: The Impact of Closing Africa's Internet Gap." McKinsey and Company. <https://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/digital-divide-the-impact-of-closing-africas-internet-gap#>.
- Carretero, Stephanie, Riina Vuorikari, and Yves Punie. 2017. "DigComp 2.1: The Digital Competence Framework for Citizens with Eight Proficiency Levels and Examples of Use." EUR 28558 EN, European Union, Luxembourg. <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/digcomp-21-digital-competence-framework-citizens-eight-proficiency-levels-and-examples-use>.
- CBE (Central Bank of Egypt). 2019. *Highlights of The Central Bank of Egypt's FinTech and Innovation Strategy*, December.
- CBInsights. 2020. "Egypt Dossier." May 20.
- Comms Update. 2020. "Etisalat Misr Paying USD325m for 2600MHz TDD Licence after Outbidding Orange." November 9, 2020. https://www.commsupdate.com/articles/2020/11/09/etisalat-misr-paying-usd325m-for-2600mhz-tdd-licence-after-outbidding-orange/?utm_source=CommsUpdate&utm_campaign=c5313a9588-CommsUpdate+09+November+2020&utm_medium=email&utm_term=0_0688983330-c5313a9588-8846233.
- CPMI (Committee on Payments and Market Infrastructures) and the World Bank Group. 2016. "Payment Aspects of Financial Inclusion." Basel: Bank for International Settlements; Washington, DC: World Bank.
- Daily News Egypt*. 2020. "MCIT Min. Receives 20 Projects after Transferring Digital Transformation File." January 15, 2020. <https://dailynewsegypt.com/2020/01/15/mcit-min-receives-20-projects-after-transferring-digital-transformation-file/>.
- Digestafrica. 2018. "Sawari Ventures closes \$35M of Its \$70M North Africa Dedicated Fund." December 10, 2018. <https://digestafrica.com/sawari-ventures-north-africa-fund/#.XGmkeY3fNuk>.
- ECES (Egyptian Center for Economic Studies). 2020a. "Strengthening Egypt's Competitive Edge in Digital Transformation with Artificial Intelligence." Webinar in collaboration with the World Bank, conference, July 2020. <http://www.eces.org.eg/EventDetails?Lang=EN&C=2&ID=336&Strengthening-Egypt%27s-Competitive-Edge-in-Digital-Transformation-with-Artificial-Intelligence---in-collaboration-with-the-World-Bank>.

- ECES (Egyptian Center for Economic Studies). 2020b. "Views on The Crisis: The Communications and Information Technology Sector in Egypt." *Views on News*, 13 April 2020, issue 8. http://www.eces.org.eg/cms/NewsUploads/Pdf/2020_4_13-7_32_25Communications%20-%20English.pdf.
- Egypt Today*. 2019. "Sisi Holds Meeting with Cabinet to Discuss Digital Transformation Plan." May 10, 2019. <https://www.egypttoday.com/Article/1/70261/Sisi-holds-meeting-with-Cabinet-to-discuss-digital-transformation-plan>.
- Eisenach, J., and Bruno Sori. 2016. "A New Regulatory Framework for the Digital Ecosystem." GSMA and NERA. <https://www.gsma.com/latinamerica/resources/new-regulatory-framework-digital-ecosystem/>.
- Enterprise. 2020a. "Google Steers Clear of Egypt with New Israel-Saudi Fiber Connection." November 24, 2020. <https://enterprise.press/stories/2020/11/24/google-steers-clear-of-egypt-with-new-israel-saudi-fiber-connection-25016>.
- Enterprise. 2020b. "MNOs to Submit Bids for New Cellular Frequencies on Thursday." September 15. <https://enterprise.press/stories/2020/09/15/mnos-to-submit-bids-for-new-cellular-frequencies-on-thursday-21905/>.
- Evans, David S. 2013. "Attention Rivalry among Online Platforms." *Journal of Competition Law & Economics* 9 (2).
- FTTH Council Europe. 2020. "New Fibre Market Panorama 2020 Data Presented by FTTH Council Europe Reveal." Press release, April 23.
- Fitch Solutions. 2020. "Egypt—Information Technology Report." Q1. <https://www.fitchsolutions.com/topic/egypt>.
- G20 Leaders. 2020. "Extraordinary G20 Leaders' Summit: Statement on COVID-19." Statement by videoconference from Riyadh, Saudi Arabia, G20 Information Centre, March 26. <http://www.g20.utoronto.ca/2020/2020-g20-statement-0326.html>.
- Government of Finland. 2020. "Finland as a Global Leader of Digitalisation." Finland Toolbox. toolbox.finland.fi/business-innovation/finland-as-a-global-leader-of-digitalisation/.
- GPFI (Global Partnership for Financial Inclusion). 2016. "G20 High Level Principles for Digital Financial Inclusion." <http://www.gpfi.org>.
- Graves, Laura. 2020. "NTRA Announces New Framework for Egyptian Towerco Licence." Tower Xchange, August 13, 2020. <https://www.towerxchange.com/ntra-announces-new-framework-for-egyptian-towerco-licence/>.
- GSMA (Groupe Spécial Mobile Association). 2017. "2017 State of the Industry Report on Mobile Money."
- GSMA (Groupe Spécial Mobile Association). 2019. *Mobile Policy Handbook: An Insider's Guide to Policy Issues*. https://www.gsma.com/publicpolicy/mobilepolicyhandbook/wp-content/uploads/2019/01/MPH7_ENG_web_spreads.pdf.
- GSMA (Groupe Spécial Mobile Association). 2020. "Effective Spectrum Pricing in Africa—Successful Awards Drive Mobile Connectivity." November 4, 2020, <https://www.gsma.com/spectrum/resources/effective-spectrum-pricing-africa/>.
- Gueguen, Chloé. 2018. *The Egyptian Fintech Ecosystem: Accelerating Financial Inclusion*. International Finance Corporation, Washington, DC.
- Hjort J., and J. Poulsen. 2018. "The Arrival of Fast Internet and Employment in Africa." NBER Working Paper 23582, National Bureau of Economic Research, Cambridge, MA.

- ICASA (Independent Communications Authority of South Africa). 2020. "Chairperson of ICASA Announcing Plans for the Licensing of High Demand Spectrum and the Wireless Open-Access Network." September 30. <https://www.icasa.org.za/news/2020/plans-for-the-licensing-of-high-demand-spectrum-and-the-woan>.
- ICC (International Chamber of Commerce) Commission on the Digital Economy. 2016. "Regulatory Modernization in the Digital Economy: Developing an Enabling Policy Environment for Innovation, Competition, and Growth." Policy statement, International Chamber of Commerce. <https://iccwbo.org/publication/regulatory-modernization-in-the-digital-economy-developing-an-enabling-policy-environment-for-innovation-competition-and-growth/>.
- IFC. 2016. "IFC Supports Tech Entrepreneurs in Egypt with Investment in Venture Capital Fund." Press release, December 14, 2016. <https://ifcext.ifc.org/ifcext/Pressroom/IFCPressRoom.nsf/0/0D39E89292DE8F50852580890059AA99?OpenDocument>.
- ILO (International Labour Organization) *Decent Work Team for North Africa and Country Office for Egypt and Eritrea*. 2016. Women's Entrepreneurship Development Assessment. Cairo: ILO. https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---ifp_seed/documents/publication/wcms_551168.pdf.
- ILO (International Labour Organization). 2017. *Towards Evidence-Based Active Labour Market Programmes in Egypt: Challenges and Way Forward*. Impact Report Series, issue 4. Geneva: ILO.
- ILO (International Labour Organization). 2018. "Decent Work in Egypt, 2017 Results" Cairo: ILO.
- INSEAD. 2018. *The Global Talent Competitiveness Index (GTCI) 2018*, Fontainebleau, France. <https://www.insead.edu/sites/default/files/assets/dept/globalindices/docs/GTCI-2018-report.pdf>.
- ITU (International Telecommunication Union). 2018. Global Cybersecurity Index (GCI) 2018. ITUPublications. https://www.itu.int/dms_pub/itu-d/opb/str/D-STR-GCI.01-2018-PDF-E.pdf.
- Karjalainen, Anna-Maija. 2020. "Finnish Digital Government COVID-19 Response." Ministry of Finance, Presentation at Webinar "Unlocking the Digital Era During the Lockdown." June 16, 2020.
- Katz, R., and F. Callorda. 2018. "The Economic Contribution of Broadband, Digitization and ICT Regulation." International Telecommunication Union. https://www.itu.int/en/ITU-D/Regulatory-Market/Documents/FINAL_1d_18-00513_Broadband-and-Digital-Transformation-E.pdf.
- Kemp, Simon. 2020. "Digital 2020—Egypt." Hootsuite and We Are Social. <https://datareportal.com/reports/digital-2020-egypt>.
- Korhonen, Heidi M. E., Kaisa Still, Marko Seppänen, Miika Kumpulainen, Arho Suominen, and Katri Valkokari. 2017. "Start-Ups Innovating Digital Platforms: Towards Successful Interaction." *Proceedings of XXVII ISPIM Innovation Conference: Composing the Innovation Symphony*, June 18–21.
- Maher, Ahmed. 2015. "Uber Testing Cash Payment in Cairo." *Digital Boom*, December 14. <https://adigitalboom.com/uber-testing-cash-payment-in-cairo/>.
- Mason, C. M., and Jennifer Kwok. 2010. "Investment Readiness Programmes and Access to Finance: A Critical Review of Design Issues." *Local Economy* 25 (4): 269–292.
- Mathew, Shaji, and Thomas Seal. 2020. "Vodafone Ends Talks to Sell Egyptian Stake to Saudi Telecom." Bloomberg. December 21, 2020. <https://www.bloomberg.com/news/articles/2020-12-21/vodafone-ends-talks-on-sale-of-55-stake-in-egypt-unit?srnd=prognosis>.
- MCIT (Ministry of Communications and Information Technology). 2018. *ICT 2030 Strategy*. http://www.mcit.gov.eg/ICT_Strategy.

- MCIT (Ministry of Communications and Information Technology). 2019. *MCIT Yearbook 2019*. Cairo: MCIT. <https://mcit.gov.eg/Upcont/Documents/swf/Yearbook2019/340-341/index.html>.
- MCIT (Ministry of Communications and Information Technology). 2020. "ICT Sector Contributes EGP 93bn to GDP." News release, February. http://mcit.gov.eg/Upcont/MediaCenter/MCIT%20in%20Press25202000EN_ICT_Sector_Contributes_EGP_93bn_to_GDP.pdf.
- Mikhail, S. 2007. "Technical and Vocational Education: A North American Perspective." Paper presented to the Conference on Vocational and Technical Education, organized by the Turkish Council of Higher Education (YOK), January 15–17, Ankara.
- Morris, R., and L. Török. 2018. *Fostering Productive Entrepreneurship Communities: Key Lessons on Generating Jobs, Economic Growth, and Innovation*. New York: Endeavor Insight.
- NTRA (National Telecommunications Regulatory Authority). 2017. *Annual Report*.
- OECD (Organisation for Economic Co-operation and Development). 2008. "E-Procurement for Good Governance and Development in North Africa and Middle East." OECD, Paris.
- OECD (Organisation for Economic Co-operation and Development). 2014. *Recommendation of the OECD Council Concerning International Co-Operation on Competition Investigations and Proceedings*. Paris: OECD. <https://www.oecd.org/competition/international-coop-competition-2014-recommendation.htm#:~:text=On%2016%20September%202014%2C%20the,and%20from%20mergers%20with%20anticompetitive>.
- OECD (Organisation for Economic Co-operation and Development). 2015. *Schools for Skills: A New Learning Agenda for Egypt*. Paris: OECD.
- OECD (Organisation for Economic Co-operation and Development). 2019. "OECD Regulatory Effectiveness in the Era of Digitalization." <https://www.oecd.org/gov/regulatory-policy/Regulatory-effectiveness-in-the-era-of-digitalisation.pdf>.
- Opiah, Abigail. 2020. "Orange Egypt Picked to Build \$135m Data Centre and Cloud Computing Platform." Broadgroup, January 14. <https://www.broad-group.com/data/news/documents/b1m08w7h4h8xwm>.
- Qasim, Qursum, Zoe Cordelia Lu, and Kalyah Alaina Ford. 2018. *An Operational Guide to Women's Entrepreneurship Programs in the World Bank*. Washington, DC: World Bank.
- PIRLS (Progress in International Reading Literacy Study). 2016. International Association for the Evaluation of Educational Achievement.
- Rahman, A. Forthcoming. "Investment Climate Analysis for a Productive Private Sector: Arab Republic of Egypt." World Bank, Washington, DC.
- Raul, Alan Charles. 2020. *Data Protection and Privacy*. London: Chambers and Partners.
- Schwab, Klaus, ed. 2018. *The Global Competitiveness Report 2018*. Geneva: World Economic Forum.
- Schwab, Klaus, ed. 2019. *The Global Competitiveness Report 2019*. Geneva: World Economic Forum.
- Shalakany. 2020. "The New Central Bank and Banking Sector Law." Shalakany newsletter, September 26. <http://www.shalakany.com/newsletter/the-new-central-bank-and-banking-sector-law/>.
- Talaat, Mohammad A. 2016. "Public Sector Information and Open Government Data." *Journal of Systems Integration* 7 (2).
- TE (Telecom Egypt). 2018. *Annual Report*.

- TE (Telecom Egypt). 2020. "Telecom Egypt Is Building Egypt's Largest International Data Center." News release, October 25. http://ircp.te.eg/IRMedia/Corporate_News/2020/Corporate_News87da7656-3e1c-4fc0-982c-72573be13219.pdf.
- Telecom Review*. 2020. "Telecom Egypt, AMS-IX Partner to Build an Internet Exchange in Cairo." November 11. <https://www.telecomreview.com/articles/telecom-operators/4280-telecom-egypt-ams-ix-partner-to-build-an-internet-exchange-in-cairo>.
- Teligen, Strategy Analytics. 2019. "Telecommunication Retail Price Benchmarking for Arab Countries 2019: Report from the AREGNET Price Benchmarking Study." <https://www.tra.org.bh/en/category/price-benchmarking>.
- TIMSS (Trends in International Mathematics and Science Study). 2015. "International Results in Mathematics and Science." International Association for the Evaluation of Educational Achievement.
- UNCTAD (United Nations Conference on Trade and Development). 2017. *ICT Policy Review: National E-Commerce Strategy for Egypt*. Geneva: United Nations.
- UNCTAD (United Nations Conference on Trade and Development). 2019. "UNCTAD B2C E-Commerce Index 2019." https://unctad.org/system/files/official-document/tn_unctad_ict4d14_en.pdf.
- UN DESA (United Nations Department of Economic and Social Affairs). 2020. *E-Government Survey 2020: Digital Government in the Decade of Action for Sustainable Development, with addendum on COVID-19 Response*. New York: United Nations. [https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2020-Survey/2020%20UN%20E-Government%20Survey%20\(Full%20Report\).pdf](https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2020-Survey/2020%20UN%20E-Government%20Survey%20(Full%20Report).pdf).
- World Bank. 2014. "Arab Republic of Egypt: More Jobs, Better Jobs: A Priority for Egypt." Washington, DC: World Bank.
- World Bank. 2016a. *Cash vs. Electronic Payments in Small Retailing: Estimating the Global Size*. Washington, DC: World Bank. <http://pubdocs.worldbank.org/en/219031465585757849/WBG-Electronic-Payments-Small-Retailing.pdf>.
- World Bank. 2016b. "Enterprise Surveys: What Businesses Experience—Egypt 2016 Country Profile." Washington, DC: World Bank. <https://www.enterprisesurveys.org/content/dam/enterprisesurveys/documents/country-profiles/Egypt-2016.pdf>.
- World Bank. 2017a. *Global Findex Survey*. Washington, DC: World Bank. <https://globalfindex.worldbank.org/>.
- World Bank. 2017b. "Women Entrepreneurship in Egypt: High-Growth Potential Start-Up Report." World Bank, Washington, DC.
- World Bank. 2017c. *Good Practices for Financial Consumer Protection, 2017 Edition*. Washington, DC: World Bank.
- World Bank. 2018a. *Information and Communications for Development 2018: Data-Driven Development*. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/30437>.
- World Bank. 2018b. *Global Findex Survey*. Washington, DC: World Bank. <https://globalfindex.worldbank.org/>.
- World Bank. 2018c. *Women Economic Entrepreneurship Study*. Gender assessment for the Arab Republic of Egypt. Washington, DC: World Bank.
- World Bank. 2019a. *The Digital Economy in South East Asia: Strengthening the Foundations for Future Growth*. Washington, DC: World Bank.

World Bank Group. 2019b. *Egypt, Arab Republic of—Performance and Learning Review of the Country Partnership Framework for the Period of FY15–FY19 (English)*. Washington, DC: World Bank Group. <http://documents.worldbank.org/curated/en/631951556806695755/Egypt-Arab-Republic-of-Performance-and-Learning-Review-of-the-Country-Partnership-Framework-for-the-Period-of-FY15-FY19>.

WEF (World Economic Forum). 2016. *The Global Information Technology Report 2016*. Geneva: WEF.

WEF (World Economic Forum). 2018. *The Arab World Competitiveness Report*. Geneva: WEF.

Appendix A. Legal and Regulatory Framework

Digital Infrastructure

The Telecommunications Regulation Law 10 of 2003 (Telecom Law) regulates the framework for licensing and access to telecommunications equipment and encryption. As its name indicates, the law regulates telecommunications; establishes a sector regulator; addresses the roles and responsibilities of service providers, operators, users, and security agencies; and establishes criminal offences.

The licensing regime under the Telecom Law is vague and discretionary, thus denying investors an objective basis on which to plan their investment timeline or risks. Under the Telecom Law, licensing is required for creating or operating a telecommunications network; providing telecommunications services; and passing international phone calls.¹⁰⁶ The law does not provide standard definitions for each licensed activity, and applicants must submit their proposed plan for the NTRA to determine whether a license can be granted. Other than for wireless equipment, the Telecom Law does not set out the rules and principles applying to the licensing scheme, the conditions or cost for obtaining a license, the period of a license, the reasons for rejection, or the possibility of judicial review.

Access to equipment and encryption is restricted and characterized by the need for extensive approvals. Import, manufacture, or assembly of telecommunications equipment is conditional upon obtaining a permit from the NTRA, and the NTRA itself needs prior consent from the Army, National Security, and Ministry of Interior.¹⁰⁷ The law prohibits the import of used telecommunication terminal equipment for trading purposes.¹⁰⁸ License for wireless equipment, installation, and operation is regulated by Law 66 of 1979, Regulating Certain Matters Pertaining to Wireless Telecommunications, complemented by MCIT Decree 258 of 2003, which gives the NTRA exclusive power to grant licenses for the possession, installation, operation, or use of wireless equipment, or use of frequencies or frequency bands.¹⁰⁹ The use of encryption equipment for telecommunications service operators, providers, their employees, and users requires authorization from the NTRA and the Army and National Security entities,¹¹⁰ with a penalty of imprisonment and up to EGP 100,000 in fines.¹¹¹

The sanction regime under the Telecom Law is vague and requires an update. The sanctions provided in the law are not sufficiently well defined or graded to reflect the different kinds of telecommunications offences that can be committed by actors of varying power and include long prison sentences. Moreover, there is significant overlap and conflict between these offences and those in the Cybercrime law.

Recommendations

Update and improve the Telecom Law, which has not been amended since its issuance in 2003 and which remains without executive regulations. The law should be amended to provide regulatory transparency and certainty to existing and future licensed operators' investments, regulate competitive

¹⁰⁶ Telecom Law 10 of 2003, Article 21.

¹⁰⁷ Telecom Law 10 of 2003, Article 44.

¹⁰⁸ Telecom Law 10 of 2003, Article 46.

¹⁰⁹ MCIT Decree 258 of 2003, Article 1.

¹¹⁰ Telecom Law 10 of 2003, Article 64 and MCIT Decree 165 of 2003, Art. 2 (18).

¹¹¹ Telecom Law 10 of 2003, Article 81.

markets, address treatment of dominance, permit the regulated use of encryption technologies, and limit surveillance and interception to defined cases of absolute necessity. The licensing scheme needs to be limited to cases such as the regulation of the frequency spectrum or the regulation of public works necessary to set up a telecommunications network and include a standard licensing scheme for all telecommunications activities. Also, restrictions on the import, manufacture, and commerce of communication equipment should be limited to setting the technical standards required to ensure an efficient operation of the networks.

Digital Platforms

Egypt has issued a number of laws to regulate digital platforms and ensure cyberspace safety. This began with the Law Protecting Intellectual Property Rights 82 of 2002; the E-Signature Law 15 of 2004; a number of laws in 2018 regulating cybercrime, media, and consumer protection; and finally, the law regulating data protection in July 2020.

The Law Protecting Intellectual Property Rights Law 82 of 2002 (IP Law) has failed to keep pace with emerging industry requirements. Egypt is signatory to several intellectual property conventions, and its IP Law is modeled on the then-current WIPO model, which protects most accepted forms of intellectual property. The MCIT established the Higher Committee for Intellectual Property Rights of Information and Communications Technology by virtue of Decree 58 of 2006. This committee is required to, among other things, participate in developing strategies to enforce the application of the IP Law in the ICT field; set standards for licensing all entities specializing in computer software and databases; develop solutions for intellectual property problems pertaining to ICT; and propose policies to digitize information, including digital libraries and cultural content.¹¹² Despite those efforts, and although the Egyptian government made intellectual property a priority in the mid-2000s to encourage investment, it has not kept pace with emerging industry requirements dictated by the internet.

The E-Signature Law is outdated and incomplete. In 2004, Egypt issued an e-signature law that established the Information Technology Industry Development Agency (ITIDA), providing it with the power to license companies to provide e-signature services.¹¹³ In 2006, ITIDA issued four licenses to provide e-signature services to Egyptian entities, but it has not licensed the world's most reputable providers of e-signature services, including DocuSign.¹¹⁴ The requirements for authenticating an e-signature are impractical, and, therefore, generally not used or recognized by the private sector. Revised executive regulations were issued in April 2020 (MCIT Decree 361 of 2020) that introduced the concepts of electronic seal, time stamp, and e-signature tool.¹¹⁵ The latter replaces the smart card in the repealed regulations. The new regulations cancelled outsourcing services for verifying e-signatures.¹¹⁶ They authorize ITIDA to provide a special permit to the government e-ratification body to carry out e-signature services for internal government affairs only. Nevertheless, the issuance of revised executive regulations does not negate the need to modernize the e-signature legal regime.

Cybercrime legislation is likely to be a significant barrier to investors in technology in Egypt and legally risky for both domestic and foreign investors. Cybercrimes are regulated under Law 175 of 2018, Combating of Information Technology Crimes (Cybercrime Law). The law became effective on August 15, 2019. The regulations were issued on August 27, 2020 by virtue of Prime Minister (PM) Decree 1699 of 2020.

¹¹² MCIT Decree 58 of 2006, Article 2.

¹¹³ E-Signature Law 15 of 2004, Article 4 (a).

¹¹⁴ Thebes Consultancy report on the Legal and Regulatory Framework for Digitizing the Egyptian Economy, <https://thebesconsult.com/services/regulatory-reform/>.

¹¹⁵ MCIT Decree 361 of 2020, Article 1 definitions.

¹¹⁶ Compare Article 8 of MCIT Decree 61 of 2020 to Article 7 (last paragraph) of MCIT repealed Decree 109 of 2005.

The law has far-reaching effects and applies to private individuals using social media, companies, public and private sector entities, any persons or companies in charge of websites or e-mail accounts), and service providers.¹¹⁷ The law has severe penalties that are not proportional to the nature of the offences; its financial crime provisions are vague and too broad to meaningfully address the sophisticated nature and variety of online fraud and forgery. The law has no privacy safeguards or due process guarantees for either users or service providers and does not address online intellectual property infringements. A total of 23 cybercrimes are punishable under the law, with fines between 10,000 and 10,000,000 Egyptian pounds, in addition to imprisonment. Finally, the Cybercrime Law has extraterritorial scope and can apply to non-Egyptians committing, outside Egypt, a crime that falls within the scope of the law in specific situations listed under Article 3. This extraterritoriality can result in blocking sites or websites hosted outside Egypt that are deemed to constitute threats inside Egypt. Finally, the executive regulations for the Cybercrime Law provide an extensive compliance list for service providers to ensure cybersafety and privacy,¹¹⁸ and provide the technical requirement for the admissibility of digital evidence before criminal courts.¹¹⁹

The Media Law is also heavy on regulating and penalizing websites and electronic media outlets and may deter market entry and business development. Law 180 of 2018, Regulating Journalism and Media and Establishing the Supreme Council for Media Regulation (Media Law), regulates electronic newspapers, media, print media, websites, commercial media, and advertising services.¹²⁰ It is complemented by the executive regulations issued by PM Decree 418 of 2020, and Decree 16 of 2019 by the Supreme Council for Media Regulation (SCMR). The media regulatory framework highly restricts freedom of expression and imposes considerable penalties and discretionary powers. For example, it requires SCMR approval for the creation of websites¹²¹ and a permit by those who engage in online promotion, marketing, or advertising.¹²² The law grants SCMR the power to take disciplinary measures against digital content outlets. These measures include blocking websites and personal pages; imposing fines and temporarily or permanently banning the broadcasting or publication of media content;¹²³ and revoking the media-outlet and website licenses if the licensee violates a material provision of the Media Law or does not practice its activity for one year following licensing.¹²⁴ The law provides for significant fines and prison sentences that range between EGP 50,000 and 3 million and between 1 to 5 years in prison.¹²⁵ SCMR's recent Decree 16 of 2019 brings more restrictions and holds media outlets, the press, and websites to a standard similar to that of a public servant. The violation of this standard triggers a warning, a mandatory apology, or a fine up to EGP 100,000.¹²⁶ The very broad definitions of electronic content under the Media Law can result in the extension of the SCMR Sanction Regulations beyond digital platforms that produce news content to include social media and sites that are owned by organizations and businesses. Furthermore, the Media Law holds websites and personal social media accounts with 5,000 followers or more to standards of liability and accuracy similar to public news outlets, which can have an overreaching effects given the number of accounts with thousands of followers who engage in non-media related activities.¹²⁷

Data Protection (DP) Law (Law 151 of 2020) offers guarantees on data protection, but it is premature to fully assess it. The long-awaited law on the protection of personal data was finally issued on July 13, 2020. It became effective on October 14, 2020. The executive regulations are expected by mid-April 2021. There is

¹¹⁷ Compare Article 8 of MCIT Decree 61 of 2020 to Article 7 (last paragraph) of MCIT repealed Decree 109 of 2005.

¹¹⁸ Decree 1699 of 2020, Articles 2, 3, and 11.

¹¹⁹ Decree 1699 of 2020, Articles 9 and 10.

¹²⁰ See definitions in Media Law 180 of 2018, Article 1.

¹²¹ Media Law 180 of 2018, Article 6.

¹²² Media Law 180 of 2018, Article 59.

¹²³ Media Law 18 of 2018, Article 94.

¹²⁴ Media Law 18 of 2018, Article 95.

¹²⁵ See Articles 101 to 110 of Media Law 180 of 2018.

¹²⁶ Decree 16 of 2019, Article 18.

¹²⁷ Media Law 180 of 2018, Article 19.

one-year transitional period from the date of issuance of the executive regulations to allow various entities to comply with the new obligations imposed by the law. The law is largely based on the provisions of the General Data Protection Regulation (GDPR), but unlike the GDPR, the law leaves many issues for the regulations. It is, therefore, too early to properly assess the extent of the digital data protection regime in Egypt.

The DP Law protects individuals' digital personal data but inexplicably excludes certain entities from its scope. The law aims to protect individuals' digital personal data (which are referred to by the law as "data subjects") that have been electronically processed either wholly or partly by any controller or processor.¹²⁸ The law defines personal and sensitive personal data.¹²⁹ The law excludes from its scope of application personal data used for personal purposes, official statistics, media, court proceedings, judicial investigation, national security, and the CBE and any of its supervised entities except money transfer and exchange companies.¹³⁰ The exclusion of media and the central bank is not justified and leads only to the fragmentation of the legal regime. In relation to courts, there should be detailed guidelines on specific data to be exempted from the law rather than a blanket exemption.

The DP Law introduces new business functions and obligations such as data controller and data processor.¹³¹ The DP Law imposes a number of obligations in relation to processing and controlling data such as appointing a data protection officer; obtaining licenses for data processing, data control, sensitive data, e-marketing, and cross-border transfer of data; maintaining the appropriate systems and controls for the protection of personal data privacy; notifying the Personal Data Protection Centre (PDPC) of breaches to personal data; obtaining licenses for foreign businesses that control or process data for individuals residing in Egypt; and appointing a local representative for ease of communication.¹³²

While the DP Law has taken the important measure of making the consent of data subjects mandatory, it requires a high application fee for data subjects to exercise their rights. Data subjects must explicitly consent to data collection, processing, and disclosure. They have the right to know what personal data is being processed by whom and access the same; to withdraw prior consent in respect to processing personal data; to correct, modify, delete, add, or update their personal data; to limit the scope of personal data processing; and to be notified of any personal data breaches. There is an application fee to exercise the data subject right (except for consent or knowledge of data breach) that can reach up to EGP 20,000.¹³³ This amount is excessive and will create financial discrimination between data subjects.

The DP Law covers direct electronic marketing and requires the data subject's consent, which consent can be withdrawn at any time through simple and clear opt-out mechanisms.¹³⁴

¹²⁸ Although it is not within the scope of this review, it is important to note that the law does not protect manually processed data, contrary to the EU General Data Protection Regulation

¹²⁹ Under the Data Protection Law 151 of 2020, Article 1 (Definitions), personal data is defined as "any data related to an identified natural person, or to a natural person identifiable, directly or indirectly, by reference to any other data, such as name, voice, picture, identification number, online identifier, or any data that identifies psychological, health, economic, cultural or social identity." Sensitive Personal Data is defined as "Data that discloses psychological, mental, physical or genetic health, biometric data, financial data, religious beliefs, political opinions or security situation; in all cases data related to children are deemed to be Sensitive Personal Data."

¹³⁰ Article 3 of Issuance Law.

¹³¹ Under the Data Protection Law 151 of 2020, Article 1 (Definitions), a controller "is a natural or legal person who, by virtue of their job or the nature thereof, has the right to obtain personal data and determine the methods and criteria for storing or processing it according to the specified objective or activity." Under the Data Protection Law 151 of 2020, Article 1 (Definitions), a processor "is a natural or legal person whose work is to process personal data either on their own behalf or for a controller in agreement with and according to the instructions of the Controller."

¹³² Data Protection Law 151 of 2020, Articles 4, 5, 7, 8.

¹³³ Data Protection Law 151 of 2020, Article 2.

¹³⁴ Data Protection Law 151 of 2020, Article 17.

Documentation related to the consent and any underlying changes must be kept for three years.¹³⁵ All entities are required to provide data on their identity, address, and clear purpose of the marketing communication.¹³⁶

The DP Law also regulates cross-border data transfer. Data can only be transferred for processing, storage, or participation to a country that offers at least an equivalent level of protection to that provided under Egyptian law, with further details to be provided in the executive regulations.¹³⁷ The law provides for exceptional cases to derogate from the above principle;¹³⁸ as well as the possibility for the regulator to authorize controllers and processors to provide personal data to counterparts outside of Egypt—the latter to be further clarified in executive regulations.¹³⁹

The DP Law creates the PDPC with extensive mandates. The PDPC will be a general economic authority under the MCIT minister with a separate legal personality. The PDPC has the general mandate of protecting personal data; regulating its processing and availability; developing and implementing the policies and strategies for personal data protection; issuing licenses, permits, approvals, and measures related to personal data protection; supervising entities falling under the DP Law; and regulating cross-border data transfer.¹⁴⁰ The PDPC is the competent authority to issue licenses and permits to controllers and processors in matters such as dealing with personal data; doing direct e-marketing; controlling and processing sensitive personal data; placing visual surveillance systems in public places; processing of data by associations, unions, and clubs; monitoring cross-border transfers of personal data.¹⁴¹ Controllers and processors may need to obtain multiple licenses or permits depending on the nature of the personal data.¹⁴² Decisions on requests for licenses and permits must be made within 90 days from the date of submitting a complete request.¹⁴³ The PDPC is also tasked with amending, and cancelling licenses and permits.¹⁴⁴ Details in relation to the different types of licenses, permits, and ratifications will be provided in the executive regulations. The fees for issuing a license are capped at EGP 2 million, and EGP 500,000 for the permit or ratification.¹⁴⁵

PDPC neutrality is questionable when compared with GDPR rules on the Supervisory Authority. The GDPR recommends the Supervisory Authority be appointed by the parliament, government, head of state, or an independent authority.¹⁴⁶ However, the PDPC is under the MCIT Minister. The GDPR requires members of such bodies to have qualifications, experience, and skills in the area of data protection.¹⁴⁷ The PDPC's board does not require specific subject matter knowledge for most of its members.¹⁴⁸

Licensing is questioned from two perspectives. First, and depending on how the regulations deal with it, licensing can become an avenue for red tape and excessive requirements that may discourage businesses from engaging in Egypt. In contrast, the GDPR encourages voluntary certification and data protection seals

¹³⁵ Data Protection Law 151 of 2020, Article 18.

¹³⁶ Data Protection Law 151 of 2020, Article 17 and 18.

¹³⁷ Data Protection Law 151 of 2020, Article 14.

¹³⁸ Data Protection Law 151 of 2020, Article 15. Those cases are: “(1) life preservation of the data subject, provision or management of medical care or treatment; (2) implementing obligations to ensure that a right is established, exercised before justice bodies, or defended; (3) concluding or implementing an already-concluded contract between the processor and third parties that is in the interest of the data subject; (4) implementing an action relating to international judicial cooperation; (5) a legal necessity or obligation to protect public interest; (6) cash transfers to another country in accordance with its legislation; and (7) transfer or circulation is in implementation of an international bilateral or multilateral agreement to which Egypt is a party.”

¹³⁹ Data Protection Law 151 of 2020, Article 16.

¹⁴⁰ Data Protection Law 151 of 2020, Article 19.

¹⁴¹ Data Protection Law 151 of 2020, Article 26.

¹⁴² Data Protection Law 151 of 2020, Article 27.

¹⁴³ Data Protection Law 151 of 2020, Article 27.

¹⁴⁴ Data Protection Law 151 of 2020, Article 29 and Article 28, respectively.

¹⁴⁵ Data Protection Law 151 of 2020, Article 26.

¹⁴⁶ GDPR, Article 53.

¹⁴⁷ GDPR, Article 53.

¹⁴⁸ Data Protection Law 151 of 2020, Article 20.

to allow data subjects to assess the level of data protection of relevant products and services. Second, it is not advisable to combine licensing with regulating under the PDPC both to ensure neutrality and to avoid adding to the PDPC's already extensive mandates and straining its resources.

The DP Law provides for a variety of criminal offenses and unwarranted prison sentences. The range of penalties includes fines between EGP 100,000 and EGP 5 million and imprisonment between three and six months. While, the fines are reasonable, the imprisonment is not justified. Additionally, some of the offenses are vague and can open the door for abuse. Below is a summary of offenses and penalties under the DP Law.

- Collecting, processing, disclosing, providing access to, or circulating personal data, by any means, other than with the consent of the data subject or as otherwise permitted by law (fine between EGP 100,000 and EGP 1 million, with more severe penalties if the act was committed to obtain a benefit).¹⁴⁹
- Preventing a data subject from exercising his or her rights under the law (fine between EGP 100,000 and EGP 1 million).¹⁵⁰
- Collecting personal data other than in accordance with the Personal Data Protection Law (fine between EGP 200,000 and EGP 2 million).¹⁵¹
- Failure by a data controller or data processor to comply with specific obligations and notification and reporting requirements under the DP Law (fine between EGP 300,000 and EGP 3 million).¹⁵²
- Failure to comply with the provisions of Article 8 of the law (which covers failure to appoint a data protection officer), penalized by a fine between EGP 200,000 and EGP 2 million.¹⁵³ This offense is particularly vague.
- Failure by a data protection officer to perform duties as specified in the PD Law (fine between EGP 200,000 and EGP 2,000,000).¹⁵⁴ There is another vague offense for crimes committed due to the negligence of the data protection officer.¹⁵⁵
- Collecting, processing, disclosing, providing access to, or circulating sensitive personal data (imprisonment for no less than 3 months and/or a fine between EGP 500,000 and EGP 5 million).¹⁵⁶
- Violating cross-border data transfer rules (imprisonment of no less than 3 months and/or fine between EGP 500,000 and EGP 5 million).¹⁵⁷
- Failure to comply with digital marketing requirements under the law (fine between EGP 200,000 and EGP 2 million).¹⁵⁸
- Violation by the PDPC members of any rules under Article 24 of the law (fine between EGP 500,000 and EGP 5,000,000).¹⁵⁹
- Violation of the licenses, permits, and ratifications conditions (fine between EGP 500,00 and EGP 5 million):¹⁶⁰ a catch-all penalty.
- Impeding employees with judicial investigation authority from performing their duties (imprisonment for no less than six months and/or fine between EGP 200,000 and EGP 2 million).¹⁶¹

¹⁴⁹ Data Protection Law 151 of 2020, Article 36.

¹⁵⁰ Data Protection Law 151 of 2020, Article 37.

¹⁵¹ Data Protection Law 151 of 2020, Article 37.

¹⁵² Data Protection Law 151 of 2020, Article 38.

¹⁵³ Data Protection Law 151 of 2020, Article 39.

¹⁵⁴ Data Protection Law 151 of 2020, Article 40.

¹⁵⁵ Data Protection Law 151 of 2020, Article 40.

¹⁵⁶ Data Protection Law 151 of 2020, Article 41.

¹⁵⁷ Data Protection Law 151 of 2020, Article 42.

¹⁵⁸ Data Protection Law 151 of 2020, Article 43.

¹⁵⁹ Data Protection Law 151 of 2020, Article 44.

¹⁶⁰ Data Protection Law 151 of 2020, Article 45.

¹⁶¹ Data Protection Law 151 of 2020, Article 46.

The new Consumer Protection Law 181 of 2018 (CP Law) introduces the concept of remote contracting. Under the CP Law, remote contracting is defined as “the offer, sale or purchase of goods and services via the internet, or any other means of audio, visual or written communications, including via telephone or any other method.”¹⁶² The CP Law mandates the supplier provide explicit and clear information to enable the consumer to make an informed choice; clarifies the modalities of contract conclusion, rectification, and revision, and details the obligations and rights on delivery, receipt, and return of the goods. The CP Law allows for invoices to be issued electronically; acknowledges the evidentiary value of electronic communication; and allows online filing of complaints to the Egyptian Consumer Protection Agency.

Certain exclusions from the scope of remote contracting could lead to further fragmentation of the legal regime. The section in the CP Law dealing with remote contracting does not cover banking and financial services, capital market services, newspaper and periodical subscriptions, and booking services for transportation and hotels. The exclusion of newspapers and flight and hotel bookings are not justifiable from the standpoint of providing consumers with a simplified and streamlined procedure to know their rights and file complaints.

The chapter on remote contracting could create practical problems for international transactions. Certain provisions clash with the nature of international transactions, such as requiring the presence of certain information on Egyptian standards in Arabic and the application of guarantees and warranties under the CP Law, which may deter online suppliers and vendors from doing transactions in Egypt. The same concern applies for online advertisement where online advertisers would be liable for the accuracy of information, which, in reality, is hard to enforce for platforms such as Amazon or Facebook but could open the door for arbitrary enforcement.

Recommendations

The following is suggested to improve the role of intellectual property in protecting internet users. Sign and adopt the WIPO Internet Treaties, the Singapore Treaty on the Law of Trademarks, and the Patent Law Treaty; amend the Commercial Code section (promulgated by Law No 17 of 1999) on technology transfer agreements to eliminate domestic hiring and local dispute resolution requirements to encourage intellectual property licensing; adopt frameworks that promote cooperative action against piracy of online content or software; pass separate digital rights management legislation to control or prevent digital copies from being shared over computer networks or telecommunications networks; adopt legal measures that provide necessary exclusive rights that prevent infringement of copyrights and related rights (including Web hosting, streaming, and linking); make available injunctive relief and disabling of infringing content online; and recognize intellectual property as an economic asset.¹⁶³

Amend the E-signature Law to allow for issuance of licenses to international e-signature providers and reduce authentication requirements.

Remove excessive penalties in the Cybercrime Law and align it with the Budapest Convention on Cybercrime.

¹⁶² Consumer Protection Law 181 of 2018, Article 1.8.

¹⁶³ Thebes Consultancy report on the Legal and Regulatory Framework for Digitizing the Egyptian Economy, <https://thebesconsult.com/services/regulatory-reform/>.

Amend the Media Law and SCMR regulations to ease requirements of registration, remove the excessive punishable acts and exorbitant offenses and limit its provisions to media-related outlets rather than include social and commercial activities.

Reduce the scope of the PDPC and create streamlined and clear licensing processes akin to certifications under the GDPR. Remove prison sentences in the DP Law.

Further modernize the new CP Law by regulating the international online contracting dimension to encourage international online commerce in Egypt and streamlining consumer protection by making CPA the coordinating authority for all consumer-related issues except for banking and financial instruments. In addition, the relevant OECD Recommendations on Consumer Protection in E-Commerce (2016) should be adopted in relation to, among others, offering free services in exchange for consumer data; allowing new payment mechanisms such as services being charged onto mobile phone bills; cooperating internationally on consumer safety; protecting persons with disabilities; addressing the product safety issues raised by ordering goods internationally, and regulating the liabilities of platforms that facilitate consumer-to-consumer transactions.

Enhance the regulatory framework for e-commerce. Although it is not necessary to have a law that tackles e-commerce, it is highly recommended that all laws and decrees that may impact e-commerce be reviewed in light of the special nature of e-commerce. This includes, in particular, dispute resolution for online transactions, consumer protections, and e-signatures.

Digital Financial Services

Despite not having an explicit mandate on electronic or mobile payment methods under the former banking law,¹⁶⁴ the CBE has been proactive in aligning with market dynamics in relation to electronic, mobile payments and prepaid cards.¹⁶⁵

- For e-payments, the CBE requires banks to obtain licenses to provide e-payment services to their customers. E-payments are divided into electronic banking transactions (essentially online banking) and issuance of electronic payment devices (such as stored value cards, smart cards, debit cards, and credit cards). The CBE determines the associated risks and provides guidance on how to deal with those.
- For mobile payments, the CBE indicates the risks associated with mobile payments, including cybersecurity, consumer protection, terrorism funding, and monitoring of fraudulent activities. Banks can employ agents in different activities to act as a link to the customers.
- Finally, in prepaid cards, the CBE identifies the different types of prepaid cards and indicates procedures for risk management, licensing procedures for issuing banks, rules on anti-money-laundering and combating terrorist financing, procedures for consumer security, and rules on payments through prepaid cards. The CBE allows outsourcing to external parties, including microfinance institutions, in relation to the provision of the prepaid card services itself.

The Financial Regulatory Authority (FRA) regulates the microfinance electronic payment system. The FRA issued decisions 3, 4, 156, and 157 in 2018 and decisions 8 and 9 in 2019 detailing the prerequisites and regulations for microfinance associations and companies to use electronic payment in funding and collection transactions. The decisions jointly lay out the requirements for obtaining the FRA's approval to use e-payment systems in microfinance transactions; the technical standards; data protection; and the relationship

¹⁶⁴ CBE Law 88 of 2003 grants in Article 6 the authority for CBE to take any measures required to implement monetary, banking, and credit policies and supervision of the banking sector.

¹⁶⁵ CBE regulations: <https://www.cbe.org.eg/en/PaymentSystems/Pages/Regulations.aspx>.

among microfinance institutions, their clients, and e-payment service providers. Microfinance institutions must secure clients' approval ahead of time, inform them of their rights and obligations and how to file complaints and, provide a copy of the instructions for using such systems.

The FRA allows electronic issuance and payment of insurance policies premiums. FRA Board Decision 122 of 2015 authorizes licensed insurance companies to issue standard insurance policies electronically, provided they comply with the provisions of the decision and obtain prior approval from the FRA.¹⁶⁶ The decision also allows for the e-payment of insurance premiums through direct debit from bank accounts, banking credit cards, and other methods approved by the CBE.¹⁶⁷ This decision was amended three times subsequently, the most relevant of which is the addition of microfinance insurance premiums to the list of insurance premiums that can be issued electronically.¹⁶⁸

The FRA authorizes e-payment companies to collect premiums for compulsory insurance. The FRA's Board allows e-payment companies to collect premiums of compulsory insurance by virtue of its Decision 27 of 2019. The decision sets the conditions, rules, and requirements for the operation of said companies and their registration with the FRA in a dedicated register. The decision requires a robust and continuously upgraded technological infrastructure for registration with the FRA and imposes a duty of data protection.¹⁶⁹ The decision was amended shortly thereafter (Decision 46bis of 2019) to remove the condition that e-payment companies must have the sole objective of collecting premiums. This amendment was important as the original decision made it unclear whether the FRA intended the creation of a new type of company or authorized a new type of activity for an already existing class of companies.

The FRA enables microfinance prepaid cards. FRA Decision 87 of 2019 enables companies, NGOs, and associations licensed to undertake microfinance activities (collectively, microfinance institutions) to become payment service providers (PSPs) to banks as part of the latter's provision of prepaid card services. In summary, the decision reiterates the services that microfinance institutions can provide as PSPs for their microfinance consumers and provides the requirements for obtaining approvals to undertake prepaid card PSP services¹⁷⁰ and includes the Post-Approval Regulations for Microfinance Institutions Qua PSPs.¹⁷¹

The Consumer Finance Law 18 of 2020 enshrines payments through nonbanking commercial cards and other methods approved by CBE. Consumer finance is regulated under Law 18 of 2020, which fills an important legislative gap where consumer finance was already widespread without a legal or regulatory framework. Under the law, consumer finance is defined as activities aimed at providing financial facilities for the acquisition by consumers of good and services through nonbanking commercial cards and other methods approved by CBE.¹⁷² In terms of scope, all consumer finance activities are subject to the law, except for (a) consumer finance activities practiced by banks; (b) financing that falls under the laws for real estate

¹⁶⁶ FRA Board Decision 122 of 2015, Article 1.

¹⁶⁷ FRA Board Decision 122 of 2015, Article 4.

¹⁶⁸ FRA Board Decisions 121 of 2016 (adding microfinance), 79 of 2017, and 145 of 2018.

¹⁶⁹ FRA Board Decision 27 of 2019, Article 4.

¹⁷⁰ To obtain the FRA's approval (or the approval of the Supervisory Unit on Microfinance NGOs and Associations) for undertaking PSP services, an application must be submitted, along with a specified fee of EGP 5,000 for microfinance companies or EGP 3,000 for microfinance NGOs and associations. Certain prerequisites must be met, including the timely submission of periodic and annual financial statements; the regular submission of periodic supervisory reports; and compliance with regulatory observations resulting from field or office inspections. The FRA or the Supervisory Unit is to decide on applications within five working days.

¹⁷¹ Microfinance institutions must submit a copy of the contract signed with the banks to the FRA or the Supervisory Unit, as well as all requested information or special reports concerning the PSP services rendered to the FRA or the Supervisory Unit. Reports must be maintained for at least a year after the end of transactions or until the issuance of a final judgment in case of judicial proceedings related to these documents. Amendments to the contracts with the banks must be reported to the FRA or the Supervisory Unit within 15 days of the date of the amendment.

¹⁷² Law 18 of 2020, Article 10.

financing, financial leasing, factoring, or microfinancing; and (c) financing the purchase of real estate from real estate developers.¹⁷³ The relevant aspects of the law include the following:

- Enshrining the payment through nonbanking commercial cards and other methods approved by CBE.¹⁷⁴
- Requiring financing companies to have the technological and ICT infrastructure to conduct financial consumer activities.¹⁷⁵
- Requiring consumers to approve in their contract with financing companies the disclosure of the information of the financing to the FRA or credit inquiry agencies. But otherwise there is a duty to maintain the confidentiality of client data.¹⁷⁶
- Establishing the Egyptian Federation of Entities working in consumer finance, which has the mandate, among others to provide opinion on related legislation.¹⁷⁷

The Electronic Registry for Movable Guarantees allows electronic registration for movable assets guarantees. The Guarantees Over Movable Assets Law 115 of 2015 provides for the establishment of an e-registry for movable asset guarantees to ensure that those guarantees are registered, perfected, and executed in a manner that is electronic, speedy, inexpensive, accessible, and transparent.¹⁷⁸ The e-registry was established on March 11, 2018. Most important, the Movable Guarantees Law requires all submissions of applications and supporting documents to take place electronically.¹⁷⁹

The new Banking Law 194 of 2020 includes a chapter on fintech and other electronic aspects of banking. A new banking law was issued in September 2020 that provides explicit powers to the CBE to regulate and supervise banks and regulate and oversee PSPs and payment service operators. It also includes a section on fintech in which the CBE is authorized to introduce fintech-related rules and regulate the terms of granting fintech licenses or any exemptions from them (Shalakany 2020). The new law is also viewed as a complete reshuffle of the regulation of the payment ecosystem by extending the CBE's powers to regulate various players in the digital payment field and impose direct licensing duties on them (Shalakany 2020). The law provides the CBE with the power to issue regulations on electronic confirmation, terms and conditions, and electronic payment orders, which will have the same evidentiary power as paper documents if stored pursuant to CBE regulations in this regard (Shalakany 2020).

On the government's side, a number of regulations and decisions were issued for the cashless transformation. The prime minister ordered a transition to cashless payments of government salaries in 2017. By virtue of Decree 123 of 2017, the prime minister mandated the transition to cashless payments (through ATMs) of all state employees' dues by April 2017.

The National Council for Payments was established to orchestrate the cashless transition. On February 13, 2017, the president issued Decree 89 of 2017 establishing the National Council for Payments to oversee the transformation towards a cashless economy. The council is chaired by the president and composed of 16 members, including the prime minister, the CBE governor, the FRA chairman, the Minister of Defense, the minister of Interior, and the head of the General Intelligence Service. The council is entrusted with reducing the use of cash while promoting the use of electronic means of payment; developing the national payment systems and the needed supervisory framework; ensuring financial inclusion for the largest number of citizens and businesses in the banking system while decreasing the cost of transferring money and increasing

¹⁷³ Article 3 of issuing law of law 18 of 2020.

¹⁷⁴ See Consumer Finance Law 18 of 2020, article 1 (definition).

¹⁷⁵ Consumer Finance Law 18 of 2020, Articles 9(5) and 14(4) and FRA Decree 56 of 2020.

¹⁷⁶ Consumer Finance Law 18 of 2020, Article 5.

¹⁷⁷ Consumer Finance Law 18 of 2020, Article 17.

¹⁷⁸ Consumer Finance Law 115 of 2015, Article 4.

¹⁷⁹ Movable Guarantees Law 115 of 2015, Article 6.

tax revenue; protecting the rights of users of electronic payment systems; and finally, ensuring competitiveness between and supervision of electronic payment services providers. The council is authorized to issue any decisions necessary to set out the general framework for the operation and supervision of national payment systems as well as the required legal framework.

The Ministry of Finance issued Decree 269 of 2018 for the collection of government dues through the e-payment and collection system. The Ministry of Finance issued the ambitious Decree 269 of 2018 (July 2, 2018) requiring the electronic payment of all government dues according to the financial thresholds in table 13:

Table 13. Financial Thresholds of Government Payments Requiring Electronic Payment

Financial thresholds	Payment type	Notes
Above EGP 100,000	Electronic	
Between EGP 5,000 and 100,000	Check	To transition as of January 2019 to mandatory e-payment.
EGP 5,000 and below	Cash	

In case of failure to pay electronically, the payee must pay 10 percent (cap EGP 10,000) over the payable amount to cover the cost the state will incur as a result of such failure.

Decree 269 of 2018 proved to be too ambitious in practice and was amended several times. Decree 760 of 2018 postponed the mandatory transition to e-payment for amounts under EGP 100,000 to May 2019 while allowing cash collection of amounts under EGP 500. Decree 760 enables the Minister of Finance to exempt certain agencies or receivables from the requirement of using the e-payment system if they lack the necessary mechanisms or procedures for electronic collection. Another amendment was introduced by Decree 305 of 2019, which provides a list of 15 government entities and collectibles to be temporarily exempted from the usage of the e-payment system, and an exemption from the application of the 10 percent fine of the cash value for failure to make electronic payment, in cases where it is not possible to use the ministry's e-payment system. Further changes were introduced by Decrees 312 of 2019,¹⁸⁰ 105 of 2020,¹⁸¹ 149 of 2020,¹⁸² and 229 of 2020.¹⁸³

On the cashless payments front, and following discussions extending over a year under the auspices of the council, on April 16, 2019, the Cashless Payments Law, 18 of 2019 was issued to regulate the usage of cashless payments¹⁸⁴ and identify the transactions subject to such payment,¹⁸⁵ all while leaving the financial threshold to regulations. The law has an ambitious application and sets fines for noncompliance, and provides for the possibility of establishing incentives encouraging cashless payment.¹⁸⁶ The law specifies a compliance period of six months from the effective date of its executive regulations, with

¹⁸⁰ Reduces the fine to 5 percent of the cash value (with a maximum of EGP 7,000 instead of the original 10,000) and extends the deadline for collecting fines to June 16, 2019.

¹⁸¹ Removes three entities from the exempted list and adds a subcategory to one of the collectibles.

¹⁸² Adds a subcategory to one of the exempted collectibles.

¹⁸³ Adds a subcategory to one of the exempted collectibles.

¹⁸⁴ Cashless payments are defined as any payment method that results in an addition of the banking account of the beneficiary, mobile payments, and any other method decided by the CBE governor (Cashless Payments Law 18 of 2019, Article 1).

¹⁸⁵ Cashless Payments Law 18 of 2019, Article 2, is on salaries and financial entitlements for both the state and private legal entities. Article 3 is on payments by the state. Article 4 is on collections by the state. Articles 3 and 4 are on authorizing the prime minister to add further categories for mandatory cashless payment.

¹⁸⁶ Cashless Payments Law 18 of 2019, Article 6.

the possibility of extension and exemptions by the prime minister upon presentation of the Minister of Finance and approval of the CBE and the cabinet. The regulations were issued on September 7, 2020.

Practically speaking, all public and private entities fall under the purview of the Cashless Payments Law. Entities that fall under this law are (a) government authorities and agencies; (b) public legal persons and corporations; (c) companies with the government as the sole or majority shareholder; (d) private legal persons and corporations.¹⁸⁷ The law also requires entities that provide public services or manage public facilities to allow cashless payments by users at no additional cost.¹⁸⁸ Additional fees may be charged if the provision of the service is accompanied by its delivery to the recipients.¹⁸⁹

Failure to observe the Cashless Payments Law results in fines collected to support the state's efforts to make cashless payments methods available. Failure to use cashless methods results in a fine of not less than 2 percent of the amount paid in cash and not exceeding 10 percent of its value, with a maximum amount of EGP 1 million.¹⁹⁰ Fines shall be collected in an account earmarked for the support of the state's efforts in making cashless payment methods available and raising citizens' awareness of such methods. The account shall be managed by the Ministry of Finance according to the guidelines in the executive regulations.¹⁹¹

The FRA issued a skeletal circular on cashless payments. Following the issuance of the Cashless Payments Law, the FRA published on May 26, 2019, circular 2 of 2019 on its website that mainly reiterates the Cashless Payments Law and aims to facilitate nonbanking financial institutions' transition to cashless payments.

The General Authority for Investment and Free Zones (GAFI) requires cashless payment for transactions with GAFI's Investor's Center. GAFI issued Decision 123 of 2019 requiring payments to be made either electronically or by check for transactions with its Investor Services Center starting February 20, 2019.

Recommendations

It is recommended that the government issue the relevant secondary regulations for payment systems and services and fintech-related matters under the new Banking Law.

Digital Entrepreneurship

To foster and encourage investment in technological activities, the Investment Law 72 of 2017 provides tech companies with a number of investment guarantees and general incentives.¹⁹² This covers, but is not limited to, fair and equitable treatment of both foreign and Egyptian investors;¹⁹³ nondiscrimination in relation to invested funds;¹⁹⁴ prohibition against nationalization;¹⁹⁵ restricted expropriation;¹⁹⁶ right to repatriate profits outside Egypt and to receive foreign funds;¹⁹⁷ and exemptions

¹⁸⁷ Cashless Payments Law 18 of 2019, Articles 2 and 3.

¹⁸⁸ Cashless Payments Law 18 of 2019, Article 4.

¹⁸⁹ Law 18 of 2019, Article 4.

¹⁹⁰ Law 18 of 2019, Article 7.

¹⁹¹ Law 18 of 2019, Article 9.

¹⁹² Law 72 of 2017, Article 9 and 11.

¹⁹³ Investment Law 72 of 2017, Article 3.

¹⁹⁴ Investment Law 72 of 2017, Article 3.

¹⁹⁵ Investment Law 72 of 2017, Article 4.

¹⁹⁶ Investment Law 72 of 2017, Article 4.

¹⁹⁷ Investment Law 72 of 2017, Article 6.

from certain taxes, registration fees for project's land, and application of a unified flat customs duty rate for machinery and equipment required to establish the investment project.¹⁹⁸

Tech companies may establish technology zones and benefit from certain tax exemptions and incentives. The Investment Law also provides for the establishment of technology zones, which are geographically bound areas established by prime ministerial decree and limited to technological activities defined under the law. All tools, equipment, and machines required to carry out the licensed activities of projects in all technology zones are exempt from taxes and customs duties. Projects in technology zones are also entitled to the special incentives granted to that sector.¹⁹⁹

However, there is no legal certainty as to whether tech companies are eligible to enjoy special incentives. According to the executive regulations of the Investment Law, the technology sector can enjoy special incentives if it meets a number of requirements.²⁰⁰ Companies meeting those requirements may also enjoy additional incentives.²⁰¹ However, the addition of the technology sector to the executive regulations is a matter of debate as it was added by the prime minister, while addition of sectors to enjoy special incentives is the exclusive right of the Higher Investment Council.²⁰²

To encourage innovation, the CBE took the important step of creating a fintech regulatory sandbox. Recognizing the need to improve and innovate its fintech solutions, the CBE published the framework of a fintech regulatory sandbox. The goal is to test new fintech products, services, and business models with actual consumers while maintaining certain safeguards and oversight through live, time-bound, limited-scale testing cycles. One of the objectives of this initiative is to review and test policy by identifying regulatory challenges and obstacles facing innovative fintech in Egypt, whether in terms of existing legislation or the lack thereof, and address them through an experimental, risk management methodology. This would allow for more innovation and assessment of the other temporarily eliminated legislation.

From a financing perspective, equity-based and lending-based crowdfunding is not permitted either under the framework of the Capital Markets Law 95 of 1992 or Law 146 of 1988 on Companies Working in the Field of Receiving Money Towards their Investment regarding the receipt of funds for their investment. Under the latter law, companies—other than those offering their shares to the public—are prohibited from receiving money from the public in any currency by any means in order to invest it or to use it to participate in any endeavor.

Protecting the freedom of competition and sanctioning antitrust practices is crucial to encouraging entrepreneurs. However, the competition legal framework of digital markets is scattered among different laws. Although the Egyptian Competition Authority (ECA) is the authority entrusted with ensuring freedom of competition by virtue of the Competition Law 3 of 2005, its mandate overlaps with other entities, such as

¹⁹⁸ Investment Law 72 of 2017, Article 10.

¹⁹⁹ Investment Law 72 of 2017, Article 32 and Articles 70 through 73 of the executive regulations.

²⁰⁰ Article 10 (last sentence) of the executive regulations to the Investment Law issued by PM Decree 2310 of 2017 that adds the technology sector to the list of activities enjoying special incentives. According to Law 72 of 2017, Article 12, these requirements include, but are not limited to, (a) having been established within the three years following the effective date of the executive regulations of the Investment Law (which can be extended for one more period) and (b) having new equipment and machines, which were not used in a company at the time of the issuance of the Investment Law.

²⁰¹ According to Investment Law 72 of 2017, Article 14, the cabinet may grant those additional incentives such as allocating land to some of the strategic activities free of charge, refunding 50 percent of the value of the land allocated for the industrial projects in case the production starts within two years from the land delivery date, and allowing the establishment of special customs offices dedicated to the project.

²⁰² Investment Law 72 of 2017, Article 11 (last sentence).

the NTRA, in relation to communication,²⁰³ the FRA in relation to consumer finance,²⁰⁴ and the CBE in relation to the banking sector.²⁰⁵

Additionally, ECA's mandate is limited and lacks essential measures to effectively address freedom of competition. ECA's mandate is criticized for regulating “monopolistic practices” rather than “monopolies” and for not imposing merger controls on large acquisitions, utilizing instead a notification process, whereby the ECA addresses potential anticompetitive effects *after* a transaction has been concluded. Additionally, ECA has no power to directly fine violators and must instead seek recourse to an economic court, which may issue large fines in proportion to the value of the transaction or arrangements.²⁰⁶ However, and within its limited powers, ECA has pursued various digital service providers and over-the-top applications operating in the Egyptian market and has issued a number of decisions that would appear to benefit Egyptian consumers.²⁰⁷

Recommendations

Update the competition framework to cover ex ante merger control and enable ECA to issue fines. ECA is also encouraged to adopt the 2014 OECD Recommendation concerning International Co-Operation on Competition Investigations and Proceedings (OECD 2014), to catch up with the international nature of internet-based services.²⁰⁸

ECA should be made the sole authority responsible for competition matters, while providing effective coordination mechanisms with other authorities such as the NTRA, the FRA, or the CBE.

Pass a law allowing investment-based crowdfunding platforms to be established in Egypt, to open up a new financing source for businesses that do not have access to bank and capital market finance.

Finally, provide legal certainty on the eligibility of the tech sector for special incentives.

Final Recommendations

As OECD puts it, digital regulation requires a “whole of government approach to rule making” that requires “increased dialogue and coherence among government bodies” (OECD 2019). Hence, overlapping functions between the different government players and the lack of coordination or involvement

²⁰³ Telecom Law 10 of 2003, Article 2.

²⁰⁴ Consumer Finance Law 18 of 2020, Article 19.

²⁰⁵ Banking Law 194 of 2020, Article 7.

²⁰⁶ Thebes Consultancy report on the Legal and Regulatory Framework for Digitizing the Egyptian Economy, <https://thebesconsult.com/services/regulatory-reform/>.

²⁰⁷ The report provides examples of

Bein Sports and FIFA (2014): ECA issued a number of decisions against FIFA and Bein sports for anticompetitive practices, finding that FIFA is in violation of Articles 7 and 8 of the Competition Law for granting exclusive license to Bein Sports to broadcast in Egypt, and against Bein for abusing that dominant position by raising prices and forcing customers to pay for multichannel subscriptions.

Uber and Careem (2018): ECA found that the merger acquisition by the ride-hailing company Uber of its regional rival Careem was bound to have an anticompetitive effect on the market, in violation of the Competition Law Article 6 (1)(a) and 6 (1)(d) and must be stopped. A settlement agreement was made with ECA, obliging the parties to maintain competition and keeping Careem's operations.

Delivery Hero, Otlob, and Glovo (2019): ECA issued two statements of infringement to on-demand online delivery companies Delivery Hero SE (investor in Otlob and Carriage) and Glovo, following Glovo's withdrawal from the Egyptian market. ECA found there was an illegal “market allocation” on the basis of geography and ordered Glovo to cease liquidation procedures in Egypt and for Delivery Hero to cease and desist from anticompetitive agreements. Subsequently, Glovo returned to the Egyptian market.

²⁰⁸ Thebes Consultancy report on the Legal and Regulatory Framework for Digitizing the Egyptian Economy, <https://thebesconsult.com/services/regulatory-reform/>.

in cross-sectional matters must become a thing of the past. To this end, the government is recommended to create a body with representatives from the public and private sector tasked with doing the following:

- Prepare a comprehensive legal strategy that takes into account the need for speed (not rush) and flexibility.
- Monitor the developments in the digital market to update the legal strategy accordingly.
- Establish a proper impact assessment for the legislation and take corrective action accordingly.
- Establish more regulatory sandboxes to test new solutions.
- Make available all digital legislation on its website for users' reference, together with an easy guide on how to comply and use the legislation.
- Streamline existing laws and regulations covering digital economy to eliminate overlap and address gaps.

Improve the existing dispute resolution mechanism in bodies involved in the digital economy. The entities discussed in previous sections have their internal dispute resolution mechanisms that, for the most part, consist of a committee to whom applicants must pay a certain fee for the issuance of a decision that can be reviewed by a court. It is suggested that alternative dispute resolution and online dispute resolution be introduced to reduce time and increase efficiency and certainty of decisions. A tracking mechanism of the type of complaints and resolutions is crucial to monitor the implementation of digitization efforts and ensure consistency to the extent possible.

Table 14. Legislation Related to the Digital Economy

Legislation	Topic
2020	
Law 194 of 2020	Issuing Central Bank and Banking Sector Law
PM Decree 1699 of 2020	Executive Regulations of Cybercrime Law
Law 18 of 2020	Consumer Finance
Law 151 of 2020	Privacy and Data Protection
MCIT Decree 361 of 2020	Revised Executive Regulations of e-signature law (Repeals Decree 109 of 2005)
ER PM Decree 418 of 2020 of Law 180 of 2018	Executive Regulations to Law on Journalism and Media and Establishing the Supreme Council of Media Regulation
MOF Decree 105 of 2020	Amending MOF Decree 305 of 2019 (itself amending Decree 269 of 2018)
MOF Decree 149 of 2020	Amending MOF Decree 305 of 2019 (itself amending Decree 269 of 2018)
MOF Decree 229 of 2020	Amending Decree 105 of 2020 (itself amending Decree 269 of 2018)
Financial Regulatory Authority Board of Directors Decision 56 of 2020	Related to Consumer Finance Law
Financial Regulatory Authority Board of Directors Decision 60 of 2020	Related to Consumer Finance Law
Financial Regulatory Authority Board of Directors Decision 61 of 2020	Related to Consumer Finance Law

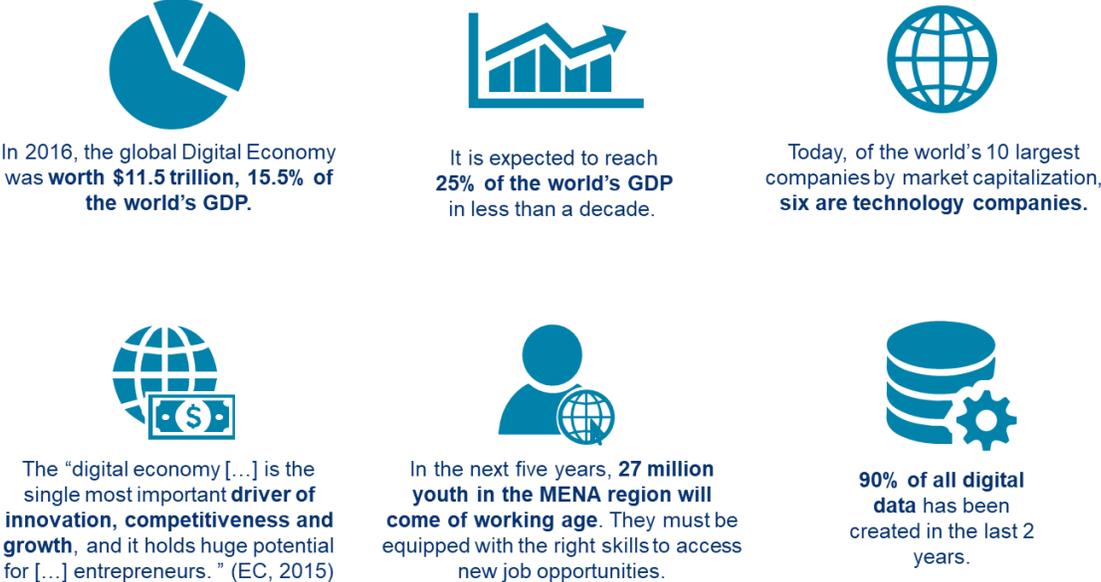
Legislation	Topic
Financial Regulatory Authority Board of Directors Decision 62 of 2020	Related to Consumer Finance Law
Financial Regulatory Authority Board of Directors Decision 63 of 2020	Related to Consumer Finance Law
Financial Regulatory Authority Board of Directors Decision 94 of 2020	Related to Consumer Finance Law
Financial Regulatory Authority Board of Directors Decision 100 of 2020	Related to Consumer Finance Law
Financial Regulatory Authority Chairman's Decision 457 of 2020	Related to Consumer Finance Law
2019	
Law 18 of 2019	Cashless Payments Law
Law 146 of 2019	Establishing e-registry with Economic Courts
PM Decree 822 of 2019	Executive Regulations of Consumer Protection Law 181 of 2018
PM Decree 1963 of 2019	Executive Regulations of National Media Authority Law 178 of 2018
MOF Decree 305 of 2019	Excluding some government entities and government dues of MOF Decree 269 of 2018
MOF Decree 312 of 2019	Amending MOF Decree 269 of 2018
Financial Regulatory Authority Decree 87 of 2019	Prepaid Cards Microfinance
Financial Regulatory Authority Decision 8 of 2019	Microfinance Electronic Payment System
Financial Regulatory Authority Decision 9 of 2019	Microfinance Electronic Payment System
Financial Regulatory Authority Circular 2 of 2019	Related to cashless payments
2018	
Law 175 of 2018	Combating of Information Technology Crimes (Cybercrime Law)
Law 178 of 2018	Law establishing the National Media Authority
Law 180 of 2018	Journalism and Media and Establishing the Supreme Council of Media Regulation
Law 181 of 2018	Consumer Protection
Presidential Decree 458 of 2018	Amendment to Presidential Decree 89 of 2017
MOF Decree 269 of 2018	Collection of government dues through e-payment system
MOF Decree 760 of 2018	Amending MOF Decree 269 of 2018
Supreme Council of Media Regulation Decree 16 of 2018	Sanctions
Financial Regulatory Authority Decision 3 of 2018	Microfinance Electronic Payment System
Financial Regulatory Authority Decision 4 of 2018	Microfinance Electronic Payment System
Financial Regulatory Authority Decision 145 of 2018	Electronically issued insurance policies
Financial Regulatory Authority Decision 156 of 2018	Microfinance Electronic Payment System

Legislation	Topic
Financial Regulatory Authority Decision 157 of 2018	Microfinance Electronic Payment System
2017	
Presidential Decree 89 of 2017	Establishing the National Council of Payments
PM Decree 123 of 2017	Mandating cashless payments of wages of state employees
Law 72 of 2017	Investment Law (incentives & tech zones)
Financial Regulatory Authority Decision 79 of 2017	Electronically issued insurance policies
2016	
Financial Regulatory Authority Decision 121 of 2016	Electronically issued insurance policies
2015	
Law 115 of 2015	The Guarantees Over Movable Assets Law (Electronic Registry of Movable Guarantees)
Financial Regulatory Authority Decision 122 of 2015	Electronically issued insurance policies
2010	
MOF Decree 531 of 2010	Electronic Payment of Government Dues in the Legal Inventory document
2006	
MCIT Decree 58 of 2006	Establishing IPR Unit in ITIDA
2005	
Law 3 of 2005	Competition Law (multiple amendments not mentioned in this doc)
Decree 109 of 2005	Related to E-Signature Law
2004	
Law 15 of 2004	E-signature and ITIDA
2003	
Communications Law 10 of 2003	Telecom, building and operation of infrastructure and provision of ICT services, licensing, access to equipment, and encryption
Decree 64 of 2003	Related to Communications Law 10 of 2003
Decree 258 of 2003	Related to Communications Law 10 of 2003
2002	
Law 82 of 2002	Intellectual Property

Note: ER = executive regulations; ICT = information and communication technologies; IPR = intellectual property rights; ITIDA = Information Technology Industry Development Agency; MCIT = Ministry of Communications and Information Technology; MOF = Ministry of Finance; PM = prime minister.

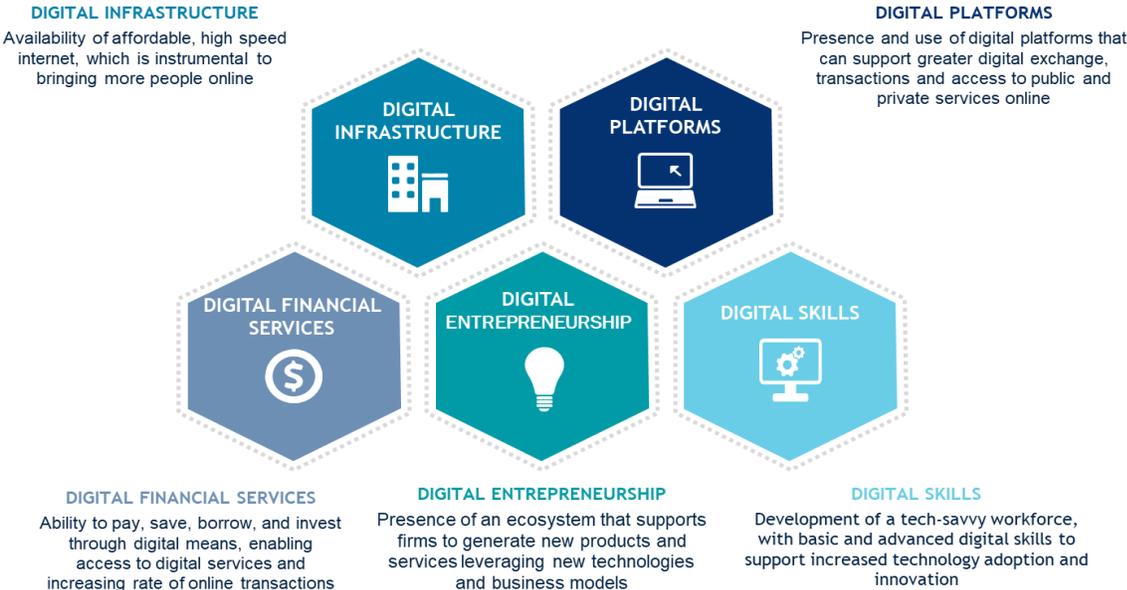
Appendix B. MNA Tech Benchmarks

Figure 42. Overview of the Digital Economy



Note: MENA = Middle East and North Africa.
 Source: World Bank MNA Tech analysis.

Figure 43. The Five Foundational Pillars of the Digital Economy



Source: World Bank analysis.

Figure 44. List and Source of Digital Indicators

Pillar 1: Digital Infrastructure	Indicators	Data source
	Mobile broadband capable market penetration	GSMA
Fixed broadband household penetration	TeleGeography	
Fiber to the Premises broadband penetration	TeleGeography	
Total used international bandwidth per internet user - Kbps	Analysis based on TeleGeography/World Bank	
% of population covered by 3G networks	GSMA Intelligence	
% of population covered by 4G networks	GSMA Intelligence	
Mobile broadband download speed (Mbit/s)	Ookla	
Fixed broadband download speed (Mbit/s)	Ookla	
Mobile broadband price - price of 1 GB % GNI per capita	World Bank research	
Entry level Fixed broadband basket price % of GDP per capita	World Bank research	
Mobile market concentration index (HHI index)	GSMA	
Fixed broadband concentration index (HHI Index)	TeleGeography	
% of government ownership in the mobile market and fixed markets	Digital development team	
% of government ownership in the Fixed market	Digital development team	
Does the country have a legal framework for data protection / privacy online?	UNCTAD Cyberlaw Tracker	
Does the country have a legal framework for cybercrime prevention?	UNCTAD Cyberlaw Tracker	

Pillar 2: Digital Platforms	Indicators	Data Source
	Under-5 birth registration rate	ID4D Indicators
National ID coverage (age 18 and above)	ID4D Indicators	
ID database digitized (Y/N) (data stored in electronic format)	ID4D Indicators	
Digital authentication enabled (Y/N)	ID4D Indicators	
e-government Index	UN e-government database	
Online Services Index	UN e-government database	
e-Participation Index	UN e-government database	
Share of population (age 15+) who cite lack of necessary documentation as a reason for not having a financial account (2017)	Global Findex, World Bank	
Percent of Population Having Mail Delivered at Home	UPU	
Percent of Income Linked to Parcels and Logistics Services	UPU	
Postal Reliability Index	UPU	
Percent of the Population Without Postal Services	UPU	
LPI International shipments score	Logistics Performance Index, World Bank	
LPI Logistics competence score	Logistics Performance Index, World Bank	
LPI Tracing & tracking score	Logistics Performance Index, World Bank	
LPI Timeliness score	Logistics Performance Index, World Bank	
Burden of customs procedures	World Economic Forum	
B2B Internet Use	The Networked Readiness Index Historical Dataset © 2012-2016 World Economic Forum	

	Indicators	Data Source
Pillar 3: Digital Financial Services	Debit card (% age 15+) [ts]	Global Findex, World Bank
	Debit card used in the past year (% age 15+) [w2]	Global Findex, World Bank
	Credit card (% age 15+) [ts]	Global Findex, World Bank
	Credit card used in the past year (% age 15+) [w2]	Global Findex, World Bank
	Cashless retail transactions per capita	Global Findex, World Bank
	Percentage of Adults having an Account at a financial institution (% age 15+)	Global Findex, World Bank
	Mobile money account (% age 15+)	Global Findex, World Bank
	Made digital payments in the past year (% age 15+)	Global Findex, World Bank
	Paid utility bills: using an account (% age 15+)	Global Findex, World Bank
	Does the country have a legal framework for electronic transactions/e-signature?	UNCTAD Cyberlaw Tracker
	Does the country have a legal framework for consumer protection when purchasing online?	UNCTAD Cyberlaw Tracker
	Pillar 4: Digital Entrepreneurship	Indicators
Number of deals		https://magnitt.com
Number of deals by industry/sector		https://magnitt.com
Value of disclosed funding by industry/sector		https://magnitt.com
Total disclosed funding		https://magnitt.com
Number of Startups		Pitchbook
Number of VC Investors		Pitchbook
Firm-level technology absorption	The Networked Readiness Index Historical Dataset © 2012-2016 World Economic Forum	
Pillar 5: Digital Skills	Indicators	Data Source
	Internet users (per 100 people)	ITU Database
	Active mobile social media penetration	Statista 2017: US Census Bureau, Facebook
	Active Social media users as % of population	Datareportal: press releases and investor earning announcements, MENA
	Mobile social media users as % of population	Datareportal: press releases and investor earning announcements, MENA
	Use of social networks	The Networked Readiness Index Historical Dataset © 2012-2016 World Economic Forum
	Digital talent as a share of total Full-time employees	McKinsey Digitization Index
	Percentage of graduates from Science, Technology, Engineering and Mathematics programmes in tertiary education, both sexes (%)	UNESCO Institute for Statistics
	Percentage of female graduates from Science, Technology, Engineering and Mathematics programmes in tertiary education, female (%)	UNESCO Institute for Statistics
Gross enrolment ratio, tertiary, both sexes (%)	UNESCO Institute for Statistics	

Source: World Bank analysis.

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