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Telecommunications Regulatory Authority
Kingdom of Bahrain - مملكة البحرين

Rethinking ICT regulation

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Regulators' essential role in capturing the full potential of the ICT sector

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The authors wish to recognize and thank the members of our expert panel — and others who did not wish to be cited — for their support, insight, and guidance in the preparation of this study. Our views were informed in debate and dialogue with the expert panel. The views of the expert panel should not be construed as representing the opinions of their organizations. The final views presented in this paper are those of the authors.

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Executive summary

In the seven years since we published our path-breaking study on regulation in the Middle East and North Africa (MENA) information, communications, and technology (ICT) sector,[1] much has changed in both the region and the industry. Today, MENA countries have far higher rates of ICT penetration and usage, with average mobile penetration exceeding 100 percent. Broadband household penetration in mature markets is approaching 100 percent and in the most mature markets is actually above that level. The telecom sector itself has undergone a fundamental transformation, evolving from a primary focus on infrastructure and basic connectivity to a focus on a broad range of services related to digitization — a phenomenon that we have defined as the mass adoption of connected digital services by consumers, enterprises, and governments. These services include cloud computing, smart meters, e-government, and remote health monitoring.

In light of the many changes in the MENA region's ICT sector, Strategy&, in collaboration with the Telecommunications Regulatory Authority, Bahrain, has updated its 2007 study. In this report we address three key questions:

1. How important is regulation in the new digital environment, which places greater emphasis on services than on infrastructure?

2. How should regulation evolve to suit the needs of the new digital environment?

3. Where do MENA countries currently stand in this evolutionary process, and what paths might they follow in the next decade?

The MENA region's evolving ICT sector

The MENA region's ICT industry has emerged as an important driver of national economic competitiveness. The ICT sector is a high priority in the MENA region. Several countries have identified ICT as a key driver of development and an enabler of future economic growth and diversification. Within the MENA region, most Gulf Cooperation Council (GCC)[2] governments regard ICT as one of the key components of their national development plans.

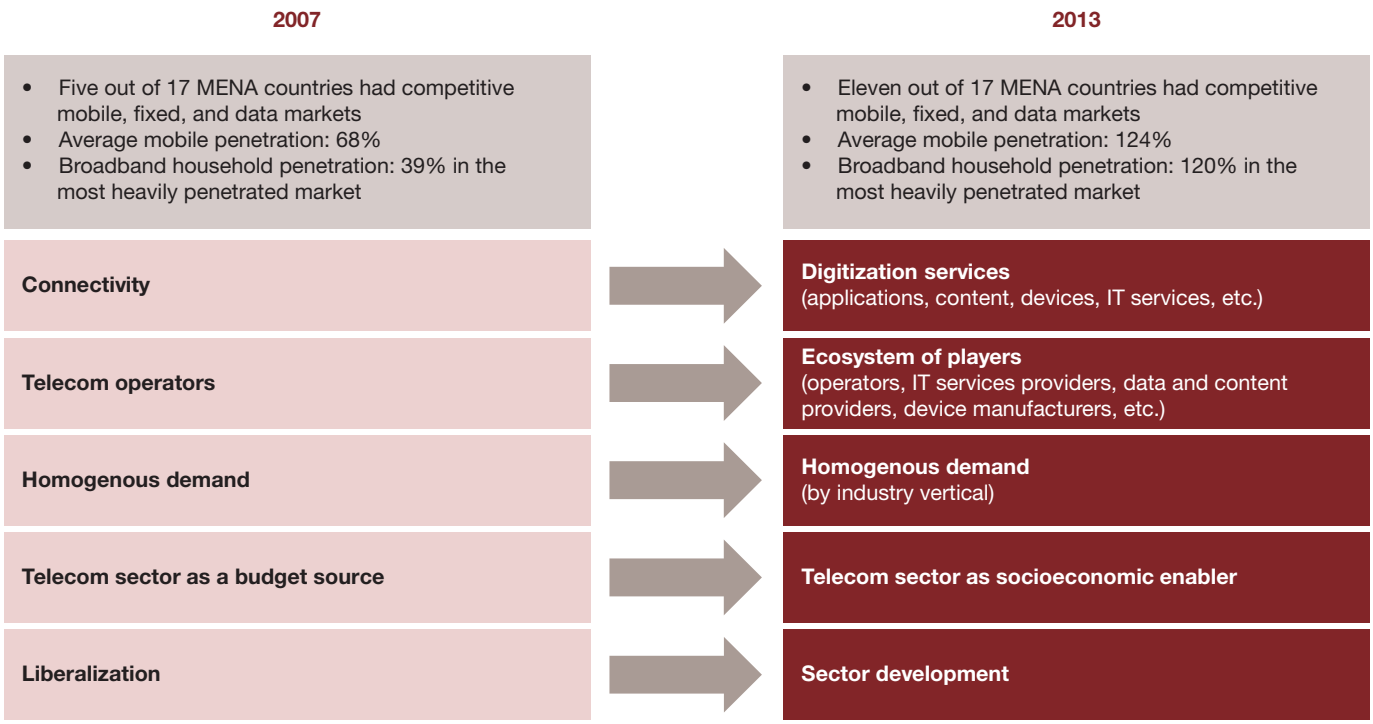
Furthermore, the ICT sector has become more diverse. Growth and innovation are fuelled by a complex ecosystem of stakeholders, including operators, over-the-top[3] providers, and device manufacturers — as opposed to licensed telecom players alone. In addition, policymakers and sector developers have shifted their focus from establishing a liberalized, competitive marketplace to developing an innovative and economically vibrant ICT sector.

The evolution of the MENA region's ICT sector is also being fuelled by burgeoning demand from the Arab Digital Generation (ADG), citizens between the ages of 15 and 35. The ADG accounts for 40 percent of the MENA population. A study that we conducted in 2012, in collaboration with Google, revealed that 83 percent of the members of this fast-emerging cohort use the Internet daily, and almost half of them strongly support a technology-led transformation of key economic sectors, including healthcare and education.[4] In short, now that connectivity is ubiquitous, demand is shifting to digitization services (*see Exhibit 1, page 6*).

Within the MENA region, most GCC governments regard ICT as one of the key components of their national development plans.

Exhibit 1

Evolution of the MENA region's ICT sector



Note: The 17 MENA countries are: Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, the Palestinian Territories, Oman, Qatar, Saudi Arabia, Syria, Tunisia, the United Arab Emirates, and Yemen.

Source: Informa; Strategy&

The changing need for regulation

In the last half-decade, the emphasis in the global ICT sector has shifted away from access, as measured by the adoption by consumers of traditional IT and telecom devices such as personal computers and telephones, to digitization. This transition toward digitization is very pronounced in the MENA region. Five years ago, broadband penetration in Saudi Arabia was less than 1 percent. Today, broadband is widespread in Saudi Arabia and the country has the highest YouTube usage per capita in the world and very high Twitter penetration. The United Arab Emirates has the highest penetration of smartphones per capita in the world, and Qatar has the world's highest growth rate for Facebook penetration. These high rates of digital device and service adoption are not restricted to the GCC countries: One-fifth of all Egyptians use Facebook, making Egypt one of the top 15 countries on the social network.

With ubiquity of access now accomplished and digitization the new order of the day, it is vital to determine whether and how the role of ICT regulation in the MENA region should change. To better understand the relationship between digitization and regulation, we used Strategy&'s Digitization Index, a global ranking database that calculates the level of a country's digitization using 23 indicators to measure six key attributes, to determine to what degree a nation's regulatory environment correlates with its overall digitization score in different stages of development.[5]

Our analysis reveals that the regulatory environment is a critical factor in evolutionary progress in the early stages of digitization. However, as the overall digitization score of a country rises — that is, as the country becomes more evolved digitally — the influence and effect of regulation lessens and other factors become more significant in the country's continued progress (*see Exhibit 2, page 8*).

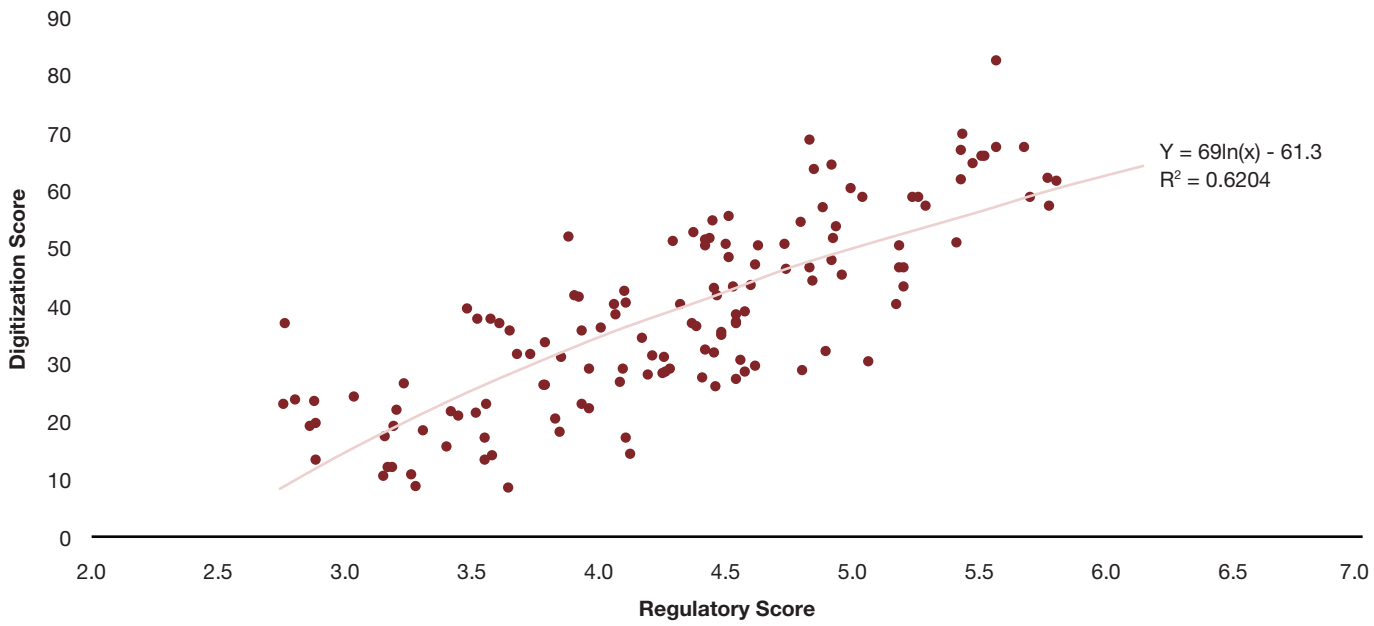
Although the correlation between regulation and digitization weakens as countries become more digitally evolved, the influence and effect of digitization on nations and their economies continues to be substantial. A 2013 South Asia–Middle East–North Africa (SAMENA) Telecommunications Council study found that digitization created 6.7

With ubiquity of access now accomplished and digitization the new order of the day, it is vital to determine whether and how the role of ICT regulation in the MENA region should change.

Exhibit 2

There is lower regulatory impact at higher levels of digitization

Relation Between Effective Regulation and Digitization in Selected Markets (Logarithmic Regression)



Note: Digitization Score is based on Strategy& Digitization Index; Regulatory Score is based on the World Economic Forum Networked Readiness Index's Political and Regulatory Score, Business and Innovation Score, and Affordability Score. As the slope of regression decreases and the digitization score increases, there is lower regulatory impact.

Source: World Economic Forum; Strategy&

million jobs in the MENA region and contributed US$631 billion to its overall GDP between 2005 and 2011. The study also found that despite these gains, the MENA region continues to lag behind other regions in its level of digitization (it ranks sixth out of seven regions in the world) and that accelerating digitization could add $1.4 trillion in economic value to the region by 2020.[6]

Regulation is one of three development levers available to governments to unlock this value, along with policymaking and sector development. Policymaking establishes the national vision and aspirations for a sector, whereas sector development provides the means for tactical market intervention. However, regulation is the critical enabler of efficient markets and consumer safeguards. Regulation protects broader national interests through three principal means:

- Market efficiency: Regulation ensures the sustainability of industry players and promotes market competition and efficiency.
- Scarcity management: Regulation manages access to, and the utilization of, sometimes-scarce national resources, such as spectrum in the ICT sector.
- Safeguarding customer welfare: Regulation protects customer rights and interests, and maximizes customer surplus.

Toward a next-generation regulatory regime

To provide recommendations as to how the regulatory regime needs to evolve, it is important to understand the three key questions that regulators ask to achieve the objectives outlined above (*see Exhibit 3, page 10*).

1. Which markets matter?

The most important question a regulator asks is which markets matter? Regulators identify the markets that might potentially fail and then regulate them. When a regulator deems a market to be important in this regard, it applies market assessment tools to test for the dominance of players within that market, examines what can be done to enhance the level of competition inside it, and looks at how consumer interests can be further safeguarded in the market. Hence most regulatory tools and remedies are derived from understanding and adopting a definition of which markets matter.

Historically regulators have been very good at defining markets that matter, evolving from legacy views of voice-centric markets (local voice, international voice, interconnection) to data markets (last mile access,

Exhibit 3
Critical ICT regulatory dimensions

Next-Generation Regulation Framework

		What is it?
Market efficiency	Market definition	• Which markets should regulators monitor to ensure efficiency and prevent failures?
	Supply models	• How should supply models in each of these markets be structured: integrated or layered?
	Supplier quality	• To what extent should the supplier quality be dictated for origin, fragmentation, and reliability?
Scarcity management	Spectrum supply	• What is the state of spectrum supply in the market?
	Spectrum use	• What are the limitations on spectrum usage: harmonized or liberalized?
Consumer welfare	Adoption	• What measures drive the adoption of services by the end user?
	Security	• What is the extent of security measures in these services, for the supply side and the demand side?
	Privacy	• How is consumer privacy being protected across these services?
	Environment	• What environmental protection measures are being taken by regulators, e.g., green technology?

Source: Strategy&

international access). However, in an environment in which most telecom markets are increasingly commoditized, or soon to be commoditized, regulators need to revisit their definitions of which markets matter.[7]

Broadly regulators have three choices. First, they can continue to see their scope and mandate limited to ensuring efficient telecommunication markets. Second, they can adopt a horizontal view of the ICT sector, which involves looking at other aspects of the ICT sector's supply side that they may deem to be important, such as the cloud computing services market. Third, they can adopt a vertical view of the ICT sector, which seeks to address market failures at the intersection of the overall economy and the ICT industry, such as the mobile payments market or the mobile health market.

Once regulators have aligned on which markets matter, the next set of questions focuses on the philosophy of how to supply these markets in terms of market structure and supplier quality. Historically regulators have preferred integrated suppliers in these markets, expecting telecom operators to play both in the services and infrastructure spaces. However, markets are becoming increasingly fragmented and new types of players are emerging. Consequently, it is important to review previous attitudes to market structure and to prefer de-layered markets (such as by separating applications, infrastructure, and services). Finally, regulators are increasingly playing a key role in ensuring supplier quality in these markets. They are balancing national interests with consumer safeguards. Most emerging economies are seeing the emergence of undercapitalized, sub-scale telecom operators in traditional telecom markets that do not have the ability to invest, but still hold scarce national resources such as parts of the spectrum. These operators continue to exert pricing pressure in the market, putting the entire national ICT sector at risk.

2. How is scarcity managed?

Closely tied to the first question of which markets matter is that of how to most effectively allocate scarce national resources to drive market efficiency. Previously, this question centered on spectrum supply. Given the growth of the mobile market, the spectrum continues to be a scarce national commodity. Two key questions emerge when discussing spectrum allocation: How much of the spectrum should the government release for the public good, and how can the government control the use of the parts of the spectrum that it releases?

In a bandwidth-hungry world, governments are moving to release more and more of the spectrum from services such as broadcast or government communication services. At the same time they are increasing availability in the unlicensed band. The growing demand for larger bands by service providers is driving the need for a secondary spectrum market, in which the spectrum can be traded between parties without, or with very limited, state involvement.

3. How is consumer welfare measured?

As consumer adoption and usage of connected ICT services grows exponentially, the previous focus of regulators on using price as a key barometer of consumer welfare appears misplaced. Their attention needs to shift away from pricing levers alone to include other metrics surrounding the quality of service received by the customer. For example, how can consumer data privacy be protected while enabling market innovation; how can consumer data and connected behavior be kept safe; and how is the environment being protected in a world where the number of connected devices could reach 50 billion by 2020?

Most emerging economies are seeing the emergence of undercapitalized, sub-scale telecom operators in traditional telecom markets.

Take the example of no charge Wi-Fi initiatives from players such as Facebook and Cisco or Gowex. Consumers, whether businesses or individuals, obtain Internet access without charge in return for agreeing to receive targeted advertising that comes from their sharing their personal data (location, online behavior, social information, etc.) with the Wi-Fi provider. Regulators need to decide whether and when to regulate these unlicensed innovative initiatives. If they decide to regulate these activities, the next question is the nature of license to be awarded to new players and the likely impact upon existing licensed players. Regulators also need to ensure customer privacy is protected while simultaneously ensuring that ICT innovation continues.

Another example is the planned use of drones (or unmanned aerial vehicles) by Facebook and Google to expand Internet access to the underserved parts of the population. These alterative communications platforms can provide Internet access at relatively lower cost. Regulators need to decide which agency will regulate these services and how — especially after such services gain significant scale and become mainstream. An additional challenge would be that these drones might not fly exclusively within national borders, or might provide services across borders. This would raise the question of the integration of national regulations with regional or international regulations. All of this will need to be considered within the broader question of what spectrum will be provided for such unlicensed, innovative players while protecting consumer privacy.

Key lessons for regulators

Our research on regulatory evolution offers three historical lessons that are applicable to the ICT sector:

1. Innovation drives regulation, not vice versa. Regulation tends to respond to industry evolution because policymakers cannot anticipate how and when innovations may change an industry through the introduction of new business models or new services that become substitutes for existing services. For example, the Federal Aviation Administration in the U.S. has responded to the growing use of drones for a range of commercial activities with a road map to formally integrate drone flights into U.S. airspace in phases over coming years.

2. Regulators need to intervene when non-regulated activities start negatively affecting customer welfare. When markets and the activities within them change in a manner that is counterproductive for customer welfare, regulators need to intervene to redefine the market and/or bring in specific regulations to protect customer welfare. For example, regulators are exploring options to regulate Uber, a smartphone app that connects drivers to passengers for a flat fee or a fare calculated through GPS, after concerns surfaced over safety (lax driver screening), pricing (differential prices based on current demand), and insurance (inadequate insurance).

3. Non-regulated activities, which create new risks in regulated markets, also warrant the attention of regulators: In innovation-driven environments, regulators should be prepared to act when non-regulated services threaten either the sustainability of regulated entities or the safety of customers. For example, the U.S. stepped up regulation of financial markets after the 2008 financial crisis, including pushing for increased transparency in derivatives trading and restricting certain kinds of unregulated activities such as proprietary trading that is not to the benefit of financial institutions' customers.

Regulators need to intervene when non-regulated activities start negatively affecting customer welfare.

These three lessons suggest two approaches for the ICT sector — a telecom-focused approach or a digitization-focused approach. In the telecom-focused approach, the regulatory regime trusts the ICT industry to drive innovation and results in the marketplace, and restricts itself to safeguarding customers (much like a legacy telecom regulatory regime). In the digitization-focused approach, the regulatory regime provides ongoing oversight and monitoring of critical ICT and digital markets as they evolve across industries. This prevents the need for major interventions. Neither approach assumes an all-powerful regulatory regime in which regulators manage all aspects of the ICT value chain and regulate all participants in the ICT marketplace.

Telecom-focused versus digitization-focused

We can chart the differences between the telecom-focused and digitization-focused regulatory regimes by examining their implications for the three main questions facing regulators (*see Exhibit 4, page 15*). What we find is that the difference between telecom-focused and digitization-focused ICT regulatory regimes comes down to the government's view regarding the effect of impending shifts in the ICT landscape on the health and operations of regulated markets and regulated suppliers. If the government believes that the communications markets and providers in their countries will remain sustainable and that new markets for ICT services that are emerging will be efficiently served by the industry, a telecom-focused regime is the logical choice. Conversely, if a government believes the sustainability and vibrancy of the communications market and the proactive monitoring of emerging digital markets are required to avoid failures, a digitization-focused regime is more appropriate.

Market efficiency

- Market definition: In a telecom-focused regulatory regime, ICT regulators are focused on maintaining and safeguarding the legacy ICT markets and the communications infrastructure they require. This regulatory regime assumes that failures in other markets will not endanger access to, or the quality of, communications services. In a digitization-focused regime, regulators adopt an expanded purview, looking beyond the legacy markets for traditional services to new markets emerging from the rapid adoption of digital services by all industries and verticals. For example, in a digitization-focused regime, ICT regulators might monitor and act to safeguard the market for e-health devices and services.

Exhibit 4

Differences in telecom-focused versus digitization-focused regulation

		Telecom-focused	Digitization-focused
Market efficiency	Market definition	Communications markets	Digital sub-markets
	Supply models	Integrated suppliers	De-layered markets
	Supplier quality	No restrictions	National support
Scarcity management	Spectrum supply	Unlicensed	Digital dividend
	Spectrum use	Liberalized	Harmonized
Consumer welfare	Adoption	Quality	Usage
	Security	Nascent	Unified
	Privacy	Monitored	Mandated
	Environment	Monitored	Enforced

Source: Strategy&

- Supply models: In a telecom-focused ICT regime, regulators would continue to prioritize integrated suppliers, occasionally preferring service-based models for their skills and expertise. In a digitization-focused regime, regulators would de-layer supply markets, by separating infrastructure, services, and applications, in order to drive adoption of digital services and market growth.
- Supplier quality: In a telecom-focused regime, regulators eschew restrictions on the origin and quality of suppliers, in effect deregulating the industry. In a digitization-focused regime, regulators would give preferential treatment to home players, creating incentives and environments that would support vibrant, local ICT supply markets.

Scarcity management

- Spectrum availability: In a telecom-focused regime, regulators would attempt to maximize the digital dividend available in the market by expanding the availability of unlicensed spectrum and allowing unlicensed services to access it. In a digitization-focused regime, regulators would likely focus on using tighter control of the supply markets to maximize licensed spectrum availability for licensed services.
- Spectrum usage: In a telecom-focused regime, regulators would liberalize spectrum usage by allowing the markets to determine the best use, price, and restrictions for a spectrum band. In a digitization-focused regime, regulators would ensure that the spectrum is harmonized but tradable by seeking a balance between scale and market efficiencies.

Consumer welfare

- Services adoption: In a telecom-focused regime, regulators would focus on the quality of services offered in the marketplace. In a digitization-focused regime, the focus would shift to the efficient usage of services by consumers, businesses, and governments in these markets.
- Services security: A telecom-focused regime would likely not have well-defined norms for the security of ICT services, and regulators' interest in the security of services would be relatively weak. In a

In a digitization-focused regime, regulators would likely focus on using tighter control of the supply markets to maximize licensed spectrum availability for licensed services.

digitization-focused regime, regulators would define and mandate a robust set of national ICT security policies and practices.

- Services privacy: In a telecom-focused regime, regulators would monitor and react to concerns of customer privacy and security. In a digitization-focused regime, regulators would dictate services privacy and customer data usage norms, thereby proactively setting standards for companies to follow.
- Services environment: In a telecom-focused regime, regulators would periodically monitor the environmental impact of ICT services, without imposing environmental (green and health) measures on the industry. In a digitization-focused regime, regulators would define and enforce environmental norms and restrictions.

For example, the Federal Communications Commission (FCC) in the U.S. initially proposed that all Internet traffic should be treated equally (a telecom-focused approach). However, after this was successfully appealed in the courts by the Internet Services Providers, the FCC is now following a market-based approach and exploring options to allow differential access in select cases as seen in the agreement between Comcast and Netflix.

The current and future state of MENA ICT regulation

The final component in the decision-making process for ICT regulatory regimes in MENA countries is an analysis of the current state of ICT regulation (*see Exhibit 5, page 19*). This analysis creates a necessary baseline for understanding the degree of change required to implement a new regime, whether telecom-focused or digitization-focused.

In terms of markets, most ICT regulators in the MENA region are still assessing the potential for failure and dominance in communications submarkets. The supply markets are mainly integrated, with limited service-based attempts to foster greater competition. In addition, most competition, especially in the communications market, is restricted (with local partners needed) and national champions are actively supported (because of their important fiscal contributions and their employment of local talent).

In terms of the spectrum, few countries in the MENA region have begun to make available the spectrum in the digital dividend band. Most MENA states continue to focus on availability of the spectrum for GSM-family communications. (It should be noted that in most MENA countries, bands available per operator are higher than global averages.) Furthermore, spectrum usage is dictated and enforced by regulators, with no spectrum trading or reuse allowed.

In terms of customer welfare, affordability continues to be a key regulatory driver, with significant effort being directed at pricing and tariff approvals. There is less emphasis on quality and usage. Regulatory concerns regarding security, privacy, and environmental concerns are nascent, if addressed at all.

Exhibit 5
MENA ICT regulation today

		Current state of regulation
Market efficiency	Market definition	Legacy communications markets
	Supply models	Integrated suppliers
	Supplier quality	Restricted entry
Scarcity management	Spectrum supply	GSM
	Spectrum use	Harmonized
Consumer welfare	Adoption	Affordability
	Security	Nascent
	Privacy	Nonexistent
	Environment	Nonexistent

Source: Strategy&

Comparison of regulatory approaches from around the world

To better understand the state of regulatory evolution and approaches being adopted by various countries at different stages of that evolution, we benchmarked three countries: the U.K., Singapore, and Bahrain.

U.K.

The U.K. ranks among the top 10 countries in terms of the World Economic Forum's Networked Readiness Index and has an integrated regulator in OFCOM. Over time, the U.K. has moved toward a more deregulated regime, adopting a telecom-focused approach of regulatory evolution. The regulator focuses on increasing the deregulation of the communications market, preferring service-based competition, with limited or no restrictions on the suppliers in the market. The regulator has made the 700 MHz spectrum available to communications providers and allows for spectrum trading under restricted conditions. The U.K. has made strong moves on consumer protection in terms of enforcing quality of services offered in the market. Cyber security norms are nascent and not enforced in the market. Privacy laws are supported by national laws and environmental regulations are strictly enforced.

Singapore

Singapore has historically been a leading ICT economy with a very active regulator in the Infocomm Development Authority (IDA). The regulator has adopted a hybrid approach with an active digitization-focused model. The IDA has actively made new digital markets such as mobile payment services by deploying nationwide infrastructure for near-field communication (which allows users to simply tap or swipe their mobile device at the point-of-sale to complete a transaction). It has also enforced de-layering in the communications market and supported the national champion, Singtel. Singapore has ensured healthy spectrum supply, although limited steps have been taken to increase the quantum of unlicensed spectrum. However, spectrum trading is allowed, subject to the IDA's approval. Consumer privacy is enforced under the newly introduced Personal Data Protection Act. The IDA has also collaborated with the private sector to improve cyber security. As part of that effort the IDA has announced a national cyber security master plan 2018.

Bahrain

Bahrain is one of the leading ICT economies in the MENA region, ranked among the top 30 in the world. The regulator has played an active role in shaping the country's ICT landscape. However, the focus continues to be on defining the communications market, supply remains integrated, and there is a high level of support for national ICT suppliers. Spectrum availability continues to be limited and spectrum trading is not yet allowed. On consumer welfare, the focus remains on ensuring service affordability, with limited emphasis on consumer privacy. A national cyber security policy is in its infancy, although there is a strong cyber security certification program. There is no unified agency to promote cyber security across all ICT assets. Environmental concerns are addressed and the International Commission on Non-Ionizing Radiation Protection's standards are regularly measured and enforced.

However, the supply side of the MENA region's ICT sector remains weak in most markets, with the exception of telecom providers. Unlike other emerging economies, such as China or India, which have taken significant regulatory or policy steps to support local ICT companies, the MENA region relies on imported ICT skills — with only a couple of exceptions, such as Egypt. In addition, the quality of the ICT labor pool in MENA markets has only recently started to improve.

Given the current situation in the MENA region's ICT sector and the challenges that lie ahead, governments must continue playing an active oversight role across emerging digital markets, supporting national ICT players, and mandating customer welfare practices across usage, security, privacy, and environmental dimensions. Based on these mandates, we conclude that a digitization-focused regulatory regime is appropriate in most of the region's countries.

Conclusion

Regulators around the world have played a critical role in ushering in the always-on digital era, and fostering continuously increasing access speeds and declining access costs. However, as we have seen in other industries, maintaining a sustainable pace of innovation by the regulated or non-regulated players requires that regulators broaden their mandate to protect consumer welfare within emerging ICT markets or to ensure that the regulated markets do not suffer exogenous shocks. At the same time, the level of regulatory oversight should be tempered by the knowledge that regulators are unlikely to be able to anticipate innovation and that they should not seek to dictate its course.

The way forward for regulators in the MENA region's ICT sector is one in which they will bring to bear their skills and knowledge in market-making and addressing market failure, and it should extend to new, emerging digital markets. They will have to identify, adapt, and apply the best regulatory practices from around the world in ways that efficiently satisfy consumer and national interests at home. It will be a tightrope to walk, but one that MENA regulators have mastered before, when they leveraged the best global communications technology and applied it to create national telecom champions. The task is difficult, but achievable, and it is necessary to ensure the future economic and social prosperity of the MENA region.

Endnotes

[1] Karim Sabbagh, Bahjat El-Darwiche, Chady Smayra, and Fady Elias, "Toward More Effective Regulation: Unlocking the Value of Telecom Markets in the MENA Region," Strategy&, 2007 (http://www.strategyand.pwc.com/media/file/Towards_More_Effective_Regulation.pdf).

[2] The GCC countries are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates.

[3] Over-the-top involves using the Internet to stream content directly to handheld devices, game consoles, and TV sets connected to broadband.

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