



Enabling digital opportunities
in the **Middle East**



The Internet Society is a global organization dedicated to ensuring that the Internet stays open, transparent and defined by its users. The Internet Society is the world's trusted independent source of leadership for Internet policy, technology standards, and future development. More than simply advancing technology, the organization works to ensure the Internet continues to grow and evolve as a platform for innovation, economic development, and social progress for people around the world.

www.internetsociety.org



United Nation-Economic and Social Commission for Western Asia (ESCWA) provides a framework for the formulation and harmonization of sectoral policies for member countries, a platform for congress and coordination, a home for expertise and knowledge, and an information observatory. Its Technology for Development Division aims at enhancing quality of life in the Arab region capitalising on the power of technology and innovation.

www.unescwa.org



Wamda is a platform of integrated programs that aims to accelerate entrepreneurship ecosystems throughout the MENA region. Its core focus includes media, community development, research, corporate, and government advisory services.

www.wamda.com

Preface

The Middle East (ME) is an incredibly diverse region with **over 350 million people**¹ with widely varying states of Internet access and digital readiness. Using research created by the **Internet Society, ESCWA, and Wamda**, this booklet shows what positive and practical steps can be taken to **increase digital opportunity and spread its benefits** to all of society.

All countries in the region share some Internet-related factors – a high youth population with accompanying challenges for education and employment, a fairly low level of local content including content in Arabic, and a shared language. The ME has huge and largely untapped markets for online activity, and a good chance to develop its own thriving ecosystem of infrastructure, content and services. The ME has many unique cultures that need to take their own place online, so that the global Internet better represents all the people of the world. Although there are challenges to be met, the outlook is very positive, as long as countries in the region act quickly and purposefully to ensure the Internet creates digital opportunity for all.

The most important take-away from this guide, is that the biggest potential gains come not just from digital start-ups, or is just available in urban areas, and are not just reserved for the most educated. The biggest potential gains come from making the whole of the economy digital and taking practical steps to make sure no one is left behind.

This booklet is intended to continue the conversation amongst stakeholders – government, business, technology experts and society as a whole – in the region. By looking clearly at both the opportunities and threats that are specific to the Middle East, it charts a pro-active path to achieving digital opportunity for the many, building more diverse economies.

The key to success will be an open dialogue on how to adopt the recommendations that work best for each country, and to implement them, working with all relevant stakeholders.

¹In this guide, we use a wide definition of the ME, and include Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, the United Arab Emirates and Yemen

Introduction

Digital opportunity means successfully using the Internet and its associated technologies to create social and economic opportunity for all. There is huge potential for digital opportunity to drive sustainable economic growth in the ME for its young population as long as they are suitably educated, and the labour market is prepared to harness their energy and skills. But digital opportunity isn't just for the young. It is essential to make sure people already in the workforce have the right skills to adapt to social and economic change.

There are 3 main reasons why people who are not yet connected remain offline

- 1 lack of access
- 2 lack of skills
- 3 lack of interest

This booklet looks at each of these challenges, and shows the huge potential and many opportunities available to governments, business, and technology leaders in dealing with them.

More than half of the people in the ME are already online (though with much variation between countries). Outside of the Gulf Cooperation Council (GCC) states, GDP is relatively low, and Internet access rates tend to track overall economic development quite closely. The Gulf Arab states, Jordan, Lebanon, Palestine and Tunisia have more than half of their populations online already, while in the rest of the region, more than half of the population is not yet online. Those already online tend to be more educated, more affluent and more likely to speak some English than most others in their countries. Lack of access means the many, often rural, areas where there is no Internet access at all. But it also means connectivity that is too expensive compared to median incomes, unreliable, or not fast enough to do more than very basic activities.

Lack of skills means lack of digital literacy – being able to navigate online, use services and to access and interpret content – and also basic literacy, for the parts of the population whose literacy is low or even non-existent. In the broader sense, it means access to life long education and the acquisition of twenty first century skills through the education system.

By lack of interest, we mean gaps in locally relevant content – news, services, opportunities for interaction – and a lack of local language content, too.

01

Digital Economy

When referring to the 'Digital Economy', much of the focus is on **digital start-ups and technology firms**, but 75% of the impact of the Internet on growth is in **traditional industries**, and benefits the entire economy². The Internet can also **increase trade** by 0.4 – 0.6%³ every year, increasing GDP and diversifying the whole economy.

The digital economy includes everything from small businesses improving their supply chain and entrepreneurs widening their mobile apps customer-reach, to governments deploying large-scale e-government solutions, to the activities of global Internet platforms like Facebook or regional players like Souq.com. To ensure the benefits of the digital economy are widely shared, the Internet must be widely deployed throughout the economy, not just as a shallow layer at the top end, or just in specialized, Internet-only companies.

Section Summary

- The ME has a young, relatively well-educated but under-employed population. This is a challenge but also a huge opportunity.
- People in the ME use the Internet mostly for entertainment and socializing, and much less for buying and selling, learning, or building new things. Higher cost and lower connectivity speed in the ME mean its people risk becoming mostly consumers of the Internet, and not creators of content and services. Better access is essential.
- The ME has relatively low numbers of existing businesses and of new digital start-ups coming online. But the fact that the ME currently accounts for just 1% of global e-commerce sales is a huge opportunity for businesses in the region to develop the market.
- Shutdowns, blocking, and other restrictions cost real money, slow down investment, and put the ME at a disadvantage compared to other regions.

² World Bank, 2016, Digital Dividends, p. 63

³ World Bank, 2016, Digital Dividends, p. 55

Case Study

Souq.com Dream Big!

Ronaldo Mouchawar, a Syrian engineer, co-founded Souq.com in 2005 as an auction site linked to Maktoob alongside Jabbar Internet Group's Samih Toukan and Hussam Khoury. In 2009, Yahoo! acquired Maktoob, and Souq continued the journey alone, changing its model to an online shopping site in 2011.

From just five employees in 2005, Souq.com now employs 3,000 people and has become a platform for more than 70,000 vendors, 400,000 products, and 23 million visits per month. Products include electronics, health and beauty, household goods and baby products, and premium brands from Dell to Pampers and Aldo, and from Boss to Nespresso. The platform is based in the U.A.E but sells also across Egypt, Saudi Arabia, Kuwait, Qatar, Oman, and Bahrain, making it the most visited shopping destination in the Middle East.

Souq.com has been called the Middle East's first unicorn, after it raised in 2016 a \$275 million funding round from Tiger Global Management, Standard Chartered Private Equity and the International Finance Corporation. Before that, the company raised \$150 million from South-Africa based Naspers, Jabbar, and other investors.

On 28 March 2017, Amazon acquired souq.com for \$700 million (the number is an estimate and has not been disclosed), making it the largest acquisition in the region.

Jobs

The labour market varies greatly across the ME, but has some common features.

- A large proportion of young people are entering the work-force; people under the age of 25 make up half the region's population, and according to the ILO, 30% of them are unemployed.
- High but declining public sector employment⁴, especially in the Gulf states.
- Many workers in 'informal' employment, working casually or for unregistered firms, often on the basis of connections rather than skill, and with few opportunities to earn a steady income and develop their skills.
- The Arab world has a huge "brain drain", losing qualified students every year to better opportunities in the GCC or elsewhere in the world.

These factors drive economic inequality and social and political unrest. However, compared to other regions that struggle with an aging population, the ME has a huge proportion of young, relatively well-educated people who just want to make their way in life, and build and provide for their own families. If these needs and goals are met, the region can enjoy strong and sustainable growth and stability. Creating digital opportunity is a key way to achieve this.

However, the disruption the Internet is bringing may also have a negative impact on jobs. The "Fourth Industrial Revolution" - structural changes to the economy being driven by technology, including the automation of many jobs - will change how we work and live. The effects on ME economies will include "growth in wholly new occupations, decline in some occupations, new skills requirements in all jobs, new ways of organizing and coordinating work, and new tools to augment workers' capabilities"⁵. About half of existing jobs in the ME are "susceptible to automation"⁶.

Other challenges include Internet-empowered global companies (such as Uber, AirBnB, etc.) who create local opportunities but also affect the local workforce and local companies. The ME needs to be ready for these challenges. The first step is to plan for it and make sure people have the skills they will need to compete globally. The second step is to take advantage of the global economy by creating global services, offshoring and/or outsourcing.

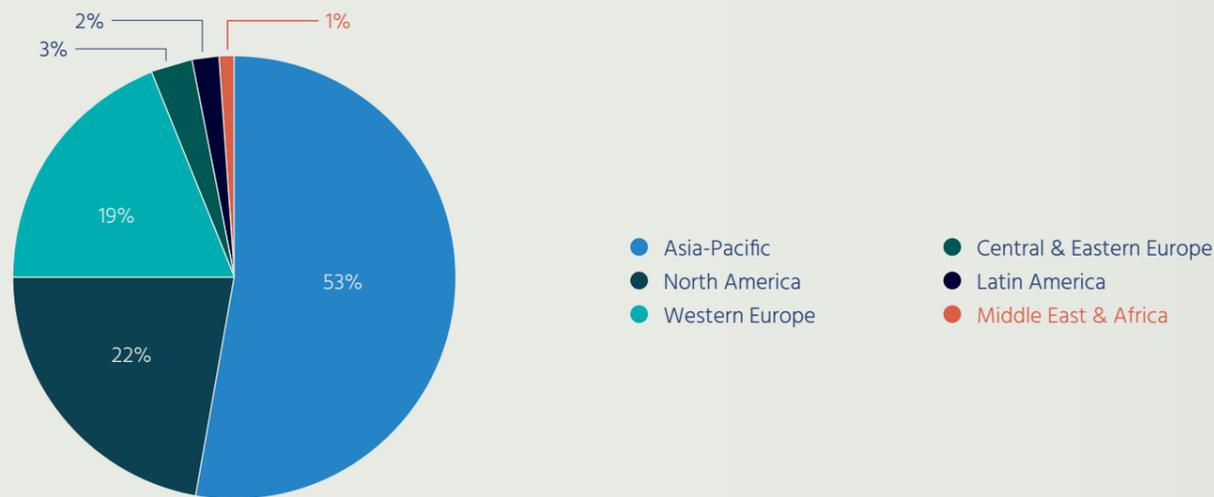
^{4&5} World Economic Forum, 2017, The Future of Jobs and Skills in the Middle East and North Africa

⁶ Harvard Business Review, April 2017, referenced in WEF 2017, The Countries Most (and Least) Likely to be Affected by Automation

Start-ups and Entrepreneurship

The ME has not fully grasped the range of opportunities the Internet creates – yet. According to Wamda’s research, the countries mentioned in this report make up 5% of the world’s population, but the region’s non-oil exports make up only 1% of the world market. There is currently a relatively low level of online retailing in the ME, compared to other regions, even less-developed ones⁷.

Figure 1 Retail eCommerce Sales by Region



Source eMarketer, 2016

Internet users across the ME use the Internet mostly for entertainment and to communicate⁸, and relatively little to make transactions, to develop and learn, or to build new things. There is also a low level of venture capital investment in the digital economy in the ME region⁹. But digital opportunity is spreading. The number of ME tech start-ups worth over \$100 million rose from just one (Jordan’s Maktoub) in 2008 to 16 in 2017. Companies like Souq, Fawry, Anghami and Talabat are helping to seed an ecosystem of entrepreneurship, skills and capital. Start-ups are growing, both in quantity and quality.

According to Arabnet, tech start-ups numbered barely two dozen, twenty years ago, are several thousand today. The initial concentration of new companies in e-commerce and entertainment is branching out into fintech (financial technology), cleantech (technologies for cleaner energy), hospitality and education. As new firms emerge, they drive awareness and market maturity, and help to further develop the ecosystem for capital investment, entrepreneurship and further jobs growth.

⁸ Mohammed bin Rashid School of Government (MBRSG), 2014, The Arab World Online

⁷ Euromonitor in UNCTAD, 2015, Information Economy Report

⁹ Arabnet, 2016, The State of Digital Investments in MENA,

Case Study

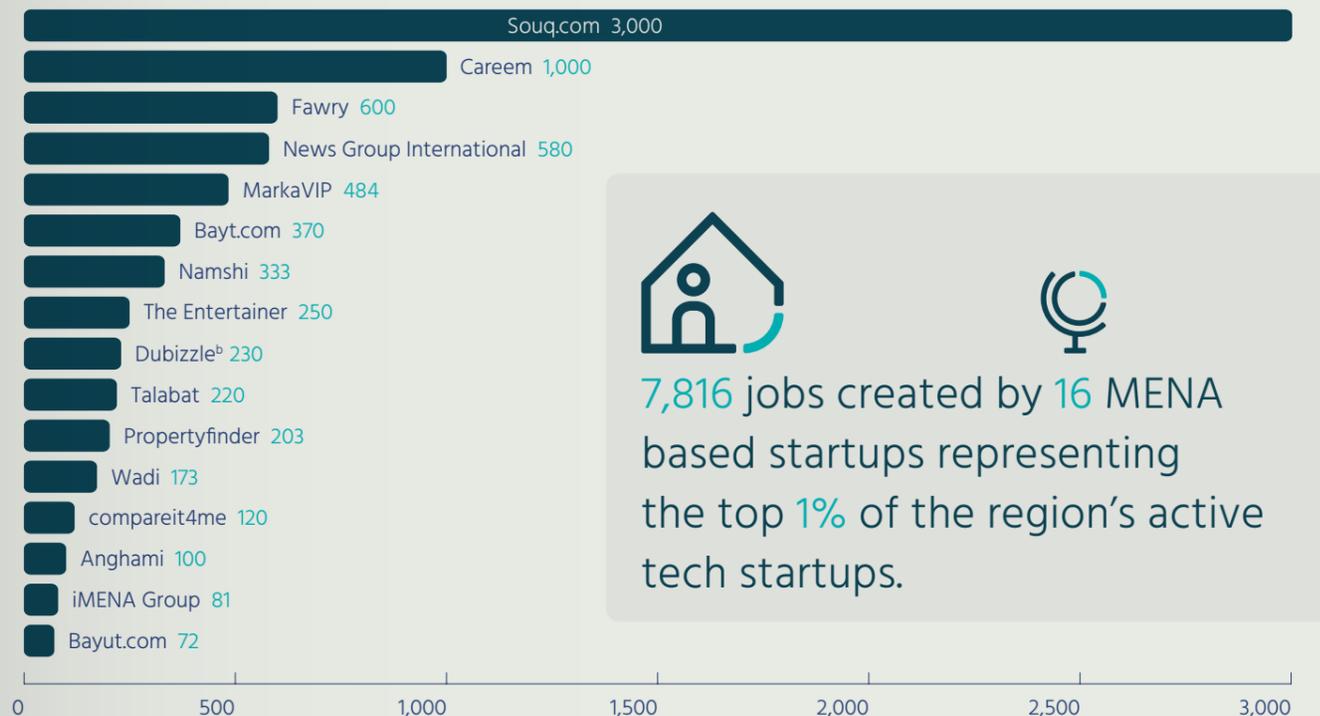
How Careem employs 180,000 drivers

Many fast-growing cities around the world are plagued by traffic jams, pollution and car accidents. Cairo’s traffic jams cost the economy \$13 billion annually, or 4 percent of GDP.

Careem, a ride-hailing app, helps reduce the time cabs spend roaming, looking for passengers, and allows people to track the route taken to their destination. It holds drivers responsible for their driving style and attitude to customers. Just five years after launch, Careem has 1,000 direct employees, and over 180,000 drivers.

Careem’s drivers in the UAE make about 30% more than other taxi drivers. In Cairo, the monthly earnings of a Careem “captain” are almost twice the average cab driver earnings. Careem brings better service for customers, empowered employees who own a stake in their company, and better-paid drivers.

Figure 2 Employment Figures^a of Leading MENA Start-Ups, 2017



Source MBRSG

^a Only direct jobs created ^b Acquired by OLX

7,816 jobs created by 16 MENA based startups representing the top 1% of the region’s active tech startups.

While the total number of jobs created by start-ups is still small, there is huge potential for these firms to create more - and high quality - jobs and drive an entrepreneurship culture where recent graduates are more likely to create their own jobs than to emigrate.

According to UN ESCWA, several countries – Egypt, Jordan, Lebanon, Morocco, Palestine, Tunisia, Saudi Arabia, and the United Arab Emirates – are actively encouraging the growth of an entrepreneurship ecosystem. They reinforce local talent and energy with business support schemes such as incubators and accelerators, funding agencies, training institutions, targeted public initiatives and university interventions

Alongside a skilled and supportive community and a good mix of public and private sector initiatives, the key to a healthy entrepreneurship ecosystem is access to finance. Access to venture capital finance has generally increased over the last five years (see figure 3).

It is tempting for policy-makers to focus on attracting big-name international tech firms to invest, but unless native entrepreneurship is actively supported, the ME will largely be just a market, and not a producer or partner for new content and services.

Figure 3 Index on ease of access to venture capital in selected Arab countries, 2012-2016¹⁰

Note This index refers to how easy is it for start-up entrepreneurs with innovative but risky projects to obtain equity funding; 1 being extremely difficult and 7 extremely easy.

	2012	2013	2014	2015	2016	Data Trend
Qatar	5.4	4.7	4.5	4.8	5.1	
UAE	4	4.1	4.1	4.4	4.4	
Jordan	2.7	2.9	3	3.5	3.7	
Bahrain	4.2	4.3	3.8	3.6	3.6	
Saudi Arabia	4.2	3.7	3.4	3.4	3.5	
Oman	3.9	3.8	3.9	3.5	3.3	
Lebanon	2.7	2.7	2.7	2.8	3.1	
Kuwait	3.4	3	2.6	2.7	2.9	
Morocco	3.3	3	2.8	2.9	2.7	
Algeria	2.1	1.8	2	2.2	2.6	
Egypt	3	3	2.9	2.3	2.5	
Tunisia	3.15	--	3	2.7	2.3	
Syrian Arab Republic	2.1	--	--	--	--	
Yemen	2.6	2.3	1.9	1.7	--	
Libya	--	2.3	2	1.6	--	

Source UN ESCWA based on World Economic Forum data, 2016

¹⁰ Compiled by UN ESCWA based on World Economic Forum, 2016, Global Information Technology Report

Women and Youth

In 2016, the estimated penetration rate for the Internet among women in the Arab States was 36.9% and that for men was 46.1%.

This placed the gender gap in Internet usage at 20% in 2016. Even more worrying is that this gap has grown, from 19.2% in 2013. The Arab region had the second largest digital gender gap in 2016, following closely behind Africa.

The table below shows the disparity between men and women using the Internet in some Arab countries¹¹.

Table 1 Individuals from Arab countries using the Internet, by gender (%)

	Latest Year Available	All Individuals	Male	Female
Bahrain	2015	93.5	92.5	95.2
Qatar	2015	92.9	94.1	91.7
UAE	2012	85	85.6	83.2
Saudi Arabia	2015	69.6	76.8	60.2
Oman	2013	66.4	71.2	59.8
Morocco	2015	57.1	62.8	51.4
Palestine	2014	53.7	59.6	47.5
Egypt	2015	37.8	40.8	34.8
Sudan	2011	17.5	22.5	12.3

Source ITU, 2016, Gender ICT Statistics, <http://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2017/Individuals%20using%20the%20Internet%20by%20gender.xls>

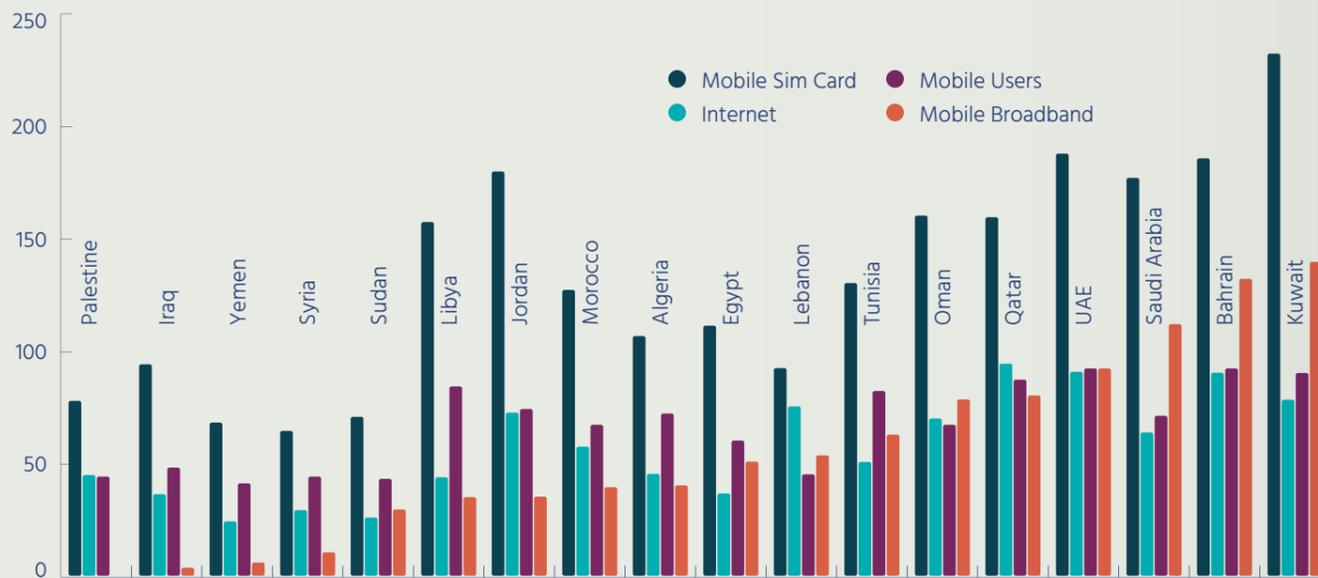
¹¹ International Telecommunication Union (ITU), 2016, ICT Facts and Figures, <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2016.pdf>

Network Access and Readiness

ICT penetration in the ME is led by GCC countries like Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and UAE, with mobile broadband coverage of around 100%¹².

Iraq, Yemen, Syria and Sudan have the lowest mobile broadband subscription rates, indicating lower use of Internet in these countries. Palestine has not been able to launch a 3G network due to spectrum restrictions by Israel, but has seen a growth in fixed Internet services. Outside the wealthier Gulf states, access speeds have been very slow until recently, when 4G was introduced¹³.

Figure 4 ICT Sector Development in Middle East and North Africa, 2015



Source International Telecommunication Union, GSMA

With Internet penetration rates still low, the ME needs to overcome a major barrier to digital opportunity; inadequate network access and readiness. Internet penetration and speed indicators are not the only measures to consider when evaluating the infrastructure needed for the digital economy. The region has an unusually high number of state-owned or controlled telecom incumbents, which hinders healthy competition. Fiber optics deployment is controlled, and a monopoly in the hands of one operator in many countries of the region.

As a result, network operators pay high prices, with low level of Quality of Service (QoS) and customer satisfaction. Operators turn to mobile broadband networks over 3G/4G and WiMAX as an alternative, which are less reliable. IXPs are not widely deployed, and are mostly underutilized in countries that have them. These issues are all key contributors to an underutilized domain name industry in the region¹⁴, and hinder the growth of the digital economy¹⁵.

¹² ITU

¹³ Akamai, Q1 2016, State of the Internet Report

¹⁴ Internet Corporation for Assigned Names and Numbers (ICANN), 2016, Middle East and Adjoining Countries Domain Name System (DNS) Study

¹⁵ ICANN, 2015, Greasing the Wheels of the Internet Economy

A short-sighted and narrow approach is often taken, to protect the telecoms' revenues at the expense of the economy as a whole, such as measures to block Internet-enabled services like VoIP (Voice over Internet Protocol) services including Skype and WhatsApp. Instead, regulators could help operators rethink their revenue streams and innovate in their business models.

The ME under-performs in network readiness, a country's ability to exploit the opportunities offered by information and communication technologies (ICTs)¹⁶.

Higher costs prevent people, especially the less affluent, from getting online. This worsens inequality, and keeps the market for online products and services small.

Trust

Governments have a uniquely powerful role to play in building trust in the Internet that encourages people to use the networks in positive and productive ways. Currently, many governments are acting in ways that reduce trust in the Internet and limit its opportunities.

Internet shutdowns now occur across the ME. In just one year, from June 2015 to June 2016, Internet shutdowns around the world cost an estimated \$2.4 billion. As an example, the Brookings Institute estimated that a single shutdown each cost Saudi Arabia \$465 million and Morocco \$320 million¹⁸.

¹⁶ World Economic (WEF), 2015, The Global Information Technology Report

¹⁷ ICANN MEAC DNS Study, 2016

¹⁸ Brookings Institute, 2016, Internet shutdowns cost countries \$2.4 billion last year, <https://www.brookings.edu/wp-content/uploads/2016/10/internet-shutdowns-v-3.pdf>

Poor connectivity also affects how people spend their time online. In countries "where basic infrastructure is weak, people spend less time online per day, and use the Internet mainly for social reasons rather than business, compared with other countries where infrastructure is stronger."¹⁷ They don't access advanced e-services or develop their own activities, applications or even businesses. They just use the Internet to socialize. This harms the ME, because the biggest benefits do not go to countries where people just consume, but to places where they also create their own content and services.

Internet shutdowns in the ME aren't typically about security. Several countries simply shut down the Internet during official high school examinations. High-connectivity countries can lose at least 1.9% of their Gross Domestic Product (GDP) for each day all Internet services are shut down¹⁹. A country with a medium level of connectivity may lose \$6.6 million per 10 million of population, per day.

¹⁹ Global Network Initiative, 2016, The Economic Impact of Disruptions to Internet Connectivity, <http://globalnetworkinitiative.org/sites/default/files/The-Economic-Impact-of-Disruptions-to-Internet-Connectivity-Deloitte.pdf>

Internet shutdowns around the world cost an estimated

2.4
Billion Dollars

Content-blocking is another way many ME governments undermine trust and restrict opportunities. Policies to restrict content result in “over-blocking”, when platforms and websites interpret the policies as wider than intended, just to be on the safe side. This blocks even more content, much of which is needed for education and business. Blocking puts people and companies in the ME at a disadvantage to other regions. It deprives them of information and new ways of doing things, and disincentivizes risk-taking by businesses and entrepreneurs.

There are other ways for governments to enable trust.

The existence of a legal framework that is transparent and consistently applied on incumbents, businesses, and citizens alike creates an environment where investment is less risky, attracting investors and entrepreneurs. For example, laws are needed for data protection to encourage cloud computing companies to deploy their business in the ME. Other policies are needed to increase credit card penetration and trust in e-payment solutions. A comprehensive e-transactions law has been formulated by some countries to provide such a legal framework. Finally, civil society has a role to play in raising awareness about safe usage of the Internet in order to reduce people’s apprehension and fears about technology.

A rules-based and broadly consensual approach, carried out openly and with appropriate technical oversight is vital to keeping the Internet open for business and innovation.

Policymakers have a choice to make. One path leads to an open and trusted Internet with all the social and economic benefits it brings. The other leads to an increasingly closed off network that is distrusted and fails to drive growth.

Recommendations

Digital opportunity multiplies if it is disseminated throughout the economy - not just in cities, or amongst the educated middle class, or in high-tech firms - but everywhere and for everyone. Spreading benefits widely will reduce inequality, drive overall growth and support political and social stability.

- Enable and strengthen the entrepreneurship ecosystem by improving the availability and access to both public and private sector funding and support, by improving regulation for a better business environment, and by providing an affordable broadband Internet infrastructure.
- Develop digital skills for all.
- Encourage e-commerce, e-government, and strengthen the e-payments infrastructure.
- Build trust in the Internet as a stable and growth-producing part of the economy by developing appropriate legal frameworks, and minimizing such measures as shutdowns, blocking competitive services, and over-blocking of content.

02

ICT and Education

The internet gives access to educational resources, offers affordability and flexibility that many students in developing economies are looking for and promotes learning that facilitates employability and social inclusion. It allows teachers access to numerous resources including their own professional development courses. In the Middle East and Northern African context, high quality educational content in Arabic can be shared across the region, contributing to quality education.

Section Summary

The education environment in the ME region has seen a great improvement over the last decade, partly due to strong commitment to public funding. The average public investment in education across the region as a percentage of GDP is above 5.3% of GDP¹. The region has also managed to reverse the gender gap in education, with girls outperforming boys from grade 4 onwards². Gaps remain in a number of areas, especially in improving learning outcomes, expanding pre-primary education, enhancing access to education by people with disabilities and refugees, enhancing youth employability and advancing research responding to the regional challenges.

^{1,2} World Bank Group, 2014, Education in the Middle East and North Africa, <http://www.worldbank.org/en/region/mena/brief/education-in-mena>

Overarching Themes for ICT Integration in Education

Five broad themes have emerged from experience to date as priorities for policymakers

- Infrastructure and Access
- Policy And Vision
- Inclusion
- Capacity
- Content Delivery

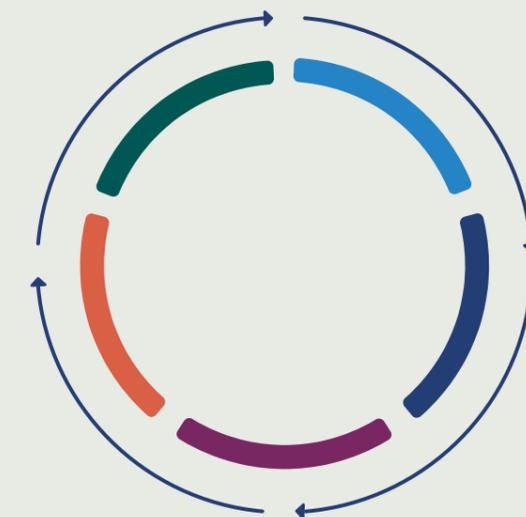


Figure 1 ISOC Overarching Themes for ICT Integration in Education

Infrastructure and Access

The first barrier to ICT in education is affordable access to the Internet. Broadband is essential for teachers and students to make full use of what the Internet can offer.

Regarding primary and secondary education, there is no reliable regionally aggregated data on ICT integration in education across the region, but evidence suggests that the situation mirrors the penetration of broadband networks. GCC countries like Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and UAE rank high and have made progress towards universal ICT penetration in primary and secondary schools. They are followed by middle tier nations, Jordan, Lebanon, followed closely by Egypt, Morocco, Algeria, and Tunisia, that have improved access to ICT in education. The bottom tier of countries have considerable difficulty with access to ICT infrastructure and include Libya, Iraq, Palestine, Syria, and Yemen. Furthermore, schools need networks, computers, tablets, whiteboards and other ICT devices to make the most of Internet-enabled learning. These need to be maintained, upgraded and to be kept cyber-secure.

They also need reliable electric power. Budgets should include the total cost of ownership; not just purchasing, but what it costs to maintain, upgrade and secure networks and devices.

For tertiary education, the ME region needs to develop its infrastructure for research and education. Data from the Arab States Research and Education Network (ASREN) indicates that seven countries have not started developing their National Research and Education Networks (Bahrain, Iraq, Libya, Kuwait, Oman, Syria, Yemen). Progress has been made in the other 11 countries which participate actively in the regional research and education network backbone linked to GEANT in Europe. There is a dire need for the universities to be connected to each other within a national NREN, and also to connect the Arab NRENs to each other.

Policy and Vision

Most ME countries are committed to ICT in education³.

Data compiled by the World Bank indicates that almost all MENA countries have committed to ICT integration in education⁴. Most countries have created institutions that oversee ICT application in education. Some ICT policies have been more successful than others. The Jordan and Qatar education initiatives are cited as best practice in ICT in education in the region.

Inclusion

There is a risk that ICTs in education can worsen the digital divide, when children and adults who already have access, devices and digital and related skills leap even further ahead of those who don't.⁵

Primary and secondary education faces unique challenges in the region. The region hosts an estimated 13 million children that are affected by conflict. The demand for providing refugees with education is high, especially in Syria and neighboring countries like Lebanon and Jordan⁶.

Capacity

Capacity is the most overlooked area, but it can determine failure or success.

Surveys in Egypt, Lebanon, Kuwait and Saudi Arabia show that the capacity of school leaders and teachers is crucial for effective integration of ICT in education. Teachers face real constraints on their time, knowledge and skills, infrastructure and incentives to integrate ICTs. They need time, resources and active support to make this work.

What is a National Research and Education Network?

NRENs design, build or lease, operate and maintain physical telecommunication networks that interconnect the education and research community locally and internationally. They provide national-scale networks that link universities and research centers to each other separately from the commercial Internet networks, thus providing un-congested, high-speed and advanced communications capabilities. Modern NRENs facilitate exchange of knowledge and collaboration, build technical capacity of their members and deliver other services like federated identity and roaming.

Content Delivery

The ME does not have regional repositories for educational content, so there is limited information on the educational content that can be reused under open license.

The lack of regional and cross-national Open Educational Resources is a missed opportunity, given the common Arabic language across most countries. Independently, countries in the region have initiatives to provide learning content including educational software, text books, e-books, educational programs for students with special needs, educational quizzes, educational videos, and the electronic versions of the school's curriculum.

Progress with Arabic Massive Open Online Courses (MOOC) has been patchy, but this area is gaining some momentum with prominent MOOCs like Edraak and Rwaq. Universities need to embrace MOOCs to develop platforms that facilitate online teaching and learning, especially for the region's large youth population.

Table 1 MOOCs initiatives in Middle East and North Africa

MOOC	Description
Edraak	<ul style="list-style-type: none"> The first Massive Open Online Course portal set up in 2013 Spearheaded by Queen Rania and other leaders in Jordan Powered by open source platform edX, the Cambridge-based collaborative education by Harvard University and MIT Arabic translation of some courses
Rwaq	<ul style="list-style-type: none"> Build an online courseware for the Middle East Established by two Saudi businessmen, Fouad Al-Farhan and Sami Al-Hussayen, in 2013 Fully Arabic Language
MenaVersity	<ul style="list-style-type: none"> Gathered experts in the creative community to offer original courses on a range of topics from social media, marketing to Lebanese cooking Arabic language courses
SkillAcademy	<ul style="list-style-type: none"> SkillAcademy (formerly Eduudle) from Egypt offers over 10,000 online courses Offers skill-camps built for specific skillsets available in English language
UVT	In Tunisia the UVT in partnership with several others organization have engaged three MOOCS Available in French

^{3&4} World Bank Group, 2013, SABER-ICT Systems Approach for Better Education Results (SABER): The Use of ICTS, http://siteresources.worldbank.org/EDUCATION/Resources/WBworkingdraft6_ICTeducationpolicydocs-public.pdf

⁵ <https://blogs.worldbank.org/edutech/worst-practice>

⁶ International Peace Institute, 2015, Securing Education for the Syrian Refugees in Jordan, <https://www.ipinst.org/wp-content/uploads/2015/05/IPI-E-pub-Securing-Education-for-Syrian-Refugees.pdf>

Education and the Future of Work

ICT, including automation and artificial intelligence, will change the world of work, destroying some jobs and changing others. But it will also provide new jobs, especially in computer science, data science and engineering. The ME already produces many high-calibre graduates in IT and engineering. But tomorrow's graduates will need to have a broad range of skills, and the intellectual flexibility and nimbleness to adapt.

Flexible and industry-facing curricula will be essential to make sure graduates have what they need to thrive, both in hard skills and soft skills like networking, analysis, and management.

Education is a key way to make society more resilient in the face of rapid and unavoidable technological, economic and social change, to become drivers of innovation and shape it to the needs of ME societies and economies, rather than simply reacting to it.

Case Study

Talal Abu-Ghazaleh International University

Talal Abu-Ghazaleh International University (TAGI-UNI) is a global educational alliance, established in 2012 to facilitate distance learning by working in partnership with international professional associations, training providers, and educational institutions.

To that end, TAGI-UNI has secured partnerships with very reputable universities and training institutions such as the University of Liverpool, Thunderbird School of Management and many other providers of online learning that deliver accredited programs, certifications, and degrees to learners across the globe.

TAGI-UNI is also implementing the European Union project - Language and Academic Skills and E-Learning Resources (LASER) in cooperation with the British Council. The three-year project will cover 2,470 Syrian and disadvantaged Jordanian students, distributed among several learning aspects; Languages (English, French and German), Academic Skills and E-Learning programs. 300 Syrian and disadvantaged Jordanian students will be given full scholarships for distance education programs leading to a recognized certificate (at the level of diploma, associate and bachelor degree), in partnership with Amity University.

Recommendations

Infrastructure and Access

- Adequate access for education means having broadband and the digital skills to make the most of it. This means that investments must be secured for infrastructure, skills and entrepreneurship.
- Telecommunications markets must be competitive in order to allow the deployment of broadband infrastructures (schools network, universities network, etc.) using fiber at competitive prices.

Policy and Vision

- ICT integration in education must be a national development priority. In order to achieve results, coordination between several ministries (Telecom, Education, Economy, Finance, Energy) and all stakeholders is necessary.
- Policies for Internet access and use should address the entire formal education system, and the informal one as well through lifelong learning, reskilling and retraining.
- Resources must be allocated for improving innovation and research, as well as to develop National Research and Education Networks. NRENs should connect all universities nationally, as well as connect to other NRENs in the ME region. Furthermore, there is a dire need for political will in order to eliminate barriers that hinder regional cooperation and interconnection.
- Adopt and encourage Open Access concepts in publishing educational and research digital materials.

Inclusion

- Policies should address structural inequalities in education, especially gender inequality. The Internet should be used to overcome restrictions on learning, and to support adult literacy.
- Policies should promote greater equality in access to learning resources for disadvantaged groups within societies, such as those living in rural areas or in poverty, ethnic minorities and speakers of minority languages, those with disabilities, and refugees.
- Governments should consult global best practices and ensure resources are available to harness technology for inclusion.

Capacity

- Teachers need to learn new skills so they can make effective use of Internet resources.
- To facilitate teacher training, policy makers could use the UNESCO ICT Competency Framework⁷ as a starting point on how to integrate ICT in education, use it in curriculum and assessment, and manage and guide students.

Content Delivery

- Policymakers should encourage Open Educational Resources (OER) and Massive Online Open Courses (MOOCs), and seek ways to integrate new resources into education without discouraging local content or the role and experience of teachers.

⁷UNESCO, 2011, ICT Competency Framework for Teachers, <http://unesdoc.unesco.org/images/0021/002134/213475e.pdf>

03

Local Content & Connectivity

As countries increasingly address the provision of basic Internet access, Internet development work is shifting from focusing only on Internet availability and affordability to increasing the local content that will drive adoption and usage. **Content and connectivity** drive each other, in a 'virtuous circle', increasing people's access and use of all the Internet has to offer.

There are main **3** reasons why the unconnected have not yet adopted the Internet

- 1 It is too difficult or expensive to access (**lack of access**)
- 2 The user does not have the required knowledge (**lack of skills**)
- 3 The content is not relevant or is not in a local language (**lack of interest**)

Locally relevant content increases interest and drives Internet adoption and usage across society¹. However, locally relevant **content needs to be hosted locally**, so that people can access it quickly and affordably.

When locally relevant content (including content in the local language) is hosted abroad, it is more expensive to access, takes longer to load and depresses usage.

The result is that the **full potential** and benefits of the Internet are not realized². Hosting content locally drives people's use of the Internet³.

The digital world should reflect the wealth and importance of the **Arabic language and cultures**. Currently, the most popular websites in the ME are English-language sites⁴, and many of those already connected in the ME use English to transact online or to access video content. In order to bring the rest of the population online, it is essential that people find relevant content and usable services in their own languages. Action is needed to support a thriving **local Internet ecosystem**. Relevant content and good, inexpensive connectivity will encourage people to adopt and productively use the Internet, and will help express the region's distinct cultural identities.

Section Summary

- ME has an unusually high number of English-language sites. A lack of Arabic and local language content makes it harder for those with limited language skills and less education to get the most from the Internet.
- Local hosting is also a problem - only 5% of the most popular content is hosted in the ME. It is more costly and time-consuming to access the vast majority of content than it would be if it were hosted locally.
- Content and connectivity drive each other in a virtuous circle: The better the content, the more demand for connectivity, and vice versa.
- The dominance of state-owned or incumbent telecoms operators seems to be stifling the establishment and growth of Internet Exchange Points (IXPs) that can reduce the cost and latency of bandwidth for users.
- Government, entrepreneurs, businesses, educational establishments, civil society groups and individuals all have a role to play in creating useful and compelling local content that drives Internet access and fulfils a vital economic and social role.

¹ UNESCO/OECD/ISOC, 2011, The Relationship Between Local Content, Internet Development, and Access Prices, www.oecd.org/internet/ieconomy/50305352.pdf

² The Internet Society, 2015, Promoting Local Content Hosting to Develop the Internet Ecosystem, <http://www.internetsociety.org/doc/promoting-local-content-hosting-develop-internet-ecosystem>

³ The Internet Society, 2012, Assessment of the impact of Internet Exchange Points – Empirical Study of Kenya and Nigeria, <http://www.internetsociety.org/ixpimpact>

⁴ ICANN MEAC DNS Study, 2016

Locally Relevant Content & Languages

Locally relevant content is content that meets local interests in news, information, public and commercial services (such as e-government, e-commerce, e-health, and e-learning).

The themes should cover culture, education, health, business, and entertainment.

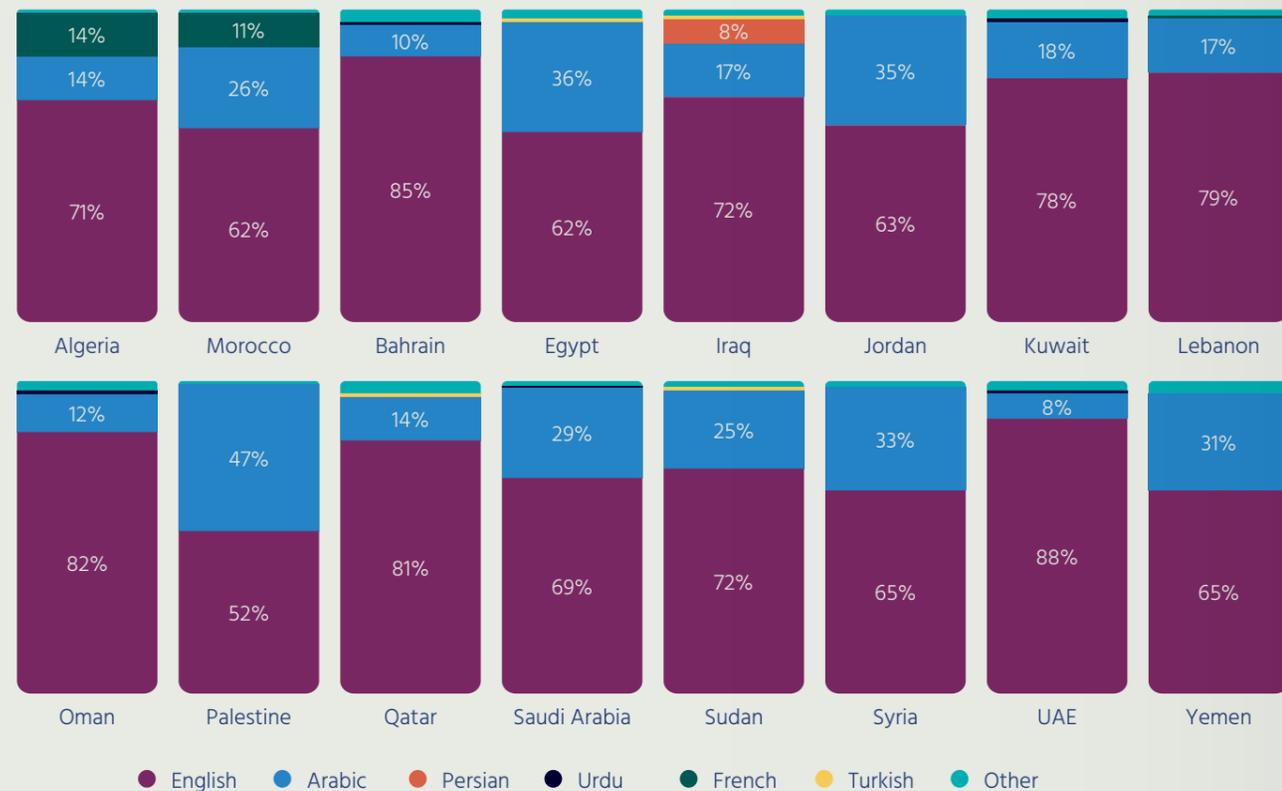
Locally relevant content can be generated internationally or locally. Locally relevant content also includes the “App Economy”, a phenomenon on the rise in the ME countries, where start-ups are creating a plethora of mobile applications to address the needs of their communities.

Locally relevant content is dependent on digital skills, policies that increase the take up of smart devices, and fixed and mobile broadband connectivity.

Locally relevant content needs to be suitable for local usage patterns, such as availability of devices people use to access the Internet, and local payment mechanisms when required. Local language products should include software, open source products, databases, language and translation processing⁵.

The ME has a higher proportion of English language content than other regions - **“70% of web content in the region is in the English language (compared with 55% globally).”**⁶ Retail platforms Amazon, eBay and AliBaba.com are popular in the region.

Figure 1 Language of Most Popular ME Websites by Country



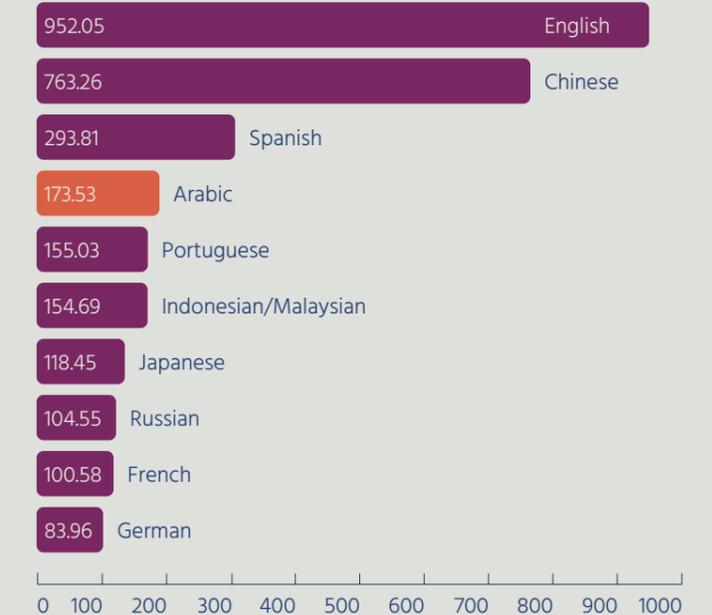
⁵ ESCWA, 2013, Policy Note on Digital Arabic Content, <https://www.unescwa.org/publications/policy-note-digital-arabic-content>

The ICANN MEAC DNS Study found that of the top 500 websites in the ME, over 400 are from ME companies, but many of them choose to use English rather than Arabic: “It therefore appears that local content or platform providers may be choosing to cater to local markets in English rather than local languages.” The study also found that the most Arabic language sites are in Palestine (47%), Egypt (36%) and Jordan (35%), and the lowest was in the United Arab Emirates (8%)⁷.

Of the 3.73 billion global Internet users,

173 million have Arabic as their mother tongue, ranking Arabic fourth in the languages of Internet users (see figure 2).

Figure 2 Top 10 languages used online, 2017 (millions of users)



Source Miniwatts Marketing Group, 2017

^{6,7} ICANN MEAC DNS Study, 2016

However, although Arabic is the fourth most used language of Internet users, only 7% of Facebook's 1.67 billion users are Arabic speakers⁸. **The largest number of Arabic Internet users is in Egypt (34.8 million), followed by Saudi Arabia (20.81 million) and Morocco (19.2 million).**

Although the use of Arabic is low, it is the fastest growing language on the Internet, growing by 6805.9% between 2000 and 2017, double that of Russian⁹. Given that Arabic is the main language spoken in the countries included in this guide, due consideration should be given to Arabic content.

Locally Hosted Content

Locally hosted content is locally relevant content that is hosted in-country, either directly on servers in caches, or delivered by content delivery networks (CDNs) with a presence in the country. It is typically less expensive to access because it does not use international bandwidth. For users, it loads faster and more smoothly.

But unless content creators – newspapers, video-makers, businesses, bloggers - can find reliable and affordable hosting services at home, they will choose to host their content abroad. In the ME, as in other emerging regions, most content accessed by local users is hosted overseas. Only 5% of the most popular content is hosted in the ME¹¹. 50% of gTLD domain name-based websites associated with the region are hosted abroad¹². This means it is more costly and time-consuming to access the majority of content than if it were hosted locally.

^{8&9} Miniwatts Marketing Group, 2017, Internet World Users by Language: Top 10 Languages

More local content will help maintain and develop the Arabic language and Arab identity, and safeguard the ME region's heritage. It also drives uptake by all citizens, creating a knowledge-rich society that contributes to individual development, the development of countries, and the impact of the region at the global level¹⁰.

Currently, about half of the population of the ME is online. There is a clear need to ensure the Internet reflects and welcomes all people in ME countries, and allows them to be not just consumers of entertainment but also creators of value-added content and opportunities for themselves and others.

Therefore, when local Internet users access a website, their ISP must download the data from abroad. It takes longer to load these websites (what is called higher 'latency'), and costs the ISP more to get the data. This cost is passed on to users, resulting in higher tariffs. The overall effect of a lot of locally relevant content being hosted abroad is slower and more expensive Internet connections for users, and fewer advanced services being used.

¹⁰ ESCWA, 2013, Policy note on Digital Arabic Content, <https://www.unescwa.org/publications/policy-note-digital-arabic-content>

^{11&12} ICANN MEAC DNS Study, 2016

Only
5%



of the most popular content is hosted in the ME.

There are several main factors that can encourage local hosting. First, costs for the hosting industry need to be low enough to serve local content creators. Competitive markets are the way to bring down hosting costs and ensure the service offerings continue to be innovative, so that services offered in the ME are just as good, or better, than those elsewhere. Governments can incentivize local hosting and service development by lowering taxes, providing subsidies, and/or supporting the training needed to operate data-centers.

Second, hosting companies need a low risk, stable, and reliable environment to protect their investment. This requires the legal framework of the Internet eco-system to be mature, defining the liability of the hosting industry, as well as guaranteeing the protection of privacy, data, intellectual property, etc... This is an area that is in dire need for more development in the region, and cannot be solved by simply imposing measures that require local hosting.

There is a strong correlation between local hosting and the development of value-added services¹³. There is also a strong association between local hosting and local language content¹⁴. Affordable local hosting encourages local content creation, setting up a 'virtuous circle' between them. Local content developers must have the choice of where to host their content. The key is to help the hosting offerings mature to the point where local content developers can have a real choice of competitive services to use.

Being able to economically host local content locally improves performance, lowers costs and drives up usage by all Internet users, including those who currently may not be able to afford it. It encourages the further development of local content, and therefore local Internet services, and supports a flourishing local Internet ecosystem; creating jobs, generating revenues and driving native innovation. It is a "win-win" for all.

^{13&14} The Internet Society, OECD, UNESCO, 2011, The Relationship Between Local Content, Internet Development and Access Prices, <http://www.oecd.org/internet/ieconomy/50305352.pdf>

Local Incumbents and IXPs

IXPs keep local traffic local and stimulate Internet development by reducing costs and latency and have also created local jobs (e.g. in Kenya and Nigeria)¹⁵. They should be supported by all decision-makers and allowed to flourish in an open and competitive environment.

State ownership of fixed telecoms incumbents is relatively high in the Middle East region. Incumbent telecom operators in the region have been an active player in rolling out infrastructure and broadband network, as well as advancing Internet services.

Nevertheless, our research shows that in many cases the incumbents have also obstructed further national and regional Internet development by refusing to participate in IXPs, denying or obstructing infrastructure access (e.g. local loop unbundling, access to fibre), charging prohibitively high prices for fiber connectivity into IXPs or data centres, and preventing or discouraging building alternative infrastructure which has the potential to increase network resilience to cyber attacks.

Best practices from around the world have shown that government-run IXPs may be unresponsive to market needs, which limits their growth and usefulness. Furthermore, executives and technical staff can lack understanding of how IXPs function and what IXPs can offer the country at large. Internet Service Providers can also be focused on their own interests and fail to see that these are not always compatible with the interests of the public or the market.

Other challenges include restrictive policies and inhibitive interconnection costs. An important challenge are policies that hinder regional interconnection, such as highly priced and non-competitive landing and interconnection costs, security concerns that usually result in more restrictive interconnection policies, as well as licensing and regulatory obligations that inhibit operators to interconnect at neighbouring countries. There is a need for joint political will to advance regional interconnection, which extends beyond general policy directives and looks more closely at measures to effectively eliminate interconnection barriers.

What is an IXP?

“An IXP is a physical infrastructure through which Internet service providers (ISPs) and Content Delivery Networks (CDNs) exchange Internet traffic between their networks.”

https://en.wikipedia.org/wiki/Internet_exchange_point#cite_note-1

IXPs are traffic exchanges that let networks interconnect directly instead of making the data travel long distances internationally, increasing costs and delays (latency).

IXPs, Internet eXchange Points, help to keep traffic local or regional, lowering costs, and improve network resilience.



¹⁵ ICANN MEAC DNS Study, 2016

Recommendations

To achieve the virtuous circle where relevant content and good connectivity reinforce each other, action is needed. This means coming together to create national content and connectivity strategies that ensure everyone can productively use the Internet.

- A national strategy for local language and content creation should be part of the overall national digital strategies. It should include identified leadership, collaboration, implementation measures, support initiatives and follow-up. It should involve stakeholders within the community, including civil society, academia, small business, urban and rural, women, and others. Content strategies can also drive collaboration across the ME by leveraging the proximity of countries and shared cultural, geographic and linguistic identities.
- Ensure legal and policy clarity for local content developers, hosting providers, content delivery networks, ISPs and other relevant stakeholders, including clear limits on intermediary liability for content. Furthermore, implement the legal and regulatory frameworks that encourage investments in regional and international connectivity, national and local networks, Internet facilities such as IXPs, and content infrastructure such as data centres and hosting resources.
- Promote local content development as a government policy priority, and encourage young entrepreneurs to develop local content for various sectors such as education, health, media and community service. National and regional programs and initiatives should be launched to encourage development of Digital Arabic Content.

Conclusions

This booklet has examined each of 3 challenges to maximizing digital opportunity throughout society: lack of access, lack of skills, and lack of interests.

It showed the huge opportunities available across the whole economy, if business, policy and technology leaders act together to address these challenges. The ME's market for digital opportunity has not been fully realized, and has captured only a fraction of its digital potential¹⁶. The Internet is a chance to craft a digital economy that works for all parts of society, and helps to achieve countries' strategic aims of prosperity and security. At the same time, the ME's unique cultures need to take their proper place online, so that the global Internet represents all the people of the world.

Today, decision-makers have a responsibility for overall economic development and social well-being of their citizens. While recognizing that the ME region faces a range of challenges, the digital economy is a huge opportunity which many countries in the region are missing. An inclusive and widely distributed digital economy, fuelled by digital skills and quality education, and spawning locally relevant content is fast becoming a necessity for country strategies and policies to meet the economic growth and job creation requirements of the coming decade.

Digital opportunities coupled with a collaborative approach to solving challenges is the ever-new vision for a happy and prosperous future. The enabler of this positive transformation is the "Internet of Opportunities, the Internet for all"...

¹⁶ McKinsey&Company, 2016, Digital Middle East Report,

Further Resources

Digital Opportunity

- A policy framework for an open and trusted Internet
The Internet Society, 2016
<http://www.internetsociety.org/doc/policy-framework-open-and-trusted-internet>
- The Future of Jobs and Skills in the Middle East and North Africa: Preparing the Region for the Fourth Industrial Revolution
World Economic Forum, May 2017
<https://www.weforum.org/reports/the-future-of-jobs-and-skills-in-the-middle-east-and-north-africa-preparing-the-region-for-the-fourth-industrial-revolution>
- Innovation Policy for Inclusive Sustainable Development in the Arab Region
United Nations Economic and Social Commission for Western Asia, 2017
<https://www.unescwa.org/publications/innovation-policy-inclusive-sustainable-development-arab-region>
- Regional profile of the information society in the Arab region
2003-2015, ESCWA (2016)
<https://www.unescwa.org/publications/profile-information-society-arab-region-2015>
- Report on the Domain Name System (DNS) for the Middle East and Adjoining Countries
Internet Corporation for Assigned Names and Numbers (ICANN), 2016
<https://www.icann.org/news/announcement-2016-02-26-en>

Education

- Internet and Education: Key considerations for Policy-Makers
The Internet Society, 2017 (Unpublished draft)
- The Future of Jobs and Skills in the Middle East and North Africa: Preparing the Region for the Fourth Industrial Revolution
World Economic Forum, May 2017
<https://www.weforum.org/reports/the-future-of-jobs-and-skills-in-the-middle-east-and-north-africa-preparing-the-region-for-the-fourth-industrial-revolution>
- ICT Competency Framework for Teachers
UNESCO, 2011
<http://unesdoc.unesco.org/images/0021/002134/213475e.pdf>

Local Content and Connectivity

- A policy framework for enabling Internet Access
The Internet Society, 2016
<https://www.internetsociety.org/doc/policy-framework-enabling-internet-access>
- Promoting Local Content Hosting to Develop the Internet Ecosystem
The Internet Society, 2015
<http://www.internetsociety.org/doc/promoting-local-content-hosting-develop-internet-ecosystem>

Acknowledgements and Special Thanks

This booklet is the result of collective work. Internet experts and ISOC members from the Middle East Internet Society chapters wanted to express their own outlook on the Internet and its impact on the region. Special thanks to all those who contributed throughout interviews, discussions, and text reviews.

شكر خاص

لم يكن هذا الكتيب ليبصر النور لولا العمل الدؤوب لمجموعة من الأشخاص (خبراء الإنترنت وأعضاء جمعية الإنترنت في الشرق الأوسط) الذين رغبوا بالتعبير عن نظرتهم حول الإنترنت ووقعه على المنطقة. شكر خاص لجميع الذين ساهموا من خلال اللقاءات والحوارات ومراجعة النصوص.

Internet Society

Salam Yamout
Konstantinos Komaitis
Maria Farrell
Robert Shuman

ESCWA

Nibal Idlebi
Lize Denner
Hania Dimassi

Wamda

Jonas Feller
Elias Boustani

Community

Musab Abdulla
Walid Al-Saqaf
Sulaiman Alansari
Nadira Alaraj
Mahmoud Allam
Ali Jawad AlMeshal
Ahmad Alsadeh
Christine Arida
Jack Bakayev
Fahd Batayneh
Nelly Baz

Tijani Ben Jemaa
Chokri Ben Romdhane
Said Bensbih
Hanane Boujemi
Nabil Bukhalid
Rafik Dammak
Khoulood Daouahi
Mohamed El Bashir
Hiba Eltigani
Baher Esmat
Hilmi Ghalib

Wasel Ghanem
Hisham Ibrahim
Manal Ismail
Layal Jebran
Tarek Kamel
Mondher Laabidi
Zahir Qasrawi
Nicolas Rouhana
Mohit Saraswat
Charles Shaban