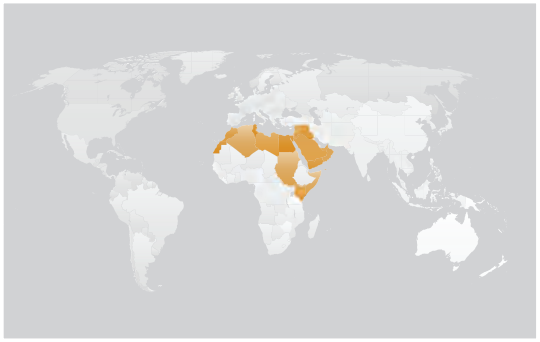
International Telecommunication Union

Information Society Statistical Profiles 2009

Arab States



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Foreword

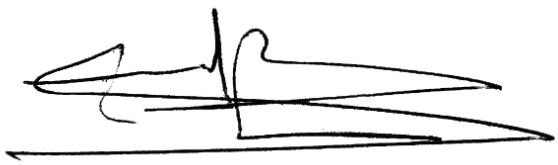
This report is the sixth of a series of regional statistical profiles on the information society prepared by ITU in 2009, as an input to the regional preparatory meetings (RPMs) for the ITU World Telecommunication Development Conference 2010 (WTDC-10). The sixth RPM - for the Arab States - takes place on 17-19 January 2010 and is hosted by the Government of Syria.

Over the past decade, the Arab States region has made significant progress when it comes to ICT access and use. In the mobile market, a number of national operators have expanded their services to customers across and beyond the region. Mobile telephony has grown at an annual rate of 55 per cent, reaching a penetration level of 63 per cent at the end of 2008. There are now 16 Internet users per 100 inhabitants, compared to only 4 in 2003. Nevertheless, compared to other regions, Internet usage, and particular broadband access, is still rather limited and out of the reach of most people in the region, in particular those living in rural areas.

The Arab States are characterized by important disparities in terms of income levels, which correspond to differences in ICT development. Countries of the Gulf Cooperation Council (GCC), which are among the wealthier economies worldwide, have witnessed high ICT uptake. UAE was the first country to surpass the 200 per cent mobile penetration mark in 2008. Other countries (such as Comoros, Djibouti, Mauritania, Sudan or Yemen), on the other hand, are among the poorest countries in the world, with very low ICT penetration levels. The region also features several high-population countries, such as Egypt, Sudan, Algeria, Morocco, Iraq and Saudi Arabia, which provide important growth markets for ICT services, featuring high net additions of mobile subscriptions, Internet users, and broadband subscribers in 2008.

There are a number of challenges the region has to address in order to increase ICT access and bring the benefits of ICTs to a large part of its population. These include timely and effective market liberalization, high-speed network deployment and providing an enabling environment for the migration to next-generation infrastructure and services.

This report highlights the latest ICT developments in the Arab States and presents key statistical indicators for each country. The report also features a regional analysis of the ITU ICT Development Index (IDI) and the ICT Price Basket, two ICT benchmarking tools that were launched in March 2009. I am confident that the findings of the report as well as the resulting policy conclusions will provide useful inputs to our members in preparation of the WTDC-10.



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Chapter 1.

Market overview

The Arab States[1] are part of an emerging and fast developing region, which is characterized by a wealth of natural resources and ongoing institutional reforms of both the public and private sectors (e.g. market liberalization). Undoubtedly, information and communication technologies (ICTs) are one of the key economic platforms for growth in the Arab States, and several developments have been taking place in this area over the past years.

For analytical purposes it is useful to distinguish between two groups of countries within the Arab States region. These include the countries that belong to the Gulf Cooperation Council (GCC)[2] on the one hand, and the countries that are part of the broader Middle East region[3] and North Africa[4] on the other hand. In 2008, GCC countries, with the addition of Libya, had GDP per capita levels above US$ 10,000, with Qatar, the United Arab Emirates (UAE), Kuwait and Bahrain leading the way (chart 1.1). All the remaining countries are characterized as middle and/or lower-income economies, with GDP per capita levels of well below US$ 10,000. These differences in countries' income levels have a direct impact on ICT services uptake.

Overall, there seems to be a linear relationship between the population of the Arab States region, which currently represents around five per cent of the global population[5], and its share in global ICT services. Hence, as of 2008, the Arab States accounted for five per cent of the world's mobile cellular subscriptions, three per cent of the world's fixed telephony lines and four per cent of the world's Internet users. With regards to fixed broadband subscribers and mobile broadband subscriptions the Arab States

There is a linear relationship between the population of the Arab States region, which currently represents around 5% of the global population, and its share in global ICT uptake

GDP per capita in the Arab States, 2008

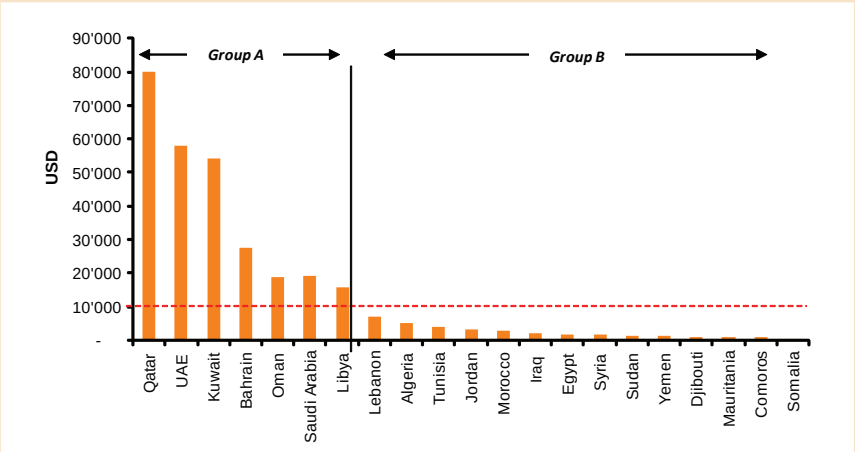
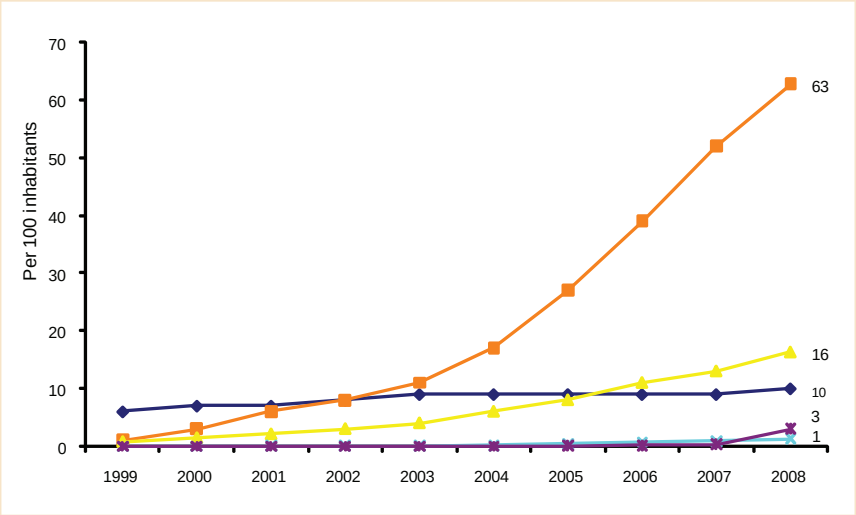


Chart 1.1

Source: ITU World Telecommunication/ICT Indicators database based on World Bank.

Chart 1.2

ICT developments in the Arab States, 1999-2008



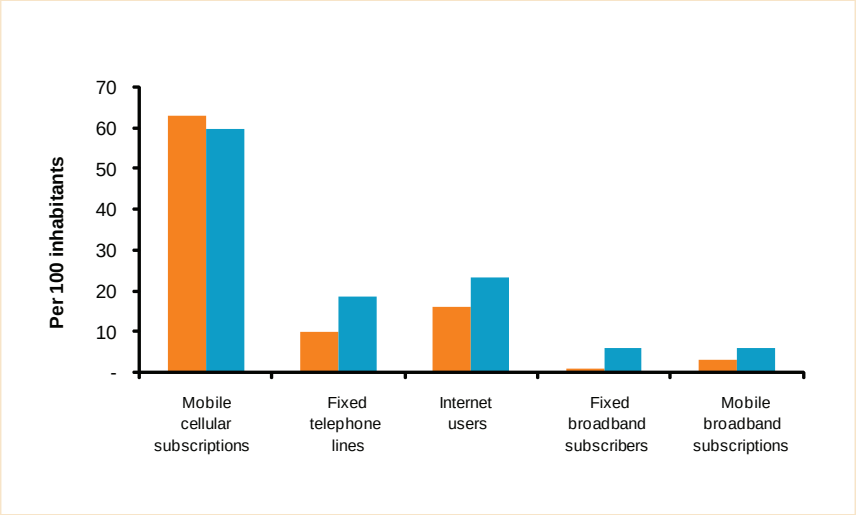
Source: ITU World Telecommunication/ICT Indicators database.

region accounted for just one and three per cent of world's total, respectively.

Over the past decade (1999-2008), mobile telephony has experienced exponential growth, increasing at an annual compound rate of 55 per cent and reaching 63 per cent population penetration by the end of 2008 (chart 1.2). At the same time, the region had 10 fixed telephone lines per 100 inhabitants, and an estimated 16 out of 100 inhabitants were using the Internet. With regards to broadband development, the Arab States are still at the very early stages and by the end of 2008, fixed broadband subscribers and mobile broadband subscriptions reached one per cent and three per

Chart 1.3

ICT uptake in the Arab States and the world, 2008



Source: ITU World Telecommunication/ICT Indicators database.

Mobile cellular subscriptions and fixed telephone lines in the Arab States, 1999-2008

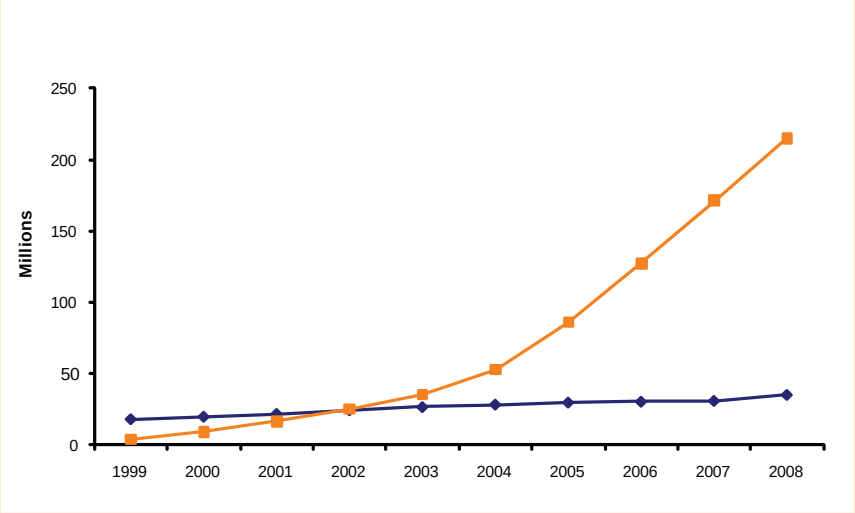


Chart 1.4

Note: CAGR: Compound Annual Growth Rate.

Source: ITU World Telecommunication/ICT Indicators database

cent of population penetration, respectively.

When compared to the world average, the Arab States demonstrate a higher adoption rate only with regards to mobile cellular subscriptions. The region is lagging behind in fixed telephone line and Internet user penetration rates and is also considerably behind the world average in terms of fixed and mobile broadband uptake (chart 1.3).

All GCC countries, except for Kuwait, had mobile penetration rates of more than 100% by the end of 2008

1.1 Fixed and mobile telephony

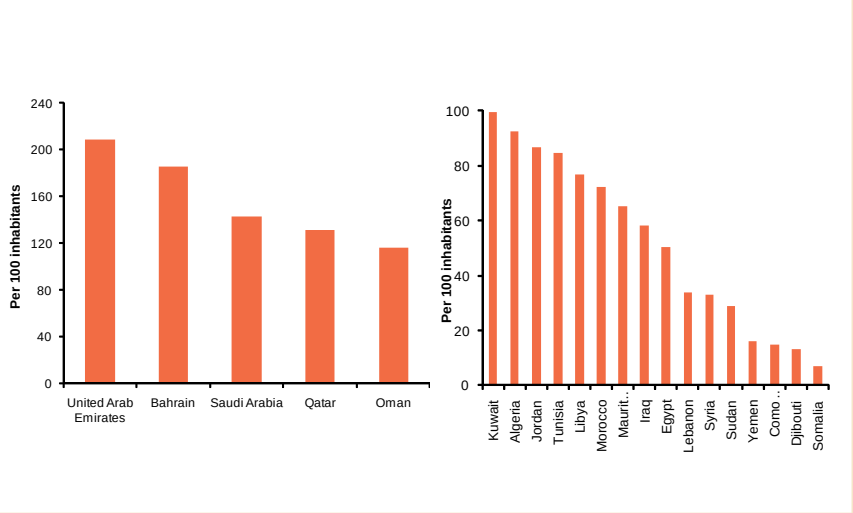
The total number of mobile cellular subscriptions in the Arab States reached almost 215 million by the end of 2008, compared to some 35 million fixed telephone lines in the region (chart 1.4).

When reviewing mobile cellular penetration in individual countries, it is noteworthy that all GCC countries, except for Kuwait, had penetration rates of more than 100 per cent by the end of 2008. The remaining Arab States present various levels of mobile cellular penetration rates, with Comoros, Somalia and Djibouti having the lowest penetration rates (chart 1.5).

It is important to note that UAE is the first country worldwide with a mobile cellular penetrate rate of more than 200 per cent (Box 1.1).

Chart 1.5

Arab States with mobile cellular penetration rates above (left) and below (right) 100 per cent, 2008



Source: ITU World Telecommunication/ICT Indicators database.

Box 1.1

Mobile cellular uptake in UAE

Remarkably, by the end of 2008, the United Arab Emirates (UAE), with 209 per cent mobile cellular penetration, has surpassed the 200 per cent threshold. This makes the country the world leader in terms of mobile cellular uptake. UAE has a very wealthy, oil-driven economy, with a high GDP per capita level (US$ 57,800), and attracts a significant number of foreigners (professionals and tourists) – two key factors that have led to a booming mobile market.

With regards to visitor inflow, the World Tourism Organization (WTO) has recently issued a study[6] that indicates that during 2008 the Middle East experienced the highest tourism growth in the world – 11 per cent compared to two per cent worldwide. In UAE alone, the total number of guests visiting the country that year reached more than 8.6 million, according to Dubai Statistics Office[7]. In parallel, there is a continuous trend for widening the gap between the number of expatriates and national residents. In 2007, there were only 0.86 million UAE nationals compared to 3.62 millions expatriates, up from 0.84 nationals and 3.4 million expatriates a year earlier[8].

A key reason also possibly affecting high reported numbers of mobile cellular penetration rates is the absence of Mobile Number Portability (MNP) regulations. Absence of MNP results in subscribers obtaining multiple SIM cards in order to enjoy lower on-net call rates. The current mobile market structure, with prepaid customers representing the vast majority of the market, is also another key parameter. As of 2008, prepaid subscriptions accounted for 91 per cent of total subscriptions in UAE. The high percentage of prepaid subscriptions is mainly due to the high number of visitors and foreign professionals/workers entering the country. Prepaid subscriptions are also often multi-SIM card holders, as there are low switching barriers to leverage on cheaper on-net calls. In parallel, a SIM card deactivation period of 90 days allows visitors to be considered as active subscribers, even if they are not present in the country anymore.

Mobile cellular subscriptions in the Arab States by income grouping, 2000-2008

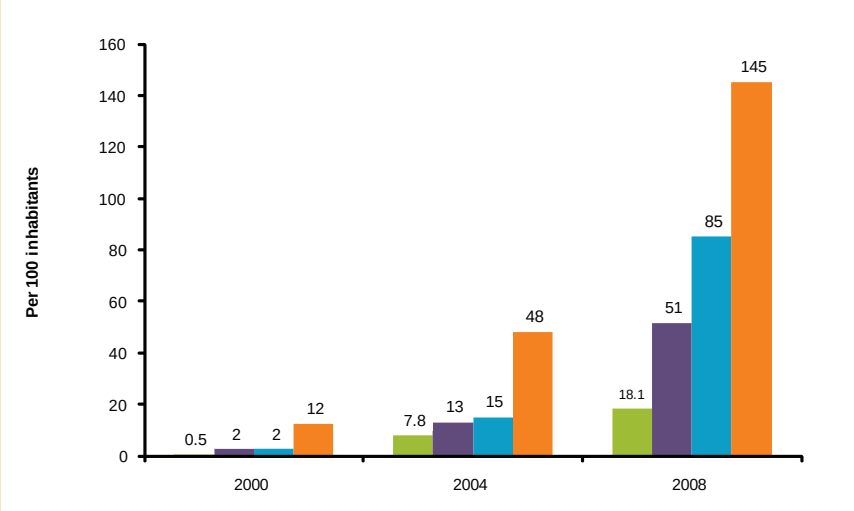


Chart 1.6

Lower income
Lower-middle income
Upper-middle income
High income

Source: ITU World Telecommunication/ICT Indicators database.

An analysis based on the Arab States' income levels reveals that the gap in mobile subscriptions uptake among low and high-income economies significantly grew over the years (Chart 1.6). Hence, between 2000 and 2008, the gap has grown from 11.5 percentage points to 130 points. It must be noted that over these years, GCC countries (which belong to the high-income group) have experienced significant economic development, which played a catalytic role in widening the gap. In parallel, countries that lie at the bottom of the list (e.g. Yemen, Comoros, Somalia, and Djibouti) are considered as low-income economies, with GDP per capita of less than US$ 2,000 in 2008.

Mobile cellular subscriptions monthly ARPU in selected Arab States, 2003-2008

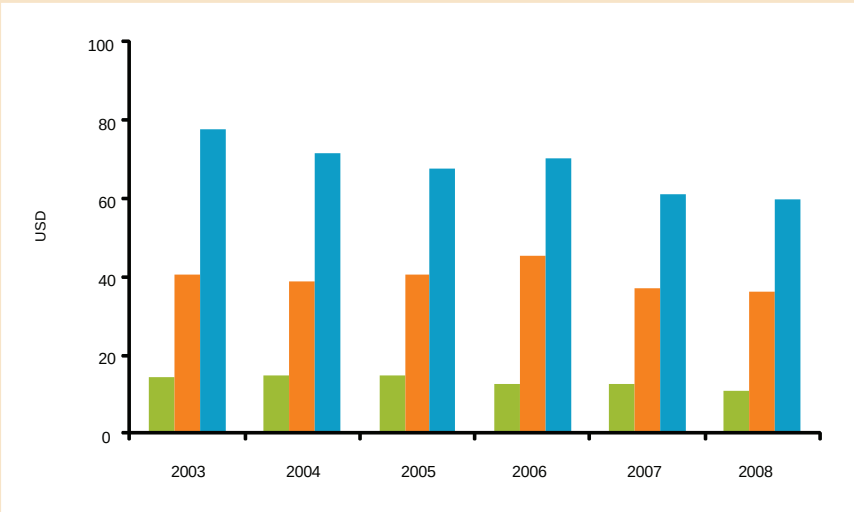


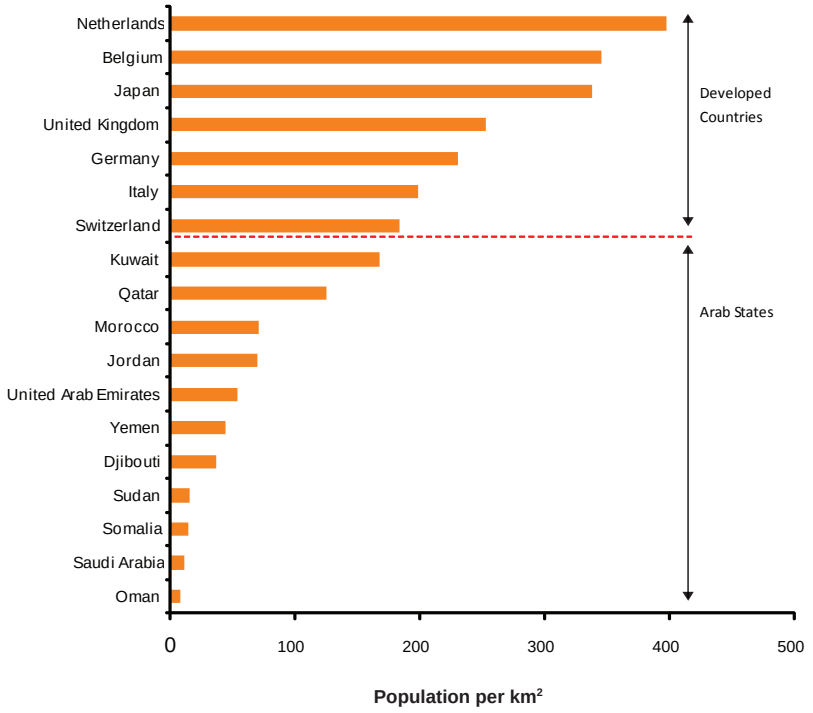
Chart 1.7

Morocco
United Arab Emirates
Qatar

Source: Arab Advisors Group Reports.

Chart 1.8

Population density in selected developed countries and selected Arab States, 2008



Source: : United Nations World Population Prospects, 2008 Revision.[11]

Average fixed telephone line penetration in the region did not exceed 10% as of 2008

Income differences are also reflected in the reported Average Revenue per User (ARPU) levels[9]. When examining ARPU levels in selected counties (e.g. Morocco, UAE, Qatar), it is evident that there are significant differences between lower-middle income economies and high-income ones with the latter group showing much higher levels of ARPU. Additionally, it is important to note that in all examined countries, as competition intensifies and retail prices decline, ARPU levels decrease (Chart 1.7).

In the fixed domain, as already mentioned above, a key characteristic of the region is that average fixed telephony uptake did not exceed ten per cent penetration as of 2008. The main reasons for that include a lack of available fixed line infrastructure (e.g. copper, cable), mainly due to countries' geographic conditions and low population density (chart 1.8), and a relatively high Fixed-to-Mobile Substitution (FMS) effect. The population density of the Arab States is considerably lower than in other developed countries. In Sudan, Somalia, Saudi Arabia and Oman less than 20 people, on average, reside per square kilometer, as large parts of these countries are uninhabited (desert landscape). There is still a significant percentage of the population in the Arab States that reside in rural areas (e.g. 17.4 per cent in the case of Saudi Arabia and 44 per cent in the case of Morocco[10]).

In terms of mobile cellular uptake, the Arab States rank just above the world average (chart 1.9). However, it is important to note that just four years earlier, in 2004, the

Mobile cellular penetration by region, 1999-2008

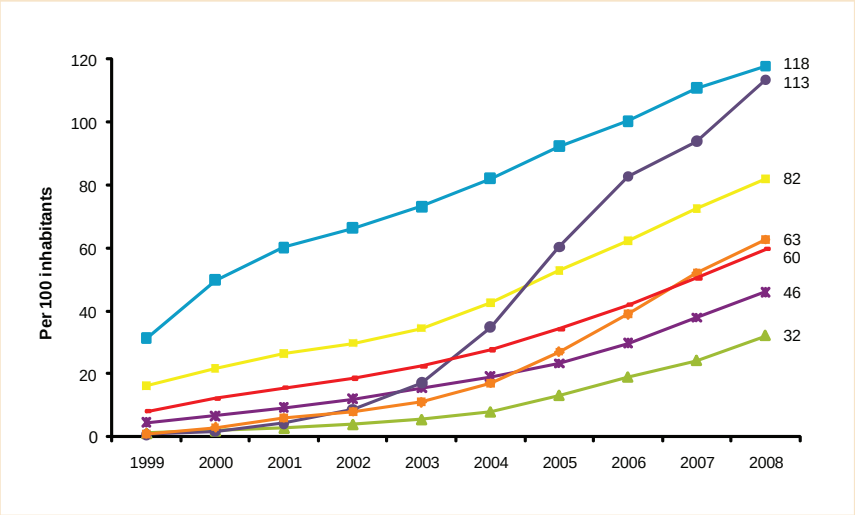


Chart 1.9

Source: ITU World Telecommunication/ICT Indicators database.

Arab States stood well below the world average and just above Africa, so they have demonstrated remarkable growth. This is due, on the one hand, to their economic growth and development, as prices for natural resources have skyrocketed over the past years. At the same time, effective policy making and regulatory intervention have led to market liberalization, incumbent privatization and increased competition. Most GCC countries (e.g. UAE, Kuwait, Bahrain, and Qatar) have licensed second and third mobile operators over the past five years[12].

Over the period 2003-2008, Egypt, Saudi Arabia, Algeria, Morocco and Iraq have had

Countries with the highest net additions of mobile cellular subscriptions in the Arab States, 2003-2008

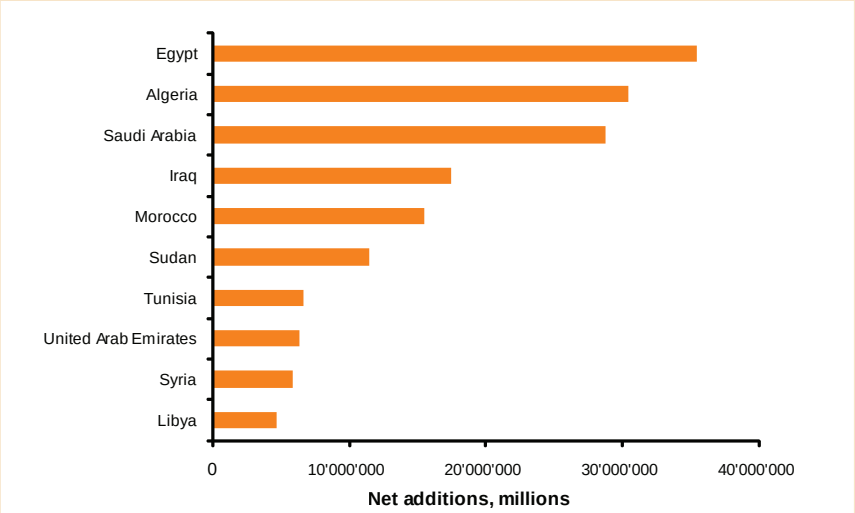
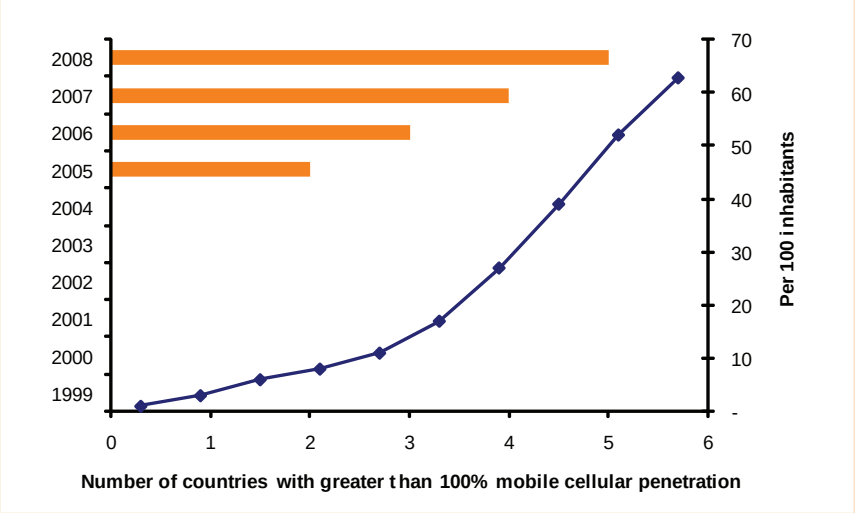


Chart 1.10

Source: ITU World Telecommunication/ICT Indicators database.

Chart 1.11

"Double-SIM" effect in the Arab States, 1999-2008



Source: ITU World Telecommunication/ICT Indicators database.

the highest number of net additions of mobile cellular subscriptions (chart 1.10). All these countries started at very low penetration levels and all have large populations.

The Arab States with mobile cellular penetration rates exceeding 100% are currently experiencing the so-called "double-SIM" effect

The Arab States that present very high mobile cellular penetration rates, essentially the GCC countries, are currently experiencing the so-called "double-SIM" effect, which refers to cases where the mobile cellular penetration rates exceed 100 per cent. As shown in chart 1.11, the number of countries that exceeds the 100 per cent penetration rate increased from two to five in 2008. All of these are GCC countries. Different parameters that affect this trend are the high number of foreigners (professionals/tourists) entering the country (for varying periods of time), individual countries' market structures (e.g. a high share of prepaid customers[13]), the relatively late introduction of mobile number portability (e.g. 2006 in Saudi Arabia) and/or no portability at all (e.g. case of Bahrain, UAE[14]).

With regards to retail pricing levels, only the GCC countries, with the exception of Qatar, present lower mobile cellular prices[15], as a percentage of monthly GNI per capita (see Chart 3.5 in Chapter 3), when compared to the developed countries' average. The other Arab States have relatively high mobile tariffs, with Morocco, Mauritania and Comoros being the most expensive countries in the region. Their low national GDP per capita, coupled with high retail prices and the lack of effective market liberalization are the main reasons for the relative low mobile cellular penetration rates.

In the fixed domain, Yemen and Syria present the lowest fixed telephone prices as a percentage of monthly GNI per capita (see Chapter 3 – on fixed telephone sub-basket[16]), while Oman and Morocco are the most expensive countries among all Arab States. Notably, Morocco, Mauritania and Comoros are the only countries in the region with fixed telephone tariffs above the world average.

Internet users by region, 2004-2008

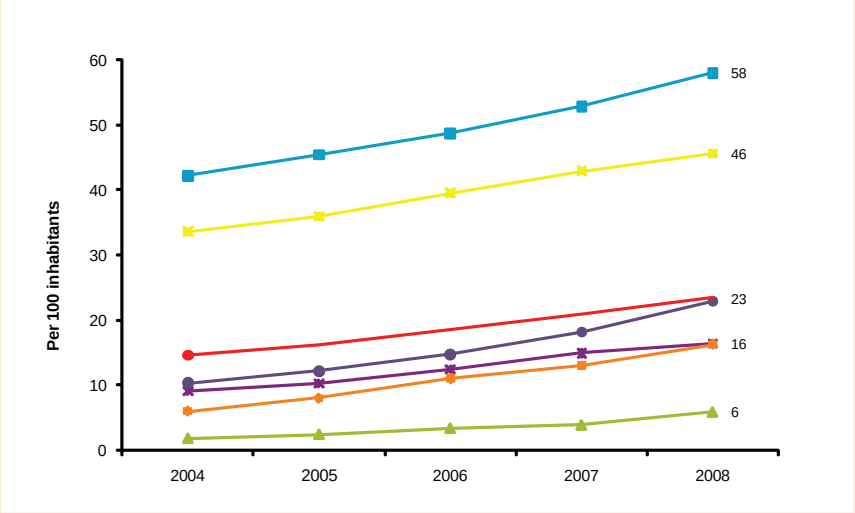


Chart 1.12

Source: ITU World Telecommunication/ICT Indicators database.

1.2 Internet and broadband

By the end of 2008, the Arab States region had one of the lowest average Internet user penetration levels in the world, with only 16 out of 100 inhabitants using the Internet. The Arab States lie far behind Europe and the Americas and only ahead of the Africa region. Despite the fact that over the past years the number of Internet users has been growing at 37 per cent annually, the Arab States region still lies well below the world average in terms of penetration (chart 1.12).

Internet user penetration in the Arab States, 2008

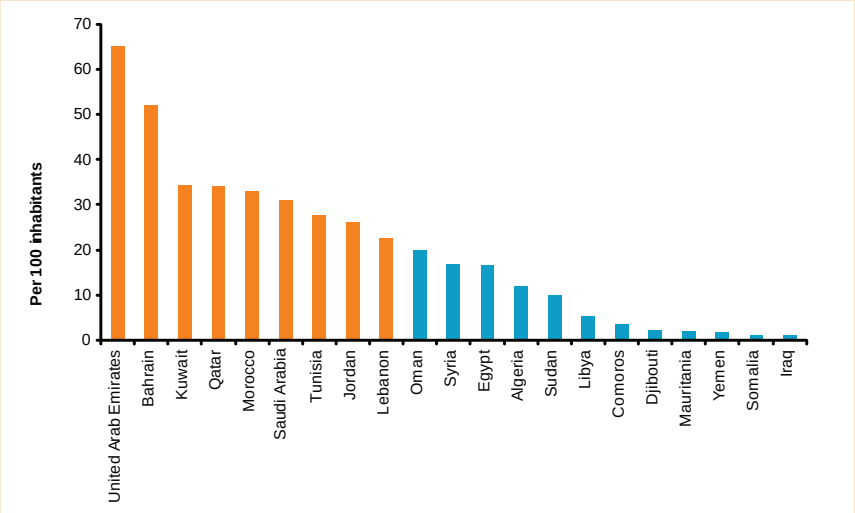
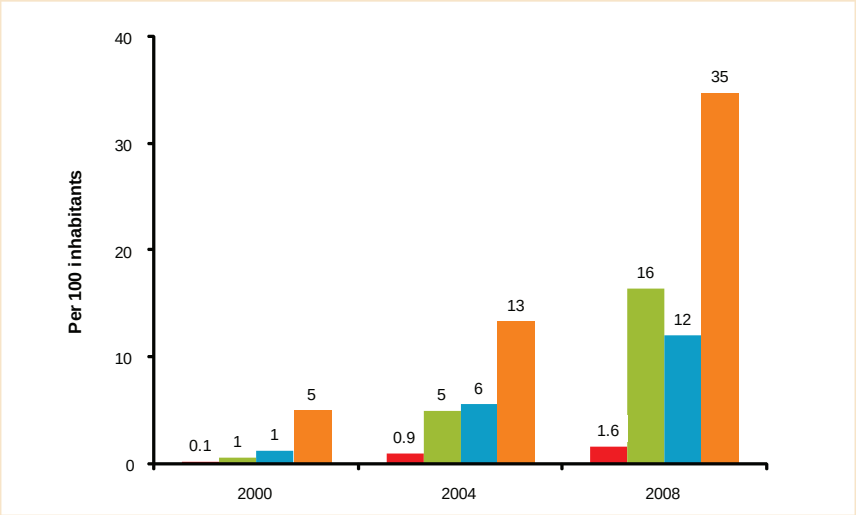


Chart 1.13

Source: ITU World Telecommunication/ICT Indicators database.

Chart 1.14

Internet users in the Arab States by income grouping, 2000-2008



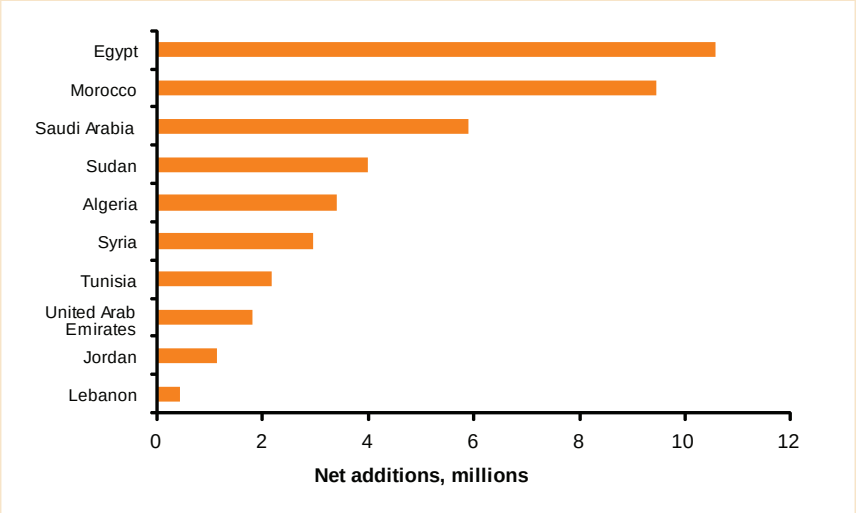
Source: ITU World Telecommunication/ICT Indicators database.

Similarly to mobile telephony, four out of five countries with the highest level of Internet user penetration are GCC countries (chart 1.13). The only exception in the top-five list is Morocco, with a penetration of 33.0 per cent, as of 2008. It is also important to note that in more than half of the Arab States (12 out of 22), Internet user penetration does not exceed the 20 per cent mark.

The significant difference in Internet user uptake between GCC countries and other Arab States is further explained by examining Internet user penetration rates and income levels (chart 1.14). The gap between low and high-income countries, with

Chart 1.15

Countries with the highest net additions of Internet users in the Arab States, 2003-2008



Source: ITU World Telecommunication/ICT Indicators database.

Average international Internet bandwidth per inhabitant in the Arab States, 2003-2008

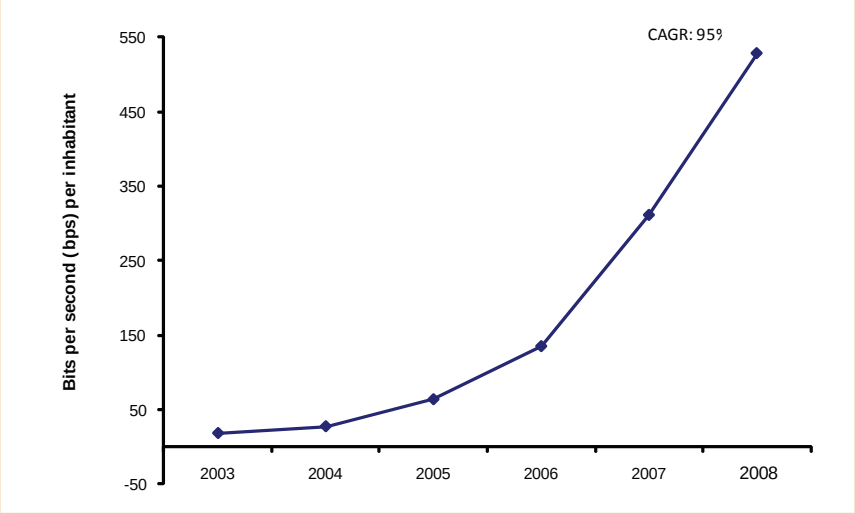


Chart 1.16

Note: CAGR: Compound Annual Growth Rate.

Source: ITU World Telecommunication/ICT Indicators database.

regards to Internet usage, has been growing from 4.9 percentage points in 2000 to 32.4 points in 2008. No significant differences lie between lower-middle and upper-middle-income economies.

Between 2003-2008, Egypt, Morocco, Saudi Arabia and Sudan were the countries with the highest number of net additions of Internet users, mainly due to their large populations (chart 1.15).

Over the past years, the Arab States region has witnessed a significant increase in the average international Internet bandwidth available per inhabitant. Over the period 2003-2008 the region reported a 95 per cent compound annual growth rate and reached 528 bps per inhabitant (chart 1.16). Some of the Arab States, such as UAE and Egypt, also act as international and regional Internet hubs, hosting various international Internet service providers and providing connectivity between Europe and Asia. Examples include Etisalat's Emirates Internet Exchange (EMIX)[17] and Egypt's Cairo Regional Internet Exchange Point (CRIXP)[18].

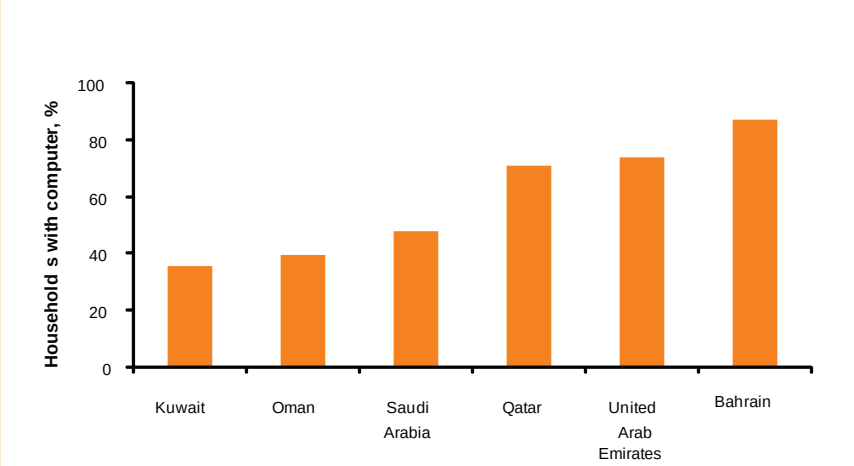
One of the key factors that impact Internet development in the Arab States is the lack of computers in households and businesses

One of the key factors that impact or limit Internet development in the Arab States is the lack of computers in households and businesses. Amongst the GCC countries, only Qatar, United Arab Emirates and Bahrain have household computer penetration of above 50 per cent (Chart 1.17). The remaining countries are well below that threshold, further demonstrating the region's relevant weakness.

Compared to other world regions, the Arab States region is currently among the least developed areas with regards to (fixed and mobile) broadband uptake. The total number of fixed broadband subscribers reached 4.3 million by the end of 2008 and the number of mobile broadband subscriptions stood at 11.4 million, representing one and three per cent penetration, respectively (Chart 1.18, Chart 1.19).

Chart 1.17

Percentage of households with computers, GCC Countries, 2008

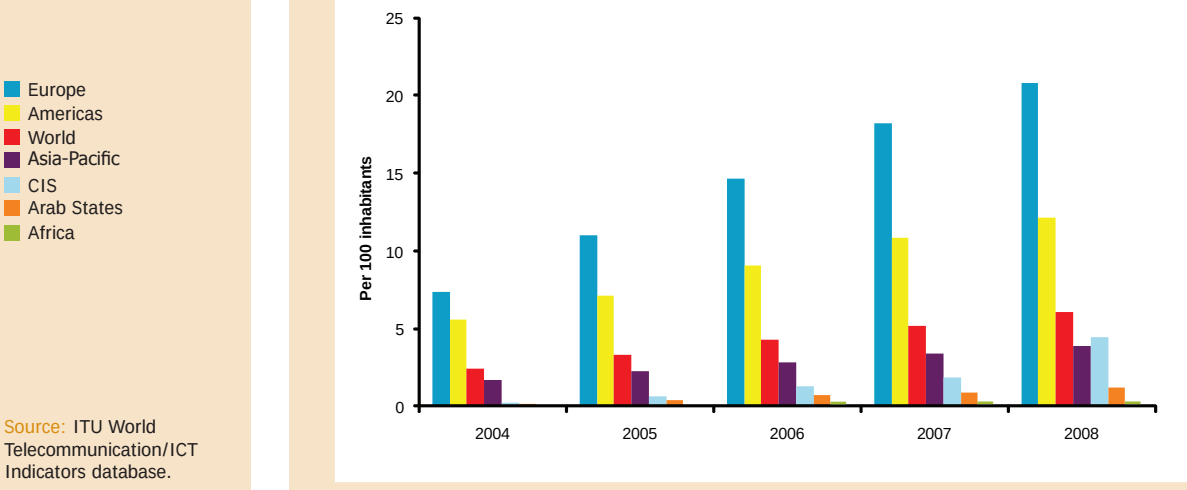


Source: ITU World Telecommunication/ICT Indicators database.

Key reasons for low broadband penetration include shortfalls in both supply and demand related drivers. On the supply side, the Arab States' mountainous and desert landscape, coupled with sparse population density, have resulted in the lack of available copper/cable infrastructure. In parallel, despite important developments in the mobile domain and the widespread launch of 3G networks in the region[19], operators have only recently introduced relevant mobile broadband packages in the market[20] and engaged into expanding coverage of their mobile data networks[21]. On the demand side, there is a significant lack of digital literacy among citizens, and especially nationals (e.g. non-expatriates). There is further a lack of computers in schools and

Chart 1.18

Fixed broadband penetration by region, 2004-2008



Source: ITU World Telecommunication/ICT Indicators database.

Mobile broadband penetration by region, 2004-2008

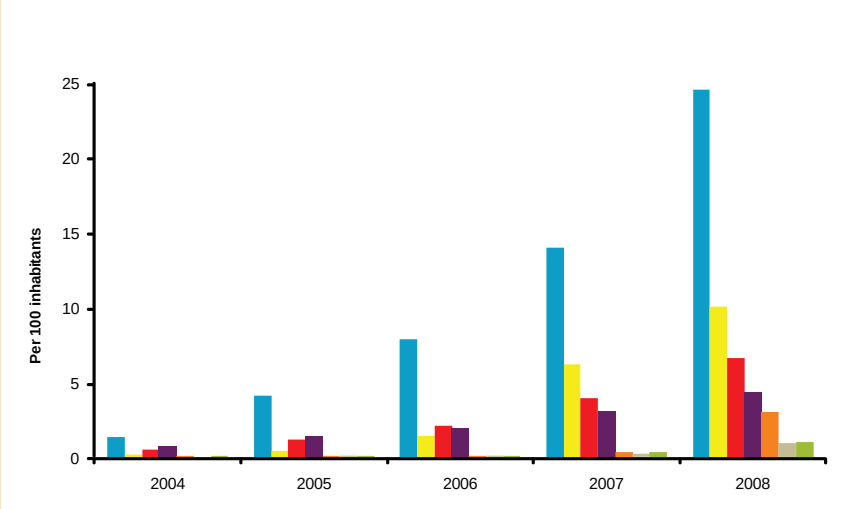


Chart 1.19

Source: ITU World Telecommunication/ICT Indicators database.

universities and considerable lack of online Arabic content (less than 1 per cent of total online Internet content[22]). Moreover, due to institutional barriers (e.g. government ownership of national incumbents), market liberalization has started rather late (end of '90s) in most Arab States. Hence, key levers such as local loop unbundling, wholesale line rental and reference offers have been absent in the marketplace, further hindering broadband market growth.

However, there are a number of countries, such as UAE, Saudi Arabia, Egypt or Bahrain that have experienced remarkable growth (over 200 per cent) between 2007/2008. As the "network effect" comes into play and as available online Arabic content increases, it is expected that at least the wealthier GCC countries will demonstrate strong broadband uptake over the coming years. Mobile broadband access packages are expected to drive market uptake. This is also in line with forecasts that predict an exponential growth of the mobile broadband market, and up to 50 million subscriptions by 2013[23].

Forecasts predict an exponential growth of the mobile broadband market, with up to 50 million subscriptions by 2013

Endnotes

[1] Refer to Annex I for the list of countries included in the ITU-BDT Arab States regional classification.

[2] Gulf Cooperation Council countries include: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates / see: http://www.gccsg.org/eng/index.php?action=GCC.

[3] The broader Middle East region includes Iraq, Jordan, Lebanon, Sudan, Syria and Yemen.

[4] The North Africa region includes: Algeria, Comoros, Djibouti, Egypt, Libya, Morocco, Mauritania, Somalia and Tunisia.

[5] In the Arab States, the total population was 345 million, in 2008, while the global population was 6,772 million, see ITU ICT Eye, at: http://www.itu.int/ITU-D/ICTEYE/Indicators/Indicators.aspx

[6] See: http://www.khaleejtimes.com/DisplayArticleNew.asp?col=&section=theuae&xfile=data/theuae/2009/July/theuae_July461.xml

[7] See: http://www.dubaichronicle.com/news/analysis/united-arab-emirates-tourism-report-q4-2008-2749 http://www.dsc.gov.ae/DSC/Pages/Tourism.aspx.

[8] See: http://uaeinteract.com/docs/Expat_growth_widens_UAE_demographic_gap__/32128.htm.

[9] Source of ARPU data is Arab Advisors Group, see http://www.arabadvisors.com/.

[10] See: http://www.laposte-export-solutions.co.uk/uk/markets/country-profiles/morocco/population-structure.

[11] United Nations, World Population Prospects: the 2008 Revision Population Database, http://esa.un.org/unpp/.

[12] National Regulatory Authorities (NRAs) websites: www.tra.org.bh / www.tra.ae / www.ict.gov.qa / www.tra.gov.om / www.moc.kw.

[13] As of 2008, the share of prepaid subscriptions in total subscriptions was 84 per cent in Saudi Arabia and Bahrain, 86 per cent in Qatar, 90 per cent in Oman and 91 per cent in United Arab Emirates (Source: ITU World Telecommunication/ICT Indicators database).

[14] Bahrain's Telecommunication Regulatory Authority (TRA) has requested mobile operators in the country to make mobile number portability (MNP) available by the end of 2009; see: http://www.itu.int/ITU-D/ict/newslog/Number+Portability+By+Yearend+BAHRAIN.aspx. Similarly, UAE's TRA has announced its plans to introduce MNP in the market, by early 2010; see: http://gulfnews.com/news/gulf/uae/general/tra-to-offer-number-portability-to-mobile-customers-1.513958.

[15] Mobile sub-basket includes 25 outgoing calls per month (on-net, off-net and to a fixed line), in predetermined ratios of minutes, plus 30 Short Message Service (SMS) messages.

[16] The fixed sub-basket includes the fee of the monthly subscription, plus the cost of 30 local calls to the same (fixed) network (15 peak and 15 off-peak calls) of three minutes each.

[17] See: http://www.emix.net.ae/home.swf.

[18] See: http://www.arabdev.org/node/add/book/parent/90.

[19] 3G networks have been launched in 11 out of the 22 Arab States (Source: ITU World Telecommunication/ICT Indicators Database).

[20] Only in Q3 2007, Etisalat (UAE incumbent) launched UAE's first USB modem, allowing users to subscribe to mobile broadband; see: http://www.etisalat.ae/index.jsp?parentid=fa58800d1f52a010VgnVCM1000000a0a0a0a____&contentid=48d88b0abb7a5110VgnVCM1000000c24a8c0RCRD&currentid=10c8e15c0b56a010VgnVCM1000000a0a0a0a____&lang=en&type=content.

[21] Example of Mobily, the leader in the mobile broadband market in Saudi Arabia, which invested greatly in its 3G network during 2008. https://www.mobily.com.sa/wps/themes/html/MobilyTheme08/files/IR/Final%20Fact%20Sheet-English.pdf.

[22] Google estimates that less than 1 per cent of information online is in Arabic; see: http://www.bi-me.com/main.php?c=3&cg=1&t=1&id=40118.

[23] Forecasts by Informa Telecoms & Media and Pyramid Research, see: http://www.gulfjobsmarket.com/mobile-broadband-to-see-50m-users-by-2013-job / http://www.prnewswire.co.uk/cgi/news/release?id=255313.

Chapter 2.

Towards digital inclusion in the Arab States

2.1 Overview

From the previous discussion of ICT services uptake in the Arab States, two main conclusions can be derived:

1. The GCC countries have, in general, higher ICT penetration levels than the other Arab States. The main reasons are that the GCC states have wealthier economies, attract more visitors and foreigners and were earlier adopters of policies to liberalize their telecommunication markets (Chart 2.1).

2. In all of the Arab States there is a significant difference between mobile cellular subscriptions and Internet user uptake. In countries where mobile cellular penetration rates exceed 100 per cent, differences are particularly pronounced (Chart 2.2).

In all of the Arab States there is a significant difference between mobile phone and Internet uptake

In order to identify and assess possible ways of bridging this gap, it is necessary to first better understand the key drivers and barriers for mobile and Internet access and use. In parallel, the role of policy makers and national regulatory authorities (NRAs) needs to be thoroughly analyzed.

Mobile cellular and Internet user penetration in GCC countries, 2008

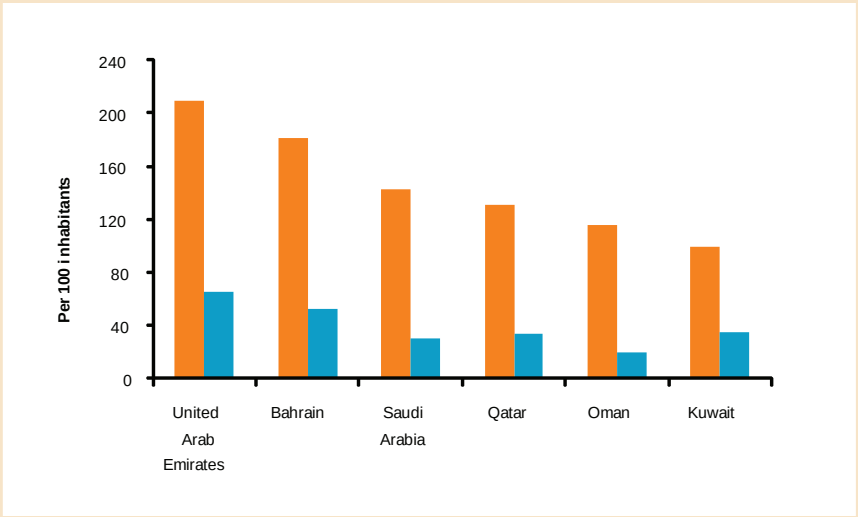
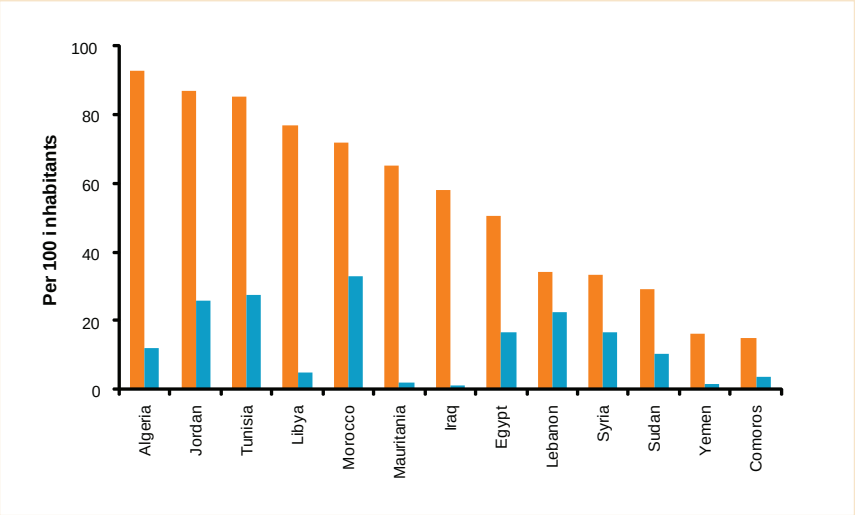


Chart 2.1

Source: ITU World Telecommunication / ICT Indicators Database.

Chart 2.2

Mobile cellular and Internet user penetration in the Arab States, non-GCC, 2008



Source: ITU World Telecommunication / ICT Indicators Database.

Therefore, three key areas will be further examined:

1. **The mobile cellular market:**
   - institutional reforms, market liberalization and growth
   - competition developments and operators' market shares
   - mobile broadband infrastructure deployment

2. **Internet access and use:**
   - available infrastructure and computers
   - digital literacy issues
   - available online Arabic content
   - investments in the ICT sector and the role of economic zones to create ICT incubators

3. **Role of policy makers and regulators:**
   - adopted regulatory strategies and policies
   - independence and effectiveness of NRAs
   - policies to enable Internet/broadband sector growth
   - infrastructure sharing for effective ICT sector development

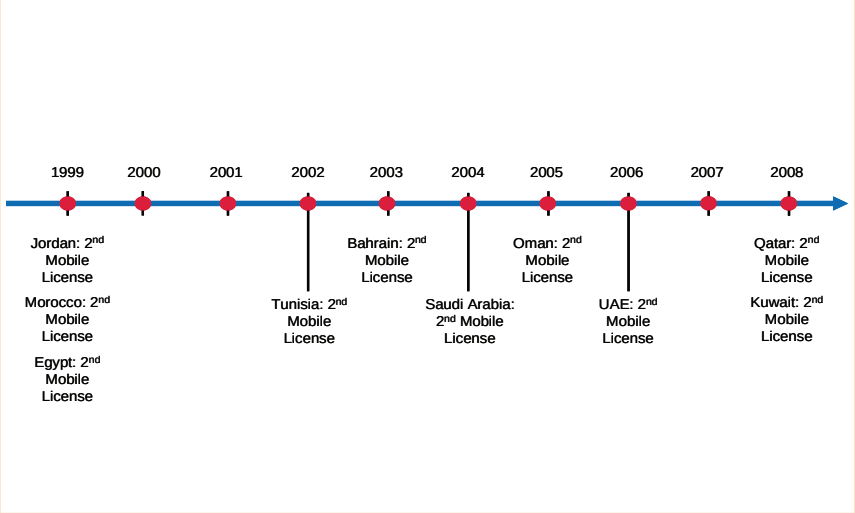
2.2 Mobile market

Jordan and Morocco were the first countries in the region to issue a second mobile license

Market liberalization in the Arab States has been delayed as liberalization first started with the launch of second mobile licenses in the late 1990s and early 2000. As presented in chart 2.3, Jordan and Morocco were the first countries in the region to issue a second mobile license, while the more developed GCC countries were rather late in opening up competition in the fast-growing mobile sector. Key reasons for that include governments'

Mobile cellular licenses in the Arab States, 1999-2008

Chart 2.3



Source: ITU-D, Arab Region, Level of Competition in Telecommunication Services.[3]

interests in protecting their investments in national incumbents and their unwillingness to allow foreign ownership in state-owned entities[1]. An important factor that acted as a catalyst to drive telecommunication market liberalization was the fact that most Arab States had to comply with their commitments to the World Trade Organization (WTO). For example, in the case of UAE, the country entered into WTO agreements in 1996, obtaining a ten-year concession period prior to fully complying with WTO guidelines (by 2006). This also included the liberalization of the domestic telecommunication sector[2].

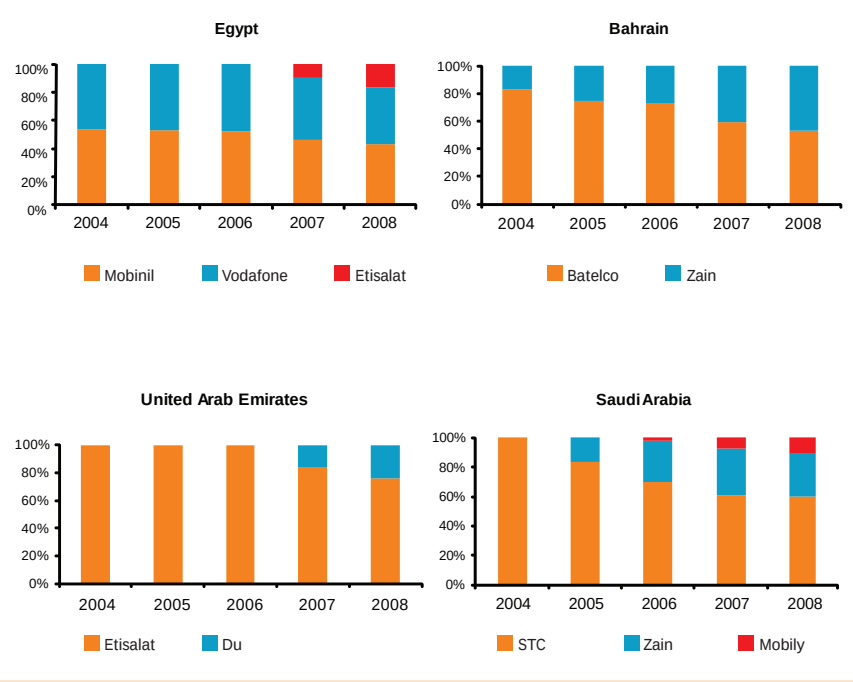
In Egypt, the incumbent operator's market share shrunk below 45% by 2008

Market liberalization has increased competition and allowed new entrants to capture significant market shares within the first years of operation (chart 2.4). Examples include Egypt, where the incumbent operator's (Mobilink) market share shrunk below 45 per cent by 2008. In Bahrain, Batelco today controls less than 55 per cent of the market. Intensified competition and the enforcement of key regulatory decisions (e.g. asymmetric regulations, mobile number portability, national roaming agreements) have given a boost to the mobile market. In the GCC countries, high reported Average Revenue Per User (ARPU) levels, as presented in Chart 1.8, provided the necessary financing for operators to further increase coverage of their cellular networks and upgrade them, based on the latest technologies[4] (e.g. High Speed X-link Packet Access –HSxPA- networks). This allows operators to introduce high-speed mobile broadband packages, providing "broadband on the move" to end-users. For example, Etisalat was in the leading group of operators worldwide, to upgrade its entire 3G network to HSPA in 2005. Since May 2005, over 1.4 million people – more than one in four of all people living in the Emirates – have become regular users of Etisalat's HSPA mobile broadband services[5]. Around 500,000 users have a monthly subscription, and 900,000 have pay-as-you-go access to all of Etisalat's mobile content. Similarly, in Saudi Arabia, the second mobile entrant Mobily, claims to have more than 600,000 mobile broadband subscriptions, as of mid-2009, with over 100 per cent growth in six months[6].

Despite the relatively late growth of the sector, and consequently that of domestic operators, there has been a remarkable "appetite" for international expansion by the

Chart 2.4

Mobile operators' market shares selected Arab States, 2004-2008



Source: World Cellular Information Service (WCIS) Report, 2008[7]

The strong financial position, coupled with ongoing international expansion, has brought some operators in the region international recognition

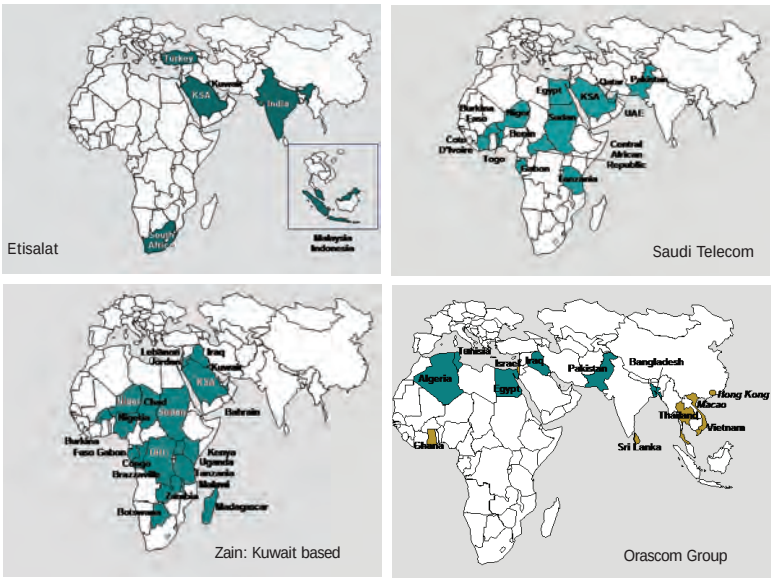
incumbent operators of these countries, especially over the past years (chart 2.5). Fuelled by national markets' exponential revenue growth and the ambition to enhance brand awareness, operators have engaged into license acquisition and bought into existing operations, mainly focusing on Africa and South East Asia. Another major concern of national incumbent operators, based on lessons from their European counterparts, has been to counter the limits of small national markets[8], and stagnating revenue growth by diversifying operations. Currently, both Zain and Etisalat operate in more than ten markets, and their main focus today is on leveraging on interregional synergies. For example, Zain has successfully launched its "One Network" mobile roaming scheme, which allows its subscribers to enjoy local rates for voice calls and short-message-service (SMS) and receive incoming calls free of charge, in all 12 countries where Zain currently operates[9].

The strong financial position, coupled with ongoing international expansion, has brought some operators international recognition. According to one brand valuation index, STC and Zain hold position number 28 and 30, respectively, in the list of top-100 most valuable telecommunication brands (Chart 2.6).[11] This is another sign of the wide success and recognition, on a worldwide level, of the mobile sector in the Arab States.

Another sign of market liberalization has been the recent issuance of Mobile Virtual Network Operators (MVNOs[13]) in a number of the Arab States. Jordan has issued two MVNO licenses in 2008[14] and during the same period, five applicants

Telecommunication operators' worldwide presence, selected Arab States [10]

Chart 2.5



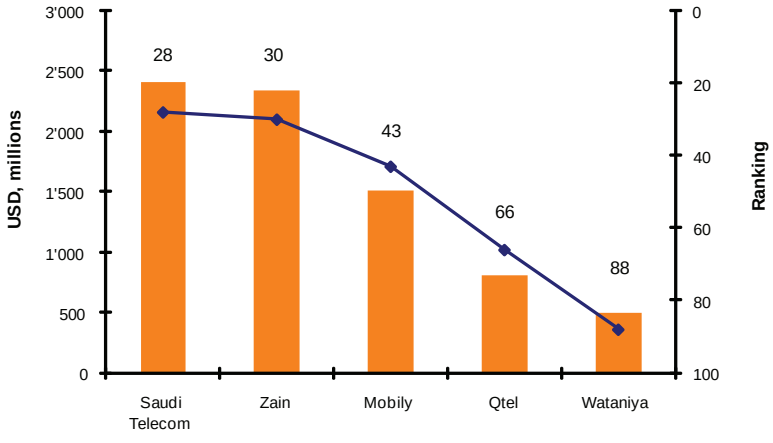
Source: Telecommunication Operators Annual Reports, 2008

were awarded MVNO licenses in Oman[15]. Saudi Arabia and Bahrain are also closely examining the possibility of allowing MVNOs into their markets, most likely before the end of 2010[16].

Overall, it can be inferred that competition and other regulatory interventions (e.g.

Telecommunication operators brand value, selected Arab States[12], 2008

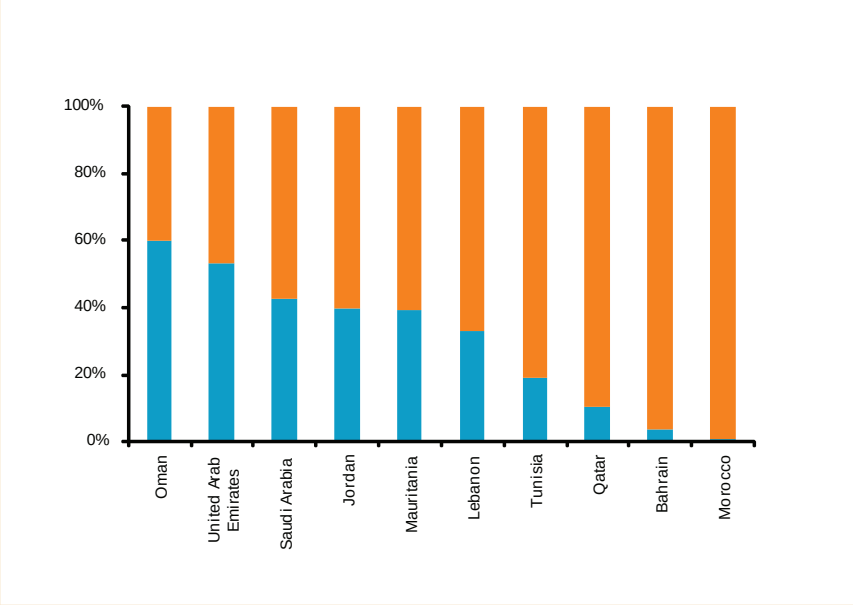
Chart 2.6



Source: Intangible Business Report, 2008.

Chart 2.7

Dial-up and broadband shares of total Internet subscribers in the Arab States, 2008



Source: ITU World Telecommunication / ICT Indicators database.

the distribution of new licenses), have made the mobile market a truly level-playing field. End-users greatly benefit from the variety of multiple networks and the availability of an open and competitive mobile market.

2.3 Internet access and use

Internet and broadband access and use have been relatively slow to develop in the region

Despite the healthy growth of the mobile sector, Internet and broadband access and use have been relatively slow to develop in the region. There are a number of reasons that have possibly hindered the timely and effective development of the Internet market:

- Lack of extensive, reliable fixed networks, to cover the majority of the country
- Late opening-up/liberalization of the fixed and data markets
- Low levels of digital literacy, especially among nationals (non-expatriates)
- Lack of available online Arabic content
- An investment bias, with investors in the region preferring to focus on the fast-growing energy and real-estate sectors, enjoying short-term returns

These issues will be considered in more detail in the following section.

Lack of an extensive fixed line network

The majority of the Arab States are characterized by mountainous landscapes and/or large desert territories. At the same time, a certain percentage of their populations

Fixed broadband subscriber share per technology in the Arab States, 2008

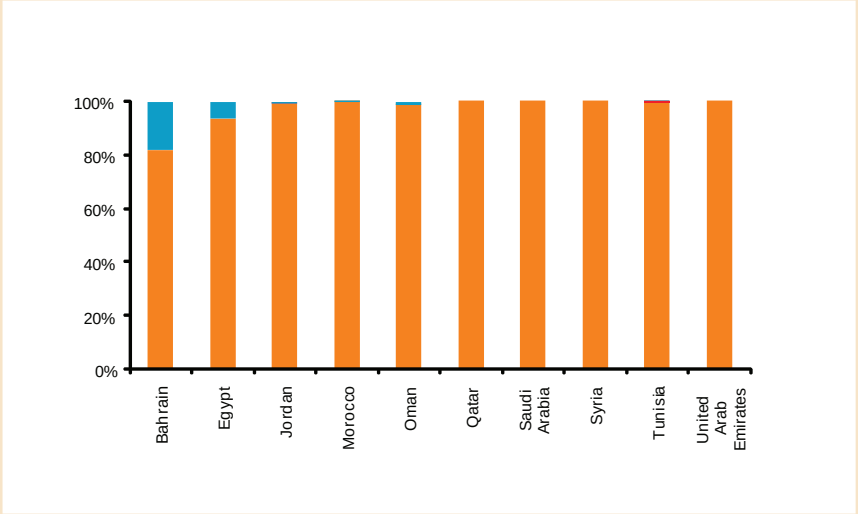


Chart 2.8

Source: ITU World Telecommunication / ICT Indicators database.

are Bedouins that change locations frequently within a country's borders[17]. As shown in Chart 1.9, the population density in the Arab States is significantly below that of other developed countries, while a significant percentage of population resides in rural areas. These parameters tend to negatively impact operators' incentives to invest in fixed network infrastructure. At the same time, Universal Service Obligations (USO), popular to expand the fixed line network in many other regions, have not been considered and/or enforced by regional policy makers, until very recently[18].

The low population density in many Arab States negatively impacts investments in fixed network infrastructure and dial-up is still the predominant technology to access the Internet

All of the above factors have played a role in contributing to the relatively poor state of the region's fixed network infrastructure. In addition, as chart 2.7 indicates, broadband subscribers make up more than 50 per cent of the total number of Internet subscribers in Bahrain, Qatar, Tunisia and Jordan. In all other cases, dial-up is still the predominant technology to access the Internet, not providing the full "broadband experience" to end-users.

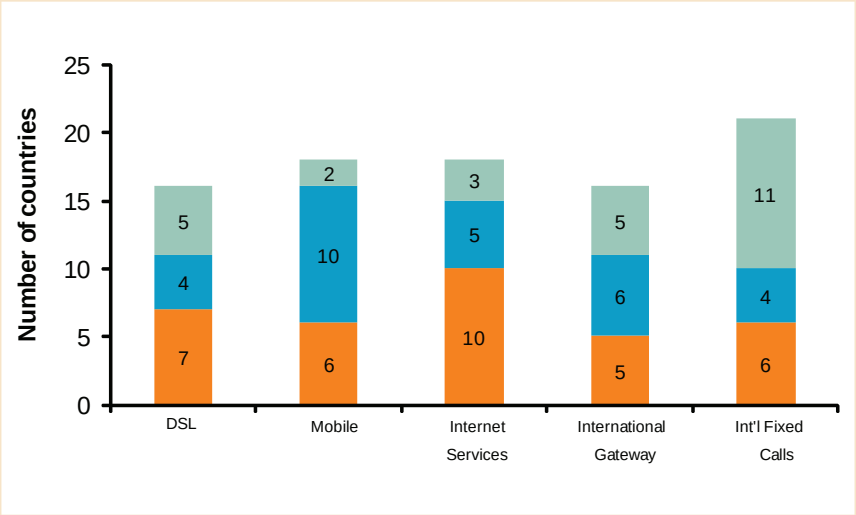
With regards to broadband connectivity and in the absence of cable networks, copper-based digital subscriber line (DSL) technology has been the preferred choice for most operators (Chart 2.8). Fiber access deployments are currently only focused on greenfield areas (e.g. new build-ups), leveraging on the construction "boom" currently experienced in these markets[19].

Competition in the fixed line market

Despite the fact that some developments have taken place to open up fixed line and data markets, the international fixed calls and international gateway segments remain largely under the control of monopolies (chart 2.9[20]). By the end of 2008, a number of countries (e.g. Oman, Syria, Tunisia, Yemen) did not yet have a second fixed license. Even for the most liberalized countries in the region, competition in the fixed market was introduced relatively late. In UAE and Qatar, a second fixed license was introduced in 2006 and 2008,

Chart 2.9

Level of competition in the Arab States, 2008



Source: ITU-D, Arab Region, Level of Competition in Telecommunication Services

respectively. A limited fixed network infrastructure and fixed market in general directly impact Internet uptake, as the majority of Internet/broadband services today are still offered through fixed infrastructure. It is also important to note that as of 2008, three countries among the Arab States (Comoros, Djibouti, Oman) have not yet liberalized the Internet services segment, negatively affecting market growth.

The international fixed calls and international gateway segments remain largely under the control of monopolies

The lack of effective competition in the Internet/broadband markets is one of the key parameters leading to high retail broadband prices. Only UAE, Bahrain and Kuwait among the Arab States, have lower fixed broadband Internet prices (as a percentage of monthly GNI per capita), when compared to the average of developed countries (Chart 3.7 – Chapter 3). Despite very high income levels in some Arab States, none have particularly low fixed broadband prices in relative terms (in terms of GNI per capita). In Yemen and Comoros fixed broadband prices exceed 100 per cent of their monthly GNI per capita, providing a strong inhibitor for broadband services uptake for the majority of the population.

In this context, a recent study conducted in Sudan[21], showed that the lack of sufficient network infrastructure, coupled with high broadband prices, were the main reasons for low penetration. Broadband Internet in Sudan was only available and affordable by a small proportion of the population, creating a national "digital divide".

The lack of competition in the Internet/broadband markets is one of the key parameters leading to high retail broadband prices

Low levels of digital literacy

In most of the Arab States less than one out of two citizens have access to a PC (Chart 1.18), and only 15 per cent of the total population are Internet users, suggesting that digital literacy levels among citizens in the region are low (Box 2.1 and 2.2). Despite the significant growth experienced over the past years, the region is still significantly lagging behind the world average (Chart 1.3).

Digital literacy in Qatar

Box 2.1

A recently published study in Qatar[22] revealed that amongst the entire population, the average digital literacy skill score was 2.3 out of 7 (Table 2.2), on a scale of 1 to 7, with 1 indicating no confidence in ability and seven indicating great confidence. However, relative scoring among the PC-literate population in the country is high (6.1 out of 7). This further supports the argument that PC availability impacts ICT services uptake, and hence levels of digital literacy throughout the country.

It must be noted that in both cases, Internet usage is mainly focused on e-mailing and researching and less on downloading software and creating personal web-pages.

The same survey also revealed that the main barriers to ICT adoption include the high cost of an Internet connection, the non-availability of the Internet at work, as well as the lack of relevant skills (Table 2.3).

Table 2.2 Digital literacy skills, Qatar, 2008

Digital Literacy Skill	Average Among PC Users	Overall Average
e-mail	6.5	2.6
Chat room	6.2	2.3
Creating personal web page	5.6	1.8
Downloading software	6.0	2.2
Researching	6.5	2.5
Validating information	6.1	2.3
World processing	6.2	2.4
Presentation	6.1	2.3
Spreadsheet	6.0	2.3
Average	6.1	2.3

Source: Qatar's ICT Landscape - Residents Survey, 2008.

Table 2.3 Barriers limiting Internet/PC use by residents, Qatar, 2008

Barrier to ICT Adoption	Percent of Respondents
High cost of Internet connection	42.0
Internet not available at work	33.2
Lack of skills	32.8
Internet not available at home	26.3
Risk of viruses too high when using the internet	21.3
Maintenance cost	20.2
Technology is too complicated	18.8
Lack of trust	16.8
Not secure to do business/purchase transactions over the Internet	14.2

Source: Qatar's ICT Landscape - Residents Survey, 2008.

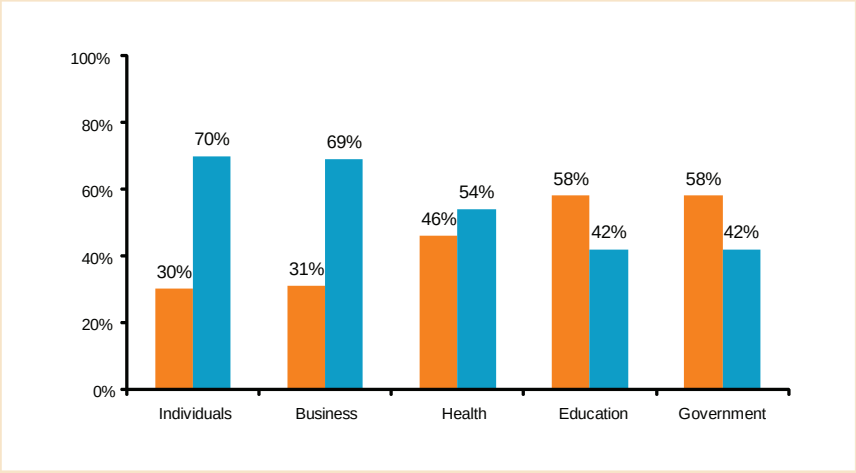
However, over the past two years, there have been strong positive signs that demonstrate the Arab States governments' intentions to promote ICT literacy, especially among the young population. Saudi Arabia is currently in the process of launching the King Abdullah University for Science and Technology (KAUST), supporting and promoting graduate-level degrees in applied sciences, engineering and biotechnology[24]. ictQatar's School Knowledge Net[25] is a similar initiative in Qatar, while in Bahrain, King Hamad Schools[26] are expected to create the country's first comprehensive

Box 2.2

Digital literacy in Saudi Arabia

A similar study to understand residents' Internet usage patterns in Saudi Arabia[23] found that the most frequently cited reason for not accessing the Internet was that people "do not know how to use the computer" (34 per cent), followed by "non-affordability" (19 per cent). This is in line with other reports' findings, and clearly demonstrates the lack of IT-related skills by individuals and professionals, across different sectors of the economy (Chart 2.10). The provision of training to only a selective group of employees is likely to result in a widening of the digital divide among citizens.

Chart 2.10 IT-related training received by different groups within the economy, Saudi Arabia, 2007



Source: CITC, Internet Usage in the Kingdom of Saudi Arabia, 2007.

e-school network, in an attempt to bridge the digital divide in the country and to enhance digital literacy among its citizens. Jordan's Education Reform for the Knowledge Economy (ERfKE) initiative has the objective to transform the education system at the early childhood, and to produce graduates with the skills needed for the knowledge economy[27]. Egypt has also developed a web-based e-learning environment, in collaboration with Oracle, to stimulate interactive e-learning[28]. In June 2009, eighty Egyptian teachers were trained by the Oracle Education Foundation (OEF) in skills, to integrate technology and project learning into the curricula.

Lack of Arabic content

Undoubtedly, another key factor hindering the development of the Internet in the Arabic States is the reported lack of available on-line content in the Arab language. According to a World Bank study, there are currently 320 million Arabic speakers around the globe (e.g. around six per cent of total world population), yet less than one per cent of online content is written in their language.[29] Taking into considera-

tion that more than half of Arabic-speaking Internet users do not speak English[30], it is well understood that this is a significant barrier, as English is the top language used on the Internet[31]. A number of online content and portals exist in Arabic (e.g. Maktoob.com, Jeeran.com, Nassej.com); however, their contribution to the overall available Arabic content on the Internet is rather small.

A key factor hindering the development of the Internet has been the lack of available on-line content in the Arab language, but recently the number of Arabic sites has markedly increased

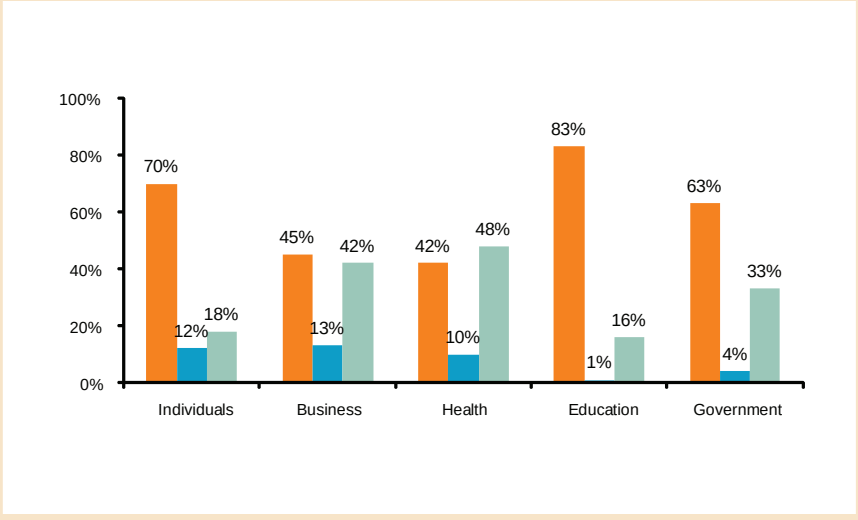
On the other hand, the statistics indicate that the picture has begun to change, albeit slowly. Although Arabic content on the net remains stable, the number of Arabic sites and pages has markedly increased. The number of web pages containing content in Arabic – including those written in both Arabic and English – has risen from 114 million pages in 2005, to 189 million pages in 2006, an increase of 65.8 per cent[32]. The corresponding increase in the number of English language pages is 63 per cent. The number of Arabic language pages is expected to reach 5.1 billion in 2012, on the basis of 80 per cent growth until 2010 and 60 per cent growth subsequently.

A study conducted in Saudi Arabia on Internet usage (see the section on digital literacy, above) revealed that the majority of individuals and professionals prefer to use Arabic language for their computer operating system (Chart 2.11). This highlights the importance for users to be able to use their mother tongue. It also points to the need to develop not only Arabic online content but also to ensure that operating systems and other IT environments and applications are available in local languages.

However, as the Arab States Internet market demonstrates significant growth over the past years, it has attracted the interest of global Internet players. For example, in August 2009 Yahoo! announced that it had acquired Maktoob.com, a leading online portal and search engine in the Arab world[33]. Maktoob reaches one in every three people online throughout the region – or 16.5 million people - and is considered to allow Yahoo! to make a key strategic geographic expansion into the region.

Language of operating systems used in Saudi Arabia, 2007

Chart 2.11



Source: CITC, Internet Usage in the Kingdom of Saudi Arabia, 2007.

Additionally, in June 2009, Google and the Egyptian Ministry of Communications and Information Technology singed a US$ 10 million contract, regarding business and workforce development in Egypt[34]. Over the medium to long-term, Google has committed to invest 25 per cent of revenues back into the Egyptian economy; this investment agreement may include the start-up of digital media businesses, incubation venture capital for the ICT sector and training students in online advertising. The joint project further demonstrates the importance that global Internet players are attributing to the emerging Arab markets.

In 2008, ictQatar has launched a new project, aiming to digitize 18'000 books in Arabic

On a regional level, national policy makers are also intensifying their efforts to bridge the digital divide among their citizens and to provide all end-users with the opportunity to access Arabic content online. In this context, ictQatar has launched a new project in 2008, aiming to digitize approximately 18'000 books in Arabic[35]. Through this, it attempts to increase the number of Arabic speaking people that access web sites and content in their own language.

Lack of sufficient ICT investments

One reason for the lack of available online Arabic content is the difficulty of regional ICT stakeholders in attracting necessary funding. The region is more biased toward traditional investments in the energy and real-estate sectors. A 2007 analysis of the top investment funds in the region showed that private equity and venture capital funds that focus on real estate have a combined size of more than US$ 2.3 billion. Those that focus on technology, communications, and media have a combined value of just over US$ 1.6 billion[36].

One difficulty for regional ICT stakeholders is to attract funding since the region is biased toward investments in the energy and real-estate sectors

Another characteristic of the region is that, to some degree, the GCC countries, as well as Sudan, Tunisia, and Yemen, have developed mechanisms to monitor and filter online content[37]. These countries, for example, censor web sites which present critical reviews of Islam and/or nudity. Some of these countries also filter web sites related to alcohol, gambling, and/or drugs.

Some countries in the region have also introduced Internet-specific laws to regulate Internet activities. Amongst them are UAE and Saudi Arabia. UAE's 2007 federal cyber law criminalizes hacking, abusing holy shrines or religious rituals opposing the Islamic religion, and setting up a web site or publishing information for a terrorist group. In January 2008, Saudi Arabia implemented 16 articles of a new law on the use of technology. The law includes severe legal penalties and a fine for web site operators who advocate or support terrorism; financial fraud or invasion of privacy; distributing pornography or other materials that violate public law.

2.4 Role of policy makers and regulators

A number of national policy makers and regulatory authorities (NRAs) have adopted national ICT sector development plans, in an attempt to achieve market liberalization, bridge the digital divide and enable the transition to a digital economy. Relevant examples include the ICT development plans launched by the Ministry of Communications

and Information Technology in Saudi Arabia and Egypt (Box 2.3).

Role of economic zones

Another important trend in the Arab States that also has a direct effect on ICT sector developments is the spread of the so-called "economic zones". These are designated areas in which companies are exempted, in whole or in part, from selected legislations and rules, such as taxation and limited foreign ownership. The important role of the existence of economic zones is two-fold: on the one hand, they present an appropriate business environment to attract foreign international ICT companies to establish their regional offices in these countries and on the other hand, they are test-beds for new technologies (e.g. fiber access deployments). In all cases, the provision of ICT services is conducted under a rather open and competitive environment, as resident companies

National ICT development plans in Saudi Arabia and Egypt

Box 2.3

In Saudi Arabia, the Ministry of Communications and Information Technology (MCIT) published, in 2005, its plan for ICT sector development[38]. The vision for ICT sector development has called for the creation of a knowledge-based society that is able to produce, access, use, and interact with the flow of latest information; thereby contributing to improving efficiency, productivity and the quality of products and services.

The following targets have been initially attached to the development plan:

- Raising direct foreign investments in ICT projects to US$ 500 million
- Establishing a number of IT incubators and technology zones
- Continuing review of government procedures to make them consistent with e-Government best practice and provide government services on the Internet
- Establishing a national gateway for e-Government
- Creating high administrative posts for IT in government agencies
- Establishing a center under the umbrella of the Chambers of Commerce and Industry to support greater use of ICT applications in the private sector
- Issuing the e-transactions regulation
- Opening up competition in fixed-line services in 2006
- Licensing at least one additional operator to deliver mobile telephone services

Box 2.3

National ICT development plans in Saudi Arabia and Egypt (continued)

- Continuing to provide digital subscriber lines (DSL) to facilitate access to Internet services
- Providing access to integrated services digital networks (ISDN) on a wider scale
- Attaining 20 PCs and 20 Internet user connections per 100 population
- Training at least one million citizens in IT applications

Similarly, the Egyptian Ministry of Communications and Information Technology (MCIT) has launched several initiatives to further develop the domestic ICT sector[39], by following three key strategic foundations:

1. ICT sector restructuring: invest in state-of-the art competitive infrastructure
2. ICT for development: ICT for all, for education, for government, for health, e-content
3. Innovation and ICT development: development of export-oriented IT services and ICT capacity of Egypt.

In this regard, a set of detailed and interrelated initiatives have been launched, actively assisting the ICT sector's growth:

- In 2002, MCIT in collaboration with Telecom Egypt launched the "PC for Every Home" initiative, offering low cost computers and an Internet connection; also, more than 1'700 Technology Clubs currently operate in Egypt to bring IT services to disadvantaged communities

.

- The Egyptian Education Initiative was launched in 2006 with the strategic objective to improve the content and delivery of the education offered by schools and universities.
- MCIT is facilitating the work of the Ministry of Population and Health (MoPH) by integrating ICT in health services and administrative structures that underpin those services.
- MCIT has been establishing an e-content industry in Egypt through its Arabic e-content initiative, by supporting the production, use and distribution of Arabic digital content on a global scale.

Source: http://www.mcit.gov.sa/english/Development/DevelopmentStages/.

http://www.mcit.gov.eg/.

request "best-in-class" telecommunication services. The high service requirements by multinational companies further push national players to improve their services. Interaction with large organizations also has a learning curve effect.

Economic zones are quickly being set up across the region to promote the diversification of countries' economies away from natural resources and enable greater employment opportunities for citizens. UAE was an early adopter of economic zones; since introducing the concept in 1985, it has established more than 30 economic zones, ranging from media and entertainment to ICT research and development. The Dubai Internet City (DIC)[40], for example, was established in 2000 and offers companies both 100 per cent tax exemption and 100 per cent foreign business ownership. It has currently attracted some of the worldwide leading ICT companies, such as Microsoft, HP, Dell, Siemens, Sony Ericsson, which have established their regional offices in the "free-zone". Also, Oman has a zone called the Knowledge Oasis Muscat (KOM[41]), dedicated to supporting technology-oriented businesses, ranging from industry niches as varied as m-commerce, e-security, and software development to international airline call centers. KOM is currently home to more than 60 companies including Oracle, Microsoft, HP, Motorola and Huawei.

Economic zones have played an important role in ICT sector development by allowing large multinational companies to establish their offices in the region

Economic zones have played an important role in ICT sector development by allowing large multinational telecommunication and IT companies to establish their offices in the region. However, this should be considered as only one step towards improving ICT services within a country and should be part of an overall ICT development plan. ICT access and use need to be expanded beyond these zones, to provide all citizens with the opportunity to benefit from ICTs.

Independent regulators

In almost all the Arab States, an independent Telecommunication National Regulatory Authority (NRA) has been established. NRAs are responsible for fostering competition in the fixed, mobile and Internet/broadband markets, and their goal is to ensure consumers' interests.

Obstacles towards the ICT sector's growth include the lack of adequate autonomy of NRAs

However, their effectiveness and timely intervention greatly depends on their overall administrative and financial independence. As in many countries in the region, the government has been the major shareholder of the national incumbent operator; NRAs have been rather cautious in opening up the telecommunication market. Another key challenge has been governments' reluctance to allow high levels of foreign ownership in national assets/commodities. Possible obstacles hindering the ICT sector's growth[42] are the lack of adequate autonomy and a clear mandate of NRAs to make and enforce key decisions - free of political interference. They also often lack adequate professional resources, have a limited capacity to actively regulate the sector, and are limited in the adoption of transparent regulatory processes.

The Arab States' NRAs are increasingly overcoming the challenges and committing to liberalize the sector. This is demonstrated by the issuance of new licenses (chart 2.9), as well as by the overall approach taken in conducting consultations with all stakeholders in the market, prior to implementing any significant regulation.

Some of the most advanced regional regulators include TRC in Jordan, CITC in Saudi Arabia and TRA in Bahrain

Some of the most advanced regional regulators include TRC in Jordan, CITC in Saudi Arabia and TRA in Bahrain[43].

A key regulatory intervention, common in all the Arab States, has been the enforcement of infrastructure sharing levers. This is justified by countries' need to optimize infrastructure investments and to avoid duplication, while in parallel fastening the pace of networks rollout and enable cooperation among service providers. Infrastructure sharing allows new entrants to capture part of the market share in a rather fast and economically viable way, increasing competition in the marketplace.

The enactment of relevant sharing regulations greatly depends on the degree of market liberalization. In the mobile domain, infrastructure sharing was initially focused on enforcing national roaming agreements between the incumbent operator and new entrants (see Zain and Mobily in 2008 in Saudi Arabia[44]). They have increasingly evolved into sites and network element sharing, as markets become more mature (for example Bahrain, where site sharing was one of the criteria for the 3rd license award[45]). In the fixed market, the fist wave of infrastructure sharing regulations have been focused on implementing Carrier Selection (CS) and Carrier Pre-Selection (CPS) principles (enforced in Bahrain, Jordan, Morocco, UAE[46]). Other forms of sharing, such as line sharing and local loop unbundling, have been delayed, as fixed market competition was only recently introduced.

A key regulatory intervention, common in all the Arab States, has been the enforcement of infrastructure sharing levers

It is apparent that national policy makers and regulators in the Arab States have undertaken significant steps in enabling growth in both mobile and Internet/broadband sectors. The mobile sector has managed to grow at a much faster rate than the Internet market, with end-users being able to enjoy a variety of low-priced, high-quality mobile offerings. To enhance citizens' digital inclusion, bridge the digital divide and enable a transition to the digital, knowledge-based economy, ICT stakeholders need to ensure the rightful and effective implementation of their well-developed ICT strategies and plans. In parallel, efforts should be focused on maintaining and strengthening competition in the liberalized and currently advanced mobile sector, while developing the necessary framework to facilitate transition to the newly formed telecommunication and media converged environment.

Endnotes

[1] Case specific examples include Algeria and the United Arab Emirates, where there is a 49 per cent foreign ownership cap (outside free zones); see: http://www.bi-me.com/main.php?id=24697&t=1 / http://www.arabianbusiness.com/567624-uae-ponders-change-in-foreign-ownership-rules---report.

[2] See: www.ebusinessforum.com/index.asp?layout=newdebi&country_id=AE&channelid=6&country=United+Arab+Emirates&title=Doing+e-business+in+United+Arab+Emirates.

[3] See: http://www.itu-int/ITU-D/arb/arab_country_data.html.

[4] Etisalat's mobile data coverage exceeds 97 per cent of the country; see: http://www.etisalat.ae/index.jsp?parentid=fa58800d1f52a010VgnVCM1000000a0a0a0a____&contentid=48d88b0abb7a5110VgnVCM1000000c24a8c0RCRD&currentid=10c8e15c0b56a010VgnVCM1000000a0a0a0a____&lang=en&type=content.

[5] GSMA- Mobile Broadband Case Study Series, Etisalat The United Arab Emirates, See: http://www.gsmworld.com/documents/26052009105201.pdf.

[6] See: http://www.gulfbase.com/site/interface/SpecialReport/EEC_09082009.pdf.

[7] World Cellular Information Service (WCIS), Informa Telecoms & Media, 2008.

[8] With the exception of Saudi Arabia, currently none of the other GCC countries exceeds 4.5 million population.

[9] Zain, Orascom, Etisalat, STC 2008 Annual reports; see: www.zain.com / www.orascom.com / www.etisalat.ae.

[10] See relevant Zain's press release: http://www.zain.com/muse/obj/lang.default/portal.view/content/Media%20centre/Press%20releases/One%20Network%2012%20countries.

[11] "The World's Most Valuable Mobile Telecoms Brands 2008", www.intangiblebusiness.com, 2008.

[12] Brand values are a reflection of a brand's ability to generate future income. The brand valuation index in the Intangible Business Report 2008 uses historic performance and future trends to predict future value. Three years of publicly available historical sales data was gathered for 500 of the world's biggest telecoms brands. To determine the strength of the brands, each brand was also scored on nine hard measures, sourced from Informa Telecoms & Media, and nine measures of brand strength from a panel of industry experts. Using this data, each brand was then valued using the relief-from-royalty methodology to produce the top 100.

[13] A mobile virtual network operator (MVNO) is a company that provides mobile phone services but does not have its own licensed frequency spectrum, nor does it necessarily have the entire infrastructure required to provide mobile telephone services.

[14] See: http://www.telecoms.com/4888/the-move-toward-mvnos-gathers-pace.

[15] See: http://www.unstrung.com/document.asp?doc_id=157937.

[16] See: http://www.accessmylibrary.com/coms2/summary_0286-34385946_ITM.

[17] In Saudi Arabia, as of the last census, 10 per cent of the population were Bedouins; see: http://www.the-saudi.net/saudi-arabia/population.htm.

[18] Saudi Arabia Telecommunications Regulator (CITC) is currently conducting a consultation process in defining Universal Service Fund (USF) strategic plan; see: http://www.citc.gov.sa/citcportal/SimpleText/tabid/103/cmspid/%7B62153C54-B062-4307-8719-1FC8C5E6127F%7D/Default.aspx.

[19] Example of Qatar, where new development Pearl Qatar and Lusail will be connected to fiber access networks; see: http://www.ict.gov.qa/output/page674.asp.

[20] Based on the "Level of Competition in Telecom Services" report, issued ITU-D, Arab States; see: http://www.itu.int/ITUD/icteye/Reporting/ShowReportFrame.aspx?ReportName=/TREG/LevelOfCompetition2007&RP_intRegionID=3&RP_intLanguageID=1.

[21] See: PPIAF, "Regulatory Study in North Sudan Identifies Opportunities in the Telecom Sector", September 2009 http://www.ppiaf.org/content/view/604/462/.

[22] Qatar's ICT Landscape Report, 2009; see: http://www.ict.gov.qa/output/page1268.asp.

[23] "Internet Usage in the Kingdom of Saudi Arabia", CITC, The first year (2007) report, 2008.

[24] See: http://www.kaust.edu.sa/.

[25] See: http://www.ict.gov.qa/output/Page442.asp.

[26] See: http://www.ega.gov.bh/downloads/news/090909E.pdf.

[27] See: http://web.worldbank.org/external/projects/main?menuPK=228424&pagePK=64283627&piPK=73230&theSitePK=40941&Projectid=P075829.

[28] See: http://www.itp.net/562442-oracle-launches-project-learning-initiative-for-egyptian-teachers# and http://www.oracle.com/us/corporate/press/018604

[29] See: http://files.shareholder.com/downloads/YHOO/785637826x0x314173/2e27fb10-ada5-4-a02-be63-eb54ec684433/YHOO_News_2009_8_25_General.pdf

[30] Madar Research Group, 2006.

[31] See: Internet World Stats publication / http://www.internetworldstats.com/stats7.htm.

[32] Chapter 4, Arab Knowledge Report 2009 – Towards Productive Intercommunication for Knowledge.

[33] See: http://ycorpblog.com/2009/08/25/yahoo-will-soon-speak-arabic/.

[34] See: http://www.webpronews.com/topnews/2009/06/25/google-and-egypt-ink-10-million-deal.

[35] See: http://www.futuregov.net/articles/2008/dec/23/more-arabic-web-sites-middle-east/.

[36] ABQ Zawya Ltd., Private Equity Monitor, 2007.

[37] See: http://opennet.net/research/regions/mena.

[38] See: http://www.mcit.gov.sa/english/Development/DevelopmentStages/.

[39] See: http://www.mcit.gov.eg/.

[40] See: http://www.dubaiinternetcity.com/.

[41] See: http://www.kom.om/index.shtml.

[42] The World Bank Group – Public Policy for the Private Sector, "Benchmarking Regulators", 2002.

[43] See for example list of past consultations at: http://www.trc.gov.jo/index.php?option=com_content&task=view&id=434&Itemid=939&lang=english / http://www.citc.gov.sa/citcportal/PublicConsultationsListing/tabid/119/cmspid/%7BC0AB8E76-3384-4A07-8C48-643-E4521B938%7D/Default.aspx / http://www.tra.org.bh/en/consultations.asp.

[44] In March 2008, Zain, 3rd entrant operator, signed an agreement to use the national 2G and 3G networks of rival operator Mobily; see: http://www.highbeam.com/doc/1G1-178085697.html.

[45] "Tower Sharing in the Middle East and Africa: Collaborating in competition" Delta Partners, April 2009; see: http://www.deltapartnersgroup.com/public_resources/files/80c4d52af7e4f7f03f49f1f810796638.pdf.

[46] National Regulatory Authorities (NRAs) websites: www.tra.org.bh / www.tra.ae / www.anrt.net.ma / www.trc.gov.jo.

Chapter 3.

Benchmarking ICT developments in the Arab States

3.1 Regional analysis of the ICT Development Index (IDI)

The ITU presented the ICT Development Index (IDI) in March 2009[1] in response to the calls for benchmarking information society developments made during the World Summit on the Information Society (WSIS)[2]. The IDI is a useful tool to benchmark and assess ICT developments, and to monitor the digital divide. The IDI is a composite index made up of eleven different indicators, grouped into three sub-indices (Figure 3.1). The sub-indices measure ICT infrastructure and access (sub-index access[3]), ICT use and intensity of use (sub-index use[4]), and the capacity to use ICTs effectively (sub-index skills[5]).[6] This chapter presents the results of the IDI analysis for the Arab region.[7]

All Arab States improved their IDI score during the five-year period

The IDI for the Arab States is shown in Table 3.1 (for details on the three sub-indices see Annex 2). The table includes the IDI values for two benchmarking years, 2002 and 2007, and countries are ranked by their 2007 value.[8] All Arab States improved their IDI score during the five-year period, as did most countries in the world. Indeed, access and use of ICTs are globally increasing, with the skills to use these technologies improving at the same time.

ICT Development Index – Weighting of indicators

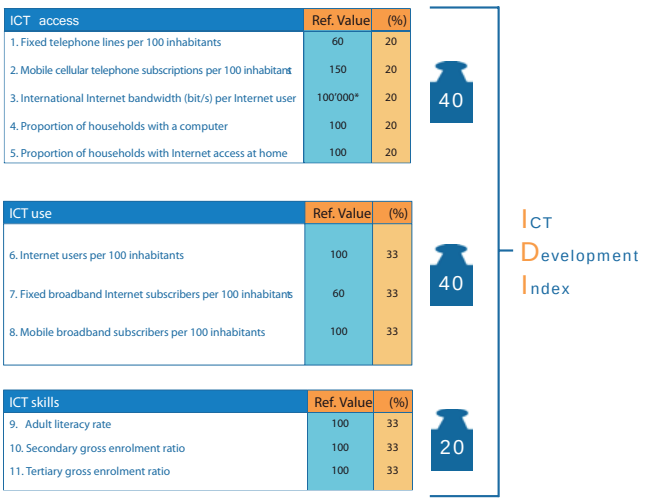


Figure 3.1

Source: ITU.

Table 3.1

ICT Development Index (IDI), 2002 and 2007, Arab States

Country	Rank 2007	IDI 2007	Rank 2002	IDI 2002	Rank change 2002-2007	IDI change 2002-2007
United Arab Emirates	1	5.29	2	3.27	1	2.02
Bahrain	2	4.69	1	3.30	-1	1.40
Qatar	3	4.44	3	2.84	0	1.61
Saudi Arabia	4	3.62	7	2.13	3	1.48
Kuwait	5	3.57	4	2.77	-1	0.80
Lebanon	6	3.43	5	2.53	-1	0.90
Jordan	7	3.06	6	2.36	-1	0.70
Oman	8	3.00	8	2.12	0	0.88
Libya	9	2.84	9	2.08	0	0.77
Tunisia	10	2.73	10	1.86	0	0.88
Syria	11	2.66	12	1.69	1	0.98
Egypt	12	2.54	11	1.81	-1	0.72
Algeria	13	2.51	13	1.61	0	0.90
Morocco	14	2.34	14	1.37	0	0.97
Sudan	15	1.56	16	1.03	1	0.53
Yemen	16	1.47	15	1.04	-1	0.42
Mauritania	17	1.36	17	1.00	0	0.36
Comoros	18	1.17	18	0.91	0	0.26

Source: ITU.

UAE tops the regional IDI 2007 ranking, thanks to a remarkable IDI gain during the five-year period, the highest in the region

UAE tops the regional IDI 2007 ranking, thanks to a remarkable IDI gain during the five-year period, the highest in the region, and among the highest IDI gains in the world. Nevertheless, the 2007 IDI value achieved by UAE (5.29) was still far from those of the global IDI top countries, such as Sweden (7.50), the Republic of Korea (7.26) or Denmark (7.22).

In the regional IDI 2007 ranking, the UAE are followed by Bahrain, Qatar and Saudi Arabia All of these countries have achieved high IDI growth during the five-year period (more than one IDI point). Syria, Algeria and Morocco also stand out for having made significant progress in terms of ICT development. Although they had lower IDI values than other countries in the region, their IDI growth was remarkable in relative terms[10].

Sudan, Yemen, Mauritania and Comoros are at the bottom of the regional IDI 2007 and all of them have IDI values below two (more than three times lower than the IDI value of UAE for the same year). These four countries are also the ones with the lowest income per capita in the region.

Chart 3.1 shows the relationship between the IDI and GNI per capita (expressed in US$) in the Arab States, using a logarithmic regression. The link between ICT

Relation between IDI and GNI per capita per region and in the world, 2007

Table 3.2

	R^2 value of the logarithmic regression
World	0.88
Asia and the Pacific	0.93
Europe	0.88
Americas	0.85
Arab States	0.75
CIS	0.66
Africa	0.69

Source: ITU.

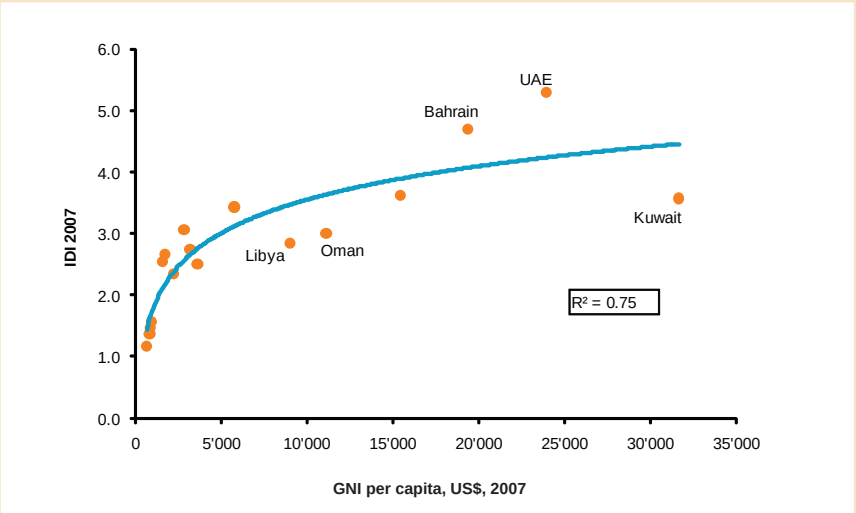
development and income in the region is not very strong when compared to that in the world, and in other regions such as Asia and the Pacific[10], Europe[11] or the Americas[12] (Table 3.2). Compared to these regions, a weaker link between ICT development and income in the Arab States can be partly explained by the fact that many countries in the region, especially those with the highest incomes[13], have followed an economic development strategy based on their natural resources (i.e. oil and gas). Nevertheless, the link between IDI and GNI per capita is stronger in the Arab States than in the Commonwealth of Independent States (CIS)[14] or in Africa[15].

The link between ICT development and income in the region is not very strong when compared to that in the world

A further analysis of the relationship between income and ICT development in the Arab States shows that the four countries with the lowest IDI values in the region (Sudan, Yemen, Mauritania, and Comoros) have IDI values that correspond to their

IDI and GNI per capita, Arab States, 2007

Chart 3.1



Source: ITU and World Bank (GNI per capita data).

(low) levels of income, A number of countries with much higher income levels, such as Kuwait, Oman and Libya, have lower-than-expected ICT levels. These countries have ample room for stronger ICT-led developments, if relevant policies are enforced. Other countries, however, have achieved higher-than-expected ICT levels compared to their income levels. In these economies – which include UAE and Bahrain – strong ICT policies have played an important role[17].

Between 2002 and 2007, the IDI gain in the Arab States was nearly the same as in the world

Table 3.3 summarizes the average changes for the five-year period in each of the three IDI sub-indices and in IDI value. In 2007, the Arab States' average IDI value was below the world average, showing that the region still lags behind in terms of ICT development. There is however a significant difference between the Gulf Co-operation Council (GCC) countries (average 2007 IDI value of 4.10) and the non-GCC countries (average 2007 IDI value of 2.35). Indeed, in 2007 the IDI average of non-GCC countries was below that of the developing world (2.60), while that of GCC countries was clearly above it but still considerably lower than the average of developed countries (5.77). Between 2002 and 2007, the IDI gain in the Arab States was nearly the same as in the world, which means that the region's relative IDI growth was higher than that of the world in the same period.[18]

IDI growth in the Arab States was driven by significant improvements in ICT infrastructure and access

During the five-year period, IDI growth in the Arab States was driven by significant improvements in ICT infrastructure and access, which resulted in an increase in the sub-index access value of 1.40 points in the region,[19] higher than in the world (1.23 points increase). Nevertheless, in 2007 the sub-index access average in the Arab States was still below the world average, so the region will need to continue its efforts to improve ICT infrastructure and access in order to catch up with the world average. The challenges are however different between the GCC and non-GCC countries. Non-GCC countries have a sub-index access average which is below that of the developing world (2.67 compared to 2.97 in 2007), but it is growing at a faster pace (76 per cent growth compared to 59 per cent in developing countries). If ICT access and infrastructure growth is sustained, they would converge with the levels of the developing world in the short term. On the other hand, GCC countries have a sub-index access average well above that of developing countries, but they still lag behind when compared to developed economies (5.24 compared to 6.70). Between 2002 and 2007, faster growth in the sub-index access in GCC countries than in developed

Table 3.3

IDI changes 2002-2007

	Arab States			World	
	Average value 2002	Average value 2007	Change in value 2002-2007	Average value 2007	Change in value 2002-2007
IDI	2.00	2.91	0.91	3.40	0.92
Sub-index access	2.08	3.48	1.40	3.91	1.23
Sub-index use	0.21	0.86	0.65	1.43	0.89
Sub-index skills	5.40	5.84	0.45	6.31	0.37

Source: ITU.

International Internet bandwidth per Internet user, Arab States, 2002 and 2007

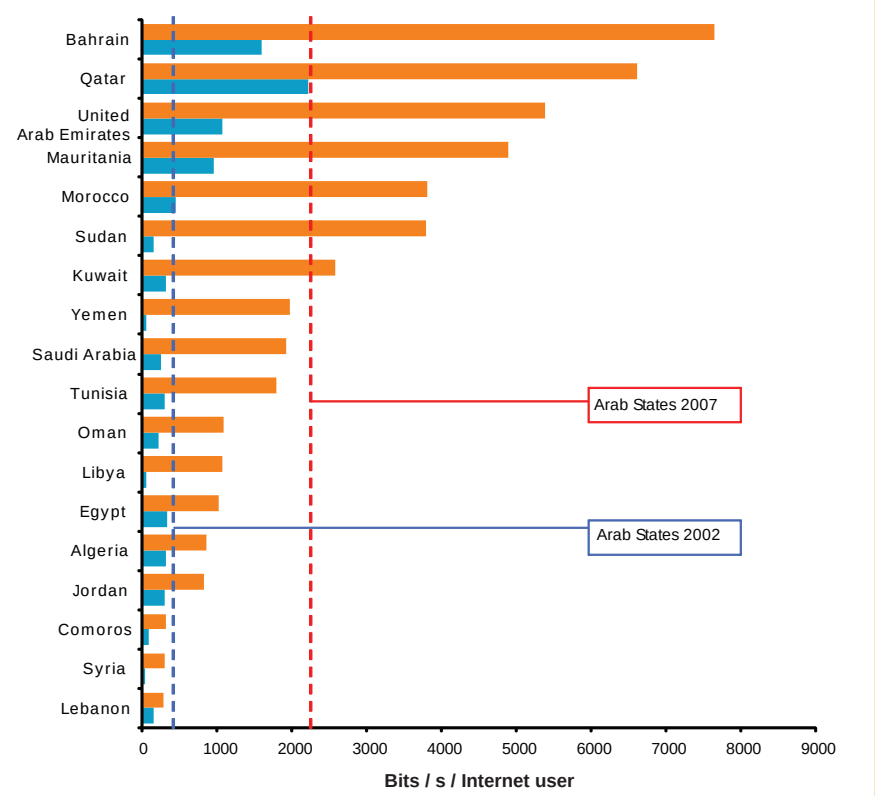


Chart 3.2

2007
2002

Source: ITU

countries (1.93 points or 59 per cent growth, compared to 1.61 points and 32 per cent) is closing the gap, and could continue to do so in the future.

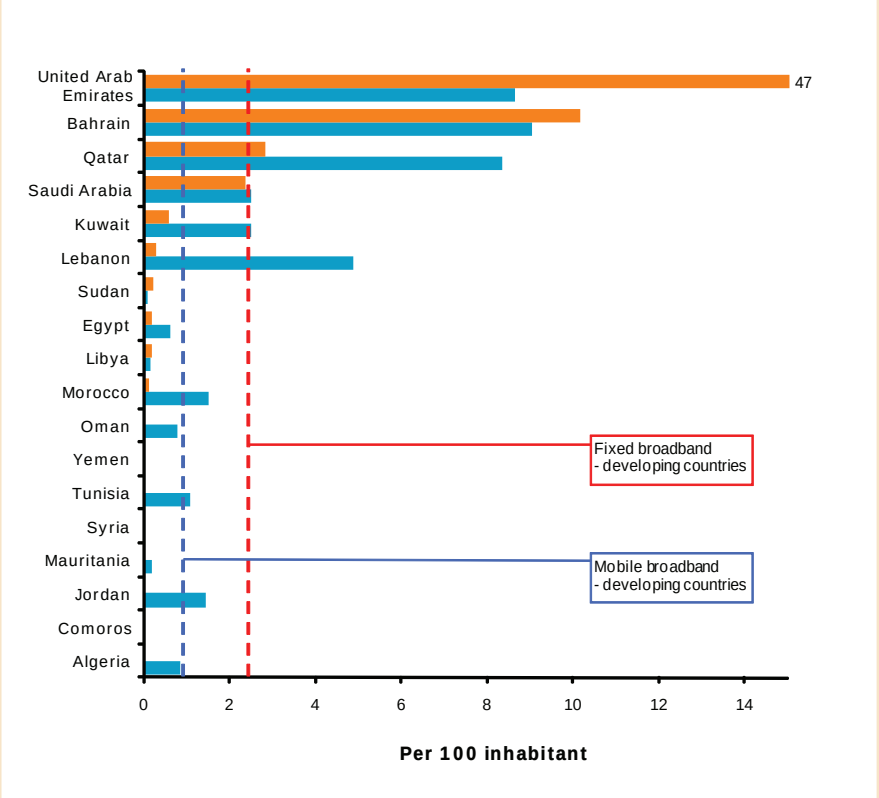
Non-GCC countries lagged behind in terms of ICT use and intensity of use

The sub-index use experienced moderate growth in the region between 2002 and 2007, especially in non-GCC countries.[20] These lagged behind in terms of ICT use and intensity of use, which are measured by the broadband and Internet usage indicators. As a result, in 2007 the region had an average sub-index use value of 0.86 points, compared to an average of 1.43 points in the world. GCC countries witnessed a higher increase (1.28 points) than the average of the world in the five-year period, which is partly explained by the outstanding progress made by UAE in this sub-index. Excluding UAE, the average sub-index use value of the remaining GCC members was below the average of the world.[21]

Finally, between 2002 and 2007 the region made significant progress in skills, achieving a higher average gain in the sub-index skills than that of the world for the same period. These dynamics are explained by the sequential three-stage model on which the index is based[22]: countries advance towards becoming information societies by developing first ICT infrastructure and access, then ICT use and intensity of use, and finally achieving ICT impact, which is enabled by ICT capabilities or skills.

Chart 3.3

Fixed and mobile broadband penetration, Arab States, 2007



Source: ITU

In the period from 2002 to 2007, among all Arab States only UAE experienced a higher increase in the sub-index use than in the sub-index access. This suggests that most countries in the region are in the first stage of ICT development, and therefore ICT growth is focused on infrastructure and access improvements.

Among all Arab States, only UAE, Bahrain, Qatar and Saudi Arabia had broadband penetration rates higher than those of developing countries

Progress in the sub-index access in the Arab States was mainly due to improvements in mobile cellular penetration, which increased from 8 to 52 subscriptions per 100 inhabitants in the region.[23] International connectivity also increased significantly in the Arab States, and as a result International Internet bandwidth per Internet user improved from 411 to 2'280 bits/s/ Internet user in the five-year period.[24] Despite the overall increase, in 2007 all Arab States stood below the world's value (from 339 to 1'023 bits / s / user), and major differences persisted between countries in the region, with Comoros, Syria and Lebanon having in 2007 less international connectivity per Internet user than the overall level of the region in 2002 (Chart 3.2).

Between 2002 and 2007, moderate progress in the sub-index use in most Arab States was due to the unavailability or negligible uptake of mobile broadband, and very low fixed broadband penetration (Chart 3.3). Among all Arab States, only UAE, Bahrain, Qatar, and Saudi Arabia had higher fixed and mobile broadband penetrations than those of developing countries in 2007. On the other hand, Internet usage grew from

three to 13 per cent in the region,[25] while it increased globally from 11 to 21 per cent. More recent trends in Internet uptake are discussed in chapter one of this report.

The average increase in the sub-index skills in the Arab States was higher than that of the world during the five-year period, and was due to moderate gains in all three indicators included in the sub-index (secondary enrolment ratio, tertiary enrolment ratio and adult literacy). By 2007, roughly half of the Arab States included in the IDI had higher sub-index skills than the world average, while some other countries, such as Morocco, Yemen, Sudan, Comoros and Mauritania were clearly below the averages of the world and of the region.

The following section takes a closer look at the IDI performance of selected countries in the region, and highlights key developments[26]:

- UAE tops the regional IDI 2007, advancing one place from 2002. ICT use has significantly increased in UAE, with a gain in the IDI use sub-index value of 2.82 or more than 300 per cent, among the highest in the world (following Luxembourg, Japan, Ireland and France). Mobile broadband penetration in UAE was already at 47 per cent in 2007, by far the highest of all Arab States, and the third highest in the world, behind those of Japan and the Republic of Korea, the two pioneer countries in mobile broadband deployment worldwide. Similarly, mobile cellular penetration has reached one of the highest values globally in 2007 (176 per cent).[27]

ICT use has significantly increased in UAE, with a gain in the IDI use sub-index value of 2.82 or more than 300%, among the highest in the world

- Bahrain lost its first place of 2002 to rank second in the regional IDI 2007. Mobile cellular penetration increased from 56 to 148 subscriptions per 100 inhabitants during the five-year period, only surpassed in the region by those of UAE and Qatar in 2007. In the same year, Bahrain achieved the highest estimated proportion of households with a computer (51 per cent), and the highest fixed broadband penetration in the region (9 per cent). Although mobile broadband penetration increased to 10 per cent in 2007, it was far from the impressive penetration achieved in UAE in the same year (which was over 45 per cent). Internet usage grew to 33 per cent in 2007, but it was lower than the penetration achieved in UAE (52 per cent) and Qatar (42 per cent).

- Saudi Arabia has jumped an impressive four places and ranks 4th in the regional IDI 2007. ICT infrastructure and access have significantly improved from 2002 to 2007, corresponding to a gain of 2.66 points in the sub-index access, one of the highest gains worldwide, and the highest of all Arab States. For example, mobile subscriptions have increased from 22 per 100 inhabitants in 2002 to 115 in 2007, and the proportion of households with Internet access from an estimated 9 to 36 per cent in the same period. On the other hand, progress on the skills sub-index has been slow and here the country still has great potential to improve its index value.

In Saudi Arabia, mobile subscriptions have increased from 22 per 100 inhabitants in 2002, to 115 in 2007

- Lebanon lost one place and ranks 6th in the regional IDI 2007. Lebanon has made remarkable progress in the tertiary enrolment ratio (from 41 to 52 per cent during the five-year period), and achieved the fourth highest sub-index skills value of all Arab States, only surpassed by Libya and Bahrain. On the other hand,

mobile cellular penetration stood at only 31 per cent in 2007, and international bandwidth per Internet user was the lowest of all Arab States included in the regional IDI, with only 289 bits/s/user.

In 2007, 35% of households in Syria had a computer and 30% had Internet access

- Tunisia ranks 10th in the regional IDI 2007, unchanged from 2002. The country improved in both ICT access and skills during the five-year period. For example, mobile cellular penetration reached 76 per cent, up from 6 per cent in 2002, and the tertiary enrolment ratio increased from 23 per cent in 2002 to 32 per cent in 2007. However, by the end of 2007 mobile broadband was still not available in Tunisia[28], and fixed broadband reached only one subscriber per 100 inhabitants.

- Syria advanced one position between 2002 and 2007, to rank 11th in the regional IDI 2007. The country has made gains particularly in ICT access and skills. For example, the secondary school enrolment ratio increased from 44 per cent in 2002, to 72 per cent in 2007. By the same year, 35 per cent of households in the country had a computer and 30 per cent had Internet access at home. Fixed telephone penetration increased from 12 to 17 lines per 100 inhabitants during the five-year period, a moderate growth, but the highest of all Arab States, as fixed telephone penetration is stagnating in the region, following the worldwide trend. On the other hand, mobile broadband was not available in Syria by the end of 2007, and fixed broadband was negligible. Mobile penetration stood at only 31 per cent in the same year.

- Egypt lost one position and ranked 12th in the regional IDI 2007. The country improved mainly in terms of ICT access, increasing mobile cellular penetration (from 6 to 40 per cent in the five-year period), international Internet bandwidth per Internet user (from 339 to 1'023 bits / s / user) and household computer penetration (from 3 to 16 per cent). However, Egypt remained below the region's average in all three indicators in 2007. Internet usage reached 14 per cent of the population in 2007, slightly higher than the average level of the Arab States (13 per cent), but mobile and fixed broadband penetration remained below 1 per cent.

Algeria made remarkable progress in mobile cellular penetration, which increased from 1 to 81% between 2002 and 2007

- Algeria ranked 13th in the regional IDI 2007, the same place it had in 2002. The country made remarkable progress in mobile cellular penetration (from 1 to 81 mobile subscriptions per 100 inhabitants). Algeria improved in the sub-index skills above the average of the region (0.65 compared to 0.45 points). On the other hand, Internet usage stood at 10 users per 100 inhabitants in 2007, a low penetration even when compared to countries with similar ICT levels, such as Morocco (21 users per 100 inhabitants) or Tunisia (17 users per 100 inhabitants). Mobile broadband was unavailable in the country in 2007, and fixed broadband penetration stood below 1 per cent.

- Morocco kept the same position it had in the regional IDI 2002, and ranked 14th in 2007. The country has improved its ICT levels significantly, and has achieved the highest relative gain in IDI value among all Arab States, with a 71 per cent growth during in the five-year period. Morocco has gained mainly in ICT access – mobile cellular penetration (from 21 to 64 per cent) and international Internet

bandwidth (from 310 to 25'130 Mbits/s) – and skills (secondary enrolment ratio increased to 56 per cent in 2007). Both fixed and mobile broadband penetration remain nevertheless very low in the country,

- Sudan, Yemen, Mauritania and Comoros occupy the last places in the regional IDI 2007, respectively. By the end of 2007, the four countries had extremely low fixed line penetration (less than 5 lines per 100 inhabitants), and, except for Sudan, also very low Internet usage levels (less than three users per 100 inhabitants). Mobile and fixed broadband was not available or negligible in all four countries. Progress during the five-year period was due to improvements in international Internet bandwidth per Internet user, which was very low in all four countries in 2002, and increased to levels comparable to the rest of the Arab States by the end of 2007 (except for Comoros, which remained with only 317 bits / s / user). In the case of Mauritania, the country also made remarkable progress in mobile cellular penetration (from 9 to 42 per cent during the five-year period).

Sudan, Yemen, Mauritania and Comoros occupy the last places in the regional IDI 2007

3.2 Regional analysis of the ICT Price Basket

The ITU presented the ICT Price Basket in March 2009[29] in order to raise awareness of the impact of ICT prices on ICT usage and to allow policy makers to evaluate the cost of ICT services in their country and benchmark them against those of other countries. ITU's global ICT Price Basket included a total of 150 countries.[30]

The ICT Price Basket is made up of three sub-baskets, which measure the prices of fixed telephone, mobile cellular and fixed broadband Internet services. Each sub-basket is presented in US$[31], in PPP$[32] and as a percentage of monthly GNI per capita. The three sub-baskets are combined into a single ICT Price Basket value, which determines the overall rank.

ICT Price Basket methodology

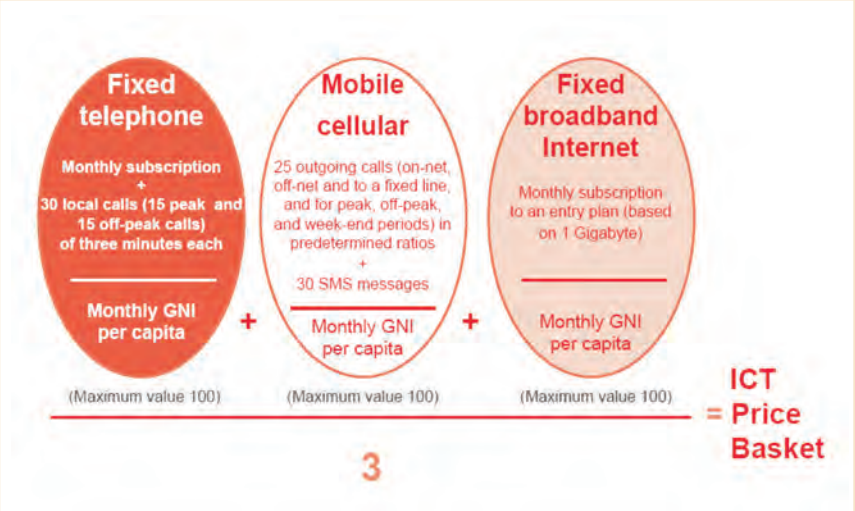


Figure 3.2

Note: In countries where no mobile prepaid offers are available, the monthly fixed cost (minus the free minutes included, if applicable) of a postpaid subscription is added to the basket. For monthly fixed broadband Internet plans that limit the amount of data transferred by including caps below 1 Gigabyte, the cost for additional bytes is added.
Source: ITU

The ICT Price Basket is the value computed as the sum of the price of each sub-basket (in US$) as a percentage of a country's monthly GNI per capita (World Bank, US$, Atlas Method), divided by three (Figure 3.2). For this exercise, the cost of each sub-basket as a percentage of the monthly GNI per capita is limited to a maximum value of 100, so that the final ICT Price Basket value may vary between a theoretical 'zero' (tariffs represent zero per cent of average monthly GNI per capita, and all three services are for free), and 100 (the price of all three sub-baskets is equal to or exceeds the monthly GNI per capita). Based on the ICT Price Basket value, countries are ranked. This section analyses the results of the 2008 ICT Price Basket in the Arab States.[33]

Overall results of the ICT Price Basket

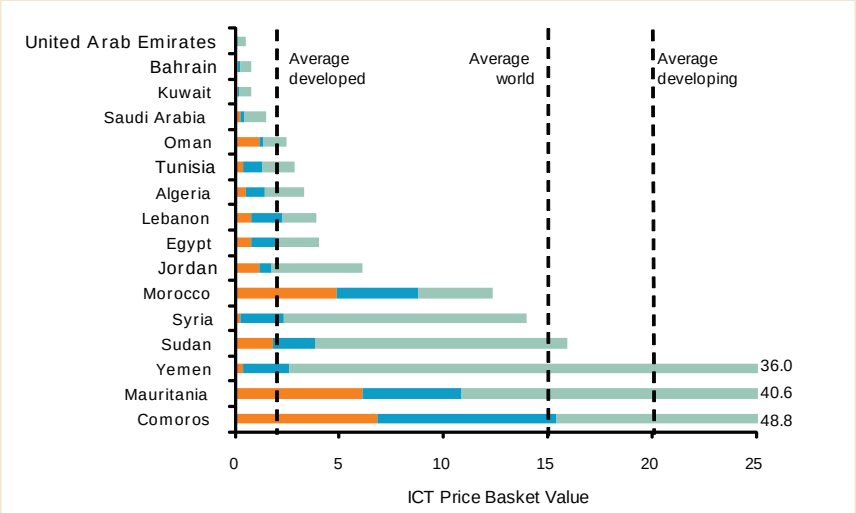
The 2008 ICT Price Basket value in the Arab States corresponds to 12% of the countries' average GNI per capita

On average, the 2008 ICT Price Basket value in the Arab States corresponds to 12.1 per cent of the countries' average GNI per capita, in line with the world average (15.1 per cent), but far from the average of developed countries (1.6 per cent). There are large differences in the region when it comes to prices for ICT services. The ICT Price Basket varies from 0.5 per cent in UAE – which stands among the top ten countries worldwide with the least costly ICT Price Basket – to 48.8 per cent in Comoros. Bahrain, Kuwait, Saudi Arabia and UAE are the countries in the region with an ICT Price Basket lower than the average of developed countries. On the other hand, Yemen, Mauritania and Comoros' ICT Price Baskets are above the average of developing countries.

Chart 3.4 shows in more detail the distribution of the ICT Price Basket in the Arab States, as well as the contribution of each sub-basket to the cost of the ICT Price Basket[34]. In all Arab States except Oman and Morocco the most expensive sub-basket is the fixed broadband one. Indeed, as in most regions, high fixed broadband prices are the main reason for high ICT Price Basket values, such as those of Syria, Sudan, Yemen, Mauritania or Comoros.

Chart 3.4

ICT Price Basket by sub-basket, Arab States, 2008



Source: ITU

ICT Price Basket 2008, Arab States

Table 3.4

Rank	Economy	ICT Price Basket Value**	Sub-baskets: Fixed (% of GNI per capita*)	Sub-baskets: Mobile (% of GNI per capita*)	Sub-baskets: Broadband (% of GNI per capita*)	GNI per capita*, USD
	World	15.3	7.3	7.6	218.9	11'189
	Developed	1.6	1.4	1.4	2.1	28'686
	Developing	20.1	9.5	10.0	300.5	4'608
1	United Arab Emirates	0.5	0.3	0.2	1.1	23'950
2	Bahrain	0.8	0.3	0.4	1.7	19'350
3	Kuwait	0.8	0.4	0.3	1.8	31'640
4	Saudi Arabia	1.5	0.7	0.7	3.1	15'440
5	Oman	2.5	3.5	0.6	3.4	11'120
	GCC Arab States	1.2	1.0	0.4	2.2	20'300
6	Tunisia	2.9	1.1	2.7	4.8	3'200
7	Algeria	3.3	1.5	2.7	5.7	3'620
8	Lebanon	3.9	2.3	4.6	4.8	5'770
9	Egypt	4.1	2.3	3.6	6.3	1'580
10	Jordan	6.1	3.5	1.9	13.0	2'850
11	Morocco	12.4	14.6	11.8	10.7	2'250
12	Syria	14.0	0.8	6.2	35.0	1'760
13	Sudan	16.0	5.5	6.0	36.4	960
14	Yemen	36.0	1.2	6.7	311.4	870
15	Mauritania	40.6	18.4	14.1	89.2	840
16	Comoros	48.8	20.5	25.7	793.7	680
	Non-GCC Arab states	17.1	6.5	7.8	119.2	2'216
	All Arab states	12.1	4.8	5.5	82.6	7'868

Note: *Note: The GNI per capita is based on the World Bank's Atlas Method. The values for the world, developed countries, developing countries, GCC Arab States, non-GCC Arab States, and all Arab States are computed as the averages of those countries included in the ICT Price Basket falling into each category.
** The ICT Price Basket Value is the sum of the three sub-baskets as a percentage of GNI per capita, divided by three

Source: ITU.

Table 3.4 presents the results of the ICT Price Basket 2008 in the Arab States. The ranking is topped by UAE, Bahrain and Kuwait, all three with ICT Price Baskets that represent less than one per cent of their monthly GNI per capita. Together with Saudi Arabia and Oman (ranked 4th and 5th), these countries have the highest income in the region. Indeed, the regional ICT Price Basket ranking corresponds to the different levels of income in the Arab States, with only the lowest income countries in the region (Sudan, Yemen, Mauritania and Comoros) having higher ICT Price Baskets than the world average. Nevertheless, the comparison with the world average needs to be interpreted with caution, as it is biased by very high fixed broadband prices in some African and Asian countries. For instance, two thirds of the 150 countries included in the world's ICT Price Basket had an ICT Price Basket value that corresponded to less than 12 per cent of their monthly GNI per capita. Compared to this, Morocco and Syria's ICT Price Baskets can be considered rather high, although they are below the world average.

The ranking is topped by UAE, Bahrain and Kuwait, all three with ICT Price Baskets that represent less than 1% of their monthly GNI per capita

Despite the strong link between income and ICT Price Basket values in the Arab States, some countries such as Tunisia, Algeria and Egypt stand out for ranking above countries with higher income levels. For instance, Egypt has some of the lowest prices

(in US$) of all Arab States, particularly in the mobile sub-basket, which explains its relatively high ranking in the regional ICT Price Basket.

The following analysis of the three sub-baskets provides a more detailed assessment of the strong and weak points of each Arab State in terms of ICT prices, and thus can help policy makers to identify areas where further efforts are needed in order to lower prices for key ICT services.

Fixed telephone sub-basket

The lowest fixed telephone prices in the Arab States are those of Yemen and Syria

The fixed telephone sub-basket represents the cost of local fixed residential telephone service. It includes the fee of the monthly subscription, plus the cost of 30 local calls to the same (fixed) network (15 peak and 15 off-peak calls) of three minutes each[35].

The lowest fixed telephone prices in the Arab States are those of Yemen (US$ 0.8, PPP$ 2.0), closely followed by those of Syria (US$ 1.2, PPP$ 2.8). When compared to global fixed telephone prices, Yemen is the second country in the world with the least costly fixed telephone prices in PPP terms, and Syria the fourth. On the other hand, Oman has the most expensive fixed telephone prices of all Arab States included in the regional ICT Price Basket (US$ 32.6, PPP$ 53.8), and Morocco has the second highest prices in the region (US$ 27.4, PPP$ 42.6).

The ten countries in the region with the least costly mobile cellular prices as a percentage of monthly GNI per capita are shown in Chart 3.5. Prices range from 0.3 per cent of the monthly GNI per capita in UAE and Bahrain to 2.3 per cent in Egypt, and 20.5 per cent in Comoros, the Arab State with the most expensive fixed telephone prices taken into account its income. UAE, Bahrain and Kuwait are among the world's top ten countries with the least costly fixed telephone sub-basket as a percentage of GNI per capita.

In the region, the fixed telephone sub-basket corresponds on average to 4.8% of countries' monthly GNI per capita, compared to 7.3% in the world

On average, the fixed telephone sub-basket corresponds to 4.8 per cent of the countries' monthly GNI per capita in the Arab States, compared to 7.3 per cent in the world, and 1.4 per cent in developed countries. Morocco, Mauritania and Comoros are the only countries in the region with a fixed telephone sub-basket above the world average.

Mobile cellular sub-basket

The mobile cellular sub-basket corresponds to the price of a standard (low-user) basket of mobile monthly usage based on the OECD/Teligen methodology.[36] It includes 25 outgoing calls per month (on-net, off-net and to a fixed line), in predetermined ratios of minutes, plus 30 Short Message Service (SMS) messages[37].

On average, the cost of the mobile sub-basket in the Arab States represents 5.5 per cent of their monthly GNI per capita, slightly higher than the average cost of the fixed telephone sub-basket. Mobile cellular prices in UAE ($US 4.1, PPP$ 6.2) are the lowest of the region. The country is among the top 15 countries worldwide with the least costly mobile cellular sub-basket in PPP terms. On the other hand, Lebanon

Top ten economies with the least costly fixed telephone sub-basket in the Arab States, 2008

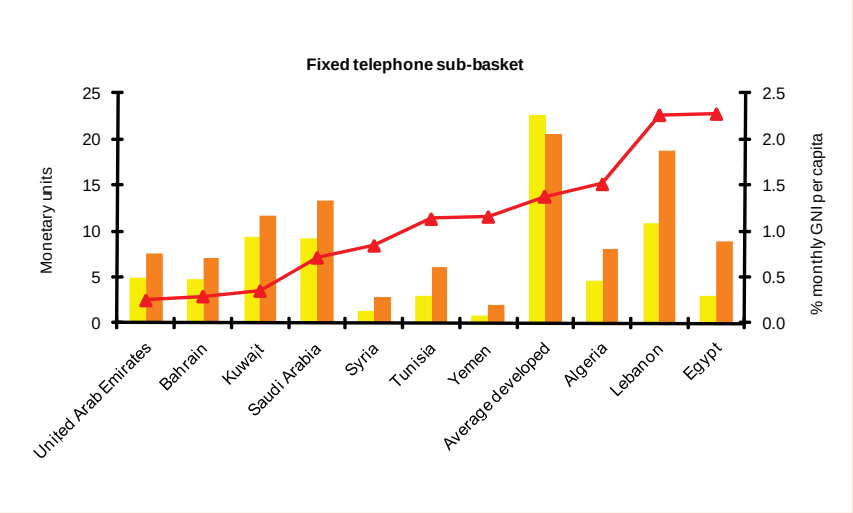


Chart 3.5

Source: ITU

(US$ 22.2, PPP$ 38.2) and Morocco (US$ 22.2, PPP$ 34.5) have the most expensive prices in the region.

The ten Arab States with the least costly mobile cellular prices in terms of GNI per capita are shown in Chart 3.6. Their mobile cellular sub-baskets range from 0.2 per cent in UAE to 4.6 per cent in Lebanon, where high mobile cellular prices are compensated by a high income level, which makes mobile cellular services more affordable than those of other countries in the region. UAE and Kuwait are among the world's top ten countries with the least costly mobile cellular sub-basket as a percentage of GNI per capita.

UAE and Kuwait are among the world's top ten countries with the least costly mobile cellular sub-basket as a percentage of GNI per capita

Morocco (11.8 per cent), Mauritania (14.1 per cent), and Comoros (25.7 per cent) are the only countries in the region with a higher mobile cellular sub-basket in terms of GNI per capita than the world average (7.6 per cent). On the other hand, the five GCC countries included in the ICT Price Basket[38] have mobile cellular prices in terms of GNI per capita below the average of developed countries (1.4 per cent), which can be an explaining factor for high mobile cellular penetration in these GCC countries.

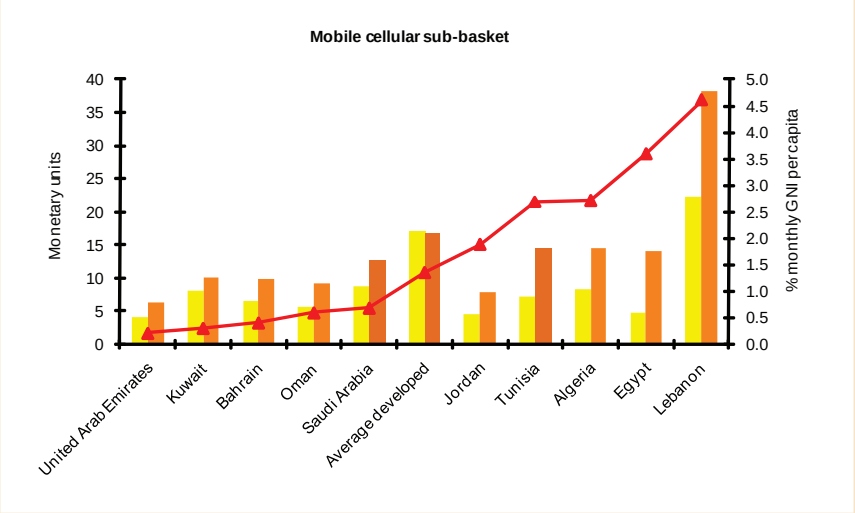
Fixed broadband Internet sub-basket

The fixed broadband Internet sub-basket is calculated based on the price of the monthly subscription to an entry level fixed broadband plan, at a minimum of 256 kbit/s.[39]

As elsewhere, the fixed broadband Internet sub-basket in the Arab States is the most expensive of the three sub-baskets. Prices range from US$ 8.3 (PPP$ 24.9) in Egypt to US$449 (PPP$ 646) in Comoros. Egypt ranks second globally when it comes to mobile prices measured in nominal US$; yet the country (as well as the other Arab

Chart 3.6

Top ten economies with the least costly mobile cellular sub-basket in the Arab States, 2008



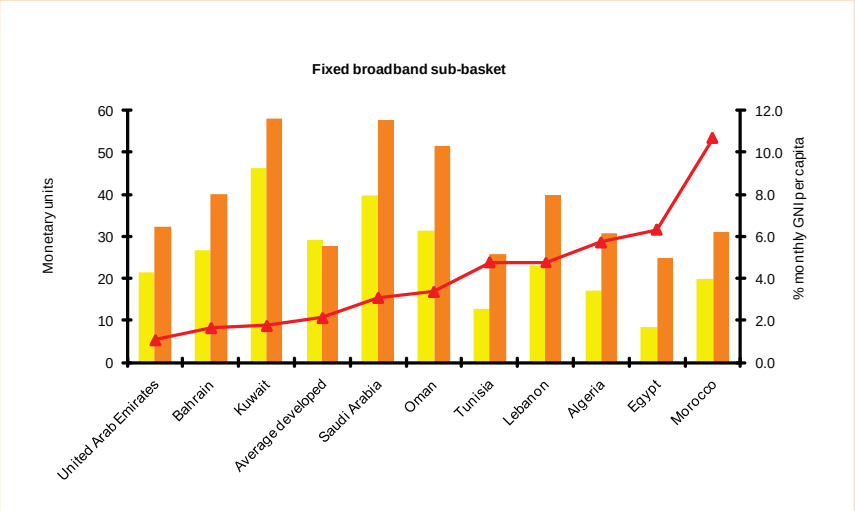
Source: ITU.

States) is far from the world's top ten list of countries with cheapest prices in PPP terms.

The ten countries in the region with the least expensive fixed broadband prices as a percentage of monthly GNI per capita are shown in Chart 3.7. Their prices range from 1.1 per cent of the monthly GNI per capita in UAE to 10.7 per cent in Morocco. Unlike most countries in the region and in the world, Morocco's fixed broadband prices are rather low when compared to its fixed telephone and mobile cellular prices. Compared to prices in other Arab States, fixed telephone and mobile cellular prices

Chart 3.7

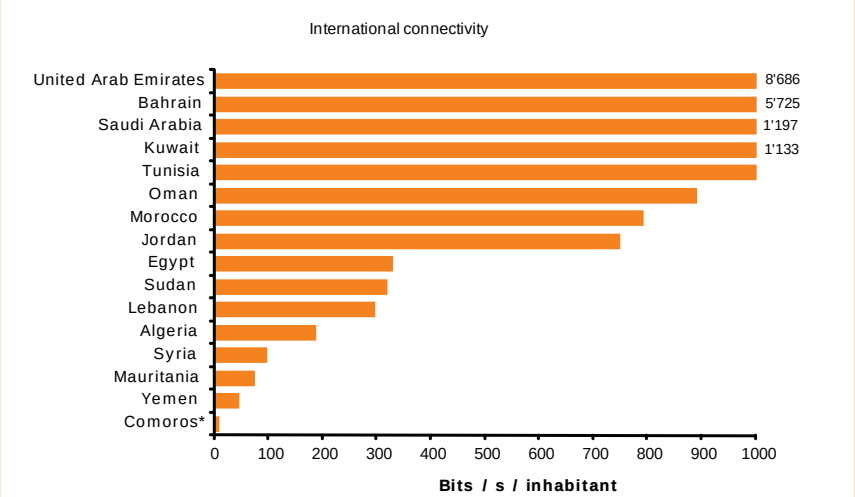
Top ten economies with the least costly fixed broadband Internet sub-basket in the Arab States, 2008



Source: International Internet bandwidth per inhabitant, Arab States, 2008

International Internet bandwidth per inhabitant, Arab States, 2008

Chart 3.8



Note: *Estimated international Internet bandwidth or data referring to previous years.

Source: ITU.

in Morocco are rather high, which suggests that policy initiatives to lower them could have a significant impact in making those ICT services affordable to a larger part of the population.

Yemen and Comoros have a fixed broadband sub-basket that corresponds to more than 100 per cent of their monthly GNI per capita, and therefore it is out of reach of the majority of their population. Mauritania's fixed broadband prices represent 89 per cent of its monthly GNI per capita, which is also too high to make services more popular and affordable. Other Arab States where fixed broadband prices are rather high compared to income include Syria (35 per cent) and Sudan (36 per cent). In the case of Yemen, Comoros, Mauritania and Syria, high fixed broadband prices can partly be explained by the shortage of international connectivity (Chart 3.8).[40] Policy initiatives to improve international Internet bandwidth in these countries could be a good starting point to lower fixed broadband prices.

Yemen and Comoros have a fixed broadband sub-basket that corresponds to more than 100% of their monthly GNI per capita

None of the Arab States are among the world's top twenty countries with the least costly fixed broadband sub-basket in terms of GNI per capita. Therefore, even those Arab States that have a fixed broadband sub-basket below the average of developed countries (i.e. UAE, Bahrain and Kuwait) could further lower their fixed broadband prices and thus advance to the price levels of the most advanced economies in terms of fixed broadband uptake.[41]

Endnotes

[1] See ITU (2009a).

[2] For more information on the WSIS and its outcome documents, see http://www.itu.int/wsis/index.html.

[3] The sub-index access includes the following indicators: fixed telephone lines per 100 inhabitants, mobile cellular telephone subscriptions per 100 inhabitants, international Internet bandwidth (bits/s) per Internet user, proportion of households with a computer, and proportion of households with Internet access at home.

[4] The sub-index use includes the following indicators: Internet users per 100 inhabitants, fixed broadband Internet subscribers per 100 inhabitants, and mobile broadband subscribers per 100 inhabitants.

[5] The sub-index skills includes the following indicators: adult literacy rate, secondary gross enrolment ratio, and tertiary gross enrolment ratio.

[6] This chapter is based on the 2009 IDI, which refer to 2002 and 2007 data. An updated 2010 IDI will be published in January 2010, and available at: http://www.itu.int/ITU-D/ict/publications/

[7] The following countries of the Arab region were not included in the regional IDI because of lack of data: Djibouti, Iraq and Somalia.

[8] Data presented in this chapter reflect the status of the ITU World Telecommunication/ICT Indicators Database as of November 2008.

[9] Syria increased its IDI value by 0.98 points or 58 per cent, Algeria by 0.90 points or 56 per cent, and Morocco by 0.97 points or 71 per cent.

[10] See ITU (2009b), Chapter 3, for more details.

[11] See ITU (2009f), Chapter 3, for more details.

[12] See ITU (2009d), Chapter 3, for more details.

[13] These are the members of the Gulf Cooperation Council: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates.

[14] See ITU (2009e), Chapter 3, for more details.

[15] See ITU (2009c), Chapter 3, for more details.

[16] The R square value of a logarithmic regression provides a measure of how well the trendline approximates the real data points. It varies from 0 to 1, being 1 the value obtained by a perfect fit of the data points. In the case of a regression between IDI and GNI per capita, the higher the R square value, the stronger the link between IDI and GNI per capita, as expressed by a logarithmic curve.

[17] The United Arab Emirates has taken some pioneer ICT regulatory initiatives in the Middle East, such as the establishment of an ICT Development Fund (http://www.ictfund.ae/ICT-Fund.html), and the launch of a Government supported platform to promote e-commerce (Tejari, http://www.tejari.com/Tejari/Pages/default.aspx), both initiatives launched in 2005. In 2003, Bahrain started the liberalizations of the telecommunications market in the country with the launch of the National Telecommunications Plan (see Ministry of Transport, 2003), which has set a new regulatory framework and fostered competition. Bahrain has also been very active in promoting e-content and e-Government services, creating in 2007 the eGovernment Authority (http://www.ega.gov.bh/en/). Another example is the Palestinian Authority, which launched a National ICT Strategy in 2004. The World Economic Forum started together with the Palestinian Authority the Palestinian Education Initiative (PEI) in 2005, following the successful implementation of a similar initiative in Jordan in 2003. The PEI aimed at raising the bottom line of ICT literacy and ICT infrastructure, among other objectives. In 2006, a similar initiative was launched in Egypt. The World Economic Forum took up again the PEI in 2008, and continues to support its development, while the Egyptian Education Initiative is being handed over (http://www.weforum.org/en/initiatives/gei/index.htm).

[18] Between 2002 and 2007, the Arab States increased their average IDI value by 46 per cent, compared to an average increase of 37 per cent in the world in the same period. GCC countries increased their average IDI value by 50 percent, while non-GCC Arab States increased it by 42 per cent.

[19] In the five-year period, GCC countries increased their sub-index access value by 1.93 points (59 per cent growth), and non-GCC Arab States increased it by 1.15 points (76 per cent growth).

[20] Non-GCC Arab States increased by 0.36 points their average sub-index use value in the five-year period, and reached a value of 0.46 in 2007. In comparison, developing countries increased on average 0.50 points their sub-index use value during the same period, and reached a value of 0.75 in 2007.

[21] The average sub-index use value of GCC countries was 1.74 in 2007. Excluding the United Arab Emirates, the average decreases to 1.33 for the same year.

[22] See ITU (2009a), Chapter 3, for more details on the conceptual framework of the IDI.

[23] Between 2002 and 2007, mobile cellular penetration increased in non-GCC Arab States from 8 to 52 per cent. GCC countries achieved much higher mobile cellular penetrations: 31 per cent in 2002 and 120 per cent in 2007.

[24] Excluding GCC countries from the computation, international Internet bandwidth per Internet user increased in the Arab States from 287 to 1819 bits / s / user.

[25] Excluding GCC from the computation, Internet usage in the Arab States grew from 2 to 11 per cent in the five-year period.

[26] References to rankings made in this section apply to rankings of economies within the region. It is to be noted that these rankings differ from the global IDI ranking, which includes 154 economies (see ITU, 2009a).

[27] By the end of 2008, the United Arab Emirates reached a record mobile cellular penetration of 209 per cent, being the first country in the world above the 200 per cent threshold.

[28] For the World Summit on the Information Society (WSIS) meeting in November 2005, a trial UMTS network was deployed by Huawei in some Tunisian cities (see http://www.huawei.com/africa/en/catalog.do?id=310). However, the first licence to commercially provide 3G/IMT-2000 services has not been awarded until June 2009 (see http://www.infocom.tn/index.php?id=14). Although not all 3G/IMT-2000 technologies are considered mobile broadband according to the ITU definition, the most widespread mobile broadband technologies are indeed included in the 3G/IMT-2000 standard, and therefore 3G/IMT-2000 licences are in most cases a prerequisite to provide mobile broadband commercially.

[29] See ITU (2009a) for more details.

[30] The main reason for not including a specific country in the ICT Price Basket was the unavailability of one or several of the tariffs used to calculate the Price Basket.

[31] The average United Nations operational rate of exchange from January 2008 to September 2008 was used (the month when prices were gathered).

[32] Current international dollars (PPP $) are calculated using Purchasing Power Parity (PPP) conversion factors instead of regular exchange rates. The use of PPP exchange factors helps screening price and exchange rate distortions, thus providing a measure of the cost of a given service taking into account the purchasing power equivalences between countries. PPP data used in the ICT Price Basket were provided by the World Bank. For more information on PPP methodology and data, see http://go.worldbank.org/UI22NH9ME0 and the World Bank (2008).

[33] The following economies included in the ITU World Telecommunication/ICT Indicators database were not included in the ICT Price Basket because of lack of data: Djibouti, Iraq, Libya, Qatar and Somalia.

[34] The ICT Price Basket is the value computed as the sum of the price of each sub-basket (in US$) as a percentage of the country's monthly GNI per capita (World Bank, US$, Atlas Method), divided by three. Therefore, the contribution of each sub-basket to the ICT Price Basket is a third of the price of the sub-basket expressed as a percentage of the monthly GNI per capita.

[35] See ITU (2009a), Annex 2, for more details.

[36] See OECD (2002).

[37] See ITU (2009a), Annex 2, for more details.

[38] The members of the Gulf Cooperation Council included in the ICT Price Basket are the United Arab Emirates, Bahrain, Saudi Arabia, Oman, and Kuwait. Qatar is not included due to lack of data.

[39] Broadband is considered any dedicated connection to the Internet at speeds equal to, or greater

than, 256kbit/s, in one or both directions. Where several offers were available, preference was given to a 256 kbit/s connection. The tariff represents the cheapest broadband entry plan (although special offers – limited in time or to specific geographic areas – were not taken into consideration) but does not necessarily represent the fastest or most cost-effective connection since often the price for a higher-speed plan is relatively cheaper (in terms of the caps). See ITU (2009a), Annex 2, for more details.

[40] The shortage of international Internet bandwidth and its effects on fixed broadband prices has been also flagged as an important problem in many African countries. See for example ITU (2009c) for an analysis of its impact in sub-Saharan countries.

[41] By the end of 2007, all top twenty countries in the world with the least costly fixed broadband sub-baskets had a higher fixed broadband penetration than that of Bahrain (9 per cent), the Arab State with the highest fixed broadband uptake.

Chapter 4.

Conclusions

This section highlights key findings and draws conclusions, with a view to providing recommendations that policy makers could implement to enhance the development of the information society in the Arab States and increase access to ICT services. Policy recommendations are mainly focused on identifying and assessing possible ways of enhancing digital inclusion, while in parallel facilitating the transition to the next-generation telecommunication environment.

The Arab States are characterized by broad discrepancies in terms of income levels. GCC countries are among the wealthier economies worldwide, while a number of other Arab States (e.g. Sudan, Somalia, Yemen, Djibouti, Comoros) are among the poorest in the world. A common characteristic of the region is its low population density, which makes digital inclusion a challenging task. In the area of business regulation, there is a reluctance to allow high shares of foreign ownership, especially during early stages of liberalization, a factor that has directly impacted the pace and degree of telecommunication market liberalization. All of these characteristics have played an important role in the way fixed, mobile and Internet/broadband sectors have developed in the Arab States. They are also helpful in identifying those areas that policy makers should focus on.

In general, GCC countries have higher penetration rates due to their wealthier economies, attraction of foreigners and early market liberalization

Over the past decade, mobile telephony in the Arab States has grown at an annual rate of 55 per cent, reaching a penetration of 63 per cent by the end of 2008. At the same time, the region had 10 fixed telephone lines per 100 inhabitants, and an estimated 16 out of 100 inhabitants were using the Internet. With regards to broadband development, the Arab States are still at the very early development stages and by the end of 2008, fixed broadband subscribers and mobile broadband subscriptions reached 1 per cent and 3 per cent penetration respectively.

When studying ICT uptake in individual countries, it can be concluded that GCC countries have, in general, higher penetration rates, due to their wealthier economies, attraction of visitors and foreign professionals and early adoption of policies addressed at telecommunication market liberalization. For example, UAE currently presents the highest mobile cellular penetration rate worldwide, surpassing the 200 per cent mark by the end of 2008. Apart from the reasons mentioned above, other key parameters leading to high penetration rates include the high share of prepaid subscribers and the late introduction or lack of mobile number portability.

In mobile penetration the region is doing well, but it is lagging behind in other ICT services such as fixed telephony, Internet and broadband

The region shows significant differences between mobile cellular and Internet user uptake. In countries where mobile cellular penetration exceeds 100 per cent (mostly GCC countries), the differences are even higher. While in terms of mobile penetration the region is doing well in international comparisons, it is lagging behind the world average in all other ICT services (e.g. fixed telephony, Internet, broadband).

On the way forward, key policy and regulatory challenges are centered around ensuring that all citizens are equipped with the necessary ICT skills and have access to high-speed broadband services, while at the same time the sector is advancing towards the next-generation telecommunication era. The following recommendations may guide policy makers and regulators in the region to achieve higher Internet (and broadband) diffusion among citizens, to enhance digital literacy and to ensure the region's full participation in the information society.

Strengthening of competition includes local loop unbundling, cost-based wholesale pricing and infrastructure sharing

- Implementation of national ICT policies: policy makers in most Arab States have developed detailed and comprehensive national policies for ICT sector development and the transition to the digital economy. Yet, what is needed is the implementation of an effective monitoring and measurement mechanism in order to identify and track the success to date. At the same time, these monitoring mechanisms could help governments identify possible bottlenecks and challenges and help them make informed policy decisions. Policy makers should develop a detailed action plan, including a set of measurable milestones to track the market's growth and to evaluate progress.

- Timely and effective market liberalization: policy makers and regulators should undertake all necessary steps to foster competition in the fixed, mobile, and Internet and broadband markets. This includes providing for transparent and clear regulatory frameworks and rules to attract private investment and drive innovation. Governments can maximize the benefits of liberalization by opening up to competition and licensing new operators in all ICT services. Concrete steps towards the strengthening of competition include local loop unbundling, cost-based wholesale pricing and infrastructure sharing.

- High-speed broadband network deployment: ensuring that citizens will be able to enjoy access to high-speed broadband networks should be a key priority for all governments. Depending on countries' economic levels of development as well as geographic and technological characteristics, policy makers and regulators can take several steps in this direction. Broadband could be further deployed through special licensing conditions and the enforcement of Universal Service Obligations. Governments could identify the appropriate technological platforms (e.g. fixed and/or mobile broadband) best-suited to bring high-speed Internet access to end-users. At the same time, regulatory intervention could be used to make broadband more affordable, including through access to the low-cost 800MHz spectrum for mobile broadband and infrastructure sharing. Governments could also envisage the migration to a unified licensing regime.

Regulatory intervention could make broadband more affordable, including through access to the low-cost 800MHz spectrum for mobile broadband

- Digital literacy enhancement: digital literacy is key to promoting ICT uptake amongst citizens and governments need to raise ICT awareness and ICT skills, for example through the integration of ICTs in the school curriculum. Governments may also grant special incentives (e.g. tax exemptions) to both public and private companies that provide IT training to their employees. In order to make computers more affordable, policy makers could subsidize computers or lower import duties on ICT goods.

- Development of a framework to enable the migration to the next-generation ICT environment: policy makers and regulators should also facilitate the ongoing transition to the next-generation ICT environment, characterized by ubiquitous access to high-speed and high-quality broadband networks and the convergence of the telecommunication and media sectors. Regulatory intervention should focus on enabling migration to digital broadcasting, and reviewing implemented levers, such as IP interconnection, content rights and frequency usage.

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Annex 1. List of countries in Arab States by income grouping

Low-income	Lower-middle-income	Upper-middle-income	High-income
Comoros	Djibouti	Algeria	Bahrain*
Mauritania	Egypt	Lebanon	Kuwait*
Somalia	Iraq	Libya	Oman*
Yemen	Jordan		Qatar*
	Morocco		Saudi Arabia*
	Sudan		United Arab Emirates*
	Syria		
	Tunisia		
EU-42 countries			

Note: Member states included in the ITU BDT region of Arab States are classified based on the World Bank income groups.

*Refers to Gulf Cooperation Council (GCC) member countries.

Annex 2. IDI sub-indices (access, use, skills) for countries in the Arab States

IDI access sub-index (2002 and 2007)

Country	Rank 2007	Access 2007	Rank 2002	Access 2002	Rank change 2002-2007	Access change 2002-2007
United Arab Emirates	1	6.22	1	4.30	0	1.92
Bahrain	2	6.09	2	3.95	0	2.14
Qatar	3	5.83	3	3.67	0	2.16
Saudi Arabia	4	4.96	6	2.29	2	2.66
Kuwait	5	4.54	4	3.38	-1	1.16
Oman	6	3.77	7	2.21	1	1.56
Lebanon	7	3.55	5	2.48	-2	1.07
Syria	8	3.29	9	1.88	1	1.41
Jordan	9	3.28	8	2.15	-1	1.13
Morocco	10	3.03	10	1.64	0	1.38
Tunisia	11	2.98	11	1.58	0	1.40
Libya	12	2.92	15	1.20	3	1.72
Algeria	13	2.86	14	1.27	1	1.59
Egypt	14	2.74	12	1.55	-2	1.18
Mauritania	15	2.13	13	1.39	-2	0.75
Sudan	16	1.85	16	0.97	0	0.89
Yemen	17	1.77	17	0.85	0	0.93
Comoros	18	1.26	18	0.82	0	0.43

Source: Based on ITU (2009a)

IDI skills sub-index (2002 and 2007)

Country	Rank 2007	Skills 2007	Rank 2002	Skills 2002	Rank change 2002-2007	Skills change 2002-2007
Libya	1	9.94	10	8.65	9	1.29
Bahrain	2	9.78	1	9.45	-1	0.32
Lebanon	3	9.36	4	8.85	1	0.51
Jordan	4	9.26	5	8.74	1	0.52
Qatar	5	9.18	3	9.08	-2	0.10
Oman	6	9.17	2	9.14	-4	0.03
United Arab Emirates	7	9.14	15	8.43	8	0.71
Tunisia	8	9.13	8	8.68	0	0.45
Kuwait	9	8.99	9	8.66	0	0.33
Egypt	10	8.92	19	8.40	9	0.51
Algeria	11	8.91	7	8.70	-4	0.21
Saudi Arabia	12	8.88	23	8.12	11	0.76
Syria	13	8.85	12	8.57	-1	0.28
Morocco	14	8.79	13	8.57	-1	0.22
Yemen	15	8.73	11	8.62	-4	0.11
Sudan	16	8.65	14	8.48	-2	0.16
Comoros	17	8.60	16	8.41	-1	0.19
Mauritania	18	8.53	6	8.72	-12	-0.19

Source: Based on ITU (2009a).

IDI use sub-index (2002 and 2007)

Country	Rank 2007	Use 2007	Rank 2002	Use 2002	Rank change 2002-2007	Use change 2002-2007
United Arab Emirates	1	3.75	1	0.93	0	2.82
Qatar	2	1.95	5	0.34	3	1.61
Bahrain	3	1.95	2	0.63	-1	1.32
Lebanon	4	1.33	3	0.44	-1	0.89
Kuwait	5	1.21	4	0.37	-1	0.85
Saudi Arabia	6	1.08	7	0.21	1	0.86
Morocco	7	0.79	11	0.08	4	0.72
Jordan	8	0.71	8	0.20	0	0.52
Tunisia	9	0.62	9	0.17	0	0.44
Syria	10	0.58	13	0.07	3	0.51
Egypt	11	0.51	10	0.09	-1	0.42
Oman	12	0.48	6	0.24	-6	0.24
Algeria	13	0.39	14	0.05	1	0.34
Sudan	14	0.32	16	0.02	2	0.30
Libya	15	0.17	12	0.08	-3	0.10
Comoros	16	0.09	17	0.01	1	0.07
Mauritania	17	0.06	18	0.01	1	0.05
Yemen	18	0.05	15	0.02	-3	0.03

Source: Based on ITU (2009a).

Annex 3. Statistical tables

Introduction

The following signs and symbols are used in the document:

*	Estimate
000s	Thousands (e.g., 1'000)
M	Millions (e.g., 1'000'000)
B	Billions (e.g., 1'000'000'000)
US$	United States dollars. See the *Technical notes* for how US$ figures are obtained.
%	Per cent
-	Zero or a quantity less than half the unit shown.
...	Data not available
CAGR	Compound Annual Growth Rate. See the *Technical notes* for how this is computed.

The absence of any sign or symbol indicates that data are in units.

List of economies

Full designation	Designation in document	Fiscal year
Algeria (People's Democratic Republic of)	Algeria	Ending 31.12
Bahrain (Kingdom of)	Bahrain	Ending 31.12
Comoros (Union of the)	Comoros	Ending 31.12
Djibouti (Republic of)	Djibouti	Ending 31.12
Egypt (Arab Republic of)	Egypt	Ending 31.12
Iraq (Republic of)	Iraq	Ending 30.06
Jordan (Hashemite Kingdom of)	Jordan	Ending 31.12
Kuwait (State of)	Kuwait	Ending 31.12
Lebanon	Lebanon	Ending 31.12
Socialist People's Libyan Arab Jamahiriya	Libya	Ending 31.12
Mauritania (Islamic Republic of)	Mauritania	Ending 31.12
Morocco (Kingdom of)	Morocco	Ending 31.12
Oman (Sultanate of)	Oman	Ending 31.12
Qatar (State of)	Qatar	Ending 31.12
Saudi Arabia (Kingdom of)	Saudi Arabia	Ending 31.12
Somali Democratic Republic	Somalia	Ending 31.12
Sudan (Republic of the)	Sudan	Ending 31.12
Syrian Arab Republic	Syria	Ending 31.12
Tunisia	Tunisia	Ending 31.12
United Arab Emirates	United Arab Emirates	Ending 31.12
Yemen (Republic of)	Yemen	Ending 31.12

1. Main (fixed) telephone lines

		Main (fixed) telephone lines (000s)		CAGR (%)	Main (fixed) telephone lines per 100 inhabitants		CAGR (%)
		2003	2008	2003-2008	2003	2008	2003-2008
1	Algeria	2'147.0	3'314.0	9.1	6.73	9.64	7.4
2	Bahrain	185.8	220.4	3.5	26.69	28.42	1.3
3	Comoros	13.2	23.3	12.0	2.25	3.53	9.4
4	Djibouti	10.2	14.9	8.0	1.31	1.76	6.1
5	Egypt	8'735.7	11'936.0	6.4	11.76	14.64	4.5
6	Iraq	1'183.3	1'082.3	-1.8	4.41	3.60	-4.0
7	Jordan	622.6	519.0	-3.6	11.87	8.46	-6.6
8	Kuwait	486.9	*541.0*	2.1	19.24	*18.53*	-0.7
9	Lebanon	700.0	*750.0*	1.4	17.65	*17.88*	0.3
10	Libya	750.0	*1'033.0*	6.6	13.19	*16.41*	4.5
11	Mauritania	38.2	76.4	14.9	1.35	2.37	12.0
12	Morocco	1'219.2	2'991.2	19.7	4.09	9.46	18.3
13	Oman	236.2	274.2	3.0	9.35	9.84	1.0
14	Qatar	184.5	263.4	7.4	25.22	20.56	-4.0
15	Saudi Arabia	3'502.6	4'100.0	3.2	15.57	16.27	0.9
16	Somalia	100.0	*100.0*	-	1.25	*1.12*	-2.2
17	Sudan	936.8	366.2	-17.1	2.52	0.89	-18.9
18	Syria	2'411.0	3'633.4	8.5	13.43	17.12	5.0
19	Tunisia	1'163.8	1'239.1	*1.3*	11.99	12.18	0.3
20	United Arab Emirtes	1'135.8	1'508.3	5.8	30.16	33.63	2.2
21	Yemen	693.9	*1'117.0*	10.0	3.50	*4.87*	6.9
	Arab States	**26'456.6**	**35'103.0**	5.8	8.61	10.29	3.6

Note: For data comparability and coverage, see the technical notes. Figures in italics are estimates.
Source: ITU World Telecommunication/ICT Indicators Database.

2. Mobile cellular subscriptions

		Mobile cellular subscriptions (000s)		CAGR (%)	Mobile cellular subscriptions per 100 inhabitants		CAGR (%)
		2003	2008	2003-2008	2003	2008	2003-2008
1	Algeria	1'447	*31'871*	85.6	4.54	*92.72*	82.8
2	Bahrain	443	1'441	26.6	63.67	185.77	23.9
3	Comoros	2	98	118.0	0.34	14.90	113.1
4	Djibouti	23	113	37.5	2.96	13.29	35.0
5	Egypt	5'798	41'272	48.1	7.80	50.62	45.4
6	Iraq	80	*17'529*	193.9	0.30	*58.24*	187.2
7	Jordan	1'325	5'314	32.0	25.27	86.60	27.9
8	Kuwait	1'420	*2'907*	15.4	56.11	*99.59*	12.2
9	Lebanon	795	*1'427*	12.4	20.06	*34.03*	11.1
10	Libya	127	4'828	107.0	2.23	76.71	102.8
11	Mauritania	351	2'092	42.9	12.40	65.07	39.3
12	Morocco	7'360	22'816	25.4	24.68	72.19	23.9
13	Oman	594	3'219	40.2	23.52	115.58	37.5
14	Qatar	377	1'683	34.9	51.47	131.39	20.6
15	Saudi Arabia	7'238	36'000	37.8	32.18	142.85	34.7
16	Somalia	200	*627*	25.7	2.51	*7.02*	22.9
17	Sudan	527	11'991	86.8	1.42	29.00	82.8
18	Syria	1'185	7'056	42.9	6.60	33.24	38.2
19	Tunisia	1'918	8'602	35.0	19.76	84.59	33.8
20	United Arab Emirates	2'972	9'358	25.8	78.94	208.65	21.5
21	Yemen	675	*3'700*	40.5	3.40	*16.14*	36.5
	Arab States	**34'857**	**213'945**	**43.7**	**11.34**	**62.74**	**40.8**

Note: For data comparability and coverage, see the technical notes. Figures in italics are estimates.
Source: ITU World Telecommunication/ICT Indicators Database.

2. Mobile cellular subscriptions (continuation)

		Mobile cellular subscriptions			Mobile broadband subscriptions		
		Prepaid subscribers (%)	Population coverage (%)	As % of total telephone subscribers	(000s)		Per 100 inhabitants
		2008	2008	2008	2003	2008	2008
1	Algeria	*97.00*	*81.50*	*90.60*	-	-	-
2	Bahrain	83.30	*100.00*	86.70	0.1	195.3	25.20
3	Comoros	*98.60*	40.00	80.90	-	-	-
4	Djibouti	100.00	85.00	88.30	-	-	-
5	Egypt	96.40	95.00	77.60	-	4000.0	4.90
6	Iraq	*82.00*	72.10	*94.20*	...	-	-
7	Jordan	92.00	99.00	91.10	...	-	-
8	Kuwait	*79.60*	100.00	*84.30*	...	59.9	2.10
9	Lebanon	78.20	100.00	*65.50*	-	-	-
10	Libya	98.50	70.70	82.40	-	1798.8	28.60
11	Mauritania	96.10	62.00	96.50	-	72.2	2.20
12	Morocco	96.00	98.00	88.40	-	709.7	2.20
13	Oman	89.90	96.40	92.20	...	146.6	5.30
14	Qatar	85.90	100.00	86.50	...	96.9	7.60
15	Saudi Arabia	84.70	98.00	89.80	...	2370.5	9.40
16	Somalia	*100.00*	...	*86.20*	...	-	-
17	Sudan	91.80	66.00	97.00	-	160.1	0.40
18	Syria	84.10	*96.00*	66.00	-	-	-
19	Tunisia	98.70	100.00	87.40	-	-	-
20	United Arab Emirates	91.20	100.00	86.10	...	1806.7	40.30
21	Yemen	*64.70*	*68.00*	*76.80*	-	-	-
	Arab States	**58.9**	**86.20**	**85.90**	**0.1**	**11'416.7**	**3.3**

Note: For data comparability and coverage, see the technical notes. Figures in italics are estimates.
Source: ITU World Telecommunication/ICT Indicators Database.

3. Internet users

		Internet users			Internet users per 100 inhabitants		
		(000s)		CAGR (%)			CAGR (%)
		2003	2008	2003-2008	2003	2008	2003-2008
1	Algeria	700.0	4'100.0	42.40	2.20	11.93	40.3
2	Bahrain	150.0	402.9	21.80	21.55	51.95	19.2
3	Comoros	5.0	23.0	35.70	0.85	3.48	32.6
4	Djibouti	4.9	19.2	31.60	0.63	2.26	29.3
5	Egypt	3'000.0	13'573.0	35.20	4.04	16.65	32.8
6	Iraq	30.0	300.0	58.50	0.11	1.00	54.9
7	Jordan	444.0	1'595.2	29.10	8.47	26.00	25.2
8	Kuwait	567.0	1'000.0	12.00	22.40	34.26	8.9
9	Lebanon	500.0	945.0	13.60	12.61	22.53	12.3
10	Libya	160.0	323.0	15.10	2.81	5.13	12.8
11	Mauritania	12.0	60.0	38.00	0.42	1.87	34.5
12	Morocco	1'000.0	10'442.5	59.90	3.35	33.04	58.0
13	Oman	183.3	557.0	24.90	7.26	20.00	22.5
14	Qatar	140.8	436.0	25.40	19.24	34.04	12.1
15	Saudi Arabia	1'800.0	7'761.8	33.90	8.00	30.80	30.9
16	Somalia	30.0	102.0	27.70	0.38	1.14	24.9
17	Sudan	200.0	4'200.0	83.80	0.54	10.16	79.9
18	Syria	610.0	3'565.0	42.30	3.40	16.79	37.7
19	Tunisia	630.0	2'800.0	34.80	6.49	27.53	33.5
20	United Arab Emirates	1'110.0	2'922.0	21.40	29.48	65.15	17.2
21	Yemen	120.0	370.0	25.30	0.60	1.61	21.7
	Arab States	**11'396.9**	**55'497.6**	**37.20**	**3.71**	**16.28**	**34.4**

Note: For data comparability and coverage, see the technical notes.
Source: ITU World Telecommunication/ICT Indicators Database.

4. International Internet bandwidth

		International Internet bandwidth						
		Mbps			CAGR (%)	Bits/s per Internet user		CAGR (%)
		2003	2008		2003-2008	2003	2008	2003-2008
1	Algeria	156.3	6'530.0	*	111.0	223.3	1'592.7	48.1
2	Bahrain	409.0	4'440.0	*	61.1	2'726.7	11'020.4	32.2
3	Comoros	0.1	7.0		171.9	25.6	316.7	87.5
4	Djibouti	2.0	465.0		196.0	421.1	24'218.8	124.9
5	Egypt	925.0	27'077.0		96.5	308.3	1'994.9	45.3
6	Iraq	...	40.0		...	...	133.3	...
7	Jordan	310.0	4'615.0		71.6	698.1	2'893.0	32.9
8	Kuwait	287.0	3'390.0	*	63.9	506.2	3'390.0	46.3
9	Lebanon	60.0	1'254.0	*	83.7	120.0	1'327.0	61.7
10	Libya	6.0	465.0	*	138.7	37.5	1'439.6	107.4
11	Mauritania	9.5	245.0		91.6	791.7	4'083.3	38.8
12	Morocco	310.0	25'130.0		140.9	310.0	2'406.5	50.7
13	Oman	344.0	2'490.0		48.6	1'877.1	4'470.4	19.0
14	Qatar	465.0	6'410.0	*	69.0	3'303.5	14'701.8	34.8
15	Saudi Arabia	390.0	30'170.0		138.6	216.7	3'887.0	78.1
16	Somalia	3.0	3.0		-	100.0	33.3	-42.3
17	Sudan	90.0	13'300.0		171.6	450.0	3'166.7	47.7
18	Syria	16.0	2'100.0		165.2	26.2	589.1	86.3
19	Tunisia	155.0	11'520.0		136.7	246.0	4'114.3	75.7
20	United Arab Emirates	1'705.0	38'958.0		87.0	1'536.0	13'332.6	54.1
21	Yemen	6.0	1'085.0	*	182.8	50.0	2'932.4	125.8
	Arab States	**5'649**	**179'694**		**99.8**	**497**	**3'238.6**	**45.6**

Note: For data comparability and coverage, see the technical notes.
Source: ITU World Telecommunication/ICT Indicators Database. *Telegeography

5. Fixed broadband Internet subscribers

		Fixed broadband Internet subscribers			Fixed broadband Internet subscribers per 100 inhabitants		
		(000s)		CAGR (%)			CAGR %
		2003	2008	2003-2008	2003	2008	2003-2008
1	Algeria	18.0	485.0	93.2	0.1	1.4	*90.4*
2	Bahrain	9.7	110.0	62.4	1.4	14.2	*58.9*
3	Comoros	-	-	...	-	-	...
4	Djibouti	-	2.5	...	-	0.3	...
5	Egypt	54.8	769.7	69.6	0.1	0.9	*66.5*
6	Iraq	...	-	...	...	-	...
7	Jordan	5.0	137.1	94.0	0.1	2.2	*88.0*
8	Kuwait	13.0	40.0	25.2	0.5	1.4	*21.7*
9	Lebanon	70.0	211.0	24.7	1.8	5.0	*23.3*
10	Libya	-	10.0	...	-	0.2	...
11	Mauritania	-	5.9	...	-	0.2	...
12	Morocco	2.7	483.9	182.0	-	1.5	*178.8*
13	Oman	0.1	32.0	198.0	-	1.1	*192.3*
14	Qatar	3.0	103.4	103.1	0.4	8.1	*81.6*
15	Saudi Arabia	46.0	1'048.1	86.9	0.2	4.2	*82.7*
16	Somalia	-	-	...	-	-	...
17	Sudan	-	44.6	...	-	0.1	...
18	Syria	-	11.1	...	-	0.1	...
19	Tunisia	0.3	227.3	287.8	-	2.2	*284.2*
20	United Arab Emirates	30.3	557.6	79.0	0.8	12.4	*72.9*
21	Yemen	-	-	...	-	-	...
	Arab States	**253.0**	**4'279.1**	**76.1**	**0.1**	**1.3**	**72.5**

Note: For data comparability and coverage, see the technical notes. Figures *in italics* are estimates.
Source: ITU World Telecommunication/ICT Indicators Database.

Technical Notes

General methodology

The compound annual growth rate (CAGR) is computed by the formula:

$[(Pv / P0) (1/n)]-1$

where Pv = Present value
P0 = Beginning value
n = Number of periods

The result is multiplied by 100 to obtain a percentage.

Regional aggregates are either *totals* or weighted *averages* depending on the indicator. For example, for main (fixed) telephone lines, the total number of *main (fixed) telephone lines* is shown, while for *main (fixed) lines per 100 inhabitants* the weighted average is shown. Growth rates generally refer to countries for which data are available for both years.

1. Main (fixed) telephone lines

Main (fixed) telephone lines refer to telephone lines connecting a customer's equipment (e.g., telephone set, facsimile machine) to the Public Switched Telephone Network (PSTN) and which have a dedicated port on a telephone exchange. Note that for most countries, main (fixed) lines also include public payphones. Many countries also include ISDN channels in main (fixed) lines (see below ISDN and ADSL). *Main (fixed) telephone lines per 100 inhabitants* is calculated by dividing the number of main (fixed) lines by the population and multiplying by 100.

2. Mobile cellular subscriptions

Mobile cellular subscriptions refers to users of portable telephones subscribing to an automatic public mobile telephone service using cellular technology that provides access to the PSTN. *Per 100 inhabitants* is obtained by dividing the number of mobile cellular subscriptions by the population and multiplying by 100. *Prepaid subscriptions refers* to the percentage of mobile cellular subscriptions using prepaid cards. *Population coverage* measures the percentage of inhabitants that are within range of a mobile cellular signal whether or not they are subscribers. This is calculated by dividing the number of inhabitants within range of a mobile cellular signal by the total population and multiplying by 100. *Mobile broadband subscriptions* refers to the number of subscriptions to mobile cellular networks with access to data communications (e.g. the Internet) at broadband speeds (greater than or equal to 256 kbit/s in one or both directions) such as WCDMA, HSDPA, CDMA2000 1xEV-DO, CDMA 2000 1xEV-DV etc. *Per 100 inhabitants* is obtained by dividing the number of mobile broadband subscriptions by the population and multiplying by 100.

3. Internet users

Internet users is based on nationally reported data. In some cases, surveys have been carried out that give a more precise figure for the number of Internet users. However, surveys differ across countries in the age and frequency of use they cover. The reported figure for Internet users – which may refer to only users above a certain age – is divided by the total population and multiplied by 100 to obtain *Internet users per 100 inhabitants*. Countries that do not have surveys generally base their estimates on derivations from reported Internet Service Provider subscriber counts, calculated by multiplying the number of subscribers by a multiplier.

4. International Internet bandwidth

International Internet bandwidth refers to the amount of international Internet bandwidth measured in Mega Bits Per Second (Mbps). Data for Internet bandwidth originate from ITU's annual questionnaire supplemented with data from TeleGeography. *Bits/s per Internet user* is calculated by dividing the international Internet bandwidth (in bits/s) by the number of Internet users.

5. Fixed broadband Internet subscribers

Fixed broadband Internet subscribers refers to subscribers who pay for high-speed access to the public Internet (a TCP/IP connection) at speeds equal to, or greater than, 256 kbps in one or both directions. It includes the sum of DSL, cable modem and other fixed broadband subscribers. *Fixed broadband Internet subscribers per 100 inhabitants* is calculated by dividing the number of fixed broadband Internet subscribers by the population of the country and by multiplying by 100.

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