

# Challenges for Information and Communication Technology Development in the Arab World

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The Information and Communication Technology (ICT) sector has become one of the core foundations underpinning knowledge economies and sustainable social and economic development. Governments around the world are called on to develop ICT strategies in order to narrow the existing digital divide between the “connected” and the “unconnected” populations, and to place themselves on a competitive platform.

This paper examines the challenges faced by the Arab world in effectively developing and leveraging ICT. A close assessment of the three layers that underline ICT development (Environment, Readiness and Usage) provides new evidence on further gaps within the Arab world itself, emanating from countries’ diverse efforts to develop their ICT potential and to bridge the digital divide with the developed world.

In this paper, we have identified three sets of challenges underpinning the significant role for ICT advancement in the economic development of the Arab World. We have also recommended a set of policy initiatives that can enhance the functioning of markets and alleviate the risks of ICT-marginalization and the consequent poor economic and social development of the Arab world:

- Environment**
- Devise a clear and comprehensive ICT development plan, supported by the highest political constituencies
  - Incorporate ICT skills and knowledge into the educational system

- Enact telecom laws and regulations to introduce competition through deregulation, privatization and sector liberalization

- Readiness**
- Drive literacy and comfort with the ICT field through the promotion of awareness, trust, training and comfort
  - Promote access device penetration among citizens, businesses (particularly SMEs) and the Government, as well as employee training schemes to improve the readiness of market players to take advantage of ICT benefits
  - Devise appropriate strategies for Governments to deliver e-Government services and participate in e-commerce

- Usage**
- Tackle the digital divide by taking positive actions among population groups less likely to use the Internet
  - Promote purposeful uptake of Internet technologies in the business community
  - Promote online public services through strategic Government policies in order to increase Internet usage among citizens, businesses and Government

These challenges and enablers for ICT growth are discussed in a more comprehensive manner in this paper, with the use of extensive references and examples from the region and best practices from international markets.

## Review of ICT Developments

### Global perspectives on ICT development<sup>1</sup>

In 2001, the global information and communications technology (ICT) market soared to more than US\$2.3 trillion, with an average compounded annual growth rate of 9.7 percent over the 1998 to 2001 period. The United States led the competitive ICT regions and countries, claiming 36 percent of the world market (with a compounded growth rate of 8.2 percent), followed by 29 percent for Europe and 11 percent for Japan.

Given the current gaps between the ICT market share in the United States, Europe,<sup>2</sup> and Japan, market analysts anticipate that the United States will continue to lead the global ICT market. It is forecasted that each region, with the exception of Japan, will maintain the same market share in 2002, with slight decreases in year-to-year growth figures; Japan is expected to see growth of more than 6 percent.

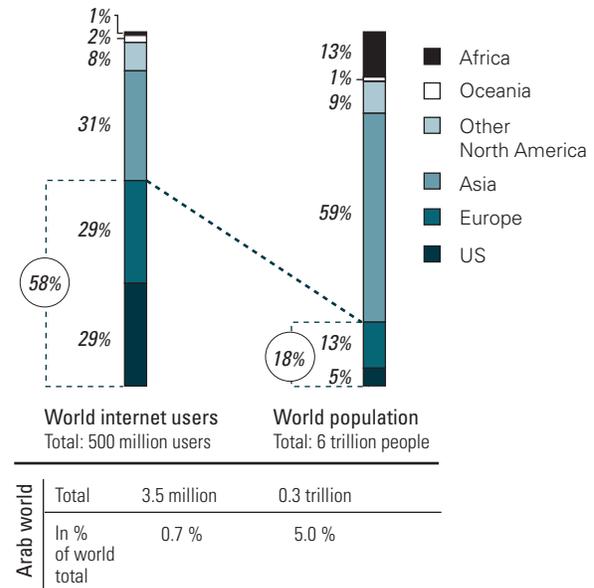
The penetration of personal computers (PCs) is considered to be the main cause of the gap in ICT markets between the United States, Europe, Japan and the rest of the world. In 2001, there were more than 62.25 PCs per 100 people in the United States, whereas in Europe, there were only 17.94 PCs per 100 people.<sup>3</sup> In 2002, worldwide PC sales are estimated to reach 134 million units,<sup>4</sup> 83 percent of which are in North America, Western Europe, and the Asia-Pacific regions. By 2004, world PC sales are expected to reach 159 million units. Furthermore, according to International Telecommunications Union (ITU) statistics, the total number of PCs worldwide currently stands at 495 million units, 88 percent of which are located in the United States, Europe, and Asia.

The World Wide Web has become a global medium for communication and information exchange and has, consequently, become an important indicator of ICT development among regions. According to ITU statistics, world Internet users amounted to 500 million people at the end of the year 2001. The United States and Europe hold almost three-fifth of the world's Internet users (58 percent), although their combined populations represent less than 18 percent of the world's population. The Arab region, with 5 percent of world population, represents less than 1 percent of the world Internet population (Figure 1).

With the substantial growth of e-commerce over the past few years, the Internet has become the most advanced commercial tool. The days when Internet usage was merely limited to e-mail and retrieving information from the World Wide Web have long gone. The emergence of e-commerce activities has greatly impacted the scale of the digital divide. According to Forrester Research, world e-commerce transactions amounted to US\$1,233 billion<sup>5</sup> in 2001, 98 percent of which were conducted in the regions of North America, Asia-Pacific, and Western. In the Arab world, the e-commerce market is estimated at US\$3 billion (i.e., only 0.2 percent of world market), and is expected to grow to US\$5 billion in 2005.

In summary, ICT usage worldwide has witnessed extraordinary growth. A closer look at the data shows a marked digital divide among nations and geographic regions. This so-called digital divide is, in some part, a reflection of deeper socio-economic inequalities between countries and regions of the world, as it is strongly related to the gap in world income distribution.

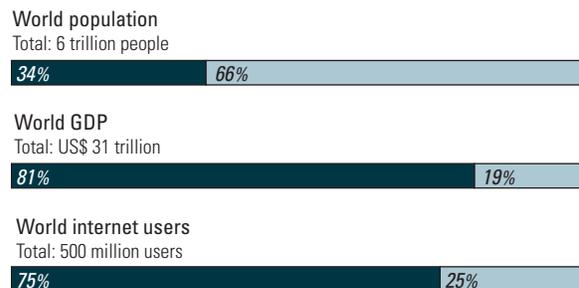
**Figure 1. Breakdown of World Internet Users by Region, 2001**



Note: In the chart, the Arab world's total population and Internet users are split between Asia and Africa  
 Source: ITU 2002

Figure 2 suggests that 34 percent of the world population comprises more than 75 percent of the world's Internet users. When considering the combined incomes of those 34 percent, they represent over 81 percent of the world's GDP. In other words, the holders of 81 percent of the world's income account for more than 75 percent of the world's Internet users. This is a strong evidence of the direct relationship between income and ICT penetration. The remaining 25 percent of Internet users are in the lower income group of countries that constitute more than two-thirds of the world population.

**Figure 2. Global Digital Divide, 2002**



Note: Countries representing 34 percent of world population and 81 percent of world GDP are: the U.S., Japan, Germany, the U.K., France, China, Italy, Canada, Brazil, Mexico, Spain, and South Korea  
 Source: U.S. Census Bureau 2002, IMF Economic Outlook 2002, ITU

It is important to keep in mind that the Arab world accounts for 5 percent of the world's population and 2 percent of the world GDP. Despite its relatively high average GDP per capita by international standards, the Arab world still accounts for less than 0.7 percent of the world's Internet users. Hence, the traditional digital divide barrier of lower income per capita does not appear to be the major impediment for ICT development in that region. This leads to the early suggestion that bridging the divide in the Arab world requires a multifaceted intervention by key stakeholders, in an even more pronounced fashion than in developing economies.

**Figure 3. Selected ICT Indicators in the Arab World, 2001**

Country	Internet Hosts per 10,000 Inhabitants	Internet Users per 10,000 Inhabitants	Estimated PCs per 100 Inhabitants
Egypt	0.3	92.9	1.5
Jordan	4.2	409.1	3.3
Kuwait	17.4	1,014.7	13.2
Lebanon	19.9	858.0	5.6
Morocco	0.8	131.5	1.3
Oman	17.8	457.5	3.2
Saudi Arabia	5.1	134.4	6.3
Syrian AR	0.01	36.1	1.6
U.A.E.	288.5	3,392.4	15.8

Source: ITU 2002

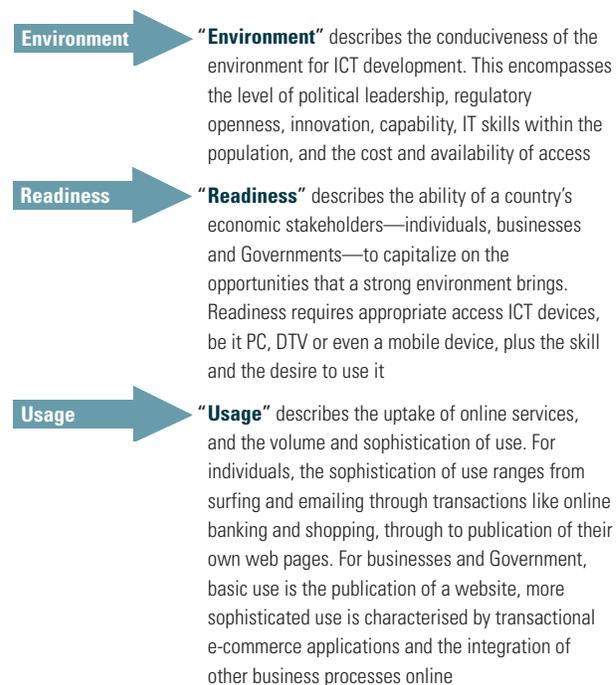
Amidst the emerging digital divide, it is important to note the prevailing gaps between countries within the Arab world (Figure 3). There are marked variances between countries in their efforts to adopt ICT tools and grow their networked economies. Therefore, Arab countries can build on each other's experiences and learning to develop and implement their individual ICT agenda as well as an integrated regional ICT market. Arab countries, by working together to position themselves on a common competitive platform, can improve their combined standing in the world ICT market.

In the remainder of this paper, we have profiled Arab countries using similar indicators in order to compare their performance. We then identified a matrix of the most significant challenges and enablers to ICT development, and looked at various ways in which countries in the region are addressing these challenges. At the end of the paper, policy recommendations are outlined to enable Arab states to create a connected environment that better supports their agendas for sustainable economic growth.

## ICT maturity evaluation

In order to assess the ICT maturity of Arab states, we have compiled a detailed quantitative and qualitative evaluation underscoring three layers of ICT development: environment, readiness, and usage (Figure 4a).

**Figure 4a. ICT Maturity Evaluation**



Each of the three evaluation parameters was further divided into subparameters. These sublayers are defined by a set of structured criteria that drove the selection of data indicators. In other words, the three evaluation parameters—environment, readiness, and usage—were built up from relevant explanatory data points collected for each profiled country (Figure 4b).

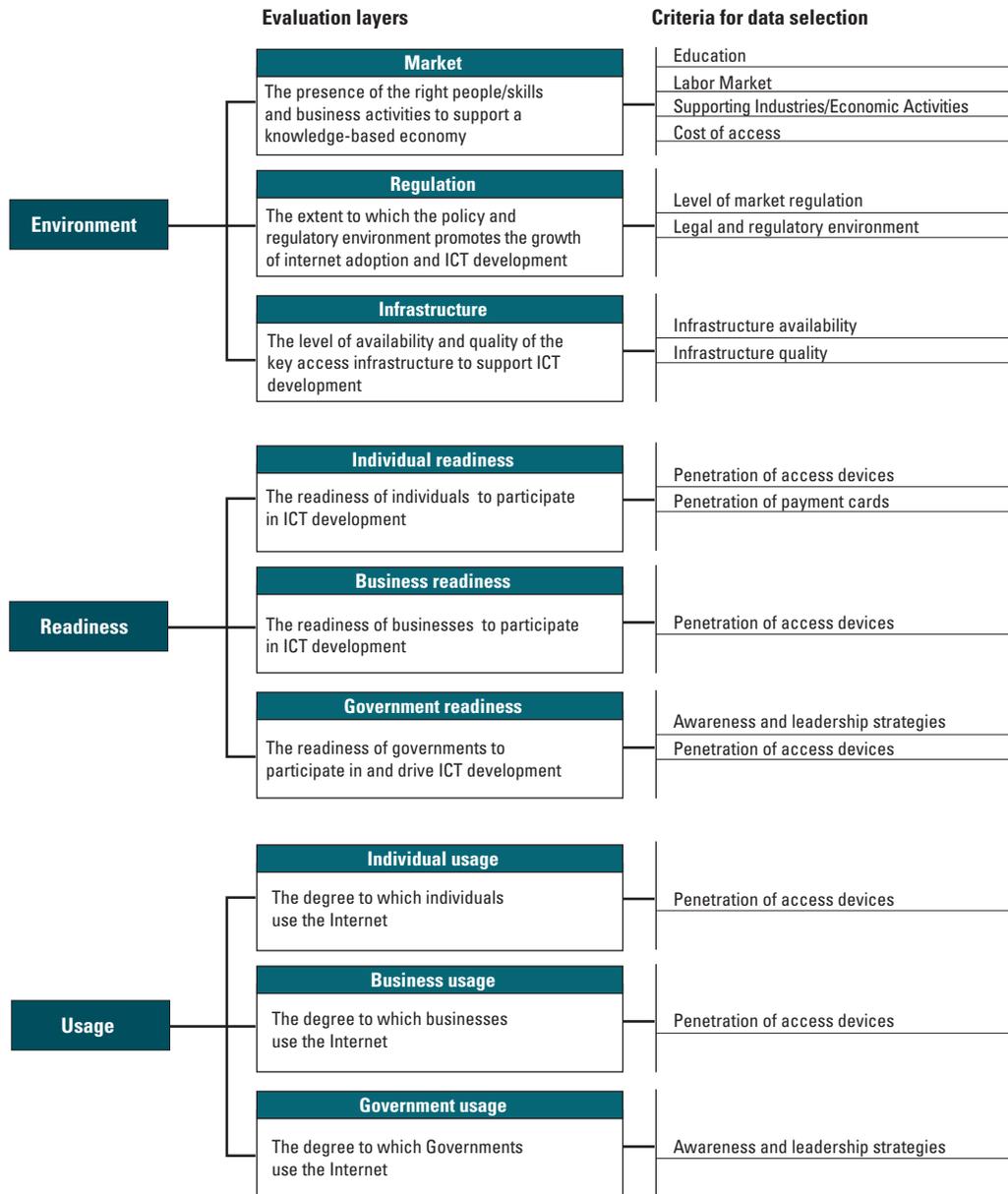
We have profiled nine Arab countries for our benchmarking exercise on the basis of:

- Subregional representativeness (Levant, North Africa, and the Gulf)<sup>6</sup>
- Reliable and comprehensive data availability

Our findings have allowed the grouping of the nine countries into three clusters based on their overall performance (countries per cluster are listed in alphabetical order):

<b>Fast-Track</b>	Kuwait, United Arab Emirates (U.A.E.)	Countries with a fast-track performance are those with an already clearly developed ICT growth agenda; they have consequently achieved adequate levels of readiness to absorb further ICT developments, as well as significant usage penetration levels.
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Figure 4b. Evaluation Layers and Criteria for Data Selection



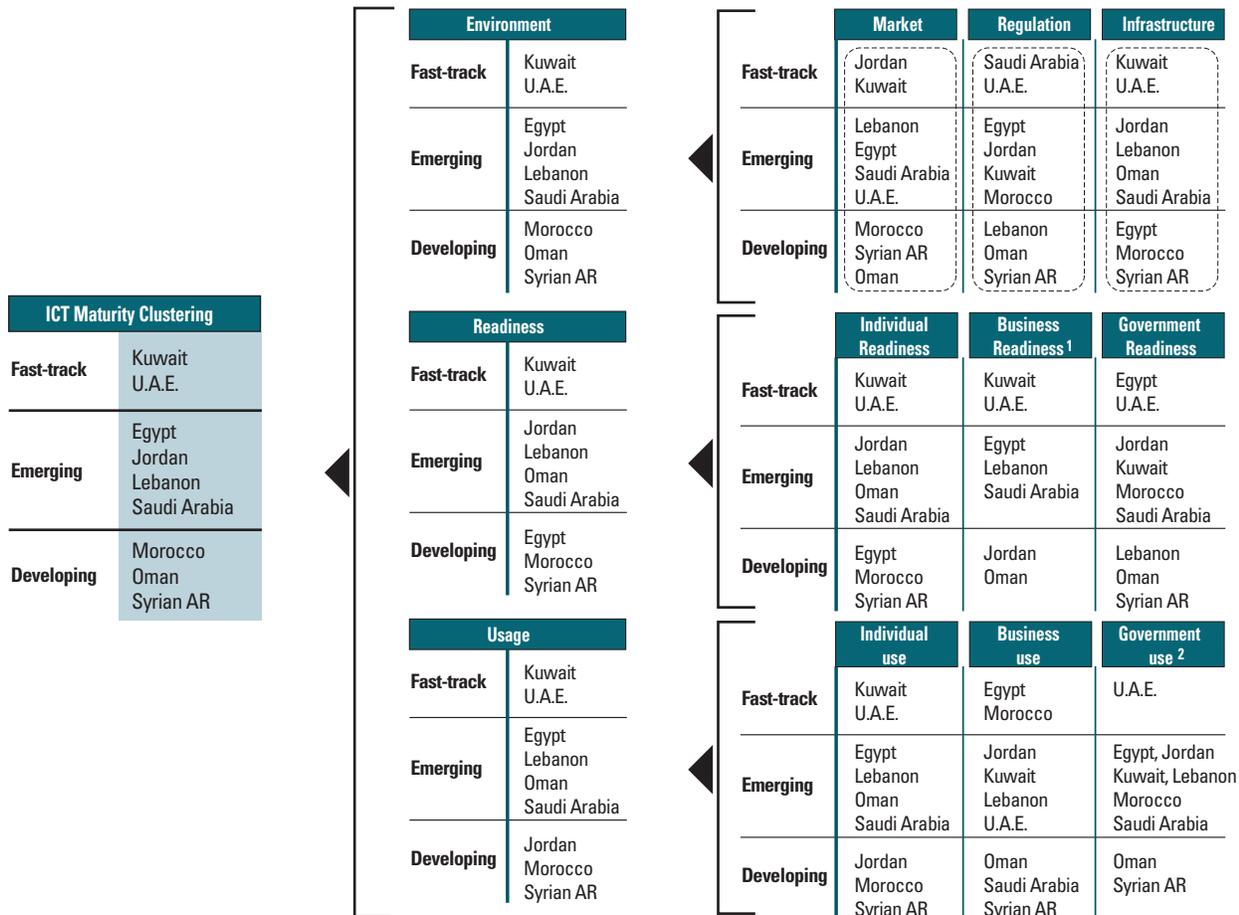
**Emerging** Egypt, Jordan, Lebanon, Saudi Arabia  
 Emerging ICT markets are those with either a well-developed environment for ICT growth but that have not yet acquired high levels of readiness and usage penetration, or those with significant readiness and usage patterns in an environment not predisposed to active ICT growth and development.

**Developing** Morocco, Oman, Syrian AR  
 Developing markets are those still lagging behind other countries in the region in their efforts to bridge the digital divide. Some have already rolled-out successful ICT initiatives despite the absence of a national integrated framework for ICT development, while others have more recently introduced ICT tools in the market and are still developing ICT policies and national plans.

Figure 5 shows the performance of countries for each evaluation parameter and subparameter according to the aforementioned cluster. Note that the clustering of ICT performance in the Arab world is valid relative to the countries chosen for the exercise, and not in absolute terms.

In the following section, we have provided an abstract on a country-by-country basis of the main drivers and initiatives that are leading ICT development. The abstracts highlight countries' performances for each evaluation parameter.

Figure 5. Arab Countries ICT Maturity Clustering



Notes: 1. There are no available data for Syria and Morocco  
 2. Countries were ranked based on qualitative assessment of usage. Quantitative data are not available  
 3. Countries within each cluster are listed in alphabetical order

We have used a symbol scheme to differentiate countries' performance within an index layer:

- indicates that a country has a "fast-track" performance
- ◐ indicates that a country has an "emerging" performance
- indicates that a country has a "developing" performance

(Countries are listed below in alphabetical order)

**Egypt**

<b>Environment</b>	Market	The Egyptian environment exhibits mixed elements for ICT development. On the one hand, Egypt stepped ahead of other Arab countries in defining a comprehensive national ICT development plan and phasing it in. On the other hand, Egypt continues to suffer from relatively high illiteracy rates. Access to capital remains limited due to a slow-moving, state-dominated banking system and a small private sector.
	Regulatory	
	Infrastructure	
<b>Readiness</b>	Individuals	PC penetration in Egypt remains low at 2 percent. This is partly due to high import duties and sales

**Egypt (continued)**

	Businesses	taxes on computer hardware (15 percent in total). A vibrant export-oriented software industry is expected to set the stage for a regional role in the Arabization of Internet content.
	Governments	
<b>Usage</b>	Individuals	Low Internet penetration rates (0.9 percent) are attributed to high illiteracy rates and lack of Internet awareness. Government's support for setting up information technology (IT) "interest groups" in various regions of the country should encourage ICT uptake in the future.
	Businesses	
	Governments	

**Jordan**

<b>Environment</b>	Market	<p>Jordan has a strong ICT agenda, backed by King Abdullah, which focuses on human resources development, in line with the country's overall economic development objectives. However, the cost of access remains relatively high in comparison to annual per capita income. PC prices remain unaffordable for most of the population.</p>
	Regulatory	
	Infrastructure	
<b>Readiness</b>	Individuals	<p>The proliferation of Internet cafés has helped improve Jordan's ICT readiness. Amman remains the regional hub in portals development (e.g., Maktoob, Arabia Online, and Al Bawaba) and is a preferred location for the Internet content industry.</p>
	Businesses	
	Governments	
<b>Usage</b>	Individuals	<p>Internet uptake in Jordan has been relatively slow as a result of high access costs (\$29 for thirty hours dial-up per month, which is high compared to per capita incomes). Internet penetration is gradually increasing (4 percent in 2001) due to the various initiatives taken by the government in this respect (access in schools and through IT community centers).</p>
	Businesses	
	Governments	

**Kuwait**

<b>Environment</b>	Market	<p>Increasingly high literacy rates, coupled with high education standards and high incomes, are the main drivers behind the fast Internet uptake in the country. The Kuwaiti telecom infrastructure was restructured and upgraded after the Gulf War (1990 to 1991). Kuwait does not have yet an elaborate ICT national plan; the leadership has concentrated on improving ICT in the education sector and developing a legal framework for e-government.</p>
	Regulatory	
	Infrastructure	
<b>Readiness</b>	Individuals	<p>Kuwait has one of the most developed PC markets in the region (13.2 percent PC penetration rate), coupled with a high penetration of credit cards (57.2 percent), which paves the way for a wider adoption of e-commerce as compared to other countries in the region.</p>
	Businesses	
	Governments	
<b>Usage</b>	Individuals	<p>Despite limited government support for universal access, Internet usage in Kuwait is relatively high compared to regional benchmarks (10 percent penetration rate). This can be partly explained by the large expatriate population; limited social opportunities and a hot climate force them to spend time indoors and to communicate online with relatives and friends back home.</p>
	Businesses	
	Governments	

**Lebanon**

<b>Environment</b>	Market	<p>Lebanon lacks central support for the ICT sector, and initiatives in this respect remain fragmented. A national ICT strategy has been drafted and awaits adoption by the council of ministers. Lebanon still lacks wireline broadband infrastructure and, as a result, lags behind other Arab countries in infrastructure.</p>
	Regulatory	
	Infrastructure	
<b>Readiness</b>	Individuals	<p>Lebanese businesses, in general, are proactively endorsing the Internet as a means of enhancing their mode of operation. Overall, the country exhibits a relatively average penetration of PCs compared to regional levels engaged (5.6 percent). The government is also in several e-government initiatives to digitize their operations (e.g., customs operations and debt management)</p>
	Businesses	
	Governments	
<b>Usage</b>	Individuals	<p>Outside the GCC region, Lebanon has the highest Internet penetration rate in the Arab world (8.6 percent). However, broadband per account is low (0.4 Kbps), and this affects speed of access. Usage is expected to grow, as the country boasts a relatively well educated population with an inclination to adopt technologies rapidly.</p>
	Businesses	
	Governments	

**Morocco**

<b>Environment</b>	Market	<p>Morocco's poor telecommunications infrastructure is a major impediment to the country's ICT growth. There are government initiatives to promote the benefits of ICT and Internet awareness, and the government has embraced the use of technology in its ministries and administrative bodies. Morocco has the best regulatory environment in the region and is ahead of other Arab markets in terms of wireless sector liberalization.</p>
	Regulatory	
	Infrastructure	
<b>Readiness</b>	Individuals	<p>Penetration of PCs stands at a mere 1.3 percent, and is the lowest in the region. The problem of a limited addressable market has hindered the readiness of online banking, which, compared to Arab markets, is considered rather advanced. Most banks have a website offering general information, and some offer e-banking services.</p>
	Businesses	
	Infrastructure	
<b>Usage</b>	Individuals	<p>Despite strong backing for the telecom sector liberalization program by the World Bank, household penetration of fixed telephone lines remains low (3.9 percent), which results in low Internet access (1.3 percent).</p>
	Businesses	
	Infrastructure	

**Oman**

**Environment**

Market  Oman signed the World Trade Organization (WTO) agreement in 2000, and is expected to liberalize its telecommunications sector soon. This will likely impact telecommunications tariffs. Nonetheless, the Sultanate continues to lack an explicit agenda for ICT development. According to Omantel, the state-owned incumbent operator, ADSL and ATM are being introduced to allow the development of broadband multimedia services, as well as e-commerce and high speed Internet.

Regulatory  

Infrastructure 

**Readiness**

Individuals  Oman has a relatively low PC penetration rate (3.2 percent) and lacks Internet services. In fact, 78 percent of businesses are estimated to have a dial-up Internet connection and only 8 percent have leased lines connections. Omantel has recently encouraged the licensing of Internet cafés in order to increase access.

Businesses  

Governments 

**Usage**

Individuals  Oman has a relatively high Internet penetration despite its overall low ranking on ICT maturity (it is a "developing" market). The young and highly educated population is expected to spur demand in the future.

Businesses  

Governments 

**Saudi Arabia**

**Environment**

Market  Saudi Arabia is one of the first Arab countries to develop a strong regulatory environment, setting a regulatory authority to oversee the telecommunications sector. A national committee for ICT policy has recently been created to draft a comprehensive ICT plan for the Kingdom. The competitive ISP market has led to recent consolidations, which is expected to improve service provision and quality.

Regulatory  

Infrastructure 

**Readiness**

Individuals  PC penetration in Saudi Arabia is equivalent to that of Lebanon (6 percent), but remains low compared to other GCC countries like the U.A.E. (16 percent) and Kuwait (13 percent). The government has introduced PCs in its ministries and is planning to provide information on government services, as well as online services to citizens, in the foreseeable future.

Businesses  

Governments 

**Usage**

Individuals  Internet penetration in Saudi Arabia remains low compared to regional levels (1.3 percent). The Ministry of Planning is seeking to articulate national policies and initiatives to promote Internet penetration and usage.

Businesses  

Government 

**Syria**

**Environment**

Market  The Internet sector in Syria is still at an embryonic stage, with the lowest penetration in the region (0.4 percent). The country leadership is seeking to fast-track overall ICT development, as evidenced by the number of projects under study (e.g., technology zones).

Regulatory  

Infrastructure 

**Readiness**

Individuals  PC penetration among individuals, businesses, and the government remains low (1.6 percent), partly because of the late introduction of the Internet on the market, and partly because of high import duties on hardware (15 percent).

Businesses  

Governments 

**Usage**

Individuals  The late introduction of the Internet (1999) to the market and the weak PC penetration explain the limited usage. However, the government is increasingly expressing its desire to draft an ambitious plan to spearhead ICT development.

Businesses  

Governments 

**United Arab Emirates**

**Environment**

Market  The U.A.E. has the most conducive market environment for ICT development in the region, benefiting from a strong infrastructure and a track record of efficient policy implementation. A national ICT plan has been devised, with explicit backing from the political leadership. Despite a monopoly operator, access costs are relatively low, and local dial-up is free.

Regulatory  

Infrastructure 

**Readiness**

Individuals  The U.A.E. exhibits the highest PC penetration in the region (15.8 percent). Dubai Internet City and Jebel Ali high-tech free zone are examples of the Emirates' political and financial commitment to ICT development.

Businesses  

Governments 

**Usage**

Individuals  Internet penetration is the highest in the region at 33.9 percent. Usage performance is enhanced in the U.A.E. through the dominant presence of an educated expatriate workforce that has institutional, social, and personal incentives to adopt and use ICT tools.

Businesses  

Governments 

## Assessment of the Key Challenges to ICT Development

In the previous sections we assessed ICT development along three layers: environment, readiness, and usage. Based on international benchmarks of ICT strategies and the particular needs of the ICT market in the region, we have identified the main challenges under each layer in Figure 6.

**Figure 6. Enablers of ICT Development in the Arab Region**

1 Environment	2 Readiness	3 Usage
<ul style="list-style-type: none"> <li>• <b>Political/Regulatory Leadership</b> <ul style="list-style-type: none"> <li>– Existence &amp; leadership of a National ICT Agenda</li> <li>– Level of integration of ICT initiatives</li> <li>– Responsibility for ICT Agenda</li> </ul> </li> <li>• <b>Market</b> <ul style="list-style-type: none"> <li>– Privatization &amp; competition landscape</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Access Affordability</b> <ul style="list-style-type: none"> <li>– Cost of PCs</li> <li>– Connection costs</li> </ul> </li> <li>• <b>Infrastructure</b> <ul style="list-style-type: none"> <li>– Availability and quality of ICT access tools</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Awareness and Universal Access</b> <ul style="list-style-type: none"> <li>– Knowledge about ICT</li> <li>– Comfort with ICT usage</li> </ul> </li> <li>• <b>Compelling Content</b> <ul style="list-style-type: none"> <li>– Language barrier</li> <li>– Content barrier</li> </ul> </li> </ul>

Note: We have used “access affordability” and “infrastructure” criteria to ICT development as challenges to driving forward ICT “readiness,” rather than “environment,” as these challenges will directly affect the readiness of stakeholders to take advantage of ICT benefits.

### Environment

#### *Political and regulatory agenda*

The development of ICT in the Arab world is unlikely to be solely determined by market-led logic. It is important for countries to articulate their national ICT strategies. Such an effort entails the assessment of opportunities for and challenges to future development, and the definition of a policy framework to take advantage of the opportunities and overcome prevailing challenges.

Governments in the Arab world have not all been proactive in formulating their ICT agendas. Some countries, for example, the U.A.E., Egypt, and Jordan, are at the forefront of ICT leadership policy, while other countries lag behind.

The U.A.E. government ICT policies aim to encourage investors to establish their enterprises in the U.A.E. and assist local businesses. An elaborate national ICT plan has been devised and is explicitly backed by the political leadership. It is a regional reference in ICT development, with proven results in creating technology parks, attracting leading companies in the ICT sector, and implementing e-government and e-learning initiatives.

Egypt has also defined a comprehensive ICT national plan. In September 1999, the government announced that the development of the information and telecommunications technology industry was a national priority. This led to the creation of a separate ministry for communications and information technology in October 1999. Realizing how a strong ICT sector could contribute to high and sustainable economic growth for the Egyptian economy, the Ministry of Communications and Information Technology has set the long-term objective of creating an export-driven, private sector-led ICT market. A three-year national plan for the development of the ICT industry has been designed, in close collaboration with the private sector and industry experts.

Jordan has also embarked on an ambitious plan to make full use of the ICT potential to support the national program for economic growth. In 1999, King Abdullah launched the REACH Initiative to bolster the country’s ICT sector and maximize its ability to compete in local, regional, and global markets. This initiative aims to achieve full-scale Internet access within five years. The King’s vision is to “...ensure that every citizen is computer-literate and that every single school and community will be wired... simply because this is the type of quality talent that we want in our workforce.”

At the regional level, ICT leadership could be developed by intercountry cooperation. Regional cooperation could be considered for:

- Setting up multipurpose information and telecommunication centers
- Establishing technology incubation schemes and providing support for start-up enterprises
- Building networks of partner institutions

A recent project has been proposed by the United Nations Development Program to address the ICT agenda at a regional level. The project, called Information and Communication Technology for Development in the Arab Region (ICTDAR), would form a number of bilateral and multilateral joint ventures with some countries, international organizations, banks, multinational companies, and other organizations for the purpose of financial, technical, and advisory assistance. The aim of ICTDAR is to bring information technology to less developed areas in member countries and introduce enhanced IT education. Helping small companies improve their IT systems and assisting in widening the application of member countries’ e-government, are other objectives of the ICTDAR.

## Market

Another way to develop the ICT environment is to create a competitive market, where access to higher quality and lower cost ICT services stimulates ICT uptake.

A closer look at the state of telecommunications in the region reveals that all domestic long distance (DLD) and international long distance (ILD) voice markets are monopolies (except for the Kuwaiti ILD voice market). The mobile market has been partially liberalized in most markets except for Oman, Saudi Arabia, and the U.A.E. (Figure 7).

**Figure 7. Level of Competition in the Telecommunications Market**

Country	Local Voice	DLD Voice	ILD Voice	Mobile	Data	Internet
Egypt	M	M	M	D	C	C
Jordan	M	M	M	P	C	C
Kuwait	M	M	C	D	C	D
Lebanon	M	M	M	D	C	C
Morocco	M	M	M	C	C	C
Oman	M	M	M	M	M	M
Saudi Arabia	M	M	M	M	M	C
Syrian AR	M	M	M	P	M	—
U.A.E.	M	M	M	M	M	M

M=Monopoly D=Duopoly P=Partial Competition C=Competition

Source: ITU 2001

The Internet and data markets reveal the monopoly markets of higher income countries like the U.A.E. and Oman. However, lower income markets like Egypt, Morocco, Lebanon, and Jordan exhibit some form of managed competition, whereas some higher income markets appear to have partial or limited competition.

There have been several ISP mergers in the region, and balancing healthy margins with reliable high quality service remains a challenge. In Egypt, Africa Online purchased Mena Net, while Batelco Middle East Company bought 48 percent of Soficom. Link Egypt and In Touch communications merged under the guidance of Orascom Telecom, and in Lebanon, Cyberia merged with IntraCom. In Jordan, NETS and FirstNet merged and allowed Batelco Middle East Jordan to own 51 percent of the merged company, and Jordan Telecom acquired Global One-Jordan.

The Saudi ISP market has, very recently, experienced a wave of mergers. There are around thirty private ISPs in the country, five of which have already merged into two larger firms. Naseej, Awal-Net, and Alamiyah merged in April 2002, and it is said that the alliance

captured around 30 percent of Internet users, while Trinet and Dallah recently revealed that they are merging to become a larger ISP. The merger will not affect the subscribers of either firm, and the aim is to improve the quality of service.

In monopolistic, high-income countries, the incumbent telecommunications operator remains the sole Internet access supplier. Operating alone in high-income markets with high PC penetrations and a well-educated population of nationals and expatriates has allowed for healthy margins.

Competition remains imperative if prospects for better service and higher Internet penetration at lower costs are to improve. The region is moving towards liberalizing the telecommunications sector based, among other things, on WTO requirements.

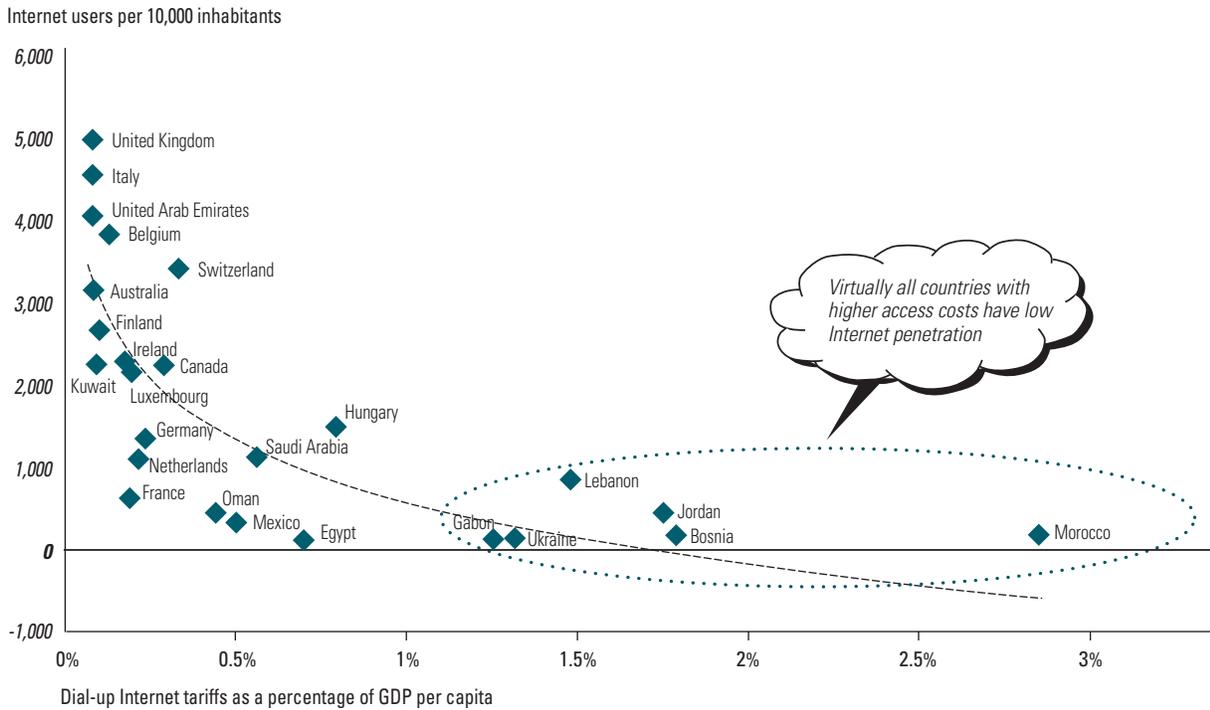
In fact, several countries in the region have been taking steps toward telecommunications market reform. For example, Morocco's communications market is undergoing a major liberalization drive. L'Agence Nationale des Reglementations de Télécommunications (ANRT), Morocco's telecommunications sector regulator, is in the process of launching a tender for a second fixed license—including data and international gateway components. This would place Morocco as one of the first Arab countries to have two fixed line operators.

Saudi Arabia's telecommunications law was published in mid-2001, and it made explicit reference to market regulation and liberalization. The national regulatory authority, known as the Saudi Communications Commission, was set up later in the year and work is already underway to define secondary legislation and draw the liberalization path. Expectations are that a managed liberalization with data and mobile licenses will be issued in 2003 or 2004. In the meantime, the incumbent operator has been undergoing major restructuring after being incorporated in 1998, in preparation for the scheduled partial privatization in late 2002.

The U.A.E. is a member of the WTO and, accordingly, the telecommunications segment has a liberalization deadline of 2005. However, as yet no explicit date has been set for liberalization.

The Kuwaiti parliament's finance and economic committee approved a draft bill to sell state-run services to the private sector in February 2001. Later, in January 2002, the minister of telecommunications announced that a law for the privatization of fixed telephone services is likely to pass during the course of 2002.

**Figure 8. Internet Penetration Versus Cost of Access, 2001**



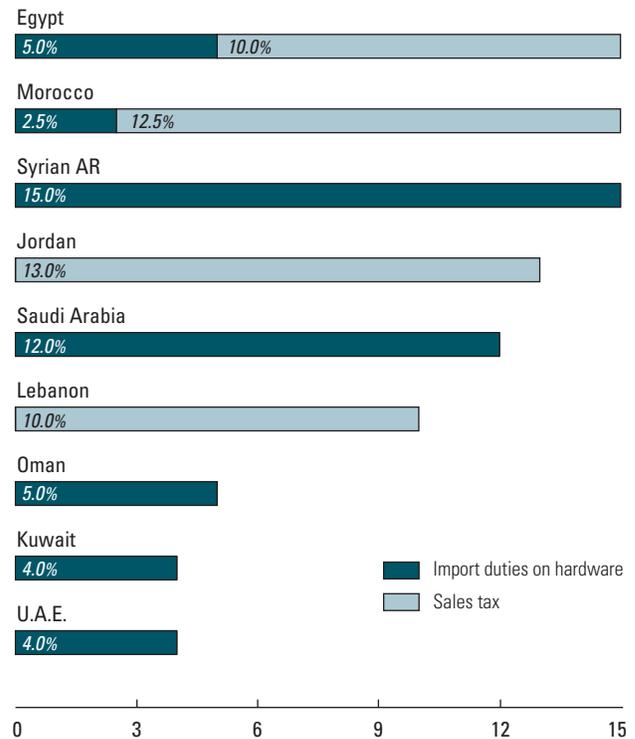
**Readiness**  
*Access affordability*

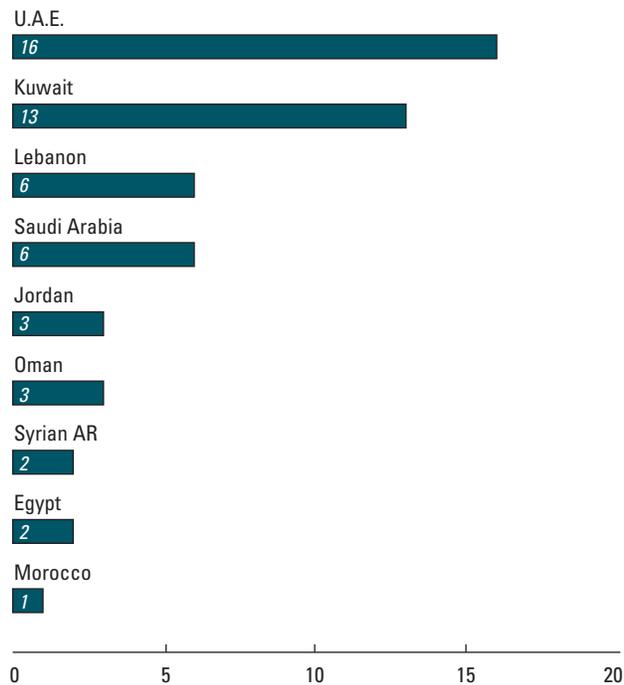
The first enabler of ICT readiness is cost; cost plays an instrumental role in influencing ICT penetration. Taking the Internet as indicative of the ICT sector, an analysis of different ICT markets suggests that the lower the access cost, the higher Internet penetration (Figure 8).

The main elements of cost are the PC acquisition price, and connection charges. Most PCs in the Arab world are imported. According to ITU, Egypt, Morocco, and Syria have the highest duties and taxes on PCs (amounting to a 15 percent additional levy on the basic PC price)—(Figure 9).

Consequently, Morocco, Egypt, and Syria have the lowest PC penetration rates (Figure 10). The U.A.E. and Kuwait, on the other hand, impose only a 4 percent import duty (with no sales tax), the lowest in the Arab world. Consequently, these two markets have the highest PC penetrations in the region (16 percent and 13 percent respectively)—(Figures 9 and 10).

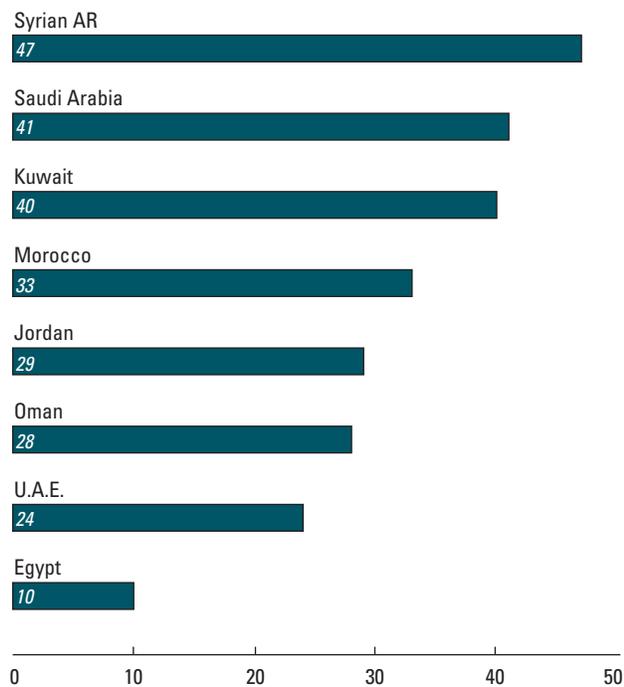
**Figure 9. Import Duties and Sales Tax on Hardware in the Arab World, 2002**



**Figure 10. Personal Computer Penetration, 2001**

Source: WTO, Country Statistics and U.S. Department of Commerce

The second element of cost is connection charges. For example, an Internet dial-up account costs US\$29 for 30 hours of use in Jordan. In Egypt, the monthly rate is as low as US\$10, while in Syria, prices are still as high as US\$47 per month (Figure 11).

**Figure 11. Dial-Up Costs for 30 Hours of Use per Month, 2001 (in US\$)**

Source: ITU 2002

Governments are working to alleviate the digital divide by managing cost barriers. In fact, average ISP rates have fallen across the region, and preferred telephone rates have been established for Internet use in some countries. The dominance of monopolies in region's telecommunications markets makes the supply of quality services at lower costs a challenging task.

### *Infrastructure*

The second enabler of ICT readiness is an adequate infrastructure. The availability and adequate quality of ICT infrastructure are prime prerequisites for network access and the creation of an online market. The degree of ICT infrastructure availability and quality influences the potential for communities to access the new resources and leverage their benefit.

The availability of infrastructure varies from one country to another in the Arab world. For example, there is an average of more than 100 residential main lines per 100 households in Kuwait and the U.A.E., compared to less than 50 lines per 100 households in Syria, Egypt, Oman, and Morocco. Cellular line penetration also varies widely between countries in the Arab world. While the U.A.E. has a cellular penetration of 72 percent, Egypt has only a 4 percent penetration and Syria, 1 percent (Figure 12).

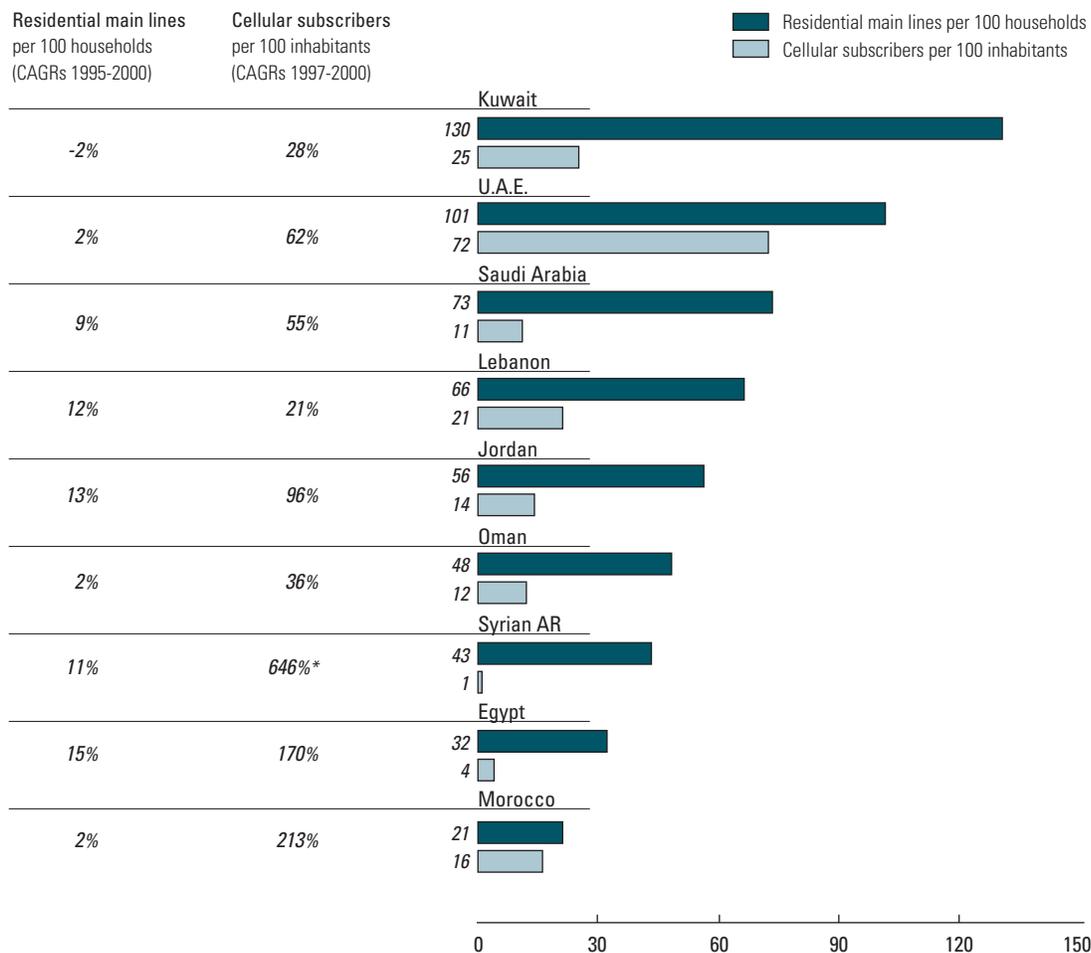
The growth rates in residential fixed line penetration reveal that fast-track countries have remained rather stable, whereas emerging and developing markets (with the exception of Oman and Morocco) have grown by more than 10 percent over the 1995 to 2000 period (Figure 12).

Cellular line penetration rates grew substantially in all markets between 1997 and 2000, again at a more pronounced pace in Syria, Morocco, Egypt, and Jordan, where penetration rates have more than doubled (Figure 12)

Because of the lack of other types of services, most users in the Arab world access the Internet via a dial-up service from home (Figure 13). This fact emphasizes the importance of telecommunications infrastructure availability as a factor affecting the degree of Internet uptake.

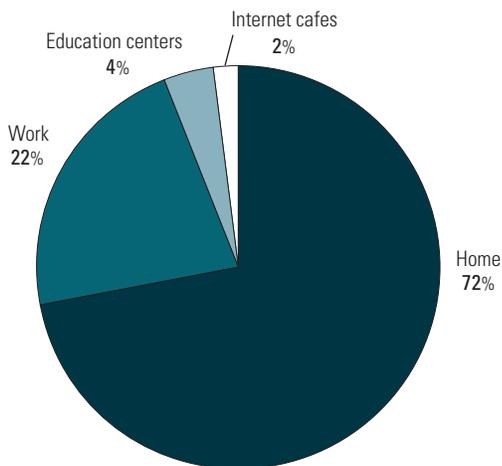
The number of faults per 100 fixed lines is an indicator used to determine the quality of a telecommunication system in a country. In the Arab world, the U.A.E., Oman, and Saudi Arabia each have below three faults per 100 fixed lines, comparable to Singapore, South Korea, and Mexico. Syria, Morocco, and Jordan each

**Figure 12. Penetration of Residential Main Lines and Cellular Lines, 2001**



\* CAGR for 1999 to 2000, as data prior to 1999 are not available Source: ITU 2002

**Figure 13. Internet Place of Access in the Arab World, 2001**

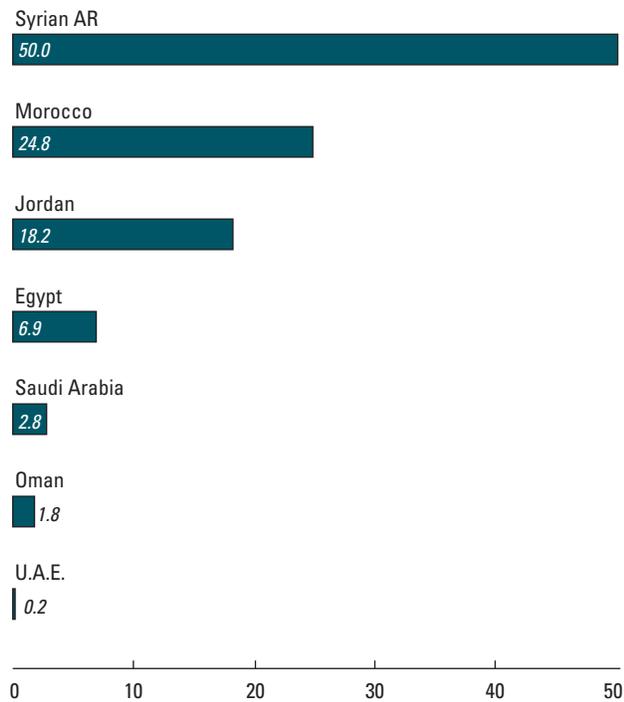


Source: ITU, Muscat Telecom Conference 2001

have more than eighteen faults per 100 lines; in fact, Syria has as many as fifty faults per 100 lines (Figure 14).

Total country bandwidth per account indicates the speed of Internet access. Morocco, Egypt, and Lebanon were among the first to introduce the Internet to the region (1992, 1993, and 1993 respectively). However, Lebanon’s country bandwidth remains much lower than that of Egypt and Morocco because it failed to expand its network capacity. In fact, bandwidth capacity did not expand with the growth in the subscriber base, resulting in a relatively low bandwidth per account (0.38 Kbps). (Figure 15.) On the other hand, Oman introduced the Internet to its market in 1996, and has managed to deliver higher bandwidth than Lebanon and Jordan.

The bandwidth per account indicates the Internet capacity per account and, hence, the quality of access. An escalating Internet subscriber base coupled with slow network capacity expansion will result in low bandwidth per account.

**Figure 14. Faults per 100 Fixed Lines, 2000**

Note: Data for Lebanon and Kuwait is not available

Source: ITU 2000

**Figure 15. Total Country Bandwidth, 2001**

Country	Year of Internet Introduction	Total Bandwidth (in Mbps)	Internet Subscribers (in Thousands)	Bandwidth per Account (in Kbps)
Egypt	1993	450	145	3.75
Jordan	1996	127	60	2.12
Kuwait	1994	—	170	—
Lebanon	1993	45	120	0.38
Morocco	1992	155	44	3.52
Oman	1996	156	33	4.67
Saudi Arabia	1999	155	425	0.36
Syrian AR	1999	12	30	0.40
U.A.E.	1995	620	251	2.47

Source: Arab Advisors Group

In Saudi Arabia, low bandwidth is the result of an inefficient intermediation framework governing bandwidth supply. In fact, the regulated market structure stipulates that the incumbent telecommunications operator provide bandwidth on demand to the Internet regulator (KACST);<sup>7</sup> the latter re-sells it at a premium to ISPs.

Bandwidth utilization tracking, as published by KACST, suggests that some ISPs are underbuying bandwidth capacity and underallocating it. The result is that end

users experience slow transmission rates. In fact, 40 percent of the incumbent operator's bandwidth supply is not used by KACST and, similarly, 40 percent of the bandwidth made available by KACST is not used by ISPs (through end 2001).

The growing need for high speed Internet access is encouraging countries to expand their broadband capacity. For example, Oman's telecommunications operator, Omantel, has recently commissioned the supply and installation of an ADSL broadband network in order to ensure higher speed Internet access. It is expected that by the end of 2002, the total country bandwidth of 155 Mbps will almost double.<sup>8</sup>

To further illustrate the point, Jordan launched a new data communications and IP offering package, which gave ISPs the opportunity to achieve a 60 percent saving on end-to-end circuits. Prior to the launch of this offering, the total bandwidth for the country did not exceed 34 Mbps, and this was virtually saturated because most traffic was routed through the United States.

## Usage

### *Awareness and universal access*

Some of the challenges facing ICT development are related to its tangible dimensions, namely hardware, software, and costs. Conversely, ICT development also faces significant nontangible challenges in the form of education, language, and culture.

There is a broad consensus that schools and the education system are the basic tools needed to provide gradual greater comfort with the digital environment. Governments can advance policies to increase Internet awareness and literacy through initiatives to include IT courses in school curricula.

In the Arab world, the Saudi Watani project is the most prominent initiative of its kind in the region. The aim of the project is to exploit ICT in the education process by connecting all Saudi schools and educational directorate districts by means of a wide local area network; in fact, covering the entire Kingdom of Saudi Arabia. This would provide every student, teacher, parent, and educator with a multitude of services and a huge source of reference information.

In Egypt, the Ministry of Communications and Information Technology concentrated on the development of human resources necessary for the telecommunications and IT sectors. A professional development program was initiated, with the aim of training 5,000 professionals per year. The ministry

plans to open a national information technology institute through which it will plan and prioritize the training programs required for the development of IT skills in Egypt. It is also seeking to set up technological universities, send young professionals abroad for training, and develop a communications and information technology curriculum in Egyptian faculties.

In Kuwait, the Ministry of Education launched a recent program to provide Internet access to 300 government schools; to start, the ministry issued a tender to the three ISPs. Quality Net won the tender to install the necessary infrastructure, connections, and so on in the schools. In addition, the three private ISPs in the country give various discounts to private schools. For example, Quality Net provides special discounts on monthly Internet charges and leased circuits to the American and English schools in Kuwait.

In the U.A.E., the Ministry of Education and Youth, together with Etisalat, have launched the Smart Schools project with the aim of promoting Internet use in schools and an interactive learning environment. The initiative includes free installation in government and private schools, with a discounted usage fee. To date, 100 of the 1,111 schools in the U.A.E. have subscribed to the service.

Jordan is also very active in developing its human resources in the IT sector. Within the overall REACH initiative, the government of Jordan has a specific human resources development agenda that has the following aims:

- initiating a training program by IT industries to benefit IT students
- helping universities focus on critical IT skills for all students
- strengthening the links between IT industries and universities
- promoting collaboration with overseas universities
- establishing a “center of excellence” training institute for the software industry

Many IT companies relocating in the region choose Egypt and Jordan as their regional headquarters, mainly because of these countries’ human capital. Recent studies have suggested the liberalization of both countries’ labor laws in order to combine their pool of IT workers.

In addition to creating an awareness of Internet usage, Internet access initiatives are required to

alleviate barriers to access for specific segments of the population. Such universal access initiatives are used worldwide, and target poor income segments and geographic areas that have less infrastructure and fewer IT facilities.

For instance, in the U.A.E., several initiatives have been launched to increase Internet access in schools and via the education system. The IT Education Project, as it is called, is subdivided into several initiatives: PC laboratories in schools, an IT academy, an IT portal, an e-store, and Internet cafés. The overall aim is to provide students with cutting-edge technology and to increase Internet access among youth.

In Saudi Arabia, the aim of the Watani project is to enhance Internet access in schools. To parallel the focus of the project, the Ministry of Planning is formulating a series of initiatives, in coordination with the incumbent telecommunications operator, to provide financial incentives for schools to access the Internet.

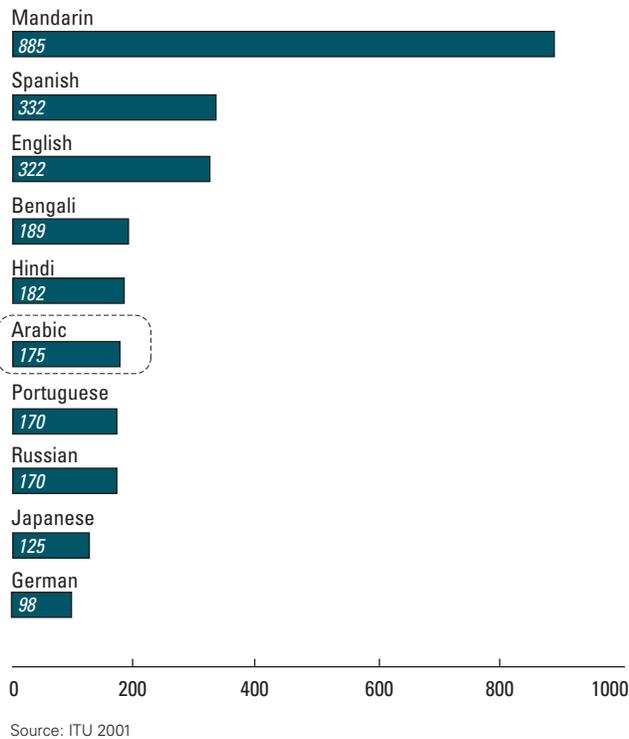
The Jordan IT Community Centers (JITCC) initiative was launched in 1999 to harness the power of information technology to support a sustainable development strategy for Jordan. The aim of the initiative is to install sixty JITCCs using a three-phase approach. A network of JITCCs will serve as a platform for enhancing technological literacy, sustainable livelihoods, and equity and human development among the remote, poor, and information deprived segments of Jordan’s population.

#### *Compelling content*

The lack of online content in the Arabic is another factor deterring ICT usage in the Arab world, as language is a key enabler for creating compelling Internet content. In fact, Arabic is the sixth most widely spoken language in the world, with 175 million speakers, but the share of Arabic content on the Internet remains as low as 1 percent (Figure 16).

In an effort to combat these obstacles, many Arab countries have undertaken initiatives to widen the Arabic web-user base by developing new portals with Arabic content. For example, maktoob.com, launched in October 1998, was the first Arabic web-based e-mail solution on the Internet. Another Arabic based website is BBCarabic.com, which came as a result of Microsoft Middle East’s cooperation with BBC world service to bring the world news, translated into Arabic, online for Arabic Internet users.

**Figure 16. Arab World Population (In Millions) Versus Arabic Language Online (In Percent)**



The innovative Arabization software industry is a promising value-added activity that will indirectly stimulate ICT development in the Arab world and create employment for Arab IT skilled labor. A growing number of international companies see the potential of the software Arabization industry in Egypt, and many have begun subcontracting Egyptian software developers in a bid to gain a share of the lucrative Middle East market. IBM, for example, has its Arabic development software offices in Egypt, and all the support for its Arabic software products is based there.

With almost 80 percent of its software exported to the Arab world, Egypt is slowly emerging as a regional software development hub. A five-year plan to promote the software industry in Egypt aims at growing the existing software market, estimated at US\$50 million, to a market of US\$2 billion. The five-year plan has received backing from international software companies as well as local software industries.

Governments can lead the market in the creation of more compelling and useful content for users, as they provide many services well suited for the online world (e.g., passport renewal applications, medical care, benefits administration). By transferring core public services to the Internet, the government will encourage take-up across the population.

By developing online provision of its services, the government can—through partnership with private enterprises—help to develop skills and assets in the commercial sector. This will create opportunities to promote entrepreneurship so that innovative new applications are launched quickly and successfully.

For example, in the U.A.E., the federal government issued a resolution for the development and implementation of a national e-government project; the Ministry of Finance was appointed to direct it. The aim of the project is to improve the effectiveness and efficiency of administrative delivery of services in all government entities. In light of this resolution, two e-government portals have been developed (Dubai and Abu Dhabi), and a third is under construction (Fujairah). The portals are interactive platforms that offer a rich source of information on each Emirate, and they also offer online services, such as trade licenses, commercial permits, and fine settlement.

### Policy Recommendations to Support ICT Development

Going forward, Arab countries have the opportunity to fast-track their ICT development program by enacting a selected set of critical policies, as presented hereafter. Our recommendations draw on international best practice policies stemming from nine ICT-developed countries, namely: the United Kingdom, Sweden, Canada, Australia, the United States, Italy, Japan, Germany, and France. The findings are based on 150 face-to-face policy interviews, as well extensive benchmarking. Importantly, we have focused on policies on that have had success and have impacted their home market.<sup>9</sup>

#### Best practice ICT development policies

For the sake of clarity, we have structured the following write-up along the same framework used to analyze the performance of Arab countries, specifically, environment, readiness, and usage. Each of these dimensions is analyzed in detail (Figure 17), to maximize what can be learned and the insights that can be gained so that Arab countries can effectively leverage the policies.

**Figure 17. Best Practice Policy Analysis Framework**

Environment	Readiness	Usage
<ul style="list-style-type: none"> <li>• Political/Regulatory Leadership</li> <li>• Market</li> <li>• Infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Individuals</li> <li>• Businesses</li> <li>• Governments</li> </ul>	<ul style="list-style-type: none"> <li>• Individuals</li> <li>• Businesses</li> <li>• Governments</li> </ul>

### *Environment—Political and regulatory leadership*

1

Political and regulatory leadership describes the extent to which governments have effectively driven the ICT agenda. Such leadership is best manifested by providing strong, high profile political momentum, setting clear strategies and targets, establishing dedicated delivery organizations, and creating a regulatory framework that fosters ICT development.

Our study of ICT-developed markets confirms that political leadership is strong, and the regulatory environment is generally open in all. Specifically, Germany, the United States, the United Kingdom, and Canada have strong political leadership, each with different styles. In the United States, the leadership is primarily treasury-based. The United Kingdom uses a cabinet office leadership, and Germany follows a home office approach for leadership.

Canada has followed a more informal approach through its e-Business Round Table. Under this policy, the private sector led an initiative to improve Canada's environment for e-commerce. The forum included representatives from across many industries, leading to credibility and distancing the initiative from a "lobby" group. The round table suggested politically safe, actionable recommendations that could benefit the entire economy, but would likely have the largest impact on the ICT sector. The impact of this initiative was a marked improvement in the Canadian environment for investment.

### *Environment—Market*

2

Fostering a strong market environment for ICT development requires building the skills of the population by promoting ICT in education, supporting cluster industries, and promoting low access cost for the Internet. Our research suggests three main trends:

- best practice approaches—Canada, the United Kingdom, and Sweden have best practice approaches in promoting ICT in education
- cluster industries—the United States has most successfully promoted cluster industries, with strong emphasis on venture capital
- low-cost access—approaches to creating low cost access vary with local competitive conditions

The United Kingdom National Grid for Learning initiative (NGFL) provides a best practice to promote ICT in education. Specifically, the program provides funding for ICT equipment and Internet connections in schools. It also focuses on providing ICT training

for teachers. Results to date show that 98 percent of schools are linked to the Internet, up from 28 percent in 1998 when NGFL began. Additionally, 84 percent of teachers have signed up for ICT training, and 190,000 having completed it.

In the same vein, the aim of ITiS program in Sweden was to bring ICT advancements to all schools (all levels). Key targets included the accessibility to e-mail addresses for all pupils and teachers, high speed Internet access to all schools, and Internet availability in every classroom. The ITiS enabled up to 90 percent of municipalities to achieve their goals. For example, there has been an increase in Internet connectivity to 78 percent of all available computers, up from 57 percent in 1999.

Last, but not least, the Connecting Canadians program has delivered strong results. The initiative seeks to ensure that all Canadians have access to the Internet; the program is an example of early action by the Canadian government. As a result, 100 percent of schools and public libraries have been connected to the Internet since 1999. Additionally, roughly 10,000 rural and remote communities have access points.

In terms of promoting cluster industries, the United States has the most successful model, as evidenced by the advent and role of venture capital. One of the most prominent initiatives has been the Small Business Investment Company (SBIC) Act, which was introduced in 1958 to fill the gap between the availability of venture capital and the needs of small businesses in start-up and growth situations. Once funded, SBICs are able to borrow from the federal government at preferential rates (approximately 2.5 percent above ten-year bond rate) over the long term (e.g., five years), which enables so-called "patient capital." SBIC ICT successes include Intel, AOL, Apple, Sun Microsystems, Sage, and Peoplesoft.

### *Environment—Infrastructure*

3

Policy-making to promote the development of infrastructure can encompass multiple approaches: setting a competitive market framework to boost competition among private sector players or lean on a strong incumbent; and investing public funds to provide infrastructure as a necessary public good, or attempting to provide incentives to the private sector to encourage them to lead.

Canada has effectively created a competitive market framework. Again, the key feature of the Canadian program has been its early start; its program can

also be replicated in other markets. Beginning in 1998, cable companies were exposed to broadcast competition from telecommunications companies, and to broadband access competition from third party ISPs. Similarly, beginning in 1997 and 1998, telecommunications companies were exposed to competition from both cable companies and CLECs in the local loop. The prospect of increased competition drove investment by cable companies and telecommunications companies ahead of deregulation; investors sought to secure market share as a defensive measure, and cultivate a new revenue stream. Canada presently boasts the lowest business and individual broadband rates among the benchmark group, and has one of the highest availability levels.

In similar moves to Canada, Japan forced the incumbent NTT to open up facilities to competitors through “local loop unbundling” in August 1999, and followed with a series of regulatory actions, namely: leaning on the NTT to upgrade exchanges beyond metropolitan areas in 2000 by revising the provision of NTT connectivity, and forcing the NTT to offer wholesale DSL in June 2001.

Australia exhibits best practice policies in investing public funds to close the urban-rural digital divide. Specifically, the Networking the Nation program aimed to: (1) enhance telecommunications infrastructure and services in nonurban areas; (2) increase access to, and promote the use of, services available through telco networks; and (3) reduce disparities in access to services and facilities. The Australian government has committed funds for this strategy and is in the process of implementing related projects. Ten rounds of funded projects were executed with more than AUD200 million invested. Additionally, Australia extended the universal service obligation in 1997 to include a digital data service obligation (DDSO), which requires the digital service provider to set out plans for how 100 percent of Australians will be served. As a result, regional Internet connectivity has more than doubled to 36 percent in the past two years.

#### *Readiness—Individuals*

1

Policymaking to boost citizen readiness encompasses measures to promote access device availability, to boost or encourage the development of skills, as well as measures to boost broader confidence in ICT media.

Sweden has achieved high citizen readiness, having acted to promote PC uptake for households. In 1998, the Swedish Government reformed the tax system to enable employees to purchase PCs tax-free from their

employer. The employer administers the scheme, typically providing the machine to the employee, who then repays it over a period of three years. Payments are deducted from gross salary. All employees were eligible, even those who did not need a machine for work purposes. Financing for the initial capital outlay was provided by banks, which took advantage of the security of a government guarantee. As a result, PC penetration in Sweden increased the most of all European countries between 1997 and 1999, despite starting at an already high level.

Italy has been prominent in supporting the European Computer Driving License (ECDL) as a common training standard. The ECDL is a common European qualification, but the government of Italy has done the most to promote this qualification as a standard. The most prominent facets of the program are: (1) public sector staff will be trained for ECDL, (2) an e-learning course will be provided to promote ECDL among teachers and students, (3) ECDL training will form part of military service, and (4) further initiatives to train unemployed people to ECDL standard. A fiscal bonus is provided for companies employing staff with an ECDL.

#### *Readiness—Businesses*

2

Policymaking to promote business readiness involves the promotion of access device penetration among businesses, designing incentives for businesses to train their staff, as well as addressing business concerns over, for example, the security of the online medium. It can also potentially involve positive action to enhance the value-for-money of online versus offline commerce.

Germany has strong business readiness, because it has concentrated on ensuring that adequately trained staff is available. The government engaged industry and unions to agree on an action plan—Innovation and Jobs for the Information Society—to attract 250,000 IT jobs by 2005 and eliminate skills shortages. The plan included a short-term emergency measure to alleviate the acute near-term shortage: 20,000 green cards for non-EU specialists over two years. Longer-term measures included EUR1 billion for training courses from the Federal Labor Office, a commitment from industry to increase training places by 50 percent, and an additional EUR50 million to create new computer science courses. Recent progress reports suggest that the target of 250,000 specialists will be reached, as 160,000 were attracted by end of 2001 alone.

U.K. Online for Business is the most successful business support network model. The program is a

government-industry partnership to support businesses in making the best use of ICT. With a budget of £67 million, the scheme represents a considerable investment. Help and support are provided through a variety of contact points: (1) a network of 400 advisers in over 100 contact centers nationwide, (2) Internet portals with access to information and e-business planning tools; (3) call centers and helplines, and (4) a partnership program to help spread best practices among SMEs. The support network was promoted by a marketing campaign in mass media (TV, radio, trade press). In terms of impact, the project exceeded its target of getting 1 million SMEs online.

### Readiness—Governments



Government readiness policies foster a government's ability to deliver e-government services and to participate in e-commerce. For a government to be ready, it must have the appropriate strategies in place, a sufficient level of equipment and, very importantly, progress should be made towards establishing common standards and architectures for cross-departmental service delivery, such as a public key infrastructure. Cases in point are government initiatives in Germany and the United Kingdom to establish common ICT related standards across agencies.

The aim of the BundOnline program in Germany is to put all priority services of the federal government online by 2005. Project planning includes very definite linkages between the development of back-office capability and front-end service delivery. Although it may take longer to get services online, they will have robust back-office foundations at delivery time, and this stability will promote user confidence. Progress to date includes a detailed implementation plan with a clear timeline and prioritization for services provided by federal agencies. The federal cabinet has accepted the plan, including funding of EUR1.65 billion through 2005.

The Government Gateway Initiative in the United Kingdom provides a secure interface enabling any department to offer a service through it and to use it as an "authentication engine." It was launched in January 2001, at a cost of £16 million; five pilots were complete by December 2001. The service is far ahead of similar schemes in other countries because it is operational; progress so far includes 390,000 registered users.

### Usage—Individuals



Promoting citizen usage involves tackling issues of the digital divide and potentially taking positive action among population groups less likely to use the

Internet. It also involves taking action to increase the incentives for use, by improving, for example, the quality of broadband content. And it involves measures to encourage citizens up the "adoption ladder" of usage sophistication, although few governments have been active in this area.

Germany's Women to the Web campaign has reduced the digital divide between genders. The program is part of a series called the Internet for All programs. Training was offered at over 200 cities across the country on a subsidized basis—the fee was EUR28 per course. The initiative was supported by Brigitte magazine, a popular women's magazine, and the program was made successful by most women's ability and willingness to pay a small fee for training. Additionally, the scheme's impact was enhanced by imaginatively leveraging the private sector through exposure in magazines. Sponsorship from DTAG also extended the reach of the scheme. This far, 100,000 women have been trained and 200,000 enrolled for future courses. Importantly, 98 percent of course attendees intend to continue using the Internet.

The Canadian government has helped numerous voluntary organizations get online. The VolNet initiative offered Internet skills and equipment to voluntary organizations. The scheme makes available resources such as a basic Internet account for one year, a discount of 50 percent on the cost of access devices, and training in basic Internet skills for general use and website publishing. Additional support takes the form of applied learning, such as online discussion groups, and support from IT volunteers. The 50 percent discount on computer equipment was a substantial incentive to organizations usually cash constrained. Additionally, the comprehensiveness of the scheme, including ongoing support, made it a complete package for volunteer groups. Progress to date includes the training and online presence of 10,000 voluntary organizations. In the process, 17,000 staff and volunteers were trained.

### Usage—Businesses



In business usage policymaking, the general level of purposeful uptake and use of Internet technologies by a nation's businesses is promoted. Strong uptake is characterized by high levels of use at several levels of sophistication, from basic use to trading online, and by high levels of use by small as well as large businesses.

Australia's Information Technology Online (ITOL) grants have facilitated industry cooperation for a small outlay. Grants are provided to projects, which broker

industry collaboration to either develop common standards within and across industries, and/or bring whole industries online through collaborative projects. Only AUD2 million are available annually (a deliberately small amount to ensure that they play only a facilitation role). Eighty-one awards, with a total value of AUD7.3 million, have been made to at least fifteen different sectors. Among other initiatives, the ITOL program has enabled Australia to achieve one of the highest proportions of small businesses that trade online.

Canada's Student Connection Program creates IT specialists and places them in SMEs. Launched in 1996, the program provides students interested in IT (though not necessarily studying it) with IT training. Students then provide training within the center, or more intensively through a placement. Some students are subsequently hired for permanent positions. The scheme operates from fifteen centers within universities and colleges. Among the key success factors is the low risk and high return for businesses in placing student trainers or in taking a course themselves—both are virtually free. Additionally, the government lends its brand and trusted status to students who would not otherwise be hired in an ICT role. So far shows more than 85,000 small businesses have used the scheme, and more than 3,500 young people have been placed on the scheme.

#### Usage—Governments

Government usage policies promote purposeful uptake and use of Internet technologies by the public sector in general. Strong uptake is characterized by a large proportion of services offered online, particularly those that are more transactional, and by the services being used by a large proportion of the nation's citizens and businesses.

Germany adopted a three-pronged approach to encourage state and local government service delivery, specifically: (1) competition to encourage innovation at a local level; (2) shared resources, such as creating procurement platforms and authentication engines, which are open to local governments; and (3) direct cooperation where services allow this. Interestingly, the German federal government has no authority over state and local governments in determining the means of service delivery. Both these approaches apply the strategy of creating an incentive for local governments to buy into online service delivery and common standards.

Canada was among the first governments to offer services through “user-centric” interfaces, rather than interfaces corresponding to traditional government departments. The redesigned website was launched in February 2001. Canadians can access 450 websites through three user-specific gateways and thirty-five service clusters. Canada has begun to move to the next stage of e-government, where services are redesigned around this customer centric delivery process. Not only are Canadian government services delivered through customer centric portals, but also the choice of services and the means of delivery are shaped by extensive customer research. For example, fifty focus groups were used in advance of the re-launch of the main website in 2001. As a result of this work, Canada's e-government service was ranked number one in an international survey in both 2000 and 2001, due to both its extensiveness and sophistication.

#### Policy recommendations for Arab countries

Our policy recommendations for ICT development in the Arab world echo the proven principles and guidelines implemented in international markets and in some Arab countries with a fast-track record. Specifically, we have formulated the proposed policies along the three pillars: environment, readiness, and usage.

#### Environment—Political and regulatory leadership

We believe that the first imperative to ICT development is the formulation of a clear national plan, supported by the highest political constituencies. Cases in point from the Middle East region are the Jordanian and Egyptian programs, which have benefited from strong advocacy at the highest national level.

The ICT development plan must formulate specific strategies, goals, and targets. As demonstrated in many ICT advanced nations and the fast-track Arab markets such as the U.A.E., initiatives are better when prioritized and paced for timely roll-out (e.g., the U.A.E.'s e-government program roll-out spans three to five years).

Critical to the success of a top-down national ICT development initiative is the governance model that defines roles and responsibilities in the design and execution, as well as performance management. International practices in governance structure vary greatly, ranging from a highly centralized set-up where a common set of ICT objectives is acknowledged in a unified master plan, to a decentralized structure where national level initiatives are not necessarily coordinated under a common umbrella.

In most developing and developed economies we have benchmarked, allowing market forces to lead the way towards higher ICT advancement—without any government interference—has not been common. Even in countries where the private sector leads the majority of initiatives towards ICT universality, the government leads the definition of a national agenda, rolls out regulation and policies that create the right environment to enable ICT advancements. Additionally, governments must set up a highly visible entity (e.g., e-Envoy in the U.K.) to establish a sustainable and accountable institutional structure.

In tandem with to the ICT leadership agenda, governments should outline a clear roadmap for developing support clusters, mainly in telecommunications and e-commerce. For telecommunications, there must an explicit roadmap for sector deregulation and liberalization. This is particularly relevant to Arab countries where most telecommunications sectors remain dominantly monopolistic and with a marked absence of market-driven regulatory framework. Deregulation and liberalization, when adequately managed, can considerably improve quality of service and added value to end-users.

Milestones for the support of e-commerce include ICT security as well as trust. This applies particularly to laws that manage the trade of goods and services through electronic means, along with laws to combat computer related crimes. The latter laws remain underdeveloped in the Arab world, with varying levels of progress. The overriding finding is that there is increasing awareness and effort to develop cyber-laws; to these activities are added proponents of unifying such laws at a regional level, for example, within Gulf countries. The initial emphasis appears to be on combating unlawful activities through electronic means in the areas of privacy offenses, content-related offences, economic crimes, unauthorized access and sabotage, as well as intellectual property offences.

### *Environment—Market*

2

At the market level, the number one imperative is incorporating ICT skills and knowledge into the educational system.

A number of Arab countries have initiated the design of national programs for building ICT skills in schools and universities. However, the general observation is that there is relative slowness in executing the envisaged plans; senior stakeholders must press on with these initiatives and instill a sense of urgency. A case in point

is the Watani project in Saudi Arabia, which presents one of the most comprehensive plans for an electronic educational network in the region since 1999, but which appears to advance at a slower pace than was envisaged.

Arab governments can also play an instrumental role in stimulating the development of support clusters. The most prominent manifestation of such a policy is the creation of economic zones focusing on ICT subsectors. Dubai pioneered the design and fast-track implementation of related concepts with the advent of the Dubai Internet City and Dubai Media City. These clusters have attracted world-class players in their related fields (e.g., Microsoft and Oracle). Jordan, Egypt, and Syria are seeking to make use of comparable potential in their countries, with plans to create new media and Internet zones. Saudi Arabia is also entertaining the idea of creating IT parks.

Conditions for ICT development are also enhanced by accessibility to capital markets. The equity market in most Arab nations continues to be underdeveloped; funding mechanisms are primarily managed through commercial banks. Further developments are required at national and regional levels to ensure that capital is available, particularly for emerging ICT related industries. Specifically, Arab markets must provide adequate capital instruments ranging from venture capital to funding through public offerings. An example of such an instrument is the recent development of the Dubai International Financial Center, which is to provide, among other things, a world-class capital market for the region—from North Africa to east and central Asia, and encompassing the Middle East. Another development is the upcoming capital market reforms in Saudi Arabia, following the successful launch of the Tadawul electronic trading platform for the local stock market.

### *Environment—Infrastructure*

3

The key requirement at the level of the infrastructure for Arab countries is the expeditious enactment of telecommunications laws and regulations that are geared toward introducing competition. As mentioned earlier in this report, the region is dominantly monopolistic. Much remains to be done in terms of enacting new telecommunications laws that call for deregulation, privatization of incumbent operators, and sector liberalization.

In addition to the core objective of enabling infrastructure development through market forces, Arab governments may have to pursue targeted initiatives, such as the Networking the Nation initiative

in Australia, to secure the connectivity required for ICT-related activities. Such programs would support infrastructure advancement and services in nonurban areas and reduce prevailing gaps. An immediate application would be the set-up of Universal Internet Access funds, targeting groups with constrained economics (e.g., public schools, rural areas, low income households, and so on).

### *Readiness—Individuals*

2

Arab government policies in the area of citizen readiness should drive literacy and comfort with the ICT field. Our research in Arab countries suggests that these elements represent the most significant barriers to ICT adoption today. Initiatives in this vein can evolve with two themes: awareness and trust, and training and comfort.

Awareness and trust represent the first hurdle, particularly in relatively conservative Arab societies. While not insurmountable, these elements require significant up-front management by the government to set the stage among the rural and urban societies for ICT development. The task can be achieved through public information and educational programs, as well as by targeted programs in schools. The objectives are to demonstrate the imperative and benefits of ICT—that is, what's in it for citizens to use the Internet and acquire computer skills—as well as to underscore ICT compatibility with social and cultural norms.

Once the initial hurdles are removed, Arab governments must play an active role in bringing citizens gradually up to speed with ICT skills. Training programs can, and must, be established at the level of educational institutions. Training activities can also be set up to support groups that are not naturally driven to embrace ICT skills, for example, young housewives. The German Women to the Web program provides a good reference in this area.

### *Readiness—Businesses*

2

The challenges for achieving business readiness in Arab countries, especially among SMEs, are comparable to the ones for citizens. On the one hand, governments need to drive awareness and trust. On the other hand, a certain level of training and comfort must be achieved to pave the way for ICT endorsement.

In line with best practice policies in ICT-developed markets, in the Arab world there have been high-potential initiatives to advance the level of readiness

among SMEs. A case in point is the Dubai Sheikh Mohammed Business Support and Development Establishment, which was developed to provide business support and tools, including ICT enabled ones such as e-government and e-procurement, to SMEs.

At a grass-roots level, initiatives driving awareness of the benefit of ICT-enabling businesses as well as providing initial consulting and help-desk support, are emerging in some market such as Saudi Arabia. Such initiatives can also be extended to encompass training and accessibility. For example, subsidized training programs in nationally accessible centers can be offered at no, or limited, fee for SMEs. Creating common platforms (e.g., e-procurement portals) and tools (e.g., standard business support applications for SMEs, with customization capabilities) can also improve accessibility.

For both citizens and businesses, readiness-driven policies must also address the issue of language barrier. As most Arab populations are not conversant in English, providing ICT content in Arabic is critical and requires dedicated attention. It is unlikely that such an Arabization effort could yield, in all cases, commercially viable ventures. Therefore, governments must be ready to invest directly in this vein, and to secure funding for related service providers.

### *Readiness—Governments*

3

At the level of government, readiness efforts must focus, again, on awareness and trust and on training and comfort. Policies must also promote and develop e-government organizations that would define strategies and targets for implementing e-government services.

As observed in ICT-developed markets, and apparent already in some Arab countries, the biggest obstacle to achieving government readiness will be inter-departmental coordination. Policies dealing with this obstacle must ensure that lines of accountability are clearly defined, and at the same time encourage participation across government departments to yield resource efficiency and effectiveness. The absence of such policies may lead to situations of conflicting agendas, undue competition across complementary entities, and inefficient use of public resources.

### *Usage—Individuals*

1

Policies to promote citizen usage should aim to create as many “contact points” as possible between ICT tools and prospective users in order to increase confidence, comfort, and adoption.

Initially, contact points could focus on training opportunities in schools, community centers, or other for-profit centers, with financial backing from public funds. The objective is to make resources available to those who would not otherwise be exposed to them.

Usage, of course, would follow a systematic buildup of readiness levers such as awareness, trust, and comfort. Therefore, Arab governments, along with national support groups, should view usage on a continuum that starts with the creation of an ICT favorable environment.

### *Usage—Businesses*



Business usage could be stimulated through policies that would promote the diffusion of ICT tools as well as the buildup of skills readiness. Through such policies, Arab governments can pursue a series of programs that would enhance accessibility to public telecommunications networks, ICT hardware and software and, most importantly, skills. At the simplest level, usage can be encouraged through supportive funding, creation of a competitive environment, and learning incentives. Importantly, governments must recognize the role of SMEs in the national economy, and aim to target them directly through ICT-usage building programs.

### *Usage—Governments*



Policies to promote ICT usage among government agencies should have as their aim the offering of a large number of online services that are accessible by a large proportion of citizens and businesses.

Typically, the application of these policies calls for a prioritization of the services to be offered online. Government agencies must also create tangible incentives to end users for the endorsement of online services over traditional services. Such incentives could underscore the internal benefits to government agencies and be a self-reinforcing mechanism that offers new services online, while improving the format and delivery of existing services.

## **Conclusion**

Our work is not intended to provide a long-range roadmap for all ICT related initiatives and policies. Rather, our aim is to outline the short- to medium-term policies that can positively impact ICT development in the Arab world. Many of these ideas have been seen in practice in one or more of the Arab countries referred to throughout this report, as well in ICT-developed countries.

We believe that a series of multiple measures, with clear and consistent policies, can deliver the best results; this is why we have designed our guide ICT advancements in a policy framework to.

In the end, each Arab country will need to develop its own policies, which should be driven by the local conditions (infrastructure, IT skills, education, and so on). It is key, however, to understand that the “window of opportunity” for catching up with developed economies is limited, hence the need for Arab governments to act quickly to boost ICT advancement in their countries.

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## Endnotes

1. Based on statistics from the European Information Technology Observatory (EITO) Report (2002).
2. Western Europe plus the following countries: Czech Republic, Hungary, Poland, Russia, Slovakia, and Slovenia
3. Based on ITU Statistics (2002).
4. World PC sales are based on eTforecasts estimates 2001. eTforecasts. "PC Sales Growth: Slow and Jagged." <<http://www.etforecasts.com/>> (May 2002).
5. Estimates of e-commerce transactions vary widely from one source to the other, ranging from as low as \$345 billion (Ovum), to \$740 billion (Goldman Sachs), to \$953 billion (Gartner Group), among others.

6. Countries selected in those three subregions are: Jordan, Lebanon, and Syria (Levant); Egypt and Morocco (North Africa); Kuwait, Oman, Saudi Arabia, and the U.A.E. (Gulf).

7. The current Internet regulator in Saudi Arabia (i.e., the Internet Service Unit [ISU] of King Abdulaziz City for Science and Technology [KACST]) is responsible for preparing policies and regulations regarding the use of the Internet in the Kingdom. The regulator also gives ISPs with access to the Internet international backbone by buying bandwidth from Saudi Telecom and re-selling it at a premium to service providers. The recently appointed Saudi Communications Commission is expected to take over Internet regulatory responsibility in the near future

8. Based on Arab Advisors Group forecast.

9. Based on Allen Hamilton Booz report, "The World's Most Effective Policies for E-Commerce." July 2002.