ECONOMIC AND SOCIAL COMMISSION FOR WESTERN ASIA (ESCWA)

REGIONAL PROFILE OF THE INFORMATION SOCIETY IN WESTERN ASIA

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Preface

This regional profile is published by the United Nations Economic and Social Commission for Western Asia (ESCWA) within the framework of follow-up activities to the World Summit on the Information Society (WSIS) outcomes. It is the third in a series of such profiles, the first published in 2003 and the second in 2005, and describes both the current situation and the progress made in the region in building the information society, providing a comparative evaluation with the rest of the world.

Within that context, this report provides essential information on the situation in the ESCWA region, thus assisting decision makers in their planning and enhancing national capacities for building the information society. Moreover, it aims to assist national authorities to compare their current status with that of other countries in the region, thereby promoting opportunities for cooperation and regional integration in an increasingly knowledge-based global economy.

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ABBREVIATIONS

2G	Second generation wireless telephone technology
3G	Third generation of mobile telephone standards and technology
ATM	Asynchronous Transfer Mode
ADMA-OPCO	Abu Dhabi Marine Operating Company
ADN	Arabic domain names
ADNS	Arabic domain names system
ADNTF	Arab Domain Name Task Force
ADSL	Asymmetric digital subscriber line
AFED	Arab Forum for Environment and Development
AIDMO	Arab Industrial Development and Mining Organization
AIDS	Acquired Immune Deficiency Syndrome
AKEA	Arab Knowledge Economy Association
ALECSO	Arab League Educational, Cultural and Scientific Organization
AOU	Arab Open University
APTLD	Asia Pacific top level domain
ATICM	Arab Telecommunications and Information Council of Ministers
ATM	Automated teller machine
AUDI	Arab Urban Development Institute
B2B	Business-to-business
B2C	Business-to-consumer
BOT	Build-operate-transfer
BSA	Business Software Alliance
CAIT	Central Agency for Information Technology
CAWTAR	Center for Arab Women Training and Research
ccTLD	Country code top-level domain
CD	Compact disc
CERT	Centre of Excellence for Applied Research and Training
CICTS	Arab City ICT Strategy
CITC	Communications and Information Technology Commission
CMMI	Capability maturity model integration
DAFZA	Dubai Airport Free Zone Authority
DNS	Domain names system
DOHMS	Dubai Department of Health and Medical Services
DOI	Digital Opportunity Index
DSL	Digital subscriber line
EDGE	Enhanced Data for GSM Evolution
EDI	Electronic data interchange
EIDA	Emirates Identity Authority
WHO EMRO	World Health Organization Regional Office for the Eastern Mediterranean
ERP	Enterprise Resource Planning
FBWA	Fixed broadband wireless access
FLAG	Fiber-Optic Link Around the Globe
FTP	File transfer protocol
G2B	Government-to-business
G2C	Government-to-citizen
G2G	Government-to-Government
Gbps	Billion bits of data per second
GCC	Gulf Cooperation Council
GDP	Gross domestic product
GIS	Geographic information system
GSM	Global system for mobile telecommunications
GXS	Global eXchange Services

ABBREVIATIONS (*continued*)

HD	Human development
HDI	Human Development Index
HIV	Human immunodeficiency virus
HMC	Hamad Medical Corporation
IAD	Institute of Administrative Development
ICANN	Internet Corporation for Assigned Names and Numbers
ICDL	International computer driving licence
ICT	Information and communications technology
ICTARB	Information and Communication Technology in the Arab Region for the Blind
ICTD	Information and Communication Technology Division
ICTDAR	Information and Communication Technology for Development in Arab Region
IDC	International Data Corporation
IDM	Inconet Data Management
IETF	Internet Engineering Task Force
IGF	Internet Governance Forum
INTAJ	Information Technology Association of Jordan
IP	Internet protocol
IPR	Intellectual property right
IPU	Inter-Parliamentary Union
IREX	International Research and Exchanges Board
IRFFI	International Reconstruction Fund Facility for Iraq
ISC	Internet Systems Consortium
ISDN	Integrated service digital network
ISP	Internet service provider
IT	Information technology
ITA	Information Technology Authority
ITEP	Sheikh Mohammed Bin Rashid Al Maktoum IT Education Project
ITI	Institute for Technical Innovation
ITIDA	Information Technology Industry Development Agency
ITU	International Telecommunication Union
JEI	Jordan Education Initiative
JITCC	Jordan Information Technology Community Centres
JTC	Jordan Telecom Company
JUST	Jordan University of Science and Technology
KACST	King Abdulaziz City for Science and Technology
kbps	Thousand bits of data per second
KFAS	Kuwait Foundation for the Advancement of Sciences
KSAU-HS	King Saud bin Abdulaziz University for Health Sciences
LAS	League of Arab States
LECRVAW	Lebanese Council to Resist Violence against Women
LMS	Learning management system
Mbps	Million bits of data per second
MDGs	Millennium Development Goals
MENA	Middle East and North Africa
MEPI	Middle East Partnership Initiative
MSI	Media Sustainability Index
MSP	Multi-sector partnership
MTCC	Multipurpose Technology Community Centre
MVU	Mediterranean Virtual University
NCCAL	National Council for Culture, Arts and Letters
NEPAD	New Partnership for Africa's Development
NITC	National IT centre
OECD	Organization for Economic Cooperation and Development
OTN	Oman TradaNet

PC	Personal computer
PCA	Professional Computer Association
PCT	Patent Cooperation Treaty
PDA	Personal digital assistant
PDN	Public data network
PICTA	PCA ICT Academy
PKI	Public key infrastructure
PLT	Patent Law Treaty
POGAR	Programme on Governance in the Arab Region
PPP	Public-private partnership
RDI	Research, development and innovation
RHAS	Royal Health Awareness Society
SABIC	Saudi Basic Industries Corporation
SAHI	Saudi Association for Health Informatics
SCP	Smart Community Project
SDH	Synchronous digital hierarchy
SMS	School management system
SMS	Short message service
STM	Synchronous transport module
SVU	Syrian Virtual University
e-TQM	E-total quality management
TRA	Telecommunication Regulatory Authority
TRIPS	Agreement on Trade Related Aspects of Intellectual Property Rights
TV	Television
UKS	Universal Knowledge Solution
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNESCO	United Nations Education, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
UNIFEM	United Nations Development Fund for Women
URL	Uniform resource locator
USAID	United States Agency for International Development
USPTO	United States Patent and Trademark Office
VoIP	Voice over Internet protocol
VSAT	Very small aperture terminal
WCT	WIPO Copyright Treaty
WHO	World Health Organization
WIPO	World Intellectual Property Organization
WLAR	World Links Arab Region
WRACTI	Women’s Rights and Children through Access to Information
WSIS	World Summit on the Information Society
WTO	World Trade Organization

Introduction

Global changes are taking place at the economic, social and cultural levels, with information and knowledge playing a major role in the move towards the information society. The accelerating development in knowledge during the past few decades has modified the principles of economic growth with the move towards a knowledge-based economy affecting all sectors of the economy.

The information society is a society that processes information efficiently in its socio-economic development, including the production, exchange, adaptation and use of information for the purpose of development and enhancing the quality of life and work environment for all citizens. In order to realize the information society, modern information and communications technologies (ICTs) need to be used. While ICTs are necessary, they are not sufficient, given that capacity-building must equally be developed in a number of areas, including economic, social, legal, educational and research.

Significant differences exist in the capacity of countries to adapt to changes in technology and knowledge. Consequently, the move towards the information society constitutes a real challenge to developing countries, particularly in view of the expanding digital divide with developed countries which renders them increasingly vulnerable to reduced productivity and economic capacity. This leads in turn to unemployment, poverty and marginalization.

In this context, the General Assembly adopted resolution 56/183 in December 2001 to endorse a proposal presented by the International Telecommunication Union (ITU), which aimed at convening the World Summit on the Information Society (WSIS) under the patronage of the Secretary-General of the United Nations. The Summit seeks to reduce the digital divide by increasing awareness regarding the benefits of the information society, and by presenting mechanisms to help developing countries advance towards such a society within the context of the global knowledge-based economy. WSIS was divided into two phases, namely: (a) the First Summit (Geneva, 10-12 December 2003), which resulted in a Declaration of Principles and a Plan of Action; and (b) the Second Summit (Tunis, 16-18 November 2005), which focused on the implementation of the Plan of Action, financing mechanisms for using ICTs for development, Internet governance issues, and follow-up to the First Summit.

It is crucial for ESCWA member countries to build information societies if they aspire to lay the foundations for sustainable economic development and achieve the Millennium Development Goals (MDGs). Accordingly, ESCWA organized the Second Regional Preparatory Conference for the World Summit on the Information Society (Damascus, 22-23 November 2004) under the motto "Partnership for Building the Arab Information Society". The conference resulted in a Regional Plan of Action, which dealt with various issues relating to the development of an information society in the region through 38 projects grouped in 10 programmes, each with a lead agency.[1] Additionally, the conference produced the "Damascus Call: Towards Partnership for Building the Arab Information Society", which aimed at providing strategic support to implement regional projects and solid foundations for building this society.

This report[2] aims to depict the status of information societies in the ESCWA region, measure the progress made in building these societies and evaluate the current status of member countries. With those objectives, comprehensive analyses are provided on the following: (a) role of Governments and all stakeholders in chapter I; (b) ICT infrastructure in chapter II; (c) access to information and knowledge in chapter III; (d) ICT capacity-building in chapter IV; (e) building confidence and security in the use of ICTs in chapter V; (f) enabling environment in chapter VI; (g) ICT applications in chapter VII; (h) cultural diversity and identity, linguistic diversity and local content in chapter VIII; (i) media in chapter IX; (j) regional and international cooperation in chapter X; and (k) MDGs in chapter XI. Chapter XII presents the regional and global comparative analysis and results.

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[1] ESCWA, "Regional Plan of Action for Building the Information Society", E/ESCWA/ICTD/2004/4.

[2] Based on the 2007 country profile reports of ESCWA member countries which were prepared by national consultants and ESCWA staff and are available at: www.escwa.un.org/wsis.

Throughout, the concept of maturity levels has been used in each of the major areas constituting the information society in order to categorize ESCWA member countries and compare their status in building information societies. Specifically, four maturity levels are used for each aspect of the information society, whereby level 1 indicates the lowest level of maturity and level 4 indicates the highest level of maturity.

Based on these results and recommendations, several initiatives and projects may be launched to reduce the existing digital divide both among ESCWA member countries and between the ESCWA region and more developed regions of the world. Within that context, ESCWA is fostering support for important regional projects through its Regional Plan of Action, which has been signed by its member countries, cognizant of the vital need to collaborate and synchronize efforts in order to reduce the digital divide and press forward towards the information society.

I. THE ROLE OF GOVERNMENTS AND ALL STAKEHOLDERS IN BUILDING THE INFORMATION SOCIETY

Governments in ESCWA member countries play an essential role in guiding society and developing economic sectors. Consequently, the transformation of these countries into information societies is contingent on Government initiatives, such as the development of strategies and policies that regulate and facilitate the participation of private-sector companies and civil society organizations in the sustainable development of society.

A. COMPARATIVE ANALYSIS

Government and stakeholder contributions to developing information societies differ from one country to another in the ESCWA region. The absence or deficiency of strategies in Iraq is matched by slow-paced implementation in most other ESCWA member countries, except for a few which have been able to achieve substantial progress largely as a result of their small size and population, wealth and political stability. However the progress achieved is not commensurate with the resources available to these countries.

1. *National information society policies and e-strategies*

All ESCWA member countries, with the exception of Iraq and Yemen, have developed detailed ICT strategies, but implementation of these strategies is progressing at a slow pace.

In 1999, a new ministry was established in Egypt under the name "Ministry of Communication and Information Technology" to facilitate the transformation of the country to an information society. Egypt's national plan was aimed at supporting and encouraging the emergence of an information society in the country, in association with concerned Government agencies and the private sector.

Work commenced on developing and expanding the country's telecommunications infrastructure, as well as on developing qualified human resources and establishing information systems and databases for Government and private sector organizations.

This was followed by the launch of the Egyptian Information Society Initiative, which laid the foundations for development until 2020. These include the development and overhaul of Egypt's telecommunications network, both mobile phone and fixed line, development of e-learning, electronic documentation of the country's heritage and culture, development of technology-based industries and development of health-care services that rely on information technology.

Meanwhile, Jordan launched its REACH initiative in 2000, with the aim of developing its information society and increasing ICT exports, as well as attracting direct foreign investment into the country. The Jordanian Government subsequently devised its National Strategic Plan for the ICT and postal sectors for 2004-2007. The objectives of the plan were to align service prices with citizens' purchasing power in order to increase the number of mobile phone subscribers, and to improve, expand and enhance services using the latest technologies. Other objectives included increasing the number of direct and indirect service providers in the country.

Jordan's National Information Technology Center carried out a comprehensive study, sponsored by the World Bank, aimed at devising a second national plan for the period 2007-2009. The plan is nearing completion and is expected to be issued shortly.

Meanwhile, Qatar's Supreme Council of Information and Communication Technology[3] devised a national strategy comprising 12 programmes, including e-health, e-learning and e-banking. The council is also working in association with an international law firm to develop draft laws and regulatory frameworks to privatize the telecommunications and e-commerce sectors.

[3] www.ictqatar.qa.

Kuwait, on the other hand, devised its national strategy in 2004 in line with WSIS requirements and the Regional Action Plan for West Asia, with the aim of integrating information technology into development. The country's e-government strategy and road plan were then developed in association with Singapore. The Information Technology Central Apparatus (established in 2006) is currently working on a national information technology action plan, which focuses on the vital role of information technology in bringing about sustainable economic and social development. The organization is also carrying out a marketing and training campaign.

Meanwhile, Saudi Arabia has devised a comprehensive five-year national ICT plan, covering e-government, e-commerce, telemedicine, e-learning and the creation of digital Arabic and Islamic content. The plan also comprises the development of the country's telecommunications sector, support for research, innovation and the transfer of knowledge, and bridging the digital divide.

The Syrian Arab Republic has adopted its 10th five-year plan, covering the period 2006-2010, as well as a national ICT strategy. The country has defined the long-term goals that must be achieved by the ICT sector during the coming 10th and 11th (2011-2015) five-year plans, including maintaining the exceptional growth of the sector, developing high-skilled human resource capabilities, realizing a significant advance in infrastructure, including the addition of one million Internet subscribers (four million users), and encouraging major global production companies to invest in the Syrian Arab Republic. The country's 10th five-year plan includes a number of important projects: establishing a Telecommunication Regulatory Authority (TRA), drafting a law to regulate the ICT sector, establishing an e-government portal, and other initiatives. The Syrian ICT strategy has been devised by a national team in association with the United Nations Development Programme (UNDP). A number of experts and consultants from the United Kingdom and other ESCWA member countries contributed to the development of the strategy.

In 2005, the United Arab Emirates devised a plan for the transformation of the country into an information society, and now ranks first in the Arab world in a number of international and regional indices. The United Arab Emirates tops the Arab world on the World Economic Forum's Networked Readiness Index, and ranks second (after Bahrain) on the International Telecommunication Union's Digital Opportunity Index. The United Arab Emirates also ranks first in the Arab world on Madar Research ICT Use Index. The country stands out for its ability to promptly put into action any plans it devises.

Bahrain's e-government portal was launched in 2006, and in May 2007, the country announced its e-government strategy for the next three years. Bahrain also announced the launch of its newly designed portal, enhanced with added services. A number of Government entities, commercial establishment and experts contributed to the development of the country's strategy.

In 2001, Oman's Government established a dedicated information technology authority, by directive of the Ministry of Economy, which was given responsibility for the development of the plans and projects needed to put into action the national strategy for a digital society and electronic services, and to build and enhance the ICT infrastructure. In 2003, the Executive Council for Information Technology was established to oversee the implementation of the national strategy for a digital society, devised the previous year.

Yemen has established a National Center for Information, as well as devised its national strategy for information technology. The country has also set up a national information network, society service centres and the Yemeni Electronic Library. The National Center for Information carried out the first field survey on the status of information technology in Yemen in 2001.

The country is currently on course to finalize policy and strategy documents in association with ESCWA, and the documents are expected to be ratified by the Cabinet in 2007.

In 2004, the Palestinian Ministry of Communication and Information Technology devised a national ICT strategy, placing the development of the sector among its top priorities. In 2006, implementation began on the education initiative (devised in 2005), which included the development of electronic syllabi and training faculty and staff on the creation and delivery of electronic content in the classroom.

The political situation in Iraq has prevented its Government from playing an effective role in the development of the ICT sector, except for liberalizing the sector beginning in 2003.

Meanwhile, Lebanon established a Telecommunications Regulatory Authority (TRA) in mid-2007, opening the way for an increase in the number of Internet service providers (ISPs) and the liberalization of the telecommunications sector.

World Economic Forum's outlook on ICT policies and strategies in ESCWA member countries

The World Economic Forum's 2007 Networked Readiness Index includes a number of indicators related to the national strategies and policies of 122 countries, including six ESCWA member countries.

The United Arab Emirates ranked first among the ESCWA member countries (and 34th globally) on the indicator related to policies, laws and regulations, and their impact on ICT development and use, followed by Qatar (39th globally), Bahrain (51st), Jordan (64th), Egypt (80th) and Kuwait (89th). Other ESCWA member countries were not included in the report.

The United Arab Emirates also ranked first on the indicator that measures the clarity of countries' executive plan for the use of ICT in developing their competitive capabilities (fourth globally). It was followed by Qatar (11th globally), Jordan (25th), Egypt (44th), Bahrain (54th) and Kuwait (99th).

On the indicator that measures the degree to which Governments are in a position to employ ICT, the United Arab Emirates again ranked first among ESCWA member countries (and seventh globally). Qatar followed in 10th place, then Jordan (27th), Bahrain (37th), Egypt (79th) and Kuwait (105th).

Meanwhile, Jordan ranked first among ESCWA member countries (21st globally) on the indicator that measures the level of competitiveness in providing online services, with Egypt in second place (35th globally) and Kuwait in third place (50th globally). The United Arab Emirates and Qatar ranked very low on the indicator (110th and below) due to the absence of competition in these countries.

2. *Public-private partnerships (PPP) or multi-sector partnerships (MSP)*

The nature of partnerships in ESCWA member countries differs from country to country. In some countries, partnerships exist between the private and public sectors on the national level (Egypt and the Syrian Arab Republic), whereas partnerships in other countries are between national and international players, the latter represented by foreign investors, as is the case in Palestine. In Jordan, the international players are foreign companies that provide support for educational projects in universities, institutes and schools.

The private and non-governmental sectors in the Syrian Arab Republic play an essential role in providing Internet services. Private sector ISPs account for five of the country's seven ISPs. Meanwhile, the country's software industry is almost exclusively undertaken by the private sector.

The Egyptian national strategy was designed to support an ICT industry geared for export. The development of the ICT industry is a strong driver for the growth of exports and job creation. The Egyptian Government has established the Information Technology Industry Development Agency (ITIDA) and provided the necessary infrastructure to support the country's ICT sector. National companies, such as Egypt Telecom, play an important role in the sector. In order to expand its services, Egypt Telecom has adopted a partnership strategy with the private sector, ranging from partnership in telecommunications infrastructure to equity partnerships, as is the case with mobile phone and fixed-line providers. Furthermore, foreign companies have invested heavily in the country.

In Jordan, meanwhile, the Jordanian Hashemite Fund for Human Development, Boston Science Museum and Intel have partnered to establish the Intel Club. Other partnership initiatives include the Cisco initiative in Al-Balqa Applied University, and Microsoft's partnership with software development

companies, as well as the participation of a number of foreign and local companies in the country's e-learning project.

Partnerships in the United Arab Emirates exist between educational institutions, on the one hand, and agencies and companies, on the other. These include Intel's education initiative for kindergarten through high school, Cisco's initiative with the United Arab Emirates University and the American University in Sharjah, and the International Computer Driving Licence (ICDL) initiative with Sharjah University.

Saudi Arabia focuses on PPPs. One of the most important achievements in this domain is the electronic Umra project, which organizes and connects international travel agencies, local providers and relevant Government authorities. Another is the "computer for every household" scheme. Participants in the scheme pay a monthly charge of $25 through their telephone bills for two years. That PPP aims at providing one million computers to as many households in the country, in order to support and expand Saudi Arabia's e-government project.

Kuwait encourages private sector investment in ICT, through Internet and data service providers' building networks and establishing national data infrastructure, providing low-cost services to consumers and renting Government sites at competitive rates that serve both parties.

In Yemen, the Government provides the private sector with support to establish specialized ICT training centres. These have multiplied in recent years, exceeding 100 centres, both private and public, by end 2006. The country has also issued a law granting licences to ISPs in order to expand the private sector's participation in the dissemination and enhancement of this service.

Meanwhile, Qatar's Supreme Council on Information and Communication Technology has devised a national strategy comprising 12 programmes that cover the education, health-care, business, banking, tourism and sports sectors.

Oman's Knowledge Oasis serves as a cluster for international information technology companies in the country, as well as an incubator for start-ups. On the other hand, the breakdown in the political, social and economic situations in Palestine and Iraq in the past few years has prevented the development of any initiatives or partnerships between the private and public sectors.

The World Economic Forum's 2007 Networked Readiness Index includes an indicator that measures the effect of Government ICT usage on the interaction between Governments, on the one hand, and companies and civil society organizations, on the other. The United Arab Emirates ranks first on this indicator among the six ESCWA member countries covered by the index (and 7th globally), followed by Qatar (13th globally), Bahrain (64th), Egypt (65th), Jordan (77th) and Kuwait (98th).

3. *Role of private sector and non-governmental organizations*

The private sector plays an important role in the ICT industry in ESCWA member countries, dominating software development in all countries and operating the majority of mobile phone networks. However, strategic investments that require substantial spending on research and development are noticeably absent, and therefore will take a relatively long time to become financially profitable.

Non-governmental civil society organizations involved in the ICT sector are still sparse in most ESCWA member countries. Some of the most important non-governmental organizations (NGOs) in Egypt are the Software Information and Communication Technology Chamber, the Egyptian Software Society, the Software Companies Association and the Egyptian Association for Computer Companies. A large number of NGOs cooperate with the private and public sectors in developing software and digital Arabic content.

Meanwhile, in the Syrian Arab Republic, the Syrian Computer Society provides the country's most active and wide-reaching ISP. On the other hand, NGO Al-Firdous Al-Ahlia has contributed to a number of activities related to the spread of information technology in rural and remote areas in the Syrian Arab Republic and also to the Open-Access Software Forum.

The long-standing Saudi Computer Association is contributing strongly to the spread of information technology awareness in society. In 2007, the Arab Knowledge Economy Association (AKEA) was announced, and is expected to play an important role in transforming the country into a knowledge society.

Meanwhile, there are two NGOs in Bahrain: the Bahrain Internet Association and Bahrain Information Technology Association. A similar organization is in the process of being established in Oman, while there is a computer society set up in each of Iraq and Palestine.

There are two related organizations in Jordan: the Jordanian Computer Association, one of the oldest in the region, and the Information Technology Association of Jordan (INTAJ), which was responsible for the development of the national REACH strategy.

In the United Arab Emirates, the Arab Internet Societies[4] was launched in Dubai in November 2006. The association brings together six Arab organizations: the Kuwaiti Information Technology Association, the Emirates Internet Group, the Bahrain Internet Association, the Palestinian Internet Society Association, the Tunisian Internet Association and the Sudanese Internet Association.

Meanwhile, Lebanon has three associations: the Lebanese Computer Association, the Professional Computer Association and the Lebanon-based Union of Arab ICT Associations.

B. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES

1. *Maturity level 1: Palestine, Iraq and Yemen*

Palestine and Iraq suffer from political crises and turmoil that hinder their Governments' efficacy in vitalizing their ICT sectors. Despite the existence of an ICT strategy and policy in Palestine, this has been placed on hold. In Yemen, meanwhile, the Government has not yet completed either its national strategy, or its ICT strategy.

2. *Maturity level 2: Kuwait, Oman, Syrian Arab Republic and Lebanon*

All four countries have devised ICT policies and strategies, but their implementation plans are either incomplete or non-existent.

3. *Maturity level 3: Jordan, Egypt and Saudi Arabia*

All three countries have devised ICT policies and strategies, as well as implementation plans. However, implementation of these policies and strategies is proceeding at a slow pace, either because of bureaucracy (Saudi Arabia) or because of insufficient resources (Jordan and Egypt).

4. *Maturity level 4: United Arab Emirates, Qatar and Bahrain*

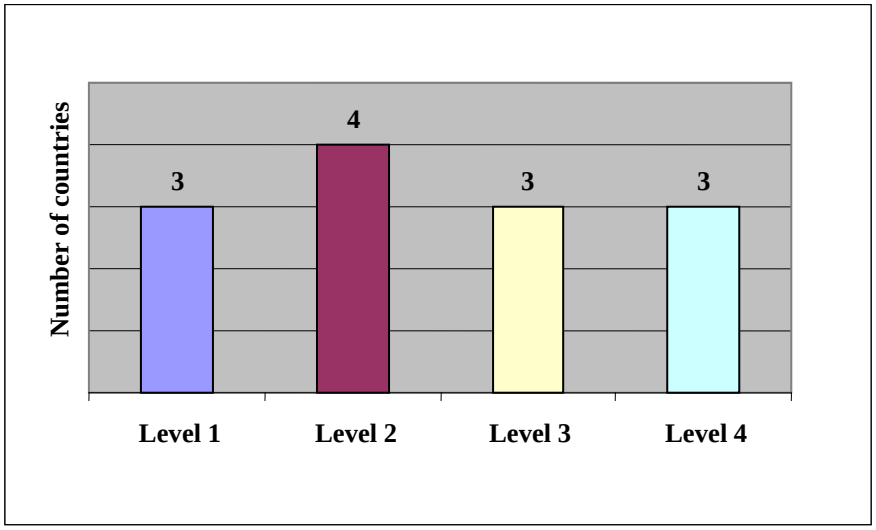
The three countries at maturity level 4 are characterized by a strong political will and concerted efforts to transform their countries into knowledge societies. They have also devised ICT policies and strategies, as well as implementation plans, where implementation is proceeding at an acceptable pace.

[4] www.aisoc.org.

TABLE 1. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN THE ROLE OF GOVERNMENTS AND ALL STAKEHOLDERS IN BUILDING THE INFORMATION SOCIETY

	Level 1	Level 2	Level 3	Level 4
Country or territory	2007	2007	2007	2007
Bahrain				✓
Egypt			✓	
Iraq	✓			
Jordan			✓	
Kuwait		✓		
Lebanon		✓		
Oman		✓		
Palestine	✓			
Qatar				✓
Saudi Arabia			✓	
Syrian Arab Republic		✓		
United Arab Emirates				✓
Yemen	✓			

Figure 1. Maturity levels of ESCWA member countries in the role of Governments and all stakeholders in building the information society, 2007



C. SUGGESTIONS AND RECOMMENDATIONS

The establishment and creation of an information society requires effective governance and widespread participation of economic and social sectors. The following are some recommendations in this regard:

(a) Revamp ICT strategies and policies, based on thorough research and studies to assess the current and future needs of society, without resorting to copying strategies and policies devised by other countries;

(b) Support the establishment of ICT-related civil society organizations, both financially and procedurally. Even Bahrain, considered the ESCWA member country most accommodating to the establishment of civil society organizations and associations, has placed many obstacles in the way of establishing some of these organizations. For example, the country blocked the attempts by AKEA to obtain a licence, which led the association to get it through Saudi Aramco;

(c) Encourage the participation of the private sector and existing civil society organizations (such as Internet and computer associations) in evaluating, revamping and monitoring the implementation of Government strategies and policies;

(d) Allocate the financial resources needed to realize ICT-related strategies and policies, figuring them into the country's annual budget;

(e) Put in place mechanisms to monitor ICT indicators for the establishment of an information society, measure the pace and extent to which policies and strategies have been implemented, and issue an annual report on the matter.

II. ICT INFRASTRUCTURE

A. COMPARATIVE ANALYSIS

All ESCWA member countries continued to make significant progress in the adoption of ICT in 2006. The average score of the 13 ESCWA member countries on Madar Research ICT Use Index increased to 0.67 by end 2006, a 24.07 per cent rise since 2005, when the index average was only 0.54. All of the ESCWA member countries made gains, with the sole exception of Kuwait, which ranked last in terms of growth rate and slipped some 0.01 points to finish 2006 with a score (1.40) and rank (13th) almost identical to those of the previous year. Madar Research ICT Use Index examines four major indicators for each of the 13 ESCWA member countries: mobile phone subscribers, fixed-line subscribers, Internet users and installed computers.

TABLE 2. RANKING OF ESCWA MEMBER COUNTRIES BY ICT USE INDEX GROWTH, 2005-2006
(*Ranked by growth*)

Rank	Country or territory	ICT Use Index 2005	ICT Use Index 2006	Percentage point change	Growth (*percentage*)
1	Iraq	0.31	0.47	0.16	51.61
2	Syrian Arab Republic	0.43	0.55	0.12	27.91
3	Saudi Arabia	1.05	1.30	0.25	23.81
4	Egypt	0.40	0.49	0.09	22.50
5	United Arab Emirates	1.84	2.25	0.41	22.28
6	Oman	0.81	0.98	0.17	20.99
7	Yemen	0.20	0.24	0.04	20.00
8	Jordan	0.91	1.08	0.17	18.68
9	Palestine	0.56	0.65	0.09	16.07
10	Qatar	1.59	1.81	0.22	13.84
11	Lebanon	0.64	0.69	0.05	7.81
12	Bahrain	1.90	2.00	0.10	5.26
13	Kuwait	1.41	1.40	-0.01	-0.71
	Average	0.54	0.67	0.13	24.07

Source: Madar Research Group.

Although GCC countries dominated the top five positions on the 2006 Madar Research ICT Use Index, only two of them (the United Arab Emirates and Saudi Arabia) made it to the top five positions in terms of growth rates. The top two positions as well as the fourth position in terms of ICT index growth were accounted for by countries representative of the remaining ESCWA region (Levant), which has largely underdeveloped ICT markets. Indeed Iraq, the Syrian Arab Republic and Egypt experienced remarkable ICT Use Index growth in 2006.

Unlike 2005, when Iraq attained growth rates of 125.25 per cent, no ESCWA economy managed triple-digit overall growth in 2006. Both the United Arab Emirates and Bahrain registered a milestone, however, by breaking through the Madar Research ICT Use Index's 2.00 barrier.

Needless to say, mobile phone subscribers continued to provide the impetus for ESCWA member countries' ICT growth in 2006, with mobile subscriptions climbing at a rate of 42.01 per cent compared with 2005. Internet users grew by 13.12 per cent, while installed computer base increased by 11.84 per cent. Growth was slowest in the fixed-line sector, with total subscriber numbers increasing only by 5.52 per cent.

TABLE 3. ICT USE INDEX RANKING OF ESCWA MEMBER COUNTRIES, 2006

Rank	Country or territory	Population	Fixed-line subscribers	Mobile phone subscribers	Internet users	Installed computer base	ICT Use Index
1	United Arab Emirates	4 433 071	1 305 000	5 520 000	2 070 000	1 100 000	2.25
2	Bahrain	730 022	196 246	831 000	248 000	185 000	2.00
3	Qatar	871 500	217 000	919 708	240 000	200 000	1.81
4	Kuwait	3 200 370	515 000	2 529 679	851 000	600 000	1.40
5	Saudi Arabia	24 458 400	3 900 000	19 668 191	5 320 000	2 950 000	1.30
6	Jordan	5 745 313	677 100	4 156 600	795 000	580 000	1.08
7	Oman	2 638 145	271 456	1 818 024	298 000	210 000	0.98
8	Lebanon	4 613 111	670 000	1 124 000	845 000	530 000	0.69
9	Palestine	3 900 454	341 330	1 471 000	525 000	190 000	0.65
10	Syrian Arab Republic	18 824 654	3 300 000	4 755 541	1 550 000	730 000	0.55
11	Egypt	76 073 372	10 807 678	17 970 815	6 000 000	2 300 000	0.49
12	Iraq	26 768 931	1 100 000	8 842 057	1 750 000	815 000	0.47
13	Yemen	21 791 266	968 328	3 022 629	950 000	380 000	0.24
	Total	194 048 609	24 269 138	72 629 244	21 442 000	10 770 000	0.67

Source: Madar Research Group.

1. *Telephone networks and services*

(a) *Fixed-line services*

In 2006, the liberalization of fixed-line markets among the 13 ESCWA member countries continued to pick up steam. By December 2006, the United Arab Emirates's Etisalat faced competition for the first time in its home market with the entrance of newly-licensed operator Du. Du took over the fixed-line base earlier developed by Sahm Telecom to service some 20,000 business and residential customers in Dubai's Internet, Media and International Financial cities, even while it began offering residential and commercial Internet access and mobile phone services.

Also in December 2006, the Jordanian Telecommunications Regulatory Commission granted the country's first Fixed Broadband Wireless Access (FBWA) licence to local mobile operator Umniah. Another company, ATCO-Clearwire, also received an FBWA licence in January 2007, and more were expected to be issued later in the year.

By mid-2007, Saudi Arabia announced that fixed-line licences would be awarded to three different consortia headed by Bahrain's Batelco, Hong Kong's PCCW and the United States' Verizon Communications. Qatar also indicated plans to invite bids for a second fixed-line by late 2007, while Egypt has expressed interest in doing the same in 2008.

The total number of fixed-line subscribers in the 13 ESCWA member countries surveyed for this study rose 5.52 per cent in 2006, while the overall fixed-line penetration rate remained fairly steady, at 12.51 per cent by end 2006. The Syrian Arab Republic experienced the highest growth (13.68 per cent), followed by Lebanon and Iraq, respectively. Bahrain had the lowest positive growth of all ESCWA member countries, a mere 0.69 per cent, indicating that the fixed-line market in the country is approaching saturation. In general, this may be said of all GCC economies, where the highest fixed-line growth for 2006 was only 5.66 per cent (Qatar).

Palestine was the only ESCWA member country whose fixed-line growth decelerated (-2.34 per cent) in 2006, sidelined by the growing popularity of mobile phone services as well as the political and economic crises that had damaged the fixed-line infrastructure in the country.

To date, the fixed-line sector in most Arab economies has been far less competitive than the mobile market, leading to higher prices and lower coverage, particularly in sparsely populated rural areas that are often poorly served by state monopolies. Despite promising increases in network capacity in countries like the Syrian Arab Republic, nationwide network coverage remains a challenge in need of creative solutions. One approach being considered to meet the high demand for fixed telephony in remote areas is the establishment of wireless fixed-line networks; another involves the application to the fixed-line market of the build-operate-transfer (BOT) model, which has been successfully used to expand mobile coverage.

The United Arab Emirates registered the highest fixed-line penetration rate in the ESCWA region, at 29.44 per cent, up almost three percentage points from 2005. Of the Levant countries, only the Syrian Arab Republic – whose fixed-line penetration rate stood at 17.53 per cent as of end 2006 – made it to the top five, snatching fourth place. The rest comprised GCC states, namely, Bahrain (second place), Qatar (third), Kuwait (fifth). As might have been expected, Iraq performed worst among ESCWA member countries, with a fixed-line penetration of merely 4.11 per cent.

TABLE 4. ESCWA FIXED-LINE SUBSCRIBERS BY COUNTRY, 2005-2006
(*Ranked by growth*)

Rank	Country or territory	Fixed-line subscribers 2005	Fixed-line subscribers 2006	Growth (*percentage*)
1	Syrian Arab Republic	2 903 000	3 300 000	13.68
2	Lebanon	600 000	670 000	11.67
3	Iraq	1 000 000	1 100 000	10.00
4	Jordan	628 200	677 100	7.78
5	Yemen	901 400	968 328	7.42
6	Qatar	205 400	217 000	5.65
7	United Arab Emirates	1 246 900	1 305 000	4.66
8	Egypt	10 400 000	10 807 678	3.92
9	Saudi Arabia	3 800 000	3 900 000	2.63
10	Oman	265 200	271 456	2.36
11	Kuwait	505 500	515 000	1.88
12	Bahrain	194 900	196 246	0.69
13	Palestine	349 500	341 330	-2.34
	Total	23 000 000	24 269 138	5.52

Source: Madar Research Group.

TABLE 5. PENETRATION RATE OF FIXED LINES IN THE ESCWA REGION, 2006

Rank	Country or territory	Population	Fixed-line subscribers	Fixed-line penetration rate (*percentage*)
1	United Arab Emirates	4 433 071	1 305 000	29.44
2	Bahrain	730 022	196 246	26.88
3	Qatar	871 500	217 000	24.90
4	Syrian Arab Republic	18 824 654	3 300 000	17.53
5	Kuwait	3 200 370	515 000	16.09
6	Saudi Arabia	24 458 400	3 900 000	15.95
7	Lebanon	4 613 111	670 000	14.52
8	Egypt	76 073 372	10 807 678	14.21
9	Jordan	5 745 313	677 100	11.79
10	Oman	2 638 145	271 456	10.29
11	Palestine	3 900 454	341 330	8.75
12	Yemen	21 791 266	968 328	4.44
13	Iraq	26 768 931	1 100 000	4.11
	Total	194 048 609	24 269 138	12.51

Source: Madar Research Group.

(b) *Mobile services*

The total number of active mobile network operators across the ESCWA region increased to 28 in 2006. Regulators in ESCWA member countries moved in the direction of mobile liberalization in 2006. In Qatar, the promulgation of a new telecommunications law gave ictQATAR the power to issue new mobile and fixed-line licences. Indeed the country's mobile licensing process was well under way by mid-2007. In December 2006, Kuwait's National Assembly endorsed a Government plan to establish a third mobile operator, expected to begin operations in the first quarter of 2008. In Bahrain, however, the TRA has delayed a decision, expected in 2007, to offer a third mobile licence.

In July 2006, Egypt granted a new 15-year licence for GSM and 3G mobile services to a third operator, Etisalat Misr, which began commercial operations about 10 months later. In September 2006, Wataniya International succeeded in winning a tender to build and operate a 2G/3G mobile network in Palestine, with the licence awarded in March 2007. A round of mobile licensing planned for the Iraqi market in 2006 did not take place, with incumbent operators receiving extensions to existing short-term licences until the security situation improved. In Saudi Arabia, a firm established by Kuwait's MTC and Partners received a licence to establish a new mobile network in the kingdom.

With four operators, the Jordanian mobile market has continued to be the most competitive in the ESCWA region, followed by Iraq, Saudi Arabia and Yemen, which had three mobile operators each. As of end 2006, however, all other ESCWA member countries had only two active operators, except Palestine, Qatar and the United Arab Emirates, each of which had only one.

TABLE 6. ACTIVE MOBILE NETWORK OPERATORS IN THE ESCWA REGION, 2006

Country or territory	Number
Jordan	4
Iraq	3
Saudi Arabia	3
Yemen	3
Bahrain	2
Egypt	2
Kuwait	2
Lebanon	2
Oman	2
Syrian Arab Republic	2
Palestine	1
Qatar	1
United Arab Emirates	1
Total	28

Source: Madar Research Group.

Growth in mobile subscribers, which registered 42.01 per cent in 2006, was still the principal driver of overall growth as measured by the latest Madar Research ICT Use Index. Iraq ranks first among ESCWA member countries in terms of mobile subscriber growth, registering a rise of 93.38 per cent compared to the number of subscribers a year earlier. No other ESCWA member country achieved in 2006 a mobile growth rate exceeding the 48.65 per cent posted by the Syrian Arab Republic which came in second place. The lowest mobile growth rate was registered by Kuwait (6.30 per cent).

TABLE 7. GROWTH RATE OF MOBILE PHONE SUBSCRIBERS IN THE ESCWA REGION, 2005-2006
(*Ranked by growth*)

Rank	Country or territory	Mobile phone subscribers 2006	Mobile phone subscribers 2005	Growth rate (*percentage*)
1	Iraq	8 842 057	4 572 300	93.38
2	Syrian Arab Republic	4 755 541	3 199 100	48.65
3	Saudi Arabia	19 668 191	13 411 800	46.65
4	Yemen	3 022 629	2 132 900	41.71
5	Egypt	17 970 815	12 821 000	40.17
6	Oman	1 818 024	1 333 200	36.37
7	Palestine	1 471 000	1 090 400	34.90
8	Jordan	4 156 600	3 171 800	31.05
9	Qatar	919 708	716 700	28.33
10	United Arab Emirates	5 520 000	4 534 500	21.73
11	Lebanon	1 124 000	1 011 000	11.18
12	Bahrain	831 000	771 000	7.78
13	Kuwait	2 529 679	2 379 800	6.30
	Total	72 629 244	51 145 500	42.01

Source: Madar Research Group.

In terms of mobile phone penetration rate, three GCC countries had exceeded the 100 per cent barrier in 2006, namely, United Arab Emirates (124.52 per cent), Bahrain (113.83 per cent) and Qatar (105.53 per cent). Two other GCC countries, Saudi Arabia and Kuwait, registered mobile phone penetration rates within the neighbourhood of 80 per cent, which explains the relatively low growth in GCC mobile subscriptions in comparison to the less-developed ESCWA member countries (particularly Iraq, Syrian Arab Republic, Yemen and Egypt). Barring Oman, where penetration was only 68.91 per cent, the GCC market is slowly becoming a saturated market for mobile phone services.

At the other end of the scale, six ESCWA member countries registered penetration rates of less than 50 per cent. In descending order, they were Palestine (37.71 per cent), Iraq (33.03 per cent), Syrian Arab Republic (25.26 per cent), Lebanon (24.37 per cent), Egypt (23.62 per cent) and Yemen (13.87 per cent). Significant changes in these markets, however, are expected as new mobile operators continue to enter these markets over the next few years.

TABLE 8. MOBILE PHONE PENETRATION RATE IN THE ESCWA REGION, 2006

Rank	Country or territory	Population	Mobile phone subscribers	Mobile phone penetration rate (*percentage*)
1	United Arab Emirates	4 433 071	5 520 000	124.52
2	Bahrain	730 022	831 000	113.83
3	Qatar	871 500	919 708	105.53
4	Saudi Arabia	24 458 400	19 668 191	80.41
5	Kuwait	3 200 370	2 529 679	79.04
6	Jordan	5 745 313	4 156 600	72.35
7	Oman	2 638 145	1 818 024	68.91
8	Palestine	3 900 454	1 471 000	37.71
9	Iraq	26 768 931	8 842 057	33.03
10	Syrian Arab Republic	18 824 654	4 755 541	25.26
11	Lebanon	4 613 111	1 124 000	24.37
12	Egypt	76 073 372	17 970 815	23.62
13	Yemen	21 791 266	3 022 629	13.87
	Total	194 048 609	72 629 244	37.43

Source: Madar Research Group.

(c) *Mobile-to-fixed-line subscriber ratios*

The phenomenal rise in mobile phone subscriptions across the ESCWA region and the relative stagnation in fixed-line growth both contributed to higher mobile-to-fixed-line ratios in all ESCWA member countries except Lebanon. As in 2005, Iraq had the highest ratio, now pegged at 8.04 mobile phones for

every fixed-line subscription. Oman ranked second, with a mobile-to-fixed-line ratio of 6.70. At the bottom end of the scale, the Syrian Arab Republic registered a modest increase, going from 1.10 mobile for every fixed-line subscriber in 2005 to 1.44 in 2006. The average ratio across the 13 ESCWA member countries surveyed for the study was 2.99 mobile phones for every fixed-line subscription.

TABLE 9. MOBILE PHONE TO FIXED-LINE RATIO, 2006

Country or territory	Number of mobile phone subscribers divided by fixed-line subscribers
Iraq	8.04
Oman	6.70
Jordan	6.14
Saudi Arabia	5.04
Kuwait	4.91
Palestine	4.31
Qatar	4.24
Bahrain	4.23
United Arab Emirates	4.23
Yemen	3.12
Lebanon	1.68
Egypt	1.66
Syrian Arab Republic	1.44
Total	2.99

Source: Madar Research Group.

2. *Internet service providers*

In 2006, the total number of Internet users in the 13 ESCWA member countries under study was 21,442,000, having risen by a modest 13.11 per cent over the previous year's figure. Growth was driven primarily by the steady progress shown by the Syrian Arab Republic (29.17 per cent) and Egypt (20.00 per cent). Overall GCC growth was 9.36 per cent, with the United Arab Emirates (9.86 per cent) and Saudi Arabia (9.42 per cent) performing only marginally better than the rest of the ESCWA member countries. Iraq's user growth (9.38 per cent) was significantly higher than in other ESCWA member countries experiencing political turbulence and its consequences, namely, Lebanon (5.65 per cent) and Palestine (5.00 per cent), which occupied the last two spots.

The United Arab Emirates led ESCWA member countries in terms of Internet penetration rising 6.6 per cent from 2005 to reach approximately 46.69 per cent. Bahrain ranked second place with the Internet penetration rate in the state reaching 33.97 per cent as of end 2006.

TABLE 10. INTERNET PENETRATION RATE IN THE ESCWA REGION, 2006

Rank	Country or territory	Population	Internet users	Internet penetration rate (*percentage*)
1	United Arab Emirates	4 433 071	2 070 000	46.69
2	Bahrain	730 022	248 000	33.97
3	Qatar	871 500	240 000	27.54
4	Kuwait	3 200 370	851 000	26.59
5	Saudi Arabia	24 458 400	5 320 000	21.75
6	Lebanon	4 613 111	845 000	18.32
7	Jordan	5 745 313	795 000	13.84
8	Palestine	3 900 454	525 000	13.46
9	Oman	2 638 145	298 000	11.30
10	Syrian Arab Republic	18 824 654	1 550 000	8.23
11	Egypt	76 073 372	6 000 000	7.89
12	Iraq	26 768 931	1 750 000	6.54
13	Yemen	21 791 266	950 000	4.36
	Total	194 048 609	21 442 000	11.05

Source: Madar Research Group.

TABLE 11. GROWTH RATE OF INTERNET USERS IN THE ESCWA REGION, 2005-2006
(*Ranked by growth*)

Rank	Country or territory	Internet users 2005	Internet users 2006	Growth rate (*percentage*)
1	Syrian Arab Republic	1 200 000	1 550 000	29.17
2	Egypt	5 000 000	6 000 000	20.00
3	Yemen	850 000	950 000	11.76
4	United Arab Emirates	1 884 300	2 070 000	9.86
5	Saudi Arabia	4 862 000	5 320 000	9.42
6	Iraq	1 600 000	1 750 000	9.38
7	Kuwait	780 000	851 000	9.10
8	Qatar	220 000	240 000	9.09
9	Bahrain	228 000	248 000	8.77
10	Oman	280 000	298 000	6.43
11	Jordan	750 000	795 000	6.00
12	Lebanon	800 000	845 000	5.63
13	Palestine	500 000	525 000	5.00
	Total	18 954 300	21 442 000	13.12

Source: Madar Research Group.

3. *Personal computer dissemination*

The Personal computer (PC) penetration rate is one of the hardest to determine, due to technical and statistical factors, including, primarily, the components upgrade factor coupled with irregularities in local computer assembly. Many small and individual assemblers typically recycle such hardware components as drivers, monitors and cases. Moreover, the grey market, which refers to the sale of original products through non-licensed channels, hinders the assessment with regard to the number of processors, motherboards and other basic components used in each country. Furthermore, the scarcity of local assembly factories and locally-branded computers renders the process of estimation closer to a process of approximation.

Despite these challenges, basic indicators developed by research centres in the region, including the Madar Research Group, help in the process of estimating the PC penetration rate in each country in the region. Within that context, the estimation uses the assumption that the average life of a PC in the GCC countries is four years, while it is set at five years in other ESCWA member countries.

Using such approximations, the installed computer base in the ESCWA region rose some 11.81 per cent in 2006 to reach 10,770,000 units.

Yemen enjoyed the highest growth, an impressive 18.75 per cent, over 2005 figures. Egypt, on the other hand, grew by 17.95 per cent, thus driving a dramatic rise in its overall ranking against the rest of the ESCWA member countries, to take second place.

Saudi Arabia showed a performance similar to Egypt's, with installed PCs in the kingdom rising by 13.03 per cent in 2006. Growth of the PC installed base for the rest of the GCC countries, however, witnessed slight deceleration. Qatar grew by 11.11 per cent, while Oman, the United Arab Emirates and Kuwait grew by 10.53 per cent, 10.00 per cent, and 9.09 per cent, respectively. The least growth among GCC states was registered by Bahrain (5.71 per cent), offset by the fact that it had the highest computer penetration rate (25.34 per cent) of all ESCWA member countries. Three ESCWA member countries that achieved less than 5.00 per cent growth were Iraq (4.49 per cent), Lebanon (3.92 per cent) and Palestine (2.70 per cent).

The total change in ESCWA penetration rates was marginal during 2006. This reflected the generally static rates of individual ESCWA member countries, which tended to register increases of less than 1.00 per cent each. The only exceptions were the United Arab Emirates (up 3.53 per cent from 21.28 per cent in

2005), Qatar (up 1.26 per cent from 21.69 per cent), Saudi Arabia (up 1.05 per cent from 11.01 per cent) and Bahrain (up 1.03 per cent from 24.31 per cent).

TABLE 12. GROWTH RATE OF INSTALLED COMPUTER BASE IN THE ESCWA REGION, 2005-2006
(*Ranked by growth*)

Rank	Country or territory	Installed PC base 2005	Installed PC base 2006	Growth rate (*percentage*)
1	Yemen	320 000	380 000	18.75
2	Egypt	1 950 000	2 300 000	17.95
3	Syrian Arab Republic	630 000	730 000	15.87
4	Saudi Arabia	2 610 000	2 950 000	13.03
5	Qatar	180 000	200 000	11.11
6	Oman	190 000	210 000	10.53
7	United Arab Emirates	1 000 000	1 100 000	10.00
8	Kuwait	550 000	600 000	9.09
9	Bahrain	175 000	185 000	5.71
10	Jordan	550 000	580 000	5.45
11	Iraq	780 000	815 000	4.49
12	Lebanon	510 000	530 000	3.92
13	Palestine	185 000	190 000	2.70
	Total	9 630 000	10 770 000	11.84

Source: Madar Research Group.

TABLE 13. PERSONAL COMPUTER PENETRATION RATE IN THE ESCWA REGION, 2006

Rank	Country or territory	Population	Installed computer base	PC penetration rate (*percentage*)
1	Bahrain	730 022	185 000	25.34
2	United Arab Emirates	4 433 071	1 100 000	24.81
3	Qatar	871 500	200 000	22.95
4	Kuwait	3 200 370	600 000	18.75
5	Saudi Arabia	24 458 400	2 950 000	12.06
6	Lebanon	4 613 111	530 000	11.49
7	Jordan	5 745 313	580 000	10.10
8	Oman	2 638 145	210 000	7.96
9	Palestine	3 900 454	190 000	4.87
10	Syrian Arab Republic	18 824 654	730 000	3.88
11	Iraq	26 768 931	815 000	3.04
12	Egypt	76 073 372	2 300 000	3.02
13	Yemen	21 791 266	380 000	1.74
	Total	194 048 609	10 770 000	5.55

Source: Madar Research Group.

4. *Internet infrastructure and backbone*

Egypt boasts high quality Internet services, from DSL and ISDN to frame relay, ATM, leased lines and satellite connections. Total national bandwidth has increased from 850 Mbps in 2003 to 9.3 Gbps in 2006.

Egypt has two main terrestrial fibre-optics cable links: a link with the Sudan, which is up to four STM-1 and upgradeable to 2.5 Gbps, and a “dark fibre” (cable laid down but not yet in use) link extending between the electricity companies in each of Jordan and Egypt for use by Telecom Egypt and JTC.

In Yemen, work is still underway to complete a 700-kilometre-long fibre-optic connection with Oman. Meanwhile, the Public Telecommunication Corporation is implementing a network expansion project that will link up all cities and major towns in Yemen with an 8,600-km fibre-optic correspondence network whose capacity is designed to meet demand for the next five years.

In early 2005 the network was used to provide ADSL services at a speed of up to 512 Kbps. However, ADSL charges were too high for end-users to allow for full use of the network, evident by the small number of subscribers, which up to the second half of 2006 reached only 2,781. Today, leased lines are also provided on the network, with speeds ranging between 64 Kbps and 2 Mbps.

By end of December 2006, the Ministry of Telecommunications announced the launch of wireless Internet (Wi-Fi) service at 17 hotspots in the capital Sana'a and the province of Aden, as the first phase of a nationwide provision of the service.

Meanwhile, the number of main ISPs in Kuwait has risen to four, which rely mainly on cable Internet. Increased competition is leading to more competitive prices. As a result, broadband Internet has become more affordable and the number of DSL subscriptions, with speeds of up to 1 Mbps, has surpassed the number of dial-up subscriptions. Dial-up subscribers are increasingly switching to the faster and affordable DSL, now available in all urban areas.

With the use of Wi-Fi technology, Internet access points have multiplied in number across Kuwait. Hotspots, which are now more available in shopping malls and coffee shops, have overshadowed the formerly popular Internet cafés. DSL service has also encouraged the use of wireless connectivity in homes, and it is becoming quite popular with families.

Additionally, a project is currently underway by the Ministry of Telecommunications to upgrade Kuwait's fixed-telephone line network to fibre optics. The project seeks to completely replace ordinary telephone lines connecting homes and businesses to the telecom provider with fibre-optic cables.

Meanwhile, some service providers in Saudi Arabia were beginning to launch next-generation networks as the kingdom completed a project to link all major cities in the kingdom through a network of some 50,000 km of fibre optics. Around 50 per cent of this network was expected to enter active service by end 2007. Moreover, services based on the WiMAX technology were also planned for launch by the third quarter of 2007.

In 2006 Saudi Arabia allocated US$ 2.5 billion for expanding, upgrading and maintaining the Kingdom's telecommunication infrastructure (International Data Center, 2006). As part of this expansion in services, an ambitious project was implemented to offer customers voice, high-speed data and television transmission over a single cable.

The United Arab Emirates has in recent years continued to witness an expansion in the total national Internet bandwidth. It climbed from 1.024 Gbps in 2003 to 2.680 Gbps in 2005, then jumped to 10 Gbps in 2006. Work has also begun on the Fiber-Optics Gulf (FOG) project, which will connect the United Arab Emirates to Kuwait after passing through Qatar and Bahrain via a 1,300-km-long fibre-optic cable. With a capacity of 10 Mbps for every pair of fibre-optic cables and with SDH technology in place, the FOG system will be able to carry a huge amount of digital traffic and will make possible a new set of advanced services such as ISDN, broadband and video on demand.

In Iraq, Nortel had completed by end 2005 the construction of 50 per cent of a national fibre-optic network.

5. *ICT connectivity*

The United Nations Conference on Trade and Development (UNCTAD) assesses ICT connectivity by measuring four indicators:[5] the number of PCs per capita, the number of telephone mainlines per capita, the number of mobile subscribers per capita and the number of Internet hosts per capita. An Internet host is a PC with a unique IP address. A PC may have several IP addresses, and several PCs may have a single IP

[5] www.unctad.org/en/docs/iteipc20065_en.pdf.

address. Internet user penetration is not included in the connectivity indicators. It is part of the "accessibility" indicators, which include adult literacy rate and cost of local calls.

The previous sections of this report made an assessment of the ESCWA member countries based on the first three ICT indicators. This section covers the fourth indicator.

The Internet Systems Consortium (ISC) issues regular statistics on Internet hosts according to top level domains (TLDs) in each country. The latest report was released by the consortium in July 2007.

TABLE 14. NUMBER OF HOSTS PER 10,000 INHABITANTS IN THE ESCWA REGION, JULY 2007

Rank	Country or territory	Population	Number of hosts	Number hosts per 10,000 inhabitants
1	United Arab Emirates	4 433 071	335 939	757.80
2	Lebanon	4 613 111	25 112	54.44
3	Bahrain	730 022	2 413	33.05
4	Jordan	5 745 313	16 973	29.54
5	Saudi Arabia	24 458 400	70 892	28.98
6	Egypt	76 073 372	151 127	19.87
7	Oman	2 638 145	3 763	14.26
8	Kuwait	3 200 370	2 013	6.29
9	Qatar	871 500	365	4.19
10	Syrian Arab Republic	18 824 654	7 692	4.09
11	Iraq	26 768 931	1 247	0.466
12	Yemen	21 791 266	163	0.075
13	Palestine	3 762 000	-	-

Source: Internet Systems Consortium (www.isc.org).

As shown in the table above, the United Arab Emirates outperformed by far all other ESCWA member countries in this indicator.

Connectivity can also be examined by economic sector, namely, education, health, manufacturing and commerce. However, such data are not available for the ESCWA member countries.

B. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES

The methodology and levels of ICT maturity used in this report are as defined by Regional Profiles 2003 and 2005. The maturity levels are:

1. *Maturity level 1*: *Iraq and Yemen*

This lowest level of ICT infrastructure is characterized by: (a) low penetration rates of fixed and mobile telephone lines; (b) lack of an environment conducive to widespread use of telecommunication services by businesses and individuals; (c) insufficient national bandwidth, inadequate backbone for voice and data telecommunication, and insufficient number of Internet players in the market.

2. *Maturity level 2*: *Egypt, Lebanon, Oman, Palestine and Syrian Arab Republic*

ICT infrastructure is characterized by: (a) average penetration rates of fixed and mobile telephone lines; (b) an encouraging environment for widespread use of telecommunication services by businesses and individuals; (c) national bandwidth/backbone for voice and data telecommunication undergoing development, and a sufficient number of Internet players in the market.

3. *Maturity level 3*: *Jordan, Kuwait, Qatar and Saudi Arabia*

ICT infrastructure is characterized by: (a) above average penetration rates of fixed and mobile telephone lines; (b) an encouraging environment for widespread use of telecommunication services by businesses and individuals; (c) robust national bandwidth/backbone for voice and data telecommunication, and active Internet players in the market.

4. *Maturity level 4*: *Bahrain and the United Arab Emirates*

ICT infrastructure is characterized by: (a) high penetration rates of fixed and mobile telephone lines and high quality services; (b) an attractive environment for widespread use of telecommunication services by businesses and individuals; (c) robust national bandwidth/backbone for voice and data telecommunication, and active Internet players in the market.

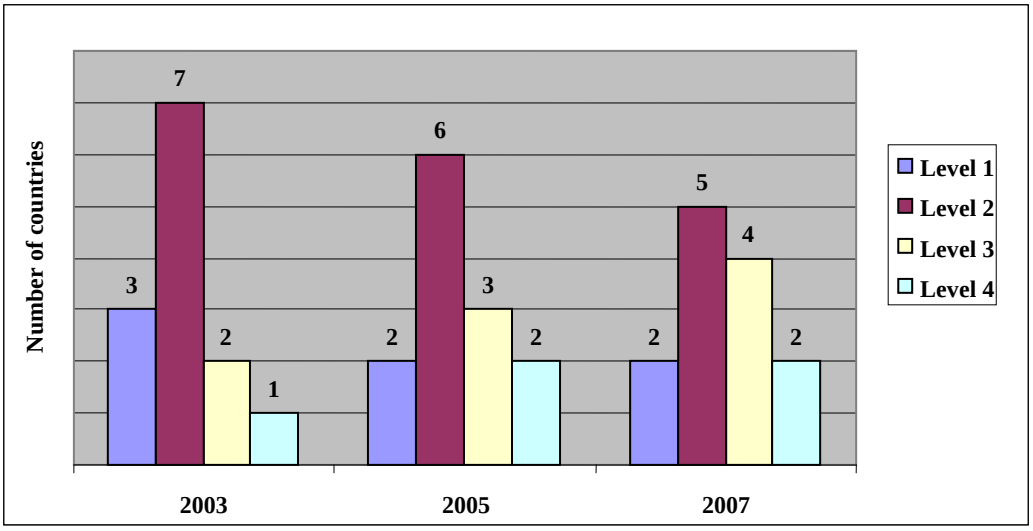
TABLE 15. RANKING OF ESCWA MEMBER COUNTRIES BY ICT INFRASTRUCTURE MATURITY LEVEL

	Level 1		Level 2		Level 3		Level 4	
Country or territory	2005	2007	2005	2007	2005	2007	2005	2007
Bahrain							✓	✓
Egypt			✓	✓				
Iraq	✓	✓						
Jordan			✓			✓		
Saudi Arabia					✓	✓		
Kuwait					✓	✓		
Lebanon			✓	✓				
Oman			✓	✓				
Palestine			✓	✓				
Qatar					✓	✓		
Syrian Arab Republic			✓	✓				
United Arab Emirates							✓	✓
Yemen	✓	✓						

ESCWA member countries have made tangible progress in developing their ICT infrastructure and in achieving growth in Internet and fixed and mobile telephone penetration. This growth, however, was offset by high population growth rates in several ESCWA member countries.

Analysis of national, regional and international ICT reports on ESCWA member countries, whose results are summarized in the ICT infrastructure maturity table, shows that Jordan is the only ESCWA member country that has moved into a higher level of maturity (from the second level to the third). Meanwhile, Qatar approached the fourth level but remained on the third, while the United Arab Emirates made significant progress within the top level which it reached two years ago. The rest of the ESCWA member countries remained at the same levels they occupied in 2005.

Figure 2. Maturity levels of ESCWA member countries in ICT infrastructure



C. SUGGESTIONS AND RECOMMENDATIONS

(a) The PC penetration rate should be increased, especially in education. The number of PCs per hundred students in ESCWA member countries is still very low. For instance Jordan, which recorded the highest ratio among its ESCWA counterparts on this measure, has only five PCs per 100 students. The ratio in the United Arab Emirates is three PCs per 100 students, while in the less developed ESCWA member countries the ratio drops to less than one PC per 100 students;

(b) While it is imperative that bringing Internet access to the largest possible number of the ESCWA region's population should remain a primary objective, the importance of the quality of that access should not be underestimated. Internet access of high quality and high speed should be increasingly made available to larger populations, especially in the richer ESCWA member countries such as the GCCs, bearing in mind that an increasing number of applications nowadays require much higher speeds than what a dial-up connection, for instance, can handle;

(c) As income levels in most ESCWA member countries with limited resources are rather low, it is essential to find resources to increase the numbers of public or community Internet centres where access is provided for free or for a minimal charge. This would give people who cannot afford Internet subscription charges the opportunity to use or learn at these free or Government-subsidized centres how to use the Internet, and thus increase ICT and Internet literacy and the number of Internet users.

III. ACCESS TO INFORMATION AND KNOWLEDGE

A. COMPARATIVE ANALYSIS

The level of access to information and knowledge in the ESCWA member countries differs from one country to another. While access to information is relatively easy in some countries with high Internet penetration rates such as in the United Arab Emirates and Qatar, such access in other countries is weak. Reasons for limited access include low Internet penetration rates, high access costs and lack of community access centres in areas not considered high priority by Government or telecommunication providers to provide Internet access services. Furthermore, subscription costs for broadband Internet, which facilitates access to information especially educational content, pictures and videos, are considered high for a large segment of the population, even in some of the wealthier ESCWA member countries.

1. *Public domain information*

Public domain information is information which is accessible to the public, free of charge, without requiring access permission. On the other hand, private information is subject to intellectual property rights, where the owner of information owns the rights to it.

Article 26 of the Declaration of Principles of WSIS states: a rich public domain is an essential element for the growth of the information society, creating multiple benefits such as an educated public, new jobs, innovation, business opportunities, and the advancement of science.

With the advancement of digital technology and the rise in Internet use, it is now possible to deliver and disseminate public information to a wider segment of the population, and make use of it to create new content.

In order to transform themselves into information societies, some ESCWA member countries began several years ago to implement e-government programmes, launching Internet websites and working to provide official public information, as well as a variety of e-government services to the general public. E-government websites in different ESCWA member countries vary in scope and type of service provided. While some countries such as the United Arab Emirates provide advanced and integrated services for individuals and businesses, allowing citizens to carry out and follow up on numerous transactions, other countries such as Yemen, Iraq and the Syrian Arab Republic are floundering in implementing their e-government programmes.

In this regard, a number of Government authorities have taken steps to publish reports, data and statistics on their websites. While such a direction is limited to a few of Government authorities, these are on the rise. For example, Kuwait's Central Agency for Information Technology (CAIT) incorporates statistics published by the different Government ministries on the use of e-government applications into its awareness campaign geared towards the general public.

Furthermore, the Kuwait Chamber of Commerce and Industry has developed its Al-Boom Project to monitor Kuwaiti websites through a knowledge management system. The system's automatic electronic search facility searches for Kuwaiti websites (Government, private and non-governmental) and within their content, and presents them to the general public. The International Chamber of Commerce awarded Kuwait's system the prize for the best technology-based project for 2005. Meanwhile, the websites of private sector companies and organizations are no longer limited to publishing promotional or marketing information, nor information related to the scope of their work. These websites now publish quarterly financial reports and other information that benefit their investor relations and stock market performance. This has been facilitated by regulatory measures taken by the Kuwaiti Government to enhance transparency between corporate management, investors and clients, especially for companies listed on the stock exchange.

The website of the Qatari General Secretariat for Development Planning[6] publishes up-to-date statistical data that reflect the country's economic and social development, including annual gross domestic product (GDP) figures, human development statistics and other data.

Use of the Internet to obtain information is gaining ground in Yemen among both individuals and organizations. A number of ministries and organizations publish data on their websites, including reports and bulletins on their performance, by way of providing information to the general public. Additionally, the National Center for Information provides its users (researchers, investors, students and others) with data collected from various sources, including Government sector organizations. The different data are restructured and archived by the National Center for Information, and are provided to the public free of charge in a number of formats, electronic and conventional (website, fax, telephone, mail and e-mail). The centre also provides its data access service through dedicated units and departments that receive customers in a number of locations in the capital Sana'a and in other provincial capitals.

Furthermore, the Yemeni Government has recently begun to publish all information related to Government tenders on the National Center for Information website. This information is regularly updated by the centre.

Bahrain, on the other hand, has established a comprehensive programme to publish all data produced by Government organizations on its websites. The e-government strategic plan also aims to publish all information related to the procedures and forms needed to carry out e-transactions, as well as information related to Government purchases and tenders on its e-government portal and on the various ministry websites.

The Bahrain Center for Studies and Research, meanwhile, has established a digital library accessible to all registered users in Bahrain and abroad. Furthermore, almost all Government ministries started to provide some of this information on their websites, and regularly update the information accessible to the public once they realized the vital importance of providing relevant and trustworthy information. This is evidenced by the rise in vacancies for content management positions in Government organizations.

Oman's belief that official statistical data is an integral component of economic, demographic, social and environmental development has driven the Omani Government to launch a national online statistical programme. This pioneering project aims to provide access to regularly-updated economic and social statistical data on the Ministry of National Economy's website. The ministry's website is actively used to obtain information on recent social statistics. The programme is expected to improve transparency levels in national planning, as well as the quality of economic research that relies on trustworthy, timely and freely accessible data.[7]

In line with its commitment to establishing an information society, the United Arab Emirates has raised awareness of the benefits of ICT, especially as the country provides access to information to everyone in an almost instantaneous manner. The United Arab Emirates' ministries provide citizens and residents with a number of services and information on their websites. Examples include the Ministry of Labour's electronic signature system, as well as electronic work permits.

Despite the difficult situation in Iraq, the Iraqi Government is striving to provide information on Government and ministry websites in line with its e-government strategy.

On the other hand, public libraries in ESCWA member countries have yet to digitize their books and provide public access to them. Some, however, have taken preliminary steps that may pave the way at later phases to providing complete digital access to book contents. For example, the Syrian Arab Republic's Al-Assad National Library has made available its various books and manuscripts in databases and archives that are accessible through a data transmission network. However, publicly available information is still limited and greater effort needs to be exerted to remedy the situation.

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[6] www.planning.gov.qa/statistics.html.

[7] Oman Information Technology Authority.

The directory of the Egyptian Libraries Network's content, which comprises a unified index of 158 libraries, has been incorporated into the automated library system created by the Information and Decision Support Center. Users can search the vast content using computers provided by the centre's library or through the Internet via the Egyptian Libraries Network.

The information published on the website of the Jordanian National Information System[8] has been produced by national public and private sector Jordanian organizations. The information comprises official data, texts and statistics, including economic and social statistical data and indicators, and data published by civil society and public organizations. The National Information System is a decentralized system that covers all organizations that create or collect data in the private and public sectors. Information is provided and shared over the Internet. This information, whether in text, data or image format, is precise, comprehensive, up to date and accessible to all, and covers all sectors of the economy.

2. *Access to information and public information*

The creation of an information society means providing free and full access to information to the public. This is contingent on the availability of the necessary technology, including an advanced ICT infrastructure. The existence of laws that protect citizens' information access rights within a framework of freedom and transparency is essential to the expansion of access to information.

Large-scale access to information on the Internet is often tied to Internet subscription costs, especially in developing countries. Consequently, the liberalization of the telecommunications sector contributes to the lowering of tariffs and guarantees access to information to all members of society equally.

There is some disparity between ESCWA member countries in terms of access to information. This is due to the disparity in the availability of advanced infrastructure and weak Internet penetration in some countries. GCC countries, for example, have an advanced ICT infrastructure in place, while the majority of the other ESCWA member countries suffer from inadequate infrastructure and low Internet penetration rates. For example, the Syrian Arab Republic recorded a low 8.23 per cent Internet penetration rate in 2006. This is the result of a number of factors, including the country's low installed computer base attributable to the high cost of computers and citizens' low purchasing power, as well as the low number of host servers in the country, the limitations placed on the use of some Internet protocols (FTP, newsgroups and chat) and the inadequacy of advanced Internet services.

Worth noting is the fact that broadband Internet penetration rates have risen recently in some ESCWA member countries, especially in the GCC countries. However, they remain low in other countries.

Box 1. Digital Opportunity Index

The World Summit on the Information Society (WSIS) publishes its annual Digital Opportunity Index (DOI) report to measure the advances countries have made in bridging the digital divide, especially with regard to the increase in broadband and wireless Internet access, in line with the Tunis 2005 commitments. The index results are published in an annual report by the International Telecommunication Union (ITU) and UNCTAD, and other members of the Digital Opportunity Forum.

The DOI is divided into three clusters (opportunity, infrastructure and utilization) to measure 11 ICT indicators. It has been compiled for 181 economies for the three-year period 2004-2006. An even longer time series for 62 leading economies for the period 2000-2006 is also available.

Four GCC countries – Bahrain, United Arab Emirates, Qatar and Kuwait – topped the Middle East and North Africa (MENA) region in the 2006 WSIS report, which covers 181 countries. Palestine, meanwhile, jumped 24 places to rank 98th globally with a score of 0.40.

[8] www.nis.jo.

Analysis of the data used to calculate the DOI reveals several general findings on international information society trends.

Firstly, reasons for the disparity in the digital divide range from inequality in ICT access to differences in user expertise.

Secondly, the report finds a large degree of disproportion between the number of households that own computers and the number of computers connected to the Internet. This is a phenomenon prevalent in the developing world. There are three Arab countries that have low Internet penetration rates compared with their installed computer base, namely, Lebanon (20 per cent), Jordan (22 per cent) and Palestine (35 per cent), thus encouraging the proliferation of Internet cafés and public access centres.

Thirdly, by end 2005, the number of broadband Internet connections exceeded dial-up connections globally, comprising 53 per cent of all Internet connections. ADSL connections, with speeds starting from 256 kbps, were available in 170 countries worldwide by end 2006.

TABLE 16. DOI RANKING OF ESCWA MEMBER COUNTRIES, 2005-2006

Arab rank	Country or territory	Opportunity	Infrastructure	Utilization	DOI score	Global rank
1	Bahrain	0.99	0.57	0.24	0.60	35
2	United Arab Emirates	0.99	0.56	0.21	0.59	37
3	Qatar	0.98	0.55	0.22	0.58	38
4	Kuwait	0.99	0.42	0.07	0.50	60
6	Saudi Arabia	0.96	0.35	0.06	0.46	75
7	Jordan	0.96	0.26	0.12	0.45	79
8	Oman	0.98	0.28	0.05	0.44	81
11	Egypt	0.96	0.22	0.04	0.41	91
12	Lebanon	0.96	0.19	0.05	0.40	93
13	Palestine	0.90	0.23	0.05	0.40	98
14	Syrian Arab Republic	0.92	0.17	0.02	0.37	104
16	Yemen	0.78	0.06	0.00	0.28	128
18	Iraq	N/A	N/A	N/A	N/A	N/A

Source: World Information Society Report 2007: Beyond WSIS.

Free access to the Internet is often obstructed in the majority of ESCWA member countries by the banning of certain websites. Reasons cited for the website blocks include national security, public welfare and conflict with religious and social values. Despite the availability of advanced Internet access services (broadband, Wi-Fi, etc.) in the GCCs, some countries use proxies on a wide basis, especially Saudi Arabia and to a certain extent, the United Arab Emirates. This greatly hinders free access to information. Furthermore, the prevalent culture of concealment and secrecy of information, particularly Government-related information, and the lack of transparency in most ESCWA member countries, are impediments to the free access to information.

The rise in Internet access costs and the lack of attention paid to connecting remote villages and areas in some ESCWA member countries, contribute to limited access. Despite the lowering of access costs by the Yemeni Ministry of Communications and Information Technology, they remain relatively high compared with income levels. Therefore, low-income and deprived individuals are unable to access information. Furthermore, in Yemen despite expanding telecommunication services to rural areas, service provision is still monopolized by the General Telecommunications Company. As a result, service charges remain high and therefore hinder the ability of individuals to subscribe to services easily, especially in rural areas.

In this context, perhaps the liberalization of the telecommunications sector in ESCWA member countries will contribute to a decrease in telecommunication charges, facilitating access to information by low-income segments, and also contributing to bridging the information divide within a single country.

Furthermore, the public access centres being established in some ESCWA member countries in association with international, regional and NGOs are playing a vital role in endorsing equal access for remote areas and underprivileged segments of society.

3. *Free and open access to scientific knowledge*

Scientific research and studies conducted by universities constitute an enormous wealth of knowledge that might be of great benefit if made available to society. Nevertheless, universities in ESCWA member countries have yet to carry out clear and systematic plans to facilitate access to such information. Where available, research and studies published on the Internet are the result of informal or individual efforts on the part of universities and students, and invariably lack institutional support.

The Syrian Ministry of Higher Education has taken an important step by establishing the virtual digital library that allows Syrian universities to gain free access to international scientific journals and periodicals through the Syrian Higher Education and Research Network.[9]

Meanwhile, the Egyptian Ministry of Communications and Information Technology, in association with the Academy of Scientific Research and Technology, created the Science and Technology Portal, which allows free access to scientific and technological information, publications and scientific research.

4. *Multi-purpose community public access points*

Multi-purpose community public access points are an important factor in establishing comprehensive access to information, especially in rural areas. They serve to bridge the digital divide among individuals in society and allow residents of rural and remote areas the opportunity to benefit from ICT. Public access points can provide services either for free or at reduced charges. Some countries use public facilities, such as libraries, schools and post offices, to provide access to the general public.

A number of ESCWA member countries have taken steps to establish public access points in rural areas, in association with international, regional and non-governmental organizations, in order to realize WSIS aims, especially that of connecting villages by 2010.

The Syrian Rural Knowledge Network Project, undertaken in association with the Ministry of Communications and Technology and UNDP, seeks to establish a large number of public access points in rural areas, as well as an Internet-based ICT network specializing in different rural and local community issues. There are two types of access centres set up within the project. The first is a multifunctional centre, comprising different access modes (Internet, public telephone network, fax, photocopiers, etc.) located mainly in rural areas. This type of public access point also provides ICT training. The second type is found in cities and offers, in addition to ICT training courses and vocational IT training opportunities for special needs and visually impaired individuals. In addition to the Rural Knowledge Network project, a network of other access centres is being set up connecting cultural centres found in smaller cities and other locations run by municipal authorities. The latter is being implemented in association with the Ministry of Communication and Technology, the Ministry of Culture and local authorities.

Jordan's knowledge stations play an important role in providing a variety of services to a wide segment of society. They aim to fulfil broad aims including:

(a) Bridging the digital divide between Jordan's provinces and regions;

(b) Overcoming computer illiteracy;

(c) Maximizing the benefits provided by the national information system by granting citizens access to national and international information over the Internet.

[9] www.shern.net.

TABLE 17. JORDAN KNOWLEDGE STATIONS STATISTICS

Year	People trained	Beneficiaries of walk-in services	Citizens benefiting from knowledge stations
2000-2006	82 450	84 000	166 450

Source: ESCWA, National Profile of the Information Society in the Hashemite Kingdom of Jordan, 2007.

In Yemen, which has a low Internet penetration rate, Internet cafés and telecommunication centres act as central public access points. By end 2006, Internet cafés in all provinces of Yemen numbered 836, averaging six Internet-enabled computers per café. An estimated 8,845 telecommunication centres also provide services in the country. However, only a small number of such centres operate in rural areas, resulting in only a limited number of residents in rural areas having access to the Internet. A recent Government decree, which calls for the removal of partitions between users at Internet cafés, serves as a form of censorship that impedes public access.

On the other hand, access services in Yemen provided by the National Information Center have been expanded, aided by the World Bank. This step is an encouraging start that paves the way for the establishment of public access centres, especially given that the country's third five-year plan for economic and social development, 2006-2010, has decreed a project to establish 14 information centres providing as a first phase local community services in the cities and rural areas of a number of provinces. The plan also decrees the establishment of 60 information units in various provinces, connected to the National Information Center, which in turn provide citizens in provinces and rural areas with information services and enhance access to the sources of this information.

NGOs in Kuwait have established public access centres connected to the Internet that allow the general public to use the Internet and gain electronic access to information. These public access centres are either located in the offices or headquarters of NGOs or in suburban centres around the country.

In September 2006, Lebanon's Professional Computer Association (PCA) established the PCA ICT Academy (PICTA) in association with ESCWA and a number of international companies, governmental organizations and local and international NGOs. Branches of PICTA have been launched in Nabatiyeh, Baalbak, Bint Jbeil and Batroun, in line with a plan to launch 10 centres around Lebanon to provide all citizens with free training courses. PICTA aims to enhance local capabilities in ICT, which will in turn contribute to the development of rural communities and facilitate individuals' access to information.

B. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES

In order to rank ESCWA member countries according to information access maturity, a number of factors were considered, including Internet penetration rates, Internet subscription costs as a percentage of income, free flow of information and the quantity of information available on the Internet.

TABLE 18. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN ACCESS TO INFORMATION AND KNOWLEDGE

	Maturity level 1	Maturity level 2	Maturity level 3	Maturity level 4
Country or territory	2007	2007	2007	2007
Bahrain			✓	
Egypt		✓		
Iraq	✓			
Jordan		✓		
Kuwait			✓	
Lebanon		✓		
Oman		✓		
Palestine	✓			
Qatar			✓	
Saudi Arabia		✓		
Syrian Arab Republic	✓			
United Arab Emirates			✓	
Yemen	✓			

1. *Maturity level 1: Iraq, Palestine, Syrian Arab Republic and Yemen*

This maturity level is characterized by low Internet penetration, high Internet costs as a percentage of income, and absence of e-government. Despite the existence of public access centres, these are few in number and do not meet the needs of rural and remote areas.

2. *Maturity level 2: Egypt, Jordan, Lebanon, Oman and Saudi Arabia*

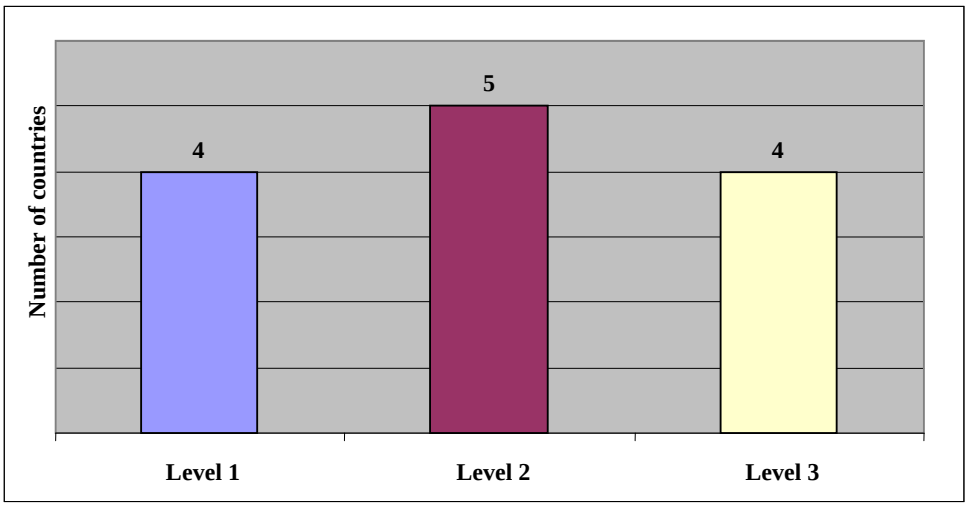
This maturity level is characterized by a relatively high Internet penetration rate (except for Egypt which was placed in this category due to its e-government activities and development of publicly-owned information). Saudi Arabia could have been ranked in a higher maturity level had it not been for information access conflicting with the country's strict censorship and filtering.

3. *Maturity level 3: Bahrain, Kuwait, Qatar and United Arab Emirates*

This maturity level is characterized by high Internet penetration, widespread broadband Internet usage and low cost of Internet connections relative to average income. However, public access centres, catering for the needs of low-income individuals, especially expatriates, are still relatively few.

4. *Maturity level 4: None*

Figure 3. Maturity levels of ESCWA member countries in access to information and knowledge, 2007



C. SUGGESTIONS AND RECOMMENDATIONS

Access to information and knowledge requires a reasonably-priced advanced ICT infrastructure, ICT literacy and the availability of digital content. Recommendations are as follows:

(a) Publish Government documents and data and provide unequivocal access to this information to the public;

(b) Increase the number of public access centres in all ESCWA member countries;

(c) Continue the liberalization of the telecommunications sector and lower Internet connection costs;

(d) Reduce censorship and the blockage of websites to a minimum;

(e) Increase Arabic Internet content to encourage usage by large segments of the population. This can be done in association with civil society organizations and schools;

(f) Provide free access to scientific content on the Internet in order to encourage research and innovation, in association with academic establishments.

IV. ICT CAPACITY-BUILDING

A. COMPARATIVE ANALYSIS

In the past two years, ESCWA member countries have shown an increased interest in building ICT capacities, placing greater emphasis on implementing the strategies and plans devised in the preceding years. Most Government bodies in ESCWA member countries have concentrated their efforts on building the capabilities of the ICT sector's workforce. Qatar has begun to train some 3,500 Government employees in ICT use, while estimates indicate that despite the difficult conditions, some 86 per cent of Palestinian Government employees have undertaken ICT training courses to develop their skills.

Furthermore, NGOs have played an important role in the spread of computers in schools and the provision of free training courses. For example, the Kuwait Foundation for the Advancement of Sciences (KFAS), in association with a number of Government bodies, has worked to introduce computer labs and curricula at all levels of the educational system. Meanwhile, the World Bank and UNESCO have worked with a number of NGOs to provide some 250 public intermediate and secondary schools in Lebanon with 5,000 computers and computer lab equipment. The United Nations Education, Scientific and Cultural Organization (UNESCO) has also distributed another 130 upgraded computers to 21 schools in northern Lebanon.

1. *Use of ICT to eradicate illiteracy*

Despite the efforts made by ESCWA member countries to reduce illiteracy, the literacy rate for adults aged 15 years and above remains low in some of the countries in the region. In 2004, the literacy rate in Egypt was 71.4 per cent, while in Kuwait the rate was 93.3 per cent. Meanwhile, in Yemen, the literacy rate is a low 49 per cent.

The concerted efforts of governmental organizations, United Nations agencies and NGOs to significantly reduce illiteracy rates in a number of ESCWA member countries have met with some success. However, these efforts are still not enough to produce fundamental changes in this regard. Furthermore, there are a number of circumstances that contribute to weakening the efforts exerted, including the lack of programmes to fight illiteracy, the lack of incentives to pursue an education, and the high population growth rates.

TABLE 19. ADULT LITERACY RATE (AGE 15 AND ABOVE) IN THE ESCWA REGION, 2004

Country or territory	Adult literacy rate (*percentage*)
Bahrain	86.5
Egypt	71.4
Iraq*	39.7
Jordan	89.9
Kuwait	93.3
Lebanon*	86.5
Oman	81.4
Palestine	92.4
Qatar	89.0
Saudi Arabia	79.4
Syrian Arab Republic	79.6
United Arab Emirates	77.3
Yemen*	49.0

Source: United Nations Human Development Report.

* 2003 figures.

The use of ICT in literacy programmes is still uncommon in all ESCWA member countries, despite the potential role of technology in broadening the range of beneficiaries and making up for the lack of trained human resources, especially in rural and remote areas. Technology can also be used to deliver other educational material through simple and modern channels.

A number of initiatives have begun to use ICT in the fight against illiteracy. In the United Arab Emirates, the organizations responsible for literacy and adult education training programmes in the emirate of Sharjah have introduced computers to their programmes, especially in rural areas such as Kalba.

Egypt, meanwhile, has launched a literacy campaign using ICT. The strategic goal of the campaign is to provide simple and effective electronic content to allow students to learn the Arabic alphabet and vocabulary, in addition to simple mathematics, via ICT clubs and CDs. Pilot projects have shown that the campaign is successful in terms of retention, learning and comprehension rates. Egypt's Ministry of Communications and Information Technology has now signed a protocol with the General Authority of Adult Education to expand these projects over the next two years, providing literacy courses for some 20,000 people through ICT clubs using the same successful educational CDs.[10]

2. *Use of ICT in education and training*

In the last three years, most ESCWA member countries have redoubled their efforts to expand ICT use in education and training. Efforts have concentrated largely on youth, where most such efforts have been undertaken by ministries of higher education. Moreover, a number of international and regional organizations, as well as NGOs, have contributed to these endeavours.

Ministries of education in most ESCWA member countries have devised plans to provide schools with computers. In Saudi Arabia, the Ministry of Education's Computer and Information Center, established in 1996, has provided some 3,000 computer labs to public secondary schools and 2,300 computer labs to intermediate and primary schools.

The Syrian Arab Republic's Ministry of Education, meanwhile, has been delivering computers to schools since 2002, as well as providing Internet access. Some 800 schools out of 3,000 planned in the next three years, have been connected to the Internet, while 4,700 schools have been provided with computers. This represents some 80 per cent of all schools (primary, intermediate and secondary), at a rate of 1.2 computers for every 100 students.

Most countries have also introduced information technology as a subject in their curricula, requiring teachers to take training courses to allow them to use information technology in the educational process in the future. Use of information technology is expected to contribute to higher comprehension and retention of subjects and curricula by students.

Despite the efforts exerted by ESCWA member countries to equip schools with computers, computer penetration rates remain low in all countries in the region. This may be partly the result of the large number of schools and students, especially in such countries as Egypt and the Syrian Arab Republic, which places a great burden on already strained education ministries. Jordan has the highest ratio of computers to students in the ESCWA region, at five computers for every 100 students, while in the United Arab Emirates, there are three computers for every 100 students. Private schools have relatively higher computer penetration rates than public schools, especially in the GCC and Lebanon.

Some ESCWA member countries have set up projects to enhance ICT use in education. Bahrain's unique King Hamad's Schools of the Future project aims to develop ICT use to elevate education in the kingdom. The first phase of the project aims to provide 11 schools with an advanced ICT infrastructure for the benefit of 11,000 students and 1,000 staff and faculty. E-learning services and the digitization of school books are an integral part of the project.

[10] Ministry of Communications and Information Technology website, www.mcit.gov.eg.

(a) *Use of ICT in higher education*

The use of computers and computer applications has had a wider appeal in academic and higher education in some ESCWA member countries, whether to teach and plan coursework, undertake projects and homework, carry out experiments and research, or in the use of the Internet for registration and counselling services. For example, Bahrain University provides its students with a variety of services, including electronic registration and tuition payment, as well as online selection of courses. The university strives to develop and introduce new services, such as e-learning syllabi. Meanwhile, students at the Bahrain branch of the Kuwait-headquartered Arab Open University use the Internet as the main channel for gaining access to information and for communicating with teachers and fellow students through discussion groups.

Moreover, all classrooms, lecture halls, libraries and facilities at Kuwait's universities are connected to the Internet. Most faculties at the University of Kuwait are connected to the Internet via a Wi-Fi network and faculty have begun to depend increasingly on ICT in the educational process. Furthermore, course registration and counselling are now carried out almost exclusively online using student information systems. The Syrian Virtual University is a notable example of e-learning in the ESCWA region, as it is the only university which undertakes all aspects of its educational process online.

(b) *Use of ICT in training programmes*

In the process of developing human resources, all Government bodies and organizations in the ESCWA region have shown a great interest in building the ICT capacities of their employees. In Oman, the Government has established a programme to provide training to 120,000-200,000 Government employees in the three-year period, 2007-2010. Lebanon, meanwhile, provided training to some 2,500 ministry employees in 2005, and is in the process of training employees in Government organizations.

Some 65,000 teachers affiliated with the Jordanian Ministry of Education have been given training in computer skills and e-learning, and the number is expected to rise to 75,000 teachers by end 2008. Some 45,000 teachers have received ICDL, while 33,000 teachers have received training on Intel programmes out of a total of 38,000 expected to be trained by end 2008. Meanwhile, 2,155 teachers have received training on CoRT Thinking (training programme to teach students thinking skills available in 30 countries worldwide, including Jordan, Qatar and Malaysia), and another 1,570 teachers have received training on WordLinks.

Hundreds of thousands of Syrians have undertaken ICT training programmes, mostly during school summer vacations, in order to benefit from existing computer facilities at schools. Over 200 centres have been used for training purposes, while Syrian universities have provided similar training programmes to increase information technology usage among university alumni. Meanwhile, the number of students that had received training through Egypt's Basic Skills Training Program by end 2006 rose to 140,300 students, while the number of trainees in specialized training rose to 27,200.

3. *Training programmes for ICT literacy*

All ESCWA member countries have continued to implement training programmes to eradicate computer illiteracy. Despite differences in programmes, all of them have contributed to a drop in illiteracy rates. With the growing interest of individuals and organizations in computer literacy training programmes in the ESCWA region, the number of institutes offering such programmes has risen. These largely concentrate on providing training on the ICDL and Cambridge IT Skills Certificate programmes, which are standard benchmarks for computer use skills.

The majority of public and private sector organizations in the GCC recommend ICDL certification, with large numbers of employees in all sectors receiving ICDL training. Some organizations require the certification as a condition to employment or enrolment. These include Saudi Arabia's King Fahd University of Petroleum and Minerals, Yamama College and the Supreme Commission for Tourism. The

Omani Ministry of Education, meanwhile, requires all 11th grade high school students to obtain ICDL certification.

The GCC ICDL Foundation in Kuwait has adopted the e-Citizen programme to train IT-illiterate individuals. The programme also provides the IT-literate public (including employees and jobseekers) with training to attain Information Worker status. Moreover, an advanced programme provides training to employees and jobseekers to attain Advanced Information Worker status.

4. *Research, development and innovation in ICT tools, equipments and services*

Innovation in science and technology, for most countries, has become the fundamental condition for improving economic performance and achieving substantial improvements in peoples' living conditions. Clearly, research and development have yet to figure as a priority in Arab societies, as political leadership focuses more on solving urgent immediate concerns rather than on making the long-term investments needed for research and development. Research and development programmes in Arab countries do not figure prominently in Government budgets nor in long-term development strategies. Consequently, research and development have yet to be used effectively in national economies or reflect positively in the changes needed to raise living conditions for the majority of people living in the region.

The latest statistics available indicate that the average spending on research and development in the ESCWA region is estimated at only 0.2 per cent of GDP, namely, one eighth of the world average and one thirteenth of the average in developed countries. At the same time, estimates indicate that non-Arab developing countries allocate some 0.6 per cent of their GDP to research and development, which places them three times further ahead of the ESCWA region. In short, spending on research and development in the ESCWA region lags behind all regions in the world, including the sub-Saharan region, which allocates 0.3 per cent of its overall GDP to research and development.

The private sector's share of overall spending on research and development in the ESCWA region is an estimated 10 per cent, with the remainder covered by the public sector. Notably, a number of large companies in ESCWA member countries have dedicated research and development budgets, including Saudi Arabia's SABIC and Saudi Aramco. The latter two companies are among the leading pioneers in research and development in the Arab world, with a number of their employees owning patents.

Kuwait's Sakhr Software (headquartered in Egypt) has a dedicated research and development team working on software Arabization, which is developing a number of education- and technology-related programmes. Moreover, the National Kuwaiti Company for Technology Projects (through its innovation centre incubator) focuses on software innovation in ICT.

While some ESCWA member countries (Qatar and the United Arab Emirates) are witnessing encouraging changes that could reflect positively on research and development in the long-term, especially with regards to infrastructure, human resources development, liberalization of the economy, provision of higher education to a wider base and Internet use, it is still too early to measure their outcomes, given how recently the initiatives have been undertaken.

ESCWA member countries undoubtedly need to move fast to adopt serious strategies and enhance capabilities in research and development if they want their economies to flourish in an era that is increasingly competitive on the global scale.

(a) *Patents*

If all patents registered by the United States Patent and Trademark Office (USPTO) over the past 30 years were distributed evenly for every one million inhabitants in the world, the Arab world's share would be around 200,000 patents, instead of the actual number registered at only 634. The absence of a culture that

encourages innovation and supports research and invention in the ESCWA region is evidenced in the number of patents registered by countries in the region. Throughout the past 30 years, the patents granted to ESCWA member countries by the USPTO numbered only 579. These are part of over 3.44 million patents issued by the USPTO to applicants worldwide, which translates into a share of 0.0168 per cent for the ESCWA region out of the total number of patents issued. However, the ESCWA region has been granted over 91 per cent of all patents issued to the Arab world.

The ESCWA figure gains additional meaning when it is examined in the context of the international patent measures, namely, the number of patents granted per one million persons in a given country. Madar Research Group has calculated the number of patents granted by the USPTO for each of the ESCWA member countries in the 10-year period from 1997 to 2006, and divided the result by 10 to arrive at the annual average. The results indicate that the annual average for the ESCWA region is 36.4 patents, or 0.188 per one million persons. This is slightly higher than the Arab average, at 0.125 patents, and the global average, at 0.0285 patents per one million persons.

(b) *Individual performance of ESCWA member countries*

Kuwait tops the ESCWA region in the number of patents per person, averaging 2.10 patents for every one million persons, with 63 patents registered by individuals residing in the country during the past 10-year period. However, despite ranking first in the ESCWA region, Kuwait's performance is much lower than that of an emerging economy such as Malaysia, which registered 4.62 patents per one million persons in the same period.

Egypt has registered 44 patents in the past 10 years, the third highest figure in the Arab world, but figured in 10th place on the patents-per-one-million-persons index at only 0.06 patents. Meanwhile, Yemen and Oman have registered one and two patents, respectively, in the past decade, while Iraq registered no patents for the same period, probably as a result of the political unrest, war and sanctions imposed on the country.

TABLE 20. AVERAGE PATENTS PER PERSON: ESCWA REGION AND SELECTED COUNTRIES, 1997-2006

Rank	Country or region	Annual average of patents registered	Patents per one million persons per year
1	Kuwait	6.3	2.10
2	United Arab Emirates	3.6	0.87
3	Saudi Arabia	15.5	0.65
4	Qatar	0.5	0.62
5	Lebanon	2.6	0.57
6	Bahrain	0.4	0.55
7	Jordan	1.6	0.28
8	Oman	0.2	0.078
9	Syrian Arab Republic	1.2	0.065
10	Egypt	4.4	0.059
11	Yemen	0.1	0.005
12	Iraq	0	0
13	Palestine	0	0
	ESCWA average	36.4	0.188
	Arab average	38.7	0.125
	GCC average	28.5	0.817
	Levant average	9.8	0.074
	North Africa average	2.3	0.029
	World average	171 235	0.0285

TABLE 20 (*continued*)

Rank	Country or region	Annual average of patents registered	Patents per one million persons per year
	Israel	972	138.46
	Turkey	13.4	0.189
	Malaysia	64	4.62
	Luxembourg	48	102.13
	Japan	33 555	263.34
	USA	91 8987	305.82
	France	3 880	61.00
	Liechtenstein	16.2	476.47
	India	244	0.217
	Philippines	20.1	0.22

Source: United States Patent and Trademark Office (USPTO).

The average annual patents registered in the ESCWA region is 0.188 patents per one million persons, but there is great disparity in regional averages. The six countries of the GCC region Saudi Arabia, Kuwait, United Arab Emirates, Oman, Qatar and Bahrain – average 0.817 patents annually per one million persons, ten times the average of 0.074 patents per one million persons recorded in the Levant region (Lebanon, Syrian Arab Republic, Iraq, Jordan, Palestine and Egypt).

The signing and ratification by a number of ESCWA member countries of the Patent Cooperation Treaty (PCT) of the World Intellectual Property Organization (WIPO) was a significant driver for the relatively high growth rate in the past decade. Membership in the PCT facilitates patent applications and processing and serves to raise awareness about patent rights and benefits.

Lebanon topped the ESCWA region on the World Bank's Innovation Index (July 2007), while Qatar registered phenomenal growth over its 2004 performance. Oman also showed significant progress on the index, while Bahrain and Jordan witnessed a relapse in performance levels.

TABLE 21. PERFORMANCE OF ESCWA MEMBER COUNTRIES ON THE INNOVATION INDEX, 2004-2007

Rank	Country or territory	2004	2007	Change
1	Lebanon	5.66	6.43	+0.77
2	United Arab Emirates	5.83	6.39	+0.56
3	Jordan	6.09	5.89	-0.2
4	Qatar	2.8	5.47	+2.67
5	Saudi Arabia	5.58	5.36	-0.22
6	Kuwait	5.03	5.17	+0.14
7	Egypt	3.98	4.3	+0.32
8	Oman	1.78	3.19	+1.41
9	Bahrain	3.11	2.71	-0.4
10	Syrian Arab Republic	1.27	2.24	+0.97
11	Yemen	2.28	1.25	-1.03
12	Palestine	-	-	-
13	Iraq	-	-	-

Source: World Bank.

B. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES

1. *Maturity level 1: None*

This level is characterized by limited computer penetration in schools, weak technical training programmes and an absence of research and innovation programmes.

2. *Maturity level 2: Iraq, Oman, Palestine, Saudi Arabia, Syrian Arab Republic and Yemen*

This maturity level is characterized by relatively significant IT use in education, existence of ICT training programmes for public sector employees and the development of clear plans for research and development and for innovation.

Most countries at this maturity level have retained their position from 2005, while only Lebanon and Kuwait have moved up to maturity level 3. On the other hand, despite the efforts made by Saudi Arabia and Oman, their performance was not enough to take them to the next level.

3. *Maturity level 3: Bahrain, Egypt, Jordan, Kuwait, Lebanon, Qatar and United Arab Emirates*

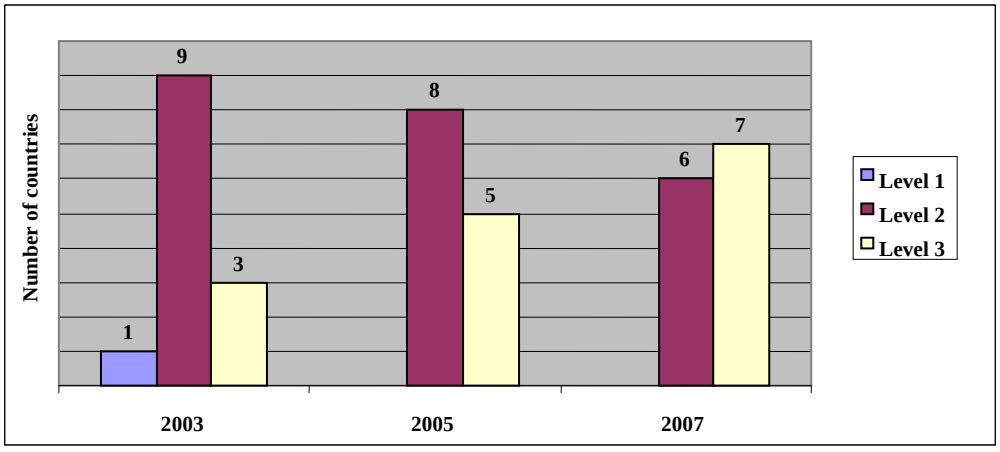
This maturity level is characterized by widespread ICT use in schools and universities, extensive IT literacy programmes and progress in research and development. Countries ranking at this level in previous years maintained their position in 2007, not having registered any developments worthy of taking them up to the next maturity level.

4. *Maturity level 4: None*

TABLE 22. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN ICT CAPACITY-BUILDING

	Maturity level 1			Maturity level 2			Maturity level 3		
Country or territory	2003	2005	2007	2003	2005	2007	2003	2005	2007
Bahrain				✓				✓	✓
Egypt							✓	✓	✓
Iraq	✓				✓	✓			
Jordan							✓	✓	✓
Kuwait				✓	✓				✓
Lebanon				✓	✓				✓
Oman				✓	✓	✓			
Palestine				✓	✓	✓			
Qatar				✓				✓	✓
Saudi Arabia				✓	✓	✓			
Syrian Arab Republic				✓	✓	✓			
United Arab Emirates							✓	✓	✓
Yemen				✓	✓	✓			

Figure 4. Maturity levels of ESCWA member countries in ICT capacity-building



C. SUGGESTIONS AND RECOMMENDATIONS

In terms of capacity-building, ESCWA member countries are distributed between maturity levels 2 and 3, while average spending on research and development remains lower than the world average. In order to build an information society, the region must pay greater attention to this aspect. The following recommendations can be used as guidelines to be developed further, in line with the circumstances of each country in the ESCWA region:

(a) Adopt serious strategies and employ greater capabilities in research and development, as well as stimulate initiatives and pledges undertaken by the ruler of Dubai (allocation of $10 billion to increase knowledge, including support for research and development) and the Emir of Qatar (allocation of 2.8 per cent of annual GDP to research and development);

(b) Raise the level of human resource training in public and private sector establishments through ongoing training programmes, and associate employee performance assessment with continued training;

(c) Devise specific measurable goals to increase computers in schools within two to three years (10 computers for every 100 students in the wealthier ESCWA member countries, five computers for every 100 students in the remaining ESCWA member countries);

(d) Incorporate the Internet and online research as subjects in school curricula.

V. BUILDING CONFIDENCE AND SECURITY IN THE USE OF ICTs

A. COMPARATIVE ANALYSIS OF SUCCESS IN BUILDING CONFIDENCE AND SECURITY IN THE USE OF ICTs IN THE ESCWA REGION

Most ESCWA member countries have similar procedures in place for building confidence and security in the use of ICTs, with only minor differences. Yet all countries suffer from a current lack of concern for network and information security, and for the protection of privacy, especially on e-government sites. Private sector companies, especially banks, display a relatively greater concern for information security. The majority of ESCWA member countries have shown serious concern for information misuse, to the extent that a number of countries have promulgated cyber crime laws and others are expected to follow suit in the near future.

1. *Information and network security*

Widespread ICT growth and the increasing reliance on ICT services places all establishments in the ESCWA region at risk for network, computer system and database threats. Information security in ESCWA member countries is characterized by widespread secrecy and the absence of popular demand for transparency in reporting cyber crimes. The matter is complicated further by the serious inadequacy of legal frameworks and the necessary resources to charge people who commit cyber crimes if and when they are reported. With the exception of cyber crimes with similar elements to traditional crimes (such as theft, forgery and fraud) that fall within the jurisdiction of criminal courts, current legislation in the majority of ESCWA member countries remains weak and is vague about addressing cyber crime.

Internationally, public and private sector companies suffer tremendous losses annually as a result of security breaches of their ICT systems. In the GCC, losses for 2004 were estimated at $200 million.[11] These losses have been sufficient for decision makers to increase precautionary measures. However, as evidenced in the results of a survey of 50 large corporations operating in the GCC carried out by Madar Research Group in 2005, current information security policies in the GCC are still deemed "average" despite the improvements seen in the past few years.[12]

Security awareness in the GCC region amongst upper management, IT experts and users has grown noticeably, relative to the relaxed attitude to the issue prevalent five or six years ago. The events of the past few years have disproved the erroneous theory that local hackers do not have skills comparable to those of international hackers and that local companies are not at high risk for attacks.

Symantec's presentation at the 2004 Middle East IT Security Forum held in Dubai indicated that Egypt then ranked 7th worldwide among the top 10 sources of virus attacks in the world (share of total attacks per individual indicator). Furthermore, attacks emanating from the GCC region – according to related reports – rose 300 per cent in 2003. The number of attacks originating from Oman is disproportionate to the country's limited Internet penetration. Symantec's 2003 study on attacks originating in Saudi Arabia found that 60 per cent of attacks are internal (from within the attacked establishments themselves) or originate from within the country.

Symantec's presentation indicated that the Middle East region is witnessing an annual growth in professional hackers, mostly university students studying computer science. Furthermore, there are a large number of unprotected computer networks and personal computers in the region, placing them at high risk for hacking, especially at the hands of individuals who use BOT networks to launch their debilitating attacks. These scenarios inevitably drive corporations in the ESCWA region to take strict measures to protect themselves from internal or external security breaches.

[11] US Department of Commerce figures published on http://commercecan.ic.gc.ca/scdt/bizmap/interface2.nsf/vDownload/ISA_5266/$file/X_2495701.DOC.

[12] Survey published in Madar Research Journal, volume II, Issue 6, February 2005.

Brown University undertook a survey in 2007[13] of 1,687 Government websites in 198 countries worldwide. The sites included in the survey were those of executive, legislative and judicial entities in the countries under study, as well as ministries and Government establishments, especially those concerned with administrative functions, taxes, foreign investment, economic development, corporate law, foreign affairs, internal security, army, transportation, tourism, natural resources, education and health-care services. Privacy and information security policies were included among the indicators studied by Brown University, numbering 18 in all.

Bahrain ranked first on the study among the countries of the Middle East and North Africa (MENA), and 15th worldwide, while Qatar ranked second in the Arab world. Notably, the banking sector in the GCC provides advanced online banking services, as well as high levels of network and database security and protection. Banks have increased security measures, especially after a number of United Arab Emirates bank ATMs were targeted in a scam.

Box 2. Brown University Global E-Government Report

The methodology of the report relies on the analysis of Government websites according to the availability of the following 18 features: online publications, online databases, audio clips, video clips, non-native languages or foreign language translation, commercial advertising, user payments, disability access, privacy policy, security features, number of different online services, digital signatures, credit card payments, e-mail address, comment form, automatic e-mail updates, website personalization and personal digital assistant (PDA) access.

2. *Countering misuse of ICTs*

The increase in cyber crime has closely shadowed the increase in the use of ICT in recent years, with crimes ranging from fraud, forgery and data theft to planning actual murders, making it imperative to promulgate laws to fight such crimes.

All ESCWA member countries, with the exception of the United Arab Emirates and Saudi Arabia, lag behind in issuing relevant laws, and even in amending existing laws that combat traditional crimes to make them apply to cyber crimes. Legislative authorities in these countries also suffer from a scarcity of legal expertise in this domain.

The United Arab Emirates was the first in the ESCWA region to issue a cyber crime law in 2006, comprising 29 articles that deal with a range of crimes, including forgery, public morality and data theft. The law also sets punishments for cyber crimes, ranging from fines to jail terms of varying length.

For its part, the Saudi Arabian Cabinet issued a cyber crime law in March 2007 to enhance information security and limit crime. Among the crimes defined by the law are tampering with and illegal access to websites, invading personal privacy through the misuse of mobile phone cameras, causing harm to others using different ICT channels, or using the Internet to exploit minors.

3. *Privacy and data protection*

Laws that protect the personal data of Internet users and prevent its misuse and exploitation are necessary to increase user confidence in ICT. While most advanced countries have devised laws that protect privacy and data, all ESCWA member countries still lack standards and regulations to protect personal privacy and data, with the exception of general laws that are applied in certain cases.

[13] Brown University Global E-Government Report, 2007.

B. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES

Since the survey showed little difference among ESCWA member countries in building ICT use confidence and security in the region, the countries were ranked in two maturity levels only: level 1 and level 2.

1. *Maturity level 1: Bahrain, Jordan, Lebanon, Oman, Palestine, Syrian Arab Republic and Yemen*

This maturity level is characterized by an almost total absence of data security, privacy policies and laws governing ICT abuse, despite some countries' such as Bahrain, Lebanon and Oman achieving some progress on the data security and privacy policy indicator in 2006. This indicates relative interest in building confidence and security but this regressed in 2007. It is to be hoped that the interest is regained and that strong policies are built in this regard, facilitating the rise of the countries in this level to maturity level 2.

2. *Maturity level 2: Egypt, Iraq, Kuwait, Qatar, Saudi Arabia and United Arab Emirates*

This maturity level is characterized by the presence of provisional concern for data security and privacy policy, as well as laws governing ICT abuse. While the United Arab Emirates suffers a deficiency in data security and privacy policies, its cyber crime law and high security banking system place it in the second maturity level. Meanwhile, Iraq's ranking in this level is the result of its high scores on protecting privacy and data security.

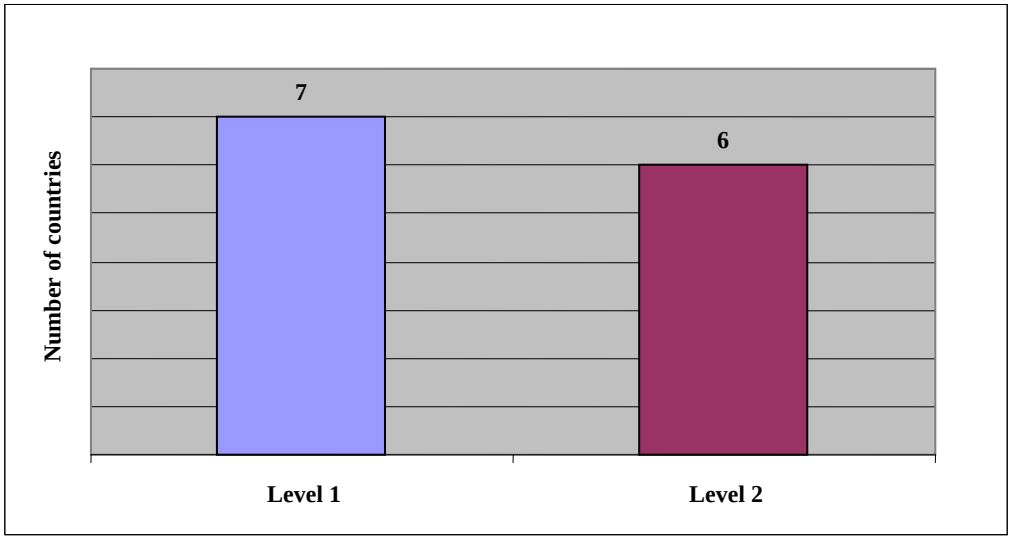
3. *Maturity level 3: None*

4. *Maturity level 4: None*

TABLE 23. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN BUILDING CONFIDENCE AND SECURITY

	Maturity level 1	Maturity level 2	Maturity level 3	Maturity level 4
Country or territory	2007	2007	2007	2007
Bahrain	✓			
Egypt		✓		
Iraq		✓		
Jordan	✓			
Kuwait		✓		
Lebanon	✓			
Oman	✓			
Palestine	✓			
Qatar		✓		
Saudi Arabia		✓		
Syrian Arab Republic	✓			
United Arab Emirates		✓		
Yemen	✓			

Figure 5. Maturity Levels of ESCWA member countries in building confidence and security in the use of ICTs, 2007



C. SUGGESTIONS AND RECOMMENDATIONS

The existence of data security and privacy policies is a basic international measure of a country's progress in building confidence and security in ICT use, and should therefore be given greater attention by ESCWA member countries. Recommendations in this regard include:

(a) Accelerating the process of devising laws to counter misuse of ICT;

(b) Ensuring transparency in reporting incidents related to network and database hacking;

(c) Increasing awareness campaigns on the different types of cyber crime, to help ICT users avoid them;

(d) Increasing international and regional cooperation in fighting ICT crime;

(e) Putting in place the tightest security measures for local networks and computer systems connected to the Internet (firewalls, anti-virus applications and spyware), especially in public sector organizations, to close security gaps and decrease the chances of attack;

(f) Devising and publishing "privacy policies" on every website.

VI. ENABLING ENVIRONMENT

A. COMPARATIVE ANALYSIS

1. *Legal and regulatory environment*

The presence of a legal and regulatory framework is one of the most important drivers for the development of an ICT sector. Laws that regulate the sector allow individuals and organizations to deal confidently with ICT and encourage growth in national, regional and international investments in the ICT sector.

An appropriate legal environment means that there are laws and regulations in place that regulate the basic activities related to the sector, including regulation and liberalization of the telecommunications sector, protection of intellectual property rights, reduction of piracy, building information storage and archive databases, concern for standards and measurements and laws that regulate electronic transactions.

The majority of ESCWA member countries are currently working on putting in place an integrated electronic transactions system and legal framework. However, despite the efforts made, progress in most ESCWA member countries is still inadequate and suffers from a lack of regional collaboration. Moreover, the legal and regulatory environment necessary to develop an ICT sector and build confidence in it is very weak.

National intellectual property laws, regulations and international agreements

Most ESCWA member countries are members of intellectual property rights-related international agreements, and have promulgated a number of intellectual property laws, with the number of countries signing international intellectual property agreements and treaties rising in the past two years.

Oman recently joined a number of WIPO agreements and treaties, and is considered with Bahrain to lead the ESCWA member countries in terms of signed WIPO agreements. Egypt follows in second place, while no significant changes have taken place with regard to international agreements in the remaining countries, especially in six of them. The only changes are in countries that changed from observer states in the World Trade Organization (WTO) to member states, such as Saudi Arabia, or countries that moved to the final stages of membership negotiations, such as Iraq, Yemen and Lebanon.

Following its membership in the WTO and the ratification of a number of international trade agreements, including the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS), Jordan signed the WIPO Treaty in 2004. The country has also promulgated a set of laws that deal with various aspects of intellectual property rights.

Meanwhile, Egypt has pledged to protect intellectual property rights and fight software piracy. The country has been a member of WIPO since 1990, and has adopted the WTO's TRIPS agreement.

In 2001, the Syrian Arab Republic issued a law protecting intellectual property rights. This law deals with the protection of printed publications, multimedia publications, works of art and computer software. The Ministry of Culture was charged with the implementation of the law, but some articles of the law are vague and its executive orders are not comprehensive. Therefore, a draft amendment for the law is currently under way.

In 1999, Kuwait promulgated a law to protect intellectual property rights, including electronic systems such as software, information systems and electronic content. Software piracy rates have dropped since the implementation of this law, falling from 95 per cent before the law was issued to 64 per cent in 2006, according to the 2006 Business Software Alliance report. Kuwait's Ministry of Commerce and Industry is currently charged with the implementation of the country's intellectual property rights laws.

TABLE 24. STATUS OF INTERNATIONAL AGREEMENTS IN THE ESCWA REGION

Country or territory	WTO	Paris Convention	PCT	WCT	Madrid Agreement	Hague Agreement	PLT	TRIPS
Bahrain	☑	☑	2007 ☑	2005 ☑	2005 Protocol ☑l	×	2005 ☑	☑
Egypt	☑	☑	2003 ☑	×	1952 Agreement ☑	☑	×	☑
Iraq	2007*	☑	×	×	×	×	×	×
Jordan	☑	☑	×	☑	×	×	×	☑
Kuwait	☑	×	×	×	×	×	×	☑
Lebanon	2007*	☑	×	×	×	×	×	×
Oman	☑	☑	☑	2005 ☑	2007 Protocol ☑	×	2007 ☑	☑
Palestine	×	×	×	×	×	×	×	×
Qatar	☑	☑	×	2005 ☑	×	×	×	☑
Saudi Arabia	2005	☑	×	×	×	×	×	×
Syrian Arab Republic	×	☑	2003 ☑	×	2004 Agreement ☑	×	×	×
United Arab Emirates	☑	☑	☑	☑	×	×	×	☑
Yemen	2005*	2007 ☑	×	×	×	×	×	×

Source: World Intellectual Property Organization (WIPO), www.wipo.int.

Notes: ☑ denotes member country, × denotes non-member country and * denotes observer nation.

The dates shown indicate the years of joining a treaty or of gaining observer status.

2. *Standardization in ICT*

The European Union defines "standards" as documented, voluntary agreements which establish important criteria for products, services and processes. Standards therefore help to make sure that products and services are fit for their purpose and are comparable and compatible. For a standard to be European, it has to be adopted by one of the European standards organizations and be publicly available.[14]

After the introduction of ICT to all economic and social sectors, a large number of international and regional standards were devised governing the production and use of ICT in every sector. There are standards, for example, for website design (length of pages, presence of a privacy policy, information secrecy, language symbol used, etc.) and standards for software production (integration with other software, compatibility, upgrade options, etc.), as well as standards for mobile phone networks and for ICT use in health care and e-learning, car manufacture and transport, etc.

International standards are introduced to the ESCWA region with imported products and services (mobile phone networks, data networks, software, etc), but many local producers of ICT products and services do not know or take into account these standards. Moreover, the activities of standards organizations in the ESCWA region remain poor, even with regards to the Arabic language and its usage in software, the Internet and mobile phones.

The ESCWA member countries' drive to evolve into information societies must be accompanied by serious efforts to unify those standards that govern ICT usage. In this context, ESCWA member countries should rely on accredited international standards and develop new ones for the region (such as the use of the Arabic language in ICT), as the adoption of uniform standards in ICT facilitates ICT use for individuals and organizations and encourages them to adopt ICT in their work and to share expertise. No unified standards

[14] http://ec.europa.eu/enterprise/standards_policy/european/flyer/index.htm.

for ICT have yet been adopted by ESCWA member countries. While all countries are aware of these standards, there is limited collaboration amongst ESCWA member countries in this regard.

Some countries are working to enhance and develop ICT use by developing a unified standards system, taking into account accredited international standards. The Egyptian Government seeks to encourage ICT companies to use international standards to develop ICT production in the country. The Software Engineering Competence Center is responsible for the publication of standards and the provision of corporate training, as well as the provision of technical and financial support to software developers, to enable them to adopt and implement Capability Maturity Model Integration (CMMI) quality standards. By April 2007, some 17 companies had managed to obtain the 2-5 levels defined by the CMMI.

The Jordanian Institution for Standards and Metrology oversees the adoption of standards in the country. However, Jordan lacks recognized ICT standards, and instead has instructions and directives that only partly govern ICT. The country also relies on international standards for ICT on an individual basis.

The Ministry of Communications and Technology of the Syrian Arab Republic has designed a unified standard for the automation of financial and administrative functions in the country's public sector organizations. The study has resulted in the formulation of unified standards for financial and administrative procedures, documentation, data entry screens and database environments. The system is expected to contribute to the creation of an encouraging environment for software development companies to develop standard software applications for widespread deployment in the Syrian public sector.

ICT standards in Kuwait rely on the use of technical measures and methodologies which guarantee the compatibility of infrastructure, operating environments and information systems, and their ability to exchange data (open systems). Standards strive to maintain technology neutrality, in order to avoid being categorized as proprietary technology, which could in turn lead to technological isolation. There is a growing trend in Kuwait to rely on specialized organizations to carry out periodical performance, usability and security testing of e-government websites based on international standards.

Saudi Arabia devised and published in late 2006 a high-level regulatory framework for service quality that incorporates new developments in ICT services. The Communications and Information Technology Commission (CITC) conducted a comparative study to define the best international practice in quality of service indicators, standards, metrologies and reports, in addition to practices used to measure the accuracy of results.

The Arab Organization for Internet Standards (InterStandards) initiative is a step in the right direction, as it is expected to help set a unified standard for the ICT sector, in five areas:

(a) Website design;
(b) Website security;
(c) Website engineering;
(d) Website content;
(e) Website advertising.

3. *ICT sector*

The ICT legal environment in all ESCWA member countries remains immature, despite progress achieved in the past few years by some of the countries.

(a) *Electronic laws and regulations*

ESCWA member countries have shown greater interest in the past two years in the legal and regulatory aspects of ICT. The issuance of laws governing electronic transactions is one of the most critical requirements that must be met, in parallel with the implementation of e-government projects in the ESCWA region. Some ESCWA member countries have made considerable progress in this regard, while others are still in the preparatory stages or are working on developing the infrastructure necessary for implementation.

A number of ESCWA member countries appeared to have identified end 2007 as a deadline for the implementation of these laws, especially those countries that rank high on the e-government Readiness Index.

Qatar was expected to issue an e-transaction law by end 2007, which would govern issues related to online security and transactions, as well as e-government. Meanwhile, Kuwait is working on a draft law for e-transactions that defines the scope of electronic and identification records, as well as e-signatures. The law is also expected to protect data and electronic privacy, and address the misuse of ICT.

Saudi Arabia has issued electronic transaction and signature draft systems, as well as a cyber crime law. Moreover, the National Center for Information Security was established in 2006.

Meanwhile, Jordan's Electronic Transaction Law no. 85 issued in 2001 is an important step towards the establishment of e-commerce and the country's e-government project. That same year, Jordan signed the Free Trade Agreement with the United States, which included articles related to e-commerce. The country also signed the European Jordanian Partnership Agreement and became a member of the WTO.

The Information Technology Authority (ITA) in Oman is devising electronic transaction laws to encourage individuals and organizations to use information technology and increase their confidence in it. A legal entity was charged with drafting the electronic transaction law, which was then submitted for review to the ITA. The law expected to be ready by end 2007. It would cover basic issues such as veracity of electronic transactions, protection of intellectual property rights, data and taxes, legal verification of electronic signatures, authenticity of e-mail data, e-payment and protection of privacy and security.

Egypt, meanwhile, has adopted progressive legal strategies to facilitate ICT growth. Some of the most important strategies have been the liberalization of the telecommunications sector, the issuance of new telecommunications and electronic signature laws and the enhancement of the investment law, to provide investment incentives in the ICT sector. These initiatives have created a positive environment, and paved the way for the ICT sector to play a larger role in the national economy.

Yemen introduced minor amendments in 1996 to its telecommunications law in place since 1991. The country has yet to issue its law governing information management, the free exchange of information, and access to information sources, which is still in draft form. The law forms the basis from which regulations and directives on information management in Government organizations can be drafted. Moreover, there are still no laws pertaining to electronic transactions in Yemen. There are also no laws, regulations, procedures or standards addressing the regulatory and procedural framework for IT activities, except on a very limited scale. This reflects negatively on the role of organizations and their contribution to the development of the IT sector in Yemen.

(b) *Telecommunications regulatory framework*

The majority of ESCWA member countries have established independent regulatory frameworks to oversee the telecommunications sector and take the necessary decisions related to telecommunication strategies and the full liberalization of the sector.

The respective authorities have established strategic priorities and issued the laws needed to implement these strategies, whether relating to number portability and wireless frequencies, the granting of licences to new or existing telecommunications providers (including Government-owned companies) or the basic services to be provided by telecommunications providers, subscriber capacities and coverage areas. These authorities can also specify prices or price caps, or allow them to be defined by a competitive market.

By end of 2006, eight ESCWA member countries had independent regulatory authorities, Qatar's being the most recent. Despite its exceptional circumstances, Lebanon made significant progress in legislative transparency in 2007, becoming the ninth country in the region to establish its own TRA.[15] It is

[15] www.tra.gov.lb.

an independent Government agency assigned to liberalize, regulate and develop the telecommunications sector. As for the remaining ESCWA member countries, their ministries of telecommunications still play the role of the country's regulatory authority for the sector as is the case for Yemen, Palestine (Ministry of Telecommunications and Information Technology), the Syrian Arab Republic (Syrian Telecommunications Establishment) and Kuwait (Ministry of Communications).

The Syrian Arab Republic has drafted a new telecommunications law that revokes the Syrian Telecommunications Establishment's monopoly over the telecommunications sector and establishes a TRA. Advisors on the draft law included a number of organizations such as ESCWA, the European Union and the International Telecommunication Union. The law has been submitted for review to the Syrian Cabinet.

There are strong indications in Kuwait, the only GCC country to lack an independent TRA, that the country is headed for the establishment of such an authority in the near future.

Announcements by the Kuwaiti minister of communications and other officials indicate that the ministry is studying the issue carefully, but it is not yet clear whether Kuwait will follow in the footsteps of Jordan and Bahrain, which are the only two countries in the ESCWA region to have truly independent regulatory authorities that are resistant to political interference and that staunchly defend competition.

The majority of countries in the region have not yet fully liberalized their telecommunications sectors, especially their fixed-line services which are still dominated by state or privately-owned monopolies, except in the United Arab Emirates and Jordan. The mobile phone sector in the region is dominated by duopolies, while Internet services are relatively competitive.

TABLE 25. STATUS OF LIBERALIZED TELECOMMUNICATIONS AND INTERNET SERVICES IN THE ESCWA REGION

Country or territory	Fixed lines	Mobile phones	Internet	TRA
Bahrain	Monopoly	Duopoly	Competitive	Yes
Egypt	Monopoly	Duopoly	Competitive	Yes
Iraq	Monopoly	Competitive	Monopoly*	Yes
Jordan	Competitive	Competitive	Competitive	Yes
Kuwait	Monopoly	Duopoly	Competitive	No
Lebanon	Monopoly	Duopoly	Competitive	Yes
Oman	Monopoly	Duopoly	Monopoly	Yes
Palestine	Monopoly	Monopoly	Competitive	No
Qatar	Monopoly	Monopoly**	Monopoly	Yes
Saudi Arabia	Monopoly	Competitive	Competitive	Yes
Syrian Arab Republic	Monopoly	Duopoly	Duopoly	No
United Arab Emirates	Duopoly	Duopoly	Duopoly	Yes
Yemen	Monopoly	Competitive	Monopoly	No

Source: Madar Research Group.

* A number of small companies operate as sub-providers, providing direct Internet services to users.

** Liberalization of mobile phone sector took place in November 2006, with selection of the country's second mobile phone operator expected to take place by end 2007.

(c) *Regulating the Internet*

International gateway operators in the ESCWA region control access to certain services provided through the Internet, including voice over Internet protocol (VoIP), peer-to-peer and file transfer protocol (FTP), and block access to other services such as Internet telephony. The latter is forbidden in most ESCWA

member countries but is still relatively accessible, albeit illegally. Moreover, proxy servers filter Internet content.

(d) *Internet censorship*

While Internet censorship is exercised in the majority of ESCWA member countries, the severity differs from one country to another. The degree of Internet censorship corresponds closely to the degree of censorship of other media channels.

Security authorities monitor the Internet and forbid access to lists of websites, including among others adult, political and religious sites and newsgroups. With the growth of Arabic blogs on the Internet, security authorities in some countries have prosecuted bloggers who breach national security and defame religion. Some blogs have been shut down, while bloggers have been jailed in some ESCWA member countries such as Egypt which was included on Reporters Without Borders' "Enemies of the Internet" list. The list comprises 13 countries including the Syrian Arab Republic and Saudi Arabia. Reporters Without Borders accuses these countries of monitoring content published on the Internet and harassing individuals who publish material critical of their Governments.

(e) *Domain name management*

Domain name registrars in the ESCWA region differ from one country to the other, as does the way in which domain names are managed. While communication ministries are charged with administering domain names in some countries such as Kuwait, where the task has been delegated to the Kuwait Institute for Scientific Research, there is still no unified domain name registrar in Yemen, nor are there any steps being taken to establish an authority to administer the sector.

Iraq's country code top-level domain (ccTLD) was not controlled by the country until 2006, when it acquired control after taking legal action against the Internet Corporation for Assigned Names and Numbers (ICANN). However, most Iraqi websites, including a large number of Government sites, do not use the .iq top-level domain name, while most e-mails sent from Iraq are done so through Yahoo.

In Lebanon, the American University of Beirut has been charged by ICANN to administer the .lb ccTLD. Meanwhile, in Jordan, the National IT Center (NITC) is the sole registrar for the country's .jo ccTLD. The centre strives to provide a secure and sustainable environment to ensure applicants' rights. It also strives to ensure transparency in publishing the registry database online and uses best practice to protect domain names by implementing a fair policy and employing highly qualified personnel. The National IT Center's registration policy conforms to international policies, though the centre has introduced some changes to align policies to Jordan's environment. While the policy is flexible, there are some restrictions, some of which are global such as registering public, geographical and international domain names.

The centre works on implementing Jordan's laws on intellectual property rights, trademarks and domain name registration to avoid cybersquatting. Jordanian law is applicable in the event of disputes, but Geneva-based WIPO may also mediate in disputes.

In Saudi Arabia, the Saudi Network Information Center is responsible for administration of the country's .sa ccTLD. The centre follows a fair policy for domain name registration for all public and private organizations, and for individuals. By end 2006, there were more than 11,000 .sa ccTLDs registered in the kingdom.

(f) *Software piracy*

Software piracy rates in the ESCWA region have remained high, despite the slight progress made in 2006. The United Arab Emirates is the top-ranking country in the region in fighting software piracy, where the piracy rate has dropped to 35 per cent according to a study by the Business Software Alliance. Meanwhile, the software piracy rate in Lebanon was a high 73 per cent in 2006, with the country maintaining

its piracy rate from 2005 in an indication of the lack of progress made on this front. Kuwait's software piracy rate is relatively high, despite some progress made in fighting piracy, whereby the country's piracy rate dropped from 66 per cent in 2005 to 64 per cent in 2006.

TABLE 26. RANKING OF ESCWA MEMBER COUNTRIES BY SOFTWARE PIRACY RATE, 2005-2006
(*Ranked by 2006*)

Rank	Country or territory	Piracy rate, 2005 (*percentage*)	Piracy rate, 2006 (*percentage*)
1	Lebanon	73	73
2	Kuwait	66	64
3	Egypt	64	63
4	Oman	63	62
5	Jordan	63	61
6	Bahrain	60	60
7	Qatar	60	58
8	Saudi Arabia	52	52
9	United Arab Emirates	34	35
10	Palestine*	-	-
11	Iraq*	-	-
12	Syrian Arab Republic*	-	-
13	Yemen*	-	-

Source: Business Software Alliance (BSA) and International Data Corporation (IDC), The Fourth Annual BSA and IDC Global Software Piracy Study, 2007.

* The study did not specify the level of use of pirated software.

4. *ICT investments and Government-supported facilitation measures*

In the past few years, ESCWA member countries have invested billions of dollars in their telecommunications infrastructures, including laying fibre-optic cables and expanding mobile phone networks. In other countries, such as Saudi Arabia and Egypt, huge investments have been made in mid- to high-capacity computer assembly plants. Investments in software development have been minimal, with Egypt as the main player in the field (excluding website development which has grown in all ESCWA member countries). Such organizations as the Mohammed Bin Rashid Establishment for Young Business Leaders have provided funding for ICT-related projects, but the majority of these have been small and relate mainly to website design and development. Egypt and Jordan offer the greatest support and facilities among ESCWA member countries for companies exporting ICT products.

(a) *Science and technology parks in the ESCWA region*

ESCWA member countries have invested billions of dollars in establishing science and technology parks, but most of these are still in the early stages of development. The United Nations Industrial Development Organization (UNIDO) has created a list of all science and technology parks in the world,[16] including the following 26 parks based in the ESCWA region:

- Bahrain Technology Park (Bahrain);
- iTeknoCity (Bahrain);
- Sultan Qaboos University Science Park (Oman);
- Knowledge Oasis Muscat (Oman);
- Qatar Science and Technology Park (Qatar);
- Dammam Technology Zone (Saudi Arabia);

[16] http://www.unido.org/doc/26781.

- King Abdullah bin Abdul Aziz Science Park (Saudi Arabia);
- Jeddah BioCity Science Park (Saudi Arabia);
- Shmaysi Science and Technology City (Saudi Arabia);
- Ras al-Khaimah Technology Park (United Arab Emirates);
- Centre of Excellence for Applied Research and Training – CERT (United Arab Emirates);
- Dubai Technology Park (United Arab Emirates);
- Dubai Biotechnology and Research Park (United Arab Emirates);
- Dubai Industrial City (United Arab Emirates);
- Dubai Silicon Oasis (United Arab Emirates);
- Dubai Internet City (United Arab Emirates);
- Sinai Technology Valley (Egypt);
- Northern Coast Technology Valley (Egypt);
- Mubarak City for Scientific Research and Technology Application (Egypt);
- Egypt's Smart Villages (Egypt);
- Hashemite University Technology Park (Jordan);
- CyberCity (Jordan);
- BeryTech Technology Pole (Lebanon);
- Beirut Emerging Technology Zone (Lebanon);
- Syria Science and Technology Park (Syrian Arab Republic);
- Yemen ICT Village (Yemen).

In addition to the technology parks, there are four incubators for technology companies in the ESCWA region. Two are located in Jordan and one each in Kuwait and Bahrain:

- Bahrain Business Incubator Center;
- Kuwait Technology Incubator;
- iPark (Jordan);
- National Consortium for Technology and Business Incubation (Jordan).

(b) *Comparative analysis of regional and international science and technology parks*

There is a fundamental difference in the aim behind the establishment of science and technology parks in the ESCWA region compared with the advanced industrial world, a factor that must be taken into consideration when analysing performance. Unlike their counterparts in the advanced world, created to address direct and emerging needs dictated by market and economic considerations, science and technology parks in the region have emerged as a result of political will. Due to the lack of a national or regional scientific research culture that could help establish basic strategies for science and technology parks as embryos for both research and development (R&D) and for industry, science and technology parks in the region have pursued a basic strategy that combines business and education. In other words, these regional parks are at the stage of establishing the very environments that will justify their existence and future growth. In order for these parks to be effective, they must achieve the right balance of technology-related partnerships, in a "smartly-run" environment, with a focus on the effective transfer of knowledge, encouragement of innovation, possession of good administrative skills and the enhancement of economic and social integration in ESCWA member countries. Only then can these parks achieve positive results.

More importantly, as science and technology parks are still in the early stages of development relative to their counterparts in the developed world, their goals and objectives must be adapted to an achievable framework, through the careful organization of priorities.

TABLE 27. COMPARISON BETWEEN REGIONAL AND INTERNATIONAL SCIENCE AND TECHNOLOGY PARKS

Factors	Successful international technology parks	Regional technology parks
Mission and vision	Clear and realistic	Clear but unrealistic
Justification for creation of parks	Emerging needs	Political leadership will
Basic characteristics	R&D, innovation, industry	Education, business
Current focus	Creation of new products	Creation of suitable environment
Interaction between parks and academia	Strong	Poor to moderate
Administrative skills	High with background in R&D	Poor to moderate
Regional economic and social integration	High	Poor
Government facilitation and support	Available	Available but inadequate
Capital	Adequate	Inadequate to acceptable

Source: Madar Research Group.

B. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES

1. *Maturity level 1: Iraq, Palestine, Syrian Arab Republic and Yemen*

Countries at this level have signed relatively few or no international agreements or treaties on intellectual property rights and patents (except Saudi Arabia). They are still behind in awareness of and concern for ICT laws and regulations, and experience high rates of software piracy.

2. *Maturity level 2: Kuwait, Lebanon, Oman, Qatar and Saudi Arabia*

These countries (except for Saudi Arabia) have signed a fair number of international agreements or treaties related to intellectual property rights and patents, relative to other countries. None of the countries (except for Saudi Arabia and Oman) has made any substantial progress in developing its legal or regulatory framework. Saudi Arabia has the lowest software piracy rate among countries at this maturity level.

3. *Maturity level 3: Bahrain, Egypt, Jordan and United Arab Emirates*

These countries have signed a relatively large number of international agreements and treaties on intellectual property rights and patents, and have made considerable progress in devising ICT-related laws and regulations. The United Arab Emirates has the lowest software piracy rate in the ESCWA region.

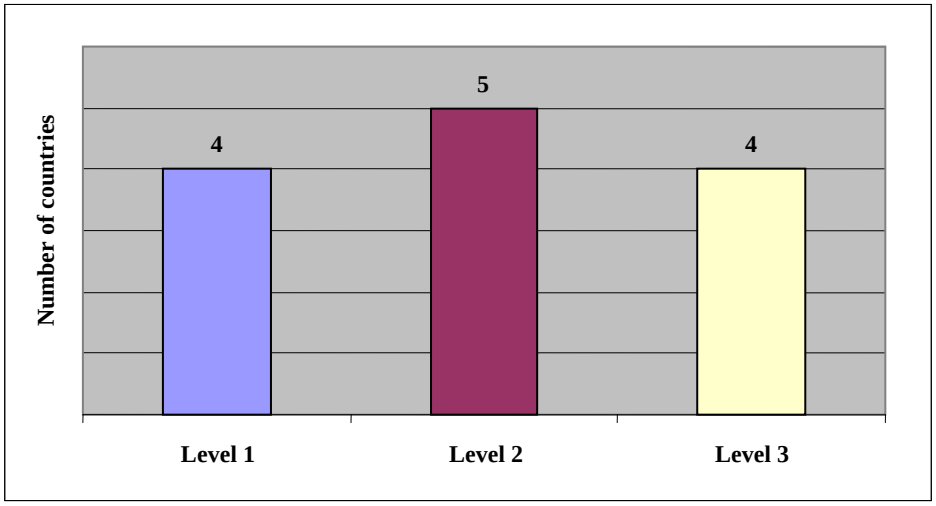
4. *Maturity level 4: None*

None of the ESCWA member countries managed to achieve maturity level 4, despite some of them meeting one of the requirements of this level (such as the United Arab Emirates in software piracy). This maturity level is characterized by maturity of ICT-related laws and regulations, and participation in most international agreements and treaties on intellectual property rights and patents. Countries at this level ideally adopt international ICT standards and contribute to the development of national and regional standards in the use of the Arabic language in software and website development and have low software piracy rates.

TABLE 28. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN ESTABLISHING AN ENABLING ENVIRONMENT

Country or territory	Maturity level 1 2007	Maturity level 2 2007	Maturity level 3 2007	Maturity level 4 2007
Bahrain			✓	
Egypt			✓	
Iraq	✓			
Jordan			✓	
Kuwait		✓		
Lebanon		✓		
Oman		✓		
Palestine	✓			
Qatar		✓		
Saudi Arabia		✓		
Syrian Arab Republic	✓			
United Arab Emirates			✓	
Yemen	✓			

Figure 6. Maturity levels of ESCWA member countries in establishing an enabling environment, 2007



C. SUGGESTIONS AND RECOMMENDATIONS

The following recommendations address the limitations in the ESCWA region which prevent the establishment of a mature enabling environment:

(a) Create awareness;

(b) Accelerate the process of signing, ratifying and joining international agreements on intellectual property rights;

(c) Accelerate the issuance and implementation of laws on e-commerce and e-signatures;

(d) Devise laws to protect online intellectual property rights and copyrights, separating them from other laws on intellectual property rights;

(e) Decrease Internet censorship;

(f) Unify ICT standards through the adoption of international standards and development of standards for the use of the Arabic language through regional committees and organizations;

(g) Complete telecommunications liberalization, especially in the fixed-line sector, decrease consumer charges and devise laws that encourage investment in the ICT sector.

VII. ICT APPLICATIONS

A. COMPARATIVE ANALYSIS OF ICT APPLICATIONS IN GOVERNMENTS IN THE ESCWA REGION

Since the late 1990s, all Governments of the ESCWA region have been seeking to use ICT applications in some or all Government activities and services. In the past few years, most Governments have managed to set up organizational structures to develop strategies and operational plans for the creation of an "e-government". However, efforts to apply these plans are proceeding with varying degrees of speed, seriousness and success.

1. *ICT in public administration*

Computerization of procedures and digitization of data in public administration are the foundation for electronic delivery of services at a later stage. From this perspective, most of ESCWA member countries have achieved some level of success during the past three years in that projects or special programmes for the computerization or automation of public administration have been launched and in some cases completed.

Computerization of public administration in these countries has mainly focused on civil and criminal records (at the ministries of the interior), financial records (ministries of finance and economy) and public services (at the level of provincial administrations, governorates and municipalities). The relative proliferation of computerization among the various Government departments differs from one country to another according to local and national priorities.

In the Syrian Arab Republic, for instance, the civil registry, whose automation is already completed, has been given high priority by the Government since all the services the Government seeks to deliver to citizens will depend on a unique national ID number. This automation process is the biggest and most comprehensive in the region. Moreover, the Syrian Ministry of finance is one the earliest and most active Government bodies to automate procedures having started in 1975 and carried out its programme in several phases. The ministry set up a computer network connecting the finance departments in governorates with the central administration. The Central Bank of Syria has also taken new steps towards the more automation of its activities.

Conversely, the process of computerization in Egypt has a different priority: the automation of internal Government processes within reflected and between departments (G2G – or Government to Government electronic data exchange). The task involves standardizing procedures and increasing accessibility between ministries. The Ministry of Administrative Development is in charge of the automation of work systems in all ministries. This includes the automation of planning and resource management systems (budget, public accounts, purchases, stocks, wages, personnel), the development of electronic archive and the automation of workflow systems, as well as re-engineering the work cycle to facilitate procedures.

Jordan, on the other hand, is known to have a strong interest in creating an information society in the kingdom to support its emerging knowledge-based economy. E-government, electronic services and the overall development of the public sector are seen as key element in fostering an information society. Accordingly, in November 2006 the Jordanian Ministry of Communications and Information Technology officially launched its e-government portal[17] as a gateway to the entire body of information and services provided by the Jordanian Government. Earlier, in August 2006, the Cabinet had approved the new e-government strategy prepared by the Ministry of Communications and Information Technology for the coming three years.

In the United Arab Emirates, the computerization process initially aimed to facilitate the activities of the business and service sectors. Its scope was later expanded to increase the efficiency of Government

[17] www.jordan.gov.jo.

systems. In early 2006, the Ministry of Finance and Industry launched its electronic portal.[18] In April 2007, the ministry signed a memorandum of understanding with the Emirates Identity Authority (EIDA) to enable the use of a national ID for the electronic payment of fees to all governmental departments and the private sector. The ministry also designed and developed an elaborate new information system for the financial management of the federal Government. Additionally, the digitization of Dubai Courts[19] is one of the most important and most comprehensive projects in the area of judicial and legal services.

In Qatar, back in 2005, the Supreme Council of Information and Communication Technology developed an e-government strategy based on the vision of the Qatari Government to offer citizen-centric services. The implementation plan for this strategy consisted of four sets of initiatives, leading to the digitization of Government information and the delivery of diverse electronic services to citizens. These services are available now on the Qatari e-government website.[20]

In 2004 and 2005, Kuwait signed two memorandums of understanding with Singapore to draw on its mature experience in the field of e-government. This was followed by a study conducted to assess the e-readiness of the Government, which led to the formation of a road map for the transition towards an e-government. A project to establish a main e-government portal[21] was laid down and several steps were taken towards its implementation.

In Bahrain, the first network of its kind in the region to link all Government departments and agencies (Government Data Network project) was already in place and operational. Among the advanced functions of the network is that it allows real-time collaboration, such as in editing documents, and the exchange of information between various Government organizations. Bahrain is also one of the first countries in the region to computerize Government departments, and it has always ranked among the top three countries in the 2005 United Nations e-government Readiness Index.[22]

Still lagging way behind is Yemen which lacks even a clear strategy for the computerization of Government departments, the majority of which are well below the region's average level of automation in terms of installed PCs and the introduction and use of computer systems and applications. Compounding the challenge, the computer systems already in place lack compatibility.

In Palestine, the "ePalestine" plan was approved in May 2005. The plan covers several projects including e-government, e-learning, smart identity cards and a Palestinian cultural database.

As for the largest economy in the ESCWA region, Saudi Arabia, the Ministry of Communication and Information Technology[23] completed the development of a national ICT plan in 2005. The same year, the ministry launched the Government e-transactions programme "Yesser"[24] in cooperation with the finance ministry and the Communication and Information Technology Committee.[25] The e-transactions programme aims to raise the productivity and efficiency of the public sector, and provide better services to individuals and the business sector. The programme, which encompasses the vision, framework and implementation plan for e-government projects in the kingdom, is scheduled by end 2010 to provide business and individual users access to easy and secure integrated Government services. Among the most important and useful e-services the Saudi Government currently provides is the e-Umrah Programme, which has completely automated visa issuance for the Umrah pilgrimage.

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[18] www.mofi.gov.ae.

[19] www.dc.gov.ae.

[20] www.e.gov.qa.

[21] www.e.gov.kw.

[22] United Nations Global E-Government Readiness Report 2005, from E-Government to E-Inclusion.

[23] www.mcit.gov.sa.

[24] www.yesser.gov.sa.

[25] www.citc.gov.sa.

Ultimately, the computerization process of governmental departments in ESCWA member countries is closely related to the special requirements of each country in the region regardless of whether there is a clear plan or strategy in place. Moreover, it is evident that the success of the computerization process relies heavily on the strength of the political will and support behind it, as well as on the availability of sufficient skilled manpower.

Bahrain, Egypt, Jordan, Oman, Saudi Arabia, the Syrian Arab Republic and the United Arab Emirates have practical plans and procedures for the digitization of civil and financial records for use only among Government departments. Nevertheless, their current efforts focus on the issuance of smart national ID cards containing personal civil register information and carrying a unique number to become the key for citizens to access and use any Government e-service.

Bahrain, Egypt, Qatar and the United Arab Emirates hold leading positions in the digitization of data compared with other countries in the region. Egypt, in particular, has in place a web portal containing a large amount of information and more than 700 services, led by the Municipality of Cairo.[26]

2. *E-government solutions (G2C, G2B)*

Bahrain, Egypt, Jordan, Qatar and the United Arab Emirates have each made substantial progress in migrating a good portion of Government public services to the Internet. Saudi Arabia has only recently caught up with them, while Oman and the Syrian Arab Republic are each expected to approach the level of their regional counterparts this year. The problem lies with Kuwait, Lebanon, Palestine, Iraq and Yemen which are lagging behind in this respect. Judging by their historical rates of progress and various obstacles, whether political, economic or other, e-government services to businesses or individual users are not expected to materialize before mid-2009. In Lebanon, Palestine and Iraq the obstacles are related to funding and the unstable political and security situations, while in Kuwait and Yemen they are due to a lack of proper planning and sagging implementation.

Among the examples of e-government services currently available in the ESCWA region, Egypt can be cited for the Government's official web portal,[27] which was launched as a first step in the provision of e-governmental services. The portal includes a large number of services, such as payment of bills, applications for birth certificates, renewal of vehicle licences, issuance of visas, etc. By the end of 2012, the portal is scheduled to offer all or most Government public services. The second version of the portal was to be launched by the end of 2007.

In the United Arab Emirates, the e-government initiative has taken off on two levels: the federal Government and the e-governments of Dubai and Abu Dhabi. At the federal level, the Ministry of Finance and Industry has been offering e-services, including an automated manual of uniform financial procedures which is seen as an important qualitative addition to the e-service package provided by the ministry on its official website. The system, which is considered to be the first of its kind in the region, was developed by the ministry to enable civil servants in all ministries to access the manual through the Internet and review any updates on the laws and financial systems of the federal Government as soon as they are approved. Users can search the manual, print it and send suggestions to the financial comptrollers at the ministry. In 2007, the ministry launched the final phase of the "UAE Industrial Electronic Market - madeinuae.com" project, which is an interactive e-commerce portal that markets United Arab Emirates products regionally and internationally. Furthermore, the ministry has developed a web portal for industrial plants in the country that allows industrial investors to register and apply for an industrial licence.

As part of its "Yesser" programme, Saudi Arabia has begun the trial run for the national portal[28] for e-government transactions which provides a single interface for accessing governmental services swiftly and efficiently. In its first stage, the portal provides information about the various public services that will be activated electronically in following stages. System and information security is also a concern for the

[26] www.cairo.gov.eg.

[27] www.egypt.gov.eg.

[28] www.saudi.gov.sa.

programme. The Saudi Interior Ministry's National Information Center has authorized Al-Elm Information Security to provide secure e-commerce services for business and individual users of the Government portal.

Oman has developed an "integrated financial system" that processes all payments to suppliers and staff in all ministries instantly online. It has also launched the "One Stop Shop" initiative for e-business through the Ministry of Trade and Industry and other ministries and Government institutions.

A study conducted in 2007 by the Center for Public Policies at Brown University shows that all the ESCWA region's e-governments, except for Bahrain, Kuwait, Saudi Arabia and the United Arab Emirates have slipped in their world rankings (even though their scores have improved over previous years). The study also points out that lack of some basic requirements for online services, such as a privacy and security policy that ensures personal information security, as well as absence of advanced features such as access for the disabled, are undermining the achievements made by these countries, whether in providing users with information and updates through electronic messages, posting more Government publications on the Internet, or providing online users with feedback facilities.

According to Brown University's e-government index, the performance of ESCWA member countries varies substantially. While Bahrain, the top-ranking country both among the ESCWA member countries and the Arab world, ranked 15 internationally, Egypt ranked 81, followed by Saudi Arabia in 89th position. Surprisingly though, according to this index, the Syrian Arab Republic took the fourth position among Arab countries, and ranked 58 internationally. This ranking is an important asset to the Syrian Arab Republic compared with its overall weak performance in most other indices. The relative progress of the Syrian Arab Republic, according to Brown University, could be attributed to relatively large Arabic content on Government websites, the availability of more English content, faster updating of content and increased availability of feedback facilities for online users.

The Brown University methodology is based on an assessment of Government websites using 18 indicators, including: availability of online publications, databases, audio-explanatory short messages, video clips, foreign-language access, ads, access fees, privacy policies, information security policies, access for the disabled, e-signatures, a user feedback facility, contact information, credit card payment options, e-mails, a registration option when access websites, access through PDAs (personal digital assistants) and the number of available e-services.

3. *E-procurement applications*

Despite their role in increasing Government transparency, speeding up purchasing processes and eliminating or decreasing corruption, e-procurement applications are obviously not among e-government priorities in the ESCWA region, and some of the region's e-government projects have not even touched upon the issue. However, some ESCWA member countries have e-procurement programmes in force, such as Egypt and the United Arab Emirates. Other countries, such as Jordan, are planning to implement e-procurement programmes, or at least use them partially by publishing information about tenders and bids on Government websites as in Qatar and Bahrain.

In Egypt, the Ministry of Administrative Development has completed the implementation of a Government procurement portal project[29] in cooperation with the General Authority for Government Services. The project aims to provide an online platform for all Government contractors and suppliers and those who wish to bid for Government contracts. The portal provides many services, including e-registration for suppliers to the various Government departments, and access to information on tenders and bids put forward by Government departments through one portal. The published information is of a general nature, concerning the tender and related details.

In the United Arab Emirates, the Government of Dubai relies on the e-market of the UAE-based "Tejari" company[30] in all procurement for local departments. Though Tejari is a private company, it plays a

[29] www.etenders.gov.eg.

[30] www.tejari.com.

major role in e-procurements throughout the region through its "manshoori" service,[31] and has signed agreements with many Government organizations in the region.

In Jordan, the Ministry of Finance, in partnership with UNDP, has implemented an e-procurement and e-accounting project. The project aims to set standards and a general framework for e-procurement and to disseminate knowledge of standard procedures in the local market.

In Iraq, the International Reconstruction Fund Facility for Iraq (IRFFI) has introduced promising initiatives to organize and standardize e-procurement processes as international organizations participating in the reconstruction process use e-procurement facilities to make purchases for various projects covering education, health, construction and many other sectors. In 2004, Tejari also entered the market through the "Iraq Tejari" initiative.

B. COMPARATIVE ANALYSIS OF ICT APPLICATIONS IN BUSINESS AND COMMERCE IN THE ESCWA REGION

As the Internet proves to be a viable global platform for doing business, as more robust and advanced ICT applications are developed to support e-business and as the legal framework improves, ESCWA member countries are increasingly adopting these applications, though to varying degrees. While in some ESCWA member countries the mainstream business use of the Internet is mostly limited to communication such as e-mail and other simple applications, other countries feature more developed uses such as online sales and transactions, e-shops, e-markets, e-banking and other electronic financial services, e-marketing services, supply and distribution activities, commercial agency, e-transportation and freight services, and other advanced e-business applications.

1. *Availability and quality of e-banking*

In terms of e-banking services, ESCWA member countries can be classified into three groups:

The first group includes the Arab Gulf countries where most commercial banks provide these services with high quality. The second group includes Egypt, Jordan and Lebanon where an increasing number of commercial banks are providing e-banking services with varying levels of quality. The third group includes Iraq, Palestine, the Syrian Arab Republic and Yemen where no e-banking services are available except for Palestine where these services exist on a limited scale.

TABLE 29. AVAILABILITY OF E-BANKING IN THE ESCWA REGION, 2006

Country or territory	Availability of e-banking services
Bahrain	✓
Egypt	✓
Iraq	×
Jordan	✓
Kuwait	✓
Lebanon	✓
Oman	✓
Palestine	✓
Qatar	✓
Saudi Arabia	✓
Syrian Arab Republic*	×
United Arab Emirates	✓
Yemen	×

Sources: Madar Research Group, and the 2007 country reports submitted to ESCWA.

* The Syrian Arab Republic has started to accept ATM cards for paying phone bills or conducting simple banking transactions.

[31] www.manshoori.com.

Most international and local banks in the Gulf region, and many banks in other ESCWA member countries (except Iraq, the Syrian Arab Republic and Yemen), provide highly developed e-services for their customers, including account enquiries, bill and credit card payments, money transfer services among different accounts either within the same bank or in other banks in the same country. Some banks even provide money transfers to any bank worldwide.

2. *B2B e-commerce*

No one doubts the role of globalization and increased competition – facilitated by the ubiquity of the Internet – in changing the business landscape in the Middle East, particularly for the oil-rich countries of the GCC all of which are now members of the WTO.

Furthermore, the formation in early 2006 of a GCC-wide business-to-business (B2B) e-marketplace (Gulf TradaNet) underlines a high level of interest by GCC countries to address the need of its thriving SMBs to exploit the benefits offered by online B2B channels. This marketplace operates under the auspices of the Federation of GCC Chambers of Commerce and Industry in partnership with Nesma Internet Services, a Saudi information technology services company, to help small and medium enterprises participate in an online trading community without the associated costs of installing expensive e-procurement solutions.

Non-financial goods and services either acquired or sold by businesses in the GCC through an online channel in 2006 were valued at an estimated $24.7 billion, which translates into a 45.5 per cent increase over 2005. Online B2B transactions in 2006 accounted for some 3.45 per cent of the six countries' accumulated nominal GDP of $718 billion, compared with only 2.83 per cent in 2005.

Roughly 85 per cent of these B2B online transactions were conducted on private e-procurement exchanges while the remaining transactions were conducted in public B2B e-marketplaces.

Madar Research Group estimates that B2B e-commerce sales transactions in the GCC will be growing at about 60 per cent per year within the next three years.

TABLE 30. E-COMMERCE TRANSACTIONS IN GCC, 2006

Country or territory	B2B transactions (*millions of US$*)	Country share of total B2B in GCC (*percentage*)	B2B as percentage of GDP (*percentage*)
Bahrain	600	2.43	3.73
Kuwait	2 015	8.14	2.10
Oman	1 080	4.37	3.00
Qatar	847	3.42	1.61
Saudi Arabia	14 000	56.58	4.02
United Arab Emirates	6 200	25.06	3.68
Total	24 742	100.00	3.45

Source: Madar Research Group.

As for the rest of the ESCWA member countries, no reliable figures are available on e-commerce. Madar Research Group, however, estimates the size of B2B e-commerce in the rest of the ESCWA member countries combined at $3.5 billion in 2006.

(a) *B2B e-commerce by industry sector*

The automobile industry dominates the GCC B2B e-market. Feedback gathered from major car distributors and dealers and from various trade ministries and customs departments indicates that a very substantial number of orders for vehicles is being carried out annually.

Trailing the very aggressive automobile industry is the IT sector, facilitated by an increasing number of vendors who now oblige their dealers and distributors to use their "extranets". This is a network that connects partners and suppliers to an internal network, by executing purchase orders and other procurement-related processes. These purchases mainly involve computers and peripherals, networking equipment and other accessories.

The oil and gas industry sector ranks third thanks to the high value of materials and goods this sector purchases electronically, while the Government sector ranks fourth in B2B e-commerce.

(b) *Models of B2B e-commerce in the ESCWA region*

Tejari.com, which runs on Oracle's exchange platform, became profitable in 2003-2004, three years after its inception. It has subsequently reported facilitating a total of $3 billion in sales transactions on its exchange from 2000 to 2006. The Bahrain-based TradaNet, which uses Global eXchange Services (GXS) solutions, has also been active in the past few years, particularly in Bahrain's airline and cargo handling industry. Oman TradaNet (OTN) has succeeded in becoming a document delivery exchange platform on its home front within the past few years, thus recently gaining the attention of global B2B e-marketplace provider Quadrem as well as EOS Technologies.

Despite the only modest success of these and a few other aspiring B2B e-marketplaces in the ESCWA region, there has been unexpected growth overall in B2B e-commerce transactions in the region in the past few years. Some large enterprises are now embracing e-procurement at various stages, however cautiously, either via extranets or an EDI-Internet hybrid network for their core purchases (e.g., industrial goods), or through membership in a B2B e-marketplace for their non-core purchases (e.g., office supplies), effectively driving the growth of overall online B2B transactions in the GCC in the past two years. Apparently the opportunities offered by globalization have proved even more effective than the early promotional drive by the stakeholders in the global B2B e-commerce industry.

The best example of the use of an electronic data interchange (EDI) network in the ESCWA region is the leading oil and gas company Aramco, which operates a private exchange for doing business with its suppliers and clients. Aramco was one of the first companies in the region to implement an EDI, which it used for about a decade before switching to an Internet-based system.

(c) *Drivers and inhibitors*

The omnipresent need to manage and control costs, particularly in a highly volatile global economy, as well as the need to streamline the rather complex procurement processes, are emerging as the primary factors driving a number of large enterprises in the GCC today to implement e-procurement solutions or become members of a B2B e-marketplace (as a buyer or supplier).

Property and luxury hotel operator Jumeirah International, for instance, turned to an e-procurement system initially for the purchase of fruits, vegetables, meat and poultry, but will start soon to purchase bakery, dairy and dry goods using the system as well. The company further hopes to bring all purchases of more than 65,000 products it regularly buys online. The initial roll-out of an e-procurement system at Jumeirah has apparently yielded empirical benefits: all of its business units are now ordering through one central system, making it easier to track items ordered, by whom and at what cost. Another company, Abu Dhabi Marine Operating Company (ADMA-OPCO), an affiliate of Abu Dhabi National Oil Company, has indicated achieving cost savings of 24 per cent in one of the tenders it conducted on the Ariba e-procurement system.

Globalization is the strongest driver for B2B e-commerce in the ESCWA region, since multinational corporations have increasingly been systematic in requiring their regional distributors to do business with them solely via electronic channels. Government support is the second most important accelerator for B2B e-commerce in the ESCWA region. A good example is the decision made by Dubai Government to move most, if not all, Government procurement processes to Tejari.com, which has induced hundreds of Government suppliers and contract seekers to join the e-marketplace.

Other B2B market drivers include the long-term cost savings usually associated with e-commerce, increased collaboration with partners and the potential for new business opportunities brought about by access to new markets.

Lack of proper awareness and education about the benefits of B2B e-commerce is seen as a major impediment, as well as the lack of a Government-industry alliance to promote B2B e-commerce. Furthermore, the slow adoption of e-procurement systems among businesses in the ESCWA region leaves fewer options available to buyers and suppliers alike; if buyers do not become members of a particular e-marketplace, then suppliers will not be enticed to join in either.

In addition, the small size of the ESCWA region's market or, more accurately, the fraction of the market that is willing to migrate to e-procurement services is a hindrance to the widespread adoption of B2B e-commerce.

Among the inhibitors of B2B e-commerce is the lack of online security, meaning in most ESCWA member countries the lack of a legal framework protecting e-commerce, in addition to technology integration, specifically the need to link an e-procurement application to a back-end system, such as an ERP. The lack of electronic payment systems is another inhibiting factor for B2B e-commerce in the region.

3. *B2C e-commerce*

Madar Research Group estimates put the value of the business-to-consumer (B2C) e-commerce market in ESCWA member countries in 2006 at about $3 billion.

B2C e-commerce channels in the ESCWA region

Many companies in the ESCWA region were prompt in adopting the Internet as a marketing tool by creating websites that provide information about their operations, products and contact details. As the trend of online consumer shopping gained firm acceptance worldwide, many companies in the region established e-commerce channels to facilitate sales to their customers through the Internet. B2C e-commerce started to gain popularity mainly among sellers of flowers, gifts, books, software and hardware.

Tourism in the ESCWA region is a fast-growing industry. Huge investments have been pumped into this sector by various Government and non-Government organizations to attract not only European tourists, but also tourists from the ESCWA region itself. During the past two years, the tourism industry has achieved tremendous growth, partly due to the presence of some world-class airlines, hotel chains and resorts in the region. Due to online reservations, the airline and hotel segments of the tourism industry have become the fastest growing in terms of B2C e-commerce transactions in ESCWA member countries, making up 35 per cent of the region's total B2C e-commerce. Online shopping, however, accounts for the bulk of B2C e-commerce transactions in the ESCWA region, about 65 per cent of the total.

4. *E-commerce standards*

Standards and protocols for e-commerce between companies (inherited from those already governing Electronic Data Interchange networks) include online searching for goods and services, online applications and approvals, creating and sending e-procurement applications, online tracking of shipments, as well as electronic billing payment. At present, not many establishments in the GCC states have fully complied with these requirements. Most of these establishments prefer to move to e-commerce gradually through a combination of traditional and electronic operations.

One of the biggest obstacles facing the standardization of e-commerce is the lack of confidence in the use of the Internet as a means for conducting secure business communication. This is despite the fact that, unlike the case with B2C e-commerce, the legal framework for B2B e-commerce is robust as business between companies, even when conducted mostly over the Internet, is largely based on tested laws, supported by jurisprudence, international law and highly professional arbitration. It seems that the main concern for the GCC states in this area is the possibility of confidential business information reaching third

parties on the Internet, having the security of internal networks compromised by the Internet, and the absence of laws governing Internet-based transactions in some ESCWA member countries.

Some GCC states have recently launched initiatives to develop a legal framework that can provide overall protection for e-commerce transactions. Encryption technology is also gaining trust in the market, as it becomes an integral part of most B2B e-commerce solutions. Comtrust, the national validation and authentication authority of the United Arab Emirates established by Etisalat in 1999, has been providing a range of useful services, ranging from the issuance of different types of certificates for business to public key infrastructure (PKI) encryption services. Additionally, in 2001 Dubai passed laws governing online transactions and e-commerce, while in December 2002 a similar law protecting e-commerce was enacted in Bahrain.

In early 2001, Saudi Arabia entrusted King Abdulaziz City for Science and Technology (KACST) with the task of developing both the PKI technology in the kingdom and a legal framework for regulating and managing digital certificates and digital signatures. Later, in 2005, this role was relegated to the eTrust Center.

TABLE 31. AVAILABILITY OF E-COMMERCE AND E-SIGNATURE LAWS IN THE ESCWA REGION, 2006

Country or territory	e-commerce law	e-signature law
Bahrain	Yes	Yes
Egypt	Yes	Yes
Iraq	No	No
Jordan	Yes	sYe
Kuwait	No	No
Lebanon	No	No
Oman	No	No
Palestine	No	No
Qatar	No	No
Saudi Arabia	Yes	No
Syrian Arab Republic	No	No
United Arab Emirates	Yes	No
Yemen	No	No

Sources: Madar Research Group, and the 2007 country reports submitted to ESCWA.

C. COMPARATIVE ANALYSIS OF ICT APPLICATIONS IN EDUCATION IN THE ESCWA REGION

Around the beginning of the past decade, some ESCWA member countries started introducing e-learning into their education sector development plans. Although computer-assisted learning has in line with the global trend, been adopted by many Governments and specialized departments in the ESCWA member countries for employee training, this aspect of education does not usually fall within the education sector, but rather within the “e-training” sector.

1. *E-learning*

Some countries in the region have set up plans to either introduce or develop e-learning as part of public education. Most notable of these are Egypt and Jordan, which have clear programmes and sound implementation plans. The United Arab Emirates stands out as the only ESCWA member country where the availability of e-learning is relatively widespread, through both Government and private institutions. However, the country has no unified or standardized e-learning strategy, instead e-learning is growing as part of the general scope of educational development. Trailing behind are Oman, Qatar, Bahrain, Saudi Arabia, Kuwait and the Syrian Arab Republic, where public e-learning plans are being developed. However, some institutions and schools in these countries provide e-learning on a small scale, involving few people. Lebanon and Yemen are at the end of the list due to the absence thus far of a clear e-learning strategy.

In Egypt, the Ministry of Communications and Information Technology, in collaboration with a group of Egyptian organizations and Cisco Systems, provides an e-learning programme on using ICT for small and medium sized enterprises through the e-Learning Competitive Center in the Smart Village. The Ministry of Higher Education, on the other hand, has established the Post-Graduate Studies e-Learning Center in order to link academic institutions and provide e-learning in universities. In 2002, the Ministry of Education[32] launched an e-learning programme for elementary, preparatory and secondary schools. The actual implementation of the programme began in 2003 and the ministry today operates an e-learning portal[33] with virtual study rooms and educational content for both the preparatory and secondary levels. As for e-learning in higher education, the National e-Learning Center[34] was established with the aim of building e-learning centres at universities and developing national e-learning standards.

In 2003, the Jordan Education Initiative (JEI) was launched. It is an ambitious e-learning project developed out of a partnership between Jordan and Cisco Systems. The initiative seeks to provide e-learning both to schools and universities. Jordan has made important achievements in this regard in collaboration with Government, civil society and international organizations, linking more than 1,200 out of 3,200 public schools with its national schools network, and establishing computer labs in more than 2,500 schools since the inception of the project. At the university level, all public and private universities but one have been linked with a fibre-optic network, which in turn is linked to the University Learning and Research Network, which has played a role in providing distance learning to some universities.

In the United Arab Emirates, both the Ministry of Education[35] and the Ministry of Higher Education and Scientific Research[36] are behind schedule in developing a strategy for e-learning in public schools and universities. However, e-learning has already been adopted in the United Arab Emirates by other Government organizations and also in the private sector where it is directed at the educational and academic sectors the business sector and labour market, particularly in Dubai. One example is the e-learning initiative known as "easyLEARNING"[37] launched by the Etisalat Academy with the aim of providing a range of specializations such as business administration, programming and IT. Meanwhile, the Institute for Technical Innovation[38] (ITI) at Zayed University provides some educational programmes via the Internet to students, where they can participate in class without having to show up at the institute.

E-Total Quality Management (e-TQM) College[39] in Dubai offers two academic programmes, which blend traditional face-to-face learning with e-learning. These offer a bachelor's degree in Business and Quality Management and a master of science degree in Organizational Excellence. In addition, e-learning and e-learning solutions are offered by several companies and institutions in Dubai, especially in Dubai Knowledge Village. Companies which provide e-learning solutions include for instance Universal Knowledge Solutions[40] (UKS), while a number of international private universities and e-learning portals provide distance learning, such as the "Arabic eLearn" portal.[41]

In Oman, Sakhr Software is building an e-learning portal for the Ministry of Education. The first phase of the project, which started in 2006, has been applied in two educational zones covering 200 schools and 116,000 students. The portal, to be launched during the 2008 academic year, includes school management

[32] www.emoe.org.

[33] http://elearning.emoe.org.

[34] www.nelc.edu.eg.

[35] www.moe.gov.ae.

[36] www.uae.gov.ae/mohe.

[37] www.etac.ae/easylearning.

[38] www.zu.ac.ae/iti.

[39] www.etqm.ae.

[40] www.uks.ae.

[41] www.arabic-elearn.com.

systems (SMS), e-learning and the Internet Portal System. The portal is expected to cover all schools in Oman (about 1,000) within five years.

In Kuwait, the Ministry of Education has begun to implement an e-learning project which started by allocating an e-mail address to every student in the country, and posting the national curricula both on the Internet and on CDs. As a first step, grade 11 books have been placed on the ministry's website, as well as on CDs distributed to educational zones. Learning management systems (LMS) have also been installed at the University of Kuwait, some private universities and schools and at vocational training institutes, to help manage the e-learning process.

For its part, Bahrain has launched the King Hamad's Schools of the Future project for the purpose of bringing schools into a full e-learning environment by 2009. The first phase of the project has recently been completed, servicing 11,000 students and more than 1,300 teachers from 11 schools. The infrastructure, which includes building the network and uploading 140 secondary school e-books, has also been completed.

In Saudi Arabia, King Abdulaziz University had long been incorporating e-learning into its curriculum and houses the largest electronic library in the kingdom (16,000 e-books). In late 2006, the Ministry of Higher Education signed a contract with the Malaysian company METEOR (Multimedia Technology Enhancement Operations) to establish the first phase of the National Center for e-Learning and Distance Learning, which will serve as a national incubator for the development and use of e-learning and distance learning by the kingdom's institutes of higher education. The contract covers the initial steps for establishing the centre, which will be implemented over three phases: designing the e-learning management system, training 1,500 employees and academics in its use and providing more than 1,000 trainees with e-learning skills. The contract also covers the building of electronic curricula. At the same time, the Ministry of Education will incorporate e-learning into the educational browser Semanoor[42] for use by all schools starting in the 2008 academic year. Additionally, the ministry's e-schools portal[43] offers elementary-level online courses and curricula.

In 2005, the Supreme Council of Information and Communication Technology in Qatar piloted the "Schools Knowledge Net Project" as the first step in implementing a number of projects which are part of Qatar's e-education strategy. In 2007, the council and the Institute of Administrative Development (IAD) launched an e-learning portal, which will provide Government employees, university students and the community at large with access to 4,000 cost-free courses covering business and professional development, IT and computer software in Arabic, English and French.

2. *E-schools*

Most schools in the ESCWA region still suffer from the lack of an Internet connection inside the classroom and thus lack one of the basic educational tools, though Internet connections are widely available in technical labs. Apart from Bahrain, Jordan and the United Arab Emirates and some humble attempts in Egypt, ESCWA member countries have poor connectivity.

So, in terms of Internet connectivity at schools, Bahrain, Jordan and the United Arab Emirates come in first place among ESCWA member countries. In Bahrain, there are three computers connected to the Internet in each school, with plans to provide 12 connected computers to each school. The King Hamad's Schools of the Future project will, however, establish the first group of e-schools committed to the highest global standards (including secure Internet services for each student inside the school's classrooms and lecture halls). In Jordan, there are on average five computers per 100 students, the highest percentage in the ESCWA region. The "Discovery Schools" project is one of the leading projects in Jordan as it will provide, apart from high speed Internet access at schools, five comprehensive curricula published electronically. In Egypt, the Ministry of Communications and Information Technology, the Ministry of Higher Education and the Ministry of Education have launched, in cooperation with Oracle, the "Think.com" programme. The programme aims to develop basic computer literacy skills for primary and secondary school students, while also helping to provide schools with greater Internet access. Egypt is one of a few countries around the

[42] www.semanoor.com.sa.

[43] www.eschool.gov.sa.

world which host Oracle's "Think.com" portal. Although the programme is still in its pilot stage, serving only 30 schools, when completed it is expected to provide a model for e-school environments.

In the United Arab Emirates, most schools are connected to the Internet, but the number of computers per 100 students is still low. The Sheikh Mohammed Bin Rashid Al Maktoum IT Education Project (ITEP), however, provides advanced curricula and sophisticated ICT equipment to about 40 secondary schools benefiting some 13,000 students annually.

Saudi Arabia has some interesting pilot projects, such as Abdul Rahman Faqeeh Model Schools,[44] established in 2006. These schools provide e-classrooms at all educational levels whereby teaching is carried out using computers. King Faisal School[45] also relies on e-learning in all its secondary-level classes.

3. *Virtual universities and distance education degrees*

There are very few virtual university projects in the ESCWA region, though traditional universities are increasingly adopting e-learning methods within their educational plans as stated earlier in this report. Among the most important virtual universities are the Syrian Virtual University, another virtual university project between Cairo University and Venice University under the auspices of UNESCO and funded by the European Union, the Jordan e-Academy and the Arab Open University. The latter, established in cooperation with the British Open University, is not fully classified as a virtual university, but features many of its elements.

The Syrian Virtual University[46] (SVU) was the first virtual university in the region. It offers a selection of graduate and post-graduate international degrees from partner-universities, in addition to its own bachelor programmes in Information Technology and Information System Engineering.

Based in Kuwait, the Arab Open University[47] (AOU) was launched in 2001 with branches in Bahrain, Egypt, Jordan and Lebanon. The university uses an integrated multimedia and multichannel system in education. This includes printed media, audio and video educational materials, CDs and Internet portals.

The Jordan e-Academy is a joint project between Technology World[48] and Al-Balqa' Applied University[49] which aims to provide online courses and certificates, in both blended and online format, to students from Al Balqa' Applied University and other universities in Jordan, as well as lifelong learning certificates to working adults in both the public and private sectors in Jordan. Currently, the academy is in the process of developing electronic content and is preparing for its opening on a date yet to be announced.

Meanwhile, the Mediterranean Virtual University (MVU), funded by the European Union, offers online interactive courses developed and delivered by one of 11 renowned universities in Europe and the Mediterranean region. These universities include the Jordan University of Science and Technology (JUST), the American University of Beirut, Ain Shams University and the Islamic University of Gaza.

D. COMPARATIVE ANALYSIS OF ICT APPLICATIONS IN HEALTH CARE IN THE ESCWA REGION

The use of ICT in the health-care sector has made it possible to access an individual's health records, allowed for remote consultations between physicians and health experts all over the world, and enabled surgeons to supervise operations remotely (telemedicine), among other applications. In the ESCWA region, however, the use of ICT applications in health care is mostly limited to hospital management systems and patient information systems and archives. There are very few public networks that connect Government and

[44] www.afsch.edu.sa.

[45] www.kfs.sch.sa.

[46] www.svuonline.com.

[47] www.arabou.org.

[48] www.twcompany.net.

[49] www.bau.edu.jo.

private hospitals for the purpose of freely exchanging information and consultations over medical cases and surgeries. However, some technologically-advanced private and public hospitals in Bahrain, Egypt, Jordan, Lebanon, Saudi Arabia and the United Arab Emirates have reached high levels of expertise in this area comparable to hospitals in developed countries, mainly through links with global medical networks, especially in the United States.

1. *Availability and Access to medical knowledge and public health issues*

There are hundreds of Arabic health related websites set up by public or private organizations or medical professionals in the ESCWA region which offer health-care tips and consultations, or focus on exchanging medical knowledge between physicians and other health workers. Some of these websites are affiliated to public or private hospitals, clinics or community organizations. Despite the fact that the health authorities in ESCWA member countries do not usually use the Internet for the delivery of health information and services to citizens, people can get access to useful health-care information and tips in Arabic by searching Arabic online directories such as those provided by the portal maktoob.com. The scarce use of the Internet as a communication channel in health care is partly due to the relatively low number of Internet users in the ESCWA region, especially among the groups which are participating in health-care programmes.

The World Health Organization Regional Office for the Eastern Mediterranean[50] (WHO EMRO) is working to promote and develop rules and foundations for e-health. On its website, the office offers valuable information for researchers on initiatives, research and health systems related to the countries of the region. This website is probably the most important source for researchers on e-health in the region.

In cooperation with WHO and the Kuwaiti Ministry of Education, the Kuwaiti Ministry of Health will introduce the e-Health Academy for students in the 2008 academic year. The e-Health Academy offers health awareness material on an interactive CD for school students. The project has been piloted in Egypt and Jordan with great success. The topics have been selected to match priority health issues in Kuwait, such as obesity, lack of physical exercise, drug addiction, smoking, food safety, osteoporosis, nutrition and health education.

National medical care databases

The percentage of websites offering health statistics and disease-related databases is still small in the region. Such information is available only to international organizations such as WHO, which has implemented several programmes in the region in cooperation with the relevant ministries. Although many ESCWA member countries have started to build national medical care databases, these databases are not yet complete as they lack comprehensive health data about their citizens. While top hospitals in the GCC countries, Jordan and Lebanon have their own databases, most hospitals are still isolated and not linked to centralized national networks.

Bahrain, Kuwait and the United Arab Emirates are the most developed countries in this sphere. The least developed are Iraq and Yemen. In the United Arab Emirates, the Ministry of Health has launched several projects related to e-health. These include linking hospitals and medical centres to an interactive electronic network. Another project focuses on developing electronic systems in medical schools, while still another is an electronic system for medical equipment. In May 2005, Emirates Computers worked with Cisco Systems and the Dubai Department of Health and Medical Services (DOHMS) to introduce wireless patient bedside computing at three of its hospitals in Dubai, using Cisco Medical Grade Network's portfolio of technologies. Currently, the Saudi Ministry of Health is linking all its hospitals and medical centres across the kingdom and to the ministry through a single network with the aim of providing information about different health-care facilities to decision makers in the ministry. A number of health-related administrative offices, medical supply sites, and blood banks have already been connected. Over the next two years, the rest of the hospitals in the kingdom will gradually be linked, starting with the medical centres. Meanwhile, the Saudi Commission for Health Specialties[51] has launched a specialized medical e-library on the Internet for its registered users.

[50] www.emro.who.int.

[51] www.scfhs.org.

2. *Telemedicine and medical use of teleconferencing*

Telemedicine and the medical use of teleconferencing are still in their early stages in the ESCWA region, though they are used by some health-care institutions.

Bahrain Specialist Hospital, a renowned medical centre in the region, is connected electronically to many leading medical centres around the world. In Egypt, the Ministry of Health and the Ministry of Communications and Information Technology have collaborated to establish the Egyptian Telemedicine Network,[52] which aims to improve medical and health-care services in Government hospitals. The network allows hospitals in remote and rural areas to consult with larger hospitals, and features an ambulance equipped with a VSAT connection to provide telemedicine services in accidents and disasters. The network has reportedly not fared well for reasons unknown.

Jordan has provided telemedicine services for more than 10 years and is connected to several international telemedicine networks. This fact reduces the need for citizens to travel abroad for treatment. Some private hospitals in Jordan are connected to other hospitals in the United States through the services of Jordanian MedLabs Consultancy Group.

Kuwait is making use of its large Internet bandwidth to provide telemedicine services in the country. It is also a member of the Arab Telemedicine Network, established to facilitate the exchange of information between medical centres and hospitals in the Arab region and international medical centres.

In Lebanon, telemedicine and teleconferencing services are for the most part restricted to some private sector hospitals. The United Arab Emirates is connected to the Arab Telemedicine Network, the Egyptian Telemedicine Network, the Dermatological Diseases Telemedicine Network and the Pediatric Consultation Network.

3. *Health-care information systems*

Although rapidly growing, the use of health-care information systems in the ESCWA region varies from one country to another, as well as within the same country from one hospital or clinic to the other. Electronic-based health-care systems are widely used in specialized and advanced hospitals in the GCC counties, Egypt, Jordan and Lebanon. Although they are also used on a very limited scale in smaller hospitals, many clinics remain dependent on paper files despite the overwhelming global shift towards the use of electronic files.

By 2009, the Kuwaiti Ministry of Health will complete a project which links health-care centres and hospitals throughout the country. Doctors working in these centres will get access to patients' files, their medical history, the medications they are currently taking and their medical diagnoses. It will also be possible for referrals to be made from health-care centres to hospitals. This will provide the ministry with "e-files" for all its patients.

In Jordan, the Royal Health Awareness Society (RHAS) is expanding its use of ICT to provide higher quality health-care services. The society is working in cooperation with the ministries of health and ICT, and with Microsoft Corporation to develop an electronic medical records system in order to supply all health-care providers in Jordan with patient records. Moreover, the society, in cooperation with the Ministry of Health,[53] is working on another project aiming at developing an electronic school clinic linking all schools via the Internet. The e-clinic will be able to provide consultation for any health issue, and the programme will create a medical file for each student. The project is also expected to introduce short documentaries on health-related issues.

[52] www.telemedegypt.net.

[53] www.moh.gov.jo.

In Qatar, the Supreme Council of Information and Communication Technology is collaborating with the Hamad Medical Corporation (HMC) and the National Health Authority to develop a comprehensive e-health programme for the purpose of establishing an advanced ICT-based medical system in the country.

In Bahrain, the Ministry of Health[54] provides some e-health services for citizens, such as scheduling medical appointments and providing X-ray results. These services are linked to the citizens' national ID numbers.

In Saudi Arabia, and in cooperation with the National Guards Health Affairs and King Saud bin Abdulaziz University for Health Sciences (KSAU-HS), the Saudi Association for Health Informatics[55] (SAHI) has started to organize the biennial Saudi e-Health Conference[56] whose second round will be held in March 2008. The conference brings together specialists in the field from all countries of the region to discuss e-health issues and share experiences. In addition, Saudi Arabia will gradually apply a unified health information system in its hospitals in order to establish a medical information infrastructure among health institutions and to serve its citizens, residents and visitors alike.

E. COMPARATIVE ANALYSIS OF ICT APPLICATIONS IN EMPLOYMENT IN THE ESCWA REGION

1. *Employment portals and online job opportunities*

The past few years have seen increased interest in online recruitment in the ESCWA region, fuelled by the growth of employment agencies across many member countries. These include Jordan, Egypt, the United Arab Emirates and other countries where the Internet and ICT tools are used to advertise job opportunities and receive applications of jobseekers.

Many companies advertising job opportunities in the media provide their e-mails as the preferred channel for receiving resumes, which encourages jobseekers to use the Internet.

Many private companies in Egypt have built online portals that offer job opportunities to graduates from various fields. Most of these portals provide free services to the public, making resumes available to both the Government and the private sector.

In Bahrain, Oman and the United Arab Emirates, public and private institutions are increasingly using online job sites, which have flourished as key channels for recruitment.

Some public and private sector institutions are now advertising their vacancies online. Dubai e-government is leading the region with its online job site supported by the Government's Department of Information Resources Planning, which provides job opportunities for all graduates and jobseekers. Other institutions providing online recruitment services include Dubai Airport Free Zone Authority (DAFZA), Civil Defense, Dubai Courts, Dubai Police General Headquarters and Etisalat, to name a few.

In Yemen, where there is no real presence of online recruitment, the Ministry of Civil Service and Insurance nevertheless uses computerized systems to choose among applicants for Government jobs, in addition to other human resources management systems.

In Iraq, some websites advertise vacancies at United Nations organizations and other regional and international organizations, and receive job applications electronically.

In Kuwait, the Civil Service Commission, the largest employment authority in the country, advertises job opportunities and receives applications for Government vacancies electronically. Many independent and

[54] www.moh.gov.bh.

[55] www.sahi.org.sa.

[56] www.saudiehealth.com.

Government-affiliated authorities in Kuwait advertise jobs and receive applications through their websites. In many other Government bodies, applying for a job online has become the main or only means of applying. In Kuwait's private sector, online recruitment takes many forms as various specialized recruitment agencies advertise job opportunities on behalf of other companies, and receive job applications online, such as "gulfjobseekers.com" and "bayt.com". It has become a common practice for private companies in Kuwait to have links on their websites to job vacancies as well as to accept job applications online.

In Bahrain, the Civil Service Bureau has developed a system to help jobseekers apply for Government jobs online. It will also allow ministries to browse through applications and contact potential candidates. Furthermore, unemployment offices allow the unemployed to register with the Government online. In this case, CVs are stored in a database, helping applicants both to find a job, and to receive unemployment allowance. This service has been available on the e-government portal[57] for over a year.

It is evident that, online job-hunting is widely popular with jobseekers. In the United Arab Emirates, a poll conducted by "bayt.com" in January 2007 showed that more than 22 per cent of those surveyed had found jobs online using websites such as "bayt.com" as compared with 11 per cent who used the services of employment agencies, and 30 per cent through newspaper ads. In fact, the growth in the numbers of employment agencies posting their job opportunities on dedicated websites will most definitely lead to a surge in the numbers of online jobseekers.

2. *National job databases*

Considering that online recruitment is still a new phenomenon in ESCWA member countries, the process of building national human resource databases is limited in these countries. Here, we specifically showcase the experience of Jordan, as it is the most developed in this area.

Al Manar Project in Jordan was established by the National Center for Human Resources Development and funded by the Canadian Government. It aims to build human resource data warehouses, with data collected, cleaned, processed, stored and published. Research conducted on the data will form the basis of policymaking and decision-taking in the area of human resources. The centre is also leading efforts to provide expertise in the field of career counselling at Jordan's schools and universities, and in its labour market, in addition to raising awareness among students of the nature and development of labour market. The centre also allows employers to announce their job vacancies without charge.

In Oman, the Ministry of Manpower is building a national human resources database, which includes the collection of and regular follow-up on data and information for updating purposes. This is a crucial project for the Omani Government. When completed, it will help streamline human resource policies, assist in the formulation of appropriate plans for the implementation of policies, and assess its effect on the economic and social development of Oman and on its labour market.

Efforts being made in the area of online recruitment include those led by ESCWA as a contribution to the reconstruction of Iraq. ESCWA is building job databases for Iraqi skilled workers inside and outside Iraq, and providing information on job opportunities and jobseekers.

3. *Teleworking and increasing employment opportunities*

The concept of teleworking has recently emerged in the region's labour markets, gradually gaining ground as a response to the increasingly widespread use of ICT in the workplace. Despite the absence of accurate numbers measuring the actual extent of this practice, the current economic boom in the Gulf region, especially in business activities that do not require the employee to be physically located at the office (such as media, research, translation, web design and consulting) has paved the way for individuals and companies to opt for this mode of work. Several companies in the GCC countries, such as the United Arab Emirates, are

[57] www.e.gov.bh.

outsourcing part of their business to employees living in other countries like Egypt, the Syrian Arab Republic and Jordan, where work tasks are being carried out over the Internet.

F. Classification and ranking of ESCWA member countries

1. *Maturity level 1: Iraq, Palestine, Syrian Arab Republic and Yemen*

This level is characterized by poor use of ICT applications in Government, weakness or absence of e-commerce and related legislation, limited usage of ICT in education (while the Syrian Arab Republic has a virtual university, computers and Internet access in schools are very rare), inferior usage of ICT in health care, and barely perceptible use in the employment sector.

2. *Maturity level 2: Egypt, Lebanon and Oman*

This level is characterized by average progress in ICT applications in all areas covered by the study. On the one hand, both Egypt and Oman have made average progress. On the other, Lebanon is leading with good progress in the area of e-banking. However, such progress was insufficient in the period under study to move Lebanon up to the third level of maturity due to its lagging in other areas.

3. *Maturity level 3*: *Jordan, Kuwait, Qatar and Saudi Arabia*

This level is characterized by progress in at least two of the five areas researched. While Saudi Arabia, for instance, had made progress in e-commerce and health, Kuwait and Jordan surged ahead in both education and health. As for Qatar, it stood out in both e-government and education. These countries made average progress in the other areas.

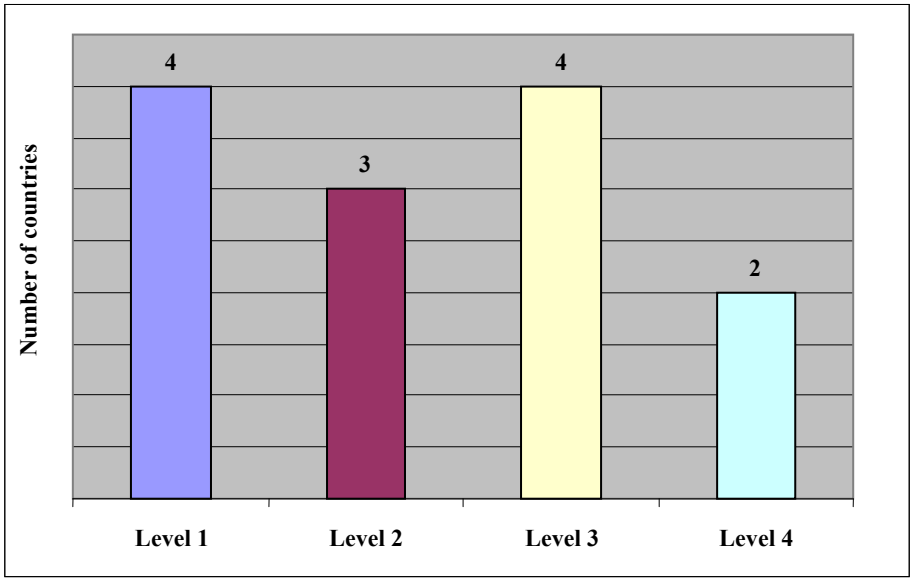
4. *Maturity level 4: Bahrain and United Arab Emirates*

The fourth level is characterized by progress in four areas. The United Arab Emirates and Bahrain have made significant progress in all areas except education where they were ranked as average.

TABLE 32. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN ICT APPLICATIONS

	Maturity level 1	Maturity level 2	Maturity level 3	Maturity level 4
Country or territory	2007	2007	2007	2007
Bahrain				✓
Egypt		✓		
Iraq	✓			
Jordan			✓	
Kuwait			✓	
Lebanon		✓		
Oman		✓		
Palestine	✓			
Qatar			✓	
Saudi Arabia			✓	
Syrian Arab Republic	✓			
United Arab Emirates				✓
Yemen	✓			

Figure 7. Maturity levels of ESCWA member countries in ICT applications, 2007



G. SUGGESTIONS AND RECOMMENDATIONS

(a) Rapidly completing e-government projects, and allocating clear budgets for them. Parallel with this is enhancement of ICT infrastructure and e-literacy so citizens might benefit from these modern services;

(b) Enforcing and activating e-transaction and e-signature laws; encouraging private sector e-business and e-commerce initiatives; and establishing a joint electronic marketplace for all ESCWA member countries in which both public and private sectors can participate;

(c) Developing appropriate curricula for e-learning, and training teachers so they can be comfortable working in an electronic environment. After all, the dissemination of e-learning is not only about introducing computers and the Internet to the classroom; ESCWA member countries with poor resources must also focus on model schools which could gradually be expanded in the future;

(d) Enhancing the use of ICT in health care could save rich and poor ESCWA member countries alike billions of dollars by reducing the number of citizens sent abroad in search of better treatment;

(e) Adopting transparency in the dissemination of news about hacking incidents, and publishing a "privacy policy" to which all websites, especially Government sites, commit;

(f) Raising awareness among Governments and private sector institutions in the less wealthy ESCWA member countries (Jordan, Iraq, Syrian Arab Republic, Egypt and Yemen) about emerging business opportunities originating in the GCC countries suitable for teleworking, such as translation, research, media, web design and consulting, as well as developing training programmes for their citizens so that they might benefit from these growing opportunities to reduce unemployment.

VIII. CULTURAL DIVERSITY AND IDENTITY, LINGUISTIC DIVERSITY AND LOCAL CONTENT

A. COMPARATIVE ANALYSIS

There is wide variation in the level of ICT usage to promote and preserve Arab culture, heritage and language among ESCWA member countries. The United Arab Emirates took the initiative several years ago by launching a portal created by Abu Dhabi's Cultural Foundation which includes hundreds of historical Arabic texts and books on the Arab cultural heritage. Alwaraq.com remains today the leading online Arab heritage portal.

1. *ICT in support of cultural and linguistic diversity*

Cultural and linguistic diversity is one of the factors encouraging artistic creativity and scientific innovation, as well as being a means of coping with the demands of modernization. Some countries of the ESCWA region have in the past few years launched initiatives aimed at promoting cultural and linguistic diversity. Not many of these initiatives have as yet achieved much progress, though it is too early to assess their relative success or failure.

In Egypt, three protocols were signed in 2005 and 2006 jointly by the Ministry of Communications and Information Technology, the Ministry of Culture and Dar El Maaref with a view to digitizing a collection of Arabic books and also plays from the national theatre. In Bahrain, the Ministry of Information has published a web-based cultural magazine. In addition, the digital library provided by the Bahrain Center for Studies and Research to its members is a contribution to the development of cultural content.

The greatest number of such initiatives however seem to belong to the United Arab Emirates and Qatar, both aiming to become active hubs for the preservation and promotion of Arab culture and heritage. Both countries' initiatives aim to establish leadership in this sphere on Arab, Islamic and international levels. Both countries plan to implement major cultural projects, such as establishing museums and libraries, and translating into Arabic books published in other languages (e.g., Abu Dhabi's Kalima Project). These projects will contribute to Arab cultural and content diversity through the websites accompanying them.

As for the rest of the ESCWA member countries, some individuals have, using their personal resources, undertaken initiatives to support cultural and linguistic diversity as well. They have managed to do so through websites on, for example, the Syriac language,[58] in the Syrian Arab Republic, and heritage-related manuscripts, in Egypt.[59]

2. *Local and foreign digital content development*

Dubai-based research and consultancy company Madar Research Group has recently conducted a study on Arabic content on the Internet (both in Arab countries and abroad) using a methodology based on world search engines. The results showed that the number of Arabic web pages is still considerably low compared with the overall number of web pages published in other languages, accounting for only about 0.16 per cent at the end of 2006. The insignificance of such value becomes more apparent when one considers that Arabic speakers constitute about 5 per cent of the world population. On the brighter side, however, the growth rate of Arabic web pages has been in excess of 400 per cent per year since 2005.

Some ESCWA member countries have undertaken certain initiatives that directly aim at increasing digital Arabic content. These include an initiative launched by Egypt's Ministry of Communications and Information Technology in 2005 to create digital Arabic content portals. The initiative aimed to provide about 300,000 URLs on the Internet, and was scheduled to be operational by mid-2007. Progress has been slow, however, and there seem to be no indications as to whether the project will be completed.

[58] www.kenshrin.com.

[59] www.ziedan.com.

Additionally some governmental and non-governmental organizations have developed an incentive-based approach to encourage individuals and institutions to contribute to the development of Arabic content on the Internet. This includes organizing competitions, offering monetary rewards and prizes. Examples are the National e-Content Competition in Egypt, and the Digital Excellence Prize initiated by the Ministry of Communications and Information Technology in Saudi Arabia. Both projects aim to enrich Arabic digital content while at the same time enhancing Arab talent in the development and design of websites.

Remarkably Egypt was the only country in 2007 to put forward a strategy to develop software tools for creating Arabic digital content.

3. *Distribution of Arabic versus English language web content in the ESCWA region*

Madar Research Group has created a methodology using search engines (Google, in particular) to determine the language distribution of websites deployed under the ccTLDs of ESCWA member countries. These domains do not include sites registered under generic TLDs, such as dot-com and dot-org.

Results gathered using this methodology are not very accurate, but they do provide a rough estimate of Arabic content on the Internet. Based on these results, the United Arab Emirates has the most web content (in Arabic and English) among ESCWA member countries, accounting for 18.8 per cent, as of mid-2007, followed by Saudi Arabia with 18.5 per cent.

Saudi Arabia led however in terms of overall Arabic web content in the ESCWA region, accounting for 20 per cent, followed by the United Arab Emirates (17 per cent), the Syrian Arab Republic (14 per cent), Kuwait (13 per cent) and Egypt (10 per cent).

The Syrian Arab Republic ranked first in content growth (Arabic and English). Arabic content multiplied some 160 times over a two-year period (mid-2005 to mid-2007). This means that about 160 Syrian web pages were added for each web page available back in 2005. Kuwait came second in terms of content growth, recording a 58-fold increase over the same period.

In terms of the proportion of Arabic pages to total Arabic and English pages, Iraq ranked first (98 per cent), followed by the Syrian Arab Republic (96 per cent), and then Kuwait (82 per cent). Iraq's leadership must be viewed in context however in that it has the fewest Arabic and English web pages of all the ESCWA member countries, accounting for only a dismal .0001 per cent.

Except for Lebanon, the amount of Arabic content has grown more than the amount of English content in all ESCWA member countries, most likely due to the increase of e-government-related projects in the region.

TABLE 33. RANKING OF ESCWA MEMBER COUNTRIES BY NUMBER OF ARABIC AND ENGLISH WEB PAGES REGISTERED UNDER THEIR CCTLDS[*]

Country or territory	Arabic 2005	English 2005	Total[**] 2005	Arabic 2007	English 2007	Total[**] 2007
United Arab Emirates	124 000	450 000	574 000	2 450 000	1 340 000	3 790 000
Saudi Arabia	259 000	129 000	388 000	2 860 000	864 000	3 724 000
Egypt	125 000	883 000	1 008 000	1 430 000	1 060 000	2 490 000
Kuwait	20 100	19 700	39 800	1 890 000	423 000	2 313 000
Syrian Arab Republic	12 200	814	13 014	2 000 000	78 100	2 078 100
Palestine	77 500	45 900	123 400	1 350 000	314 000	1 664 000
Jordan	30 300	62 600	92 900	870 000	450 000	1 320 000
Lebanon	8 620	171 000	179 620	551 000	738 000	1 289 000
Bahrain	18 500	28 800	47 300	410 000	196 000	606 000

TABLE 33 (*continued*)

Country or territory	Arabic 2005	English 2005	Total** 2005	Arabic 2007	English 2007	Total** 2007
Qatar	14 500	28 300	42 800	238 000	218 000	456 000
Oman	6 610	17 100	23 710	218 000	123 000	341 000
Yemen	10 100	11 200	21 300	44 500	12 800	57 300
Iraq	-	-	-	17 500	423	17 923
Total	706 430	1 847 414	2 553 844	14 329 000	5 817 323	20 146 323

* Based on pages displayed by search engines.

** Other foreign language content is not included.

TABLE 34. RANKING OF ESCWA MEMBER COUNTRIES BY SHARE OF ARABIC CONTENT ON THE INTERNET

Country or territory	Arabic web pages per total Arabic and English web pages in each country* (*percentage*)		Percentage point change
	2005	2007	
Iraq	None	98	-
Syrian Arab Republic	94	96	+2
Kuwait	51	82	+31
Palestine	63	81	+18
Yemen	47	78	+31
Saudi Arabia	67	77	+10
Bahrain	39	68	+29
Jordan	33	66	+33
United Arab Emirates	22	65	+43
Oman	28	64	+36
Egypt	12	57	+45
Qatar	34	52	+18
Lebanon	5	43	+38
Average	28	71	+43

Source: Madar Research Group.

* Other foreign language content is not included.

TABLE 35. RANKING OF ESCWA MEMBER COUNTRIES BY CONTRIBUTION TO TOTAL ARABIC CONTENT ON THE INTERNET IN THE REGION

Country or territory	Ratio of Arabic web pages in each country to total Arabic pages for all ESCWA countries (*percentage*)		Percentage point change
	2005	2007	
Saudi Arabia	37	20	-17
United Arab Emirates	18	17	-1
Syrian Arab Republic	2	14	+12
Kuwait	3	13	+10
Egypt	18	10	-8
Palestine	11	9	-2
Jordan	4	6	+2
Lebanon	1	4	+3
Bahrain	3	3	0
Qatar	2	2	0
Oman	1	2	+1
Yemen	1	1	0
Iraq	-	1	-

Source: Madar Research Group.

TABLE 36. RANKING OF ESCWA MEMBER COUNTRIES BY CONTRIBUTION TO TOTAL ARABIC AND ENGLISH CONTENT ON THE INTERNET IN THE REGION

Country or territory	Arabic and English web pages in each country to total Arabic and English web pages in the ESCWA region (*percentage*)		Percentage point change
	2005	2007	
United Arab Emirates	22.5	18.8	-3.7
Saudi Arabia	15.2	18.5	3.3
Egypt	39.5	12.4	-27.1
Kuwait	1.6	11.5	9.9
Syrian Arab Republic	0.5	10.3	9.8
Palestine	4.8	8.3	3.4
Jordan	3.6	6.6	2.9
Lebanon	7.0	6.4	-0.6
Bahrain	1.9	3.0	1.2
Qatar	1.7	2.3	0.6
Oman	0.9	1.7	0.8
Yemen	0.8	0.3	-0.5
Iraq	..	0.1	-

Source: Madar Research Group.

TABLE 37. RANKING OF ESCWA MEMBER COUNTRIES BY GROWTH OF ARABIC AND ENGLISH CONTENT ON THE INTERNET BETWEEN 2005 AND 2007*

Country or territory	Multiple increase in Arabic web pages	Multiple increase in English web pages	Multiple increase in Arabic and English web pages
Syrian Arab Republic	162.9	95.9	159.7
Kuwait	94.0	21.5	58.1
Oman	33.0	7.2	14.4
Jordan	28.7	7.2	14.2
Bahrain	22.2	6.8	12.8
United Arab Emirates	19.8	3.0	6.6
Palestine	17.4	6.8	13.5
Qatar	16.4	7.7	10.7
Egypt	11.4	1.2	2.5
Saudi Arabia	11.0	6.7	9.6
Yemen	4.4	1.1	2.7
Lebanon	63.9	4.3	7.2
Iraq	-	-	-
Average	20.3	3.1	7.9

Source: Madar Research Group.

* Number of web pages in 2007 divided by the number of web pages in mid-2005.

4. *Use of ICT to preserve national heritage*

ICTs help to preserve national heritage by making it accessible to younger and future generations and to a wider audience. Also, digitizing heritage-related literature, especially historical manuscripts, ensures that they remain intact much longer than when kept in their original form.

Some ESCWA member countries have worked to preserve their national heritage using ICT, launching many projects to reinforce this policy. Egypt, for instance, announced at one point an online library project (Al Azhar) to house its valuable manuscripts. However, this project has been terminated for

reasons unknown, and its URL[60] now points to a different page. Fortunately the website of the Egyptian National Center for Documentation of Cultural and Natural Heritage,[61] founded by the Egyptian Ministry of Communications and Information Technology, continues to grow in terms of the breadth and scope of heritage-related information and other online documents it carries.

The website "Eternal Egypt",[62] launched jointly by the Alexandria Library's Center for the Documentation of Cultural and Natural Heritage, the Supreme Council of Antiquities and IBM, is perhaps the best Egyptian heritage site on the Internet today.

Another successful initiative in the usage of ICT to preserve national heritage is the previously-cited Al-Waraq project (alwaraq.com). This website was created by the Cultural Foundation in Abu Dhabi and includes hundreds of Arabic heritage books. It is the biggest Arabic heritage site on the Internet so far. In Saudi Arabia, there have been individual efforts in this regard by some libraries (e.g., the King Abdulaziz Library and King Fahd National Library), including developing e-content and making their indices available on the Internet.

In Oman, the Ministry of Heritage and Culture has collected 4,500 manuscripts and prepared comprehensive, well-organized indices for them. They will be published on the Ministry's website, with the intention of making them available to researchers and others in related fields.

The following institutions in Kuwait have likewise undertaken several projects that will help preserve if not increase Arabic digital resources:

(a) Kuwait Foundation for the Advancement of Sciences, which currently translates the American science magazine "Scientific American";

(b) Center for Research and Studies on Kuwait, which studies the history of Kuwait;

(c) Dar Al-Athar Al-Islamiyah (House of Islamic Antiquities), which focuses on Islamic heritage and history;

(d) National Council for Culture, Arts and Letters (NCCAL), concerned with cultural and literary movements in both Kuwait and the Arab world. Its most popular publications include "Alam Al-Maarifah" (World of Knowledge) series;

(e) Suad Al-Sabah Publishing and Distribution House, which focuses on literary publications;

(f) Al-Babtain Central Library for Arabic Poetry.

These institutions have taken serious steps, both quantitative and qualitative, to employ electronic publications and have shown a keen interest in linguistic diversity. Furthermore their websites are bilingual and utilize the most recent web publishing technologies.

Finally, we must cite the "Memory of the Arab World Project", which aims to use information technology in the preservation of different aspects of Arab heritage. Launched in October 2007, the project is sponsored by a group of cultural institutions from several Arab countries, including Egypt, the Syrian Arab Republic, Lebanon, Qatar, Palestine and Saudi Arabia, and has already enlisted the participation of UNESCO. The project is to be completed in four years. The participating institutions have agreed that each state should collect and document its own cultural, physical and moral heritage. The Center for the Documentation of Cultural and Natural Heritage of Egypt has set the stage for the project by designing a bilingual web portal, which will be launched soon.

[60] www.alazharonline.org.

[61] www.cultnat.org.

[62] www.eternalegypt.org.

Furthermore Sheikh Muhammad Ibn Rashid Al Maktoum, ruler of Dubai, launched several initiatives targeting the dissemination of knowledge in the Arab countries during the Knowledge Conference held in Dubai on 28 October 2007. One of these was the establishment of the Arabic e-Content Fund, designed to further grow Arabic content on the Internet. It is still too early to make an objective assessment of the effectiveness of such initiatives.

The Arab media is one of the most crucial factors contributing to the enrichment of online Arabic content. For example, the websites of TV stations such as Al-Jazeera,[63] Syria News,[64] and Elaph,[65] each comprise tens of thousands of Arabic web pages. While these web pages were excluded from the initial web-page-per-country statistics due to their non-usage of ccTLDs, they have been included in the overall estimate of Arabic web pages.

On a macro level, the initiatives undertaken by ESCWA member countries to increase and disseminate digital Arabic content on the Internet – laudable as they are – may still fail to match the explosive growth of Internet content in the developed countries. Hence the ratio of Arabic web pages to total web pages may decrease further in future.

5. *Arabic Domain Names System*

Only eight Arab countries are contributing to the Arabic Domain Names Pilot Project, seven of which are ESCWA member countries, namely, Egypt, Jordan, Oman, Qatar, Saudi Arabia, the Syrian Arab Republic and the United Arab Emirates. This project aims to provide an experimental environment for Arabic domain names in a way that allows Arab countries to acquire the experience needed to administer and experiment with Arabic domain names. The project should prepare participants to determine the prerequisites to launching these domain names, find relevant technical solutions to potential problems, agree on the related standards and develop the tools and policies needed to manage the Arabic Domain Names Pilot Project.

In 2003, ESCWA formed the Arab Domain Name Task Force (ADNTF), which at the time was the sole regional mechanism designed to revive, coordinate and promote country-level initiatives in this field. The League of Arab States subsequently formed in 2004 a group called the Arabic Team for Domain Names which has worked closely with ESCWA.

The ADNTF then established a strategy for building an integrated, interactive system, approved by ESCWA. This yielded the first document[66] (Internet draft), which was published on the website of the Internet Engineering Task Force (IETF). The effect of the draft guidelines in the Arab region was clear and reflected the efforts and dynamism of the Arab countries, especially those members of the League of Arab States concerned with Arabic domain names. The draft guidelines were later referred to the Arab Telecommunications and Information Council of Ministers (ATICM) for approval. In 2007, the ADNTF held three additional meetings which resulted in several important recommendations (see box 3 below).

Early in 2008, ESCWA provided additional financial resources to the Arabic Domain Names Pilot Project through its own trust fund for regional activities. In addition, ESCWA is currently evaluating the project, with collaboration from a number of Arab countries and based on the technical guidelines developed by ESCWA. The evaluation aims to implement the project on a wider scale. Furthermore, ESCWA is cooperating with UNESCO and the Internet Corporation for Assigned Names and Numbers (ICANN) to promote the efforts already made.

[63] www.aljazeera.net.

[64] www.syria-news.com.

[65] www.elaph.com.

[66] Guidelines for an Arabic Domain Name System.

Box 3. Recommendations of the seventh meeting of the Arabic Domain Name working group and the second meeting of the IGF preparatory working group (Cairo, 10-12 September 2007)

Both meetings were held at the headquarters of the General Secretariat of the League of Arab States in Cairo, and were attended by experts representing 12 Arab countries (Egypt, Iraq, Jordan, Kuwait, Libyan Arab Jamahiriya, Morocco, Qatar, Saudi Arabia, Syrian Arab Republic, the Sudan, Tunisia and Yemen) and the following organizations: the Technical Secretariat of the ATICM, the Arab Regional Office of the International Telecommunication Union, ESCWA, UNESCO, the Arab Industrial Development and Mining Organization (AIDMO) and ICANN. The participants discussed the agenda items, notably the working papers listed below:

(a) The draft memorandum of understanding between the League of Arab States and UNESCO, and the project document;

(b) The Saudi paper on the results of the Asia Pacific Top Level Domain (APTLD) meeting, held in Dubai in June 2007;

(c) ICANN's proposal concerning the results of its 29th international public meeting in San Juan, Puerto Rico, in June 2007;

(d) ESCWA's presentation on the technical specifications of the ADNS and the Arabic Domain Names Pilot Project;

(e) The Jordanian proposal to form a regional consortium of country TLD operators in the Arab region;

(f) Discussing and completing the ICANN Governmental Advisory Committee questionnaire on the internationalization of top level domains;

(g) Setting up an action plan and strategic objectives for the ADN working group regarding the Internet Governance Forum;

(h) The ESCWA questionnaire on Internet governance prepared for the second meeting of the IGF, to be held in Rio de Janeiro, Brazil, in November 2007.

Below is an overview of the most important recommendations:

(a) Adopting the Arabic text of the memorandum of understanding between the League of Arab States and UNESCO regarding writing Internet domain names in Arabic letters. Mandating focal points for following up the steps of the project;

(b) Commissioning a working group from UNESCO and ESCWA to prepare an Internet draft document for the project and reviewing it with members of the ADN working group delegation;

(c) Setting up an advisory council for the project to include the ATICM Technical Secretariat, the Mohamed bin Issa Al Jaber Foundation, UNESCO, ESCWA, and executives from the ADN working group and from the Steering Committee for the Arabic Domain Names Pilot Project. The council may elect to recruit other members, up to a maximum of nine, representing the different parties implementing the project. Also, the council is entitled to invite whomever it chooses to attend its meetings;

(d) Approving the minutes of the meeting held with the Iranian administration on using the Arabic script for both Arabic and Persian;

(e) Forwarding thanks to ESCWA for its efforts in transforming the linguistic components (approved sets of characters) from a draft into a request for comments preliminary to approval;

(f) Calling upon the Arab Governments to actively participate in the Arabic Domain Names Pilot Project in order to support the request for comments standards internationally;

(g) Welcoming the Jordanian proposal to create a regional consortium of country TLD operators in the Arab region and establishing a virtual group spearheaded by Jordan (to include the Syrian Arab Republic, the Sudan, Egypt, ICANN and ESCWA) to draft a memorandum;

(h) Disseminating the questionnaire in preparation for the IGF meeting, in Rio de Janeiro scheduled for November 2007, and stressing its importance for the working group in the future;

(i) Integrating the ADN working group with the IGF preparatory working group to prepare for the IGF.

B. Classification and ranking of ESCWA member countries

1. *Maturity level 1: Iraq, Palestine and Yemen*

Iraq and Palestine suffer from military conflict and political and social instability which undermine any serious efforts by either country to develop Arabic and cultural content.

2. *Maturity level 2: Bahrain, Jordan, Lebanon, Oman and Qatar*

These five countries have been ranked by the quantity of online Arabic and English content found on their ccTLDs, Jordan obviously outpaced the rest in terms of volume, though Qatar's extremely high growth could increase its ranking in the near future.

3. *Maturity level 3: Egypt, Kuwait, Saudi Arabia, United Arab Emirates and Syrian Arab Republic*

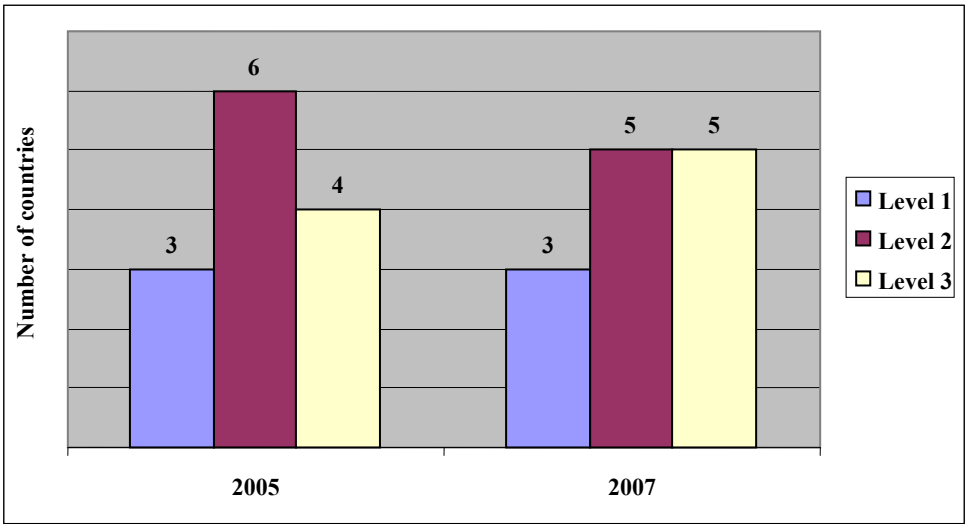
These countries rank highest for quantity of online Arabic and English content on their ccTLDs. Egypt outranks the others in number of initiatives, though these initiatives continue to suffer from slow implementation and weak financing. The United Arab Emirates tops the list for online Arabic and English content thanks to its many cultural heritage Internet initiatives, some of which have been successfully implemented, such as "Al-Waraq". Over the last two years, the Syrian Arab Republic has witnessed the highest growth rate in Arabic and English content, recording a 160-fold increase, fuelled by some distinctive individual contributions. However, Saudi Arabia ranks first in terms of online Arabic content thanks to the unique activities of its public libraries in increasing digital Arabic content. Kuwait, besides ranking fourth in contributing to online Arabic and English content, enjoys a successful record in promoting cultural diversity through translating books and global scientific periodicals into Arabic. The majority of these can now be found online. Mention must also be made of the crucial contribution of Sakhr in providing Arabic dictionaries and digital heritage books on the Internet.

4. *Maturity level 4: None*

TABLE 38. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN CULTURAL DIVERSITY AND IDENTITY, LINGUISTIC DIVERSITY AND LOCAL CONTENT

	Maturity level 1	Maturity level 2	Maturity level 3	Maturity level 4
Country or territory	2007	2007	2007	2007
Bahrain		✓		
Egypt			✓	
Iraq	✓			
Jordan		✓		
Kuwait			✓	
Lebanon		✓		
Oman		✓		
Palestine	✓			
Qatar		✓		
Saudi Arabia			✓	
Syrian Arab Republic			✓	
United Arab Emirates			✓	
Yemen	✓			

Figure 8. Maturity levels of ESCWA member countries in cultural diversity and identity, linguistic diversity and local content



C. SUGGESTIONS AND RECOMMENDATIONS

(a) Accelerate the implementation of e-government projects through the allocation of additional funds, since these projects specifically increase online Arabic content;

(b) Set up effective governmental programmes to develop Arabic content, establish non-profit Arabic digital information banks, and crystallize a plan for regional cooperation in this regard;

(c) Support individual projects promoting cultural and linguistic diversity by offering them free hosting and financial assistance to sustain their activities;

(d) Increase governmental infrastructure investment to promote Internet use. Focus on the Internet as a distinct advertising medium which can convey the product message to the consumer in a more effective way than traditional methods, in order to help develop commercial content;

(e) Accelerate digital copyright legislation;

(f) Relinquish unnecessary controls and minimize the strict filtering of websites in certain ESCWA member countries to the extent possible;

(g) Provide an enabling environment that encourages the private sector to participate in establishing the Arabic content industry;

(h) Focus on e-learning content within the framework of a public strategy for lifelong education;

(i) Focus on the media of local ethnic and religious groups and consider the cultural diversity within Arab countries a factor supporting the Arabic content industry.

IX. MEDIA

A. OVERVIEW OF THE MEDIA'S ROLE IN BUILDING THE INFORMATION SOCIETY IN THE ESCWA REGION

Conventional print, audio and visual media play an important role in building and developing the information society through the transmission of information to the public. The media can be a tool that teaches members of society new skills necessary for their transformation to an information society. Conversely, ICT supports the development of the media.

The media's role is no longer restricted to the transmission of news. It can now be used as an educational medium, conveying the building blocks of knowledge.

In order for the media to contribute to the development of society and its transformation into an information society, it must conform to the principles of press freedom, the unrestricted flow of information, independence, pluralism and diversity. The freedom to acquire, exchange and use information contributes to the creation, accumulation and distribution of knowledge.

1. *Media diversity, independence and pluralism*

(a) *Media independence*

In the Arab world, where the independent media is either censored, lacks institutional support, or is subject to weak business management, Qatar ranks first in media independence, according to the International Research and Exchanges Board (IREX). IREX's Media Sustainability Index (MSI), which now for the first time, covers the MENA region gives Qatar a score of 2.48 out of 4. This places Qatar at the halfway point, earning it the classification of "near sustainability". The MSI's scoring system ranks a score of 0-0.99 as "unsustainable, anti-free press", while a score of 1.00-1.99 ranks a country as "unsustainable mixed system". Meanwhile, countries with a score of 3.00-3.99 are ranked as "sustainable".

Kuwait ranks second in the MENA region on the MSI, with Lebanon and Jordan tying for third place. Meanwhile, Libyan Arab Jamahiriya ranks last among 17 Arab countries together with Iran.

IREX's MSI provides in-depth analyses of the conditions for independent media in 38 countries across Europe, Asia and the MENA region. It has evolved into an important benchmark for how media systems change over time and across borders.

The MSI assesses five "objectives" in shaping a successful media system. These objectives are the most important aspects of a sustainable and professional independent media and are weighted equally in the overall score. The five objectives are free speech, professional journalism, plurality of news sources, business management and supporting institutions. A score for each objective is attained by rating seven to nine indicators, which determine how well a country meets that objective.

The first MSI for the MENA region reveals several weaknesses, in particular free press protections in the law that are not upheld in practice and pervasive self-censorship, both common not only in Arab countries but also in other parts of the world. The assessment reveals another characteristic of MENA region media outlets, however, that is largely absent elsewhere: Money available for media business investment has allowed outlets to better professionalize and access new technologies, providing more sophisticated media products and a relatively higher degree of plurality of news sources, despite the other constraints.

A number of ESCWA member countries that have adopted constitutional guarantees of press freedom have then passed laws that directly contravene these guarantees. The IREX report provides examples of laws that contradict constitutional provisions in a number of countries. In Jordan, for example, the penal code allows authorities to prosecute journalists for a variety of infractions despite Article 15 of the country's constitution guaranteeing citizens' freedom of expression. Egypt likewise suffers limitations due to an emergency law in force since 1981. In Bahrain, the country's new constitution supported in a 2002 referendum mentions freedom of speech, but is contravened by press law No. 47. In the Syrian Arab Republic, the article in the constitution denoting free-speech rights is superseded by an emergency law in place since 1963 that permits the imprisonment – without trial – of anyone deemed an enemy of the state.

This combination of relatively progressive laws but poor enforcement by the Government and judiciary is typical across the MENA region.

Meanwhile, self-censorship is markedly prevalent among all media professionals, even in Qatar, home to the Al-Jazeera satellite television station. Qatar is regarded as one of the most forward-looking Arab countries in terms of freedom of expression and quality media, yet the MSI assessment found that a considerable number of editors and journalists, particularly expatriates, are reluctant to report critically for fear of losing the relatively highly paid jobs that brought them to Qatar in the first place.

The media in the Arab world is characterized by what are called "red lines" and "grey areas". This self-censorship is typical in Arab countries that are deemed undemocratic or have a dominant ruling party, as well as in countries that enjoy relative freedom. In Lebanon, where historically its socio-political system is considered the nearest to a full democracy in the Arab world, a Lebanese participant in the MSI survey stated that journalists "live in total paranoia, and fear for their jobs and their lives".

The media in ESCWA member countries, as well as in many developed countries, is subject to a number of restrictions when it comes to criticism of political leaders, religion and other sensitive subjects. Pressure from political sources and business interests, as well as the desire for self-protection, have led many media professionals to work within strict boundaries and in some cases to identify with the political leadership, greatly undermining press integrity and ethics.

The MSI report indicates that the situation in the GCC countries is somewhat different, due to the relative success of the media industry and its adoption of new technologies. Despite limits on media freedom and professionalism, local media in the United Arab Emirates, Qatar, Saudi Arabia and Bahrain are, in general, doing well financially. A range of factors contributes to this success, including the growing number of satellite news channels such as Al-Jazeera and Al Arabiya and the support for the establishment of media "free zones". Another important factor is rapidly increasing advertising revenue as a result of the rise in oil prices, which has led to increased Government spending on new projects and a boom in all business sectors, including advertising. The latter sector has matured in recent years to become one of the most vital economic sectors to use modern technologies. This media success in some of the ESCWA member countries and the emergence and rapid adoption of new technologies against the backdrop of only gradually-loosening restrictions on information and state-linked media is not mirrored anywhere else in the world. The wealth of the Gulf countries and their use of the Arabic language have contributed to this phenomenon.

The ESCWA region's average overall score on the five objectives of the index was less than the average score of 2, which earned it the "unsustainable mixed system" label. Qatar scored highest overall on the index, at 2.48 or "near sustainability", while Kuwait ranked in second place with an overall score of 2.30.

TABLE 39. MSI RANKING OF ESCWA MEMBER COUNTRIES, 2005
(*Ranked by overall score*)

Country or territory	Free speech	Professional journalism	Plurality of news sources	Business management	Supporting institutions	Overall score
Qatar	2.68	2.48	2.54	2.68	2.03	2.48
Kuwait	2.32	2.29	2.69	2.42	1.80	2.30
Lebanon	1.88	2.14	2.54	1.92	2.34	2.16
Jordan	2.10	1.93	2.07	2.56	2.12	2.16
Palestine	2.30	2.10	2.32	1.88	1.86	2.09
Saudi Arabia	1.78	2.05	2.24	2.43	1.70	2.04
Oman	1.97	2.13	1.91	2.05	1.38	1.89
Egypt	1.66	1.85	2.09	1.87	1.93	1.88
United Arab Emirates	1.66	1.89	1.79	2.37	1.62	1.87
Bahrain	1.47	1.93	1.73	2.14	1.84	1.82
Yemen	1.11	1.31	1.13	1.02	1.76	1.27
Iraq	1.27	1.33	1.25	1.02	1.06	1.16
Syrian Arab Republic	0.84	1.55	1.32	0.84	0.85	1.08
ESCWA average	1.77	1.92	1.97	1.93	1.71	1.86

Source: International Research and Exchanges Board (IREX).

Several international reports were published in 2006 and 2007 on the status of the media in the Arab world, including those of Reporters Without Borders and Freedom House. Despite the criticism of these reports voiced in the Federation of Arab Journalists' report entitled "Media Freedom in the Arab World 2006", the latter is a step in the right direction in monitoring press freedom in the Arab world, as well as a means for highlighting the obstacles and difficulties faced by journalists in carrying out their work. It contributes to the endeavours undertaken to limit these obstacles and consolidates efforts to rid the media of obstacles to achieving an independent, varied media, reliant on a plurality of sources.

The authors of the Federation's report point to the favourable response the report has received from numerous agencies and organizations working in the field of press freedom, which have deemed it a qualitative leap forward in research methodology, analysis and media studies in the Arab world. The report concurs with other international reports that 2006 was the worst in the history of Arab journalism, especially with regard to the kidnap and murder of journalists. Some 71 journalists were killed in three ESCWA member countries, 69 in Iraq, and one each in Lebanon and Yemen.

The report also confirms that a large number of restrictions have been placed on Arab journalism, such as the suppression of information and censorship (particularly of editors-in-chief), including self-censorship. Journalism in the Arab world is also subject to some of the harshest restrictions, namely questioning by security forces and the imprisonment and fining of journalists.

The Federation's report includes a general overview of journalism in the Arab world, as well as a table showing media ownership and the relationship of Governments to media establishments. It sheds light on media plurality, including private, public and foreign media, and can be summarized as follows:

(a) Eleven ESCWA member countries allow private ownership of newspapers, of which nine have state-owned newspapers as well. Only three countries have newspapers of mixed state/private ownership, while only the United Arab Emirates and Iraq have foreign-owned newspapers;

(b) Private ownership of audio visual media exists in eight member countries, while state-owned media establishments are found in 13. Three member countries have mixed private/state-owned media establishments, while foreign owned outlets exist in three member countries: Saudi Arabia, United Arab Emirates and Iraq;

(c) Private news agencies are permitted in only four member countries, namely Iraq, Egypt, Lebanon and Palestine. Meanwhile, online-only newspapers are available in eight member countries.

TABLE 40. MEDIA OWNERSHIP IN ESCWA MEMBER COUNTRIES AND THE GOVERNMENT-MEDIA RELATIONSHIP

Country or territory	Newspaper ownership				TV and radio ownership				Government support for reporters	Government support for media institutions	Online-only newspapers			Private news agency
	Private	Mixed	Government	Foreign	Private	Mixed	Government	Foreign			Yes	No	Conditional	
Bahrain	*		*				*		No	No			*	No
Egypt	*		*				*		Yes	Yes	*			Yes
Iraq	*	*	*	*	*	*	*	*	Yes	Yes		*		Yes
Jordan	*	*			*		*		No	No	*			No
Kuwait					*		*		Yes	Yes	*			No
Lebanon	*				*	*	*		Yes	Yes				Yes
Oman	*		*				*		Yes	Yes	*			No
Palestine					*		*		No	Yes	*			Yes
Qatar	*		*				*		No	No		*		No
Saudi Arabia	*		*		*		*	*	No	No	*			No
Syrian Arab Republic	*		*		*		*		Yes	Yes	*			No
United Arab Emirates	*	*	*	*	*	*	*	*	Yes	Yes		*		No
Yemen	*		*				*		No	Yes	*			No

Source: Federation of Arab Journalists' report "Media Freedom in the Arab World 2006".

The report's conclusive findings on the status of journalism in the Arab world differ from those of Reporters without Borders, Freedom House and other international bodies which have issued reports. In this context, the Federation of Arab Journalists' report "Media Freedom in the Arab World 2006" based its findings on information supplied by official press authorities in different Arab countries. A comparison of findings indicates the following:

Saudi Arabia and the Syrian Arab Republic rank first in terms of discrepancies between the findings of the Federation of Arab Journalists' report and those of international reports, followed by Bahrain and Jordan in second place. The differences between the reports were minor for the United Arab Emirates and Yemen, and marginal for Egypt, Kuwait and Lebanon. In the cases of Qatar, Palestine and Iraq, the findings of the Federation of Arab Journalists' report and international reports were identical.

(b) *Reporters Without Borders' worldwide press freedom index*

The 2007 worldwide press freedom index published by Reporters Without Borders monitors press freedom in 169 countries. Kuwait ranked first on the index among Arab countries, and 63rd worldwide – a ranking it has maintained since 2006. Palestine, on the other hand, ranked 17th among Arab countries, down from 10th place in 2006 – representing the largest drop in a score in the Arab world. Saudi Arabia witnessed the greatest improvement in its score, rising to 13th place among Arab countries in 2007 from 17th in 2006. Score improvements were also recorded in Lebanon, Bahrain, Yemen and the Syrian Arab Republic, while Jordan dropped by one place in the 2006 rankings and Iraq maintained its position.

TABLE 41. RANKING OF ESCWA MEMBER COUNTRIES ON THE PRESS FREEDOM INDEX, 2006-2007

Country or territory	Index value 2006	Arab ranking 2006	Index value 2007	Arab ranking 2007	Global ranking (169 countries)
Kuwait	17	1	20.17	1	63
United Arab Emirates	17.5	2	20.25	2	65
Qatar	18	3	24	3	79
Lebanon	24.83	5	28.75	4	98
Bahrain	27.5	7	38	6	118
Jordan	28	6	40.21	7	122
Yemen	46.75	13	56.67	10	143
Egypt	53.75	9	58	12	146
Saudi Arabia	54	17	59.75	13	148
Syrian Arab Republic	62.5	15	66	14	154
Iraq	66.83	16	67.83	16	157
Palestine	76	10	69.83	17	158
Oman*	-	-	-	-	-

Source: Reporters Without Borders.

* Oman was not included in the Reporters Without Borders report for 2006 and 2007 and indeed has not been included since 2003, when it ranked 152nd globally.

2. *Role of the media in bridging the knowledge divide*

Traditional print and audio visual media play a vital role in addressing the knowledge gap, due to their wide-ranging appeal in society. As a result, the media can contribute to the transformation of society, bringing to it advanced levels of knowledge.

Conversely, advanced ICT supports the media, and contributes to its delivery to a wider audience. An example of this is short message services (SMS) via mobile phones, used by news agencies and television channels to deliver breaking news to subscribers.

Another recent development has been the delivery of live television broadcasts over 3G- and EDGE-enabled mobile phones. A unique example of this is Kuwait's Smile Services, which deliver digital multimedia content to mobile phone operators, simultaneously broadcasting the same digital multimedia content over a satellite channel, thus allowing users to receive SMS and chat.

On the other hand, the percentage of media programmes in the ESCWA region dedicated to science and technology or designed to raise awareness about the information society via television and radio is still very limited. In most case, it is rather the marketing of ICT products that dominates media broadcasts.

Nevertheless, some media outlets assume their responsibility for raising society's awareness by broadcasting the latest technology news and anything else that contributes to introducing society to the benefits of using ICT and to encouraging its use in all walks of life.

The Kuwaiti Central Agency for Information Technology (CAIT), in association with private and state-owned media, has launched a television and radio awareness campaign to establish an electronic culture among its citizens and decision makers that fosters the optimal use of ICT and contributes to the success of the country's e-government programme. CAIT has dedicated a weekly broadcast, during one of the country's popular family programmes, to raising viewers' IT awareness. The agency, in association with the private television channel Al-Rai, is also planning to broadcast a programme dedicated to novice and intermediate level information technology users.

In the Syrian Arab Republic, a weekly radio programme discusses ICT topics, with listeners calling in to voice their opinions or contribute to the discussion. Furthermore, the Syrian Computer Society has, for several years, broadcast a weekly television programme designed to raise IT awareness among the general public.

The situation is relatively better in the print media, where the majority of daily newspapers have an online presence and many have dedicated ICT sections or issue weekly supplements on the topic. Those publish technical articles introducing ICT and explaining its benefits and uses. In addition, magazines and periodicals dedicated to ICT are published in a number of ESCWA member countries.

Online-only newspapers, as distinct from online versions of printed Arabic newspapers, remain uncommon in the ESCWA region, due perhaps to low Internet penetration which stands at only 11.05 per cent. This explains the existence of online-only newspapers in only eight ESCWA member countries, while the majority of traditional Arabic newspapers do publish their content, fully or partly, on the Internet.

Television drama, so popular among a wide segment of the region's society, could play an important role in addressing the digital divide and building an information society, by producing series and movies which integrate ICT-related subjects into the script in a subtle way. This would allow a wide segment of society to overcome the discomfort barrier when using technology. However, such programmes have yet to embrace subjects related to the information society or modern technology.

In the context of the association between ICT and the media, a conference was held in Cairo in May 2006 to address "The Convergence of ICT and the Media Industry". During the conference, a number of initiatives were identified that would enable the media to carry out its role in building the Egyptian information society. The conference was attended by many experts discussing how to best harness the telecommunication industry to disseminate media content on a wider scale, allowing users to obtain relevant media content anytime anywhere.

In order for the media to carry out its desired role in addressing the digital divide, the media in the region must have free and open access to information. This is contingent on the availability of diverse media drawing from a plurality of sources, as well as the practice of professional journalism.

The media in a number of ESCWA member countries suffers from lack of ICT capacity-building and technical resources, weakening its role in addressing the knowledge divide. A study published by the Yemeni Ministry of Information found that only 243 computers and 26 Internet servers were available to state-owned media outlets. The study also found that ICT-qualified staff accounted for only 3.2 per cent of all employees in the country's media institutions.

3. *Gender portrayal by the media*

The media as a whole continues to produce content that feeds into gender stereotypes and the traditional roles of men and women in society. Given that the content produced is tied to media agendas formulated by high-ranking people who are generally men, women are not likely to receive fair and even coverage, as evident in television programmes, news reports and drama, whether in terms of airtime or in the attention given to women's actual role in society and their achievements in a large number of sectors. Women generally get minor and marginal coverage in the media, and when they do receive wider coverage, it is usually to confirm their image as feminine creatures and to use this image for commercial purposes.

The number of women working in the media has increased in recent years, especially in Egypt and Lebanon, but they are still far-removed from decision-making positions. This may explain the inadequacy of coverage of women's issues, such as domestic violence and unfair social practices, both in terms of quantity and depth. These issues require courageous reporting and the participation of experts to discuss and explore appropriate solutions.

Tens of women's magazines are published in the ESCWA region, while television channels are rife with programmes that target women. However, an in-depth look into the content reveals that these, almost exclusively, enforce gender stereotyping of women and define her role in society through programmes addressing cooking, makeup and fashion, while ignoring the positive roles modern women play in society today.

A rare exception to this rule is a programme on Al-Jazeera called "Pioneers" which breaks the stereotypical image of women by introducing pioneering Arab women in the realms of literature, science and the arts.

B. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES

In order to determine the maturity of the media environment in the ESCWA region, a number of international and regional reports published in the past two years, in particular those by Reporters Without Borders and the International Research and Exchange Board, were used for reference. The research and analysis undertaken for these reports covered all aspects of the media in the countries examined, including ESCWA member countries.

In this context, the four maturity levels were defined as follows:

1. *Maturity level 1: Bahrain, Iraq, Syrian Arab Republic and Yemen*

This level is characterized by the existence of laws that hinder an independent press and shackle press freedom, in addition to less-than-professional journalism and ineffective business management.

2. *Maturity level 2: Egypt, Jordan, Oman, Palestine, Saudi Arabia and the United Arab Emirates*

This level is characterized by the existence of some laws that work against press freedom, despite relative improvements in media freedom and journalistic professionalism.

The MSI measures progress towards five "objectives" in shaping a successful media system. These objectives are the most important aspects of a sustainable and professional independent media, and are weighted equally in the overall score. The five objectives are free speech, professionalism, plurality of news sources, business management and supporting institutions. A score was attained for each objective by rating between seven and nine indicators of how well a country meets that objective.

3. *Maturity level 3: Kuwait, Lebanon and Qatar*

This level is characterized by clear progress towards an independent media, with laws in place to protect this independence. There are also legal and professional standards in place that define the general framework for working in the media.

4. *Maturity level 4: None*

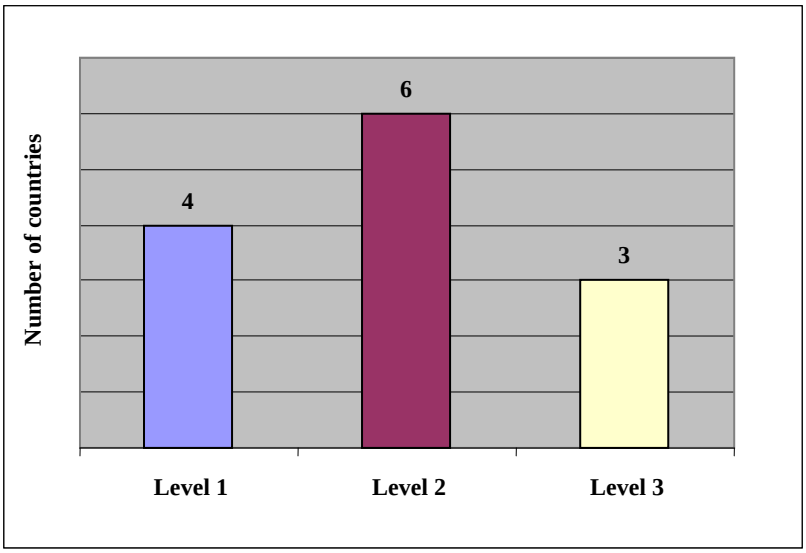
This level is characterized by journalistic professionalism and a high degree of press freedom. Laws in place protect an independent press. None of the ESCWA member countries ranked at this maturity level.

The failure of any ESCWA member country to achieve maturity level 4, the attainment of maturity level 3 by only three out of 13 countries, and the placement of six countries at level 2 and four at level 1, indicate the abysmal state of the media environment in the Arab world. Clearly, the road is long and difficult for all ESCWA member countries in their quest to improve this situation, one that is incongruous given the progress made by a number of these countries in other sectors and to today's environment of open access, which Governments can no longer control. It is no longer possible to revert back to old ways that may have been popular before the information technology revolution.

TABLE 42. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL OF MEDIA ENVIRONMENT

	Maturity level 1	Maturity level 2	Maturity level 3	Maturity level 4
Country or territory	2007	2007	2007	2007
Bahrain	✓			
Egypt		✓		
Iraq	✓			
Jordan		✓		
Saudi Arabia		✓		
Kuwait			✓	
Lebanon			✓	
Oman		✓		
Palestine		✓		
Qatar			✓	
Syrian Arab Republic	✓			
United Arab Emirates		✓		
Yemen	✓			

Figure 9. Maturity levels of ESCWA member countries in media environment, 2007



C. SUGGESTIONS AND RECOMMENDATIONS

(a) Support media independence and freedom of the press;

(b) Support the production of television programmes that educate people about ICT and the concept of the information society;

(c) Increase advertising campaigns, in all media and especially television, regarding e-government services available on the Internet and encourage their use by citizens;

(d) Require television programme producers to add segments that introduce the use of ICT to women's programmes, for example, how technology can be used to stop violence against women. This would serve to eliminate popular stereotypes from women's programmes;

(e) Support the production of media content that presents the roles of men and women in society according to modern-day norms;

(f) Develop women's programmes on television and radio to address the family as a whole, given that women's issues are society's issues;

(g) Establish a legislative and economic environment that allows the development and enhancement of a professional Arab electronic media;

(h) Present the contribution of Arabs to humanity and civilization and confirm the importance of adapting to the present day, with all its technical advances and knowledge, in order to join the information society;

(j) Digitalize television, radio and press archives by using ICT in order to convert audio, video and textual content to a digital format. Once preserved, these materials can become a part of the Arab and world heritage and their content will be able to benefit researchers and academics.

X. REGIONAL AND INTERNATIONAL COOPERATION

A. OVERVIEW OF REGIONAL AND INTERNATIONAL COOPERATION IN THE ESCWA REGION

Regional and international cooperation helps to transfer expertise and share success stories among countries, as well as provide technical and financial aid to developing countries' ICT sectors, deemed cornerstones for the establishment of an information society.

Accordingly, in order to implement their plans for the establishment of information societies, countries in the region are striving to benefit from the initiatives launched by developed countries and regional and international organizations. Among the leading initiatives are those of the United Nations and its agencies in the region to achieve the aims of WSIS. These projects represent one source for the financial and technical support needed by developing countries to realize their development goals.

UNDP lead the list of such projects, while UNESCO, the Arab League Educational, Cultural and Scientific Organization (ALECSO), ESCWA, the ITU Arab Regional Office and the League of Arab States have all launched some initiatives and also contributed to their implementation.

Moreover, the initiatives of international governmental organizations and NGOs constitute another form of cooperation, represented by joint ventures between countries in the region and various international organizations such as the European Union. The latter contributes to ICT sector development programmes in cooperation with a number of Arab, and especially Mediterranean, countries, providing technical and financial support for the implementation of these programmes.

Other programmes include, for example, the partnership between the Egyptian National Postal Authority and the European Union on institutional development, with the aim of helping the postal authority liberalize its services by drawing on the European Union's expertise in this area. Egypt also benefits from international cooperation through the e-Schools project of the New Partnership for Africa's Development (NEPAD), sponsored by a consortium of companies headed by Oracle. The partnership aims to make available to school pupils such ICT tools as computers and expertise, allowing them to harness knowledge for economic development. The partnership also seeks to improve health awareness in schools and to help teachers and administrators use ICT as a tool to improve educational and learning standards.

In the context of the Middle East Partnership Initiative (MEPI), Yemen is implementing an experimental e-learning project to be carried out over three phases. The first phase seeks, in association with MEPI, to establish an e-learning network comprising 24 secondary schools nationwide.

Jordan, in association with international and regional organizations, aims to generate the funds needed to establish ICT networks and develop new services in the country. It has benefited from a number of initiatives, including the World Links programme which seeks to improve education, job opportunities, and international understanding among developing countries youth through the use of technology and the Internet. Other initiatives include three sponsored by Intel to build networks and infrastructure and another three projects to develop human resources sponsored by the United Nations Development Fund for Women (UNIFEM), the British Embassy in Amman and the Dutch Government.

Jordan has also benefited from MEPI, which aims to support democratic reform in the region. MEPI is divided into four different reform areas: political, economic, educational and the empowerment of women. In addition, the Jordan Education Initiative (JEI), launched at the World Economic Forum held in 2003 at the Dead Sea, is the fruit of international and local cooperation and a public-private partnership, which aims to develop and deliver education to Jordan's citizens through the use of ICT.

Several international organizations, including the World Bank and the European Union, provide technical and financial support for projects in Palestine. Among the ITC development projects in the Syrian Arab Republic to which the European Union contributes, is one to upgrade the country's financial system in 2005-2008 and another to upgrade municipal administration in 2004-2009.

Kuwait, usually a donor country, is seeking to benefit from advanced international expertise in order to develop its ICT infrastructure. The country has cooperated with Singapore to develop the Kuwait Information Network project, which includes ICT infrastructure and the deployment of a nationwide network linking Government websites and offices. Kuwait has also signed a memorandum of understanding with South Korea for cooperation in such areas as information security, privacy and building confidence in the use of ICT.

Regional cooperation in ICT serves to promote regional integration and is reflected in the regular meetings of Arab ICT ministries that take place. The sharing of expertise and joint initiatives among ESCWA member countries, despite their dearth, aim to link them to each other as well as to other Arab countries outside the ESCWA region. This serves, in turn, to develop these countries' basic infrastructure and to facilitate the establishment of information societies. Countries in the region can benefit from their collective advantages, including a common language and homogenous culture. Indeed, the diversity of resources in the ESCWA region should ultimately lead to economic integration. While a number of member countries have huge oil reserves, others have the human resources needed for development. However, few joint projects have emerged to benefit from these resources.

1. *Realization of WSIS objectives and the regional plan of action*

WSIS was held in two phases, the Geneva phase in 2003 and the Tunis phase in 2005. It aims to "build an inclusive people-centred and development-oriented information society, where everyone can create, access, utilize and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life".

The ITU was mandated in 2006 to organize annual meetings to review programmes and initiatives, either completed or under development, in support of the 11 action lines agreed upon in the Geneva Plan of Action and adopted in the Tunis agenda in 2005.

The WSIS has stated that setting up specific targets for building information societies must take into account the specificities of each country and should be aligned with national development strategies. In this context, ESCWA member countries participated in both phases of the summit and committed themselves to the WSIS outcomes. While some countries have set up official plans, others, lacking these, are nevertheless working to realize WSIS goals by developing their ICT sectors and promoting the use of ICT by businesses and individuals. However, all ESCWA member countries need to put greater effort into implementing the action lines and monitoring and following up on activities already implemented.

ESCWA member countries are striving to implement WSIS outcomes, especially those related to the formulation of ICT policies and electronic strategies. Some have made considerable progress towards their transformation into information societies, while others are still lagging behind. Moreover, some ESCWA member countries face multiple challenges due to weak ICT infrastructure, funding shortages and weak support for the ICT sector in their national strategies.

In line with its commitment to develop member countries' capabilities, ESCWA organizes numerous workshops, expert group meetings and training courses, including, for example, virtual workshops on digital Arabic content creation and the development of e-government.[67] ESCWA member countries endeavour to attend international and regional conferences and workshops that support the realization of the summit goals and that address development issues, capacity-building and IT sector development.

Arab ministers of communication hold periodic meetings to monitor progress in implementing the Arab ICT strategy to establish the information society. The latest conference was held in July 2007 in Damascus, to discuss the action plan for updating the Arab ICT strategy and the establishment of the information society for the period 2007-2012, in line with WSIS initiatives.

[67] Review of Information and Communications Technology and Development, Issue No. 7 (September 2007).

ESCWA member countries are also continuing their efforts on the national level. Egypt's Ministry of Communication and Information Technology organized a conference in March 2006 for all information society stakeholders to discuss means of implementing the Declaration of Principles and Plan of Action adopted by the WSIS. A committee of representatives from 17 Governments and private-sector organizations was established to set in motion initiatives, projects and programmes in line with the WSIS initiatives. A database was created to allow stakeholders to register their project details. By November 2006, the number of projects entered in the database exceeded 120.

Based on internationally-agreed development goals, the WSIS has adopted a number of targets, that can be used to measure the progress made on the Geneva Plan of Action, to be achieved by 2015. These targets are to:

- Connect all villages by 2010;
- Connect all universities by 2005;
- Connect all secondary schools by 2010;
- Connect all primary schools by 2015;
- Connect health centres and hospitals by 2010;
- Provide wireless access to 90 per cent of the population by 2010;
- Provide wireless access to 100 per cent of the population by 2015;
- Central Government departments and establish websites and e-mail addresses by 2005;
- Connect all local Government departments by 2010.

2. *Regional and sub-regional projects and initiatives*

As stated earlier, regional and sub-regional projects, in the ESCWA region in particular and in the Arab world generally, are not up to par. Furthermore, the paucity of such projects does not match the resources available in the region which, if properly invested, could facilitate regional integration in all economic sectors and not just the ICT sector.

International agencies and their regional branches fund and support a number of projects in the region some of which are mentioned below in chapter XI which is dedicated to ICT projects that serve to realize the Millennium Development Goals. Here follow some of those initiatives:

(a) *United Nations Development Programme*

The UNDP programme Information and Communication Technology for Development in Arab Region[78] (ICTDAR) is one of the most important in the ICT area. One of the regional projects initiated by ICTDAR is Information and Communication Technology in the Arab Region for the Blind (ICTARB), which aims to use ICT to help reintegrate the visually impaired into society as independent, productive citizens and to provide them access to new job opportunities. The ICTARB programme is currently being implemented in Egypt and the Syrian Arab Republic. Four centres have been established in Egypt to provide services for hundreds of beneficiaries while over 150 people have been given training in Gaza. In the Syrian Arab Republic the existing ICTARB centre serves over 700 people and another ICTARB centre is currently under construction.

(b) *World Links programme*

World Links Arab Region (WLAR) is the regional branch of World Links. Its mission is to improve educational outcomes, economic opportunities and global understanding for youth in the Arab region through the use of technology and the Internet and through the professional development of teachers to learn how to employ participatory learning to achieve better educational results. These skills allow youth to contribute to the success of the global knowledge economy after graduation.

[78] http:// www.ictdar.org.

WLAR launched its pilot programme in Jordan in June 2003 with funding from a number of international and national organizations. The programme is expected to benefit over 100,000 students over a five-year period.

(c) *Iraqi Networking Academy Project*

ESCWA's Iraqi Networking Academy Project aims to build institutional capabilities in the higher education sector in Iraq, in order to provide students with internationally accredited certification in networking technology. ESCWA has partnered with Cisco Systems to establish five regional networking academies in Baghdad (2), Basra (1), Mosul (1) and Irbil (1), which in turn support 50 local academies. In addition to Cisco Systems and ESCWA, the Lebanese American University, the Iraqi Ministry of Higher Education and Scientific Research, five major Iraqi universities and a number of other stakeholders have all partnered on the project.

(d) *New projects*

On the occasion of World Information Society Day (WSIS, 17 May 2007), Qatar announced it would secure funding for the ITU Youth Initiative, to support 250 new scholarships in addition to creating 1,000 new internship opportunities within the next three years, by 2010. It is hoped that both underprivileged individuals and rural areas, especially in low and medium development ESCWA member countries, will benefit from this initiative.

Other Arab projects have been announced, but these are still under study or have yet to be implemented, such as the Memory of the Arab World Project, which aims to document Arab heritage and create an Arab heritage portal on the Internet. A number of Arab countries are contributing to the project, including Egypt, Qatar, Lebanon, the Syrian Arab Republic, Saudi Arabia, Kuwait and Palestine, through national institutions.

(e) *Commercial projects*

Among the most popular regional projects are the operation of mobile phone networks in the Arab world by regional telecommunication providers and such fibre-optic cable technology projects as Thuraya, ArabSat and IntelSat.

Meanwhile, the Fiber-Optic Link Around the Globe (FLAG) project is indicative of regional countries' determination to develop their telecommunications infrastructure. FLAG is a submarine communications cable containing optical fibre that allows for high-speed Internet connection. A number of ESCWA member countries are connected to FLAG, including Bahrain, Egypt, Jordan, Kuwait, Oman, Qatar, Saudi Arabia and Yemen.

(f) *Subregional projects*

The GCC countries have agreed to establish the smart ID card project, which aims to provide personal identification cards to their citizens. The project is currently under way and covers five of the six GCC countries (Bahrain, Oman, Qatar, Saudi Arabia and the United Arab Emirates) with plans to eventually issue smart personal IDs to all their citizens and legal residents.

Cooperation between the Iraqi Ministry of Higher Education and Scientific Research and the Ministry of Communications, announced at the Iraq ICT and Education Summit held in Sharjah (United Arab Emirates) in February 2007, represents a form of subregional cooperation which aims to enable the Ministry of Communications to fully benefit from the data centres established by the Ministry of Higher Education and Scientific Research.

3. *Global partnerships for development*

The importance of regional and international cooperation is most evident in building the capabilities of developing countries, as specified in the eighth goal of the MDGs which aims to create global partnerships for development. One of the objectives of this goal is to increase job opportunities for youth, given the rise in unemployment among the (15-24) age group. Global partnerships for development are also expected to decrease poverty in the world.

Global partnerships oblige rich and developed countries to provide financial and technical assistance to poor and developing countries, especially in ICT. This will help to bridge the digital divide and build the information society.

A number of initiatives and projects are reviewed in boxes 4-11 below, in chapter XI. However, the size and scope of these initiatives and projects remain below the level aimed for by some ESCWA member countries, especially those that suffer from poor funding and a shortage of technical expertise, among other obstacles standing in the way of implementing vital projects in the ICT sector. As a result, progress towards creating global partnerships for development is still in the early stages, and is not expected to be completed by 2015.

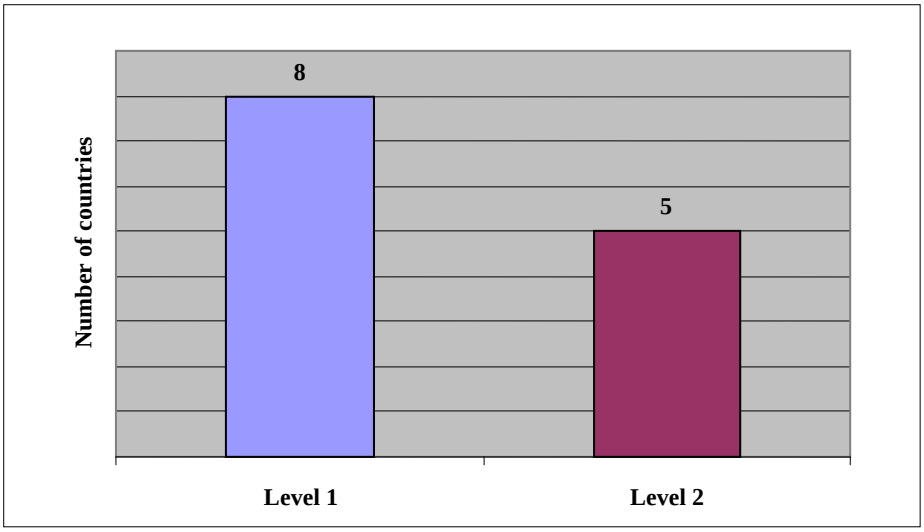
B. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES

Regional and international cooperation in ESCWA member countries remains weak, with maturity levels not exceeding level 2. Analysis of available data places Egypt, Jordan, Kuwait, Qatar and the United Arab Emirates at maturity level 2, with the remaining countries ranked at maturity level 1.

TABLE 43. RANKING OF ESCWA MEMBER COUNTRIES BY REGIONAL AND INTERNATIONAL COOPERATION

	Maturity level 1	Maturity level 2	Maturity level 3	Maturity level 4
Country or territory	2007	2007	2007	2007
Bahrain	✓			
Egypt		✓		
Iraq	✓			
Jordan		✓		
Kuwait		✓		
Lebanon	✓			
Oman	✓			
Palestine	✓			
Qatar		✓		
Saudi Arabia	✓			
Syrian Arab Republic	✓			
United Arab Emirates		✓		
Yemen	✓			

Figure 10. Maturity levels of ESCWA member countries in regional and international cooperation, 2007



C. SUGGESTIONS AND RECOMMENDATIONS

All ESCWA member countries have taken tangible steps towards regional integration in some economic sectors such as tourism, electricity and natural gas pipelines. However, in order to build an information society in the region, further regional cooperation in ICT is necessary. Recommendations in this field include:

(a) Establish a clear framework for regional cooperation, supervised by the League of Arab States or ESCWA, which encourages regional efforts by deriving benefits from relative advantages such as common language, common social practices and geographical proximity;

(b) Benefit from various financial and human capabilities and resources found in the ESCWA region, to meet the requirements of regional cooperation and integration;

(c) Commitment by donor countries to deliver on pledges made to developing countries in order to help them realize WSIS goals;

(d) Establish a framework for sharing expertise, especially in education, computer training and e-government, where some ESCWA member countries (Bahrain, Qatar and the United Arab Emirates) have made considerable progress, while others (Iraq, Palestine, Syrian Arab Republic and Yemen) remain in the preliminary stages of development.

XI. MILLENNIUM DEVELOPMENT GOALS

A. OVERVIEW OF THE MDGS IN THE ESCWA REGION

A total of 191 countries adopted the United Nations Millennium Declaration at the Millennium Summit, which was held from 6 to 8 September 2000, thereby renewing their commitment to peace and security and to promoting democracy, good governance and respect for internationally agreed human rights and fundamental freedoms, including the right to development. The summit identified and adopted a set of eight time-bound, measurable goals aimed at eradicating extreme poverty and improving living conditions for women and men alike. These goals are:

1. Eradicate extreme poverty and hunger.
2. Achieve universal primary education.
3. Promote gender equality and empower women.
4. Reduce child mortality.
5. Improve maternal health.
6. Combat HIV/AIDS, malaria and other diseases.
7. Ensure environmental sustainability.
8. Develop a global partnership for development.

The summit identified complementary objectives for each goal, to be achieved by 2015, and set indicators to measure the progress made towards each objective.

All ESCWA member countries are working towards the achievement of the MDGs. However, though tangible progress has been made by some countries, others still lag behind in achieving some or all of the goals.

Meanwhile, the 2006 UNDP Human Development Report showed that Arab countries lag by almost 27 years in achieving the human development targets set for the year 2015.[79]

When classified according to the Human Development Report (2006), some ESCWA member countries, particularly the GCC countries, show a high level of human development, with the exception of Saudi Arabia. Yemen, on the other hand, has a low human development ranking, while the rest of the ESCWA member countries are ranked in the medium human development category. Iraq was not mentioned in the report perhaps due to the conditions prevailing in the country.

The Human Development Index (HDI) measures life expectancy, literacy, education, standard of living, and GDP per capita for countries worldwide. It is used to determine whether a given country is a developed (high index), developing, or underdeveloped country (lower index). The United Arab Emirates ranked first among ESCWA member countries in terms of life expectancy (81 years), while Kuwait has the highest literacy rate (90 per cent). The United Arab Emirates again led the ESCWA countries in terms of per capita GDP, at $24,000 per year.

[79] The Millennium Development Goals in the Arab region 2005 (E/ESCWA/SCU/2005/3/Rev.1); available at: http://www.escwa.un.org/information/publications/edit/upload/scu-05-3-rev1.pdf.

TABLE 44. HDI RANKING OF ESCWA MEMBER COUNTRIES, 2006

Country or territory	HDI value	Arab ranking	Global ranking	Human development assessment
Kuwait	0.871	1	33	
Bahrain	0.859	2	39	
Qatar	0.844	3	46	High
United Arab Emirates	0.839	4	49	
Oman	0.810	5	56	
Saudi Arabia	0.777	6	76	
Lebanon	0.774	7	78	
Jordan	0.760	8	86	Medium
Palestine	0.736	9	100	
Syrian Arab Republic	0.716	10	107	
Egypt	0.702	11	111	
Yemen	0.492	12	150	Poor
Iraq	-	-	-	-

Source: Human Development Report, UNDP 2006.

Progress towards achieving the MDGs

All ESCWA member countries have committed to achieving the MDGs although their potential for achieving these goals varies greatly due to their diverse socio-economic and political environments. The high-income GCC countries, for instance, have a strong chance of achieving these goals compared to the medium-income countries. Moreover, Iraq, Palestine and Yemen will most likely fail to achieve the majority of the MDGs within the given time frame.

(a) *Goal 1: Eradicate extreme poverty and hunger*

Methodologies used to measure poverty vary. Defined by the dollars-per-day per capita index, poverty is barely evident across the ESCWA member countries, with the exception of Yemen, where the poverty rate is estimated at 35.5 per cent. Also, Egypt recorded the highest rate of malnutrition among ESCWA member countries, while Palestine recorded the highest rate of food deprivation.

Generally speaking, it is unlikely that all ESCWA member countries will be capable of eradicating poverty within the given time frame (2015), especially countries such as Iraq and Palestine that are suffering from political turmoil.

Box 4. Examples of ICT initiatives helping to achieve MDG Goal 1 in ESCWA member countries

The poor are increasingly aware that easy access to ICT may help them get out of the doldrums. While ICT can be viewed as a driving force in poverty alleviation, it must be integrated into a wider vision of reform. Policymakers should note that the impact of improvements generated by ICT will depend on other factors. For example, farmers with easier access to agricultural and environmental information will improve the quality and quantity of their crops but will not be able to sell them if there are no roads to carry these crops to distant markets. Following are examples of ICT initiatives that are helping with the achievement of Goal 1.

ESCWA is currently implementing the "Smart Community Project (SCP)" in Iraq, the Syrian Arab Republic and Yemen. The project is designed to promote the acquisition and dissemination of integrated modern technologies to establish small enterprises and create employment as well as reduce poverty. The SCP includes two core components: (1) the "Multipurpose Technology Community Centre (MTCC)" which aims at providing the local community with access to a number of ICT-based services as well as computer-based vocational training programmes; and (2) the "Agro-Food Processing Unit (AFPU)" which aims at processing and marketing agro-food products utilizing modern hygienic and quality standards.

Box 4 (*continued*)

UNDP and the Jordanian Ministry of Planning and International Cooperation have initiated the "Jordan IT Community Centres"[80] (JITCC) project, which entails the establishment of ICT community centres throughout Jordan. These centres aim to raise awareness and to provide ICT training and Internet access. Most of the centres have been established in the least developed, ICT-poor regions, with a view to improving living standards. The centres have indeed trained to date more than 85,000 underprivileged people, mostly women.

In Lebanon, the Professional Computer Association (PCA) has created, with the assistance of USAID, SRI International, the Business Software Alliance, Microsoft, Cyberia and IDM, the "PCA Internet Point of Presence"[81] (PiPOP) initiative which establishes computer and Internet access centres throughout Lebanon. These centres also deliver training courses in basic computer applications and Internet skills. The initiative aims to improve the standard of living of underprivileged communities by providing ICT access and by building a website for every village to help with the creation and promotion of new job opportunities.

In Palestine, a group of NGOs is using technology and agricultural knowledge to help poor farmers.[82] The "Land Development Project" is creating new farmland from uncultivated hillsides. As well as creating jobs, the project provides advice to farmers to help them with crop selection and irrigation techniques. The various NGOs that are working on the project coordinate their work with an interactive Geographic Information System (GIS) database that stores information about all aspects of the project, from research and planning to implementation and follow-up.

In the Syrian Arab Republic, the "Reefnet Portal" is being funded by UNDP in partnership with the Syrian Ministry of Telecommunications and Technology. The project is part of the "Strategic ICT Programme for Social and Economic Development in Syria"[83] which aims at: (a) creating an enabling environment for ICT use; (b) reducing the digital divide between urban and rural areas; (c) accelerating the development of information facilities and infrastructures; and (d) improving the poor's capacity to benefit from ICT.

(b) *Goal 2: Achieve universal primary education*

Most ESCWA member countries made significant progress from 2000 to 2006 in both their rates of net enrolment in primary education and in their primary school completion rates. For instance, the net enrolment rate for basic education in Bahrain hovered at around 98.3 per cent in 2005, compared with 86.5 per cent in Kuwait, 98 per cent in the Syrian Arab Republic and 75.8 per cent in Yemen (2004).

While most ESCWA member countries have made progress in achieving high primary education enrolment rates, they still face a range of challenges in education which differ depending on the circumstances of each country. These challenges include developing their education systems, integrating information technology within the curricula and reducing absenteeism. Countries with high population rates are further overwhelmed with the sheer task of building enough schools annually to accommodate the increasing number of primary school pupils.

[80] http://www.ks.gov.jo/.

[81] http://www.pipop.org/.

[82] http://www.undp.ps/.

[83] Strategic ICT Programme for Social and Economic Development (SYR/02/001), available at: http://www.undp.org.sy/index.php?page=content&id=project19.

TABLE 45. TOTAL NET PRIMARY EDUCATION ENROLMENT RATE, 2005[a/]

Country or territory	Total net primary education enrolment rate in both sexes (*percentage*)
Bahrain	98.3
Egypt	97.2
Iraq	87.7
Jordan	92.6
Kuwait	86.5
Lebanon	94.3
Oman	75.7
Palestine	84
Qatar	99.5
Saudi Arabia	78
Syrian Arab Republic	98[b/]
United Arab Emirates	76
Yemen	75.8[c/]

Source: MDG indicators (www.millenniumindicators.un.org).

a/ At the time this report was prepared, the 2006 indicators were not yet included in United Nations databases.
b/ Second National Development Goals Report 2005.
c/ The value available is for 2004.

Box 5. Examples of ICT initiatives helping to achieve MDG Goal 2 in ESCWA member countries

The widespread adoption of ICT-based training and the production of electronic textbooks, for example, could alleviate the problem of teacher and schoolbook shortages in developing countries. Internationally, several public-private partnerships have been created specifically to address the problems and shortages facing the education systems of poorer and underprivileged countries. These partnerships have created ICT-based initiatives and programmes that are currently being put to the test in various parts of the world.

In cooperation with the Governments of several countries, Intel has launched several education-focused ICT initiatives.[84] These include: (a) the "Intel Teach Program", a professional development programme that helps classroom teachers effectively integrate technology to enhance learning; (b) the "Intel Computer Clubhouse Network", an after-school programme that enables youth in underserved communities to access cutting-edge technology and become self-confident and motivated learners; and (c) the "Intel Learn Program" is a community-based programme that helps eight to 16-year old learners develop computer literacy as well as problem-solving and collaboration skills.

In cooperation with the Governments of several countries worldwide, including some in the ESCWA region, Microsoft has developed the "Partners in Learning"[85] programme. This initiative: (a) helps educators integrate technology into daily teaching, learning and research; (b) connects a global community of educators focused on 21st-century learning and recognizes their exemplary efforts to prepare students for the future; and (c) provides affordable software for primary and secondary students' personal use at home.

(c) *Goal 3: Promote gender equality and empower women*

Gender equality starts with providing education for both sexes at all levels of education and the empowerment of women to participate in the political process in their countries. This is measured by the number of seats occupied by women in national parliaments.

[84] http://www.intel.com/education.

[85] http://www.microsoft.com/education/partnersinlearning.mspx.

The 2006 Human Development Report made it clear that women earn less than men generally, even in developed countries, and it goes without saying that women's salaries are dramatically lower than those of their male counterparts in many developing countries. In the ESCWA region, the report stated that women's wages in Jordan and Lebanon amounted to only 30 per cent of men's. As for the GCC countries, women's wages are highest in Bahrain and lowest in Saudi Arabia.

In terms of political participation, women generally play only a modest role in the ESCWA member countries, although the extent of women's political contribution varies from country to country. Indeed, the level of political participation of women in the ESCWA member countries is among the lowest in the world, despite the fact that these countries' laws all grant equal rights to men and women. While there have been some positive developments, such as Kuwaiti women being granted the right to vote in 2005 and the adoption of a quota system giving Iraqi women 32 per cent of parliamentary seats, such developments require more support.

The gender equality indicator for all educational levels has been on the rise in ESCWA member countries, though it varies somewhat from country to country. It is worth noting that the differences in gender equality in education tend to decrease at higher educational levels. Indeed, in the GCC countries, the enrolment rate for girls in universities exceeded that for boys, by 63 per cent (1.63 female students per male student). In Kuwait, the 2006 Human Development Report noted that the ratio of females in all levels of education had reached 79 per cent in 2004, making Kuwait 33rd in the world on the HDI, the highest rank for any Arab country. If ESCWA member countries maintain their current rate of progress, they will very probably achieve gender equality at all levels of education by the year 2015.

TABLE 46. RANKING OF ESCWA MEMBER COUNTRIES BY PERCENTAGE OF WOMEN IN PARLIAMENT

Rank	Country or territory	Women in parliament (*percentage*)
1	Iraq	25.5
2	Syrian Arab Republic	12
3	Jordan	5.5
4	Lebanon	4.7
5	Bahrain	2.5
6	Oman	2.4
7	Egypt	2
8	Kuwait	1.5*
9	Yemen	0.3
10	Saudi Arabia	0
11	United Arab Emirates	0
12	Qatar	0
13	Palestine	NA

Source: Inter-Parliamentary Union (IPU).

* No woman succeeded in the 2006 elections, and two were appointed in the year 2007.

Box 6. Examples of ICT initiatives helping to achieve MDG Goal 3 in ESCWA member countries

ICT promotes gender equality by providing online opportunities to women that may not always be available offline. A woman's traditional role as homemaker and mother can inhibit her ability to attend school or, in traditional societies, to participate in activities that involve mixing with men. ICT can help overcome these and other barriers to gender equality and development by facilitating easier access to: (a) education at all levels and at all times through e-learning; (b) information and services related to health, nutrition and distance learning; (c) micro-credit and the ability to make financial transfers (remittances); and (d) new job opportunities in the knowledge economy that may include web programming, data entry and online sales. ICT also allows women to profit from women-friendly working models that include telecommuting in cultures that do not allow women to circulate freely or to mix with men. Following are examples of ICT initiatives that are helping with the achievement of Goal 3 in ESCWA member countries:

Box 6 (*continued*)

ICTDAR,[86] in partnership with the European Union, Egypt's National Council for Women, Tunisia's Center for Arab Women's Training and Research, Lebanon's KAFA (enough) Violence and Exploitation, the Lebanese Council to Resist Violence against Women and Microsoft, has implemented the "WRACTI" project (Promoting the Rights of Women and Children through Information) in Palestine, Egypt, Tunisia and Lebanon. The initiative educates women about their rights and the rights of their children providing legal information through websites and CDs.

The ESCWA Centre for Women has either launched or is set to launch the following: (a) an "e-network" where stakeholders can post ideas and opinions and exchange good practice with a view to mainstreaming a gender perspective in the ministries, councils and commissions of their respective countries. The e-network will also include an e-learning tool that could benefit women in general and national women's organizations in particular, including gender mainstreaming guidelines and checklists that may be used in the planning, implementation and evaluation process of any development project; (b) two electronic databases, namely, a compilation of all United Nations gender activities in the Arab region as well as an electronic repository of Arab women politicians, members of Arab parliaments, businesswomen, women scientists and women in the media and academia; and (c) a monthly online magazine with contributions from more than 20 governmental and non-governmental bodies as well as independent Arab writers. The magazine highlights basic issues of concern that govern the fate of Arab women in several ESCWA member countries and promotes gender equality through better coordination, cooperation and the exchange of experiences.[87]

(d) *Goal 4: Reduce child mortality*

Generally speaking, the Arab countries are moving towards achieving the target which aims at reducing child mortality by one-third by 2015. The mortality rate among children under five decreased between 1990 and 2003. GCC countries recorded the lowest under-five child mortality rates during the same period, going from 39 deaths per 1,000 live births in 1990 to 23 in 2003. The child mortality rate also decreased in the Levant countries with the Syrian Arab Republic recording 15 deaths per 1,000 live births, and Egypt 26. In Iraq, however, child mortality rates increased during the period due to repeated wars and more than 10 years of sanctions. Yemen suffered from the highest under-five child mortality rate with 102 deaths per 1,000 live births.

Box 7. Examples of ICT initiatives helping to achieve MDG Goal 4 in ESCWA member countries

Access to health information, and awareness-raising about disease play a major role in the achievement of the fourth millennium development goal. ICT contributes to tackling these issues as it is able to: (a) enhance the delivery of basic and in-service training for health workers; (b) improve monitoring of and information-sharing about disease and malnutrition; and (c) facilitate the access of caregivers to specialist support, remote diagnosis, and reproductive and other health information.

The Global Observatory for eHealth (GOe) was established in 2005 by the World Health Organization. Its main focus is to put ICT at the service of health. "The Observatory's mission is to improve health by providing member States with strategic information and guidance on effective practices, policies and standards in eHealth. The GOe will: (a) provide timely and high-quality evidence and information to support national Governments and international bodies in improving policy, practice, and management of eHealth services; (b) raise awareness and commitment of Governments and the private sector to invest in, promote and advance eHealth; (c) collect, analyse and distil knowledge which will make a significant contribution to the improvement of health using ICT; (d) publish an annual report, and special guidelines, on key eHealth research topics as a reference for Governments and policymakers; and (e) build capacity in eHealth research, analysis and reporting in countries".[88]

[86] www.ictdar.org.

[87] www.escwa.un.org/divisions/ecw_editor/Download.asp?table_name=other%20&field_name=id%20&FileID=%2073.

[88] http://www.who.int/kms/initiatives/ehealth/en/.

(e) *Goal 5: Improve maternal health*

There is a clear disparity among ESCWA member countries in maternal mortality rates. In 2000, the maternal mortality rate in the GCC countries was 29.6 deaths per 100,000 live births, in Lebanon 150, and in Jordan 41. In Yemen, on the other hand, the number reached 570 in 2005.

As for the percentage of births taking place under the supervision of qualified health personnel, these exceeded 95 per cent in the GCC countries between 2000 and 2005 (100 per cent in Kuwait and the United Arab Emirates and 95 per cent in Oman). The rate is much lower in the Levant, however, where only 67.1 per cent of births took place under the supervision of a qualified health professional between 1995 and 2001. In Yemen, moreover, only 27 per cent of all births were supervised by a qualified health professional in 2005.

Box 8. Examples of ICT initiatives helping to achieve MDG Goal 5 in ESCWA member countries

ICT can help improve maternal health by: (a) developing the capacity to collect, analyse, update and manage data on disease; (b) promoting a more rapid diffusion of information on good maternal practices; (c) increasing awareness and outreach programmes, targeting both men and women on reproductive health rights; and (d) expanding access to health care.

The ITU is conducting telemedicine pilot projects in developing countries. Network connectivity is used to access medical services and databases, as well as for tele-consultation, tele-education, vital sign monitoring, image transfer and video conferencing applications. Here are some country-specific examples in the ESCWA region: (a) The Bahrain Specialist Hospital is connected electronically to many leading medical centres across the world; (b) The United Arab Emirates is connected to the Arab Telemedicine Network, the Egyptian Telemedicine Network, the Dermatological Diseases Telemedicine Network and the Pediatric Consultation Network; (c) Kuwait is making use of its large Internet bandwidth to provide telemedicine services in the country. It is also a member of the Arab Telemedicine Network, which was established to facilitate the exchange of information between medical centres and hospitals in the Arab region, on the one hand, and international medical centres, on the other; (d) In Egypt, the Ministry of Health and the Ministry of Communications and Information Technology have collaborated to establish the Egyptian Telemedicine Network, which aims to improve medical and health care services in Government hospitals. The network allows hospitals in remote and rural areas to consult with larger hospitals and features an ambulance equipped with a VSAT connection to provide telemedicine services in accidents and disasters; (e) Jordan has provided telemedicine services for more than 10 years and is connected to several international telemedicine networks. This fact decreases the need for citizens to travel abroad for treatment; (f) In Lebanon, telemedicine and teleconferencing services are, for the most part, restricted to some private sector hospitals.

(f) *Goal 6: Combat HIV/AIDS, malaria and other diseases*

Despite the high number of HIV-positive cases recorded in the world during the last few years, HIV does not appear to be spreading on a wide scale among ESCWA member countries. However, there is not enough reliable information to assess the number of HIV-positive cases in the region.

In addition, malaria is no longer spreading in the ESCWA region, except for Yemen where positive cases recorded in 2005 were 9.6 per cent.

As for tuberculosis, 437 cases were recorded in 2000 in the Levant countries and 272 in the GCC countries. In Yemen, however, tuberculosis cases per 100,000 population reached 16.1 in 2004.

Box 9. Examples of ITC initiatives helping to achieve MDG Goal 6 in ESCWA member countries

ITC can play a leading role in achieving MDG goal 6. Well-focused radio campaigns can lead to a heightened awareness among young people of health issues while teaching them how to prevent illness. For people reluctant to discuss health and sex-related issues, the private nature of the Internet offers information which could literally mean the difference between life and death. ITC can improve: (a) basic on-the-job training for health-care workers; (b) monitoring and information-sharing about disease and famine; (c) remote access to support and diagnostic services for those living in rural areas; and (d) access to health-care services and information in local languages.

Box 9 (*continued*)

In 2006 the ICTD, working in cooperation with local Government bodies and NGOs and Microsoft, launched the ICTDAR programme in the Arab region with the implementation of the "Ajyalco" initiative "Opening the Doors of Opportunity" in Yemen. By using ICT as a principal tool, Ajyalco strives to educate young people and to enable them to play a greater role in their local communities. The Ajyalco initiative has also supplied youth centres in Egypt with computers, servers, Internet access, content and ICT training. These youth centres address major issues such as drugs, HIV/AIDS and sex education, while promoting learning, health and job opportunities.

(g) *Goal 7: Ensure environmental sustainability*

Most ESCWA member countries have made progress in meeting the challenges of sustainable development, and environmental sustainability has been a regional concern for some time. In 2002, the League of Arab States launched the Arab Forum for Environment and Development (AFED) initiative with the aim of improving the management of natural resources, resulting in the 2003 Abu Dhabi Declaration.

Water provision and sanitation indicators show that some countries in the region still suffer from shortages, especially in rural areas. Moreover, according to the Human Development Report, many Lebanese villages are denied access to sanitation and the water of the Litani River is being polluted by sewage. In terms of access to fresh drinking water, the highest rate of access was recorded in the GCC countries with 100 per cent availability in three countries: Bahrain, Kuwait and Qatar. By contrast, in Oman the rate was only 75.3 per cent. As for Yemen, it still suffers from a severe shortage of safe drinking water with a mere 73.7 per cent access rate for the country overall, and an even lower 27.9 per cent rate in rural areas, according to 2004 numbers.

The report further shows that access to drinking water in the Palestinian territories is unevenly distributed, for it is estimated that an Israeli receives six times as much supply of safe drinking water as his or her Palestinian counterpart, despite the fact that both use the same water resources in most of the region. Such a shortage of safe drinking water has significantly affected development in Palestine.

Box 10. Examples of ICT initiatives helping to achieve MDG Goal 7 in ESCWA member countries

ICT can enable greater participation by the population in environment-protection activities through networking and information exchange.[89] ICT also provides researchers with critical tools for the observation, simulation and analysis of environmental processes.[90] Telecommuting and other online activities can indirectly lower CO_2 emissions by reducing vehicular traffic to offices, shops, banks, doctors and schools. Indicators such as the number of telecommuters, Internet banking subscribers, consumer-to-business e-commerce transactions and students enrolled in ICT-based distance learning already exist in some countries. Paperless offices, though still an elusive long-term goal for many organizations, can reduce the consumption of paper and the destruction of rain forests. By the same token, computerized monitoring of water resources, together with the use of geographical information systems and databases, can enhance the management of water quality and pinpoint sources of pollution.[91]

The Arab Urban Development Institute[92] (AUDI) has launched the "Arab City ICT Strategy (CICTS)" to raise awareness and to use ICT to address the challenges and problems of urbanization, including those affecting the environment. Activities include the organization of conferences and workshops and working with the private sector to promote and implement the ideas and findings of CICTS in various ESCWA member countries.

[89] Report of the UN Millennium Project Task Force on Environmental Sustainability, "Environment and Human Wellbeing: a Practical Strategy": http://www.unmillenniumproject.org/documents/Environment-complete-lowres.pdf.

[90] "ICT and a Sustainable Environment", available at: http://topics.developmentgateway.org/ict/sdm/previewDocument.do~active DocumentId=569545.

[91] Report of the Thematic Panel on Information and Communication Technology and its Implications for Water Resources, available at: http://www.unmillenniumproject.org/documents/WaterComplete-lowres.pdf.

[92] http://www.araburban.org/AUDI/English/.

(h) *Goal 8: Develop a global partnership for development*

The achievement of a global partnership for development relies on aid provided by developed countries to developing ones. Within this framework, Egypt, Jordan, Iraq and Palestine regularly receive international and regional aid. Moreover, the wealthy GCC countries provide financial grants to assist in development efforts regionally and internationally. In 2003, Saudi Arabia donated $2.8 billion, Kuwait $82 million and the United Arab Emirates $130 million in aid.

In the last few years, Iraq has received the largest proportion of aid among ESCWA member countries, followed by Jordan, the West Bank and Gaza Strip, Egypt and Yemen.

Box 11. Examples of ICT initiatives helping to achieve MDG Goal 8 in ESCWA member countries

The "Million Book Project" is a global digital library seeks to spread access to knowledge, preserve human heritage and spread the benefits of the information society. Bibliotheca Alexandrina in Egypt,[93] in partnership with Carnegie Mellon University, the Internet Archive and other US-based universities and development institutions, China and India, is in the process of digitizing one million books so that they can be published on the Internet. The various partners are providing diverse, multilingual content.

In 1999, the Jordanian public sector started implementing an initiative called "REACH".[94] The aim of the project was to turn Jordan into a regional IT leader and an internationally-recognized exporter of IT products and services. The implementation strategy was based on a public-private partnership involving the Jordanian Ministry of Information and Communications Technology, USAID, and the private sector represented by the Information Technology Association of Jordan (INT@J).

In Lebanon, "Berytech", a technological hub established in 2001, offers incubation services to start-ups for a maximum period of 24 months. Assistance comes in the form of management training, business counselling and access to infrastructure and shared resources. The initiative receives grants from different donors and covers part of its expenses by leasing office space to well-established companies. Tenants include companies from the ICT and graphics industries and the health sector.

The "Iraq ICT Alliance" promotes greater collaboration and cooperation within the ICT sector in Iraq. The initiative assembles partners from the Iraqi public, private and academic sectors, multinational companies and both multilateral and bilateral donors. It encourages the formation of new and the expansion of existing development partnerships with a focus on training programmes for Iraqi women and youth. The overall goal of the alliance is for the ICT sector to serve as a catalyst for the country's economic growth.

B. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES

1. *Maturity level 1: Iraq, Palestine and Yemen*

For many years Iraq has suffered from oppressive circumstances, including wars and political instability, which have greatly eroded its chances of achieving the MDGs. Yemen, for its part, continues to be hampered by a shortage of funding and adequate technical experience. Palestine's ongoing plight in relation to Israel has also greatly limited the country's human development efforts.

2. *Maturity level 2: Egypt, Jordan, Lebanon, Oman, Saudi Arabia and Syrian Arab Republic*

The Syrian Arab Republic, Jordan and Lebanon all managed to register some significant achievements in certain indicators, especially in education and gender equality. However, they still need to make more progress on the rest of the indicators, especially in the eradication of poverty and the reduction of unemployment. For instance, Egypt continues to suffer setbacks in the areas of unemployment and poverty,

[93] www.bibalex.org/isis.

[94] "*Jordan's Information Society: A fast growing sector for a transforming nation*", E/ESCWA/ICTD/2003/WG.1/12.

despite marked improvement in other indicators, particularly education. Wealthy as it is, Saudi Arabia's economic progress has not yet enabled the country to realize all the MDGs, particularly in education and gender equality.

3. *Maturity level 3: Bahrain, Kuwait, Qatar and the United Arab Emirates*

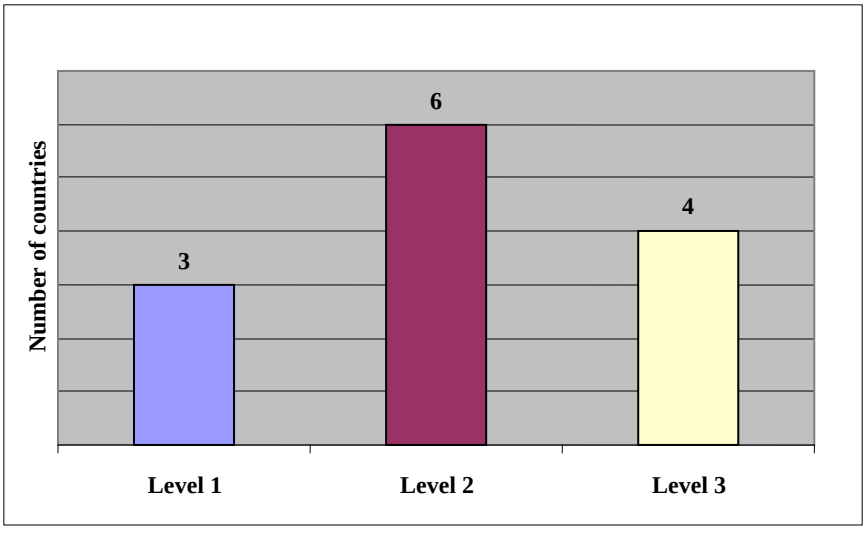
The progress made at this maturity level varies from country to country. While Bahrain and Qatar have excelled in terms of total net enrolment ratios in primary education, they do not differ much from Kuwait and the United Arab Emirates when it came to promoting the participation of women in their political processes. All these countries are still in need of progressing further on several other indicators to achieve parity with the developed countries.

4. *Maturity level 4: None*

TABLE 47. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN ACHIEVING THE MDGs

Country or territory	Maturity level 1 2007	Maturity level 2 2007	Maturity level 3 2007	Maturity level 4 2007
Bahrain			✓	
Egypt		✓		
Iraq	✓			
Jordan		✓		
Kuwait			✓	
Lebanon		✓		
Oman		✓		
Palestine	✓			
Qatar			✓	
Saudi Arabia		✓		
Syrian Arab Republic		✓		
United Arab Emirates			✓	
Yemen	✓			

Figure 11. Maturity levels of ESCWA member countries in achieving the MDGs, 2007



C. SUGGESTIONS AND RECOMMENDATIONS

(a) Increase media campaigns to raise community awareness regarding the MDGs;

(b) Take advantage of the experiences of developing countries which have successfully alleviated or eradicated poverty, specifically in rural areas;

(c) Due to its direct impact on the achievement of most goals, ESCWA member countries must raise women's health awareness and activate their role in family and society;

(d) Hold donor countries accountable for fulfilling their commitments to the developing countries in terms of providing the necessary assistance regardless of political considerations;

(e) Develop plans and appropriate budget to utilize ICT in promoting literacy;

(f) Build a database with accurate numbers for the MDG indicators, and make it available on the Internet;

(g) Boost investments in the e-health sector;

(h) Utilize digital technology, especially the Internet, to raise health awareness among school pupils.

XII. REGIONAL AND GLOBAL COMPARATIVE ANALYSIS

A. PERFORMANCE OF ESCWA MEMBER COUNTRIES IN BUILDING THE INFORMATION SOCIETY

In order to depict the status of information societies in the ESCWA region, measure progress in building these societies and evaluate the current status of member countries, the profile of the information society has been divided into 11 basic components. Each component is rated on a four-level maturity scale, whereby level 1 indicates the lowest level of maturity (1 point) and level 4 the highest (4 points). The score for each country, derived both from information provided to ESCWA in national country reports and from external sources, was calculated by adding up the point scores for the 11 components and then dividing the result by 11. This makes possible country comparisons and rankings according to progress made in building the information society.

The following table ranks ESCWA member countries according to their progress in building their information societies:

TABLE 48. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN BUILDING AN INFORMATION SOCIETY, 2007

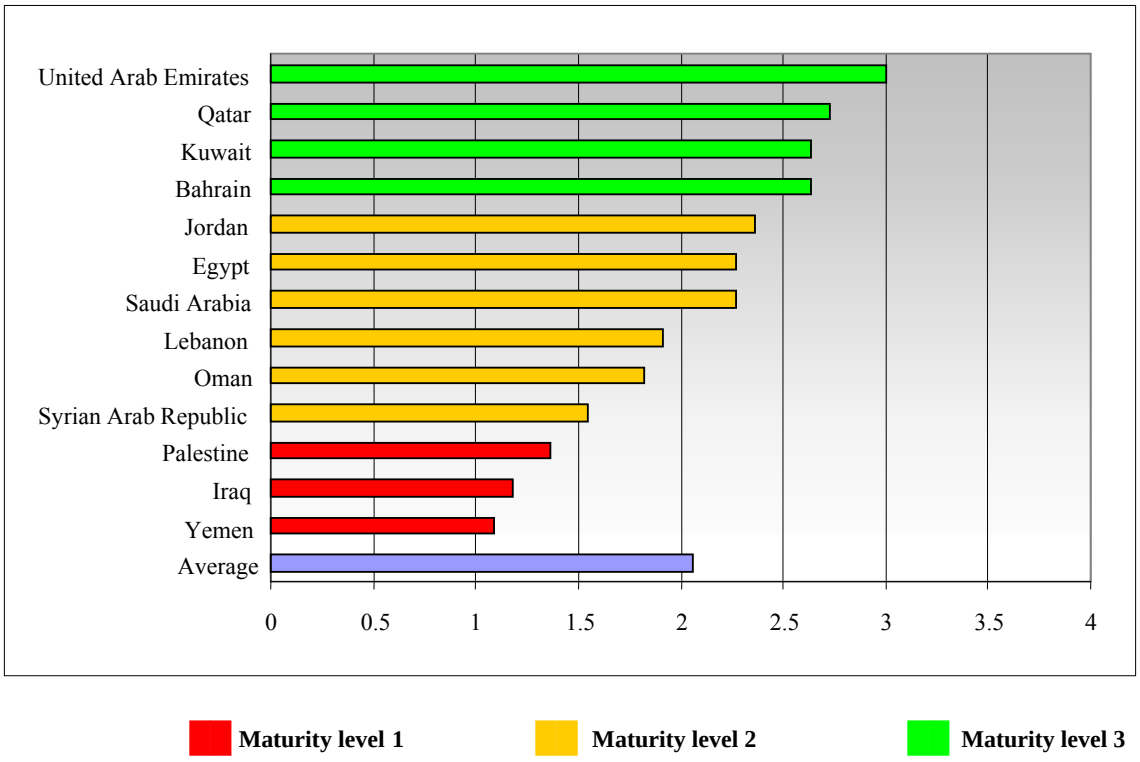
Country or territory	Role of Governments	ICT infrastructure	Access to information	ICT capacity-building	Building confidence and security	Enabling environment	ICT applications	Cultural diversity and local content	Media	International cooperation	MDGs	Average
United Arab Emirates	4	4	3	3	2	3	4	3	2	2	3	3.00
Qatar	4	3	3	3	2	2	3	2	3	2	3	2.73
Bahrain	4	4	3	3	1	3	4	2	1	1	3	2.64
Kuwait	2	3	3	3	2	2	3	3	3	2	3	2.64
Jordan	3	3	2	3	1	3	3	2	2	2	2	2.36
Saudi Arabia	3	3	2	2	2	2	3	3	2	1	2	2.27
Egypt	3	2	2	3	2	3	2	3	2	2	1	2.27
Lebanon	2	2	2	2	1	2	2	2	3	1	2	1.91
Oman	2	2	2	2	1	2	2	2	2	1	2	1.82
Syrian Arab Republic	2	2	1	2	1	1	1	3	1	1	2	1.55
Palestine	1	2	1	2	1	1	1	1	2	1	2	1.36
Iraq	1	1	1	2	2	1	1	1	1	1	1	1.18
Yemen	1	1	1	2	1	1	1	1	1	1	1	1.09
Average	2.46	2.46	2.00	2.46	1.46	2.00	2.31	2.15	1.92	1.38	2.08	2.06

The United Arab Emirates ranked first, scoring an average of three points out of a total of four, while Qatar ranked second, averaging 2.73 points. Bahrain and Kuwait tied for third place with 2.64, while Yemen ranked with a score of 1.09.

The average score for the ESCWA region overall was 2.06 points. That for the GCC countries was an above-average 2.52, whereas the non-GCC countries averaged only 1.68. This clearly indicates that GCC

countries have taken greater steps than the rest of ESCWA member countries towards building their information societies. The figures also indicate that ESCWA member countries, including even top performers such as the United Arab Emirates and Qatar, still lag far behind developed countries in building information societies.

Figure 12. Ranking of ESCWA member countries by maturity level in building an information society, 2007



Source: Madar Research Group.

The average score for each ICT component was calculated for each ESCWA member country, with the following results:

TABLE 49. AVERAGE SCORES OF THE ESCWA REGION IN VARIOUS INFORMATION SOCIETY COMPONENTS, 2007
(*Ranked from lowest to highest*)

Information society component	ESCWA region average scores
Regional and international cooperation	1.38
Building confidence and security in the use of ICTs	1.46
Media	1.92
Access to information and knowledge	2.00
Enabling environment	2.00
Millennium Development Goals	2.08
Cultural diversity and local content	2.15
ICT applications	2.31
Role of Governments and stakeholders	2.46
ICT capacity-building	2.46
ICT infrastructure	2.46
Overall average	2.06

ESCWA member countries scored lowest on regional and international cooperation, due to the absence or inadequacy of joint initiatives on a regional or international level towards a common vision for building an information society. ESCWA member countries also scored low on building confidence and security in the use of ICT, as a result of the absence of laws and regulations that ensure citizens' privacy and confidentiality and the delay in issuing laws and regulations to counter the misuse of ICT.

Limited press freedom and the inadequacy of the media in bridging the digital divide in the ESCWA region both contributed to the low score of 1.92 points attained on the media component.

ICT infrastructure and the role of Governments and all stakeholders registered the highest average scores, at 2.46 points each. This is reflective of the relatively high penetration rates of ICT in the GCC countries and to the effective roles played by Governments in the region. The high average score of 2.46 on ICT capacity-building, on the other hand, reflects similarities between GCC countries' scores and those of the remaining ESCWA member countries; in fact not a single country was ranked at either maturity level 1 or 4 on this component.

B. PERFORMANCE OF ESCWA MEMBER COUNTRIES COMPARED WITH OTHER COUNTRIES AND REGIONS

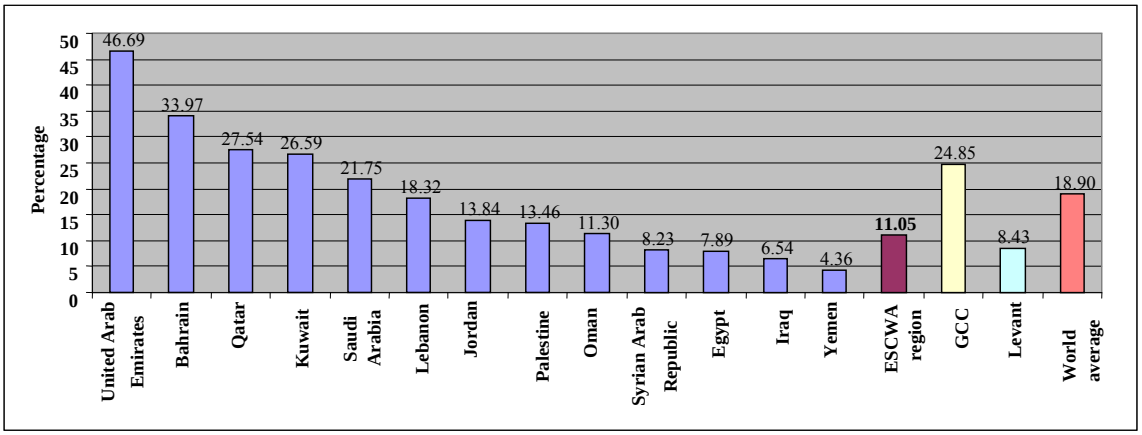
1. *Performance of ESCWA member countries in the role of Governments and all stakeholders*

Despite the formulation of national strategies in line with WSIS objectives, which call for the integration of ICT-related programmes with national and regional development strategies, the differences in development strategies among countries make it difficult to establish fixed international standards that can be used to measure or quantitatively compare performance. Nevertheless, and however much efforts may differ from country to country, depending on local conditions, most countries in the region are striving seriously to formulate and implement ICT-related policies

2. Performance of ESCWA member countries in ICT infrastructure

(a) *Internet penetration*

Figure 13. Internet penetration rates in the ESCWA region, 2006



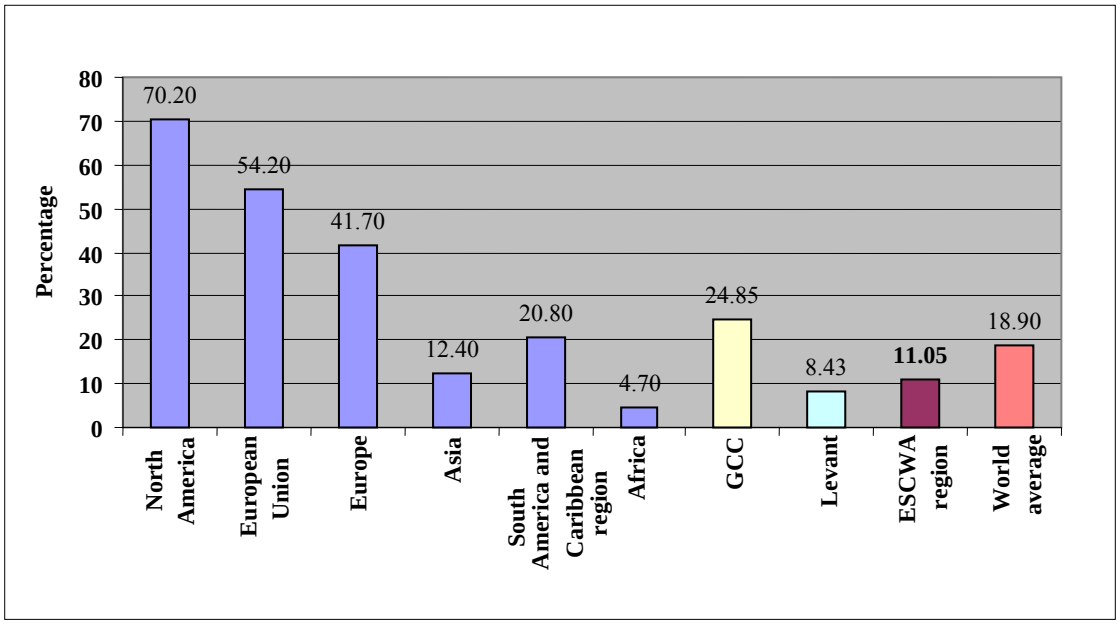
Source: Madar Research Group.

TABLE 50. INTERNET PENETRATION RATES IN SELECTED REGIONS, 2006-2007

Region	Internet penetration (*percentage*)
North America	70.20
European Union	54.20
Europe	41.70
Asia	12.40
South America and Caribbean region	20.80
Africa	4.70
World average	18.9
ESCWA	11.05
Gulf Cooperation Council	24.85
Levant	8.43

Sources: Madar Research Group, www.internetworldstats.com.

Figure 14. Internet penetration rates in selected regions, 2006-2007

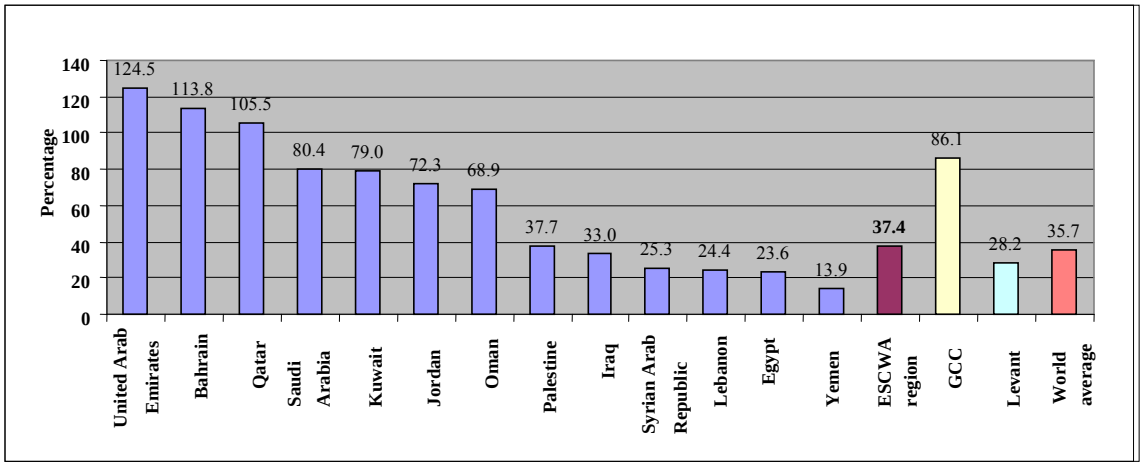


Sources: Madar Research Group, www.internetworldstats.com.

The 11.05 per cent average Internet penetration rate in the ESCWA region is lower than the world average of 18.90 per cent, meaning that ESCWA member countries fall behind most regions of the world, with the exception of Africa. However, the GCC countries' Internet penetration rate averages 24.85 per cent, overtaking South America and Asia, though falling behind the rates in the European Union (54.20 per cent) by a large margin.

(b) *Mobile phone penetration*

Figure 15. Mobile phone penetration rates in the ESCWA region, 2006



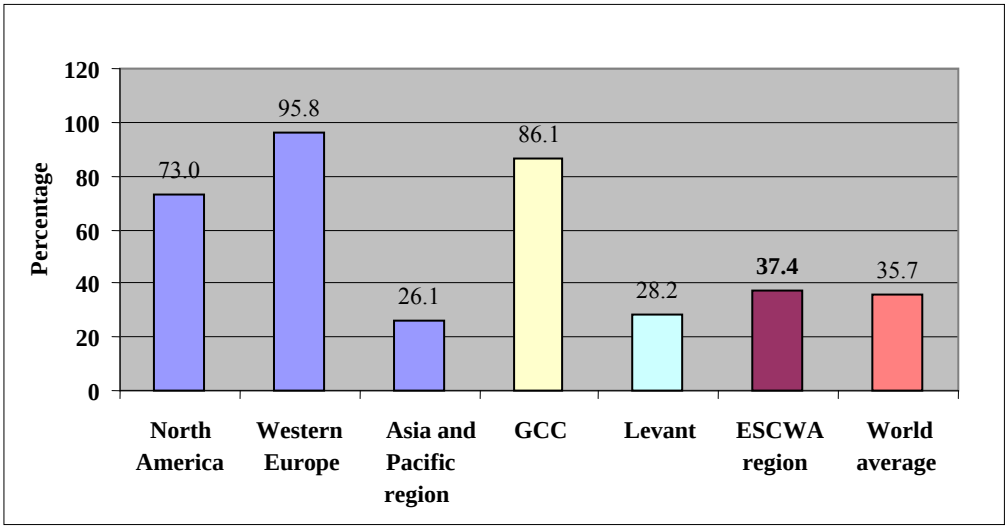
Sources: Madar Research Group, www.internetworldstats.com.

TABLE 51. MOBILE PHONE PENETRATION RATES IN SELECTED REGIONS, 2006-2007

Region	Mobile phone penetration (*percentage*)
North America	73.00
Western Europe	95.80
Asia and Pacific	26.10
GCC	86.11
Levant	28.19
ESCWA	37.43
World average	35.70

Sources: Madar Research Group, Taiwan Market Intelligence Center.

Figure 16. Mobile phone penetration rates in selected regions, 2006-2007



Sources: Madar Research Group, Taiwan Market Intelligence Center.

When comparing mobile phone penetration rates, we find that ESCWA member countries surpass the Asia and Pacific region by a large margin, while falling behind Western Europe. Indeed, the 86.11 per cent penetration rate in the GCC region exceeds the North American rate of 73 per cent. While the ESCWA region's average is higher than the world average, the Levant region's average (28.19 per cent) is lower than the world average.

(c) *Personal computer penetration*

Figure 17. PC penetration rates in the ESCWA region, 2006

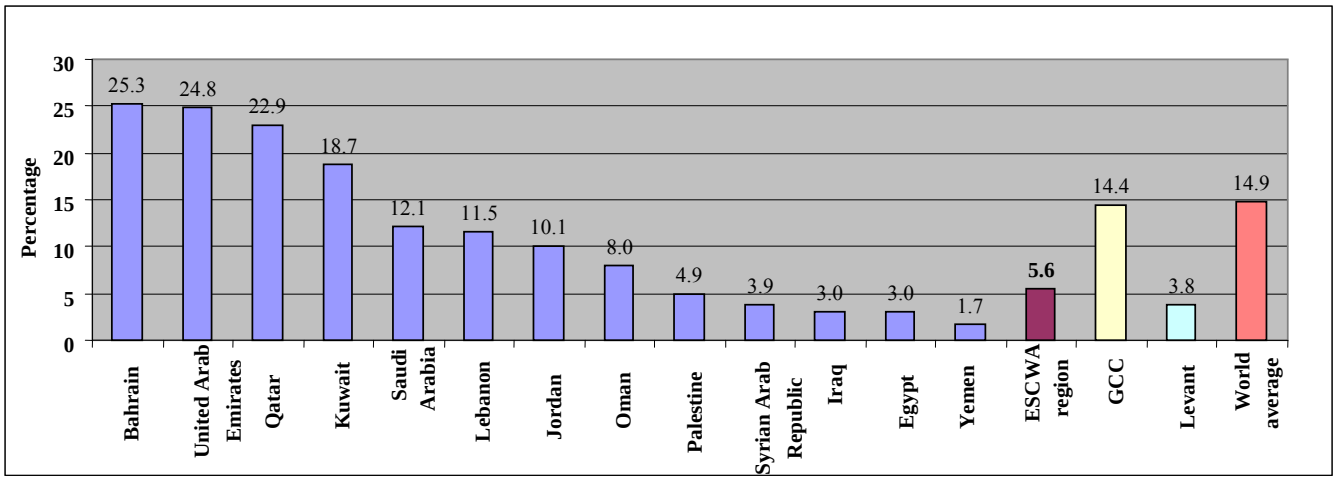


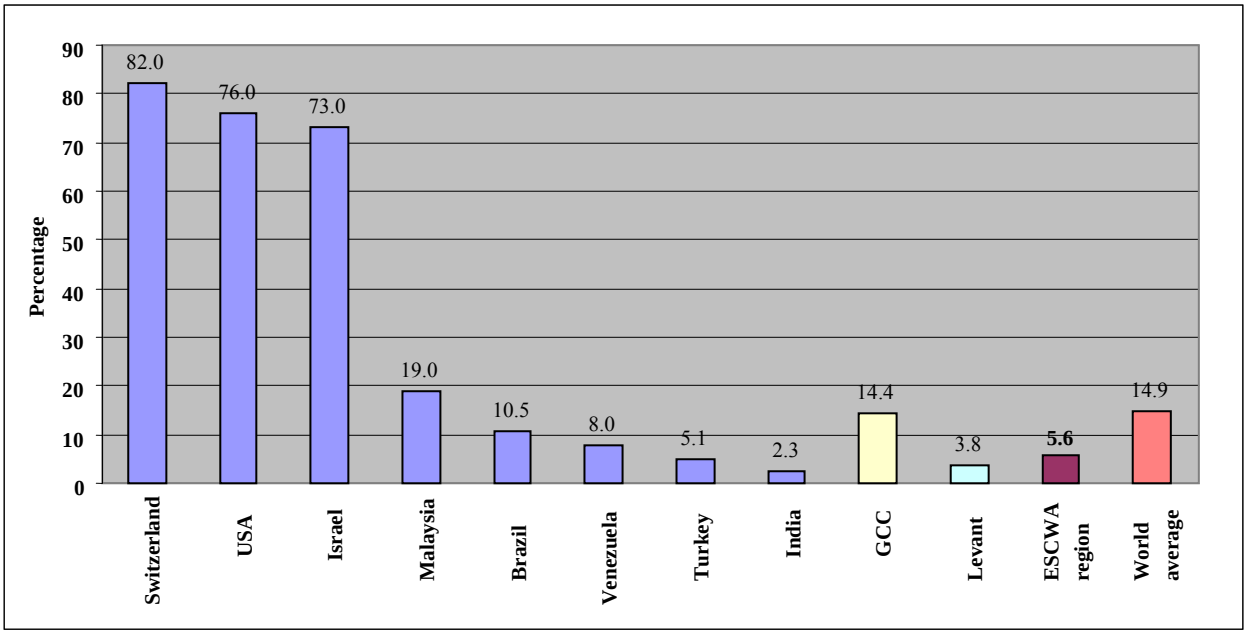
TABLE 52. PC PENETRATION RATES IN SELECTED COUNTRIES AND REGIONS, 2006

Country or region	PC penetration (*percentage*)
Switzerland	82.00
USA	76.00
Israel	73.00
Malaysia	19.00
Brazil	10.50
Venezuela	8.00
Turkey	5.13
India	2.30
GCC	14.44
Levant	3.79
ESCWA	5.55
World average	14.90

Sources: Madar Research Group, ITU, Gartner and other sources.

The PC penetration rate of ESCWA member countries remains low at 5.55 per cent on average, far below the world average at 14.9 per cent and only slightly higher than Turkey's average of 5.13 per cent. GCC countries are on relatively higher ground, but their regional penetration rate of 14.44 per cent is still far below that of developed countries or even Malaysia (19 per cent).

Figure 17. PC penetration rates in selected countries and regions, 2006



Sources: Madar Research Group, ITU, Gartner and other sources.

3. *Performance of ESCWA member countries in access to information and knowledge*

The average ESCWA score on this component (2.00) indicates that access to information, whether through community access centres or via wireless and broadband providers, is still limited in comparison with other countries such as Brazil. The latter has established access centres all along the area bordering the Amazon. Furthermore, community access centres in ESCWA member countries that allow poor and rural citizens to benefit from information technology cannot even be compared with the "rural Internet" initiative in Spain, which provides free access to over three million citizens in rural areas.

The two most important criteria for access to information are the availability of infrastructure and cost-effective access methods for large segments of the society. The digital opportunity index measures these two criteria.

TABLE 53. RANKING OF ESCWA MEMBER COUNTRIES AND SELECTED COUNTRIES ON THE DIGITAL OPPORTUNITY INDEX, 2005-2006

Country or territory	Global ranking	Selected countries for comparison	Global ranking
Bahrain	35	Denmark	3
United Arab Emirates	37	Singapore	5
Qatar	38	Israel	14
Kuwait	60	Norway	12
Saudi Arabia	75	USA	20
Jordan	79	Ireland	31
Oman	81	Malaysia	57
Egypt	91		
Lebanon	93		
Palestine	98		
Syrian Arab Republic	104		
Yemen	128		
Iraq	N/A		

Source: ITU Digital Opportunities Report, May 2007.

Note: The performances of Bahrain, the United Arab Emirates and Qatar are almost on a par with that of Ireland, while the performance of Egypt, Lebanon, Palestine and the Syrian Arab Republic were weak. Yemen in particular performed very poorly on the index.

4. *Performance of ESCWA member countries in ICT capacity-building*

Measurements of ICT capacity-building mainly reflect the use of ICT in education, training and literacy programmes, the status of R&D and the development of an enabling environment for innovation. To illustrate the situation in ESCWA member countries, a number of criteria have been selected for comparison with other regions and countries.

Illiteracy is still widespread in ESCWA member countries, the region having one of the highest rates in the world, demonstrating that these countries have yet to benefit from the use of ICT to reduce prevailing high illiteracy rates.

TABLE 54. PATENTS REGISTERED ANNUALLY IN SELECTED COUNTRIES AND REGIONS, 1997-2006

Country or region	Patents registered annually between 1997 and 2006	Patents per one million population per annum
ESCWA	36.4	0.188
Arab	38.7	0.125
GCC	28.5	0.817
Middle East	9.8	0.074
North Africa	2.3	0.029
World	171 235	0.0285
Israel	972	138.46
Turkey	13.4	0.189
Malaysia	64	4.62
USA	91 898	305.82
France	3 880	61.00
India	244	0.217
Philippines	20.1	0.22

Source: United States Patent and Trademark Office (USPTO).

Furthermore, spending on R&D and the number of working scientists in the region remain very limited and far below the world average. When comparing patent registration in ESCWA member countries with that in other countries, the ESCWA region outperforms North Africa, but lags behind Malaysia by a large margin. While the GCC region, whose average of 0.817 patents per million population exceeds the ESCWA average, is ahead of Turkey (0.189), it lags far behind Malaysia (4.62) and even further behind Israel (138.46).

5. *Performance of ESCWA member countries in building confidence and security in the use of ICT*

With regard to information security and data, and privacy protection, the region is characterized by the absence or inadequacy of standards and regulations safeguarding Internet users' personal information. While some countries are working to prevent cyber crimes, their efforts still fall short. However, according to a study published by Brown University on e-government performance, ESCWA member countries are far from alone in having inadequacy of their privacy policies.

6. *Performance of ESCWA member countries in establishing an enabling environment*

Despite the exceptional performance of some ESCWA member countries in combating software piracy, the region still suffers badly from this phenomenon. The 2006 Business Software Alliance report indicates that pirated software accounts for 60 per cent of software in use in the MENA region, namely, almost double the world average of 30 per cent. Meanwhile, the average software piracy rate in the GCC countries is 55 per cent. Despite a recent drop in rates, software piracy is still a major problem in most of these countries, with the exception of the United Arab Emirates which registered a lower 35 per cent rate.

TABLE 55. SOFTWARE PIRACY RATES IN SELECTED COUNTRIES AND REGIONS, 2006

Country or region	Software piracy (*percentage*)
North America	22
Western Europe	34
European Union	36
Asia and Pacific region	55
Middle East and North Africa	60
Lebanon	73
Kuwait	64
United Arab Emirates	35
South America	66
Russia	77
China	82
World average	35

Source: Business Software Alliance (BSA).

Until recently, Bahrain was the region's only signatory to the Patent Law Treaty, signed by 56 member countries around the world. Oman signed the treaty in 2007, becoming the only other Arab member. Meanwhile, only five countries from the ESCWA region are signatories to the Patent Cooperation Treaty which boasts 131 signatories and 128 members. These are Egypt, the Syrian Arab Republic, Oman and the United Arab Emirates and Bahrain, the newest member, which signed the treaty in 2007.[95] The ESCWA region is in general characterized by a weak legislative and regulatory framework, compared with developed countries.

7. *Performance of ESCWA member countries in ICT applications*

The performance of e-governments differs from one ESCWA member country to another, with Bahrain ranking first among both ESCWA and Arab countries, and 15th worldwide, on Brown University's e-government index. This puts Bahrain close behind 13th-place Brazil. Egypt, meanwhile, ranks 81st worldwide, close behind Kenya (84th), and ahead of Saudi Arabia (89th). The latter outranked Iran by six places only. The Syrian Arab Republic's coming in 4th in the Arab world, 58th worldwide, and only one place behind Colombia, was surprising. The country's ranking is an important gain for the Syrian Arab Republic, given its weak overall performance on most indicators. The Syrian Arab Republic's relative advance on this indicator is a consequence of the large amount of Arabic content that has been added to its e-government sites and the translation of a considerable part of this content to English (and often French, as in the case of the Ministry of Tourism website), as well as its continued updating of information and acceptance of visitors' comments and feedback.

8. *Performance of ESCWA member countries in cultural diversity and identity, linguistic diversity and local content*

Compared with other world languages, Arabic content on the Internet remains very limited, estimated at only 0.16 per cent at the end of 2006. This percentage is especially low given that Arabic speakers constitute five per cent of the world's population. However, the annual growth rate of Arabic web pages, about 400 per cent in 2005 and 2006, is encouraging. The data on the proportion of web content in each language is relatively old, going back to 2003. The following table shows Internet users by language.

[95] World Intellectual Property Organization, http://www.wipo.int/treaties/en/ShowResults.jsp?lang=en&treaty_id=6.

TABLE 56. TOP TEN LANGUAGES USED ON THE INTERNET, 2007

Language	Percentage of all Internet users (*percentage*)	Internet penetration by language (*percentage*)	Language growth rate 2000-2007 (*percentage*)
English	31.20	17.90	157.70
Chinese	15.70	13.60	469.60
Spanish	8.70	22.90	311.40
Japanese	7.40	67.10	83.30
French	5.00	15.30	385.40
German	5.00	61.10	112.90
Portuguese	4.00	20.20	524.70
Korean	2.90	45.60	79.20
Italian	2.70	52.90	138.50
Arabic	2.50	8.50	940.50
Top ten languages	85.00	19.30	203.70
Other languages	15.00	12.40	440.30

Source: www.internetworldstats.com.

9. *Performance of ESCWA member countries in the media*

Despite the diversity of media in ESCWA member countries, the media's role remains weak in developing information societies. One of the findings of the report is that media freedom in all countries in the developing region is at its lowest level compared with developed countries. According to the 2007 Reporters Without Borders Worldwide Press Freedom Index, the GCC countries did at least fare better than others such as India, Malaysia and Turkey. Nevertheless, social issues continue to be covered in a stereotypical way by all media outlets in ESCWA member countries, not unlike the way they are still covered in many other countries worldwide.

TABLE 57. RANKING OF ESCWA MEMBER COUNTRIES ON THE REPORTERS WITHOUT BORDERS WORLDWIDE PRESS FREEDOM INDEX, 2007

Country or territory	Worldwide ranking	Selected countries	Worldwide ranking
Kuwait	63	Norway/Iceland	1
United Arab Emirates	65	Canada	18
Qatar	79	Israel	44 (Occupied territories 103)
Lebanon	98	USA	48 (Occupied territories 111)
Bahrain	118	Hong Kong	61
Jordan	122	Turkey	101
Yemen	143	India	120
Egypt	146	Malaysia	124
Saudi Arabia	148		
Syrian Arab Republic	154		
Iraq	157		
Palestine	158		

Source: Reporters Without Borders' 2007 Worldwide Press Freedom Index.

10. *Performance of ESCWA member countries in regional and international cooperation*

Despite the importance of international and regional cooperation, it is difficult to measure what has been achieved in this regard by different countries and regions. Subsequently, it becomes difficult to make quantitative comparisons between the level of cooperation in the ESCWA region and that in the rest of the world.

The critical importance of regional and international cooperation for capacity-building in developing countries, is underlined by the eighth MDG, on the establishment of global partnerships for development. Some of the targets set for attaining this goal focus on developing strategies to create decent and productive job opportunities for youth, spread the benefits of modern technology, address the special needs of the least developed countries and increase official aid for development. ESCWA member country Yemen, despite falling into the "least developed countries" category, receives very little aid relative to other ESCWA member countries, especially Jordan, Iraq and Egypt, not nearly enough to meet its dire needs. Hence, it is necessary to increase the amount of aid pledged to Yemen and to intensify projects and initiatives, especially regional ones, to help the country better develop.

The United Nations devised a schedule to assess the progress made in achieving the MDG worldwide by the year 2007. Youth unemployment and Internet penetration rates were among the indicators used to measure progress towards meeting the eighth MDG goal of developing a global partnership for development.

TABLE 58. PROGRESS IN DEVELOPING A GLOBAL PARTNERSHIP FOR DEVELOPMENT BY 2007

	Africa		Asia				Pacific region	South America and Caribbean	Commonwealth of independent states	
	North Africa	Sub-Sahara	East Asia	South East Asia	South Asia	West Asia			Europe	Asia
Youth unemployment	Very high	High	Low	High	Medium	Very high	Low	High	High	High
Internet penetration	Medium	Very low	Medium	Medium	Low	Medium	Low	High	Medium	Medium

Source: United Nations Millennium Development Goals.

11. *Performance of ESCWA member countries in achieving the MDGs*

The human development index (HDI) is an international standard for measuring countries' development and is linked to the MDGs. Countries in South America and the Caribbean fared slightly better than ESCWA member countries (0.755) on the development index, but the gap widens when comparing the region with countries such as Israel (0.927), Cyprus (0.903) and Malaysia (0.805). Indeed, the ESCWA region as a whole scored similarly to Turkey. Even ESCWA member countries that topped the region on the index, such as Bahrain, Kuwait and Qatar, did not fare well compared with Cyprus, Israel and Portugal.

TABLE 59. HUMAN DEVELOPMENT INDEX FOR SELECTED COUNTRIES AND REGIONS, 2006

Region or country	Human development index
ESCWA member countries (except Iraq)	0.755
Arab countries	0.680
Developing countries	0.676
South America and Caribbean countries	0.795
OECD countries	0.802
Other countries	**Human development index**
Israel	0.927
Portugal	0.904
Cyprus	0.903
Malaysia	0.805
Turkey	0.757

Source: 2006 Human Development Index, UNDP.

Certain initiatives using ICT to meet development goals, such as the "rural telephone initiatives" in Bangladesh which have extended telephone service to more than 39,000 villages and 45,000 women (a project copied in a number of African countries including Uganda), are easier to measure qualitatively than others. In the case of ESCWA member country projects carried out in association with international organizations, it is difficult to compare them with other regions worldwide due either to their unique characteristics or to their as-yet-unknown outcomes.

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