

Chapter 14

Arab countries

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THE ARAB COUNTRIES: ECONOMIC AND SOCIAL CONTEXT

Information and communications technologies (ICTs) are affecting all countries, whether developed or developing. The Arab countries are no exception. They are also struggling to meet the challenge of ICT's multiple impact on the social, economic, cultural and political aspects of life. This paper focuses on the penetration and use of information and communication technologies in the Arab region. It begins with a brief presentation of general economic and social data in the Arab countries and concludes with a look at future prospects for the development of ICT within this regional context.

The first striking feature in the Arab region is the wide variation among countries in terms of population, gross national product (GNP) per capita, education and use of ICT. The total population (Table 14.1) is over 260 million, according to 1997 estimates. The population of individual countries ranges from 0.6 to 62.5 million, with four countries numbering over 20 million inhabitants and one country, Egypt, more than 60 million. Nine countries – Bahrain, Djibouti, Kuwait, Lebanon, Mauritania, Oman, Palestine, Qatar, United Arab Emirates – are below 5 million. Three of them are found in the Gulf area and have populations below 1 million.

In the period between 1970 and 1995, annual population growth rate in the region ranged from 0.8% to 9.6%. Lebanon's rate was the lowest, but this is expected to rise after the civil war has ended. By contrast, in Qatar and the United Arab Emirates, the annual population growth rate was very high, 6.6% and 9.65% respectively, due to the large number of immigrants needed to improve the quantity and quality of the labour force in these two oil-producing countries. Growth is expected to decline between 1995 and 2015 in all countries except Lebanon. There are a number of reasons for this trend. Many countries are adopting family planning, terrorism in Algeria is

also affecting the rate, and the end of the building boom in oil-producing countries is reducing the need for imported labour.

Per capita GNP in the region ranges from \$260 to over \$17,000 in the Gulf area, where oil revenues support a small population, as shown in Table 14.1. It is below \$500 in two countries, but above \$2,000 in two others and above \$5,000 in three oil-producing countries. According to the World Bank (World Development Report, 1997), no country in the region has an annual growth rate exceeding 2%.

In some countries, only 10% of the land is inhabited; the rest is mostly desert. In such an environment, where literacy levels are also low, the new communication technologies, including television, can be very useful.

Illiteracy remains a challenge for some Arab countries in spite of the campaigns which have been launched in the last few decades. Table 14.2 shows that where data are available, most countries have an illiteracy rate between 20% and 50%. Women's literacy in all countries of the region is lower than men's.

Table 14.1 → Arab countries: general descriptive data, 1997

Country	Estimated population in millions	Area in 1,000 km ²	Population density per km ²	Annual population growth rate, as %		Gross national product (GNP) per capita	
				1970–1995	1995–2015	in \$	Average annual growth rate, as %
	1997	1995	1997	1970–1995	1995–2015	1995	1985–1995
Algeria	29.47	2,382	12	2.9	2.0	1,600	(2.4)
Bahrain	0.62	0.661	938	3.8	1.6	na	na
Djibouti	0.63	22	29	5.8	2.3	na	na
Egypt	62.5	1,001	62	2.3	1.6	790	1.1
Iraq	21.18	441	48	3.1	2.7	na	na
Jordan	5.77	89	60	3.5	2.9	1,510	(4.5)
Kuwait	1.81	18	75	3.3	2.1	17,390	1.1
Lebanon	3.14	10	302	0.8	1.4	2,660	na
Libya	5.78	1,927	3	4.1	3.2	na	na
Mauritania	2.39	1,026	2	2.5	2.4	460	0.5
Morocco	27.52	447	42	2.2	1.5	1,110	0.9
Oman	2.40	212	9	4.6	3.9	4,820	0.3
Palestine	2.76	0.379	7,266	na	na	na	na
Qatar	0.57	11	50	6.6	1.5	na	na
Saudia Arabia	19.49	2,150	8	4.7	3.1	7,040	(1.9)
Somalia	10.22	638	16	na	na	na	na
Sudan	27.9	2,536	11	2.7	2.1	na	na
Syria	14.95	185	81	3.3	2.4	1,120	0.9
Tunisia	9.32	164	57	2.3	1.5	1,820	(1.9)
United Arab Emirates	2.38	84	32	9.6	1.6	17,400	(2.8)
Yemen	16.48	528	87	3.5	3.5	260	na

Sources: UNDP 1998, Human Development Report; ITU 1997, World Telecommunication Development Report; World Bank 1997, World Development Report.

Table 14.2 → Literacy and education in Arab countries, 1995

Country	Adult illiteracy, as %	Adult literacy rate, as % 1995		Combined first-, secondary and third-level gross enrolment ratio, %		Gross enrolment ratio in primary education		Gross enrolment ratio in secondary education		Higher education as a % of all education phases	
		1995	Female	Male	Female	Male	Total, ¹	Females	Total,		Females
							as %	as a % of males	as %		as a % of males
		1995	Female	Male	Female	Male	1995	1995	1995	1995	1990–1995
Algeria	38	49.1	73.9	62	66.7	107	89	62	89	na	
Bahrain	na	79.4	89.1	85.9	78.1	108	102	99	103	na	
Djibouti	na	na	na	na	na	38	75	13	73	14	
Egypt	49	38.8	63.6	63.4	68.9	100	87	74	85	36	
Iraq	na	45	70.7	45.4	55.1	na	na	na	na	21	
Jordan	13	79.4	93.4	66	66	94	101	na	na	34	
Kuwait	21	74.9	82.2	57.9	52.6	73	99	64	100	16	
Lebanon	8	90.3	94.7	75.1	66.1	109	97	81	109	na	
Libya	na	63.1	87.9	89	85.5	106	97	97	na	na	
Mauritania	na	26.3	49.6	33.4	41.4	78	85	15	58	20	
Morocco	56	31	56.6	40.6	50.7	83	76	39	75	16	
Oman	na	46	71	58.1	60.1	80	95	66	94	6	
Palestine	na	na	na	na	na	na	na	na	na	na	
Qatar	na	79.9	79.2	72.8	65.2	89	95	83	101	na	
Saudia Arabia	37	50.3	71.5	54.4	55.1	78	96	58	87	18	
Somalia	na	na	na	na	na	na	na	na	na	na	
Sudan	na	34.6	57.7	28.8	33.1	54	81	13	86	na	
Syria	na	55.8	85.7	57.8	61.2	101	90	44	85	na	
Tunisia	33	54.6	78.6	66.4	67.6	116	94	61	94	19	
United Arab Emirates	21	79.8	78.9	72.1	66.1	94	96	80	111	na	
Yemen	na	39	39	26.9	67.7	79	40	23	22	na	

1. The enrolment ratio exceeds 100% when the actual age distribution of pupils extends beyond the official school ages.

Sources: UNDP 1998, Human Development Report; World Bank 1997, World Development Report.

In schools, the gender balance is somewhat better. The high enrolment rate in primary education suggests that literacy rates could improve dramatically over the next generation, provided the high number of dropouts were reduced. The total enrolment rate ranges from 38% to 116%. It was above 80% in all but six countries in 1995, and higher than 90% in nine countries. The percentage of females to males is over 80% except for two countries. In secondary schools, enrolment rates decrease. In a few countries they never exceed 25% of the registration achieved in primary education. Overall, enrolment rates in secondary school vary from 13% to 99%. In ten countries the percentage is above 60%, and in six of them it is above 70%. The number of females registered as a

percentage of the total number of males registered in secondary school is above 80% in twelve countries. As for higher education, the limited data available shows that the overall enrolment rate rose to 30% in only two countries, and reached 20% in four countries. However, the rates for females and males enrolled in higher education are about equal in most countries.

Significant progress has been made in recent years in the development and strengthening of higher education in Arab states. This has led to more equitable representation of different social groups among graduates. In addition, the recent initiative for the establishment of an Open Arab University, which should be quite effective considering the geographic and social conditions of the region, has raised new

hopes throughout the region. Finally, in spite of free education and literacy campaigns, achieving United Nations (UN) goals for the year 2000 remains a major challenge.

STATUS OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN THE ARAB REGION

In order to organize the presentation of ICT in the Arab countries, we have adopted the model proposed by Kobayashi (1986) which suggests five main categories. The first category, called 'human interface', covers the technologies involving interaction between the machine and human beings, such as radio, television, the telephone, personal computers (PCs) and connections to the Internet. The second category refers to all ICT networks, including broadcasting, telecommunications and computer networks. The third category deals with ICTs used in government and administration, and the fourth concerning those found in education and research. The last group deals with information and knowledge services, such as decision support systems, the world wide web and all printed – or 'typographical' – information as it is called by Kobayashi.

Human interface technologies

Table 14.3 provides data for the main technologies in this category: radio, television (TV), telephone lines, PCs, Internet, and fax machines. As expected, radio shows the highest penetration rates. Five countries show over 400 radio sets per 1,000 inhabitants, and four of these rise above 450 radios per 1,000 inhabitants. Only three countries are below 150 sets per 1,000. Television is the second most common communication technology, with a range of 13 to 457 sets per 1,000 inhabitants. Seven countries show a penetration rate above 250 sets per 1,000 inhabitants, and eight are below 100. Telephone lines are expanding. In 1997, these ranged from less than 1 line

for 100 inhabitants in Somalia to more than 35 lines per 100 inhabitants in the United Arab Emirates. Fifteen countries are above 4 per 100 inhabitants.

Within the region, therefore, it is therefore possible to distinguish three groups of user countries in terms of telecommunications development. The first group comprises the Gulf countries with teledensities well above the world average and where almost every household has a telephone. The second group, comprising the majority of the countries, shows a teledensity a little above 4%. The third group includes countries with teledensities below these levels.

The personal computer is the most important terminal used with a human interface: it allows for a high level of interaction, and makes it possible to do co-operative work online. It may include the use of a CD-ROM, as well as general Internet connectivity including e-mail and many other functions. Data on the penetration rate for personal computers are limited, but those available show that the level of 50 PCs per 1,000 inhabitants has been reached in two countries in the Gulf. The lowest rate is found in the Syrian Arab Republic with 0.1/1,000.

Data on Internet users are limited to eleven countries in 1995 and the rate ranges from 0.1 to 2.1 users per 1,000 inhabitants. Internet data in Table 14.4 show a subscriber boom between July and December 1997, with a significant growth by the end of the year. Table 14.4 also compares the number of Internet hosts in the Arab region from January to July 1998. The total numbers almost tripled during this six-month period. In many countries the number decreased, yet in one country, the United Arab Emirates, the number increased dramatically. The total number of Internet users almost doubled in most countries during the six-month period extending from July to December 1997.

In the Arab countries, 98% of the Internet users are men, which is a disturbing figure. Users are evenly split among those who use the Internet at home and those who use it from their place of work.

Table 14.3 → Radio, television, telephone, fax, PC and Internet users in Arab countries, 1995–1997

Country	Radio receivers per 1,000 inhabitants	TV receivers per 1,000 inhabitants	Main telephone lines				Number of PCs per 1,000 inhabitants	Number of Internet users per 1,000 inhabitants	Fax machines per 1,000 inhabitants
			Total telephone lines (thousands)		Per 100 inhabitants				
			1995	1997	1995	1997			
Algeria	238	71	1,176.3	1,400.3	4.21	4.75	3	0	0.2
Bahrain	575	439	140.9	152.3	25.69	24.57	50.3	1.7	10.8
Djibouti	80	73	7.5	1.31	1.33	1.33	na	0.2	0.2
Egypt	312	126	2,716.2	3,452.7	4.7	5.57	na	0.3	na
Iraq	224	74	675	675	3.3	3.28	na	na	na
Jordan	251	175	317.4	402.6	7.3	6.97	8	0.2	7.4
Kuwait	473	373	382.3	411.6	23.15	22.74	56.2	2.1	20.7
Lebanon	891	268	330	460.6	8.2	14.93	12.5	0.6	na
Libya	231	138	318	380	5.88	6.79	na	na	na
Mauritania	150	58	9.3	13.1	0.42	0.55	na	na	0.1
Morocco	226	145	1,158	1,375	4.3	5	1.7	0.1	na
Oman	580	61	169.9	200.6	7.9	8.35	12.7	na	na
Palestine	na	na	na	120	na	4.35	na	na	na
Qatar	438	457	122.7	141.9	22.3	24.94	na	1.8	17.1
Saudia Arabia	291	269	1,719.4	2,285.4	9.58	11.72	na	0.1	na
Somalia	42	13	15	15	0.17	0.15	na	na	na
Sudan	270	86	75	151	0.3	0.54	na	na	0.2
Syria	264	89	969	1,312	6.8	8.78	0.1	na	0.3
Tunisia	200	156	521.7	654.2	5.82	7.02	6.7	0.1	2.8
United Arab Emirates	271	263	672.3	835.1	29.1	35.09	48.4	1.1	10.5
Yemen	43	267	187	220.3	1.35	1.34	na	na	0.1

Sources: UNDP 1998. Human Development Report. ITU 1995. World Telecommunication Development Report. ITU 1997. World Telecommunication Development Report. UNESCO 1997, Statistical Yearbook.

Table 14.4 → Internet subscribers in selected Arab countries, 1997–1998

Country	Number of internet subscribers			Estimated number of actual users		Internet hosts	
	July 1997	Nov. 1997	Dec. 1997	July 1997	Dec. 1997	Jan. 1998	July 1998
	Tunisia	0	1,400	1,750	na	2,993	69
Jordan	4,000	6,000	7,350	11,840	20,213	249	360
Qatar	2,800	5,185	6,289	8,262	17,295	189	23
UAE	15,250	27,000	32,201	45,150	88,552	1,940	13,519
Oman	3,860	6,490	7,595	11,425	20,888	670	666
Kuwait	1,000	14,000	15,400	29,600	42,350	4,057	5,597
Lebanon	12,000	15,000	15,938	35,520	43,828	1,143	1,400
Bahrain & Saudi Arabia	13,000	16,000	16,923	38,408	46,538	375	379
Egypt	12,000	14,500	15,255	35,520	61,021	2,013	2,013
Yemen	920	840	882	na	2,426	10	10
Total	64,830	99,015	110,483	251,254	322,898	10,715	24,024

Sources: Commercenet research center (www.commerce.net); Network wizards (www.nw.com).

Regarding electronic commerce, a survey conducted in 1998 by the magazine *Internet Arab World*, published by Dubai Information Technology, showed that only 4% of users in Arab countries made a purchase through the Internet during the year. Among the factors affecting the penetration of electronic commerce, one can mention the fact that this kind of commerce is relatively new in the region, that it lacks a critical mass of consumers and has to overcome a conservative attitude regarding the security of electronic transactions. However, Arabic software companies expect to generate 33% of their sales through the Internet in the next two or three years. Some observers expect electronic commerce to grow by 100% over the next 12 months.

The fax machine is complementary to the telephone, whether it is used directly on the telephone line or through a PC. Existing levels of penetration range from 0.1 per 1,000 inhabitants to 20.7 per 1,000. As the Internet expands, e-mail may rapidly replace fax since it is more user-friendly and supports multimedia message delivery.

Telecommunication and computer networks

As was seen in Table 14.3, radio, television and telephone are the most widespread communication technologies. The situation is more diversified for broadcasting. Available radio frequencies have reached the saturation point in most Arab countries in the last decade. On the other hand, TV channels and telecommunications have expanded greatly with the creation in 1967 of ARABSAT, the Arab Satellite Communications Organization (www.arab.net/arabsat/contacts.html). The purpose of this enterprise is to invest in and operate the Arab space sector; arrange and secure extended communication of telephone, faxes, telexes, and pictures; arrange radio and TV broadcasting; offer paid consulting services in the area of satellite communication; and encourage Arab industries to invest in satellite communication.

Table 14.5 → ARABSAT use data, 1997

Country	Total minutes of international use (in millions)	Minutes per subscriber	No. of unfulfilled demands
Algeria	79	68	675,716
Bahrain	89	632	0
Djibouti	4	530	3
Egypt	100	37	0
Jordan	72	227	128,978
Kuwait	126	33	0
Lebanon	34	541	0
Libya	47	148	0
Mauritania	5	na	1,472
Morocco	130	123	93,326
Oman	54	318	0
Qatar	76	620	450
Saudia Arabia	537	313	1,262,479
Sudan	na	107	na
Syria	60	65	2,292,282
Tunisia	78	150	129,274
UAE	504	709	1,319
Yemen	23	123	75,306

Source: ARABSAT report to co-ordination committee, 1997.

The first satellite was launched in 1985. The available channels were used by Arab information ministries (broadcasting and TV) as well as telecommunication ministries and in co-ordination with the ground networks. ARABSAT worked as a business organization and was able to finance all successive projects. During this first generation experience it manufactured three satellites and bought two more (in orbit) to meet the increasing demand. Then it launched two second-generation satellites to expand the area covered. The first satellite of the third generation was launched on 27 February 1999 and will cover both the Arab region and Europe.

ARABSAT's activities are expanding all the time. Details of use, according to the 1997 ARABSAT report to the Project Co-ordination Committee, are shown in Table 14.5. The total amount of time spent for international calls ranges from 537 million minutes in Saudi Arabia to 504 million in U.A.E, but it goes down to 4 million in Djibouti and 5 million in Mauritania. The number of minutes of satellite link used by each individual subscriber for international communication

is quite high, at 709 minutes in U.A.E., 632 in Bahrain, and 620 in Qatar. In Egypt and Kuwait, however, the number adds up to less than 40 minutes per subscriber. Unfulfilled demand is quite high: it reaches over 2.2 million minutes in the Syrian Arab Republic and over 1.2 million in Saudi Arabia. According to ARABSAT, these data would seem to encourage additional investment in telecommunication, especially for more optical fibre networks in the Arab countries. As for the cellular mobile telephone, ITU data show the total percentage increase between 1995 and 1997 in Arab countries to be 62.8%, probably due to the privatization of this service. The Egyptian satellite NILESAT was launched in April 1998 to provide digital TV and radio broadcasting, Internet services, and distance education at different levels and in different languages. It covers the Middle East region from Baghdad to Rabat, and parts of southern and northern Europe. Several Arab countries such as Bahrain, Kuwait, Iraq, the Libyan Arab Jamahiriya, Oman, and Tunisia are channel providers.

With respect to computer networks, many organizations are moving away from centralized information systems or local area networks (LANs), a change which often implies the revision of administrative structure. Some large organizations have started thinking of establishing Intranets based on the Transmission Control Protocol/Internet Protocol (TCP/IP).

Heavy demand for telecommunication networking pushed some countries like Egypt to begin privatizing this sector. Public data networks are being enhanced from the X.25 standard to Frame Relay and Asynchronous Transmission Mode (ATM). Internet connectivity uses a variety of methods, whether through satellite links or optical fibre. Total channel capacity to access the Global Internet has reached around 12 Mbps, of which 2.5 Mbps are used by the Egyptian Universities Network. This capacity also serves various governmental sectors, and more than 40 Internet Service Providers (ISPs) are distributed

among 16 governorates. Some of the remote ISPs in upper Egypt use very small aperture terminals (VSATs) for their local connections.

A regional communication network, RITSENET, has been planned by the Egyptian government, but implementation is still in progress. Efforts to link Algeria, Morocco, Tunisia, Mauritania and the Libyan Arab Jamahiriya to the network have begun. Some discussions also are underway about establishing backbone networks at the local, sub-regional, or regional levels in order to offer a more cost-effective means of supplying Internet connectivity.

Government and administration

In most Arab countries, attempts to computerize government offices began during the mid-1980s. Since then, the building of data bases and networks within different departments and local organizations has continued to grow. Because of the non-latin alphabet of the Arab language, fax communication, introduced more than two decades ago, is still widely used despite the spread of e-mail.

The classical applications known as clerical automation and management information systems (MIS) have now matured and include accounting, inventory control, financial information, personnel and planning. The Arab League ICT Regional Arabic Institutes have tried to stimulate these countries' interest in adopting ICT through studies, workshops and conferences organized at the national level.

Geographical Information Systems (GIS) were introduced in Egypt in 1996. The systems were designed with a long-term perspective that would allow progressive implementation and continuous monitoring. Priority was given to environmental applications, infrastructure building, municipal administration, socio-economic studies, and information and mass communication.

With support from the Islamic Bank, efforts are underway to improve productivity and strengthen industrialization in the field of electronics, informatics

and communication, by linking data input, operations research, modelling and implementation. Decision Support Systems (DSS) have been installed in different Arab countries since the mid-1980s. An Egyptian centre for DSS was set up in 1985 and is expanding its activities to include training and other services.

The National Information Centre in the Syrian Arab Republic was established in 1991. It has a comprehensive mandate for developing and managing information systems. It also collects, analyses, processes and stores data with the aim of providing statistical information to researchers and decision-makers in such fields as informatics, politics, economics, law, social, military, and cultural affairs. These services are in addition to promoting awareness and participating in drawing up a draft development plan for the country.

Arabization, however, is a critical factor in developing information systems, but with the increasing investment in ICT and the increase in the number of users, companies are also responding faster. Microsoft introduced an Arabic version of Windows 98 in October 1998 in Dubai, just five months after introduction of the English version. Each year there are also conferences and exhibitions in different Arab countries which address particular issues such as expert systems, modelling, virtual reality, but it is too early to evaluate the results. Finally, the number of businesses in this field is expanding and the number of software companies linked to multi-national firms, or specialized foreign companies in the same sectors, such as GIS or banking, is also increasing. A high percentage of systems are designed and implemented by foreign companies.

With regard to management and administration, many national services in the Arab countries have been automated and are improving: from customs, taxes and licenses, to reservations, check payments and, to some extent, information retrieval. National activities that have direct relation with international facilities such as airports, maritime ports and financial

service cards are the most advanced in this respect since they require only a single node to be linked to a global network. National identification numbers similar to the social security number in western countries will soon facilitate the collection of statistics and improve interactions between government and the population.

Research and education

Within the research community, ICT is becoming an essential tool, particularly with respect to the retrieval of scientific information. Moreover, specialized institutions involved in informatics are being established. In some cases, they participate in supervising the dissemination of scientific knowledge at the national level. In Saudi Arabia, for example, King Abdul Aziz City of Science and Technology is supervising the introduction of Internet connectivity in Saudi Arabia. It has licensed 37 companies to provide Internet access, and 85,000 subscribers are expected by the end of 1999.

In Egypt, the Academy of Scientific Research and Technology is facilitating the access to scientific library material and patent databases. The Egyptian Universities Network is serving Egypt's top-level national administrators. The Information and Decision Support Centre (IDSC) is supervising the introduction of Internet services to the governmental sectors and also licensing Internet access to the private ISPs. The electronic Research Institute in Cairo and the Mubarak City of Science and Technology have established special departments for dealing with Informatics. Similar examples can be found in Algeria, Morocco and Tunisia.

As for university education, the task of coordinating information among Arab institutions is being undertaken by the Union of Arab Universities. Almost all Arab universities are connected to the Internet, although there is not yet an Arab Backbone Network. In some countries, universities are all connected to a single network. For example, Egypt's

twelve universities are linked through the Egyptian Universities Network, together with Al-Azhar and the American University. Since Tunisia, Kuwait and Egypt were the first Arab countries to have Internet connectivity, they have accumulated more experience in using this technology in the university context. Nevertheless, the United Arab Emirates and Lebanon have recently witnessed a sharp increase in Internet penetration.

Many universities already have separate departments for computer engineering and computer science. In some cases, separate colleges for Information and Computer Science have been established. Distance learning is becoming more important as pilot projects are being implemented using ARABSAT and NILESAT.

For precollege education, four types of computer applications can be identified. The first type concerns the introduction of computers at schools to let students, teachers, and administrators grasp the fundamentals of information technology. The second type is the use of computers in a multimedia environment to support the teaching of different subjects and to experiment with new methods of cognitive-based education and learning. The third type is the use of Internet as a means of enhancing collaboration between Arab students and their fellows all over the world, and also to experiment with Web-based education and learning. The fourth type concerns teacher-training and the support of education administrators through the use of videoconferencing networks. For instance, all the regional teacher-training centres in all the governorates of Egypt are linked to the main centre at the Ministry of Education through a videoconferencing network. Prototype multimedia-based educational material is being tested in Saudi Arabia and Egypt.

However, it should be emphasized that computer penetration is still low in Arab countries, and more funding and teacher training are essential. Additional efforts are required to produce educational material in the Arabic language and which reflects the cultural

values of the region. On these issues, see also Chapters 2 and 3.

Printing and publishing

The printed word has had a significant impact on the history of humanity and should continue to do so for many generations to come. Printed products – books, newspapers, magazines, scientific periodicals, dictionaries and encyclopaedias, black and white pictures or coloured images – still represent a basic tool for diffusing information, knowledge, and news.

The interaction between printing and ICT is quite strong. For instance, it is now possible to receive news on-line and in real time from all over the world, to store it, to communicate it worldwide and to make it accessible on demand. Editors and publishers can now revise in parallel with the authoring process, saving precious time. Authors and writers now have at their disposal a number of time-saving tools for retrieving information and data, or to assist them during writing. A great number of journals are accessible on the Internet. A number of encyclopedias and dictionaries are in electronic form, some of them as hand-held devices. ICT paved the ground for remote printing, allowing newspapers, journals, and periodicals to be on time all over the world and in the form required. Libraries are also automated and equipped with CD-ROMs. The era of the electronic library is on the way. All these changes are also taking place in the Arab region. Table 14.6 provides data on magazines and daily newspapers.

The total number of newspaper and magazine titles adds up to 421. The highest figure, 101, comes from Lebanon, and five countries publish over 30 titles each. Morocco has the highest number of daily newspapers at 20, but the highest distribution rate is in Kuwait, with 387 papers per 1,000 inhabitants. There are a number of Arab newspapers published abroad, mainly in the UK and the USA. Most of the Arab countries also import a number of magazines and newspapers from abroad, although their

Table 14.6 → Newspapers and periodicals in Arab countries, 1995–1996

Country	Total number of newspapers and magazines	Daily newspapers			Importation and exportation of newspapers and periodicals (amount in millions of \$)		
		Number of daily newspapers	Circulation		Exports	Imports	Balance
			Total (in thousands)	Distribution of daily newspapers per 1,000 inhabitants			
	1996	1995	1995	1995	1995	1995	1995
Algeria	11	8	1,440	51	1.7	0.9	0.8
Bahrain	7	3	70	126	na	na	na
Djibouti	na	na	–	–	na	na	na
Egypt	53	15	2,373	38	2.4	3.6	(1.2)
Iraq	6	4	530	26	na	na	na
Jordan	12	4	250	47	na	na	na
Kuwait	39	9	655	387	0.3	5.5	(5.2)
Lebanon	101	14	330	110	na	na	na
Libya	4	4	71	13	na	na	na
Mauritania	na	1	1	0.5	na	na	na
Morocco	21	20	630	24	0.3	3.5	(3.3)
Oman	12	4	63	28	0.2	2.1	(1.8)
Palestine	9	na	na	na	na	na	na
Qatar	10	4	80	146	na	na	na
Saudia Arabia	63	12	1,060	58	0.0	0.8	(0.7)
Somalia	na	1	10	1	na	na	na
Sudan	15	5	650	24	na	na	na
Syria	6	8	274	19	na	na	na
Tunisia	15	8	270	30	0.5	6.5	(6.1)
United Arab Emirates	36	8	310	140	na	na	na
Yemen	1	3	230	15	na	na	na

Sources: Egyptian State Information Service; UNESCO, 1998. Statistical Yearbook.

distribution is limited to a small number of cities. There is also a union for distributors of Arab newspapers and an Arab union of journalists, founded in 1964. The latter contributes quite actively to upgrading the profession, through a number of courses and seminars including, lately, the use of modern technology and the Internet.

Arab civilization has been closely linked with the production of books and other printed matter. Historically, its efforts in translation have been instrumental in transmitting the works of ancient writers, and Arab contributions in many fields of knowledge are well known. Today, the publishing situation is different and the basic production is translated from western sources. Most of the textbooks used at university level in certain faculties are in

English or French, even if the original is Russian or Japanese. Table 14.7 on book production shows that in seven countries, the total number of titles published ranges from 293 in the U.A.E. to 3,108 in Egypt.

An important exchange of books is taking place among the Arab countries, including those in the western region. This is facilitated in part by the use of a common language. As for school texts, the data are limited, but surely the primary, preparatory and secondary schools in all Arab countries have their own books in Arabic, except for private schools that have science and mathematics in English or French and, sometimes, in German. The Arab region imports more books than it exports, resulting in a negative balance in this respect. In Arab countries the number of libraries is limited, but many campaigns have been

carried out for their expansion. These programs were first intended for children but are now aimed at a wider audience. An Arab Publishing Union has been established and is quite active in preparing and expanding the presence of Arabic editions in different countries, including participation in book fairs in other regions.

ICT AND ARAB COUNTRIES: GENERAL TRENDS

The Arab region appears to favour the simultaneous promotion of industrialization and communication

technologies. However, there seems to be more focus on ICT. ICT systems are being upgraded at many levels, but this is especially apparent in efforts to increase efficiency and thus improve productivity. Some of the countries, however, are only just now becoming familiar with ICT. Nevertheless, education at all levels is a top priority throughout the region, and computers and modern communication technologies are considered key tools in preparing all countries for the 21st century.

Studies are being conducted to establish optimum ways of using ICT to improve literacy. At

Table 14.7 → Book production in selected Arab countries, 1995

Country	Book production (Number of titles)										
	Total	General	Philosophy	Religion	Social sciences	Philology	Pure sciences	Applied sciences	Arts	Literature	Geog./History
Algeria	323 [94]	22 [94]	21 [94]	9 [94]	97 [94]	4 [94]	42 [94]	14 [94]	10 [94]	72 [94]	32 [94]
Egypt	3,108 [93]	289 [93]	58 [93]	329 [93]	220 [93]	238 [93]	190 [93]	280 [93]	118 [93]	378 [93]	176 [93]
Jordan	465	15	9	74	106	10	19	26	22	128	56
Morocco	940	275	8	58	273	12	9	37	24	134	110
Oman	na	na	na	na	na	na	na	na	na	na	na
Qatar	419	21	5	70	84	36	120	40	5	16	22
Tunisia	569 [94]	18 [94]	26 [94]	11 [94]	130 [94]	4 [94]	9 [94]	39 [94]	11 [94]	286 [94]	27 [94]
United Arab Emirates	293 [93]	na	3 [93]	68 [93]	2 [93]	83 [93]	99 [93]	9 [93]	2 [93]	na	27 [93]

Country	Book production: total number of copies	Production of school textbooks		Importation and exportation of books and pamphlets (in millions of \$)		
		Number of titles	Number of copies	Exports	Imports	Balance
Algeria	na	na	na	na	8	(8)
Egypt	108,042 [93]	735 [93]	41,149 [93]	4.9	10.6	(5.8)
Jordan	na	na	na	15.1	6.7	8.4
Kuwait	na	na	na	0.8	8.5	(7.8)
Morocco	2,861	na	na	1.3	22.6	(21.3)
Oman	na	na	na	0.2	3.4	(3.2)
Qatar	na	259	na	na	na	na
Tunisia	na	49 [94]	na	1.5	12.9	(11.5)
United Arab Emirates	5,117 [93]	na	na	na	na	na

Source: UNESCO, 1998, Statistical Yearbook.

the strategic level of management, the focus is now on decision-making methodology to make better use of the tools already available. Below the strategic level, some organizations are studying the newly introduced data warehousing platforms, together with some data mining techniques that sometimes use expert-system methodologies. There is also an urgent need to support the creation of public information systems and to make them accessible to the general public. The launching of the last ARABSAT satellite will greatly contribute to the improvement of telecommunication, broadcasting and access to information. Local wireless loop services may be developed as a complement. The satellite will also facilitate broadcasting news about events of common interest to Arab and Islamic countries, whether conferences, cultural events, or sports. NILESAT-2 is also expected to be launched at the end of 1999. Finally, an internal expansion of telephone subscribers is taking place in most countries of the region.

FUTURE PROSPECTS

In spite of globalization, it is generally acknowledged that governments and their associated institutions have a key role to play in formulating and implementing ICT strategies. There are fundamental and complex issues that have to be addressed, and the benefits that some countries have obtained from this successful experience should be considered. Increasingly, ICTs are an integral part of the overall national strategy and this interdependence between them both is a precondition for their common success. Arab countries rank ICTs as a high priority within their development objectives. They are seen as an essential element in education, communication, and technology transfer. The strategic plans have to become more systematic in order to develop integrated information systems that would support greater co-operation between enterprises at different levels across the country. But in order to achieve positive results and increase efficiency, the quality of the data, their

definition, and the agencies responsible for their collection and validation must also improve. Network technologies are to be applied not only for data and information, but across the board. Some of the programmes for ICT at the European Union could be used as a model for the Arab countries. The type of co-operation that is already taking place for broadcasting should be extended.

ICT is making radical changes in teaching and learning in higher education, both on campus and in distance education. The Open University is just starting in the Arab region, but provides a model that should help modernize other sectors and promote continuous learning.

Electronic commerce is new in the region and consumer resistance can be overcome gradually with appropriate information campaigns. The integration of ICT into the different activities will help ensure a positive outcome.

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