

ECONOMIC AND SOCIAL COMMISSION FOR WESTERN ASIA (ESCWA)

**NATIONAL PROFILE OF THE INFORMATION SOCIETY
IN YEMEN**

United Nations

Distr.
GENERAL

August 2007
ORIGINAL: ARABIC

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Introduction

Information technology is considered nowadays an efficient tool serving the progress and development of countries, and today's primary, irreplaceable means of achieving the required development. The ICT sector has become a golden opportunity for all countries around the world, particularly developing countries, to achieve development and build an efficient economic sector.

Given the remarkable disparity between countries and societies in terms of dealing with IT -disparity mostly due to discrepancy in economic, social and development conditions- several countries made over the last few years improvements to serve their societies, sustain their economy and reach unprecedented levels of development performance. While seeking to benefit from ICT opportunities, thus adopting practical trends and steps, these countries established national ICT policies, strategies and work plans and considered them the main component of global development elements and objectives. In the mean time, developing countries and less developed countries showed several fields of interest and made efforts to help their societies benefit from the new potential of ICT. They therefore developed new interests and became seriously intent on benefiting from ICT to develop their societies, especially within the new trends and the outcome of the WSIS¹ held in Geneva in 2003 and Tunisia in 2005, and to seize the available chances and opportunities allowing them to enhance their capacities and consequently contribute to the world information society.

Like other less developed countries, the Republic of Yemen is seeking to develop this vital sector to sustain its development process. In fact, the last couple of years saw many changes and steps aimed at establishing an information society. Yemen achieved tangible results in this field and especially in developing policies and plans, adapting infrastructure components and electronic applications, and human capacity building.

The following parts of the present report describe the major aspects of the Information Society in Yemen. They represent an overview of several progress elements and indicators of achieving the Yemeni information society.

¹ Website: www.wsis.org

I. THE ROLE OF THE GOVERNMENT AND ALL STAKEHOLDERS

A. NATIONAL INFORMATION SOCIETY POLICIES AND E-STRATEGIES

Yemen's efforts towards building an Information Society can be summarized as follows:

- The National Information Centre (NIC) was established (during the second half of 1995) as an institution that will a pioneering role in elaborating, suggesting and following-up on the implementation of information development policies (applications – information content). Even though the NIC's inception was a major step in the Yemeni government's information strategy, the Centre still faced at the beginning several impediments and complications represented mostly by the fact that the information sector was quite recent, and that Yemen's socio-economic conditions limited the Centre's ability to assume its national comprehensive duties. This situation persisted until 2000 when the Centre developed the institutional information framework. Practical steps followed to set up the main structure of information on the national level and to adopt several information infrastructure projects (Yemen's National Information Strategy, the National Information Network, the Information Institute). Later on, several projects were adopted (Society Service Centres, Yemen's e-library ...), in addition to many other tasks and activities, namely publishing data and information and allowing access thereto for citizens and institutions;
- In 2001, the NIC collaborated with different private and public institutions, and adopted a national initiative on the National Information Policy and Strategy and sectoral strategies. A National High Commission was established (upon the Prime Minister's decision, based on the Center's suggestion) to elaborate sector-related policies and strategies. The Center conducted the first field survey for Yemen's information situation in 2001. Currently, documents pertaining to national information policies and strategies are being completed in cooperation with the ESCWA. These documents represent the executive framework of the National Information Strategy at the sectoral level, and will be submitted in 2007 to the Cabinet for adoption². As for setting up the electronic work environment, the NIC completed technical and economic feasibility studies to establish the National Information Network (project adopted by the Center), a project provided for in the five-year socio-economic development plan in Yemen³.
- The 2003 Government established the Ministry of Telecommunication and Information Technology. It was entrusted with IT management (technical aspect), in addition to the development and organization of communication policies. Based on the ministry's suggestion to adopt "the Communication and Information Technology strategy", the government adopted the strategy as part of the National Strategy for Sustaining Integrated Development Plans in Yemen (2001-2005) and concentrated on offering and facilitating ICT services. In 2005, the Ministry launched the National IT Program Initiative (E-government)⁴;
- The Central Statistics Department, affiliated to the Ministry of Planning and International Cooperation, adopted a national strategy on statistical work. It is one of the fundamental steps to collect data on ICT indicators;
- As a continuation of the goals established in the second Socio-economic Development Plan (2001-2005), the third Socio-economic Development Plan adopted several policies and measures aimed at developing

² Website: <http://www.yemen-nic.net/contents/Informatics>

³ The Second Five-Year Socio-economic Development Plan (2001-2005), the Third Socio-economic Development Plan for Poverty Reduction (2006-2010), Ministry of Planning and International Cooperation, government of Yemen.

⁴ Information and Communication Technology in Yemen, Ministry of Communication and Information Technology, November 2005, p.39, 63.

the ICT sector towards building an information society. These major policies include⁵:

- Restructuring ICT institutions to accompany development and establishing a plan for the privatization of communications;
- Responding to the increasing demand of economic sectors and citizens for communication services, providing a full service and increasing its availability to accompany demographic and economic growth, along with introducing modern services resulting from rapid technical development;
- Providing modern ICT installations within an integrated digital network for fixed and mobile telephone lines as a basis to provide local and international services abiding by international standards, and increasing network coverage of these services;
- Taking care of rural areas by replacing traditional systems with wireless fixed telephony systems and digital transmission systems and enlarging the infrastructure to cover secluded and isolated villages and re-using ground stations in other remote areas;
- Reviewing communication tariffs, reducing international call charges to make them in line with the average per capita income and encouraging citizens to use communication and information;
- Encouraging private investments in ICT, encouraging competition between service providers and operators especially Internet service providers;
- Developing external linkage access points to provide transmission capacities that facilitate telephone and information communications and finding larger and multiple access points to absorb the rapidly increasing development of the global network;
- Enacting a law on information management and freedom of exchange, and preparing regulations and data organizing information management in government institutions;
- Reinforcing the NIC's institutional structure, establishing and developing information infrastructure, keeping up with the developments in this sector, and encouraging government entities to establish information units, use information systems as well as sector and subsidiary networks, and develop mechanisms and means of interaction;
- Coordinating information projects within NIC plans to achieve efficient distribution of financial resources and guarantee the efficient use of these projects. Establishing national information standards that include equipment, systems and software;
- Developing human capacities and skills in the information sector, including on the social level, and raising awareness on information and its importance in developing the national economy and facilitating its regional and international integration. Reinforcing regional and international cooperation between Yemen and the rest of the world in the information field.

B. PUBLIC/PRIVATE PARTNERSHIP (PPP) OR MULTI-SECTOR PARTNERSHIP (MSP)

Yemen is working on establishing new forms of partnership based on integration between different categories of stakeholders from the public and private sectors. The private sector is considered an efficient partner in preparing and planning information society strategies. The latter, as well as draft strategies (under preparation) include clear measures defining the private sector's participation and role in implementing them. In fact, the private sector has long been an efficient participant in the communications sector. In 2000⁶, its

⁵ Third Socio-economic Development Plan for Poverty Reduction (2006-2010), Ministry of Planning and International Cooperation, Republic of Yemen, August 2006, p. 115, 162.

⁶ Website: www.sabafon.com

role grew after granting two private companies concessions to operate the mobile phone network, i.e. Sabafon and Sabatel currently working under the name of MTN⁷. A third company was licensed by the end of 2005 to operate the GSM system. In July 2007, the name of this company was announced (Ynet) and it entered the market in 2007. Yemen Mobile, a fourth company, has been working since 2004 as a mobile phone operator (with CDMA technology). It was established under the sponsorship of Yemen's Public Telecommunications Corporation and its shares were on the exchange in 2006. Yemen's private sector is considered a major partner in offering communication services to several communities, and covering wide surfaces. It operates telecommunication service centers and Internet Cafes. The government is striving to encourage the private sector to establish specialized training and rehabilitation centers in the field of IT, which crossed the 100 mark at the beginning of 2007.

Cabinet decision number 16 of 2000 on granting licenses to ISPs represents a step in the right direction, aimed at expanding the private sector's participation in providing and improving the quality of this service. However, this decision has not yet been implemented.

C. ROLE OF NON-GOVERNMENTAL ORGANIZATION

The contribution of NGOs and CSOs in creating the appropriate environment for change towards the information society is still minimal. In fact, a limited number (no more than 10 organizations) is adequately active in this field for the time being. Nevertheless, the socio-economic development plan relies mostly on the role of these organizations to build an information society and still considers them in their formation stages.

D. PROGRESS TOWARDS FULFILLMENT OF NATIONAL POLICIES AND STRATEGIES

As a result of measures taken to establish policies and strategies for the creation of the information society in Yemen, the delay in adopting certain policies and strategies and their deficient global aspect also delayed implementation based on a clear vision. This is why the adopted or announced initiatives are stammering. This reality slowed down several initiatives such as the initiative on the national information technology program, i.e. e-government. Moreover, discussions over national policies and strategies, with the participation of different governmental and private sector institutions and the resulting common understating, consensus and common culture on policies and strategies, are considered a fundamental aspect that sustains development towards building the information society.

II. ICT INFRASTRUCTURE

A. INFRASTRUCTURE

Official interest in information gained ground in Yemen during the last decade of the 20th century. The NIC was established and entrusted with building and managing an integrated national information system. As an official institution in charge of information and service development on the state level, and with the participation of several parties from the public and private sectors, the Center helped raise social awareness on ICT issues. Several institutions established their own information centers and units and started using modern ways to manage information work and prepare the basic and institutional features of this activity.

The Ministry of Telecommunication and Information Technology and Yemen's Public Telecommunications Corporation developed the communications sector and widened the scope of its activities.

The information and communications sector in Yemen is witnessing a rapid expansion as the size and

⁷ Website: www.mtn.com/mtn.group.investor/profile/yemen.asp

quality of private sector investments developed in the information and communications sector (mobile phone services and the increasing number of telecommunications centers, internet cafes, and software companies, etc...).

Telephony capacity

Fixed telephone lines density increased from 4.1 lines per 100 inhabitants in 2004, to 4.6 lines per 100 inhabitants in 2006. In fact, this increase was due to the expansion of fixed telephone line services, at a cost of roughly USD 60 per line, in addition to the decrease in telephony service fees and telephone call tariffs during official holidays and vacations. The Ministry of Telecommunication and Information Technology is pursuing the implementation of a project to add one million fixed phone lines to the service.

As for rural calls, rural communication services (via fixed telephone networks) are still relatively low. Therefore, Yemen's Public Telecommunications Corporation used rural analog communication systems and established new locations for rural communications by inaugurating wireless fixed telephony systems. This contributed to a slight improvement in the rural communication service indicators.

Despite the efforts, reality proves that Yemen is still among the countries that benefit little from communication services as it faces several challenges and obstacles:⁸

- The country's difficult topography;
- Scattered population groups and low density;
- Weak infrastructure services;
- Low level of distribution networks in the cities as well as in rural areas.

Table 1. Telephone Communications Indicators (urban and rural) during 2003-2005⁹

Indicator/Years	2003	2004	2005
Urban Calls			
Overall capacity of communication networks	1505192	1564349	1575169
Equipped capacity (line)	1161041	1243838	1275782
Population	19131977	19721631	20305269
Telephone density (telephone/100 inhabitants)	3.5	4.1	4.4
Vacant lines (line)	476157	445702	376930
Number of operational telephone lines (line)	684884	898136	901385
Increase in operational telephone lines (line)	142680	113252	103249
Number of major centrals (number)	47	52	54
Number of subsidiary centrals (numbers)	208	222	223
Rural Calls¹⁰			
Equipped capacity (line)	101344	128385	240245
Operational lines (line)	62593	96027	124921
Proportion of operational lines to equipped capacities (%)	62	75	52

⁸ Quarterly bulletin on Economic News, Ministry of Planning and International Cooperation, p.19.

⁹ Central Statistics Department, National Information Center, 2005.

¹⁰ Quarterly Economic News Bulletin, op. cit. Annual Economic Report, 2006, Ministry of Planning and International Cooperation

Internet services

Internet services started in 1996 in Yemen with one single provider (Yemen International Telecommunications Company) “TeleYemen”, a joint venture between Cable and Wireless Plc. (51%) and Yemen’s government (49%). This company’s full ownership was transferred to the Yemeni government, represented by the Public Telecommunications Corporation affiliated to the Ministry of Telecommunication and Information Technology by the end of 2003. In April 2002, Yemen’s Public Telecommunications Corporation started working as a second Internet service provider. This is why Yemen’s Public Telecommunications Corporation and Yemen’s International Telecommunications Company (owned by the Corporation) monopolized the service.

Yemen has been connected to the outside world since 1995 via a fiber optic network and a 226 Km long deep-sea cable that reaches Djibouti, where it is connected to a number of Arab countries, to Southeast Asia and Europe. At present, work is still underway to connect Yemen to Oman via a 700 Km long fiber optics network.

Since 1996, Dial-up has been the available means of connecting users to the Internet in Yemen. In 2001, ISDN network communications service was introduced at a speed of 64 KB/s then at a speed of 128 KB/s. In early 2005, ADSL network communication started at a speed of 512 KB/s. However, the high cost of the ADSL service prevented optimized exploitation and the number of subscribers did not exceed 2,781 until the second half of 2006. Leased Line services are available at present at a speed ranging between 64KB/s and 2MB/s.

Towards the end of December 2006, the Ministry of Telecommunication launched WIFI services, thus allowing Internet service subscribers to have wireless access to the network through hot points in 17 locations in Sana’a and Aden.

Mobile phone services

Between 2004-2006, Yemen improved its mobile communication services as the number of mobile telephone subscribers jumped from 1.483 million in 2004 to 3.201 million in 2006. Competition between private sector companies operating in this field led to the expansion of mobile telephone service coverage to include all governorates, diversified services, competition in service prices and therefore increased public demand on services.

Table 2. Internet and Mobile Phone Indicators in Yemen¹¹

Indicator/Years	2004	2005	2006
Overall Internet subscribers (subscriber)	74615	109127	158476
Overall Internet subscribers (per 100 inhabitants)	0.38	0.54	0.76
Internet users (User)	221000	330000	450000
Overall number of Mobile phone subscribers	1483233	2277553	3201796
Mobile phone subscribers per 100 inhabitants	75	11.2	15.3
Number of computers in the Republic (computer)	210000	270000	330000
Computer dissemination density (one device per 100 inhabitants)	1.1	1.3	1.6

¹¹ National Information Center and the Ministry of Communication and Information Technology.

B. INVESTMENTS IN ICT INFRASTRUCTURE AND DEVELOPMENT OF NEW SERVICES

Investments play a major role in technology transfer and settlement. In Yemen, the flow of foreign investments remains limited and far from reaching the desired level. In fact, most international companies are active in the oil sector (oil and gas), hence their limited impact on the operational aspects, trade, and opportunities in the Yemeni economy. Moreover, they play a modest role in transferring and installing modern technology, and expanding innovation opportunities. Among the current investments in ICT are the investments of Yemen's Public Telecommunications Corporation (PTC) which aims at widening the fiber optics network to link major and secondary cities through an 8600 Km long communication network with a capacity matching the demand for the 5 coming years. At present, PTC is working on finishing Yemen's fiber optics connection with Oman via a 700 Km long network, at a cost of 1.5 million Yemeni Riyals.

The Yemeni government was planning on developing the infrastructure by executing many of the 5-year plan's major projects, among which is the National Information Network project developed by the NIC in coordination with several parties. However, steps executed so far have been strictly preliminary, including technical and economic feasibility studies, in addition to some field surveys, preliminary installations of the network portal, and primary installations to link several government bodies. The government funded these steps through periodic public budget allocations, as it has thus far been unable to benefit from foreign funds for this project as well as other information infrastructure projects.

C. ICT CONNECTIVITY

The number of fixed telephony service subscribers jumped from 346,000 subscribers in 2000 to 901,000 by the end of 2005, at an increase rate of more than 150%. Therefore, the expansion rate of fixed telephony services increased from 1.9% to 4.4%. Equipped capacities jumped from 459,000 public telephone lines in 2000 to 1,276,000 telephone lines by the end of 2005. The number of central offices grew from 118 to 223. By mid 2005, the number of public telephone service centers reached about 8,845 centers in most governorates, and operational lines reached 53,070 phone lines at an average of six lines per center.

Rural communication lines increased from 8,000 lines in 2000 to 125,000 by the end of 2005. Rural communication stations reached 773 in 2005, including fiber optic cabins. Rural areas coverage increased from 449 stations in 2000 to 1,100 stations in 2005. Equipped telephone capacities in the rural communications network jumped from 13,450 lines in 2000 to 240,000 and 245 telephone lines by the end of 2005.

The mobile telephone service-to-inhabitants ratio increased from 15% in 2000 to 15.3% in 2006.

International communication services also expanded in 2004, and the global capacity of the International Communications Organization reached 3,812 phone channels distributed as follows: satellite systems (1414 channels), sea cables (655 channels) and fiber optics (1743 channels).

These developments coincided with an increase in Yemen's number of computers from 36,600 devices in 2000 to 330,000 devices in 2006. The computers-to-inhabitants ratio increased from 0.2% in 2000 to 1.6% by the end of 2006. The rate of computer literacy among inhabitants reached 2.7% in 2005.

The number of Internet service subscribers reached 7,000 in 2000 with one sole provider. As Yemen's Public Telecommunications Corporation became the second service provider, the number of service subscribers over the last years increased from 74,615 in 2004 to 158,476 by the end of 2006 at a rate of 0.76 subscriptions for every 100 inhabitants. Internet users jumped from 24,000 in 2000 to 221,00 in 2004, and over 450,000 users in 2006 at a 2.2% expansion rate of Internet services for every 100 inhabitants. The number of Internet Cafes in most Yemeni cities reached 836 cafes in 2006.

D. ICT EQUIPMENT AND SERVICES

Between 2000 and 2005, Yemen's Public Telecommunications Corporation increased fiber cables span at a rate of 78%, reaching 1 Km between major and peripheral cities. Currently, the network coverage rate is at 85% of all governorates. This increased coverage is helping provide telephone mobility and a multi-rings data transmission network, along with audio-text services.

Yemen's Public Telecommunications Corporation (TeleYemen) provides several services such as:

- Direct international connection for telephone and fax;
- Phone booths for international call services with prepaid cards;
- International phone calls through local and foreign phone operators;
- ISDN international service as well as Internet and related services;
- Data transmission services via telephone lines and mobile satellites;
- International telephone and fax services by means of mobile satellites;
- International television and radio broadcasting services.
- In 2002, Yemen Post started offering e-Riyal services, consisting of various prepaid cards sold to beneficiaries who can activate their accounts online and settle their financial and commercial obligations (electricity, water and telephone bills);
- Internet sites hosted by local providers reached 286 until the second half of 2005. They are distributed as follows: 61 governmental sites, 17 news agencies sites, 29 for organizations and embassies, 36 for travel and tourism, 101 for private companies, 23 for education, 9 for banks and insurance companies and 10 for forums and services;
- The number of public internet cafes increased from 50 cafes in 2000 to 836 in 2006 in most governorates at an average of 6 internet screens per café;
- Until the second half of 2005¹², 50 bodies were connected to channels rented for internet use with an overall 275 nexus point, 35% of which were governmental and 65% private.

E. INTERNET GOVERNANCE

The Ministry of Telecommunication represented by the state-owned Public Telecommunications Corporation currently operates Internet services. In the absence of a private service provider, Yemen's Public Telecommunications Corporation provides services and manages Internet use. The Yemeni government does not prohibit public use of the Internet, but it restricts access to several socially disrupting foreign sites. In any case, usage policies are often dictated by the estimates and concerns of service subscribers or the material published on the network from within Yemen.

F. TRADITIONAL MEDIA

Traditional media's current contribution to raising information awareness is not enough to transform Yemen into an information society. Written media pays little attention to raising awareness on information society and does not publish weekly articles or papers on IT, its benefits and uses; and IT-related magazines and periodic publications are scarce. There are two TV channels in Yemen, the satellite channel in Sana'a and the channel in Aden. The number of radio broadcast hours for eight radio stations (out of ten) was 29,732 hours in 2005. Nevertheless, audiovisual media does not dedicate more than 8.9% of the total number of broadcasting hours to raising awareness on scientific, educational and cultural topics.

¹² General Telecom Institute. Website: <http://www.gti.edu.ye/arabic/index.php>

Table 3. Annual transmission hours for cultural and scientific development programs for 2005¹³

Programs	TV channels and radio stations	
	Number of hours	Percentage
Cultural and artistic development - cultural entertainment	13,448,36	27.06%
Scientific and educational development - cultural and scientific information	4,415,27	8.88%

III. ACCESS TO INFORMATION AND KNOWLEDGE

A. PUBLIC DOMAIN INFORMATION

Both individuals and institutions are increasingly using the Internet for information purposes. Several ministries and institutions publish their data on their own website and issue written reports and news bulletins on government and institutional performance. These activities are part of public domain activities. The National Information Center provides information services to researchers, stakeholders, investors, and students. It collects information from different sources including public sector institutions, re-organizes, stores and provides the incoming information to beneficiaries based on information requests. Even though the Center provides free services, it offers multiple services such as web publications, and replies to information requests (communicated by means of telephone, fax, post and e-mail). The Center also provides services by means of specialized departments and units in charge of receiving beneficiaries and responding to their needs in Sana'a and other governorates' capitals.

Recently, following the President's directive, the government started providing all information regarding public tenders, and publishing it on the NIC website, with regular updates.

B. ACCESS TO INFORMATION AND PUBLIC INFORMATION

Citizens can access information on governmental websites. Internet Cafes are among the best access points for obtaining information published on the websites of Yemeni institutions or on the Internet in general.

Many Yemeni institutions have their own websites. However, only a few have enough high-quality data and consistent updates on their website.

Even though the Ministry of Telecommunication and Information Technology reduced communication tariffs, these charges remain high compared to the revenue per capita, which is considered low, which is why the poor, the disadvantaged and the rural population cannot access information.

C. MULTI-PURPOSE COMMUNITY PUBLIC ACCESS POINTS

Internet cafes and communication centers represent major access points available to all citizens. The number of public Internet cafes reached 836 by the end of 2006 in all governorates at an average of six internet screens in every cafe. The number of communication centers is estimated at more than 8,845 centers in most governorates. Nevertheless, communication centers are numbered in rural areas, where citizens have little chance to access the network.

On the other hand, access services provided by the NIC headquarters grew to include one unit specialized in public domain information access and another one based at Sana'a University. These two units were created in collaboration with the World Bank. The NIC has operated three affiliated coordination

¹³ Central Statistics Department, 2005.

offices in governorates to facilitate service delivery to citizens. Several major Yemeni governorates, in coordination with the Center, started working on establishing information centers at the governorate level (the first stage included four governorates). This step is an encouraging start as it paves the way for the establishment of community access centers, especially that the third five-year socio-economic development plan (2006-2010) adopted a project to open 14 information centers for local community services the cities and rural areas of certain governorates, as well as to create 60 information units in institutions and governorates and link them to the NIC. These centers and units will help provide information services and enhance citizens' access to their different sources in governorates and rural areas. According to the evaluation report on the outcomes of the 2006 plan (which was prepared by the NIC, acting as project supervisor), the implementation was postponed due to insufficient funds.

D. USING DIFFERENT SOFTWARE MODELS

Yemen's public and private institutions, ministries, the NIC, the Central Organization for Control and Audit (COCA), and the Central Statistics Department, use different types of software such as free and open source software and commercial software. The absence of unified standards in these institutions leads to incompatibility between the systems and applications as well as to a weak integration. Therefore, there is hardly any chance of using them together when providing integral electronic services.

E. FREE AND OPEN ACCESS TO SCIENTIFIC KNOWLEDGE

Internet users in Yemen can freely access scientific sites and e-libraries, particularly those available free of charge. However, problems nowadays lie in the ability to access scientific subscription-based websites, especially that access to scientific knowledge takes place via external websites since local websites offering such scientific services are scarce. Moreover, few Yemeni institutions, including educational institutions, haven subscriptions that give them access to websites specializing in scientific information. And yet, such subscriptions are often available to a limited number of staff members.

IV. ICT CAPACITY BUILDING

A. BASIC LITERACY

Yemen is exerting huge efforts to fight illiteracy. During the last years, the number of people joining literacy centers amounted to 124,875 for the years 2004-2005¹⁴. This phenomenon was coupled with an increase in the number of education and training centers for men and women. Nevertheless, basic literacy (capacity to read and write) remains high and affects more than 5.5 million citizens in the 15+ age category. Females represent more than 67.1% of the total number of illiterates. The high rates of illiteracy are concentrated in rural areas. Illiteracy rates increased due to weak services in rural areas, non-implementation and inefficiency of compulsory basic education, widespread poverty (especially in rural communities) and limited financial allocations for literacy programs¹⁵.

B. ICT IN EDUCATION AND TRAINING

Yemen joined the fast-track initiative to develop education, which was launched by the World Bank in 2004¹⁶. Internet was introduced in 50% of schools and there are currently 250 computer-equipped schools. Several public and private university faculties are currently teaching ICT majors (telecommunication engineering, computer and software engineering, information science). However, the adopted curricula are not sufficiently updated to accompany subsequent developments. Yemen adopted the National Strategy of Basic Education (2003-2015), as well as the National Strategy for Technical Education and Vocational

¹⁴ Education indicators, 2004-2005, High Council of Education Planning, p.90.

¹⁵ Part of the High Council of Education Planning report was published on the website www.almotamar.net/news/37275.htm.

¹⁶ The Third Socio-economic Development Plan for Poverty Reduction (2006-2010), op. cit., p.479.

Training (2005-2014) in addition to the National Strategy for the Development of Higher Education (2006-2010). Most of these strategies hope to achieve major goals related to integrating IT in the different phases of education.

C. TRAINING PROGRAMMES FOR CAPACITY BUILDING IN THE USE OF ICT

Several Yemeni institutions contribute to the development of the necessary human resources in order to sustain ICT expansion. In fact, the Ministry of Telecommunication and Information Technology created a center for the promotion of innovation in order to develop and transform creative ICT ideas into IT production and industry projects. The NIC also worked on establishing an IT institute to conduct annual programs for the training and rehabilitation of the Center's staff, along with the staff of institutions and government bodies in the field of information and its applications. Also, the National Institute for Administrative Sciences and the General Telecom Institute organize training programs for public servants in ICT. Moreover, development centers affiliated to several universities such as Sana'a and Aden universities offer special training and rehabilitation programs for government institutions staff members. The private sector plays its part in the development of human resources by using several IT training and rehabilitation centers spread throughout Yemeni governorates.

D. RESEARCH AND DEVELOPMENT

Decree number 2 of 2002 recommended the establishment of the High Council for Scientific Research. Universities law number 18 of year 1995 stipulated that knowledge shall be developed by means of scientific research in the different fields of knowledge. Still, Yemen lacks a clear research and development ICT plan.

V. BUILDING CONFIDENCE AND SECURITY IN THE USE OF ICTS

A. USE OF ELECTRONIC TRANSACTIONS AND DOCUMENTS

Despite Yemeni institutions' interest in introducing computer networks, which amount to 253 in different sectors¹⁷, integrated online services and applications are still operated to facilitate work and activities by using electronic means through networks¹⁸ and electronic exchange between institutions.

B. ONLINE TRANSACTION SECURITY

So far, Yemen has no legislations governing and securing electronic transactions.

C. COUNTERING MISUSE OF ICTS

So far, there are no legislations to organize the use and counter the misuse of IT.

D. PRIVACY & DATA PROTECTION

Information security levels and measures are decreasing as the use of primary and simple means of data and information protection and insurance prevails¹⁹, due to the nascence of IT. Therefore, legal organization of this field is still in its infancy.

¹⁷ Evaluation of the current ICT reality in the Republic of Yemen, NIC, p.44.

¹⁸ E-government "Yemen's particularities and methodology for achieving ambition", paper submitted to Yemen's Shoura council meetings, NIC, June 2005, p.27.

¹⁹ E-government, Yemen's particularities, op. cit., p.30.

E. INFORMATION SECURITY AND NETWORK SECURITY

Yemeni institutions, which have been able to build and operate information networks, are using several protection and firewall systems and software in addition to varying levels of systems and procedures granting access to and enabling use of these network resources. The security level of these networks and information differs from one institution to another.

VI. ENABLING ENVIRONMENT

A. SECURE STORAGE AND ARCHIVAL

In spite of the relative weakness of information infrastructure due to the absence of automated information systems and modern means of storage, documentation law number 12 of year 2002, and the relevant regulations passed by virtue of the President's decision number 7 of year 2005, represent a step towards enforcing and laying the foundations for the protection of national documents and clarifying legal rules pertaining to their storage. The NIC is on the right track to create a primary environment in charge of protecting electronic storage and archiving means.

B. DOMAIN NAME MANAGEMENT

So far, Yemen has no unified reference to manage domain names and no effort is made in this direction.

C. STANDARDIZATION IN ICT

Standardization is considered a major function that has not garnered enough attention from concerned parties be they the NIC or the Ministry of Telecommunication and Information Technology.

D. ICT SECTOR

ICT sector in Yemen is composed of several institutions undertaking supervision-related IT activities, among which is the NIC as it is in charge of building a National Information System (information content and management systems, as well as access, publishing and sharing applications) and contributing to the development of the computer skills of institutions' personnel. The Ministry of Telecommunication and Information Technology is in charge of the communication and material infrastructure. The Central Statistics Department handles the data and statistics of the entire country. Moreover, there are public institutions assuming different roles such as public education institutions (e.g. Ministry of Education, Ministry of Technical Education and Vocational Training, Ministry of Higher Education), which are in charge of human cadres in ICT sectors. There are other parties representing the institutional basis of ICT in Yemen: information centers and units in different sectors, research, studies and documentation centers, public and specialized libraries, printing houses, scientific and information associations and training and rehabilitation institutions.

The diversity of institutions participating in this sector is a positive indicator of the sector's participatory infrastructure. However, at present, there is yet to be a vision, clear roles, responsibilities and specialization limits, as old legislations persist and remain unrevised.

E. SUPPORTING MEASURES

The legislative and legal context of ICT in Yemen is not favorable to the activation of the role of the sector. So far, the Communications Law in force since 1991 has not been updated except for a few amendments introduced in 1996. The law governing information management, freedom of exchange and access to sources is yet to be enacted; it is under preparation and represents the basis for adopting online transaction legislations. As for regulatory and procedural frameworks pertaining to information activity,

laws, rules, regulations or any regulating criteria have a very limited and narrow scope. This situation negatively affects the role of institutions and the nature of their duties and contributions to the development of the information sector in Yemen. In general, the available legislations are limited to the following:

- Communications law, published in 1991 and amended in 1996;
- Statistics law number 28 of year 1995;
- Documents law number 21 of year 2002;
- Intellectual Property law number 19 of year 1994;
- Republican decision number 155 of year 1995 and its relevant amendments providing for the establishment and organization of the NIC.

VII. ICT APPLICATIONS

Several Yemeni institutions were able to introduce automation systems and information networks, including: HR system, biological imprint at the Ministry of Civil Service; accounting and financial system at the Ministry of Finance; financial analysis, loan management and assistance system, and foreign transfers system at the Central Bank; information management and content digitization system including several data rules at NIC; ESCODA system at the Ministry of Interior, department of customs, civil status, and passports; and voters' information system at the High Commission of Public Elections. Other systems and applications are implemented at the Ministry of Planning and International Cooperation, the Ministry of Technical Education and Vocational Training, PTC, COCA, Central Statistics Department, etc.

The number of information networks used at institutions reached almost 253 LAN networks²⁰. The national information portal network implemented by the NIC in partnership with several parties is among the major applications soon to be operated. The portal network will link government services through one network system that allows the exchange of electronic data and information and provides citizens with online services.

A. E-GOVERNMENT²¹

In 2003, the e-government initiative was announced and its website was launched. However, the initiative was derailed in the absence of a change-inducing environment, as most bodies and institutions were beneath the expected levels of introducing and using computerized systems and applications. Moreover, most of the available information systems lack technical compatibility, which negatively affects networking.

B. E-BUSINESS

Given the nascence of information applications in Yemen and in the absence of regulating legislations, e-commerce is almost inexistent in spite of bank websites and the use of small-scale electronic payment systems. According to the IT reality survey conducted by the NIC and updated in 2005, e-commerce accounts for only 5.12%²² of the total internet services provided.

²⁰ The Third Socio-economic Development Plan for Poverty Reduction (2006-2010), op. cit., p.161.

²¹ E-government "Yemen's particularities and methodology for achieving ambition", op. cit., pp 16, 17, 18.

²² Evaluation of the current ICT reality in the Republic of Yemen, op. cit.

C. E-LEARNING

E-learning is quite limited in Yemen. The General Telecom Institute in cooperation with Jordan Telecom is providing long-distance learning and several educational institutions offer ICDL tests online. Yemen boasts a branch of the Cisco Academy (<http://www.yca.edu.ye/cisco.aspx>). Internet services were introduced in 50% of schools; 250 schools are now equipped with computers. Several university faculties, especially the ones specialized in ICT, are providing their students with access to the Internet and educational sources. A three-phase e-learning pilot project is being tested²³ in collaboration with the USA. The first phase of the project aims at establishing a learning network of 24 colleges in Yemen in three steps during which main connectivity issues are reinforced, internet chapters are renovated and equipped, and teachers and students are trained to using computers and the Internet. These schools will be linked to e-learning sources in the region and the USA. There are no other e-learning applications.

D. E-HEALTH

Even though health institutions have several websites, in addition to the website of the Ministry of Public Health and Population, there is little medical information published and no other online services are provided.

E. E-EMPLOYMENT

At present, there is no e-employment. The Ministry of Civil Service and Insurance uses computer devices when favoring candidates vying for public functions in addition to other HR management systems. Several private companies post vacancies on their websites but employment procedures are not completed electronically.

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

A. USE OF ICT IN SUPPORT OF CULTURAL AND LINGUISTIC DIVERSITY

Yemen is regarded as one of the richest Arab countries when it comes to history and cultural information. However, IT is not sufficiently exploited or used to publish Yemeni cultural and historic information on websites, which at present do not exceed 400²⁴. Some of these sites offer historic and cultural information that does not exceed more than 8% of the overall published material. Arabic is used in 80% of published material; the remaining percentage is in foreign languages (English then French).

B. LOCAL AND NATIONAL DIGITAL CONTENT DEVELOPMENT

The recent automation tendencies of Yemeni institutions have contributed to the development of their digital content, which has led to the creation of new content on their websites. This is one of the main tendencies being promoted by local authorities in governorates. In fact, Hadramout governorate succeeded in adapting almost all its work flow to web applications and facilitating citizens' access to the local council's activities. The governorate is also sharing its experience online with other governorates.

At a larger level, the NIC is mainly responsible for the development and expansion of the information content in Yemen, making it thus available to beneficiaries such as decision makers, investors, interested parties, researchers, public and private institutions and stakeholders. The Center is currently compiling information and reports from several sources including various public institutions. The Center is in charge of studying, analyzing, producing, digitizing, reorganizing and archiving incoming information via automated

²³ WSIS report, report, October 2005, <http://www.itu.int/wsisis/docs2/tunis/off/5-ar.doc>

²⁴ Evaluation of the current ICT reality in the Republic of Yemen, op. cit., p.11/

and specialized systems, then presenting it to the beneficiary audience on websites, or through other services provided. Yemeni legislations and laws, republican decisions, cabinet decisions and orders, university studies and research, development performance indicators, government tenders and bids, information management, sector-related information (17 sectors) are among the specialized information systems currently used to manage and organize information and digital content at the Center. Also, the Center has a wide range of information and an internal e-library containing more than 4,000 electronic books in various fields.

C. ARABIC DOMAIN NAME SYSTEM – ADNS

So far, Yemen does not have a unified reference for domain name management. And with no steps being taken in this direction, there does not seem to be an interest in managing Arabic domain names at this point.

D. ICT TOOLS, AND R&D PROGRAMMES

With respect to ICT research and development, the Ministry of Telecommunication and Information Technology launched in 2002 the first stage of ICT city, including a production and program development center created to provide the Yemeni market with IT development requirements.

IX. MEDIA

A. MEDIA INDEPENDENCE AND PLURALISM

The Yemeni media is diverse and includes audiovisual and written media. Radio and television are state-owned, whereas newspapers are classified according to their founding bodies²⁵: public newspapers, factional newspapers, local or independent newspapers, public organizations, ministries and CSO newspapers. Several public and factional newspapers publish information on their own local or foreign server websites, while news and media sites and portals are created and supervised by media institutions, or are affiliated to political parties and organizations in the government or in the opposition.

B. THE MEDIA AND ITS ROLE IN THE INFORMATION SOCIETY

The audiovisual media (television and radio) dedicates 8.9% of the total broadcasting hours to scientific, educational and cultural programs. Awareness through the written media is slightly better. Nevertheless, the various media do not play their expected role in raising awareness on a Yemeni information society. Studies and statistics show a weakness in technological means and qualified and trained human cadres in charge of communication. According to a study conducted²⁶ by the Ministry of Information, the number of computers available in public media institutions did not exceed 243 devices. The overall number of network servers available for the media is 26. They connect the media to some information networks, most of which are local. There is a huge shortage in qualified human cadres in the media. The percentage of qualified cadres is 3.2% of the overall number of media personnel.

C. GENDER PORTRAYAL IN THE MEDIA

The Yemeni media covers women and gender topics in general. And yet, the current coverage is below the desired level.

²⁵ Freedom of Information and Access to Information from the Perspective of the Civil Society, Dr. Ali Al Braihy, Media and Communications instructor at the Information Faculty in Sana'a University, p. 8-9.

²⁶ Freedom of information and access to information, op. cit., p. 5.

X. INTERNATIONAL AND REGIONAL COOPERATION

A. FINANCING OF ICT NETWORKS AND SERVICES

The Yemeni government is planning to develop an ICT infrastructure by implementing several related projects provided for in the five-year socio-economic development plan (2006-2010). It has already financed preliminary activities using limited public budget allocations. Therefore, the ability to execute infrastructural projects is linked to Yemen's thus far limited opportunities to engage in international and regional cooperation. The need for international funding of institutional and strategic projects carried out would help Yemen's transformation into an information society.

B. INFRASTRUCTURE DEVELOPMENT PROJECTS

Proposed or underway infrastructure development projects include:

- President's project to spread computers;
- Social services centers project;
- Yemeni e-library project;
- Geographic information systems project;
- Yemen-Oman fiber optics regional network project;
- Yemen-Djibouti sea fiber optic cable system project;
- Smart network project.

In preparation for the electronic work environment, Yemen prepared, in cooperation with consultancy companies, technical and economic feasibility studies to establish the national information network, which is one of the primary projects adopted in the five-year socio economic development plan, in addition to other projects such as Yemen's universities information network.

Within the MEA partnership initiative, Yemen is currently implementing a three-phase e-learning pilot project, the first part of which aims at establishing an education network between 24 schools in Yemen²⁷, in cooperation with the USA.

C. REGIONAL PLAN OF ACTION (RPOA)

At present, final reviews are underway to complete policy and strategy documents in cooperation with ESCWA. These documents include the National Information Policy, the National Information Strategy and its executive framework with respect to sectors. These revisions will fit these policies and strategies into the regional Work Plan for the creation of an Information Society and thus for the achievement of a clear methodology for building an Information Society in Yemen.

XI. MILLENNIUM DEVELOPMENT GOALS – MDG

A. PROGRESS TOWARD ACHIEVING THE MDG

The third five-year plan (2006-2010) in Yemen is based on the 2015 Millennium Development Goals. Temporary and specific goals were defined along with the MDGs. Progress toward achieving MDGs in Yemen is shown in table 4.

²⁷ WSIS evaluation, Report, October 2005, <http://www.itu.int/wsisis/docs2/tunis/off/5-ar.doc>.

Table 4. Progress toward achieving MDGs in Yemen²⁸

MDG Goal	Indicator	Indicator value (%)	Year
Eradicate Extreme Hunger and Poverty	General poverty	35.5	2005
	Poverty	5.0	2005
	Population living under food poverty line	14.5	2005
	Poverty gap ratio	11.3	2005
Achieve Universal Primary Education	Gross enrollment rate in basic education for both sexes	64.3	2005
	Gross enrollment rate in basic education for males	73.1	2005
	Gross enrollment rate in basic education for females	53.9	2005
Promote Gender Equality and Empower Women	Ratio of female to male in basic education	42.8	2005
	Ratio of female to male in secondary education	30.9	2005
	Ratio of female to male in higher education	28	2005
	Percentage of women in Parliament	0.33	2005
Reduce Child Mortality	Under-five mortality rate per 1000 live births	102	2005
	Proportion of infants dying before reaching one year of age per 1000 live births	75	2005
	Proportion of 1-year-old children immunized against measles	76	2005
Improve Maternal Health	Death on delivery per 1000 live births	366	2005
	Proportion of deliveries under supervision of qualified healthcare personnel in 2003	27	2005
Combat HIV/AIDS, Malaria and other diseases	Rate of immunization against the 6 diseases	80	2005
	Malaria	9.6	2005
	Number of persons affected by HIV/AIDS in society	1662	2005
	Tuberculosis cases per 1000 inhabitants	16.1	2004
Ensure Environmental Sustainability	Urban population continuously accessing suitable source of drinking water	73.7	2004
	Rural population continuously accessing suitable source of drinking water	27.9	2004
	Rate of urban agglomeration population connected with sanitation networks	82.8	2004
Develop a Global Partnership for Development	Number of fixed and mobile phone lines per 100 inhabitants in 2005	10.7	2005
	Number of computer devices used per 100 inhabitants in 2006	1.6	2006
	Number of internet users per 100 inhabitants in 2006	2.2	2006

B. USE OF ICT FOR ACHIEVING THE MDGs²⁹

In 2003, the Yemeni government, in coordination with the World Food Programme surveyed cartography and information system in Yemen to inquire about food security³⁰. The third five-year plan (2006-2010) established several ICT projects to execute the MDGs, including shedding light on the role of

²⁸ Statistics and percentages are based on “the Third Socio-economic Development Plan (2006-2010), and the book of communications and Information Technology in Yemen”.

²⁹ Source: Oman Digital Society report 2007, p31

³⁰ The Third Socio-economic Development Plan (2006-2010), op. cit., p.77.

ICT in serving human development, reinforcing its use in rural development, poverty alleviation, education and health, etc.

C. ICT FIELD PROJECTS AIMING AT ACHIEVING MDGS

Yemen started planning field ICT projects in order to implement MDGs. However, institutions and relevant parties do not have a clear vision regarding some of these projects. Moreover, the lack of funding is among the main challenges to implementation.

XII. WORLD SUMMIT ON THE INFORMATION SOCIETY - WSIS

A. FOLLOW-UP AND EVALUATION

The lack of coordination between information and communications institutions delayed the adoption of a clear mechanism on follow up, coordination and integration between institutional activities in this sector and the rest of Yemen's institutions in different sectors. This situation was aggravated by the absence of legislations and regulations governing institutional relations in the sector. Measures that are currently being studied and that determine responsibilities, roles, integration mechanism, and coordination between the Ministry of Telecommunication and Information Technology and NIC, will put Yemen on the right track to establishing an Information Society, which will reinforce cooperation for the purpose of follow-up and evaluation.

B. INITIATIVES AND PROJECTS

Planned initiatives and projects are essential for the achievement and execution of Geneva's work plan. The government³¹ intends, through the third five-year plan (2006-2010), to increase equipped capacities of fixed telephone lines to 1.5 million lines and operational lines to 1,242,000 lines so that telephone density increases to 54 per 1000 inhabitants. The plan also aims at doubling mobile lines to 4,280 lines i.e. 183 per 1000 inhabitants by implementing policies to rehabilitate communication institutions and drafting a communications privatization plan. These initiatives are being taken to keep up with developments and to meet the growing demand of economic sectors and citizens for communication services in addition to serving rural areas by replacing traditional systems with wireless fixed telephony systems and digital transmission systems.

C. SUCCESS STORIES

Several Yemeni institutions were able to introduce automation and information network systems such as HR system, biological imprint system, accounting and financial information system, financial analysis and loans and assistance management, information management system, digitization of the information content and customs, voters' information system as well as other automation projects.

As part of the Yemeni institutions' recent shift towards automation, the Hadramout governorate succeeded in adapting almost all its work flow to web applications and facilitating citizen's access to the local council's activities. The governorate is also sharing its experience online with other governorates.

The NIC's new website <http://www.yemen-nic.net>, which was launched in late 2006, is regarded as one of Yemen's largest sites specialized in providing digital content related to a variety of fields. This successful experience in Yemen is a continuation of previous efforts (deployed by Yemen as represented by the Center) to build, prepare, enlarge, develop and update a national information database to serve information seekers, using a system of multiple means and ways, which allow the public to acquire the necessary information.

³¹ The Third Socio-economic Development Plan (2006-2010), op. cit., p.125.

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