ECONOMIC AND SOCIAL COMMISSION FOR WESTERN ASIA

PROFILE OF THE INFORMATION SOCIETY IN THE ARAB REPUBLIC OF EGYPT

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INTRODUCTION

Egypt declared its national project for technological renaissance. It was stressed that the next national project would be to establish a technological basis on the land of Egypt confirming importance of the studies necessary for the formulation and execution of this project. Within this framework several instructions were issued.[1]

(a) The importance of integrating the technological system in Egypt no matter the number of sectors and authorities undertaking it;

(b) Scientific planning to build large technological institutions in the age of scientific technological blocks;

(c) Putting into consideration that the aim is to improve quality of Egyptian products;

(d) Raising the productivity of workers and technicians to improve worldwide goodwill and reduce production costs;

(e) That industrial technological development aims at increasing exports and Egypt obtains a fair proportion on the international arena and achieve improvement in the balance of payments;

(f) That the target would be to achieve increase in industrial production together with a continuous increase in chances of labor.

The establishment of a new Egyptian ministry of communications and information technology in October 1999, was the first scientific step towards the execution of the national project for technological renaissance to achieve the Egyptian information society, ran together with finishing the studies which took place by international expertise establishments and businessmen associations concerned with the communications and information sector which recommended speeding up the execution of a national communications and information plan.[2] The Ministry adopted this trend as it put the project of the national plan for communications and information in December 1999 aiming at interpreting the national project for technological renaissance into a concrete reality by preparing and carrying out several ambitious projects.

The national plan for communications and information in Egypt aims at achieving the following:[3]

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[1] Dr. Abdel-Moneim Bilal et al, "Communications and Information in Egypt: Present and Future until 2020", Academic Bookshop, January 2003.

[2] Dr. Mohammed Gamal El-Din Darwish, "Planning for Information society", Academic Bookshop, January 2001.

[3] Ministry of Communications and Information Technology, "The National Communications and Information Plan", December 1999.

(a)   Encouraging and developing communications and information industry in order to establish an advanced industry depending on the thought and minds of Egyptian youth and occupying an advanced place among Egyptian exports;

(b)   Building the information society able to go with and contain the tremendous flow of advanced information and knowledge and making better use thereof;

(c)   Availing and developing communications and information systems to serve the national issues concerned with reforming and developing Egyptian economy and raising the standard of living of the citizen and family;

(d)   Supplying the necessary cadres for the communications and information sectors;

To work towards the information society the following national priorities were put:

i.   Increasing local demand on the use of communications and information technology in the different state sectors;

ii.   Developing human resources in the field of communications and information and their different usages;

iii.   Modernizing the communications infrastructure in Egypt;

iv.   Increasing Egyptian exports in the field of communications and information technology, orientation to international markets and holding alliances with international industries in this field;

v.   Making the suitable legislative environment to be directed towards information society.

I. POLICIES AND STRATEGIES

A. AXES OF THE NATIONAL PLAN FOR COMMUNICATIONS AND INFORMATION

The Egyptian national communications and information plan includes the following axes:

(a)   *Axis One*: Increasing national demand for information technology and their use;

(b)   *Axis Two*: Heading to international markets to have a share of international demand;

(c)   *Axis Three*: Developing human resources;

(d)   *Axis Four*: Holding alliances with international industries;

(e)   *Axis Five*: Modernization of the communication infrastructure;

(f)   *Axis Six*: Making the suitable legislative environment for the industry booming.

1. *Axis One: Increasing the national demand for information technology and their use*

The local market represents the first point of attraction to build advanced industry for communications and information technology. Government demand represents a large proportion of the local market. Building the Egyptian information society requires offering several national and sector projects in ministries, organizations and governorates to achieve information systems, databases and communications networks and their adjoined services such as training, consultations, technical support and their affiliated industries of computers, communications equipments and software production.

2. *Axis Two: Heading to international markets to have a share of international demand*

This takes place through:
(a)   Establishing the organization to develop software exports;
(b)   Establishing technological incubators;
(c)   E-business and E-commerce;
(d)   Establishing information industry groupings.

3. *Axis Three: Developing human resources*

This includes:

(a)   Availing the specialized cadres necessary for developing communications and information industry

The plan aims at qualifying 5000 individual annually with increasing individual productivity from $ 10000 to $ 40000 annually to achieve an increase in the volume of industry to reach $ 500 million in 2002.

(b)   Qualifying the youth and children to enter into the information era

It is necessary to cooperate with the Ministry of Youth and Social Development Fund in expanding the establishment of information technology training centers for the youth at a rate of 200 new center every year and continuing in establishing XXI Century Children Clubs at a rate of 100 centers a year in cooperation with the Ministry of Education and local associations.

(c) Raising community awareness of communications and information technology

4. *Axis Four: Holding alliances with international industries*

By making fixed establishments such as production centers, engineering and design centers and training centers. These centers create work opportunities for graduates. They also contribute to technology and know-how transfer and raising the quality standards for local industry.

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5. *Axis Five: Modernization of communication infrastructure*

The plan aims at establishing the most modern communications network for information transfer in and outside Egypt and linking it with world countries. This goes hand in hand with liberalization of the communications industry through developing and modernizing the Egyptian Communications Company (Telecom Egypt) and activating the role of the Communications Coordination Organization in supporting the industry, preventing monopoly and monitoring services quality and developing the tariff of local and international calls.

6. *Axis Six: Making the suitable legislative environment for the industry booming*

The industry of communications and information technology is linked to a number of organizing legislations that protect the innovator, the producer and the marketer. Among the most important of these legislations is the law of protecting intellectual property rights and the measures guaranteeing its efficient execution to protect software manufacturers. To complete the legislative image in front of investors and businessmen a comprehensive information law resolution and a communications law resolution should be prepared to go with the on-going development and liberalization of the activities and services.

B. PROJECTS OF THE NATIONAL PLAN

The plan includes the following projects:

1. *Projects of Developing the Communications and Information Industry*

Projects of developing the communications and information industry included the following projects:

(a) Developing Egyptian software exports;

(b) Establishing zones and incubators for communications and information technology;

(c) Encouraging partnership with international companies;

(d) Making the legislative environment suitable for developing communications and information industry;

(e) Providing the investment environment;

(f) Developing communications and information applied researches.

2. *Projects of Human Development Plan*

Projects of human development plan included the following projects:

(a) Specialized training for postgraduates;

(b) Establishing information technology training centers for youth;

(c) Establishing 21st century child clubs;

(d) Establishing community centers for communications and information services;

(e) Training the youth abroad on advanced technology;

(f) Information technology training for government employees;

(g) Developing the content of university education of communications and information technology.

Naturally, human resources development projects will provide communications and information job opportunities for high and medium skilled labors. This appears from the foreseen expectations shown in Table 1.

TABLE 1. EXPECTED NUMBER OF JOB OPPORTUNITIES

Year	High skilled labor (Programmers, designers & trainers)	Medium skilled labor (Data entry, information specialists)
1999	5000	20000
2000	10000	40000
2001	15000	80000
2002	20000	120000
2003	25000	180000
2004	30000	240000
2005	36000	360000
2006	42000	390000
2007	50000	430000
2008	60000	500000
2009	70000	580000

Source: Ministry of Communications and Information technology "National Plan for Communications and Information", December 1999

3. Projects of Communications Infrastructure

Projects of communications and information infrastructure included the following:

(a) Integrated project for developing the communications network.
(b) Developing the performance of Communications Coordination Authority.
(c) Integrated framework for communications services and tariff.

4. Projects of information structure and increasing national demand

(a) National projects supervised by the Ministry

The national projects supervised by the Ministry included the following:

i. National ID Number;
ii. Material registry projects;

iii. Information network for the services;
iv. E- commerce;
v. Establishing national projects technical support and follow up unit;
vi. Developing national mail authority;
vii. National project for registration of civilization and natural tradition;

(b) Sector projects supervised by the ministry and different ministries

The sector projects supervised by the Ministry of communication and information technology included the following:

(a) Ministry of Education;
(b) Ministry of Interior;
(c) Ministry of Health;
(d) Ministry of Justice;
(e) Ministry of Tourism;
(f) Ministry of Local Administration;
(g) Ministry of Finance;
(h) Ministry of Higher Education and Scientific Research.

The Ministry of Communications and Information technology is currently renovating the national plan of communications and information in Egypt through the Egyptian information society initiative including seven basic axes, namely:

(a) Digital preparation dealing with development and renovation of the communications network in the field of fixed and mobile phones;

(b) E-government aiming at supplying services to citizens and investors in their locations with speed and ease through the Internet;

(c) E-business aiming at transformation of the Egyptian community into an information society to go with the international development and reach the era technology;

(d) E-learning aiming at spreading knowledge and information using electronic technological means through the Internet. Also computer literacy among school students within five years;

(e) Developing health services using information technology to raise the efficiency of presenting therapeutic services and telemedicine especially in distant areas;

(f) E-documentation of civilization and nature tradition through building integrated information systems to make local and international presentation of Egyptian civilization;

(g) Developing technological industries through raising the quality level of Egyptian companies and raising their international ability for competition.

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II. LEGAL AND LEGISLATIVE FRAMEWORK

In order for Egypt to make optimum use of communications and information technology in order to reach the digital and the information society, the state is issuing a set of legislations and policies helping Egypt to reach the digital community. Most important of these legislations are:

A. COMMUNICATIONS LAW[4]

Recently the Egyptian government prepared an integrated law for communications that was sanctioned by the Egyptian People's Council (The Parliament) in February 2003. The new communications law aims at liberalizing the communications sector in Egypt and transparency in the different fields of communications. The Law also lays down the organization needed by the different communications services and encouraging investments in this vital sector.

B. NATIONAL AUTHORITY FOR COMMUNICATIONS REGULATION

The new Egyptian law of Communications included establishing a national authority to manage the communications utility. This is called "Telecommunication Regulatory Authority " being a legal person, subordinate to the Minister of Communications and Information technology, located in Cairo and may establish branches all over the Arab Republic of Egypt.

The Authority aims at coordinating the communications utility through application of the policy decided to develop and spread communications services of all kinds going with the development of communications technology and guaranteeing all individual and state demands of all sectors: service, production, economic and administrative with communications services at the most appropriate prices, with encouraging investment in this sector on non-monopolizing bases under free and open competition among the best national and international expertise. This aims especially at:

(a) Guaranteeing the application of state plans to supply all kinds of communications services to satisfy the needs and desires of benefactors in all areas of the Republic and areas of economic and urban expansion. This includes urban, rural and distant areas equally;

(b) Protecting the aims and interests of national security and the sovereignty rights of the state;

(c) Guaranteeing optimum use of wireless frequency range to maximize revenue thereof;

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[4] Ministry of Communications and Information Technology, "Communications Law in Egypt", 2003.

(d) Confirming obligation with international treaties and resolutions issued by international and local organizations concerning communications and sanctioned by the state.

The Authority undertakes the specializations necessary to achieve its goals. It may especially do the following:

(a) Working towards going with technical and technological progress in the field of communications;

(b) Issuing licenses for the companies to work in the field of communications and follow up of their activity and supervising them, and also putting the rules guaranteeing healthy competition among them. A licensing decree is to be issued by the Authority board;

(c) Monitoring verification of technical and economic efficiency levels of all communications services;

(d) Verifying the cost of the different services in the field of communications to guarantee reaching suitable prices and authorization of the prices of these services;

(e) Determining the due revenue for using the frequency range;

(f) Supervising communications teaching institutes which qualify for obtaining international telephone and telegraph certificates;

(g) Issuing equipment licenses;

(h) Putting the plan of using the frequency range, reviewing and amending it whenever necessary;

(i) Putting the plan for national numbering of communications and supervising the execution thereof;

(j) Issuing a periodical bulletin determining the services that need licensing and those that need not.

C. INFORMATION TECHNOLOGY INDUSTRY DEVELOPMENT AUTHORITY[5]

The Egyptian government prepared a draft law on establishing the Information Technology Industry Development Authority. The Egyptian People's Assembly is expected to approve it in June 2003. The Organization aims at:

(a) Developing and enhancing information technology industry on the national level;

(b) Working towards transfer and use of advanced information technology;

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[5] Draft law to establish Information Technology Industry Development Authority presented by the Ministry of Communications and Information technology, 2002.

(c) Increasing the chance for exporting Egyptian advanced information technology products;

(d) Helping development and growth of companies working in the field of information technology;

(e) Coordination and care for information technology industry;

(f) Care for the common interests of the information technology sector and its representation before the specialized bodies;

(g) Developing investment in the field of information technology industry.

The Authority carries out all the capacities necessary to achieve its aims and it is exclusively concerned with the following:

(a) Putting the work rules to guarantee respect of career traditions which should be respected by personnel in the information technology sector;

(b) Undertaking training works and giving the necessary technical consultations to raise the standard of the companies and their appraisal in the technical aspects in the field of information technology;

(c) Putting the systems and rules of e-business and authorization of the different technical and financial operations concerned with issuing the necessary licenses and guarantees;

(d) Keeping and registration of original copies of programs and systems presented by producing companies or individuals to maintain the intellectual property rights;

(e) Giving practice licenses to organizations and companies in the field of authorizing and presenting services of electronic signature and any other activities in the   field   of e-business and information technology stipulated by the organizing laws;

(f) Studying all questions and complaints from information technology community;

(g) Availing technical consultation to solve disputes among the parties concerned with the activity in the field of information technology;

(h) Keeping communications channels with foreign companies to activate partnership with Egyptian organizations and companies;

(i) Publishing studies and researches in the field of information technology;

(j) Holding exhibitions, conferences and seminars specialized in the field of information technology;

(k) Working towards marketing Egyptian products in the field of information technology on the international level;

(l) Activating the distinguished technological areas, technological incubators and training centers in the field of information technology;

(m) Cooperation with Arab and international organizations and companies working towards developing information technology industry.

D. LAW OF INTELLECTUAL PROPERTY

The Egyptian government prepared a law for intellectual property to protect intellectual property rights, which include several articles among which are:

(a) Copyright;
(b) Invention patents;
(c) Trademarks;
(d) Industrial designs;
(e) Commercial secrets;

In order to fight against software piracy, the Egyptian government signed two agreements with Microsoft Company:

(a) The first agreement, between the Ministry of Higher education and State Ministry for Scientific Research on one hand and Microsoft Company on the other, is to avail the use of Microsoft software at low prices for staff members and students in the different universities and institutes as well as centers and units of scientific research;

(b) The second agreement avails supplying government bodies with the different Microsoft programs.

The Egyptian government also signed two similar agreements with the international company Oracle.

E. ELECTRONIC SIGNATURE LAW

To encourage and support the use of e-business and e-commerce within the framework of the national plan for communications and information, there is a dire need for a law organizing e-signature allowing the use of e-media so as to guarantee the rights of all dealing bodies and at the same time guaranteeing legality of the Labor Law. The Central Bank and the Ministries of Interior, Finance, Communications and Information technology made a committee formed of representatives of the Ministry of Justice, Information and Decision Support Center of the Cabinet in addition to experts from the Universities and Private Sector. The committee made the draft law of e-signature. Issuing the Law in its final form is underway.

III. ICT INFRASTRUCTURE[6]

A. COMMUNICATIONS TECHNOLOGY

1. *Local and International Service*[7]

The automatic services started in Egypt in 1929 with the first automatic rotary electro mechanic telephone exchange in Auto Building in Ramses. Then followed the installation of the electro-mechanic telephone exchanges with crossbar and electronic switches. Then, the electronic exchanges have developed and the digital exchanges appeared all over the world. As a result of the clarity of its advantages in comparison with all other types whether technically or economically; Telecom Egypt, which is the company concerned with communications sector in Egypt, had to go with this development by installing digital telephone exchanges. The first of these was in 1987 with a capacity of 40,000 lines in Talaat Harb exchange, Down Town. Moreover, there had been a contract to build a new factory for the modern digital electronic telephone exchanges in the 6th of October City in corporation with Telecom Egypt, the Egyptian Company for Telephone Equipments Industry and the Egyptian-German Siemens Company for the production of automatic telephone exchanges with a capacity ranging between 200,000 and 300,000 lines annually and with a total capital of 36 millions Egyptian Pound.

The international Service began by an international manual exchange and some wireless circuits. Then this service has developed to become automatic in 1981 with the installation of a similar electronic telephone exchange, then an electronic digital telephone exchange in Cairo in 1987. An electronic digital telephone exchange was established in Alexandria to go with the increasing movement in the beginning of the year 1990. The correspondent connection with the whole world takes place via the four marine co-axial cables heading to South East Asia and France passing through the Arab Republic of Egypt, a cable to Greece, one to Italy and another to Lebanon. In addition to the INTELSAT stations directed to the satellite in the Atlantic Ocean, the satellite in the Indian Ocean, and the marine ship station ARABSAT. In addition to connection with the Arab East via a microwave connection mid-Sinai to Aqaba in the Kingdom of Jordan with primary capacity 300 channels that could be increased to 960 channels. Optical fibers cable has been made out to connect South East Asia, India, Pakistan, Gulf Countries, Kingdom of Saudi Arabia, Arab Republic of Egypt, Italy then France.

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[6] Dr. Mohammed Gamal El-Din Darwish, "Egypt and the Information Society", West Asia Preparatory Conference of the Summit of the Information Society. ESCWA, Beirut, 4-6 February 2003.

[7] Dr. Abdel-Moneim Bilal, "Communications Services in the Arab republic of Egypt". A study presented to the United Nations Economic and social Committee for West Asia (ESCWA), August, 2000.

Furthermore, the car wireless subscribers service has been developed by installing an electronic digital telephone exchange with a capacity of 300 lines covering Cairo, Alexandria and the whole Lower Egypt until El Alamein, Port Fouad, and Suez. The distance from Luxor and Aswan has been covered by the tourism service.

Egypt cared for the development of the Communications Utility and putting policies of communications matching the international development. In order to carry out this, the Presidential Decree was issued in April 1998 to establish a regulating association of Wire and Wireless Communications Utility in the A. R. E. subordinate to the Minister of Transportation and Communications to organize the communications sector via Telecom Egypt (The former National Organization for Communications). It is to have a managing board of directors headed by the Minister of Communications and Information technology.

The Authority implements the policy decided to develop and publish the different types of communications services in accordance with the international technological development, satisfying citizens needs and several sectors of state: social, economic, administrative and services with the most suitable prices and encouraging investment on non-monopolist bases under open and free competition among international and national experiences.

2. *The Egyptian National Network For Information Transfer (EGYPTNET)*

The national network for information transfer has been established to face different needs in private and public sectors especially the commercial and industrial institutions. The national network for information transfer began by using the system of protocols X.25 in 1990. Recently the speed of the national network has been developed to work using Frame Relay System in compliance with the increasing demands on high speeds to transfer data. The network points covers most of Egypt's governorates where there is 44 sites for the network with speeds reaching up to 2 Mbps.

3. *Mobile Phone*

Working with the mobile phone system G.S.M 900 started in cooperation with the French company Alcatel and Telecom-Egypt to cover Greater Cairo, Alexandria, Ismailia, Luxor, Aswan, Sharm El Sheikh, Hurghada and the Cairo-Alexandria, and Cairo-Ismailia Desert Roads. The mobile phone introduces other services in addition to voice services, faxing, connecting to the World Wide Web, e-mail, accounting and caller ID. It has waiting service, data collecting: news, climate, plane timetables, etc... Also there is roaming system and agreement was made with Saudi Arabia, Bahrain, U.A.E., Germany, U.K. and the rest of European and Asian countries in order to use this service.

In 1998, this whole system has been completely privatized through 2 consortiums (MOBINIL and MISRPHONE recently Vodaphone) among specialized foreign companies.

In the U.S.A, France, U.K., local investment and private sector companies. These companies cover all parts of Egypt under a free competitive system. Recently, the number of users of the mobile phones in Egypt has exceeded 4 millions subscribers covering all governorates of Egypt.

4. Public Phones

To facilitate making use of the greatest amount possible for the automatic service at the Telecom Egypt for the citizens any time and in any place, coin phones that have been installed in all parts of the Republic of all their 3 varieties (International, automatic distant and local calls). The total number of cabins currently available reaches about 45000 cabins.

Table 2 shows development of communications sector in Egypt from 1981 till 2002.

5. Internet

In 1993, the Internet was introduced into Egypt through the Egyptian Universities Network in the Supreme Council of Universities with a capacity of 64 Kbps. After that comes Information and Decision Support Center in the Cabinet and many private companies. The total capacity of the Internet currently reaches 895 Mbps and the number of users 2,3 million. Furthermore, the Internet covers all Egypt and free Internet was introduced to Egypt since the beginning of 2002 to encourage the use of Internet at all levels.

TABLE 2. THE DEVELOPMENT OF COMMUNICATIONS SECTOR IN EGYPT

Item		1981	1999	2002	Times of multiplication
Local and International Service					
Telephone Lines	Line	510000	640000	990000	20
Number of Subscribers	Subscriber	418000	490000	743000	18
Telephone density	%	1,0	7.6	11.0	11
Amount of the distance & Mobile	Million minutes	53	2867	7796	147
International working telephone circuits	Circuits	160	6130	11528	72
Auto-connection countries	Countries	29	234	234	8
Direct international services subscribers	Subscribers	571	129618	157678	276
Amount of international telephone communications	Million minutes	28	689	1038	37
Wireless call services subscribers	Subscribers	--	27755	22705	--
National information network subscribers	Subscribers	--	1910	2547	--
Remote areas subscribers	Subscribers	--	919	1978	--
ISDN subscribers	Subscribers	--	50	9766	--

TABLE 2 *(continued)*

Item		1981	1999	2002	Times of multiplication
ADSL subscribers	Subscribers	--	--	447	--
Mobile phones services					
Wireless car telephone subscribers	Subscribers	400	6937	4867	12
Mobinil company subscribers	Subscribers	--	408021	2256641	--
Misrphone company subscribers	Subscribers	--	245993	1886570	--
Iridium service subscribers	Subscribers	--	172	204	--
Public phones services					
Telecom Egypt cabins	Cabins	250	5181	4855	19
Menatel company cabins	Cabins	--	4624	27631	--
Nile communications company cabins	Cabins	--	3500	13000	--

Source: Telecom Egypt, December 2002.

It is remarkable that the number of telephone lines and subscribers have been multiplied about 20 times and telephone density has been multiplied 11 times from 1981 to year 2002. The total number of mobile service subscribers multiplied more than six times from 1999 to 2002 and the number of public telephone cabins also multiplied more than three times from 1999 to 2002.

B. INFORMATION TECHNOLOGY

1. *Egyptian software industry*[8]

Software industry in Egypt is considered relatively modern. This industry is characterized by having high-intensity skilled labor and high organizing capabilities, where information and knowledge are the most obvious items of competition. Among characteristics of software industry is that a package of computer programs may cost few thousand dollars, while the cost of storage medium containing these programs may not exceed few dollars. In 1998, Egyptian software production is estimated at 392.29 million pounds, i.e. about $ 113.7 million, of which 29.2% is exported to Arab countries, Europe, U.S.A. and the Far East. The number of professionals working in this industry is estimated at about 5700 individuals (programmers and developers — technicians — administrators — secretaries). There are about 80 registered companies with capital of about 118.3 million pounds, ($ 34.3 million).

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[8] Academy of Scientific Research and Technology. "Study of Developing Electronic Industries in Egypt and suggesting the projects to be established to achieve renaissance in electronics industry", June 2000.

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The most important activities done by the Egyptian software companies are about 23 activities, the most important of which are financial systems, administrating systems, geographical information systems, multimedia systems, and Arabization programs.

The data concerning software international competition is incomplete. This is due to the multiplicity of sources, including the available governmental statistics, directory of working companies and published articles, and directories of new industrial cities. It is worthy to mention that the Central Agency for Public Mobilization and Statistics, which is the official organization responsible for all state data in all sectors, did not issue any integrated data about software industry and companies working in this field.

The skilled individual is the main production item needed at software industry provided that it is supported by the suitable organizing capabilities and capital that would accept taking the risk. Education system is the main provider of technicians available for Egyptian software industry. Until recently, the number of graduates in computers at Egyptian universities or those who have knowledge on computer science and applications was limited. About one thousand individuals have B. Sc., M. Sc. and Ph. D. at computer science. Every year an additional 200 individuals are trained on computer applications for a duration not more than nine months. This encouraged the Ministry of Higher Education to expand establishing new departments, colleges, and institutions of computer science and applications, in order to increase the base supplying software industry with its needs. Moreover, the Ministry of Education headed to teaching the use of computers at schools in order to break the psychological barrier concerned with their use. The cost of individual item is one of the relative advantages of software industry provided in Egypt in which the average salary of worker at software zone is third what is received by same worker in U.S.A., and half what is received by similar worker in India and Israel.

There is no doubt that conditions of demand are considered among the most obvious characteristics of competition at services industry generally, and software industry in particular. Some countries are considered more capable of establishing specific industries because of their local requirements. Despite the relative limitation of local requirement of software, the important thing is the growing rate of requirement. The increase in teaching computer through the different grades of education and the fast drop in computer prices help increasing the number of computer owners. So, the base of programs requirement expands. Gradual increase in local requirement may encourage companies to concentrate on the local market, while rapid fulfillment of this demand often leads companies to search for exporting markets. In addition to this, expansion in privatization processes led to the increase in demand on the use of computes in administrative and technical operations in private sector companies. This is because they are more capable of accepting new technologies. This led the Public Sector Companies to introduce computer use also in their activities. Add

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to this the expansion of government ministries and organizations in the use of these computers.[9]

The local demand on the Egyptian software is closely connected to the Arab market's demand for these software whether these prepared or those arabized in Egypt. The distinguished geographical location of Egypt in the middle of the Arab world represents an additional advantage for the Egyptian software industry as it benefits from being the pioneer in increasing its experience through development of its products and the good knowledge of distribution channels. Foremost among the problems facing Egyptian software industry are those related to piracy operations on software and the illegal copying which affects the market's profit concerning the companies working in the field of software industry.

This industry is in bad need to specialized marketing companies in the field of software trying to recognize marketing chances and to introduce them to working companies especially in the outside markets. The government can play an effective role in the subsidy of Egyptian software industry like the Indian experience, which was based upon the establishment of national union for companies of software and their service to take care of this industry. Also the establishment of silicon valleys in addition to facilitating the procedures of software exporting and importing.

Software industry in Egypt is controlled by the following organizations:

(a) Chamber of Software Industry;
(b) Egypt Software Association;
(c) Egypt Hi-Tech Association;
(d) Business Software Alliance;
(e) Egyptian Association for Computer companies;
(f) Information and Decision Support Center;
(g) Ministry of Communications and Information Technology.

The dominant characteristic of the skeleton of this industry is that most of the working companies there belong to the private sector and a very small number of them belong to the public sector. It can be said that this industry witnesses a hard competition between the local companies on one side and international software producing companies on the other. This competition is a positive sign as every company works towards decreasing the usage of its resources in order to become able to introduce a service with competitive price and reliable quality. The rise, continuity and development of these companies reflect their capability of competition with international companies working in this industry. Some of these local companies work as agents for international companies. This enables managers of local companies to obtain developed styles of management and marketing.

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[9] The National Committee for Informatics "Development of Software Industry in Egypt", Academy of Scientific Research and Technology, 1999.

The principal activity of the companies working in the software industry in Egypt includes many fields such as: financial systems, banking systems, administrative systems, educational systems, document management systems, hospital systems, personnel systems, tourism, transportation, multimedia, linguistics, geographic information systems.

The Ministry of Communications and Information Technology in Egypt cared for supporting the software industry through application of international standards therein. In June 2001, the Ministry established a Software Engineering Competence Center (SECC) in order to encourage and support the development of software and improve the methods used in industry to a very mature degree in order to obtain a fair share of the international market. The center aims at the following:

(a) Changing the concepts of managing software production companies to go with the standard specifications;

(b) Improving the efficiency and maturity standard of software production companies according to international standards;

(c) Developing awareness of software engineering and support of its usage;

(d) Defining measures to develop software production in Egypt;

(e) Support of software technology transfer;

(f) Encouraging software exportation and remote working

The field of work in the center includes:

(a) Egyptian companies working in the field of software industry;
(b) Egyptian universities;
(c) Training centers in the field of software industry training;
(d) Companies working in the field of compact systems manufacturing;
(e) Similar organizations and higher institutions;
(f) International companies working in the field of software

The axes of work in the center include:

(a) Appraisal and categorization of software producing companies in Egypt;

(b) Creating the atmosphere encouraging the use of international standards of software engineering;

(c) Presenting technical consultation to software companies to assist obtaining quality certificates;

(d) Holding training seminars and courses for software companies and individuals in the field of software quality;

(e) Making a website containing information on methods to raise software quality and standard specifications;

(f) Building a database for Egyptian software companies and their categorization;

(g) Giving quality certificates to match international standard specifications;

(h) Partnership with international companies and similar organizations.

During 2002, the center made the achievements shown in Table 3.

TABLE 3. ACHIEVEMENTS OF THE SOFTWARE ENGINEERING COMPETENCE CENTER IN 2002

Item	Value
Training Courses	
Number of Training Courses on the second level of CMM	8
Number of Training Courses on the third level of CMI	1
Number of participating companies	64
Number of trainees	528
Workshops and Seminars	
Number of workshops	4
Number of participants	211
Programs of Software Engineering Institute in the USA	
Number of Programs carried out	3
Number of trainees	60
Primary Appraisal of Software companies	
Number of companies primarily appraised	4

Source: Data of Software Engineering Competence Center, January 2002.

2. *Hardware Industry*

It is difficult to make an accurate comprehensive listing of all kinds and systems of computer and communications and equipment of information technology in Egypt because of lack of information and multitude of purchase sources. The assembly industries represent the major activity of equipment manufacturing in Egypt in the first place. A company was already established to fabricate computer components. The production will start by end of year 2003 by manufacturing screens and motherboards in addition to establishing center for R&D to design electronic circuits and different components.

Expansion in Egyptian electronic industry started, yet it is considered a limited one. In 1979, the Arab Industrialization Organization (Electronics Factory), and Military Production (Benha Factory) began producing electronic equipment. The major production activities include: Air force reception and transmission sets, local exchanges, fax machines, radio and television sets. Elarabi Company is one of success story in manufacturing electronic equipment under the supervision of Toshiba international company. Another success story is Al-alamia international company which manufacture T.V. and air conditioning sets in addition to advanced medical equipment. In a study of the Central Agency for public Mobilization and Statistics

(March 1998) on the number of establishments that introduced technology in their work (small and medium business up to 10 workers), it was found to be a tiny percentage of 1.8% of the number of establishment. The total number of establishments reached 344556 and the total number of the companies that introduced technology was 6167. Among these 0.51% used automatic control (1714 companies), 0.18% use computers (589 companies).

Many factors encourage the improvement of electronic industry in Egypt including:

(a) Availability of qualified technical human resources;

(b) Partnership with European Union;

(c) Reduction of sales taxes by 50% for industrial export from Mediterranean countries to EU;

(d) Facilities and services provided by the Egyptian government for projects aiming for export.

Currently, there are two companies in the Arab Republic of Egypt specialized in local manufacturing of communications equipment and telephones, in addition to the other electronic industries in the public and private sectors. These are:

(a) Egyptian company for the manufacture of telephone equipments (ETC)

Work started in this company 4o years ago in 1962. The most important major products of this company are:

i. Telephones;
ii. Public and private exchanges;
iii. Distribution cabins;
iv. Distribution boxes.

In 1997, the total value of production of the company was estimated about 167,595 millions Egyptian pounds. Production in this company has been developed quantitatively and qualitatively starting from 1999 the whole company went to the Private Sector; it gives its whole production to Telecom Egypt to support the communications sector from the local production.

(b) The Egyptian-German Company for Manufacture of Telecommunications Industry (EGTI):

It has been established as a joint company of the National Authority for Communications (30%) and the Egyptian Company for Telephone Apparatuses (30%), and Siemens Company (40%). The main products of the company are public and private exchanges with capacities up to 60000 lines. The company mainly manufactures in order to cover the exchanges needed by the local market (Telecom

Egypt) and starting to export abroad. The company was completely privatized in 1999. According to previous contracts with the Telecom Egypt, the Company is supposed to supply all Egypt's demands of public and private exchanges all over the republic.

C. THE SMART VILLAGE

The Smart Village is located just 15 minutes away from downtown Cairo in the 6th October city. It is a center of excellence and a technological park with state of the art infrastructure geared towards Hi.Tech Business. The Smart Village situated in a lush environment, offers superior Internet connection and a myriad of technological and administrative services.

The Smart Village is backed by its investors, the Egyptian government and its committed tenants. In addition Egyptian government is backing the project via legislation and the land. This has caused the major global IT companies to become committed tenants of the Smart Village.

The Smart Village infrastructure and facilities include:

(a) A high speed network for data, voice and video transmission;

(b) VPN connection, VoIP capability, and data center;

(c) Cable TV and video conferencing systems;

(d) State of the art power network that meets the international standards and code of practice;

(e) Uninterrupted power supply and standby generators;

(f) Central Air Conditioning;

(g) Conference Center capable of accommodating a variety of conventions and meetings, equipped with state of the art technological facilities to assist any hi-tech requirements;

(h) Exhibition Center with the most up to date facilities and services;

(i) A reception, meetings & events center to serve tenants and guests;

(j) A Business center to provide offices for hourly or daily rental, an information center, media facilities and a wide range of business support services;

(k) Public Library;

(l) International Press Center;

(m) Hotel;

(n) Shopping center and restaurants;

(o) Sports and recreation facilities.

The area of the village is more than 1500000 square meters and can accommodate about 30000 persons.

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D. Current Indicators of the Information and Communications Sector in Egypt

Table 4 shows the major relative indicators and Table 5 shows the whole current indicators of the Communications and Information sector in Egypt. (Reference: Information Center of the Ministry of Communications and Information technology, July 2003).

Table 4. The Major Relative Indicators for ICT in Egypt

Item	Value
Number of Telephone Lines for every 100 individual	22
Number of exchanges for every one million individual	21.9
Number of mobile telephone subscribers for every 100 individual	7.6
Number of public telephone cabins for every 1000 individual	0.7
Internet capacity for every one million individual	13.23 bps
Rate of Internet users to the total number of population	3.2 %
Number of personal computers for every 100 individual	2.3

Table 5. Current Indicators for ICT in Egypt

Item	Value
Communications Sector	
Total Number of Telephone Lines	10.9 million
Total Number of subscribers	8.4 million
Total Number of telephone lines waiting list	146 thousand
Total Number of exchanges	1498
Total Number of automatic exchanges	995
Total Number of half-automatic exchanges	475
Total Number of villages with exchanges	1073
Total Number of mobile telephone subscribers	5.168 million
Number of Mobinil subscribers	2.713 million
Number of Vodaphone subscribers	2.455 million
Total Number of public telephone cabins	48683
Total Number of Menatel Cabins	30111
Total Number of Nile Com. Cabins	14000
Total Number of Telecom Egypt Cabins	4575
Information Sector	
Internet capacity	895 Mbps
Number of Internet users	2.3 million
Number of Internet provider companies	149
Number of companies in the field of computers and software	1042
Total Number of Personal Computers	1.5 million
Issued capital of companies in the field of computers and software (inside the country)	1830 million LE
Issued capital of companies in the field of computers and software (in free zone)	47 million $

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TABLE 5 (*continued*)

Item	Value
Investment costs of the companies	3100 million LE
Jobs	27459
Total actual number of basic trainees since project start-up in 2000	77000
Total actual number of specialized trainees since project start-up in 2000	14840
Total number of on-going trainees	1654
Total Number of information technology clubs	550
Number of public post offices	3296
Number of automated post offices	115

IV. INFORMATION AND COMMUNICATIONS CAPACITY BUILDING

A. EDUCATION IN ICT

Graduates of Egyptian Universities in Communications, Computers and Information constitute the major part of the high-skilled manpower needed by the different information sectors in the state. The specializations of communications, computers and information are concentrated in the following faculties[10]:

(a) Computers and information faculties in Egyptian universities;

(b) Specializations of communications and computers in Egyptian universities, faculties of engineering;

(c) Specializations of communications, computers and information in private universities;

(d) Private high institutes.

There are also some departments in the universities including computer branches, yet the major share in qualifying graduates specialized in computers and information is taken by faculties of computers and information and faculties of engineering.

Computers and information faculties in Egypt started in 1996 with the following universities:

(a) Cairo University;
(b) Ein-Shams University;
(c) Helwan University;
(d) Mansoura University;

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[10] Universities Supreme Council "Statistics of University Education for Arab Republic of Egypt", October 2001.

(e) Suez Canal University;

(f) Zagazig University.

In 2001 two faculties of computers and information were added in Assiut and Menoufeyya Universities. In September 2003 another one will be opened in Miniya University. Computers Specializations are present in faculties of engineering in the following universities:

(a) Cairo University;

(b) Alexandria University;

(c) Ein-Shams University;

(d) Assiut University;

(e) Tanta University (Kafrel-Sheikh);

(f) Menoufeyya University (Menouf);

(g) Suez Canal University (Port said);

(h) South of the Valley University (Aswan).

There is also communication specialization in faculties of engineering in most Egyptian universities. Table 6 shows the total number of graduates of the current universities in specializations of communications and information technology compared to the targeted numbers with clarification of the numbers to be covered in numbers of graduates. (*Source*: National Plan for Communications and Information, December 1999, A Study on Private Universities in Egypt, June 2000).

TABLE 6. TOTAL NUMBER OF UNIVERSITY GRADUATES IN ICT

Year	Targeted Number	Total Numbers available	Deficit to be covered
1999	5000	4485	515
2000	10000	6080	3920
2001	15000	7100	7900
2002	20000	8130	11870
2003	25000	9332	15668
2004	30000	10662	19338
2005	36000	12127	23873
2006	42000	13727	28273
2007	50000	15510	34490
2008	60000	17465	42535
2009	70000	19680	50320
2010	80000	22095	57905

Source: Study on New Cairo University for Science and Technology, June 2000.

In order to spread the use of ICT, ministry of higher education signed an agreement with Microsoft allowing to use Microsoft products for staff and student at a reduced rate.

B. NILE TECHNOLOGICAL UNIVERSITY PROJECT

This project is conducted by the ministry of communications and information technology in cooperation with the ministry of higher education aiming to provide opportunities for distinguished education for both Egypt, Arab, Islamic and African countries in the new fields of science and technology to meet the present and future market needs. The university will be established in 6th October City near the Smart Village. The university will focus on the new specialized technological fields including:

(a) Information Technology;
(b) Electronics and Communications;
(c) Management of Technology and Information Systems;
(d) Industry and Design;
(e) Aeronautics and space.

In addition to providing distinguished education opportunities, the university will focus on establishing:

(a) Training center in cooperation with international and local specialized companies;

(b) Research center to serve industry;

(c) Technological Incubators, which act as advanced industrial technological centers.

C. TRAINING IN ICT

1. *Training young graduates (Specialized Training Program) in communication and networks*

Within the framework of carrying out the national plan of the Ministry of Communication and Information to find cadres qualified on the international level to promote the industry of communication and information technology and create job opportunities for the youth to achieve a national income for Egypt: the National telecommunication Institute held courses in the field of communication systems and technology for the young graduates. These courses were carried out by specialized trainers from international companies. The plan aims at training about one thousand young graduate every year. The courses are held in a period ranging between four and six weeks for each course. Table 7 shows the numbers of trainees according to the executing companies.

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TABLE 7. EXPERIENCED TRAINING IN ICT

Company	Number of Trainees
CISCO	1022
LUCENT	282
ERICSSON	228
NORTEL	74
QULCOMM	40
SIEMENS	62
TOTAL	1708

Source: National Telecommunications Institute, July 2003.

2. Specialized Training in the Field of Information Technology

As of January 2002, and in coordination with the Ministry of Communication and Information, the National Institute Telecommunication took over supervising this national program and carrying out the courses through international companies to train information technology specialists at a rate of 5000 specialist every year in the following fields:

(a) Developing software, e-business and e-commerce;

(b) Business cycle flow, system analysis and design;

(c) Database management, Support of Decision Making;

(d) Geographical information system, computer network design and development, computer network building and operation.

This project is going to cover most governorates of Egypt. The term of the course is six months. Table 8 shows the numbers of trainees until 30.06.2002 as well as the numbers of those under training.

TABLE 8. SPECIALIZED TRAINING IN ICT

Company	The numbers trained	The number under training
IBM	3000	1520
ICL	250	86
ORASCOM	2030	--
Arab Academy for Science and Technology	150	150
Total	5430	1856

Source: National Telecommunications Institute, July 2003.

Also within the framework of the national plan of communications and information the training of about 20000 trainees is going on the basics of information technology in collaboration with Egyptian Universities.

D. COMPUTERS IN SCHOOLS

The computers in schools spread in Egypt about 1985 as the uses of computers in schools is concentrated in the following axes:

(a) Teaching principles of computers and information technology;
(b) Using computes as an educational means for the various study curricula;
(c) Using computers in school management;

Currently there is a national project for the applications of communications and information technology in schools conducted by ministry of communications and information technology. It is called "SMART-SCHOOLS". The Egyptian Ministry of Education is adopting the project: "A computer to each student" which avails computers for students at installments for four years allowing to improve the use of ICT and provide the necessary infrastructure for the Egyptian House.

E. RESEARCH AND DEVELOPMENT IN ICT

The efforts of research and development in the communications and information sector are concentrated in the following directions:

1. *Universities*

Most Egyptian universities make basic and applied researches in the field of communication and computers in both:

(a) Faculties of Computers and Information, which are currently eight public faculties in addition to several private faculties;

(b) Departments of Communications in Faculties of Engineering which are currently 13 public faculties in addition to several private faculties.

Most of these faculties make researches on the level of M. Sc. and Ph. D. as well as several research applies projects.

2. *Research Centers*

There are several research centers in Egypt, which care for communications and information technology sector, of which:

(a) Electronics Research Center of the Ministry of Scientific Research;

(b) National Telecommunications Institute of the Ministry of Communications and Information technology;

(c) Atomic Energy Organization of the Ministry of Electricity

V. BUILDING THE ICT SECTOR

A. ICT COMPANIES

More than 800 companies in the field of communications and information are working in Egypt. Yet, the greater majority of these lie in the field of small and medium companies. Table 9 shows the current situation of these companies until July 2003.

TABLE 9. CURRENT INDICATORS OF COMPANIES WORKING
IN INFORMATION &COMMUNICATIONS

Item	Value
Number of Companies working in the field of computers and software	1042
Number of Companies supplying Internet services to subscribers (ISP)	149
Number of Companies supplying application services (ASP)	4
Number of Major Companies in the Communication sector	3
Issued Capital of companies working in the field of computers and software	340 million $
Investment Costs of Computers and software companies	600 million $
Investment costs of the major companies of communications	8000 million $

Source: Information Center of the Ministry of Communications and Information technology, July2003.

B. INVESTMENTS IN ICT SECTOR

Table 10 shows the investments in the Communications and Information Sector in Egypt.

TABLE 10. INVESTMENTS IN THE COMMUNICATIONS AND INFORMATION SECTOR
IN EGYPT

Sector	Share of sector in market			Value in $ million		
	(96/97)	(98/99)	2000/2001	(96/97)	(98/99)	2000/2001
Equipment (Exchanges, Telephones, Fax machines etc.)	60%	58%	58%	309	395	490
Programs (Computer software used in different applications)	23%	24%	23%	118	163	195
Presenting Services of Information Systems Management and selling the service of data transfer	12%	12%	12%	62	82	105
Local Area Networks and Infrastructure Network	5%	6%	7%	26	41	58
Total	100%	100%	100%	515	681	484

Source: Information and Decision Support Center of the Cabinet. January 2002.

The national plan for communications and information also determined the annually expected volume of demand on communications and information as show in Table 11.

TABLE 11. THE ANNUALLY EXPECTED VOLUME OF DEMAND
ON COMMUNICATIONS AND INFORMATION (IN MILLIONS OF US$)

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Information	50	100	200	400	800	1200	1800	2400	3200	4000	5000
Communications	500	600	750	1000	1300	1600	2000	2400	3200	4000	5000
Total	550	700	950	1400	2100	2800	3800	4800	6400	8000	10000

Source: Ministry of Communications and Information, "The National Plan for Communications and Information", December 1999.

Table 12 shows the revenue of communications in Egypt and its ratio to the GNP.

TABLE 12. REVENUE ON COMMUNICATIONS IN EGYPT

Item	1994	1995	1997	2000
Total annual revenues in $ million	710	638	874	1150
Ratio of communications revenues to GNP %	1.4	--	1.1	1.2

Source: Telecom Egypt, June 2001

C. GOVERNMENTAL SUPPORT AND ICT EXPORT

The Government gives support to public and private companies to increase exports of their products and services in the field of communications and information technology as this includes a number of measures of which:

(a) Tax Exemptions for a limited period for operating companies;

(b) Export encouragement and companies subsidy through establishing the Information Technology Industry Development Authority;

(c) Giving technical and material support to software companies in order to develop their institutional and technical performance through Software Engineering competence center (SECC) of the Ministry of Communications and Information.

VI. APPLICATIONS IN GOVERNMENT ORGANIZATIONS

A. COMPUTERIZATION OF PUBLIC ADMINISTRATION

The state cared for computerization of financial and administrative works in the different government sectors since the beginning of the sixties, as most applications in this period were concentrated in the following:

(a) Accounting systems;
(b) Personnel systems;
(c) Inventory systems;
(d) Purchase systems;

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Since the beginning of the nineties, the state increased care for applications of communications and information technology in the different governmental sectors in order to raise the efficiency of the government apparatus, monitoring and supervision with speed in supplying accurate information to support decision taking through the Information And Decision Support Center in the Cabinet and the Central Agency for Public Mobilization and Statistics. From the end of the nineties, the Ministry of Communications and Information Technology leads computerization of administrative and financial works in the different governmental sectors, as this was concentrated in the following:

1. *Automation of working systems in the Ministries*

This includes:

(a) Resources planning and management systems (budget, general accounts, purchases, inventories, salaries, personnel affairs);

(b)   Electronic archive and work cycle flow.

2. *Automation of administrative systems and availing information*
for decision-making

This includes:

(a)   Re-engineering of the work cycle to have simpler procedures;

(b)   Automation of the work cycle to raise efficiency and lower the time to achieve transactions;

(c)   Availing information and possibility of operation from several sites.

The Egyptian government signed two agreements: the first with Microsoft Company and the second with Oracle Company to supply government bodies with software of these two companies at suitable prices to be used in the different administration applications.

The Ministry of Communications and Information is carrying out more than 20 projects with several government bodies at a total value over $ 30 million. Table (13) gives details of some of these projects.

TABLE 13. PROJECTS UNDERTAKEN BY THE MINISTRY OF COMMUNICATIONS AND INFORMATION IN COOPERATION WITH MINISTRIES AND ORGANIZATIONS

Project	Beneficiary Body
Database of Standards	Ministry of Industry
Developing the web site of the General Organization for standards	Ministry of Industry
Information network for of Industrial Products	Ministry of Industry
Construction Contractors Union Information System	Construction Contractors Union
Ministry of Agriculture Web Site to serve economic activity	Ministry of Agriculture

TABLE 13 (*continued*)

Project	Beneficiary Body
Economic Activity Information System	Investors and Decision Makers
Ministry of Supply Information System	Ministry of Supply
Facilitating Investors Dealing Procedures	Investment Authority
Developing Customs	Ministry of Finance
General Income Tax Information System	Ministry of Finance
Estate Tax Database	Ministry of Finance
Automation of Personal Affairs Prosecution	Ministry of Justice
Automation of Notary Public	Ministry of Justice
Automation of Documentation Bureaus	Ministry of Justice
Underage money listing database	Ministry of Justice
Automation of Foreigners Licenses	Ministry of Labor
Database of those desiring to work	Ministry of Labor
Automation of Labor Bureaus	Ministry of Labor
Automation of work systems in city quarters	Ministry of Local Development
Automation of Foreign Ministry Consulates	Ministry of Foreign Affairs

Source: Data from Information Center of the Ministry of Communications and Information Technology. July2003.

B. DIGITALIZATION OF INFORMATION

Through the different applications of communications and information technology in government bodies, the state cares for keeping information in a digital manner that can easily be restored and the spread of their use in the different applications where the government cares to supply digital information on many of the economic and social fields in the country. Among these are:

(a) Digital Information on the different economic sectors;
(b) Digital Information on laws and legislations;
(c) Digital Information on labor force;
(d) Digital Information on services.

C. E-GOVERNMENT PLANS

The applications of the E-Government adopted by the Ministry of Communications and Information Technology and the Information and Decision Support Center in the Cabinet in Egypt aim at the following:

(a) Availing services for the public everywhere and in the suitable form and time;
(b) Creating a suitable environment for investment;
(c) Obtaining updated accurate information;
(d) Modernizing governmental administration;
(e) Lowering government spending;
(f) Increasing Egyptian compatibility in international markets.

The project of E-government concentrates on five main projects namely:

(a) Laying down the infrastructure (organization, legal and technological);
(b) Availing services through nets;
(c) Work automation;
(d) Creation and building the government communication network;
(e) Developing new forms for government purchases.

The execution of the E-government started in some Ministries in Egypt and availing services on the Internet. Table 14 shows the different services automated and availed on the Internet as well as on-going ones.

TABLE 14. SERVICES OF THE E-GOVERNMENT IN EGYPT

Service	Cooperating Body	Automation	Availability on the Internet
Telephone Bill	Telecom Egypt	√	√
Birth Certificate Extract	Civil Reg.	√	√
Mail services Prepaid Card	National Mail	√	Nov. 2003
Services of (Tax -Custom) Payers	Ministry of Finance	√	Nov. 2003
Traffic penalties information and payment	Alex. Traffic Prosec,	√	Nov. 2003
ID (National Number)	Civil Reg.	√	√
Universities Entrance	Ministry of Higher Education	√	√
Services of Electricity distribution Companies	Min of Electricity	√	Nov. 2003
Mandates and Notary Public	Ministry of Justice	√	Dec. 2003
Complaints and information on communication services	Comm. Regulation Authority	√	√
Exporters Services	Ministry of Foreign Trade	√	Nov.2003
Courts of Appeal Information Services	Cairo and Alex CoA	Nov. 2003	Nov. 2003
Extraction and Addition Taxes	Ministry of Finance	Sept.2003	Nov. 2003
Trade Register	Ministry of Supply	√	Nov. 2003

Source: Data from Information Center of the Ministry of Communications and Information. July 2003.

D. E- PROCUREMENT APPLICATIONS

The Government cares to spread the initiative: towards a no-paper, no-money information society by activation of e-procurement applications through:

(a) Spreading the use of e-signature e-documents and e-contracting in government bodies and banking sector;

(b) Use of e-payment in the fields of government services and utilities;

(c) Spreading the use of pre-paid cards and banking cards;

(d) Establishing Consumer Credit Information system.

From the technological point of view the government in Egypt cares to locally connect the e-business network and facilitate its connection to local and international network. Also, the government considers establishing instructions, which encourage and support e purchasing and e-payment.

VII. APPLICATIONS IN EDUCATION

A. E-LEARNING

E-learning is considered an effective tool to obtain equal learning and training opportunities without being restricted to the geographical location. So, it is possible to use communications and information technology to provide or improve remote learning services through providing learning and training programs to benefit from foreign expertise without moving or traveling from one country to another. Besides, it is an effective way to solve many problems from which education in Egypt currently suffers.

Efforts of e-learning in Egypt is centralized in the Supreme Council of Universities at Higher Education Ministry, Ministry of Education and Ministry of Communications and Information Technology as the following:

1. *Supreme Council of Universities*

Since September 2002, The Supreme Council of Universities established a national center of e-learning for different high institutions and universities services which aims for the following:

(a) Supporting capabilities and developing skills for teaching staff at universities and high institutions to use communications and information technology in developing learning system;

(b) Executing infrastructure for the center and its needs of different technologies to take over its rule in serving universities and high institutions;

(c) Helping teaching staff in developing many courses in the different universities and following up their execution and their technical and educational support in universities.

The expected outcomes from this center during the coming three years are as follows:

(a) Preparing, qualification and training 100 members of teaching staff in universities a specialized training in developing, preparing, and structuring electronically the courses,

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(b) Preparing and qualification of 100 members of teaching staff in universities to use electronically prepared courses and their practical applications;

(c) Producing and developing 100 courses using electronic ways of producing courses which cover different selected fields and publishing them on the Internet;

(d) Preparing specialized studies about international reality and expertise in the field of developing the curricula electronically;

(e) Executing courses developed in co-operation with different universities;

(f) Establishing a portal for e-learning in Egypt.

2. *The Ministry of Education*

The Ministry of Education considered using communications and information technology in different schools and developing learning ways. Few years ago, a center for technological development was established to take over adaptation of the different technologies that suit the education system in Egyptian schools. Recently, this center takes care of using e-learning methods in developing education at schools where all curricula of the preparatory schools were published on the Internet as well as some of the primary and secondary school curricula as well (http://elearning.emoe.org, www.emoe.org). In addition to the efforts of the Ministry of Higher Education and the Ministry of Education, there are some private associations which present programs for e-learning, of which are:

(a) The Regional Information Technology and Software Engineering Center (RITSEC);

(b) This center presents programs for e-learning to provide master degree in co-operation with some British and American universities;

(c) The Arab Open University: The Branch of the Arab Open University was opened in Cairo in February 2003. It aims at presenting studies for remote learning, which avail obtaining B. Sc. degree in specialties of information technology, administration and languages. Yet, the number of students joining this university is about 70 students only so far. This university provides the different methods of distance learning including e-learning.

B. E-SCHOOLS PROJECT

The Ministry of Communications and Information Technology adopts, in co-operation with the Ministry of education, a project to expand the use of information technology in schools, which is called the Smart Schools Project. It consists of two basic stages:

(a) First stage of duration of 5 years covering 7500 preparatory schools with 4.5 million students. This stage will start in September 2003 with a pilot project for 60 schools covering 13 governorates distributed as follows:

i.   30 governmental and experimental schools;

    ii. 20 private schools and national institutions;

    iii. 10 schools in co-operation with Education Development Program in Alexandria.

At this stage, the concentration will be on:

(a) Intensification of education of computer and Internet principles for students at preparatory schools;

(b) Developing use of information technology in learning different scholar subjects;

(c) Developing the use of information technology in scholar administration;

(d) These schools are to act as community centers to provide information technology services to individuals and youth at areas where these schools exist.

The infrastructure costs of this project are estimated at $ 80000 dollars for every school and operation costs are about $ 20,000 dollars annually for every school. The annual cost is about $150 dollars for every student.

The first stage is executed for five years until 2008, as follows:

(a) 500 preparatory schools in 2003/2004;
(b) 1500 preparatory schools in year 2004/2005;
(c) 1500 preparatory schools in year 2005/2006;
(d) 2000 preparatory schools in year 2006/2007;
(e) 2000 preparatory schools in year 2007/2008.

The second stage is expected to include most primary and secondary schools. The number of students at these schools is about 11 million students.

C. VIRTUAL UNIVERSITIES

The Egyptian universities co-operate through Computer and Information College at Cairo University in Ibn Sina Virtual University Project, which is managed by the UNESCO and financed by the European Community. The budget of the project is estimated at about 5 million Euros while fifteen European and Mediterranean countries participate in this project. The project started since January 2003, and it is expected to achieve the following until end of the year 2005:

(a) Establishing a network formed of 15 knowledge centers for electronic learning in countries joining this project;

(b) Preparation and qualification of 45 expert to work in this field;

(c) Preparation and qualification of 300 members of teaching stuff to the electronic production of curricula;

(d) Preparation and qualification of 600 auxiliary associations in electronic learning;

(e) Developing 120 courses electronically to serve different education sectors;

(f) Establishing a virtual library to include curricula developed through the project.

VIII. APPLICATIONS IN COMMERCE AND BUSINESS SECTORS

A. E-COMMERCE AND E-BUSINESS[11],[12]

Using e-commerce is considered one of developing applications in Egypt although e-commerce is very limited currently, yet the Egyptian government is issuing many legislations and policies to help the spread of e-commerce and its use in the different sectors of the state. The most important of these strategies and politics are:

(a) Communications Law;
(b) Intellectual Property Rights Law;
(c) Electronic Signature Law;
(d) Establishing an organization for developing information technology industry.

Currently there are no accurate data available about the actual volume of exchange in e-commerce field. Yet, many studies expect a rapid growth of e-commerce in Egypt. A different field of e-commerce that could be applied in Egypt was discussed in a study named "Developments in Electronic Commerce in Egypt" which was prepared by American department of commerce in December 2002. This study showed that the field of e-commerce in Egypt is promising and it pointed to the efforts and strategies made by the government to protect and secure e-commerce operations. This study invited private sector to join the government to increase and spread e-commerce.

The government is interested in activating e-commerce and e-business applications in Egypt through:

(a) Organizing and spreading the use of electronic signature;

(b) Building infrastructure for electronic signature using smart card technology;

(c) Spreading the use of electronic signature, documents, and contracts at governmental organizations and the banking sector;

(d) Providing services of electronic signature and documents to public through mail bureau, information technology clubs and community centers;

(e) Connecting networks of electronic exchange locally and facilitating their connection to local and international networks to increase using electronic sale points;

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[11] American Department of Commerce "Developing e-commerce in Egypt", December 2002.

[12] Arab organization of education, culture, and science "Arab information strategy", November 2002.

(f) Stimulating the private sector to invest in the development and spread of e-commerce and e-business software and systems especially in the field of electronic payment systems, production planning, administrating systems, client services systems, etc. making use of international experiments and experts;

(g) Community acknowledgment about challenges, opportunities, and work samples application in the age of e-commerce and e- business.

B. E-BANKING

Re-structuring banks in Egypt became necessary to increase e-commerce applications through encouraging electronic payment operations and electronic exchange. Although nowadays only 10 % of Egyptians have bank accounts, this number is increasing at a high rate, which encourages the use of electronic bank operations. Consequently this supports deal between clients and associations (B2C), and among different associations (B2B). Automatic teller machines (ATM) have been spread in Egypt during the last years as there are 850 automatic teller machines in Egypt, and most of the banks in Egypt are connected now to a network of automatic teller machines, although not all banks are connected to the same network of teller machines which leads electronic telling cards not to work on all teller machines. Yet, Egyptian central bank is currently putting criteria and specifications to connect banks together. This provides easy use of telling cards and raises qualification of electronic banks operations. Eight years ago, a company was established to take care of entering and using information technology in Egyptian banks and provide them with technical support. Currently, the number of clients using electronic bank operations is scanty compared to the total population. There are no accurate data about amount of electronic bank deals but it has a good quality, which encourages its spread. The Government is making great efforts to put using electronic bank operations into action through:

(a) Converting salaries and pensions into accounts at banks and national mail association;

(b) Establishing center for Credit Bureau instructions to support converting to using credit bureau;

(c) Using electronic payments in the field of governmental services and utilities including Internet banking, Mobile banking, pre-paid cards and bank cards.

IX. APPLICATIONS IN HEALTH CARE SECTOR

A. E- HEALTH

Communications and information technology contributes to raising the health service level, and consequently development of individuals through:

(a) Connecting health services units: it is possible connecting health units in rural areas with communication networks to developed health units in urban areas, which facilitate co-operation and benefit from expertise provided;

(b) Telemedicine: It is possible to use communications and information technology to benefit from expertise and rare specialties in world without much concern about being far through different geographic areas by applying "video conference" systems;

(c) Providing information and knowledge :It is possible to provide huge national data base that include individuals data and their medical history, so they could be reached any time anywhere paying attention to security and privacy. Also information of modern medical technology, and modern therapies could be provided which help renaissance of health services level and increase qualification of workers at the health sector.

The government paid attention to developing health services in Egypt by using information technology through:

(a) Improving diagnosis services in governorates and remote areas;

(b) Improving diagnosis services for patients who want to get therapy abroad, and follow up afterward;

(b) Providing diagnosis services for Arab and African patients;

(c) Start providing medical follow up services at home for stationary cases;

(d) Establishing data base for patients records to be able to exchange it between medical centers electronically;

(e) To lessen time of response for accidents;

(f) Providing inquiry systems about medical problems for public;

(g) Providing continuous medical education for doctors, nursing associations and hospitals administrations;

Ministry of Communications and information technology co-operates with ministry of health to execute many projects in this field, of which is:

(a) Renewing medical emergency recall centers through developing systems of receiving emergency calls electronically and connecting to geographical information systems. The first stage included Great Cairo (Cairo, Giza, and Kalubeya) with 200 umbalances and developed communication center. It is aimed to increase medical emergency recall centers to cover Alexandria, Delta, Asuit and the rest of remote areas;

(b) Citizen's treatment data system on the expense of Egypt and it is integrated system that covers 18 Location in Cairo and governorates to Facilitate introducing the service to the citizens without traveling to Cairo. This system uses the national code to determine the beneficiary and to guarantee that spending will not be repeated and to watch treatment expenses. The aim is it connect citizen treatment network on the State's expense to the sanitary records network and to the Exchange hospitals database via the national code.

B. DATABASES FOR HEATH CARE

The Ministry of Health and population established database on the national level for health Care where data and information management are circulated through:

1. *Insurance Information Center*

It Contains information and medical record data (CIS) and the financial (MIS. FHF) devoted to Family Health Fund. The center was established since the start of the nineties as the first health information system in Arab Republic of Egypt. It is developed now through the health Reformation programme in order to design information management programmes on of family health units, family health centers (CIS) and on the level of family health Funds management (FHFS)

2. *Information Resources Unite (RC)*

It contains books, reports and Scientific and electronic periodicals. The Central Management for Technical Support and Projects in the ministry develops the basic structure of information, which is represented in establishing major unit of scientific information to support the exchange management and the workers in the ministry. This unit is divided into smaller units of information in every governorate where they all integrate in a developed circulation to support the leaderships of the Ministry of Health and Population and supporting them with all modern accurate and organized information that satisfy their needs and help them accomplish their missions effectively and efficiently.

3. *The Ministry Website (Web Site)*

It is established by Information, Education and Communication Department to include all information devoted to repair the health Sector.

The Egyptian health records and Family medicine network has been built via the database of the health records of 30 millions citizens. Its First Stage included 900 health units and the second stage included 3500 health units representing the rest of units to achieve the following:

(a) The use of the national code to connect the citizen's health data with the place and to get birth Certificates;

(b) Mechanization of the central hospitals and connecting them to the health records network.

C. TELEMEDICINE AND MEDICAL USE OF TELECONFERENCING

The Ministry of Health establishes, in co-operation with Ministry Communications and information technology, the Egyptian remote – treatment network using teleconferencing where the network has been carried out in Five Sites:

(a) Nasser's Institute in Cairo;
(b) Beni Suef Governorate;

(c) Aswan Governorate;
(d) Al Mahalla Al-Kobra City;
(e) Mobile.

Two other sites are to be added in the coming months to include:

(a) Sharm Al-Sheikh;
(b) Luxor

The target of this project is to achieve the following:

(a) The network in the rest of Egypt's governorates;
(b) African and Arab Countries in the network to introduce treatment services and medical consults.

X. DIGITAL ARABIC CONTENT

A. DIGITAL ARABIC CONTENT FOR NATIONAL USE

Like most of the Arab Countries, the digital Arabic content in Egypt is considered very tiny in comparison with the English content as though most governmental institutions and several non-governmental institutions have Internet websites. However, most of these sites are written in English. Recently, there are no accurate data about the percentage of the Arabic content to the English content on the Internet. Most of the Arabic content in Egypt on the Internet includes:

(a) News Sites (i.e. papers and TV news);
(b) Cultural Sites;
(c) Encyclopedias and translation.

The Ministry of communications and Information technology adopts the idea of establishing a national center for the electronic documentation of the urban and natural heritage .A big part of the urban and the natural heritage was published in the Arabic language on the Internet. Moreover, ministry of education has published the preparatory stage curriculums and a big part of the primary and the secondary in Arabic on the Internet.

Nowadays, there is great attention paid to support the Arabic content on the Internet to achieve:

(a) Communication among the society's individuals or among different societies;

(b) Learning via educational materials available on the Internet;

(c) Shopping, Purchasing and selling and banking deals between individuals and institutions;

(d) Identifying individuals, institutions, and different aspects;

(e) Introducing Arabic information in general.

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B. BARRIERS FOR DIGITAL ARABIC CONTENT

The weaknesses of the digital content in Egypt, in comparison with the English content, is due to several reasons such as:

(a) The decrease of the spreading rate of communications and information technologies;

(b) Weakness of the spreading of many Arabic applications;

(c) Weakness of the cultural activities as a result of the increase of the illiteracy percentage;

(d) In Egypt, most institutions and companies put an informational content for them on the Internet using the English language.

The Egyptian initiatives for the development of the digital Arabic content in Egypt includes the following:

(a) The development of translation application in Arabic and publishing them on the Internet;

(b) The support and activating of the scientific researches in the field of using and developing instruments and systems that make the production of the Arabic content possible. The Egyptian Academy of scientific research and technology pays much attention, through the Information and Communications Research Council, to offer many projects in this field to encourage researchers, university teaching staff members and research centers to participate in the development of the instruments and systems of the Arabic language;

(c) Encouraging national programs and supporting them for the sake of an electronic documentation of heritage in the Arabic language;

(d) Encouraging private and public association, and civilized community associations to establish Internet sites in Arabic;

(e) Using Arabic language at information technology tools and ways such as Arabic Internet explorer and writing site addresses in Arabic;

(f) Few years ago, a scientific non-governmental association was established to take over spreading Arabic language among different information technology fields, especially digital Arabic constituent on Internet, through organizing conferences and seminars, and encouraging scientific researches in this field.

XI. SUMMARY AND RECOMMENDATIONS

Through previous items, this study included traits of Egyptian information society in which appears a fact that Egypt has gone along way at building information society. In order for Egypt to proceed deeply toward Egyptian information society, many efforts are necessary of which we include in the following recommendations:

(a) The necessity of renewing communications and information national plan

The current plan which has been for three years, the current situation in Egypt, and communication and information international development, all these necessitate renewing the current communication and information national plan to be able to use communications and information technology at different national sectors. Nowadays, ministry of communications and information technology is preparing Egyptian information society Initiatives;

(b) Developing governmental administration

Communication and information technology applications help changing the general system of administration, to change from the pyramidal shape to the network shape. Information networks and computers plays a basic role in connecting different departments of the same association internally at one side, and connecting the association to other associations externally at another side, in addition to connecting it to public. Applications in many developed countries point to communication and information technology ability to increase qualification and action of governmental administration;

(c) Developing technical infrastructure at governmental sectors

Using information technology and electronic government applications needs providing a strong basic infrastructure at these governmental sectors, communication networks, and integrated database to allow integration and coordination among governmental sectors, which increase demand requirement at information technology sector. Consequently, this helps finding new job opportunities and increase growth rates of this sector;

(d) Developing operations with business associations

This happens through developing communication networks among governmental sectors, factories, exporters and persons who take over governmental purchases. Also, through communications and information technology uses, it is possible to publish finance sources available for business units, and insurance opportunities available for small and intermediate projects which play a basic role in achieving commercial development;

(e) Facilitating operations

Facilitating operations among citizens and governmental sectors without paying attention to time and place, which increases qualification level of governmental services performance;

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(f) Publicizing for governmental projects

Many governments and different executing associations started using Internet network to publicize for their future plans and developing projects, and to publish their co-operating projects to external, to present and provide them constantly for citizens, and local and international investors;

(g) Expanding the use of e-commerce and increase getting benefit from them;

(h) Raising qualification of training and teaching activities

    i. The Human factor is the basic for commercial and community development in any country. Communications and information technology contributes in developing and raising human factor, which is positively reflected on achieving integrated development at one side, and developing modern technology as one of human developments outputs at another side;

    ii. *Raising qualification of teaching:* This happens through spreading computers at teaching in classes, which leads to improving learning level of students. Also it is possible to raise teaching outputs through providing Internet network at schools as research channel to widen knowledge of teachers and students;

    iii. *Developing teaching administration:* Communications and information technology helps developing teaching administration and its services, beside the ability to connecting teaching sectors to one network which provides information about recent knowledge at different culture and science fields, with the ability of making courses for teaching staff about the recent developed teaching ways;

    iv. *Demand growth of education software:* Increasing use of information technology in education services leads to demand increase of companies in field of information technology to provide technical support and consulting services for schools and teaching sectors. This is positively reflected on value of local product at one side, and produce new job opportunities in this industry and industries needed for it at another side. This leads to demand growth of education software;

    v. *Improving research capabilities:* Communications and information technology provides the ability to connect schools, universities, libraries, and research centers locally and internationally. Also, it provides the ability to get knowledge about intellectual activities in different research fields, which helps raising research capabilities and developing academic and applied research activities;

(i) Producing huge leap in scientific research system

This happens through moving and digesting incoming technology with the cooperation of private sectors, and providing funds and support for applied research in communication technology and computers fields lately in this field, Academy of scientific research and technology in Egypt has established a council to take over applied research in communications and information fields;

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(j) Developing Internet uses and services

As discussed in this study, Internet uses in Egypt still limited as percentage of Internet users is estimated by 3.2%, which is a small percentage in comparison with international rates. Because of this, there is a necessity to develop Internet uses and services in order to build Egyptian information society, which could be achieved through:

i.   Spread using computers by school and universities students and also by public. In this field, ministry communication and information and ministry of education have started a project for selling computers, computer for every house and for every student with lowered prices and at installments allowing to provide infrastructure for the Egyptian house;

ii. Developing Egyptian universities network at supreme council of universities to provide Internet services for students, teaching staff, and workers at universities in Egypt;

iii. Developing infrastructure for communication network to be able to respond to growing demand of Internet uses.

(k) Expanding the Establishment of Smart Villages

Smart Villages are considered as integrated information society for development and use of communications and information technology. Egypt has started establishing Smart Villages .The first village will be started in 6 October City at Giza in September 2003. We should widen establishing these villages at different sites to create the suitable environment for growth of communication and information industries and services in Egypt.

(l) Removing psychological and community barriers against using communication and information technology

There is no doubt that applying communications and information technology in different local sectors faces resistance from some workers against using these technologies, so the government should consider this social factor through:

i. Providing the stimulants needed to encourage workers to deal and use information technology in their different work;

ii. Providing the suitable training for developing workers skills to deal with these technologies.

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18. M.G. Darwish, "Study for Egypt and Information Society", Western Asia Preparatory Conference for WSIS, ESCWA, Beirut, 4-6 February 2003.

19. American Ministry of Commerce, "Development of e-commerce in Egypt", December 2002.

20. Data from UNDP, 2002.

21. Data from World Bank, 2002.

22. Data from ITU, 2002.

INFORMATION SOCIETY INDICATORS

	Year 2000	Year 2001	Year 2002
1. Basic Background Indicators			
1-1 Population (Million)	67.9	69.4	70.9
1-2 Total Area (1000km2)	1001	1001	1001
1-3 Population Density (population/km2)	67.9	69.4	70.9
1-4 Urban population (Million)	30.9	31.6	32.3
1-5 Human Development Index (HDI)	0.642	0.649	0.657
1-6 Human Poverty Index (HPI-1)	31.20%	30.60%	29.90%
1-7 Adult Literacy Rate (%)	55.3%	56.6%	57.9%
1-8 Adult Female Literacy Rate	33.8%	35.8%	37.7%
1-9 Youth Literacy Rate	69.8%	70.7%	71.6%
1-10 GNI (Thousand Million $)	96.7	99.6	102.5
1-11 GNI per capita ($)	1424	1435	1446
1-12 GDP (Thousand Million $)	98.7	101.7	104.6
1-13 GDP per capita ($)	1454	1465	1476
1-14 GDP per capita (PPP $)	3635	3740	3849
2. Telecommunications Infrastructure			
2-1 Total Fixed Telephone Lines (Million)	6.4	8.2	10.1
2-2 Number of Telephone Lines per 100 People	9.4	11.8	14.3
2-3 Percentage of Urban Telephone Lines	85%	81%	78%
2-4 Waiting List (Millions)	1.02	0.712	0.302
2-5 Average Waiting Time (Year)	3.1	1.3	0.4
2-6 Revenue Per Line ($)	235	258	284
2-7 Cost of Local Call ($ per 3 Minutes)	0.029	0.025	0.02
2-8 Cost of Call within Region ($ per 3 Minutes)	0.52	0.38	0.3
2-9 Cost of Call to US ($ per 3 Minutes)	5.7	4.8	3.8
2-10 Number of Fixed Lines Operators	1	1	1
2-11 ISDN Subscribers	50	2610	9766
2-11-1 Initial Cost ($)	1000	700	500
2-11-2 Monthly Charge ($)	15	10	7
2-12 DSL Subscribers	-	-	447
2-12-1 Initial Cost ($)	-	-	1000
2-12-2 Monthly Charge ($ for 256 kbps)	-	-	44
2-12-3 Monthly Charge ($ for 512 kbps)	-	-	62
2-13 Leased Lines Subscribers	430	780	1420
2-13-1 Initial Cost ($)	1000	1000	1000
2-13-2 Monthly Charge ($ for 256 kbps)	570	500	333
2-13-3 Monthly Charge ($ for 512 kbps)	1000	875	583
2-14 Cable Subscribers	-	-	-
2-14-1 Initial Cost ($)	-	-	-

	Year 2000	Year 2001	Year 2002
2-14-2 Monthly Charge ($)	-	-	-
2-15 Outgoing Traffic (Million Minutes)	140.1	188.4	243.6
2-16 Outgoing Traffic (Minutes per Subscriber)	21.8	22.9	24.1
2-17 Incoming Traffic (Million Minutes)	498.7	670.8	867.8
2-18 Incoming Traffic (Minutes per Subscriber)	77.9	81.8	85.9
2-19 Number of Mobile Phones lines (Millions)	0.654	1.96	4.39
2-20 Number of Mobile Phones Operators	2	2	2
3. Media Infrastructure			
3-1 Radio Receivers (Million)	20.2	21.3	22.6
3-2 Radio Receivers per 100 People	29.7	30.7	31.8
3-3 Television Receivers (Million)	8.1	8.5	9.1
3-4 Television Receivers per 100 People	11.9	12.3	12.7
3-5 Home With Satellite Antennas (Thousand)	601	636	684
3-6 Daily News Papers	6	6	6
3-7 3.7 Number of Daily Newspaper Copies per 1000 People	5.1	5.2	5.4
4. Computers and the Internet			
4-1 Personal Computers (Millions)	0.800	1.1	1.5
4-2 Personal Computers in Education (Thousands)	280	385	600
4-3 Networked PC's (%)	30%	40%	60%
4-4 Internet Subscribers (Million)	0.180	0.320	1.2
4-5 Internet Users (Million)	0.450	0.800	1.6
4-6 Internet Hosts	2240	2802	3061
4-7 ISP's	50	80	124
4-8 ISP Monthly Charges ($)	20	12	Free
4-9 Telephone Usage Charges ($)	23.8	16.4	3.4
4-10 Available National Band Width (Mbps)	100	300	850
4-11 Hosting Availability	Yes	Yes	Yes
4-12 Secure Servers Availability	Yes	Yes	Yes
5. ICT Expenditures			
5-1 Telecom Expenditures (Million $)	710.3	781.3	859.4
5-2 IT Expenditures (Million $)	348.9	357.1	360.1
5-3 ITC Expenditures (Million $)	1059.2	1138.4	1219.5
5-4 ITC Expenditures as Percent of GDP	1.09	1.14	1.19
5-5 ICT Expenditures per Capita ($)	15.6	16.4	17.2
6. Capacity Building			
6-1 Scientists and Engineering in R & D in ICT	1674	1793	1925

	Year 2000	Year 2001	Year 2002
6-2 R & D Expenditures in ICT as percentage of GNI	1.90%	2%	2.10%
6-3 ICT Related University Graduates per Year	2600	2800	3200
7. ICT Government and Business Environment			
7-1 e-readiness index	-	-	1.73
7-2 e-government index	-	-	1.73
7-3 IPR enforcement	Weak	Weak	Moderate
7-4 Basic Telecom Agreement	No	No	Yes
7-5 Reference Paper	No	No	Yes
8. Laws and Regulations			
8-1 Patent Law	No	Under Way	Yes
8-2 Trademark Law	Yes	Yes	Yes
8-3 Copyright Law	Yes	Yes	Yes
8-4 IT Agreement	Yes	Yes	Yes
8-5 e-Commerce Law	No	No	Under Way
8-6 e-Signature Law	No	No	Under Way
8-7 Piracy rate		Not Defined	Not Defined
9. ICT Policy			
9-1 ICT Strategy	Well Defined	Well Defined	Well Defined
9-2 ICT Plan of Action	Yes	Yes	Yes
9-3 National Initiatives	Yes	Yes	Yes
9-4 Existence of Technology Incubators	Yes	Yes	Yes
9-5 Planned Technology Incubators	Yes	Yes	Yes
10. Connectivity Status			
10-1 Leased Lines	Yes	Yes	Yes
10-2 ISDN Lines	Yes	Yes	Yes
10-3 DSL Lines	Yes	Yes	Yes
10-4 Cable	Yes	Yes	Yes
10-5 Regional Satellite	Yes	Yes	Yes
10-6 Regional Fiber Optic Connection	Yes	Yes	Yes
10-7 International Fiber Optic Connection	No	No	No

LIST OF MAIN STAKEHOLDERS (INCLUDING NGO'S, CIVIL SOCIETIES INSTITUTIONS AND MAJOR PRIVATE SECTOR FIRMS)

S	Name of Stakeholder	Address
1	Ministry of Communications and Information Technology	Ahmed orabi St. Mohandessin – Giza
2	Telecom Egypt	Ramsis St. Cairo
3	Telecommunication Regulation Authority	Mohy Eldin Abo el-ez- Dokki - Giza
4	Information and Decision Support Center (IDSC)	Kaser Eleini St. Cairo
5	Software Engineering Competence Center	Smart Village - 6th October city – Giza
6	Mobinil for Mobilphone	El Nile St. - Cairo
7	Vodafone for Mobilphone	Pyramids St. - Giza
8	Egyptian Company for Telephone Sets EGTI	Maasara – Helwan – Cairo
9	Egyptian German Company for Telecommunication Industry (EGTI)	6 th October city – Giza
10	Chamber of Software Industry	Kornish El Nile – Cairo
11	Egyptian Society for Software	Nasr city – Cairo
12	Egyptian Federation for Software Companies	Nasr city – Cairo
13	Egyptian Society for Computers Companies	Nasr city – Cairo
14	Aptec Egypt (Aptec)	Mohamed Nashed St. – Cairo
15	Adcom	El Gabalaia St. Zamalek – Cairo
16	Advanced Computer Technology (ACT)	Medhat Abd Elhameed St.– Mohandessin-Giza
17	Ain e-Solutions	Abd Elhamed Lotfy – Nasr city - Cairo
18	AITEC Consulting	Okasha st. mesaha – Dokki – Giza
19	Alahram Management & Computer Center	El Galaa St. – Cairo
20	Alcatel	Bolis hana St. – Dokki – Giza
21	Alex Center for Multimedia & Libraries	El Nozha St. Saudi Building – Cairo
22	Alis Technology	Degla st. – Mohandessin – Giza
23	Allied Soft	Abd Elwahed El wakel St. – Cairo
24	Almottaheda Software	Ahmed Oraby St. – Mohandessin– Giza
25	Alpha Misr Computer Consultants	El Sheik Mohamed Nadi – Makram Ebed - Nasr City, Cairo
26	Arab Brothers	Mahmoud Sedki St. Aguza – Giza

S	Name of Stakeholder	Address
27	Arab Consultants for Computers (Informax)	El Malek Fesal – El Haram – Giza
28	Arabian co. for Advanced computer (ACS)	Kan Younis St. – Mohandessin- Giza
29	Arabic Information Systems (Info Arab)	Zamzam St. – Mohandessin - Giza
30	Arabize	Hasan El Mamoun – Sharara-Nasr city– Cairo
31	Arabize Computer Services (Arabize)	Anouar El Mofty St. - Nasr city – Cairo
32	Assel Inter@soft	El Farik Mohamed Ibrahim – Nasr city– Cairo
33	Asserag knowledge system (A.K.S.)	El Sheikh Abd Allah St. Abbasia – Cairo
34	Asset	Hanaen Ebn Eshak - Nasr city Cairo
35	Automation Consultants	Hosny Kalaf St. - Nasr city – Cairo
36	Bahgat Group	Block 240 - 6 October City – Giza
37	Bayanet	Ahmed orabi St. Mohandessin– Giza
38	Binary Works	Tayran St. – Nasr city– Cairo
39	BIT	Al Rashdan St. – Mesaha – Dokki – Giza
40	Booz. Allen & Hamillton Inc.	Maser Helwan St. – El Maadi – Cairo
41	Business Management Software (BMS)	Montazha St. - Heliopolis – Cairo
42	Cairo 2000	Mohamed Hasona St. – Cairo
43	Cairo Information Technology & Engineering	Kaser El Eini St. - Garden City – Cairo
44	Career Mid East	Anas Ebn Malek St. – Mohandessin– Giza
45	Centra	Heliopolis – Cairo
46	Ciranet	Degla St. – Mohandessin- Giza
47	Comm Net Group (CNG)	Osman Ebn Afan St. – Mohandessin - Giza
48	Compex for Information Technology (Compex)	Mohamed Nadi St. – Nasr city - Cairo
49	Compu Globe	Esmaeel El Kabany St. - Nasr city - Cairo
50	Compu Link	Damascus St. – Mohandessin– Giza
51	Computek	Mesaha st.– Dokki – Giza
52	Comsys	El Naser Road – Nasr city - Cairo
53	Crystal Mind computer solution	Makram Ebead St. - Nasr city - Cairo
54	Data Management Systems (DMS)	Galaa St. - Heliopolis – Cairo
55	Datum	Beirut St. – Heliopolis – Cairo

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S	Name of Stakeholder	Address
56	Delta Computer (Delta)	Abd Alla Ebn El Zohear – El Nozha – Heliopolis, Cairo
57	Delta Software	Hashem El Askar – El Nozua New – Cairo
58	EDS	Tatbekeen Tower – Abbassia – Cairo
59	Egynet	Hasan El Sharaey St. – Heliopolis – Cairo
60	Egyptian IT	Dr. Abd Elazem Salama St. - Nasr city - Cairo
61	Egypt soft	Mohamed Ebakly St. - Heliopolis – Cairo
62	Ericsson	Palesteen St. – New Maadi – Cairo
63	First Engineering & Software service	Gamet El Dywal El Arabya St. – Giza
64	Fujitsu	Abou El Mahasen El Shazly St.– Mohandessin– Giza
65	Future Soft (Future Soft)	Talaat Harb Square – Cairo
66	GAM	Beirut St. - Heliopolis – Cairo
67	General Dynamics	Manial St. – Cairo
68	Giza Systems	Teba st. – Mohandessin– Giza
69	Global Marketing Technology	Mohamed Sayed El Halawany-Heliopolis–Cairo
70	Harf	Free Zone - Nasr city - Cairo
71	Horizon	Asmaa Fahmy St. – Heliopolis – Cairo
72	IBM	Ahram St. km 22 – Giza
73	Information Technology (Infotech)	El Shaheed Sayed Afifi – Heliopolis – Cairo
75	Informatique	Mostafa El Nahas St. Nasr city – Cairo
76	Infosoft	Ahmed Ragab St. – Garden City – Cairo
77	ISIS	Nady El Sayed St.- Dokki – Giza
78	IT Soft	Lebanon St. – Mohandessin – Giza
79	IT Ventures	Ahmed Shawki St. – Giza
80	IT Worx	Free Zone - Nasr city - Cairo
81	Khalifa Computer Group	King Feasal St. – El Haram – Giza
82	Ladis	Anas Ebn Malek St. – Mohandessin– Giza
83	Link Dot Net	Mosadek St. – Dokki – Giza
84	Lucent	Salah Salem St. - Maadi – Cairo
85	Meddle East Network Solutions	Babal St. - Dokki – Giza
86	Mega Com	Abour St. - Nasr city - Cairo

S	Name of Stakeholder	Address
87	Mega Media	Tahrer St. - Dokki – Giza
88	Memscap	Ebn Batota St. – Heliopolis – Cairo
89	MenaNet	Beirut St. - Heliopolis – Cairo
90	Mentor Graphics	Beirut St. - Heliopolis – Cairo
91	Microsoft	Abd El Kader Hamza St. – Garden City – Cairo
92	Microtech	Mosadak St. - Dokki – Giza
93	Mobinil	Kornish El Nile – El Agoza – Giza
94	Motorola	Bou El Feda St. – Zamalek – Cairo
95	National Systems & Communication Co	Mostafa Kamal – Alexandria
96	NCR	Giza St. – Giza
97	Net Wave	Zhour St. – Heliopolis – Cairo
98	Networks Valley	Mostafa Refaat St.–Sheraton–Heliopolis – Cairo
99	Nile Clix	Kanonien Tower – Kornish El Nile St.– Maadi– Cairo
100	Nile On Line	Mohamed Hafez St. – Dokki – Giza
101	Nile Soft International	Asmaa Fahmy St. - Heliopolis – Cairo
102	Nilegroup	Seventh Region – 6 October City – Giza
103	Nilesoft	Asmaa Fahmy v. El Golf – Heliopolis – Cairo
104	NSR	Road 200 – Maadi – Cairo
105	Open Soft S.A.E (Open Soft)	Dokki St.– Giza
106	Oracle	Hegaz St. - Heliopolis – Cairo
107	Orascom Electronics Industries	Nahda St. - Heliopolis – Cairo
108	Oratech	Wadi En Nile St. - Mohandessin– Giza
109	Primasoft	Kanonien Tower – Kornish El Nile St. – Maadi –Cairo
110	Pronet	Gablaya St. Zamalek – Cairo
111	Prosylab	Mesaha St. – Dokki – Giza
112	Pyramid Technology	Sysostres – Korba – Heliopolis – Cairo
113	Raya Academy	Gomhorya St. – Dokki – Giza
114	Raya Holding	Mohy Eldin Abo El-Ez- Dokki– Giza
115	Raya Software	Abd El Hamed Lotfy St. – Nasr city - Cairo

S	Name of Stakeholder	Address
116	RDI	Omar Ebn El Katab St. – Mohandessin– Giza
117	Serhank Group	Iran St. - Dokki – Giza
118	Shakr	Free Zone - Nasr city - Cairo
119	System Integrated Co.	El Ahrar St. – Dokki – Giza
120	T Computers	Horya St. – Heliopolis – Cairo
121	Tag Systems	Abou El Mahasen El Shazly St. – Mohandessin – Giza
122	Technical Business Application Systems (Tebas)	Gamet El Dywal El Arabya St. - Mohandessin – Giza
123	Tritech	Mosadek St. – Dokki – Giza
124	United Consultant Group (U.C.G.)	Nozha St. – Heliopolis – Cairo