Egypt Information and Communications Technology Sector: Competitiveness, growth and key challenges

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<thead>
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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADSL</td>
<td>Asymmetric Digital Subscriber Line</td>
</tr>
<tr>
<td>BPO</td>
<td>Business Process Outsourcing Services</td>
</tr>
<tr>
<td>CAGR</td>
<td>Compound annual growth rate</td>
</tr>
<tr>
<td>CDMA</td>
<td>Code Division Multiple Access</td>
</tr>
<tr>
<td>CMIC</td>
<td>Cairo Microsoft Innovation Center</td>
</tr>
<tr>
<td>CMM</td>
<td>Capability Maturity Model</td>
</tr>
<tr>
<td>CMMI</td>
<td>Capability Maturity Model Integrated Services</td>
</tr>
<tr>
<td>CoE</td>
<td>Centers of Excellence</td>
</tr>
<tr>
<td>COPC</td>
<td>Customer Operations Performance Center</td>
</tr>
<tr>
<td>e-LCC</td>
<td>E-Learning Competence Center</td>
</tr>
<tr>
<td>EISI</td>
<td>Egyptian Information Society Initiative</td>
</tr>
<tr>
<td>ETSI</td>
<td>European Telecommunications Standards Institute</td>
</tr>
<tr>
<td>FDI</td>
<td>Foreign Direct Investment</td>
</tr>
<tr>
<td>IPRs</td>
<td>Intellectual Property Rights</td>
</tr>
<tr>
<td>ISIC Rev.3</td>
<td>International Standard Industrial Classification of all economic activities,</td>
</tr>
<tr>
<td></td>
<td>third revision</td>
</tr>
<tr>
<td>ISP</td>
<td>Internet Service Provider</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>ITAC</td>
<td>Information Technology Academia Collaboration</td>
</tr>
<tr>
<td>ITI</td>
<td>Information Technology Institute</td>
</tr>
<tr>
<td>ITIDA</td>
<td>Information Technology Industry Development Agency</td>
</tr>
<tr>
<td>ITU</td>
<td>International Telecommunication Union</td>
</tr>
<tr>
<td>PSTN</td>
<td>Public Switched Telephone Network</td>
</tr>
</tbody>
</table>
Kbps  Kilo bytes per second
KPO  knowledge process outsourcing services
LAN  Local Areas Network
MCIT  Egyptian Ministry of Communications and Information Technology
MB/Sec  Megabyte/ second
MPC  Mediterranean Partner Countries
M & As  Mergers and Acquisitions
NTI  The National Telecom Institute
NTRA  National Telecom Regulatory Authority
OECD  Organisation for Economic Co-operation and Development
R & D  Research and Development
SECC  Software Engineering Competence Center
TDF  Technology Development Fund
UN  United Nations
UNCTAD  United Nations Conference on Trade and Development
USF  Universal Service Fund
VoIP  Voice over Internet Protocol
VSAT  Very Small Aperture Terminal
WiBro  Wireless Broadband
Wi-Fi  Wireless Fidelity
WiMAX  Worldwide Interoperability for Microwave Access
WLL  Wireless Local Loop
xDSL  any of several types of digital subscriber lines
3G  Third-generation mobile network or service
1. Introduction

In the last decades, the world has witnessed uninterrupted growth in terms of telecommunication and ICT infrastructure development and service uptake. According to the International Telecommunication Union (ITU) (2009)\(^2\), by the end of 2008 the world attained over 4 billion mobile cellular subscriptions translating into a penetration rate of 61 percent. Moreover, the ITU estimated that the world had 1.3 billion fixed telephone lines (19 per 100 inhabitants) and that almost a quarter of the world’s 6.7 billion people were using the Internet.

The Egyptian government has made big strides in the last couple of decades towards establishing the country as a potential ICT hub in the region. Major infrastructure developments have upgraded the ICT capacities in Egypt. In addition to laying a modern communication infrastructure, the government is promoting the use of computers and the internet for economic growth.

The Government of Egypt recognizes the ICT sector as a critical component of the national economy, not only due to its substantial contribution to value added, employment, exports and diversification of the economy, but for its dynamic and innovative potential, and its broader role in providing enabling technologies, products and services that underpin the development of Egypt as a knowledge economy in the global market.

Over the last decade Egypt has successfully mainstreamed ICT as part of its national development strategy. Egypt’s 2010 ICT Strategy\(^3\) consolidates and builds on the progress made to date by the government in partnership with the private sector and civil society. Egypt’s 2010 ICT strategy key priorities are: to continue development of state-of-the-art ICT infrastructure that provides an enabling environment for government and businesses throughout Egypt and links it globally; to create a vibrant and export-oriented ICT industry; to leverage public-private partnerships as an implementation mechanism; to enable society to absorb and benefit from expanding sources of information; to create a learning community whose members have access to all the resources and information they require regardless of gender and location, thus allowing all to achieve their full potential and play a part in the country’s socioeconomic development; to support the development of the skills required by the ICT industry; to support research and innovation in the field of ICT.

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\(^1\) This paper benefited from valuable input from Dr. Nagwa EL Shenawy, Information Center, Egyptian Ministry of Communications and Information Technology (MCIT); Dr. Howaidah Ismail from MCIT, Heba Youssef, Manager of the Economic Analysis Unit, Information Center, and Maha Abdel Fattah, Research Analyst at the Egyptian Center for Economic Studies (ECES).


\(^3\) Egypt ICT Strategy 2007-2010, MCIT.
In March 2008, Egypt became a regular Observer to the OECD Committee for Information, Computer and Communication Policy (ICCP). Egypt is the second African country after South Africa to join ICCP. Since joining the ICCP, the Ministry of Communication and Information Technology (MCIT) has participated in all official meetings and has adopted the OECD Seoul Ministerial Declaration on the future of the internet economy that took place June 2008.

Egypt aims to position itself as a potential ICT hub Middle East region and to become one of the top five major outsourcing and off-shoring destinations. With its unique location at the crossroads of Europe, Africa and the Middle East, and a young population with diverse skills and economic potential, ICT is one of the key drivers of economic development and growth. The aim of this paper is to analyse the current and potential contribution of Information and Communication Technology (ICT) to the Egyptian economy and to discuss its challenges. We will also compare Egypt’s ICT competitiveness to OECD enhanced engagement countries as they are like Egypt classified as middle income countries as per the World Bank definition. More precisely, China, India, Indonesia and Egypt are classified by the World Bank as lower-middle-income economies, whereas, Brazil and South Africa are classified as upper-middle-income economies. Figure A1 in Annex, shows the gross national income per capita in 2007 for Egypt and OECD enhanced engagement countries.

The current research paper is structured as follows; section 2 addresses the general economic environment; section 3 discusses ICT contribution to the Egyptian economy; section 4 reviews Egypt’s ICT industry and its growth; section 5 contrasts Egypt’s ICT competitiveness to OECD enhanced engagement countries; section 6 presents Egypt’s outsourcing success story; section 7 highlights Egypt’s ICT competitiveness driving factors and discusses the key challenges facing Egypt’s ICT sector and section 8 concludes.

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4 OECD member countries define the ICT sector as a combination of manufacturing and services industries that capture, transmit and display data and information electronically. This definition based on (ISIC Rev.3) and adopted by OECD member countries in 1998 was considered a first step towards obtaining some initial measurements of ICT sector core indicators. The principles underlying the definition are the following: For manufacturing industries, the products of a candidate industry: -Must be intended to fulfil the function of information processing and communication including transmission and display; -Must use electronic processing to detect, measure and/or record physical phenomena or control a physical process. For services industries, the products of candidate industry:- Must be intended to enable the function of information processing and communication by electronic means. One important feature of the OECD ICT sector definition is that it breaks the traditional ISIC dichotomy between manufacturing and services activities. (Refer to annex box A1 and A2 for OECD sector definition based on ISIC Rev.3.1 and ISIC Rev.4, respectively).

5 According to the World Bank definition lower-middle-income economies are those with a GNI per capita ranging between US$936-US$3,705 in 2007.

6 According to the World Bank definition upper-middle-income economies are those with a GNI per capita ranging between US$3,706-US$11,455 in 2007.
2. General economic environment

Egypt’s economy has been growing steadily over the last five years with an average real GDP growth rate of six percent during the period from 2003/04 to 2007/08 as shown in figure 1 below. The driving sectors behind the fast growth witnessed in 2007/08 were tourism (4.2 percent of GDP, 24.3 percent growth), Suez Canal (3.7 percent of GDP, 18 percent growth), construction (4.5 percent of GDP, 14.8 percent growth) and telecommunication (3.3 percent of GDP, 14.2 percent growth).

Figure 1: Egypt’s real GDP growth at factor cost (%)

The upward economic growth trajectory is a result of various structural reforms and improvements in the overall business environment. Those were reflected in the World Bank’s “Doing Business Report, 2009”. Egypt remained among the ten reforming countries for the third time in four years and top regional reformer in 2008, moving up eleven places to 114th out of 181 countries in the global rankings. This was largely due to improvements in the ease of starting a business, registering a property, managing construction permits, obtaining credit information, investor protection and cross border trade.

Foreign direct investments (FDI) inflows increased over the last two years to unprecedented levels, reaching US$13.2 billion in 2007/08 and US$ 11.1 billion in 2006/07 this is against US$ 3.9 billion in 2004/05. According to the World Investment Report (2008) by the UNCTAD, Egypt is the first FDI recipient in North Africa and the second in Africa.

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7 Egypt’s fiscal year starts July 1st and ends June 30th of the following year.
Despite the upward trend in the Egyptian economic growth and improvements in the overall business environment, key challenges include maintaining economic growth, achieving balance of payments stability, addressing fiscal imbalances, reducing poverty, decreasing income inequality and curbing inflation.

In the context of the global financial turbulence and the deteriorating international economic outlook, Egypt’s real economic growth for the period October-December 2008/09 displayed signs of deceleration, with real GDP at factor cost growing at 4.1 percent during the second quarter of 2008/09 compared to 7.7 percent in the same quarter of the previous year. The recent deceleration comes with the slowdown in investment growth during the second quarter of 2008/09 to 3.4 percent versus 16.1 percent in the same quarter of 2007/08. From a sectoral perspective, the deceleration is mainly due to sluggish growth of some sectors, Tourism (4.9 percent of GDP, -7.8 percent growth), Suez Canal (3.6 percent of GDP, -2.5 percent growth) and manufacturing (15.9 percent of GDP, 3.8 percent growth). It is worth noting that the sectors that remained resilient are the extractive industries (13.9 percent of GDP, 4.8 percent growth) and telecommunications (3.4 percent of GDP, 19.2 percent growth). \(^9\)

**Figure 2:** Growth rates of key sectors in the Egyptian economy in the second quarter of 2008/09 as compared to second quarter of 2007/08

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Série1</th>
<th>Série2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suez Canal</td>
<td>19,2</td>
<td>19,2</td>
</tr>
<tr>
<td>ICT</td>
<td>15,5</td>
<td>38,3</td>
</tr>
<tr>
<td>Tourism</td>
<td>4,8</td>
<td>-7,8</td>
</tr>
<tr>
<td>Oil and Gas</td>
<td>2,4</td>
<td>-2,5</td>
</tr>
<tr>
<td>Construction</td>
<td>9,3</td>
<td>3,8</td>
</tr>
<tr>
<td>Industry</td>
<td>15,4</td>
<td>8</td>
</tr>
</tbody>
</table>

Source: Ministry of State for Economic Development (2009), Follow-up report on first half of FY 2008/09, Egypt.

The international crisis is expected to impact negatively FDI inflows and make domestic investors more cautious; private consumption is expected to decline and net exports of goods and services are expected to decrease as key markets slow down and prices fall. As a result, GDP

\(^9\) Data obtained from Ministry of State for Economic Development, Follow-Up report for the first half of fiscal year 2008/09.
growth is likely to decrease in the next couple of years. As a stimulus to economic growth, the government declared that it will increase its expenditure on infrastructure projects, while avoiding increases in recurrent expenditure. Similarly, the Central Bank of Egypt started to adopt a less restrictive monetary policy as inflation starts to ease.

To offset the impact of the ongoing financial crisis on the ICT sector, The Ministry of Communication and Information Technology (MCIT) has adopted several measures to stimulate local demand on ICT and to support exports of which: encouragement of ICT usage in different economic and social sectors, especially education and health; supporting software companies to increase their sales, through the implementation of programs that generate excess funds to these companies; and encouraging banks and financial institutions to offer credit facilities to local companies investing in the ICT sector.

Moreover, MCIT is encouraging other ministries and government entities to outsource some of their activities which can be implemented with high quality customer services through using local contact centers, which will result in creating thousands of job opportunities in the year 2009 and 2010. In addition, a joint committee from the MCIT and ITIDA\(^1\) (Information Technology Industry Development Agency) and the civil society organizations was established to select suitable qualified projects that are to be financed and assisted by the ministry. These efforts are expected to boost the ICT domestic demand and to create job opportunities in the sector.

To stimulate Egypt’s ICT exports, MCIT encourages multinational companies to invest in the Egyptian ICT market and also assists Egyptian IT companies to expand their outsourcing services to the rest of the world and to guarantee five-years employment contracts for their employees. The above measures are implemented side by side to the existing policies already adopted by the Government of Egypt which focus on attracting foreign investments, increasing ICT domestic demand, supporting exports, creating job opportunities and increasing skills through sustainable and continuous training programs

### 3. ICT contribution to the economy

As stated in the Information Economy Report 2007-08\(^11\) by UNCTAD, ICT is a general-purpose technology and hence has a pervasive impact on the economy. The economic impact of ICT could be more important in terms of externalities and spillovers through its use and applications in the various sectors of the economy, than its direct contribution to GDP. Faster and better communications result in cost-saving transactions and better communication between economic agents. The ICT sector has generated new types of services such as e-commerce, e-government, e-business...etc. The use of ICT for business processes can contribute to income generation and

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\(^{10}\) The Information Technology Industry Development Agency (ITIDA) is dedicated to promoting, developing and growing Egypt’s information and communications technology industry with a particular focus on business process outsourcing. As a self sustainable agency, ITIDA plays a leading role in enhancing the Egyptian cyber security and data protection framework towards a more secure e-Business and Business Process Outsourcing (BPO) services positioning.

\(^{11}\) UNCTAD, Information Economy Report, 2007-08.
increased labour productivity. In the current section we will examine the ICT contribution to the Egyptian economy

3.1 ICT contribution to GDP

Egypt’s ICT contribution to GDP almost doubled over the last five years to reach 3.3 percent of GDP by 2007/08 as compared to 1.9 percent in 2003/04. ICT contribution to real GDP increased to almost 4 percent during the quarter October-December 2008/09. Figure 3 shows ICT sector contribution to real GDP on a quarterly basis from 2006/07 to Q2 2008/09.

Figure 3: ICT Sector Contribution to Real GDP

Over the last five years, the sector has managed to maintain growth rates of up to 20% for ICT revenues. In 2007/08, the total value added of the sector at fixed prices has reached 4.5 billion dollar; with an annual growth rate of 14.2%, coming among the fastest growing sectors in the economy. The ICT sector component of GDP at constant prices increased to LE 26.3 billion in 2007/08 up from LE 23 billion in 2006/07.

As mentioned in section 2, despite of the global financial crisis Egypt’s ICT sector recorded a growth rate of 19.2 percent in Q2 2008/09 ahead of all other economic sectors for the period.

3.2 Employment in ICT

With the increase in utilization of ICT within the Egyptian economy, there has been significant growth in the number of Egyptians employed in ICT by both ICT and non-ICT firms. Egypt’s employment in ICT has been growing by an average of 9 percent annually over the last four years. The growth in employment in the Egyptian ICT sector has outstripped the national average, indicating Egypt’s increasing contribution to the knowledge economy. Figure 4 shows the growth in employment in ICT from Q4/2006 to Q4/2008 where employment in ICT sector grew by 18 percent over the period. By the end of year 2008, the number of ICT sector direct employees reached 175.1 thousand jobs, compared to 162.5 thousand by the end of 2007. Those figures do not include those working in internet cafes, IT clubs and mobile cards and accessories shops; if those are included the figure for employment in ICT would be even higher.
Employment in ICT private sector represents more than 70 percent of total employment in ICT sector. Despite the growth in employment in ICT sector and its potential for further growth, the contribution of employment in ICT to total employment in Egypt is still below its potential constituting around 1 percent of total employment in the country. The government of Egypt target is to create 10 thousand direct jobs and 25 thousand indirect jobs in the ICT sector annually.

**Figure 4: Egypt’s employment in ICT (Q4/2006 to Q4/2008)**

*Not including those working in internet cafés, I.T. clubs and mobile cards and accessories shops.*


### 3.3 Investment in ICT

In Egypt investments in ICT have been growing steadily. Investments in ICT grew considerably from 2001/02 to 2007/08 (as shown in figure 5). Annual growth of investments in ICT averaged 30 percent during the same period. Moreover, the private sector has been the major investor in the sector with a growing share year after another, private sector share in ICT total investments grew from 65 percent in 2001/02 to 88 percent in 2007/08.

**Figure 5: Total investments in ICT in Egypt (2001/02 to 2007/08)**


### 3.4 Contribution of ICT to the treasury

Over the last decade, Egypt’s ICT sector was transformed from one dependant on subsidies and grants to a revenue generating sector and a net contributor to the treasury, adding over US$ 7.8

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12 Data from the Ministry of State for Economic Development, 2009.
billion to the treasury during the period (2005-2008), hence enabling the government to enhance and widen its provision of social services and developmental plans. Figure 6 presents ICT contribution to treasury and its components from 2005 to 2008.

Figure 6: Egypt’s ICT contribution to treasury from 2005 to 2008 in LE billion.


3.5 Trade in ICT

The ICT sector plays an important role in the development of a competitive information economy. ICT trade has been growing over the last few years. ICT sector supply and markets in developing countries grew much faster than in member countries of the Organization for Economic Co-operation and Development (OECD). As reported by UNCTAD, the shift from developed to developing countries is likely to continue and the ICT sector will play an increasing role in trade. ICT services account for more than two thirds of ICT sector value added in the OECD countries, with growth sectors being communications services and software services.

3.5.1 Trade in ICT services

Egypt is a key player in trade of ICT enabled services. Egypt ranked 40th out of the top 50 ICT enabled exporters in 2005 with exports value of US$ 2.3 billion as per UNCTAD Information economy report 2007-2008.

Figure 7(a) below demonstrates Egypt’s total ICT services exports per capita versus the OECD enhanced engagement countries in 2006 whereas Figure 7(b) shows Egypt’s total ICT imports per capita as compared to OECD enhanced engagement countries for 2006.

\[ \text{Source: UNCTAD, Information Economy report, 2007-2008.} \]

\[ \text{ICT enabled services go beyond the economic activities described in the ICT sector classification and include such BOP services categories as communication services, insurance services, financial services, computer and information services, royalties and license fees, other businesses, and personal, cultural and recreational services (UNCTAD, 2008).} \]
In 2006, Egypt’s ICT services exports per capita in US$ surpassed Indonesia, China and Brazil whereas in terms of imports of ICT services per capita in US$ Egypt came ahead of India and China and lower than Brazil, South Africa and Indonesia.

ICT services exports are composed of two categories: exports of communication services; and exports of computer and information services. In 2006, Egypt was the second largest exporter of ICT services in Africa for both communications and computer and information services, competing strongly with South Africa. Egypt has a great potential of becoming a competitive international location for offshore services owing to its competitive workforce, and location\textsuperscript{15}.

In 2006, Egypt had the highest exports of communications services per capita in US$, higher than each of the OECD enhanced engagement countries (Figure 8). As for exports of computer and information services, Egypt exports per capita were higher than Brazil and Indonesia and lower than South Africa, China and India which had the highest per capita exports of computer and information services in that year (as per table 1). According to OECD Information Technology Outlook 2008, India is the leading exporter of computer and information services.

\textsuperscript{15} Yankee Group Report, 2007.
3.5.2 Trade in ICT goods

Even though Egyptian ICT goods exports have a considerably lower value than ICT services exports, yet it grew considerably by 22 percent (CAGR) annually from 2000 to 2007, while services increased at a lower rate of 9 per cent (CAGR). Telecommunications equipment and audio and video equipment account for more than three quarters of exports and grew considerably as of 2000. The main importers of Egyptian ICT goods are neighboring countries in North Africa and Middle East. Table 2 shows Egypt and OECD enhanced engagement countries value of exports and imports in 2007. We note that Egypt is a net importer of ICT goods and that ICT goods deficit mounted to US$ 1.7 billion in 2007.

Since 2004, China has been the world’s largest exporter of ICT goods. Brazil has increased its exports of ICT goods by 16 percent a year since 1997 faster than imports growth of 5 percent a year owing to strong growth in exports of communication equipment. Yet, Brazil had a trade deficit in ICT goods in 2007. South Africa’s ICT goods exports and imports have been growing by 10 percent a year during the last ten years with slightly stronger growth in exports. Both

Table 1: Exports of computer and information services per capita (US$) in 2006

<table>
<thead>
<tr>
<th></th>
<th>Exports of computer and information services per capita (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>25.3</td>
</tr>
<tr>
<td>Indonesia</td>
<td>0.5</td>
</tr>
<tr>
<td>China</td>
<td>2.3</td>
</tr>
<tr>
<td>Egypt</td>
<td>0.7</td>
</tr>
<tr>
<td>Brazil</td>
<td>0.5</td>
</tr>
<tr>
<td>South Africa</td>
<td>2.7</td>
</tr>
</tbody>
</table>

Source: UN Service Trade Database, 2008.
Brazil and South Africa have trade deficit in all categories of ICT equipment. Indonesia, on the contrary has substantial and growing trade surplus in ICT equipment.

Table 2: Total value of ICT goods exports and ICT goods imports in 2007 in million USD

<table>
<thead>
<tr>
<th>Country</th>
<th>Total ICT goods Exports</th>
<th>Total ICT goods Imports</th>
<th>Surplus/deficit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>5,237</td>
<td>10,692</td>
<td>-5,455</td>
</tr>
<tr>
<td>China</td>
<td>440,951</td>
<td>290,420</td>
<td>150,531</td>
</tr>
<tr>
<td>Egypt</td>
<td>22</td>
<td>1,727</td>
<td>-1,705</td>
</tr>
<tr>
<td>India</td>
<td>4,325</td>
<td>20,591</td>
<td>-16,266</td>
</tr>
<tr>
<td>Indonesia</td>
<td>8,961</td>
<td>5,296</td>
<td>3,665</td>
</tr>
<tr>
<td>South Africa</td>
<td>1,632</td>
<td>10,185</td>
<td>-8,553</td>
</tr>
</tbody>
</table>

Source: UNCOM Trade Database, 2008.

4. ICT industry and its growth

4.1. The regulatory and institutional environment

The regulatory environment plays a major role in boosting the ICT sector and its growth. In this section we will briefly highlight the key measures taken by the Egyptian government to deregulate and liberalise the ICT sector.

Since the late 1990s, the Egyptian government has made deregulation and development of the telecommunications sector a priority. One of the main steps in deregulating the sector was the creation of the National Telecommunications Regulatory Authority (NTRA) in 1998. The key responsibilities of the regulator (NTRA) are: to increase private investment in the sector; to oversee telecommunications technical aspects such as monitoring frequencies and their spectrum; and to issue service licenses and to approve all sector related tariffs.

In October 1999, the Ministry of Telecommunications and Information Technology (MCIT) was launched as the policy making authority for the ICT sector. MCIT’s mandate is to develop and improve the telecommunication infrastructure and to promote the development of Egypt’s information society.

Egypt was an early signatory of the GATS agreement. In 2002 it voluntarily acceded to the Basic Telecommunication Agreement (BTA), thus committing itself to dismantling all governmental monopoly on the provision of telecom services. Egypt’s international obligations have been reaffirmed through the promulgation of Telecom Act which set definite timelines for liberalizing telecom services. The act also outlined the provision by which Egypt pledges to safeguard the
publicity of information and the protection of free competition, provisioning of universal service and protecting consumer rights.

To create an enabling environment a series of laws and regulations were issued over the last few years covering areas including telecommunications, e-signature, intellectual property rights and industry development. In 2003, telecom law was issued which asserted the role of NTRA as the regulator. Recently, a draft law on data protection, privacy and cybercrime law has been prepared and will be forwarded to legislative bodies in the near future.

As per law No. 10 for the year 2003 “the Telecom Regulation Law” the role of the National Telecom Regulatory Authority (NTRA) was asserted as the national authority to administer the telecommunication sector, considering transparency, open competition, universal service and protection of users’ rights. NTRA is self funded from licenses fees and provision of other services.

According to the national law governing telecommunications in Egypt, all licensed companies are obliged to adhere to the Protocol of Health Aspects and Rules of Safety, as well as, to all environmental and health regulations issued by either the Ministry of Environment or the Ministry of Health and Population. All licensed operators are obliged to comply with quality of service terms and conditions parameters that are set according to ITU and ETSI recommendations. Those parameters are monitored and measured by NTRA and in case of incompliance penalties are in place.

Universal service can be defined as the provision of affordable telecommunication services to all citizens- especially those residing in areas where supply of telecom services is thought to be economically non-feasible- with the aim of enabling the citizens to access other public telecommunication networks being local, national or international, including fax and data services with speed rates that allow for accessing the internet. This should be achieved within a framework of technology neutrality and a competitive environment.

In March 2005, NTRA established a universal service fund (USF) with an initial budget of LE 50 million. The aim of the USF is to compensate telecommunications operators and service providers for “price differences between the approved economical price for a service and that which may be determined by the government in favor of the user” and to fund the provision of universal services in un-served or underserved areas, for example the deployment of payphone service in these areas. This fund will subsidize tariffs in those areas and in areas where services are non economical.

Goals of the NTRA Universal Service Policy include guaranteeing access to telecommunications services to all citizens at affordable prices; enhancing usage of modern technologies and
expanding the scope of services offered and narrowing the digital divide between people especially e-government services, internet and data services; and to increase the average penetration rate of fixed line telephony from the current average of 15.1 per cent to 20 per cent across the 26 governorates. NTRA did not yet fully introduce unified/converged/ service neutral licensing regime but is working towards full convergence\(^{16}\).

The first two sectors that have been privately operated are the mobile services and the internet services. Mobile services were liberalised as of 1998 with the establishment of two mobile operators. A third mobile operator was licensed in 2006. Currently, there are three companies which offer cellular communication service in Egypt. Those are Mobinil, Vodafone Egypt and Etisalat Egypt. These companies are providing services surpassing voice communication such as 3G and 3.75G services. The competition among these operators resulted in a major decline in mobile services prices and the introduction of high quality mobile services in the Egyptian market.

The Egyptian internet service providers (ISPs) market is fully liberalized and highly competitive, with over 220 ISPs offering a range of services, including dedicated, dial-up, pre-paid and premium services. With the introduction of Asymmetric Digital Subscriber Line (ADSL) for homes and businesses, more subscribers are introduced into the market. It is expected that by the end of 2010 high-speed Internet access will be available across the entire country.

To date the fixed line market is still dominated by a sole operator, Telecom Egypt (TE), which has been partially privatized (20 per cent private; 80 per cent public). TE owns 44.95 per cent of Vodafone Egypt, one of the existing three mobile operators. Telecom Egypt operation is totally separate from Vodafone’s and negotiations on the infrastructure and wholesale services occur in a transparent way. In 2007, the Ministry of Communications and Information Technology (MCIT) has announced that it will auction a second fixed line license including the provision of international services. Yet, given the difficult international climate, the auction of the second fixed-line telecommunications license has been postponed.

4.2. ICT access and use

In this section we will present the trends in ICT access and use by individuals and enterprises in Egypt focusing on the technologies of mobile telephony and internet which have been recognised as having the greatest impact on developing countries\(^{17}\).

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\(^{16}\) Meeting with NTRA senior officials in September 2008.

\(^{17}\) According to UNCTAD, information economy report 2007/08, mobile phones have lowered the threshold of ICT access for developing countries, while the Internet and particularly broadband internet exponentially increase the availability of access to information and the ability to exchange it.
4.2. 1. ICT access and use by individuals

4.2.1.1. Fixed Line Telephony

Egypt’s fixed lines penetration rates increased from 9 percent in 2000 to 15.7 percent in 2008. The total number of subscribers reached 11.8 million by December 2008 as compared to 5.8 million in year 2000 (as shown in figure 9).

Figure 9: Egypt’s fixed lines penetration rates and number of subscribers (2000-2008)


Egypt international voice traffic (minutes) have been growing considerably over the last few years. This could be interpreted as a sign of greater communications and integration with the rest of the world. Figure 10 shows the growth in international voice traffic in Egypt from year to year and corresponding trillion minutes.

Figure 10: International voice traffic in Egypt (2002-2008)

4.2.1.2. Mobile phones
In the past few years, mobile telephony has emerged as the principal gateway to increased ICT access and use, particularly so for developing countries. Over the last five years, the number of mobile phone subscribers in developing countries has almost tripled accounting for almost 58 percent of total mobile subscribers worldwide. The surge in mobile telephony can serve as a digital bridge. Moreover, mobile phones, being the main communication tool for many entrepreneurs, particularly, small and medium sized enterprises can play an effective role in communicating with clients and for ordering supplies.

In Egypt, the surge in the number of mobile subscribers and usage of mobile phones is remarkable. Mobile subscribers grew from 3.4 million in 2000 to 41.3 million in 2008. In 2007/08 annual growth rate for mobile lines was around 37 per cent and mobile penetration grew by 14.12 percent. Figure 11 illustrates the boom in the Egyptian mobile market from 2000 to 2008.

Figure 11: The boom in Egypt’s mobile market (2000-2008)


According to UNCTAD information technology report 2007/08, a trend to watch in the years to come is fixed-mobile convergence (FMC), or the integration of fixed and mobile services. Technology has evolved in the few years allowing such convergence. FMC holds great promise especially for developing countries where fixed telephony faces infrastructure hurdles and where internet access is often restricted by limited availability of computers and fixed-line connections.

4.2.1.3. Internet
Access to the World Wide Web is necessary for the understanding and the optimum use of new technologies underpinning today’s modern life. Expanding the internet user base has become an integral part of a country’s ICT policy framework and of its overall development strategy. The expansion of a country’s Internet penetration level could be considered a form of technological

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diffusion as workers who use it are more likely to be more efficient or/and produce new kinds of goods and services.

MCIT is exerting tremendous efforts to increase the internet usage and penetration. In this respect several initiatives are in place. Egypt’s Free Internet initiative and broadband connectivity programs have helped increase accessibility to the internet and made connectivity affordable to most citizens. Subscription-free internet enables all Egyptians to access the Internet at the cost of a local phone call. As a result, the number of Internet users in the country has increased from 0.65 million users in 2000 to 12.6 million users in 2008. Internet penetration hiked from 1.01 per cent in 2000 to 16.7 per cent in 2008. Broadband is increasingly replacing dial-up due to the reduction of monthly cost of ADSL to reach USD 8 per month. The international internet bandwidth reached 27077 MB/Sec by the end of 2008 compared to 14866 MB/Sec a year earlier. I.e. an annual growth of 93 percent. Figure 12 illustrates Egypt’s growth in internet usage and penetration during the period 2000-2008.

Figure 12: Egypt’s growth of Internet users and Internet penetration (2000-2008).


Similarly, Egypt witnessed an observable increase in the number of broadband users to reach 7 million in 2008 up from 2.9 million in 2005 (as per figure 13).
4.2.1.4. ICT services affordability

Besides quality and dependability of a service, affordability is a key determinant for increased usage of a particular type of ICT service. Table 3 shows the price baskets for mobile, fixed-line and fixed broadband services in $ for Egypt and OECD enhanced engagement countries in 2007. Of all countries, India had the lowest mobile price basket followed by China and then Egypt. For broadband prices, India enjoys the lowest fixed broadband price at US$ 6. Egypt comes next with a price of US$ 8.3.

As for fixed line price basket, Egypt had the lowest prices followed by India and China. The reason behind such low prices in Egypt was subsidization of fixed line local minute costs. Tariff rebalancing was recently introduced in Egypt in July 2008 where local minute cost was increased and national and international minute price was reduced.

As of July, 2008, the fees for installing a new landline was cut by 50 per cent to be LE 250 instead of LE 500 for home use and LE 500 instead of LE 1000 for commercial use. The tariff for a phone call from a landline to a mobile phone and vice versa was reduced by 33 per cent from 45 Piasters during peak time and 35 Piasters rest of day to become 30 Piasters all day long. The paging service (inter-province fixed line rates) fees during peak time decreased by 20 percent to be 16 Piasters for more than 60 kilometers and 8 Piasters for less than 60 kilometers like the currently applied fee for non-peak times. The monthly subscription for the home landline has been increased by 20 per cent from LE 10 to LE 12. For commercial landlines, the subscription has been increased by 50 per cent from LE 16 to LE 24. The tariff for local phone calls was increased from 2 Piasters to 3 Piasters per minute.
Table 3: Services Price Baskets\textsuperscript{19} for Egypt and OECD enhanced engagement countries 2007

<table>
<thead>
<tr>
<th>Country</th>
<th>Mobile in $</th>
<th>Fixed line in $</th>
<th>Fixed broadband in $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>37.01</td>
<td>29.12</td>
<td>47.33</td>
</tr>
<tr>
<td>China</td>
<td>3.60</td>
<td>3.70</td>
<td>18.50</td>
</tr>
<tr>
<td>Egypt</td>
<td>3.62</td>
<td>3.00</td>
<td>8.33</td>
</tr>
<tr>
<td>India</td>
<td>1.63</td>
<td>3.49</td>
<td>6.07</td>
</tr>
<tr>
<td>Indonesia</td>
<td>5.33</td>
<td>4.53</td>
<td>21.68</td>
</tr>
<tr>
<td>South Africa</td>
<td>12.33</td>
<td>22.44</td>
<td>26.31</td>
</tr>
</tbody>
</table>


4.2. ICT access and use by enterprises

Access to ICTs by enterprises means that they have better access to information and their use of ICTs business processes can help increase their productivity. In this section we will look at the adoption of the Internet and e-business by small and medium enterprises (SMEs) in Egypt.

Table 4: Enterprises with internet and website (enterprises with 10 or more employees)\textsuperscript{20}

<table>
<thead>
<tr>
<th>Reference year</th>
<th>Enterprises using computers</th>
<th>Enterprises using internet</th>
<th>with an intranet</th>
<th>receiving orders online (from those using internet)</th>
<th>placing orders online (from those using internet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt 2008</td>
<td>51.2</td>
<td>30.5</td>
<td>30.5</td>
<td>19.3</td>
<td>19</td>
</tr>
</tbody>
</table>

Source: MCIT data, 2008.

Thirty percent of SMEs in Egypt are using the internet. 19 percent only use it to receive and place orders online. The greater SMEs are aware of the benefits of using information technology in managing orders and purchases as well as linking and automating the various business activities, the greater their usage will be of the internet. Moreover, the reduction in prices for ADSL connectivity and free internet for all are promoting internet usage by new segments of the SMEs in Egypt.

\textsuperscript{19} ICT price baskets are in accordance to definitions of the ITU. The average monthly costs of fixed telephone, mobile cellular and broadband internet in USD are measured according to the following equations:

**Fixed telephone**=
fixed telephone monthly subscription + 30 local calls (15 peak and 15 off-peak calls)/ monthly GNI per capita

**Mobile cellular**=
25 outgoing calls in predetermined ratios+30 SMS messages/ Monthly GNI per capita

**Fixed broadband Internet**=
Monthly subscription to an entry plan/Monthly GNI per capita

\textsuperscript{20} Brazil data from the “Survey on the use of ICT” conducted by the Brazilian Internet Steering Committee. Egypt data from the 2007 survey on “Use of ICT in businesses” conducted by the Central Agency for Public Mobilization and Statistics (CAPMAS).
According to MCIT, Private Enterprises Survey results, private enterprises are gaining significantly from using different ICTs; for instance internet helped 93% of Egyptian private enterprises using the Internet to speed up their operations, while around 53% believed it increased customer accessibility. Other benefits included reducing transaction costs, according to 22% of private enterprises using the Internet, and increasing security, according to 15%. (Figure 14) shows the private enterprises benefits from using the internet in 2007 and 2008.

**Figure 14: Private Enterprises Benefits from Using the Internet (2007 and 2008)**

![Bar chart showing benefits of internet usage](chart.png)


Access to the internet especially via broadband can enhance the adoption of certain applications that have a positive impact on enterprise productivity. Having secure internet servers is key to increased usage of internet in conducting financial transactions and e-business.

To increase e-commerce, trust in the safety of electronic transactions must be increased among consumers and SMEs, this could be achieved by greater awareness-raising, increased secure internet servers and better regulatory environment.

### 4.3. Egypt’s information economy

Egypt’s ongoing strategy to increase e-access, implemented in partnership with the private sector, is providing ways and affordable access to ICT to an increasing segment of the population. New initiatives such as PC 2010- Nation online will further increase access and quality of public services. The PC 2010-Nation online initiative provides low cost PCs in instalments starting from USD 7 per month. It aims to increase PC penetration within households and academic sector. As a result to date, PC penetration increased to 13 per cent. IT Clubs, of which there are now over 1,776 nationwide manage by partnering local NGOs, continue to be successful as educational and ICT access centers in outlying areas, particularly for women. IT
Clubs exist all over the country primarily in remote and deprived areas to provide access and training to local communities.

Education, health and government services are key priorities for the country’s development where ICT provides considerable added value. The Egyptian Education Initiative is enhancing the effective use of ICT in all levels of education. The Telemedicine, Network, the Health Informatics Program and the Medical Emergency Call Centers are reducing costs and increasing efficiency of public health services in Egypt. Public private partnerships with multinational companies have enabled Egypt to lead in providing e-government applications.

The promotion of ICT literacy and an entrepreneurial culture, particularly to young people and in academic circles, is essential for the sustainable development of the Egyptian ICT environment. MCIT launched the Egyptian Educational Initiative (EEI), through which it has established infrastructure in 2,000 k-12 schools, upgraded that of the Egyptian universities network and also provided high-speed connectivity to many of these institutions. The initiative has also addressed issues of capacity building for in-service professionals and those under training in aspects of utilizing ICT for education and content development. The capacity building programs have benefited more than 80,000 trainees at different levels. The EEI is a partnership between Ministry of Education and MCIT and is built on public private partnership between the government, the World Economic Forum’s IT member community and various multinationals. The initiative comprises four tracks: pre-university, higher education, life-long learning and ICT industry development. One of the key objectives of the EEI is to ensure that all preparatory schools be connected to broadband by 2012 and that teachers are trained on how to integrate ICT in education.

Other notable projects to support the integration of ICT in training and education are the Smart Schools Network Program and ICT for illiteracy eradication. The Smart Schools Program aims to introduce new methods of pedagogy and administration in preparatory schools. The first phase covered 38 schools across Egypt. By the end of 2007, two new phases were launched to cover another 135 preparatory schools nationwide.

The ICT for illiteracy eradication program introduced electronic content for teaching basic Arabic and elementary mathematics. The program adopted a mixture of taught and self-study courses.

Despite efforts and educational initiatives aiming to prepare individuals to benefit from ICT, there is a real need to address the lack of initiatives addressing vocational training and ICT.

A wide spectrum of programs has been developed with the objective of increasing ICT skills, ranging from basic ICT literacy to advanced and specialized training. These programs have
served more than 100,000 persons of various skill levels to address market needs. The National Telecom Institute (NTI), the Information Technology Institute (ITI) and the E-learning Competence Center (eLCC) are creating specialized training programs in ICT.

MCIT championed the establishment of Nile University, a high-tech, not-for-profit research and development institution specialized in engineering technology and business administration. Other efforts to address both capacity building and entrepreneurship support include the Egyptian Information, Telecommunications, Electronics and Software Alliance (EITESAL), which focuses on bridging the gap between academia and the ICT industry. EITESAL helps young talents develop practical and industrial skills within educational programs.

Another priority for MCIT is support of ICT start-ups. An annual ICT business plan competition is conducted to spot young talents. An incubation facility was set up at Egypt’s technology park, the Smart Village. Virtual R & D Centers of Excellence clustering start-up companies, multinationals, Egyptian expatriates and research centers were created in key niche areas such as data mining and wireless technologies. Moreover, a private technology venture capital fund was established.

There are also targeted programs such as SMEs programs with the objective of increasing SMEs utilization of ICT. The Industrial Modernization Program provides training to ICT training to industrial companies.

The government has launched a series of e-health initiatives harnessing the power of technology to expand the delivery of medical care and diagnostic services throughout Egypt. The Telemedicine Network, the Health Informatics Programs and the Medical Emergency Call Center are successful technology-based programs that deliver improved health care and illustrate the importance of ICT as a tool for reaching underserved areas.

There are a number of e-government projects of which the automation of the Land Registration System, a project that seeks to digitize all land data and maps in Egypt in order to simplify registration procedures. Arabic content on the web accounts for less than 0.5 per cent, in sharp contrast to the massive contribution of Arab culture and civilization to human history. The Arabic e-content Initiative launched by MCIT is creating a portal that will digitize in its first phase 2000 books and 300 software programs. Under the Arabic e-content initiative there are several ongoing projects of which the Arabic e-content portal operative since 2007 and egynews.net portal in alliance with the Egyptian Radio and Television Union. The Center for Documentation of Cultural and Natural Heritage (CULTNAT) is documenting Egypt’s heritage using latest technologies.
The ICT Trust Fund, a partnership between MCIT and UNDP, aims to raise the awareness of the developmental potential of ICT, while helping make it more accessible to Egyptian citizens. ICT trust fund programs included the Mobile IT Club, the KenanaOnline developmental portal and the utilization of ICT in eradicating illiteracy.

5. Competitiveness of ICT sector

In this section we will compare Egypt stance to OECD enhanced engagement countries by examining some key ICT indicators and then by examining the rank and scores obtained in key ICT related indexes.

5.1. How does Egypt fair in terms of ICT key indicators as compared to OECD enhanced engagement countries?

- **ICT structure**: comparing Egypt’s ICT sector structure to that of OECD enhanced engagement countries in 2006 we note that in terms of existence of a separate telecommunications regulator, all countries with the exception of China had a separate telecom regulator. As for the status of the main fixed-line operator in 2006, we find that it is private only in Brazil; mixed in China, India, Indonesia and South Africa; and that Egypt is the only country that remained with public main fixed-line telephone operator. In terms of government prioritization of the ICT sector score in 2006, India obtained the highest score of 5.7 followed by South Africa with a score of 4.9 and then by both Egypt and Brazil with a score of 4.4, China came next with a score of 4.2 and last came Indonesia with a score of 3. (Refer to Table A1 in Annex).

- **Level of competition**: examining the level of competition in the provision of international long distance service, mobile service and internet service among Egypt and the OECD enhanced engagement countries, we note that all countries have competition in internet services. As for mobile service, China, Egypt and South Africa had partial competition in 2006. In terms of international long distance service, Egypt was the only country where international long distance service is under monopoly. China and Indonesia had partial competition in the international long distance service provision (See Table A2 in Annex).

- **Fixed line telephony**: comparing Egypt to OECD enhanced engagement countries in terms of fixed lines penetration we find that the highest penetration for fixed lines per 100 inhabitants is found in China followed by Brazil and then Egypt. We also remark that India has the lowest fixed lines penetration and that it also had the highest percentage

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21 Government prioritization of sector is based on replies to the following question: “information and communication technologies (ICT) are an overall priority for the government” (1= strongly disagree, 7= strongly agree). (World Economic Forum)
The decrease in fixed lines in operation between 2005 and 2007 (As shown in Table A3 and Figure A3 in Annex). The decrease in numbers of fixed lines in operations is noticed in three countries Brazil, India and South Africa as per figure A4 in Annex. The slow growth of fixed line networks and even the declining trends in some countries could possibly be due to change in customer needs. Increasingly, customers are moving towards mobile telephony. To gain a greater share, fixed-line operators will have to expand their service offerings and particularly introducing new value added services such as broadband and content applications.

- **International voice traffic:** compared to OECD enhanced engagement countries, Egypt in 2006 had the second highest international voice traffic (minutes per person) after South Africa (Figure A5 in Annex).

- **Mobile telephony:** examining the level of mobile phone penetration in 2007, countries could be ranked from the highest to the lowest as follows: South Africa, Brazil, China, Egypt, Indonesia and India. In terms of growth achieved during the period 2005-2007 countries ranked as follows: South Africa (growth of 86 percent), Brazil (growth of 62 percent); China (growth of 40.2 percent), Egypt (growth of 39 percent), Indonesia (growth of 34 percent) and India (growth of 19 percent). China and India are the most populous countries in the world, yet despite the strong growth in mobile telephony, in terms of mobile penetration they are below other countries such as South Africa and Brazil (See Figure A6 in Annex).

- **Internet usage:** In 2007, Brazil had the highest number of Internet users per 100 inhabitants followed by China and Egypt. Indonesia had the lowest number of internet users per 100 inhabitants in the same year (as shown in Figure A7 in Annex).

- **Internet bandwidth:** Egypt’s internet bandwidth per inhabitant (bit/s) is almost 1:10 times that of Brazil and almost half that of China (Figure A8 in Annex).

5.2. Key ICT related Indexes

5.2.1. The Knowledge Economy Index (KEI)

The World Bank computes the knowledge economy index at the country and regional levels. The KEI takes into account whether the environment is conducive for knowledge to be used effectively for economic development. It is an aggregate index that represents the overall level of development of a country towards the Knowledge Economy. The KEI is calculated based on the average of the normalized performance scores of a country on four pillars related to the
knowledge economy - economic incentive and institutional regime; education and human resources; and the innovation system and ICT\textsuperscript{22}.

Table 5: The Knowledge Economy Index (2008)

<table>
<thead>
<tr>
<th>Country</th>
<th>KEI (rank out of 134)</th>
<th>KEI score</th>
<th>ICT</th>
<th>Economic Incentive and Institutional Regime</th>
<th>Innovation</th>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>54</td>
<td>5.57</td>
<td>6.08</td>
<td>4.3</td>
<td>6.07</td>
<td>5.84</td>
</tr>
<tr>
<td>South Africa</td>
<td>55</td>
<td>5.55</td>
<td>4.98</td>
<td>5.81</td>
<td>6.92</td>
<td>4.51</td>
</tr>
<tr>
<td>China</td>
<td>77</td>
<td>4.35</td>
<td>4.16</td>
<td>4.01</td>
<td>5.12</td>
<td>4.11</td>
</tr>
<tr>
<td>Egypt, Arab Rep.</td>
<td>84</td>
<td>4.03</td>
<td>3.66</td>
<td>3.57</td>
<td>4.55</td>
<td>4.35</td>
</tr>
<tr>
<td>Indonesia</td>
<td>98</td>
<td>3.23</td>
<td>2.82</td>
<td>3.36</td>
<td>3.32</td>
<td>3.42</td>
</tr>
<tr>
<td>India</td>
<td>100</td>
<td>3.12</td>
<td>2.59</td>
<td>3.67</td>
<td>3.97</td>
<td>2.26</td>
</tr>
</tbody>
</table>

*Scores range from 0= lowest and 10= highest.*


For KEI 2008, Egypt ranked 84\textsuperscript{th} out of 134 countries. Its ranking was higher than Indonesia by 14 positions and India by 16 positions. China surpassed Egypt by 7 positions; Brazil and South Africa were higher in ranking than Egypt by 30 and 29 positions, respectively. If we look at the various components of the KEI, we note that what is dragging Egypt overall down is its score in economic incentive and institutional regime. In terms of education, innovation and ICT, Egypt’s score is in line with its overall score .i.e. Egypt’s surpasses Indonesia and India (Table 4 and Figure 15).

\textsuperscript{22}The Economic Incentive and Institutional regime is the simple average of the normalized scores of three key variables: Tariff and non-tariff barriers, Regulatory quality and Rule of law. The Innovation system is the simple average of the normalized scores of three key variables: Total Royalty payments and receipts, patent applications granted by the US patent and trademark office, scientific and technical journal articles. Education is the simple average of the normalized scores of three key variables: adult literacy rate, secondary enrollment, tertiary enrollment. ICT is the simple average of the normalized scores of three key variables: telephone, computer and internet penetrations (per 1000 people).
The Network Readiness Index (NRI) 2008-2009 by WEF

The Network Readiness Framework assesses the extent to which different economies benefit from the latest ICT advances based on three main principles: environment as crucial enabler of networked readiness, multi-stakeholder effort involving the government, the business sector and civil society is required and that ICT readiness facilitates ICT usage. The NRI can be broken down along its three dimensions to environment, readiness and usage.

According to the NRI results for 2008-2009, China comes first with rank (46), followed by South Africa (52), India (54), Brazil (59), Egypt (76) and Indonesia (83). Egypt’s could improve its rank if it achieves considerable improvements in its ranking in the readiness sub-component, particularly if it improves the quality of its educational system, improves the buyer sophistication, and ameliorate the quality of management schools\(^\text{23}\) (Table 5).

\(^{23}\) For detailed sub indicators please refer to the global information technology report 2008-09 by WEF.
Table 5: The Network Readiness Index (NRI) 2008-2009 for Egypt and OECD enhanced engagement countries

<table>
<thead>
<tr>
<th>Country</th>
<th>(rank out of 134)</th>
<th>Score</th>
<th>Environment component (rank)</th>
<th>Readiness Component (rank)</th>
<th>Usage Component (rank)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>59</td>
<td>3.94</td>
<td>87</td>
<td>58</td>
<td>41</td>
</tr>
<tr>
<td>South Africa</td>
<td>52</td>
<td>4.07</td>
<td>39</td>
<td>56</td>
<td>63</td>
</tr>
<tr>
<td>China</td>
<td>46</td>
<td>4.15</td>
<td>55</td>
<td>36</td>
<td>48</td>
</tr>
<tr>
<td>Egypt, Arab Rep.</td>
<td>76</td>
<td>3.76</td>
<td>64</td>
<td>85</td>
<td>72</td>
</tr>
<tr>
<td>Indonesia</td>
<td>83</td>
<td>3.62</td>
<td>81</td>
<td>65</td>
<td>94</td>
</tr>
<tr>
<td>India</td>
<td>54</td>
<td>4.03</td>
<td>60</td>
<td>40</td>
<td>59</td>
</tr>
</tbody>
</table>


5.2.3. IT competitiveness index by EIU, 2008.

The IT industry competitiveness index prepared by the Economist Intelligence Unit compares 66 countries in different regions in the world on the extent to which they possess the conditions necessary to support a strong IT industry. The index is organised into six quantitative and qualitative categories. Figure 16 demonstrates the scores for Egypt and OECD enhanced engagement countries in 2008.

Figure 16: IT industry competitiveness index scores, 2008

*Countries are scored on a scale of 1 to 100

Egypt ranked 53 out of 66 countries in 2008 up two places from its previous year ranking of 55 out of 66 countries in 2007. Egypt’s rank in 2008 came after South Africa (ranked 37th), Brazil (ranked 43rd), India (ranked 48th), and China (50th). Similar to the results in other indexes it surpassed Indonesia which ranked 58th in 2008. If we examine the quantitative and qualitative results for the six categories (Table 6), we note that Egypt fares well especially in the business environment and support for IT industry development. Areas where there are need to achieve greater progress include R & D environment, legal environment and human capital development.

Table 6: IT industry competitiveness index score by category (2008)

<table>
<thead>
<tr>
<th></th>
<th>Overall index score</th>
<th>Business environment</th>
<th>IT infrastructure</th>
<th>Human capital</th>
<th>Legal environment</th>
<th>R&amp;D environment</th>
<th>Support for IT industry development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category weight</td>
<td>10%</td>
<td>20%</td>
<td>20%</td>
<td>10%</td>
<td>25%</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td>32.6</td>
<td>76.9</td>
<td>8.4</td>
<td>39.9</td>
<td>63.5</td>
<td>1.1</td>
<td>57.5</td>
</tr>
<tr>
<td>Brazil</td>
<td>31</td>
<td>66</td>
<td>13.4</td>
<td>38.6</td>
<td>46</td>
<td>1</td>
<td>61.3</td>
</tr>
<tr>
<td>India</td>
<td>28.9</td>
<td>59.3</td>
<td>1.3</td>
<td>48.8</td>
<td>47</td>
<td>0.6</td>
<td>54</td>
</tr>
<tr>
<td>China</td>
<td>27.6</td>
<td>46.9</td>
<td>5.2</td>
<td>46.6</td>
<td>59.5</td>
<td>1.7</td>
<td>41.1</td>
</tr>
<tr>
<td>Egypt</td>
<td>25.3</td>
<td>61.3</td>
<td>2.9</td>
<td>34.5</td>
<td>42</td>
<td>0.2</td>
<td>49.4</td>
</tr>
<tr>
<td>Indonesia</td>
<td>23.1</td>
<td>49.6</td>
<td>1.3</td>
<td>36.5</td>
<td>44</td>
<td>0.1</td>
<td>41</td>
</tr>
</tbody>
</table>


5.2.4. ICT Opportunity Index

The last column of Table 7 gives the rankings for Egypt and OECD enhanced engagement countries in terms of the “ICT Opportunity Index”. This index, developed by the International Telecommunications Union (ITU) in November 2005 for 183 countries, uses a number of indicators to compare ICT development in different countries over time. It consists of a combination of 10 different indicators grouped into four sub-indices that cover different aspects of ICT development: Networks, Skills, Uptake and Intensity. Looking at the sub-indices we note that Egypt can improve its ranking by improving skills and increasing uptake.
Table 7: ICT Opportunity Index (2005 values)

<table>
<thead>
<tr>
<th>Country</th>
<th>Networks (main telephone lines per 100 persons; mobile phone subscribers per 100 persons; international internet bandwidth; (kbps per inhabitant))</th>
<th>Skills (Adult literacy rates; gross enrollment rates)</th>
<th>Uptake (Internet users per 100 inhabitants; proportion of households with TVs)</th>
<th>Intensity (Total broadband Internet subscribers per 100 persons; international outgoing telephone traffic (minutes) per capita)</th>
<th>World Ranking (1= Sweden; 183= D.R. Congo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>124.2</td>
<td>121</td>
<td>168.6</td>
<td>136.78</td>
<td>64</td>
</tr>
<tr>
<td>China</td>
<td>113.3</td>
<td>106.1</td>
<td>81.6</td>
<td>146.17</td>
<td>79</td>
</tr>
<tr>
<td>South Africa</td>
<td>104.7</td>
<td>101</td>
<td>96.3</td>
<td>86.15</td>
<td>90</td>
</tr>
<tr>
<td>Egypt</td>
<td><strong>75.9</strong></td>
<td><strong>91.2</strong></td>
<td>71.5</td>
<td><strong>77.97</strong></td>
<td><strong>107</strong></td>
</tr>
<tr>
<td>Indonesia</td>
<td>57.5</td>
<td>102.6</td>
<td>48.8</td>
<td>72.48</td>
<td>121</td>
</tr>
<tr>
<td>India</td>
<td>38.9</td>
<td>78.6</td>
<td>35.6</td>
<td>75.48</td>
<td>133</td>
</tr>
</tbody>
</table>


5.2.5. The ICT Development Index (IDI) by ITU, 2009

Egypt ranked 94th out of 154 countries in 2007 in the ITU ICT development index, worse than Brazil (ranked 60), China (73), South Africa (87) and better than Indonesia (108) and India (118). Egypt’s position in the index sub indices (access and skills) is similar to that of the overall index. Figure 17 shows Egypt’s score as compared to OECD enhanced engagement countries in 2007 whereas Table 8 demonstrates the ICT development index and sub-indexes’ rank.

Figure 17: ICT Development Index scores in 2007

Table 8: ICT Development Index and Sub-indexes (access, use and skills) in 2007

<table>
<thead>
<tr>
<th>Economy</th>
<th>IDI Rank (out of 154)</th>
<th>Access</th>
<th>Use</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>60</td>
<td>69</td>
<td>51</td>
<td>61</td>
</tr>
<tr>
<td>China</td>
<td>73</td>
<td>64</td>
<td>71</td>
<td>94</td>
</tr>
<tr>
<td>South Africa</td>
<td>87</td>
<td>84</td>
<td>92</td>
<td>80</td>
</tr>
<tr>
<td>Egypt</td>
<td>94</td>
<td>98</td>
<td>84</td>
<td>95</td>
</tr>
<tr>
<td>Indonesia</td>
<td>108</td>
<td>106</td>
<td>108</td>
<td>101</td>
</tr>
<tr>
<td>India</td>
<td>118</td>
<td>129</td>
<td>106</td>
<td>118</td>
</tr>
</tbody>
</table>

*According to ITU IDI, countries are classified by IDI groups as follows: Brazil Upper IDI, China, Egypt, Indonesia and South Africa as Medium IDI and India as low IDI.


A new ICT price basket was created by ITU to track changes in tariffs charged for key ICTs. The ICT Price Basket, which combines prices for fixed and mobile telephony, and broadband Internet access, provides a measurement tool for accessing ICT affordability across countries. It compares prices among countries for the three ICTs in US$ values, in Purchasing Power Parity (PPP) values, and as a percentage of Gross National Income (GNI). Table 9 shows the ranking of Egypt and OECD enhanced engagement countries in terms of ICT price basket in 2008.

In terms of ICT price basket, Egypt got the best rank (67th) if compared to OECD enhanced engagement countries. This signals clearly Egypt’s competitive prices in ICT which is one of the factors that are attractive for investing in Egypt.

Table 9: ICT price basket 2008, Egypt versus OECD enhanced engagement countries

<table>
<thead>
<tr>
<th>Rank</th>
<th>Economy</th>
<th>ICT Price Basket Value **</th>
<th>Sub-baskets</th>
</tr>
</thead>
<tbody>
<tr>
<td>67</td>
<td>Egypt</td>
<td>4.1</td>
<td>2.3</td>
</tr>
<tr>
<td>70</td>
<td>South Africa</td>
<td>4.2</td>
<td>4.7</td>
</tr>
<tr>
<td>71</td>
<td>China</td>
<td>4.4</td>
<td>1.9</td>
</tr>
<tr>
<td>75</td>
<td>India</td>
<td>4.7</td>
<td>4.4</td>
</tr>
<tr>
<td>90</td>
<td>Indonesia</td>
<td>7.6</td>
<td>3.3</td>
</tr>
<tr>
<td>91</td>
<td>Brazil</td>
<td>7.7</td>
<td>5.9</td>
</tr>
</tbody>
</table>

Note: *The GNI per capita is based on the World Bank’s Atlas Method

**The ICT Price basket value is the sum of the three sub-baskets as a percentage of GNI per capita, divided by 3

To sum up Egypt’s rank in most of the ICT related indices was better than India and Indonesia and worse than Brazil, South Africa and China. Egypt’s ranking can improve considerably if it achieves greater progress in R & D environment and if it invests in human capital development and particularly in education. Egypt has a definite competitive advantage in terms of pricing of ICT and compares well in terms of e-government readiness.

6. Egypt’s outsourcing and off-shoring services success story

6.1. Outsourcing and off-shoring services growth

Between 2004 and 2008, Egypt’s total volume of offshore industry grew from US$150 million to US$ 700 million that is a growth of 367 percent over four years. One of the key priority objectives for Egypt is to acquire a greater share of the global outsourcing market. Egypt aims to achieve export revenues of over US$1 billion by 2010-2011 (as per figure 18). In terms of direct jobs, outsourcing activities could create 300-450 thousand direct jobs for Egypt and 800-1200 thousand indirect jobs by year 2017.

Egypt offers different types of business lines that include: R & D and engineering activities, knowledge process outsourcing (KPO) services, localization and Arabic content services, business process outsourcing (BPO) services, technical support activities, contact centers and IT products and services. Egypt plan to achieve 1.1 billion USD (four times the 2005 revenues), with target of generating 280 million USD from off-shoring IT services.

Figure 18: Egypt’s target offshore services revenues by 2010

<table>
<thead>
<tr>
<th>Year</th>
<th>R&amp;D/Engineering</th>
<th>KPO Services</th>
<th>Localization</th>
<th>Arab Content</th>
<th>BPO Services</th>
<th>Technical Support</th>
<th>Contact Centers</th>
<th>IT Products*</th>
<th>IT Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>$100 m</td>
<td>$30 m</td>
<td>$40 m</td>
<td>$200 m</td>
<td>$75 m</td>
<td>$200 m</td>
<td>$116 m</td>
<td>$45 m</td>
<td>$290 m</td>
</tr>
<tr>
<td>2010</td>
<td>$1,085 million</td>
<td>$805 million</td>
<td>$945 million</td>
<td>$905 million</td>
<td>$950 million</td>
<td>$925 million</td>
<td>$125 million</td>
<td>$90 million</td>
<td>$1,100 million</td>
</tr>
</tbody>
</table>

CAGR: 38%, 43%, 22%, 46%, 72%, 27%, 50%, 26%, 27%


24 Data from MCIT, 2009.
Egypt’s competitive pool of human resources with its foreign language skills, relatively cheap labor costs and proximity to Europe, Asia-Pacific and the Middle East make it a prime contender to be one of the top outsourcing hotspots.

Egypt was positioned as the Middle East's prime winner to take advantage of the boom in global outsourcing, already worth an estimated $300bn in 2009 according to international research centres. Egypt was assessed as having the strongest position based on its young population, sustainable and abundant talent pool of technologically skilled and multi-lingual university graduates. Its geographical position - close to Europe and Asia - coupled with strong government support are also factors which contribute to Egypt being an outsourcing hotspot.

As a reflection of Egypt’s competitiveness in ICT, a multitude of international companies are using Egypt as a base for software development, technical support contact centers and research facilities. Examples of which include IBM, Intel, Microsoft, Cisco, Oracle, Satyam, Wipro, Orange, Alcatel, Tele-performance and Vodafone, among others (Refer to figure A2 in Annex).

Furthermore, the British National Outsourcing Association (NOA) named Egypt the Outsourcing Destination of 2008, as Egypt won the first place for the best outsourcing provider for the year 2008 after beating the Philippines and Romania in a "race" to win this category. Winners of the awards represent the length and breadth of the outsourcing industry, from banking to telecoms, small companies to large, individuals and major corporations.

Seeking the growth of Egypt’s share of the global outsourcing market, the Egyptian government has set an aggressive plan that resulted in Egypt’s jump to the 13th position as an outsourcing destination according to A.T. Kearney Global Services Location Index 2007. Actually, Egypt ranks, today, above the emerging delivery locations in Eastern European locations such as the Czech Republic, Hungary and Poland as well as other African locations such as South Africa and Tunisia.

6.2 National vision for ICT with special focus on BPO and underlying initiatives

The Egyptian national vision is mainly focused on attracting more Foreign Direct Investments (FDI’s), especially in Business Process Outsourcing (BPO) activities in view of its positive spill-over on employment rates. This is carried out through a comprehensive framework that facilitates the achievement of the major goal of the national vision. The framework aims at attracting more Multinational Corporations (MNC’s) that are interested in BPO, encouraging technology and know-how transfer and building qualified human capital that would meet international standards while being competitive in terms of cost.

25 Egypt has competitive pool in human resources that are well suited to work in the ICT sector and business outsourcing. This is in no contradiction with the fact that not all of Egypt’s population has access to training in ICT and high quality multilingual education necessary to work in outsourcing services especially for non-Arabic speaking countries.
The national strategy established for the development of the BPO market in Egypt is defined by Information Technology Industry Development Agency (ITIDA)'s strategy grid that contains the following pillars:

- Ensure that all requirements (human resources, infrastructure, legislative matters, etc) are ready and available to promote Egypt as a BPO destination.
- Increase and enhance the quality and quantity of talents pool, particularly through the training of 4,500 university students, expected to scale up to 40,000 students within the next 3 years with a view to enhancing their skills in order to make them able to work in the BPO segment.
- Promoting Egypt as a BPO destination via a world-class public relations company.
- Offer ready-made incentive packages tailored to suit all investors in accordance with the numbers of positions that will be deployed in Egypt, in terms of training and telecom costs.
- Encouragement of local and foreign companies’ cooperation.
- Provision of single window clearance with the full cooperation of different governmental agencies/authorities.

The Egyptian government has tailored incentive packages that are offered to support both local and foreign investors. The government partners with investors and customizes incentive packages tailored to investors’ needs. Examples of such incentives are as follows:

- The Egyptian government offers special tax exemptions and reductions for ICT industries.
- Special reduced land prices are offered to investors in the ICT sector.
- Easing of export and import regulations.

The government offers training courses in IT, communications and networks according to investors' standards and specifications. These training programs are often offered at the government's expense.

Egypt has been undertaking many initiatives with the objective of creating an attractive and conducive business environment for international multinational organizations. The government announced the development of a new delivery business hub, called Maadi Investment Park, which is specifically aiming at attracting BPO companies. It will be centrally located in Cairo and easily accessible by public transportation. Moreover, a UK-based company has signed a deal to establish a business center in Alexandria, while several other leading MNCs are also actively considering Alexandria as a business hub.

MCIT also took a number of initiatives focusing on the development of the necessary high-quality human capital needed to drive forward the IT and BPO industry of which:
The National Telecom Institute (NTI), the Information Technology Institute (ITI) and the E-Learning Competence Center (e-LCC) are providing specialized ICT training programs. An internationally competitive IT industry requires a strong pool of local talents. Over the four coming years, MCIT focus shall be on the enhancement of specialized technical skills as well as on programs that provide participants with additional soft and business skills. Moreover, MCIT will transform the basic ICT literacy programs into certification programs and will provide academic programs to develop managerial and business skills for practitioners in the ICT sector.

The Software Engineering Competence Center (SECC) is providing Capability Maturity Model (CMM) and Capability Maturity Model Integrated (CMMI) services to local software companies, offering them technical and financial support to help them achieve Levels 2 and 3 CMMI accreditation. Project staff members provide consulting advice, training, pre-appraisal and formal appraisal services. The project’s goal is to train software engineers on software standards application as part of the system development life cycle. It also aims at offering training on data collection and analysis, strategic planning and business models. SECC, in partnership with the Customer Operations Performance Center (COPC), is also involved in providing technical and financial support to Egypt’s Contact Center industry to help it compete at the world level. By the end of 2008, the total number of companies that succeeded to obtain CMMI certificate reached 31 companies.

A pilot university intervention has been launched to train 5000 students BPO on basic pre-process skills. This course is being offered to final year students in Cairo University, Ain Shams University, and Alexandria University. MCIT contracted leading BPO partners such as IBM, Infosys and First Source to be the content developers, train the trainer and delivery partners in this important talent enablement program. The aspiration of MCIT is to scale this program to 20,000 students in the next 2-3 years and, in parallel, launch a finishing school program also scaling up to 20,000 students by 2011-2012.

One of the initiatives that ITIDA is hosting and that is implemented by McKinsey & Co. is the talent pool initiative; it’s main goal is to enhance the supply of talent pool within Universities “Edu-Egypt”. It is expected to scale up to 40,000 students within the next 3 years. This will work for both the outsourcing and the captive industry in BPO service lines. The course have two tracks - a "Basic Voice" track and a "Medium Data" track, focused on enhancing students’ skills in order to allow them to be employed in the basic voice and medium data BPO segment positions accordingly.

26 Information from Egypt’s ICT Sector Competitiveness, April 2009.
27 The content for both tracks is being designed and customized for Egypt by the partner Indian BPO service providers (IBM Daksh, Infosys BPO, Firstsource) and shall cover English language and voice training (including grammar, accent, MTI neutralization, comprehension, writing), soft skills and presentation skills, customer servicing, culture sensitivity, analytical and
6.3 Egypt’s BPO competitive advantages

MCIT aims that Egypt be among the top five BPO destinations within the next 10 years and to service the European markets in particular. According to Yankee group report (2007) “Egypt is well-placed to go after the Middle Eastern market. With a workforce boasting multilingual capabilities (unlike India, where English speakers dominate), it can appeal to European-based companies as well”.

The Egyptian outsourcing services advantages include low cost, competitive pool of human resources, stable macroeconomic environment, strategic geographical locations, government support, telecommunication infrastructure and improved business environment.

7. ICT driving factors and challenges

In the current section we will review Egypt’s ICT key driving factors as a whole including those that make Egypt best positioned to be a BPO delivery location and Egypt’s ICT key challenges.

7.1 Driving factors

The key driving forces for Egypt’s ICT sector growth are up-to-date telecommunications infrastructure, multilingual talented labor at competitive prices, business environment that is attractive to MNCs, strong government support and prioritization of the sector, a central geographical location and strong focus on R & D, entrepreneurship and innovation.

7.1.1 Cost competitiveness

Egypt is cost competitive due to its relatively low cost of skilled human resources and the competitive prices of real estate, electricity and telecom. Figure 19 (a, b, c & d) compares Egypt to India in terms of costs for year 2007. We note that Egypt is more competitive than India in terms of real estate costs, telecommunication costs, electricity costs and internet charges.

Moreover, Egypt enjoys a competitive labor market given its young labor force abundance characterised by being qualified, skilled and cost competitive. Figure 20 (a & b) compares Egypt’s population size and young labor market abundance to OECD enhanced engagement countries.

According to Yankee group report (2007), both Egypt and India allow high levels of foreign ownership of ICT companies. The allowed foreign ownership level in India is 75%, while in

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reasoning skills and basic PC & Data skills, with a different focus between the two tracks. The trainers of the program who will deliver the training course in the Universities will be from local training providers, BPO providers, university staff and training institutes (such as ITI). They will all undergo a Train-of-the-Trainer program, trained by master trainers from the Indian BPO providers on their company-specific content and delivery methodology and will be certified accordingly in the end.

28 In this section we compare Egypt to India as A. T. Kearney ranked India as the top destination on the global index for offshore destinations in 2007.
Egypt there is no limit. Both Egypt and India are demographically similar in terms of population age structure; the average age is 23-years old in India and 24-years old in Egypt indicating that the workforce in both countries is very young and trainable.

India is far ahead of Egypt in terms of the development of IT service outsourcing, the basic indicators suggest that Egypt’s ICT infrastructure is far ahead of India’s ICT infrastructure. The penetration of both internet users and telephone subscribers in Egypt is three times higher than in India. Egypt should use this edge and accelerate its development in the IT services market.

**Figure 19: Comparing costs in Egypt and India in 2007**

a. **Real estate cost**

b. **Electricity cost (commercial)**

c. **Internet usage charges**

d. **Telecommunication Costs**

Figure 20: Egypt’s young population in comparison to OECD enhanced engagement countries

1. Young population

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td>45</td>
<td>81.7</td>
</tr>
<tr>
<td>Indonesia</td>
<td>41</td>
<td>239.2046</td>
</tr>
<tr>
<td>South Africa</td>
<td>43</td>
<td>47.957</td>
</tr>
<tr>
<td>India</td>
<td>42</td>
<td>114.8</td>
</tr>
<tr>
<td>Brazil</td>
<td>39</td>
<td>191.9</td>
</tr>
</tbody>
</table>

*Latest data available for Indonesia is from 2005. **Latest data available for South Africa is 2007.

Sources: WEF, 2009 and World Bank Development Indicators online database, 2009.

7.1.2 Young talented pool

The strong ties and familiarity with the Western culture and its well established international educational institutions (English, French, and German high schools and universities) are all factors that strengthen Egypt’s aim to be an outsourcing hub. The total number of multilingual and suitable talent pool that is willing to work in the BPO in Cairo is estimated to be at least 24,000. Combined with its solid base of IT and technical skills, this provides Egypt with a strong critical mass of talents available to the global BPO industry (refer to figure 21).

Figure 21: Egypt’s talent pool

<table>
<thead>
<tr>
<th>Annual number of graduating students</th>
<th>Total suitable and willing pool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thousand graduates</td>
<td>Number of graduates</td>
</tr>
<tr>
<td>Commerce 63</td>
<td>English ~ 19,000-20,500</td>
</tr>
<tr>
<td>Education 44</td>
<td>French 2,800-3,000</td>
</tr>
<tr>
<td>Arts 43</td>
<td>German 1,500-1,700</td>
</tr>
<tr>
<td>Law 28</td>
<td>Spanish 700-1,050</td>
</tr>
<tr>
<td>Arabic studies 27</td>
<td>Italian 350-550</td>
</tr>
<tr>
<td>Engineering 17</td>
<td>Total suitable talent pool 24,000-27,000</td>
</tr>
<tr>
<td>Sciences &amp; Tech 8</td>
<td></td>
</tr>
<tr>
<td>Medicine Other 8</td>
<td></td>
</tr>
<tr>
<td>Other 8</td>
<td></td>
</tr>
</tbody>
</table>

*The figures above refer to Greater Cairo Metropolitan area alone, not the entire country.
7.1.3 Geographical location

Situated at the center of the world, Egypt has better time zone offering than India or the Philippines. Egypt's location in the North East corner of Africa, at the centre between the continents of the world is an amazing asset for any investor who wishes to tap this region. As a political leader in the MENA region, Egypt provides excellent access to markets in the area and acts as a bridge between East and West, North and South. Egypt is the perfect location for a regional office that would cover the entire MENA region.

7.1.4 Business environment

Since 2004, the Egyptian government has been working hard to increase the attractiveness of Egypt’s business environment. Hence an anti-trust law and a unified tax law have been promulgated. The latter increased the transparency of the Egyptian tax system and reduced corporate and personal taxes by half. Key reforms in business environment are summarised in the following Box 1:

<table>
<thead>
<tr>
<th>Tax reforms (2005)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest personal tax rate cut from 32% to 20%</td>
</tr>
<tr>
<td>Corporate tax rate cut from 42% to 20%</td>
</tr>
<tr>
<td>Streamlined collection procedures adopted</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customs reforms (1991)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced tariffs from an average of 14.6% to 6.2%</td>
</tr>
<tr>
<td>Simplified and reduced tariff bands from 27 to 6</td>
</tr>
<tr>
<td>Streamlined customs procedures adopted</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Financial sector reforms (1991)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banking sector consolidated and restructured</td>
</tr>
<tr>
<td>Privatization of public banks initiated</td>
</tr>
<tr>
<td>Supervisory role of autonomous Central Bank strengthened</td>
</tr>
<tr>
<td>Anti-money laundering regulations in line with international standards</td>
</tr>
</tbody>
</table>

The attractiveness of the business environment has been further enhanced by the government's incentive packages offered to support the investor. The government works in partnership with each investor to customize an incentives package to cater for the investor's needs.

Other reforms that helped Egypt to attract outsourcing companies are the reforms of the Egyptian labor law in 2003 which removed many impediments to hiring and firing staff. Reforms have focused on creating a balance between employees and employers rights and obligations.
7.1.5 World-class telecommunications infrastructure and services

The Smart Village Business Park, located outside Cairo, has state-of-the-art infrastructure and has attracted a number of global IT players. Additional business parks are planned for Alexandria, Damietta, and New Cairo. MCIT is to provide a uniform and streamlined telecommunication infrastructure nationwide and to ensure the availability of cost-effective, high-speed and reliable broadband connectivity that meets the current and future needs of the industry and the country at large.

Efforts made by Egypt over the last decade have allowed significant improvements that have benefitted its BPO strategy. Currently, Egypt enjoys high-quality network facilities that are built around a world-class infrastructure, including 10 gb/s optical fiber and 2.5 gb/s rings, delivering services over a Public Switched Telephone Network (PSTN). Mobile and packet-based networks spread across the country.

7.1.6 Focus on R&D, entrepreneurship and innovation

Egypt makes efforts to further develop its ICT sector through research based activities and innovation that are expected to add value to different ICT programs. Some of the R&D related projects include the following:

- **Centers of Excellence (CoE):** the Centers of Excellence (CoE) program at ITIDA sponsors research centers constituted of consortia of experts in academia and industry alike, leading teams of senior and junior researchers to produce top-quality R&D products and services that have not only commercial value but also academic merit supported by prestigious publications and patents.

- **Technology Incubation Program:** which aims to create a new tier of seed companies and start-ups that contribute towards economic development, create job opportunities, and increase Egypt patent recognition and exports of ICT products. There are already existing 20 incubators in Cairo, Alexandria and Assiut with 250 million EGP to fund newly established projects and support their development.

- **Technology Development Fund (TDF):** The fund is the Middle East pioneer in providing venture capital to innovative, early-stage Egyptian IT companies. TDF was established in 2004 with the mandate of driving the growth of innovative Egyptian start-ups in the Communications and Information Technology fields through providing them with the most comprehensive set of venture capital financing and venture development services. To date, TDF has provided LE 50 million to Egyptian IT entrepreneurs, and is set to provide another LE 150 million.

- **Information Technology Academia Collaboration (ITAC):** ITIDA’s Information Technology Academic Collaboration (ITAC) aims to promote Industry/Universities
collaboration through linking academic research with industry and market needs. These collaborative research programs will bring value to IT companies, universities, researchers and the technology community. ITAC programs have been designed to link industry research with market needs. This is coupled with opportunities within IT companies for undergraduate, graduate, master students and Ph.D. students, preparing them for the global IT marketplace. There are six main programs available as part of ITAC. These include: Product Development Projects, Advanced Research Projects (ARP), ITIDA Fellowships, Patent Filing Program (PFP), Student Graduation Projects and Students Summer Training.

- **MED-IST Project**: which aims at bringing the Mediterranean Partner Countries (MPC) closer to the European framework program in the field of information society technologies.

- **Map IT Project** is a joint Euro-Mediterranean initiative, funded by the IST program of the European commission, aimed at promoting and developing research co-operation among the ICT communities of Europe and the south Mediterranean (MED) countries including Egypt.

- **Cairo Microsoft Innovation Center (CMIC)**: represents the Microsoft group interest in applied research and development initiatives in the Middle East and Africa. The project has five main programs: 1-the Information Retrieval Program, 2-image-Based Search Program, 3-the Digital Content Services (DCS) Program, 4-the Multi Media Content Services Program, and 5-the Collaborative Environment Services Program.

- **IBM nanotechnology Center**: Egypt and IBM signed two cooperation agreements for establishing a nanotechnology research center in Egypt, developing a services science university curricula and launching a Global Service Delivery Center based in Egypt. Egypt’s first Nanotechnology Center is also the first in North Africa. The three-year agreement starts January 2009 with joint investments in the range of $30 million. Partners in the Center are Nile University, Cairo University and IBM; with main fields of research being in the areas of simulation and modelling software, alternative energy sources (thin film silicon photovoltaic’s) and energy recovery for desalination.

- **IBM Academy**: another agreement for training and human resources development Services Science, Management and Engineering (SSME) was signed; it will establish an IBM Academy to introduce SSME into the Egyptian Universities’ curricula. SSME is a new academic discipline designed to develop the skills required in an increasingly services-based global economy. It brings together ongoing work in computer science, operations research, industrial engineering, business strategy, management sciences, social and cognitive sciences, and legal sciences.
7.2. Key challenges for ICT and IT outsourcing services

In light of the current global turmoil, Egypt has to prepare for unprecedented challenges to not only maintain its position as successful BPO destination but also to reach its goal of becoming one of the top five BPOs in the world. Challenges include:

Enforcing intellectual property rights and reducing security risks; further improvement in infrastructure especially roads and the creation of several ICT parks; increasing the pool of well trained middle level graduates (between university graduates and technical institute graduates); moving from monopoly based telecommunications environment to a more competitive market which is expected to increase ICT activities and improve quality and prices of services.

According to Yankee group report (2007), the key concerns and challenges in front of Egypt’s bright future for Outsourcing IT services include the following:

- Concerns about personal, property and data safety in Egypt exist, especially in North America. Also one of the biggest worries facing investors in an emerging market such as Egypt is the enforcement of intellectual property. In Egypt, intellectual property protection was introduced in 2002 under Law 82, indicating the Egyptian government’s commitment to protecting investors’ intellectual property.

- Like India, serious infrastructure issues are rampant in Egypt, including bad roads and heavy traffic particularly in Cairo.

Moreover, one of the potential weaknesses could be the lack of wider pool of talent if the sector grows at faster rates than the talent pool, possibly leading to higher salaries and lesser cost competitiveness. Also, there is a continuous need to develop soft/business skills to market the industry internationally.

ICT as an enabler of innovations is recognized by the Egyptian government and encouraged. Yet, some of the challenges in this respect could be to ensure that the institutional framework leads to a good flow of knowledge between scientific research and technological applications as well as a good flow of information among researchers and users both at the national and international level.

Similar to other developing countries, the digital divide between different income groups in the population and between urban and rural areas exists. The government has several initiatives to close the digital divide. Yet there is a need to invest further in the development of human capital capable of using new technologies, to promote the use of e-commerce, provide protection and security to users under cyber laws and to continue investing in infrastructure.
In Egypt, SMEs use of ICT is still limited. For enterprises to benefit from ICT adoption, the government can encourage enterprises to use e-government services to improve the efficiency of their operations. There is a need to launch new initiatives. For instance, Egypt can replicate India’s electronic trading programme for agricultural products that was launched by the government of West Bengal (India) or Korea’s government initiatives which provide firms with information on exports and imports logistics, customs and electronic documentation.

9. Conclusion

The Egyptian government plays a great role in the diffusion of ICT and the creation of awareness among enterprises, particularly SMEs, on the potential of ICTs for business use. For Egypt to move to the top five list of outsourcing destinations and particularly top five BPO destinations will require a constant adaptation of national and corporate strategies as well as increased agility in responding to unexpected changes in relative factor prices. Central to such agility will be efforts to always maintain a high level of responsiveness in terms of the skills and human resources required. As e-skills (i.e., skills for the knowledge economy) continue to be further defined and identified across the world, national outsourcing strategies will remain a laboratory where inputs from governments and businesses will continue to be combined and shaped to provide innovative approaches and environments. In turbulent times even more than in quieter periods, innovative thinking and strategies will be required. There are reasons to think that Egypt strives its way to success.
Annex

Box A1. The 2002 OECD ICT sector definition (based on ISIC Rev. 3.1)

ICT Manufacturing
- 3000 Manufacture of office, accounting and computing machinery
- 3130 Manufacture of insulated wire and cable*
- 3210 Manufacture of electronic valves and tubes and other electronic components
- 3220 Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy
- 3230 Manufacture of television and radio receivers, sound or video recording or reproducing apparatus, and associated goods
- 3312 Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment*
- 3313 Manufacture of industrial process control equipment*

ICT Services
- 5151 Wholesale of computers, computer peripheral equipment and software
- 5152 Wholesale of electronic and telecommunications parts and equipment
- 6420 Telecommunications
- 7123 Renting of office machinery and equipment (including computers)
- 72 Computer and related activities
* Note that the activity of these classes is excluded from the OECD’s 2007


Box A2. The 2007 OECD ICT sector definition (based on ISIC Rev. 4)

ICT manufacturing industries
- 2610 Manufacture of electronic components and boards
- 2620 Manufacture of computers and peripheral equipment
- 2630 Manufacture of communication equipment
- 2640 Manufacture of consumer electronics
- 2680 Manufacture of magnetic and optical media

ICT trade industries
- 4651 Wholesale of computers, computer peripheral equipment and software
- 4652 Wholesale of electronic and telecommunications equipment and parts

ICT services industries
- 5820 Software publishing
- 61 Telecommunications
- 62 Computer programming, consultancy and related activities
- 631 Data processing, hosting and related activities; Web portals
- 951 Repair of computers and communication equipment

Figure A1: Gross national income per capita 2007 for Egypt and OECD enhanced engagement countries (in US dollars)


Figure A2: ICT MNCs in Egypt

Figure A3: Main fixed telephone lines per 100 inhabitants for Egypt and OECD enhanced engagement countries in 2007

![Bar chart showing main fixed telephone lines per 100 inhabitants for Brazil, China, Egypt, India, Indonesia, and South Africa in 2007.](Source: ITU online database, 2008.)

Figure A4: Percentage change in main fixed lines in operation between 2005 and 2007

![Bar chart showing percentage change in main fixed lines in operation for Brazil, China, Egypt, India, Indonesia, and South Africa between 2005 and 2007.](Source: ITU online database, 2008.)
**Figure A5: International voice traffic (minutes per person)* in 2006**

*Outgoing and incoming.*


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**Figure A6: Mobile phone penetration in Egypt and OECD enhanced engagement countries 2005-2007**

Source: ITU online database, 2008.
Figure A7: Number of Internet users per 100 inhabitants for Egypt and OECD enhanced engagement countries (2005-2007)

Source: ITU online database, 2008.

Figure A8: International Internet Bandwidth per inhabitants (bit/s) for Egypt and OECD enhanced engagement countries in 2007

Source: ITU online database, 2008.
<table>
<thead>
<tr>
<th>Country Name</th>
<th>2000</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>China</td>
<td>..</td>
<td>No</td>
</tr>
<tr>
<td>Egypt</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>India</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Indonesia</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>South Africa</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Status of main fixed-line telephone operator**

<table>
<thead>
<tr>
<th>Country Name</th>
<th>2000</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>Private</td>
<td>Private</td>
</tr>
<tr>
<td>China</td>
<td>Public</td>
<td>Mixed</td>
</tr>
<tr>
<td>Egypt</td>
<td>Public</td>
<td>Public</td>
</tr>
<tr>
<td>India</td>
<td>Public</td>
<td>Mixed</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Mixed</td>
<td>Mixed</td>
</tr>
<tr>
<td>South Africa</td>
<td>Mixed</td>
<td>Mixed</td>
</tr>
</tbody>
</table>

**Government prioritization of sector (1-7,7=highest)**

<table>
<thead>
<tr>
<th>Country Name</th>
<th>2000</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>..</td>
<td>4.4</td>
</tr>
<tr>
<td>China</td>
<td>..</td>
<td>4.2</td>
</tr>
<tr>
<td>Egypt</td>
<td>..</td>
<td>4.4</td>
</tr>
<tr>
<td>India</td>
<td>..</td>
<td>5.7</td>
</tr>
<tr>
<td>Indonesia</td>
<td>..</td>
<td>3.0</td>
</tr>
<tr>
<td>South Africa</td>
<td>..</td>
<td>4.9</td>
</tr>
</tbody>
</table>

*.. Imply no information or data available.

Table A2: Competition in selected ICT services for Egypt and OECD enhanced engagement countries (2000 and 2006)

<table>
<thead>
<tr>
<th>Country Name</th>
<th>2000</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>P</td>
<td>C</td>
</tr>
<tr>
<td>China</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Egypt</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>India</td>
<td>M</td>
<td>C</td>
</tr>
<tr>
<td>Indonesia</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>South Africa</td>
<td>M</td>
<td>C</td>
</tr>
</tbody>
</table>

*International long distance service*

| Brazil       | P    | C    |
| China        | P    | P    |
| Egypt        | P    | P    |
| India        | P    | C    |
| Indonesia    | C    | C    |
| South Africa | C    | P    |

*Mobile telephone service*

| Brazil       | C    | C    |
| China        | C    | C    |
| Egypt        | C    | C    |
| India        | C    | C    |
| Indonesia    | C    | C    |
| South Africa | ..   | C    |

*Internet service*


Table A3: Number of main fixed telephone lines in operation for Egypt and OECD enhanced engagement countries (2005-2007)

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>39,852,600</td>
<td>38,800,200</td>
<td>39,399,624</td>
</tr>
<tr>
<td>China</td>
<td>350,444,992</td>
<td>367,785,984</td>
<td>365,636,992</td>
</tr>
<tr>
<td>Egypt</td>
<td>10,396,148</td>
<td>10,807,678</td>
<td>11,228,849</td>
</tr>
<tr>
<td>India</td>
<td>50,176,508</td>
<td>40,770,000</td>
<td>39,413,000</td>
</tr>
<tr>
<td>Indonesia</td>
<td>13,507,830</td>
<td>14,820,733</td>
<td>17,827,924</td>
</tr>
<tr>
<td>South Africa</td>
<td>4,729,000</td>
<td>4,700,000</td>
<td>4,642,000</td>
</tr>
</tbody>
</table>

*Source: ITU online database, 2008.*
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