The Evolution of the ICT Sector in Egypt – Partnership4Development

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Abstract

Emerging information and communication technology (ICT) is setting the pace for a changing, competitive and dynamic global marketplace and representing an enabling platform for business and socioeconomic development in the 21st century. In that respect, developing nations are urged to keep pace regularly with the developments taking place in the developed world through the design and implementation of plans for universal access in terms of ICT literacy and its effective utilization for developmental purposes. It is important to note that building the ICT infrastructure will not realize quantum leaps in the development process unless it is coupled with concrete projects and activities that engage the community at large with its different stakeholders irrespective of their locations whether urban or remote, gender or background. This paper describes the evolution of the ICT sector in Egypt over the last decade as an integral element of the nation's overall development process within the context of a an emerging economy and the various growing potentials ICT offers for its socioeconomic development.

Keywords: ICT and socioeconomic development, ICT strategy formulation, ICT transfer and deployment in developing and emerging nations

1. Introduction

Developing nations when addressing their future development plans, they need to develop a formula that integrates the changes and developments that are taking place globally and adapt a methodology that addresses their local changing needs while optimally allocating their limited resources to serve their business and socioeconomic development requirements. Within the context of information and communication technology (ICT) deployment in developing nations, it is worth noting that in the 1960s and 1970s the focus was more directed to the role played by the state. During the 1980s and 1990s, the attention was shifted to the role played by the private sector. In the early years of the 21st century, the attention was shifted to the role of non-governmental organizations (NGOs) and their vital involvement in diffusing ICT among different communities at urban and rural levels. Developing nations should focus on various socioeconomic needs of the society and to the benefits that could be realized from the amalgamation of the experiences and resources of the state, private sector, public sector and the civil society through models of partnership and collaboration such as public-private partnership (PPP).

ICT innovations are increasingly having important implications on business and socioeconomic development due to its role in introducing and diffusing the concepts of knowledge sharing, community development and equality. The implications could be felt at the individual, organizational and societal levels. ICT advances have always changed the way human interact. While the basic needs of humankind have long been food, clothing and shelter, the time has come to add information to such invaluable list. The implications on developing nations could be remarkably effective if these technology innovations are properly introduced and managed in a world increasingly affected by access to timely, effective and accurate information. However, if the implementation process is not well supported and controlled, the result could be an increasing digital divide between developed and developing nations. It is important to avoid the fact that ICT could be marginalized in the development process. There is an urgent need to show that ICT generates the wealth of the enterprise, which in turn pays for socioeconomic development at large. Moreover, it is ICT that is delivering the productivity gains that enable lives of material comfort for many around the world that would have been unthinkable only two centuries ago [11].

ICT is not an end in itself but a means towards reaching broader policy objectives. ICT main objective should be to improve the everyday lives of the community to fight poverty and to contribute towards the realization of the Millennium Development Goals-MDGs [33]. It is widely diffused in the literature that the developing world's lack of universal access to ICT is often labelled the digital divide. Nevertheless, it is important to note that such divide is available between nations and within nations both developed and developing. The digital divide is usually due to a number of reasons including, but not limited to, expensive personal computers for most citizens of developing nations, poor or limited telecommunications infrastructure especially in remote locations, and high illiteracy rates and poor educational systems [18]. There are various factors that can help curb down the digital divide that relate to the legal and regulatory environment, awareness and capacity development among the community as well as the mechanisms in place for the collaboration between the different sectors in the economy.

Since the early 1990s and with the diffusion of the Internet, millions of people around the world started relying on it for information interchange on a daily basis [10]. Today, the Internet represents the global medium in the new millennium [2] and is a major driving force of change in the global market place [22] with over one 1.2 billion Internet users exchanging around 82 billion emails and browsing the Internet almost on daily basis [6]. It is truly

believed that ICT in general while neutralizing the time and distance barriers are the driving forces of globalization with great potentials for people to improve their lives [4].

With the growing use of ICT, it is becoming a priority to deploy them effectively to serve the socioeconomic and development objectives of the community. It is perceived that by combining emerging technology, appropriate organization, capital formation techniques, and proper understanding of the needs of rural populations, this might pave the way for innovations that bring the Internet to more than 40% of the world population who live in the rural areas in developing nations [29]. According to the literature, 19% of the world's population accounts for 91% of Internet users [32]. Therefore, there is an urgent need to close the technology divide through a comprehensive plan for social inclusion and by decentralizing the ICT infrastructure presence in developing nations beyond the capitals and the major cities because the Internet connectivity in those areas is extremely poor and represents a compelling need to improve village life [30]. This can only be realized through national ICT plans, strategies and policies that would characterize the needs of the community and set out initiatives and projects accordingly. It is important to note that improving ICT universal access has been one of the primary recommendations of the World Summit on the Information Society (WSIS) that was held in Geneva (Switzerland) in December 2003 and emphasized in the second summit in Tunis (Tunisia) in November 2005 [15] with follow-up projects and activities.

According to the study conducted in 1995-1996 by the United Nations Commission on Science and Technology for Development (UNCSTD), it underlined the importance of coordination for the formulation of national ICT strategies [24]. Moreover, the study pointed out the complexity of strategies to attract and maintain support for installation and maintenance of national ICT infrastructure in relatively low-income developing nations. The need for resources mobilization, proper environment, legislations and regulations, amongst other elements is important for building and sustaining such infrastructure. It is important to note that to promote an efficient and equitable national information infrastructure, governments of developing nations must create a negotiating environment in which banks, local telecoms, as well as other concerned parties are willing to act in a developmentally responsible way [5].

There are four aspects to the digital divide (a) people, (b) information, (c) knowledge, and (d) technology and these critical aspects should be developed together for an effective implementation to take place. ICT, which is a vital element of the knowledge economy, can be both a unifying and a divisive force. Its disruptive aspect has come to be known as the digital divide, referring to the differences between those who have digital access to knowledge and those who lack it [1]. The digital divide, also referred to as haves and have-nots, relates to the possession of ICT resources by individuals, organizations, corporations, associations, schools and libraries to variables such as income level, economic status, age, ethnicity, education, gender and rural-urban residence [16]. Reactions vary concerning the digital divide. In the final analysis, its existence is undeniable, but it is not a purely technological issue. Technology has always been, and will continue to be, a social product that represents a vehicle for societal development. It is important to note that the challenge has to do with the environment at large with all logistics and operational details involved and not just the technological elements.

For societies to develop, grow, and benefit from the ICT evolution, nationwide introduction, adoption, diffusion and adaptation of technology should take place, something that is hardly seen in developing nations where most of the technology implementations and infrastructure are focused in the capital and the major cities. All these elements demonstrate the importance of developing national ICT strategies. Following is a demonstration of the efforts that were exerted by the government of Egypt since the mid 1980s to develop the ICT sector with an emphasis on the development of a long-term vision for the formulation and deployment of a national ICT strategy for business and socioeconomic development.

2. Research Methodology

ICT developments and their contribution to socioeconomic development are often researched and studied to assess their effectiveness and benefits on individuals, organizations and societies especially in the context of developing nations. The objective of this paper is to demonstrate the role of partnerships between different stakeholders in rendering ICT a platform for development and its implications on the economy. The evidence compiled from the literature will be analyzed to identify a set of lessons and recommendations for future implementations in similar environments. The research method followed was qualitative based on a set of interviews coupled with the researcher's impressions and interpretations of the implications of ICT diffusion within the community as well as analyzing a body of knowledge and an extensive literature survey that includes reports, articles and documents on ICT

deployment and diffusion in developing nations with a focus on Egypt. The interviews conducted addressed different stakeholders including the government, public and private sector organizations. This paper will primarily focus on the analysis of aggregate level information on ICT deployment in Egypt and its associated role on the economy at large given the identification of ICT as a driver for socioeconomic development. The interviews targeted policy makers, CEOs and managing directors from local ICT companies, multinationals operating in Egypt as well as government officials and policy makers in the ICT sector including CEOs of IT associations and agencies.

3. ICT Diffusion in Egypt

Information and communication technology in developing nations is becoming a necessity for socioeconomic development [31]. However, this can only be realized through a two-tier approach where society will contribute in shaping the infrastructure and such infrastructure will in-turn contribute in shaping the society. Egypt, as a developing country, has heavily invested in its technology and information infrastructure since 1985 to become the platform for the economy's development and growth [17]. During the period 1985-1995, a government-private sector partnership had a remarkable impact on the build-up of Egypt's information (infostructure) infrastructure [21] and [22]. During that period, hundreds of informatics projects and centers were established in various government, public and private sector organizations targeting socioeconomic development [20]. These projects included human, technology and financial infrastructure development had invaluable inputs in building a growing information technology literate society capable of leading Egypt into the 21st century from an information perspective [14]. Such elements represented the major building blocks necessary to establish a full-fledged information infrastructure capable of keeping pace with the developments taking place globally.

In 1999, ICT was identified as a priority at the highest policy level and a new cabinet ministry was established namely the ministry of communications and information technology (MCIT) leading to more investments and infrastructure build-up [17]. Thus, the growth of the ICT industry took massive steps during the last decade in different aspects including human, information, legislation and infrastructure [13]. During the third quarter of 2008, the number of ICT companies exceeds 1750 going up from just over 300 companies in 1999 working in the sales and technical support of hardware, software, and in the development of IT solutions, systems integration and consultation. This has helped create employment opportunities for fresh graduates within major cities and more importantly in the remote and

underprivileged communities directly contributing to improving their economic status. Moreover, ICT multinationals coming to Egypt to expand their businesses and penetrate the local and regional markets are growing in number as the potential for a large IT marketplace grows [3] that has also helped create more than 15,000 job opportunities over the last decade. Table 1 demonstrates the investments in the ICT sector from 1986 to 2006 [28]. It is important to note that the ICT sector has injected over 2.9 billion US dollars into the economy over the last decade transforming itself from a sector that consumes resources in the infrastructure build-up phase into a sector that is revenue generating, providing employment opportunities and a platform for development and growth through its variety of value-added services.

Table 1: Investment in the ICT Sector 1986-2006

Item	Law 8	Law 159	Free Zone	Duration
Number of established IT firms	1714	356	30	1986-2006
Capital issued for established IT firms (Billion US$)	3.1	99	16	1986-2006
Investment costs of established IT firms (US$)	0	0	110	1986-2006
Employment Opportunities in IT firms	0	0	2721	1986-2006

During WSIS in Geneva (2003), the President of Egypt highlighted the importance the current administration is giving to ICT diffusion and its role in development reflecting the commitment of all constituencies of the collaborative efforts set to introduce and diffuse ICT in the nation. The examples demonstrated included initiatives that aimed at preparing the community for the information society such as free-Internet model, PC for every home, establishment of IT clubs, and the introduction of broadband services in addition to projects relating to key sectors such as education, health, banking, and public administration amongst others [26]. These projects have helped improve the digital demographics of the community at large especially when the infrastructure was diffused to reach communities in the remote and unprivileged areas. Table 2 demonstrates the status of electronic readiness in Egypt showing the number of Internet

users, PC penetration rates and the total number of IT clubs [17] and [19].

Table 2: Electronic Readiness in Egypt

Indicators	2004	2007	Growth rate
Internet Users	3.6 million	7 million	48.57%
PC Penetration Rate	1.5 million	3 million	50%
IT Clubs	1000	3000	66.67%

One of the effective platforms that helped diffuse ICT in Egypt during the last decade has been the models of IT clubs. There was a variety of models used but the most successful reflected a public-private partnership initiative providing affordable Internet access throughout the nation's 28 provinces. The locations include youth centers, culture centers, non-governmental organizations, universities, schools, public libraries and information centers amongst other locations. The total number of clubs currently exceeds 1094 as compared to 30 in 1999. All IT clubs are equipped with computers with Internet connectivity [28]. They have the facilities to offer training programs to help promote ICT awareness and utilization. Among the expansion plan for the IT clubs are the provision of an electronic library, dedicated space for trainees with special needs, and the provision of access to electronic government (eGovernment) and electronic learning (eLearning) services amongst other facilities. The target is to have one club in every village by the end of 2008. The model of IT clubs in Egypt reflects the typical telecenters available in many other developing nations [19]. In the case of Egypt, the objective of these telecenters goes beyond ICT diffusion with more focus on using the IT clubs as platforms supporting socioeconomic development of the local community especially in remote and unprivileged areas [18].

It is important to note that an ideal ICT strategy should guide the development of a sound information environment in order to deliver convenient and universal access to information, improve communication, support collaboration and learning and ensure flexible, responsive and above all reliable systems. The strategic objective of the strategy should be to develop and implement a business-driven institutional IT strategic plan that positions IT as a strategic asset and provides a context for institutional decisions regarding IT investments, governance and organizational structure. Being part of the global economy, Egypt has realized the importance of promoting the ICT sector and marked a new era for Egypt's ICT sector by the formation of MCIT in 1999, where the IT industry enjoyed a new and more liberalized regulatory framework.

4. ICT Sector Profile

The ICT market in Egypt generates around 2.9 billion US dollars of annual revenue with almost 2.5 billion US dollars (86%) derived from the telecommunications sector. During the period 2002-2005, the number of ICT companies has more than doubled, sustaining an increasing growth rate that reached an average of 30% annually, which is significantly higher than the growth rate in other traditional economic sectors [3]. Investments in the ICT sector were phenomenal in the last few years, where it reached nearly 1.6 billion US dollars of capital investment in 2004 according to the data of the General Authority for Investment (GAFI) with more capital investment directed towards IT companies rather than telecommunications. More investments have been allocated for the continuous development and improvement of the information infrastructure as well as for the investment in human resource capacities. It is important to note that, the increasing investment in the ICT sector has been realized due to a number of reasons including the improvements in the overall economic conditions and the sustainable growth of the economy, which has reached 5% in the period 2004-2005. Moreover, expectations indicate that continuous growth derived by increasing consumption demand in response to bold trade and tax reforms that would realize a stronger economic activity and increased disposable income for households [23].

Reference the strategic vision of the nation, the government is sustaining its ongoing economic and institutional reforms, investment incentives, infrastructure development and global integration to enhancing Egypt's competitiveness globally and in the region to support investment in different fields and especially in the ICT sector. According to IDC, revenues of the IT sector in Egypt in 2004 were about 562 million US dollars. This figure is expected to increase significantly by 2009 to reach 973 million US dollars. The analysis of these figures indicate that although the increase comes from the hardware industry, the percentage of revenues from hardware had decreased compared to software and IT services as it represented 63.6% in 2004 while it had reached 66.4% in 2000 and it is estimated to reach 62.8% in 2009. Spending on ICT represented about 0.9 % of GDP in 2004, which is nearly equal to the Middle East North Africa (MENA) region average in the same year that is about 1%. However, there is a lot to be done to reach the developed countries level of IT spending as a percentage of gross domestic product (GDP) such as in Europe which was more than 2.5% in 2004. Table 3 demonstrates the IT spending as a percentage of GDP in different regions of the world [9].

Table 3: IT Spending as a Percentage of GDP in 2004

Region	IT Spending as a percentage of GDP
Egypt	0.93%
Middle East North Africa	1.01%
Worldwide	2.48%
Western Europe	2.65%
United States	3.37%

In terms of IT spending in Egypt, the highest percentage relates to hardware because of the fact that the government, the main customer, has high expenditures (63%) on this element of the industry followed by software and application software that represents about 16% and 13% respectively [9]. Figure 1 demonstrates the distribution of IT spending in Egypt.
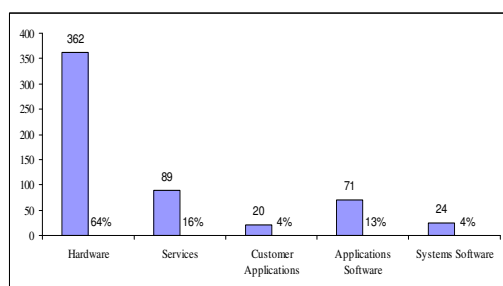
Fig 1. Distribution of IT Spending

IDC projects that the contribution of the ICT sector in terms of value will increase from 671 million US dollars to 1.1 billion US dollars between 2004 and 2009 with an expected growth rate of more than 70% [9]. These projections are based on the increase in IT investments due to the government efforts to improve the business climate, which led to foster economic growth since 2004. In terms of investment in human capacities, MCIT has made a commitment to invest in the future by working to ensure that today's students and employees receive the education and training that will prepare them to lead Egypt in the information society. MCIT in collaboration with its different partners is focusing on developing basic and professional ICT skills by collaborating with government ministries, agencies as well as multinationals and companies from the private sector to develop a variety of training programs designed to provide a wide range of ICT-related concepts and applications. Some of the initiatives and projects that also contributed in the investments in human capacities included the Smart Schools Network, the eLearning Competence Center as well as the support received from Egypt's ICT Trust Fund which was established in cooperation with UNDP in 2002 [12].

5. Egypt Information Society Initiative (EISI)
Egypt shares with other developing nations many of the challenges of building an information society. Therefore, Egypt efforts for ICT development are

Table 4: Egypt Information Society Initiative [27]

eReadiness "Equal Access for All"	eLearning "Nurturing Human Capital"
− Enabling all citizens to have easy and affordable access to the opportunities offered by new technologies − Developing a robust communication infrastructure is key	− Promoting the use of ICT in education − Developing a new generation of citizens who understand and are comfortable with the use of ICT in their daily lives
eGovernment "Government Now Delivers"	**eBusiness "A New Way of Doing Business"**
− Delivering high quality government services to the public in the format that suits them − Reaching a new level of convenience in government services − Offering citizens the opportunity to share in the decision making process and greatly improve efficiency and quality	− Creating new technology-based firms − Improving workforce skills − Using electronic documents − Developing ePayment infrastructure − Using ICT can be a significant catalyst to increase employment, creating new jobs and improving competitiveness
eHealth "Increasing Health Services Availability"	**eCulture "Promoting Egyptian Culture"**
− Improving citizens' quality of life and healthcare workers work environment − Adding value using ICT through reaching remote populations − Providing continuous training for doctors, and offering the tools for building a national health network	− Documenting Egyptian cultural identity through the use of tools to preserve manuscripts, archives and index materials − Offering worldwide access to cultural and historical materials − Generate and promote interest in Egyptian cultural life and heritage
ICT Export Initiative "Industry Development" − Fostering the creation of an export-oriented ICT industry − Developing an ICT industry can be a powerful engine for export growth and job creation	

government-led in collaboration with the private sector and the civil society. MCIT was charged with the task of creating an information society, which started with the preparation of the national ICT plan. The plan paved the way for Egypt Information Society Initiative (EISI), which has been structured around seven major related tracks, each designed, when fully implemented, to help bridge the digital divide and facilitate Egypt evolution into an information society [27]. Table 4 demonstrates EISI elements.

6. SWOT Analysis of the ICT Market in Egypt

The ICT sector grew tremendously during the last 20 years going through a number of phases from introduction to adaptation to diffusion and

adaptation. However, the analysis of the local and global markets showed a number of challenges that faced the growth of the sector. The following SWOT analysis has been developed based on studying the different factors related to the ICT sector and highlighting the relative and competitive advantages of the sector in Egypt and its potentials for growth and contribution in overall development. This analysis served as a main platform for building Egypt national ICT strategy. Table 5 demonstrates the findings of the SWOT analysis.

7. Developing Egypt National ICT Strategy

Developing national ICT strategies in recent years has been the culmination of efforts undertaken by many countries in since the 1980s.

Table 5: SWOT Analysis of the ICT Sector in Egypt

Strengths	Weaknesses
− Number of university graduates − Low employee turnover (labor laws) − Government vision and support to ICT − Political stability − Infostructure − Telecommunication infrastructure − Low ICT infrastructure cost − Low cost of doing business	− Small market size (IT companies and market) − Mainly hardware-dominated industry − Limited services business opportunity − Limited outsourcing projects − Most large bids are government-related − Bureaucratic purchasing rules − Fierce competition and price-driven market − Buyers market (service and quality value) − General business climate / environment − Import-based industry − Limited industry expertise − Availability of capital investment
Opportunities	**Threats**
− Growing economy with a focus on exports − Local market growth rate − Human capacity building programs − ICT to improve sectors competitiveness − eGovernment services − Large number of private sector SMEs − Multinationals subcontracting national companies − Price-sensitive markets/lines of business − Outsourcing activities from US and EU − Buyers market created by competition − Emerging technologies adopted to increase productivity and reduce costs − Mobile technology advantages − Role of government and NGOs in supporting and promoting the ICT sector	− Availability of skills in required numbers − Perception of IT value and delivery of required quality − Ability to cooperate between companies − Competition between government and companies − Competition from other countries to Egyptian exports − Failure to link government, education and industry − High local software and intellectual property piracy rate − Inadequate legal and regulatory climate − EU countries causing price pressures on ICT exporters to create low-cost, effective IT outsourcing to their markets

Strategies during that time were focusing on computerization of the government administrative and operational procedures, coordination of computer education and training as well as the development and promotion of a computer services industry. Highly articulated ICT policies were developed in the 1990s, inspired by the Unites States announcement of the development of a national information infrastructure (NII) plan that

focuses on private investment, competition, access and universal services [7]. Developing countries followed two different approaches in defining their national ICT strategies. Some focused on developing ICT as an economic sector either to boost exports as in the case of Costa Rica and Taiwan or to build domestic capacity as in the case of Brazil, India and Korea [34]. These countries strengthened the market orientation of their

economic policies and institutions, have gradually dismantled barriers to trade and investment, and facilitated rapid changes in production and telecommunications technologies. These countries made combined efforts to educate their people to keep them on track of global developments, promoted ICT as an enabler of a wider socioeconomic development, and worked on repositioning their economy to secure competitive advantage in the global economy.

Egypt, as an African nation, was part of the framework of the African Information Society Initiative (AISI) that emerged from recommendations of the conference of African ministers of economic development and planning in 1996. Egypt among other nations strived to develop its national information and communication infrastructure (NICI) plans strategies and policies that articulate long-term policy, infrastructure, content and application as an integral part of overall national development [8]. Egypt is considered among the nations that have advanced their national strategies from conceptualization to implementation. This was translated in the deployment of a two-tier approach, developing national strategies and harnessing ICT applications in key sectors such as education and commerce with an emphasis on promoting electronic commerce, attracting foreign direct investment (FDI) to stimulate the knowledge-based economy and to create jobs for the youth and to harness the potential of ICT.

Egypt ICT strategy goes beyond telecom reaching a cross-sectoral approach to creating an enabling environment and mainstreaming ICT into national development policies by addressing all sectors such as trade, finance, investment, education, government, health and media amongst others. The target is to transform Egypt into becoming a vibrant and dynamic ICT hub in the Middle East with a thriving digital economy and IT-empowered citizens [25].

sector organizations as well as the civil society. According to WSIS in 2003, all countries were encouraged to develop their national ICT strategies including the necessary human capacity building taking into account national local conditions. In that respect, strategies should aim to maximize the social, economic and environmental benefits of the information society, which can only be realized if governments create a trustworthy, transparent and non-discriminatory legal, regulatory, and policy environment [33]. Egypt national ICT strategy objectives were mainly formulated to promote the information society and to build an export oriented ICT industry. Figure 2 demonstrates the overall objectives of the national ICT strategy during the period 2000-2004 [26].

The national ICT strategy was formulated to encourage social inclusion in the information age. The use of ICT to minimize the creation of communities of haves and have-nots was a key-targeted outcome. At the local level, the commitment to maximum social inclusion of its population required considerable pro-active support including financial investment to ensure that the nation at large is given universal access to the Internet backbone and to the NII. Moreover, the strategy addressed issues such as human resources capacity development and upgrading the physical infrastructure to be able to compete in global deregulated markets. At the global level, access became invaluable in shaping the role Egypt plays in global trade and markets. Respectively, convergence became vital. The emerging role of ICT and its integration in major sectors such as education, entertainment, health, and financial services also became a prerequisite for developing nations to be able to integrate in the global information economy and Egypt factored that element in its national ICT strategy.
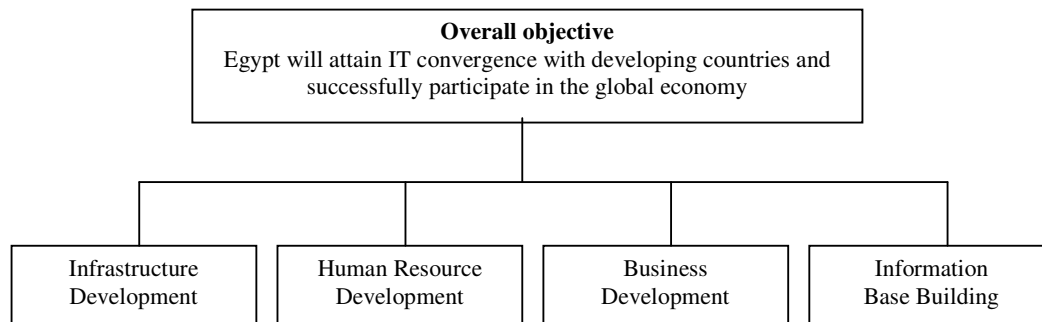
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│                Overall objective                  │
│  Egypt will attain IT convergence with developing │
│  countries and successfully participate in the    │
│             global economy                        │
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| Infrastructure Development | Human Resource Development | Business Development | Information Base Building |

Fig 2. National ICT Strategy Building Blocks (2000-2004)

The national ICT strategy is a product of the collaboration of many stakeholders including the community, the government, private and public

Egypt national ICT strategy has been dynamic and flexible adapting to the changing nature of the sector. In that respect, during the period 2004-2006

a revised strategy was formulated to include new elements such as providing an institutional support for developing electronic access (eAccess) and providing institutional development of electronic government (eGovernment) and electronic business (eBusiness). Figure 3 demonstrates the amendments that were introduced to the national ICT strategy for the period (2004-2006). The government of Egypt has made a strong commitment to advance the cause of human development in the context of an open economy. Additionally, the structural adjustment program that began in the early 1990s has caused positive and profound changes in the competitiveness of the country. Three main elements could characterize the economy being more open and that includes strengthening of market mechanisms, privatization of government enterprises and an increasing role for the private sector and the civil society [23].
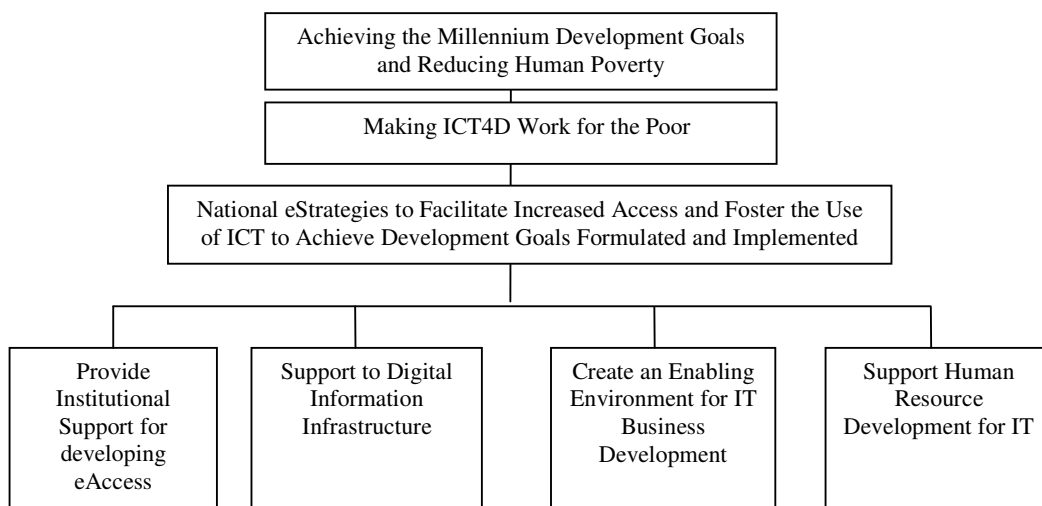

Fig 3. National ICT Strategy Building Blocks (2004-2006)

The role of MCIT required the provision of a policy framework for the ICT sector to grow and become competitive both locally and globally. Table 6 demonstrates the main categories under which fall the initial 23 projects of the national ICT plan. The majority of the projects were implemented by the private sector with financial and technical support and guidance from MCIT [28].

In 2006, and with the continuous development in the ICT sector in Egypt, a revisit to the strategy was conducted and a new ICT sector strategy was formulated for the period 2007-2010. The new strategy has been formulated to cater for three main components, ICT sector restructuring, ICT for reform and development and ICT industry development as demonstrated in figure 4.

Table 6: Projects of National ICT Plan

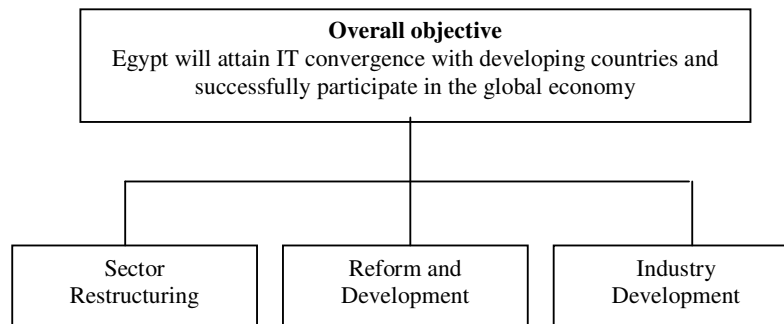| |
|---|
| − Promotion of national demand through numerous incentives for the private sector and with the contribution of 15 sector ministries in upgrading their operations and logistics using IT-based solutions |
| − Exports with a focus on the software industry that can provide substantial contribution to the global IT marketplace |
| − Human resource development that reflects one of the primary building blocks based upon which the future of the ICT sector in Egypt is depending upon |
| − International alliances through enticing multinationals in the ICT sector increase and diversify their investments and operations in Egypt resulting in the creation of job opportunities |
| − Modernization of infrastructure to improve and upgrade the capacities available in terms of ICT and information to participate in the global IT industry |
| − Legislative environment to enable a mechanism that allows the successful implementation and sustainability of projects and activities |

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┌─────────────────────────────────────────────────┐
│              Overall objective                    │
│  Egypt will attain IT convergence with developing │
│     countries and successfully participate in     │
│              the global economy                    │
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| Sector Restructuring | Reform and Development | Industry Development |

Fig 4. National ICT Strategy Building Blocks (2006-2010)

For the duration 2007-2010, the focus of the national ICT strategy would be to focus on a number of objectives. This will include sector restructuring by increasing the state resources to reach 3.9 billion US dollars through restructuring the national postal service, initial public offering for TE and the provision of NTRA licenses such as 3G and WIMAX services amongst others. Moreover, the government intends to exert maximum efforts to maintain the current level of investments in the ICT sector that is levelled at an annual growth rate of 20%. Finally, the government plans to help deploy state-of-the-art ICT tools and applications to serve the development in the society in different sectors.

In terms of using ICT for reform and development, the strategy intends to follow three main paths. This includes; deploying ICT tools through increasing the penetration rates to mobiles, PCs, Internet usage, broadband services and ICT clubs; developing the postal services with its over 4000 branches representing the largest network in the nation; and finally completing the technology infrastructure in different institutions. Moreover, the strategy will focus on using ICT as a catalyst in reforming a number of sectors including education, health, and government institutions (ministries) amongst others.

In terms of industry development, the strategy intends to focus on innovation, research, and development in ICT through the formulation of partnership agreements with multinational companies in the ICT sector. This will also include the development of technology incubators for SMEs in the ICT sector, investing in human capital, media convergence, development of eContent, promoting ICT exports to increase from 250 million US dollars to 1.1 billion US dollars by 2010 through outsourcing. The new strategy for ICT in Egypt for the period 2007-2010 intends to look at ICT as a platform for empowering the community as a key element for socioeconomic development.

7. Conclusion

Successful ICT strategies need a number of elements in order to be effective and to realize its targeted objectives. This includes, but is not limited to, leadership from top executives and policy makers, involving all stakeholders in implementation, deploying a holistic approach covering all sectors, enabling a liberalized economy, monitoring ICT developments, tailoring towards the nation's requirements and mainstreaming ICT into national socioeconomic development plans. There is a need to emphasize the role of the government in creating the right atmosphere that encourages private sector investment in ICT related businesses. The liberalization of the telecom sector is important to encourage competition and promote FDI. The creation of a universal access policy through broadband is invaluable to induce mass-market deployment of ICT leading to improving the service quality and speed. Moreover, instituting the necessary foreign investment laws and enforcing software piracy and copyright infringement laws, which encourage ICT multinationals to establish regional operations, thus providing work opportunities for skilled individuals and limiting the brain drain effect. Egypt has already shown over the last decade some headway on the ICT development path. However, it needs to strengthen its commitment and speed its process for a long-term sector development and growth. Such a strategy would invariably drive faster growth across all economic sectors, which will lead to a sustainable socioeconomic development that can be reflected at the individual and societal level.

8. Acknowledgement

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