Technology Innovation and Entrepreneurship Strategy 2011-2014
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Executive summary

As a result of implementing the strategies of the Ministry of Communications and Information Technology (MCIT) over the past decade, the revenues from information and communication technologies (ICT) exports reached USD1.1 billion by the end of 2010. Egypt is now recognized by international organizations as a global hub in offshoring and outsourcing. The “outsourcing as usual” model is becoming commoditized with an increasing number of competitors from emerging markets. Innovation combined with increased expertise is the only way to consolidate and sustain Egypt’s continued success in outsourcing.

Egypt has decided to move to the next level to enhance the global competitiveness position of the country in the ICT sector, becoming the primary regional hub for innovation by 2020.

On 14 January 2010, the prime minister of Egypt, announced the establishment of an innovation center in the Smart Village to enable Egypt to become a world-class hub for ICT-based innovation and entrepreneurship. On 27 September 2010, the minister of communications and information technology, announced the launch of the Technology Innovation and Entrepreneurship Center (TIEC) to act as the main vehicle enabling Egypt to become the leading regional player in ICT-based innovation and entrepreneurship.

The Technology Innovation and Entrepreneurship Strategy 2011-2014 document details the strategic plan to positively influence Egypt’s development through the growth of a vibrant and innovative ICT sector. This will be achieved by focusing on four goals:

1. Enabling ICT companies to become established, to operate and to innovate in Egypt.
2. Enticing foreign and local ICT companies to generate, enrich and expand on innovative ideas.
3. Building Egypt’s brand as a regional hub for innovation.
4. Engaging diverse stakeholders in the task of generating, financing, supporting and deploying ICT-related innovation.

By carefully studying Egypt’s competitive position, performing a strengths, weaknesses, opportunities and threats (SWOT) analysis, and accounting for best practices in countries that succeeded in promoting innovation and entrepreneurship, the developed strategy to hand is based on a “six-pillar” model. The respective pillars are:

1) Stimulating a culture of innovation at the national and firm level.
2) Branding Egypt’s ICT sector as well as celebrating innovation and entrepreneurship.
3) Facilitating intellectual property management and enabling the exchange of intellectual property.
4) Establishing innovation clusters and offering common infrastructure.
5) Creating a business environment that facilitates innovation and entrepreneurship practices.
6) Capitalizing on and improving resources.

While accounting for MCIT’s four main goals and the six pillars upon which MCIT’s strategy is based, 13 initiatives were identified that guide how the TIEC will operate over the next four years. These 13 initiatives can be categorized into three layers:

1) Establishing the foundation of innovation and entrepreneurship.
2) Empowering businesses.
3) Recognizing innovation and entrepreneurship.

Each category is comprised of corresponding initiatives:

**ESTABLISHING THE FOUNDATION OF INNOVATION AND ENTREPRENEURSHIP:** Policy acceleration and advocacy; developing Egypt’s ICT innovation and entrepreneurship platform; capacity building through education and training; innovation assessment and certification.

**EMPOWERING BUSINESSES:** Startup support; innovation support; public-private funding; technology-specific clusters; intellectual property exchange; multinational corporation attraction and collaboration.

**RECOGNIZING INNOVATION AND ENTREPRENEURSHIP:** Awareness and celebration of innovation and entrepreneurship; branding Egypt as an ICT innovation and entrepreneurship hub.
Introduction

Since the beginning of the 1990s, Egypt has adopted a comprehensive program for economic reform and structural adjustment. This program, along with customs and tax reforms, helped in accelerating the economic growth of the Egyptian economy and attracting more investment. The government of Egypt has been working hard to build the institutional and regulatory framework for a successful market economy, as well as continuously improving the investment climate, aiming towards a well functioning, free market economy. The success of these reforms has contributed positively to overall economic growth. Foreign direct investment (FDI) has multiplied and exports are growing by more than 30% annually. As a result, Egypt is now considered one of the most attractive and favorable investment destinations in the Middle East and North Africa (MENA) region.

During the past decade, the government of Egypt has been committed to supporting the ICT sector and facilitating its strong and distinguished performance. Accordingly, Egypt’s ICT sector has become one of the key drivers of economic and social development. It has also become a role model in Egypt, in terms of pace and policies of deregulation and privatization, as well as a catalyst for reform in other sectors, contributing significantly to the abovementioned successes in the Egyptian economy. In addition, Egypt’s ICT sector has become a fundamental pillar in social development efforts, through a unique and distinguished experience of public-private partnership (PPP).

Egypt has successfully mainstreamed ICT as part of its national socioeconomic development strategy over the last decade. The government formulated an ICT Master Plan in 2000 to ensure the effective deployment and use of ICT for the benefit of all citizens. This plan succeeded in building the necessary infrastructure and ensuring the transference of technology and knowhow into Egypt. Several steps were then taken to enhance and develop the “Knowledge Economy” in line with parameters set out at the World Summit on the Information Society (WSIS) held in Geneva in 2003 and Tunis in 2005. Accordingly, the National Plan for ICT paved the way in 2003 for the initiation of the Egyptian Information Society Initiative (EISI), structured around seven major and related tracks, to help bridge the digital divide and facilitate Egypt’s transformation into an information society.

Following the successful implementation of EISI, the Ministry of Communication and Information Technology (MCIT) initiated a new strategy covering the period 2007 to 2010 with the objective of further liberalizing the sector, emphasizing the role of ICT in development, better developing the knowledge society, and focusing on building an offshoring and outsourcing industry and expanding ICT exports.

Egypt’s ICT sector benefited from a number of deregulation and liberalization policies during the past decade, with the private sector encouraged to play a larger role in the market. In parallel, the price of many ICT goods and services decreased tremendously. Liberalization policies led to the entrance of new players in the market, giving space for competition and driving forward improvements in infrastructure. They also resulted in a USD1 billion average annual flow of FDI during the past five years. ICT infrastructure indicators have reflected the extensive efforts made to promote the sector over the last 10 years, resulting in the widespread use of ICT goods and services. For example, the number of fixed line subscribers has more than doubled during the period 2000-2010, from 4.9 million to 9.59 million. In the field of wireless communications, the number of cell phone subscribers has risen from one per 100 people at the end of 1999 to 86 per 100 by the end of 2010. Internet use has also increased drastically to reach around 25 million subscribers (a 29 per 100 penetration rate in 2010 compared to only 0.58 in 1999), with ADSL and mobile Internet services provided by a larger number of companies.

The success of the latest ICT strategy (2007–2010) was reflected in the strong and steady performance of Egypt’s ICT sector, contributing to the growth of the economy overall. The sector has managed to maintain a growth rate of 12-15% on average in the past three years, achieving the highest growth rate of 14% among economic sectors during the fiscal year 2008/2009 and 13% during 2009/2010. The sector has also contributed with 4% of the country’s gross domestic product (GDP) in 2009/2010 and with around 10% of the economy’s growth rate, which reached approximately 6% during the same year. Moreover, the sector was transformed from one competing for subsidies and grants to a revenue generating engine and net contributor to the treasury, adding around EGP71 billion during the period 2008/2009 and 13% during 2009/2010. The sector has also contributed with 4% of GDP during fiscal years 2008-2009 and 2009-2010. The success of these reforms has contributed positively to overall economic growth. Foreign direct investment (FDI) has multiplied and exports are growing by more than 30% annually. As a result, Egypt is now considered one of the most attractive and favorable investment destinations in the Middle East and North Africa (MENA) region.

Additionally, the ICT sector’s exports have reached USD1.1 billion by the end of 2010, which come mainly from revenue of the Egyptian outsourcing industry, considered an Egyptian success story according to a number of international organizations. Egypt managed to become one of the top five outsourcing destinations in the world in 2010. The number of employees specialized in the outsourcing industry in Egypt has increased from 6,000 in 2005 to 33,000 in 2010, generating USD30,000 a year according to 2009/2010 figures. The expansion in technology specialized areas and the growth in IT services’ exports have contributed greatly to the remarkable increase in employees. Currently, the Smart Village the technology flagship of Egypt — alone employs more than 40,000 people and is expected to grow to more than 100,000 by 2015. In addition, the inauguration of Maadi
Building on the above achievements in the ICT sector, Egypt’s new ICT strategy for the next four years takes the successes already achieved and breaks through to the next level, providing a strategic roadmap to position Egypt and its ICT industries as a globally recognized innovation hub.

Egypt’s latest ICT sector strategy (2011-2014) focuses on innovation and entrepreneurship as its main pillars, because of their potential role in enabling long-term and sustainable ICT sector growth. Innovation and entrepreneurship in ICT will be the linchpin of a national effort to increase competitiveness, create jobs and opportunities, and to enhance Egypt’s overall standard of living and quality of life.

The Technology Innovation and Entrepreneurship Strategy (2011-2014) will focus on enabling ICT companies to become established, to operate and to innovate in Egypt, enticing foreign and local ICT companies to generate, enrich and expand on innovative ideas. The strategy also aims at building Egypt’s brand as a regional hub for innovation, in addition to engaging diverse stakeholders in generating, financing, supporting and deploying ICT-related innovation.

The Technology Innovation and Entrepreneurship Center in Egypt (TIEC) was launched in September 2010 with the goal of achieving the strategic objectives outlined in this report. The TIEC acts as a center for business leadership and technology creativity and aims at developing technology innovation and promoting the culture of business leadership and entrepreneurship among the youth, as well as instilling a culture of innovation and risk-taking within the Egyptian ICT community as key drivers of economic growth. The TIEC works under the public-private partnership (PPP) framework adopted by the government, academia, industry, and NGOs.

This strategy report is based on a study conducted between MCIT and experts from the INSEAD School of Business and D&L Partners during the period March to June 2010. That study was later reviewed and reworked by a think-tank group formed of TIEC employees and consultants in order to define the 13 initiatives that currently comprise the key strategic areas that TIEC will focus on in its programs. The 13 initiatives are outlined in detail in Part III of this report.

The objectives of this report are to provide:

1) An assessment of the current situation with respect to innovation in Egypt’s ICT sector as well as an overview of Egypt’s position relative to other countries.

2) An overview of the key initiatives of the Technology Innovation and Entrepreneurship Strategy (2011-2014), the implementation approach, and the factors necessary to achieve the strategic goals established.

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Conceptual framework

In carrying forward Egypt’s wider goals, and identifying possible priority areas for action, the strategy is guided by three principles:

PRINCIPLE ONE — The objectives of innovation in the ICT sector are aligned with those of Egypt’s socioeconomic development strategy as a whole. These objectives are:

1) Attract FDI in new, innovative trends and niche areas of the technology market.
2) Create high value-added jobs.
3) Maximize the positive effects of ICT on Egyptian society.
4) Enhance Egypt’s brand as an innovative knowledge-based economy.

PRINCIPLE TWO — Areas identified for priority action are organized around a set of simple yet powerful strategic goals, in the execution of which all levels of management know what is expected of them. The three axes identified in this context (this is the “what” side of the framework, or “I3” in Figure 1 below) are:

1) Inspire — What can be done to “lead by example” and to allow role models to emerge in Egypt’s ICT industry relative to innovation?
2) Innovate — What kind of genuine innovation can be pursued and created that would spark a chain reaction across Egypt’s ICT sector and generate a critical mass of innovative enterprises? What obstacles should be addressed? What resources should be mobilized?
3) Impact — What are the areas of ICT innovation through which a positive impact on Egypt’s economy and society can be achieved? What measures should be taken to maximize this impact?

PRINCIPLE THREE — The key performance indicators and targets should be consistent across all action areas. For this, the strategy needs to respond to clearly identified and measurable ways in which progress is expected to happen (this is the ‘how’ side — the “L3” in Figure 1 below — of the conceptual framework proposed). It is a combination of:

1) Learn — How much will be learned at the end of the process (by local firms, citizens and public entities)? How much knowledge will be acquired through technology transfer, partnerships, and adaptations of best practices, as well as from local success stories?
2) Localize — How much will be achieved in terms of local content (in production, export value and information generation) across Egypt’s ICT sector, and society in general? How much of this will be recognized worldwide and associated with Egypt as a brand? Localizing actions and priorities to the specific context of Egypt’s market, economy and society will be the key to success in those areas.
3) **Leapfrog** — How much progress will be made at the end of the process with regard to foreign investment, job creation, and the acquisition of new ways of innovating, producing and doing business locally and abroad? The answer to this question will largely depend on how successful Egypt has been at overcoming existing hurdles by finding creative ways to leapfrog and innovate in ICT. It will result from Egypt’s success among the first two Ls (learning and localizing).

The interaction between these objectives and principles can be schematized as follows:

![Figure 1: The interaction between objectives and principles](image)

### Methodology

To arrive at MCIT key initiatives, the methodology adopted for strategy development has been a combination of factual evidence from the ground and a strong analytical framework.

- Evidence from the ground (missions, interviews, data collection) — A series of interviews was undertaken with key players in the ICT sector in Egypt. The objective was to gain a first-hand understanding of the key issues at hand and constraints under which firms operate, as well as an appreciation of the factors that initially attract firms to Egypt. These interviews were complemented with a questionnaire that was sent out to more than 30 ICT firms. The questionnaire was based on D&L Partners’ Innovation Readiness Model (IRM) and was intended to quantify the current level of innovation in firms, thereby identifying what needs to be improved.

- A strong analytical framework — here the study relied mainly on Network Readiness Index (NRI) that measures the propensity for countries to exploit the opportunities offered by information and communications technology and seeks to better comprehend the impact of ICT on the competitiveness of nations, the Global Innovation Index (GII) and the IRM developed largely by the D&L Partners team. The GII provides a holistic assessment of the overall innovation capability of countries, whereas the IRM assesses firms’ innovation capacities. Taken together, the framework provides a unique approach to the “innovation path” Egypt may chose to follow and the three phases by which countries ascend the ladder of international competitiveness:

1. **Stage One**: Competitive advantage arises from natural advantages such as access to a large talent pool.
2. **Stage Two**: Competitive advantage arises from the ability to innovate and leverage efficiency and gain higher productivity.
3. **Stage Three**: Competitive advantage results from the ability to innovate by creating new knowledge.

Along such a path, steps will be taken — simultaneously and successively — to enhance Egypt’s ability to compete and innovate (and/or that of its enterprises). This can be represented as follows:

![Figure 2: Frameworks for assessing national and firm level innovation](image)
Structure of the document

This strategy document is composed of five main parts:

**Part I** summarizes the current situation of Egypt with regard to ICT and innovation, and benchmarks some key components.

**Part II** assesses the ICT/innovation performance of Egypt and introduces a strengths, weaknesses, opportunities and threats (SWOT) analysis.

**Part III** combines the findings of parts I and II to formulate the architecture and main axes of the Technology Innovation and Entrepreneurship Strategy (TIES), to enhance Egypt’s performance in the area of innovation in ICT, and to present a selected set of key initiatives that should allow Egypt to accelerate its progress and move up among regional and world champions of ICT innovation in the coming decade.

**Part IV** describes the approach that will be used to guide the implementation of the TIES.

**Part V** presents the critical success elements that are vital for TIES to be successful. These factors are considered the main enablers that will drive the strategy forward.

**Part I — ICT and innovation in Egypt: Ready for more**

Egypt has successfully mainstreamed ICT as part of its national socioeconomic development strategy over the last decade. The government formulated an ICT Master Plan in 2000 to ensure the effective deployment and use of ICT for the benefit of all citizens. This plan also spearheaded the building of infrastructure and the transfer of technology and knowhow into Egypt.

Several steps were then taken to enhance and develop the “Knowledge Economy” in line with parameters set out at the World Summit on the Information Society (WSIS) held in Geneva in 2003 and Tunis in 2005. Accordingly, the National Plan for ICT paved the way in 2003 for the initiation of the Egyptian Information Society Initiative (EISI).

Following the successful implementation of EISI, the Ministry of Communication and Information Technology (MCIT) initiated a new strategy in 2007/2010 aiming to stimulate the emergence of an innovation-enabled ICT sector. Positive results are starting to become visible. At the same time however, the world and Egypt’s competitors and partners have moved forward and transformed. In such a context, what is the value of Egypt’s past efforts and successes? And what more is needed to gain leverage on past successes and address remaining — and new — challenges?

**Egypt — A high-tech destination**

Based on one of the speeches of His Excellency Tarek Kamel, minister of communications and information technology:

“Egypt recognizes that a country’s capacity for innovation and entrepreneurship is critically important to successfully competing in the global marketplace and promoting social progress. That’s why the Ministry of Telecommunications and Information Technology has dedicated extensive resources during the past 10 years to laying the foundation for innovation and entrepreneurship initiatives.

“The groundwork achieved in order to support our vision for the future includes enhancing Egypt’s ICT infrastructure, which encompasses our countrywide communications/data networks, and the careful preparation of a highly specialized cadre of knowledge workers. Moreover, the development of our ICT industry has played a key role in positioning Egypt among the top 10 offshoring and outsourcing destinations in the world.”
“In response to the success of earlier initiatives and to our readiness to move to the next level of global competitiveness, Prime Minister Ahmed Nazif announced the establishment of an innovation center in the Smart Village to enable Egypt to become the leading regional hub and world-class destination for ICT-based innovation and entrepreneurship. On 14 January 2010, he hailed it as a place that empowers talented people and small businesses to turn original ideas into successful enterprises. Among the primary objectives of this center are: the support of start-ups by young entrepreneurs; the generation of revenue through intellectual property; the creation of high-end jobs; and the attraction of foreign direct investment, all of which will clearly add great value to the Egyptian economy. “We hope our progress in the field of ICT will be a model for other sectors to follow, and we believe that our commitment to innovation and entrepreneurship hold extraordinary promise not only for Egypt’s future, but for the world. We invite you to join us.”

Indeed, Egypt’s successful ICT industry will continue to progress with the support of the Technology Innovation and Entrepreneurship Center (TIEC) established in September 2010. Formed as a catalyst between the government, the private sector and academia, the TIEC supports the entrepreneurial spirit of Egypt’s youthful workforce with a variety of educational, technological and financial resources. Already, specialized programs are being conducted, strategic partnerships with leading companies in the ICT sector are being formed, and greater venture capital investment is being attracted.

As part of the programs designed to encourage innovation and entrepreneurship, viable ICT start-ups may receive support, including funding, space in a business incubator program, expert advice in taking products or services to the market, and help with intellectual property protection. Through these and other efforts, Egypt is gaining recognition as a serious competitor in world-class innovation and creative entrepreneurial leadership.

1) Laying the foundation

Egypt’s expanding technology infrastructure

Over the past 10 years, MIT has made significant progress in strengthening Egypt’s technology infrastructure, internally and in terms of connectivity with other parts of the world. Some of the greatest advances in facilitating innovation and entrepreneurship can be found in the national telecommunications system and at Egypt’s high-tech Smart Village.

a) Telecommunications

Since the late 1990s, the Egyptian government has made deregulation and development of the telecommunications sector a priority. In 2003, the Telecommunications Law was enacted to regulate the telecommunications service sector and to enhance and deploy services in compliance with the most advanced technology, satisfying users’ needs at affordable prices. The Telecommunications Law also aims at encouraging national and international investment in this field within the framework of free competition. In addition, the government of Egypt has been keen to ensure the strength of Egypt’s ICT sector through encouraging competition between different operators, which also led to a significant decline in the price of ICT services in Egypt.

As a result of the abovementioned policies, specifically liberalization policies, the price of telecommunication services in Egypt are considered competitive globally. The liberalization of the ICT sector also helped attract national and foreign investment. Total ICT investment in Egypt exceeded EGP44 billion by the end of 2010. It is expected that the competitiveness of the ICT sector and its increasing role in economic development will lay a strong foundation for high value-added innovation activities in Egypt revolving around this vital sector.

b) Technology and business parks

ICT and business parks provide a seamless, high-technology environment where synergies in creativity, innovation and business development are enhanced. In 2003, Smart Village Cairo was inaugurated as the country’s first “technology cluster and business park”. Encompassing over three million square meters, this prime location houses some of Egypt’s most cutting-edge facilities, multinational and local companies, government bureaus, financial authorities and educational institutions, all of which share the most up-to-date infrastructure, advanced-facility management and a full range of business and recreational services. Furthermore, members of the Smart Village community enjoy a thriving environment beyond the excellent business service provided.

In 2010, the first phase of the Maadi Business Process Outsourcing (BPO) Park was inaugurated. The establishment of this park aims to meet the increasing demands of the industry and to export a wide range of technological services to clients around the world from Egypt. It is expected to create around 40,000 direct job opportunities and 100,000 indirect job opportunities by 2015. It will include around 40 buildings on 75 acres of land exclusively dedicated to outsourcing call center operations. The project has a great deal of potential to increase Egypt’s ICT exports and will help attract foreign investment to the country.

2) Nurturing homegrown talent

An incubator program for innovative enterprises is being conducted. Entrepreneurial principles like boldness, originality and the pioneering spirit are the foundation of any truly innovative business environment. Several years ago, Egypt’s Information Technology Industry Development Agency (ITIDA) established a successful incubator initiative to help start-ups develop business skills and managerial efficiency, and to attract multinational companies to invest in promising ideas. Today, the incubator program plays a key role in strengthening ties between business and academic innovation, nurturing the growth of small and medium enterprises (SMEs) throughout Egypt, and cultivating a culture that stimulates pioneering values and rewards entrepreneurship. Initially linked to the ICT Business Plan Competition (BPC), the incubator program has expanded to Alexandria, Assiout and Mansoura to allow more entry points. Selected projects receive space in incubator program buildings, advice about business processes, and financial support for operational costs for an 18 to 24 months incubation period.

The success of the unique start-ups and SMEs that have benefitted from ITIDA’s incubator program highlights the effectiveness of this strategy that creates business and technology champions by rewarding vision; that cultivates entrepreneurial spirit by strengthening ties between business and academia; that attracts multinationals for collaborative partnership and investment, and increases specialized capacity building to address the needs of individuals, institutions and industries. Moreover, the strong relationships developed between the ICT industry and academic and research institutions both increase the flow of trained individuals into the labor market and facilitate the emergence of new enterprises in the ICT sector.
3) Investing in tomorrow

Financing and Venture Capital Sources
The three main funding mechanisms for Egyptian startups are angel and seed funds, soft loans, and venture capital. Internal financing is provided by the incubation initiative for early-stage startups and by the Technology Development Fund (TDF) for more mature companies. The TDF, a public-private partnership fund established in 2004, was considered to be MCIT’s first effort towards building an ICT venture capital industry in Egypt.

a. Funded projects

- Smart card production.
- Business process outsourcing.
- Arabic language processing.
- Device modeling for microwave and optical engineering.
- Technical consulting.
- Open source software development.
- Educational content provision.
- Arabic multimedia and voice technologies.
- Integrated circuit and turnkey chip design.

The TDF’s services are not limited to financing alone, but cover various areas such as international and local marketing, management, manpower, legal issues, and facility development.

b. Venture capital and angel investors

Outside the TDF’s involvement, there are other venture capital funds in Jordan, Saudi Arabia, and the United Arab Emirates that invest in innovative Egyptian ICT ventures, as several multinational technology companies do with small venture funds. Angel investment in Egypt is not yet very active and generally based on personal contacts. Some high net worth individuals invest in Egyptian technology ventures at these early stages.

4) Creating future entrepreneurs

Entrepreneurial training and education
Egypt is developing innovators and entrepreneurs through extensive undergraduate and postgraduate education, and non-degree executive training. Lots of institutions offer ICT-related programs, such as Nile University, the Information Technology Institute, and the National Telecommunication Institute and other Egyptian universities. The following table provides a sample of some of the programs and activities that support the provision of entrepreneurial training and education:

<table>
<thead>
<tr>
<th>Education/Training</th>
<th>Focus Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>Ensuring that students are qualified to compete in a global market. EDU-Egypt, the Education Development Program for Egyptian Universities, is one of the most successful programs. It provides students with basic computer skills required by the business process outsourcing (BPO) industry.</td>
</tr>
<tr>
<td>Postgraduate</td>
<td>Recognizing the value placed on integrating engineering and business-related programs, four schools have been established: two in engineering, one in business, and one in management of technology. Providing combined software application development programs, designed mainly for new graduates in the field of information technology to provide them with training in state-of-the-art software technologies. The program offers advanced training for distinguished university graduates.</td>
</tr>
<tr>
<td>Non-degree executive training</td>
<td>Hosting seminars, workshops, and conferences on telecommunications and information technology, business development, and marketing.</td>
</tr>
</tbody>
</table>

Table 1: Sample of programs and activities that support the provision of entrepreneurial training and education

5) Creative ICT collaborations

National and international programs
Partnerships with national and international high-tech research and development (R&D) programs are an effective way to stimulate innovation and bring new ideas to the market, whether local or global. Through such cooperation, Egypt is able to leverage its technology expertise and precision-trained engineers, both locally and in conjunction with other countries.
**Business and academia collaboration**

The Information Technology Academia Collaboration (ITAC) is an ITIDA program designed to foster cooperation between ICT companies and R&D institutions. In order to empower competition in local and global markets, ITAC programs promote collaboration between industry and academia, link industry research with market needs, and create opportunities within ICT companies for undergraduates and graduates.

ITAC provides six main grant programs, four of which are at the postgraduate level, comprised of fellowships, advanced research projects, product development projects and the patent filing program. The other two are undergraduate programs consisting of student graduation projects — for which IT companies identify and propose subjects based on market needs — and student summer training, which provides students with practical on-the-job training in the largest ICT companies in Egypt.

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**6) Sustaining innovation**

ICT ecosystem support

A variety of support is necessary to generate and sustain innovation and entrepreneurship and to bring creative solutions to the world. Here are some of the ways Egypt attempts to foster the free flow of innovation in the ICT field.

a) Regulatory support

Egypt has worked hard to improve the investment climate with a number of recent reforms. Highlights include World Trade Organization (WTO) agreements that slashed trade barriers for ICT products and services; a new investment law that allows full repatriation of profits, unrestricted ownership of investment capital, elimination of price controls and reduced tax rates; the partial privatization of Telecom Egypt and other state-owned enterprises; and free zones that provide incentives for ICT companies that foster innovation.

b) Legal support

In April 2008, Egypt established specialized courts for economic, financial and investment affairs. These courts are responsible for the rapid issuance of decisions regarding investment and commercial disputes so as to encourage local and foreign investment in the Egyptian market. ITIDA provides a dedicated service unit for assisting organizations with drafting contracts and agreements, and supporting international negotiations.

c) Intellectual property rights support

Egypt is committed to protecting intellectual property rights (IPR). Following the introduction of a new Intellectual Property Law in 2002, the Intellectual Property Rights Office was established to reinforce these changes and administer a national copyright system. The office also works with national and international organizations to increase awareness and understanding of IPR.

d) Marketing support

A wide range of support is available from ITIDA to help Egypt-based SMEs to market their products and services. For high-tech trade shows, qualified companies can obtain conference preparation assistance including the development of marketing brochures and CDs. A business transformation program is available to help enterprises improve their competitiveness. And, if an IT firm wants to enter regional or global markets, there is a platform for partnerships with leading system integrators and channel partners in the region.

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**7) Egypt’s innovation success stories**

Innovation and entrepreneurship partnerships

Over the past several years, MCIT has committed extensive resources to the expansion of Egypt’s ICT industry while the country’s reputation as an innovation powerhouse has continued to grow. From state-of-the-art telecommunications to electronic design automation and groundbreaking nanotechnology advances, Egypt is proving to be a hotbed for cutting-edge enterprises.

By partnering with multinationals, incubating new enterprises, establishing world-class R&D centers of excellence, and fostering a nationwide entrepreneurial culture, Egypt is successfully helping global players bring new technologies to market. Collaborative partners from the U.S. and Europe are winning innovation awards while developing products and services that create a huge impact in their respective industries.

The Egypt Nanotechnology Center is one example of the partnership developed among IBM, two Egyptian universities and two funding organizations. The center’s research focuses on simulation and modeling software, alternative energy and energy recovery for desalination. The Cairo Microsoft Innovation Center (CMIC) focuses on applied research and development activities in the Middle East and North Africa (MENA). Orange Labs Cairo allows France Telecom Group to expand its presence in Egypt, to enhance the group’s capacity to deliver innovative services to its customers, especially in the MENA region. Valeo International Automotive Software (VISA) is a unique engineering center working under the umbrella of the VALEO Center of Electronics Excellence located in Paris. It has 250 trained Egyptian engineering staff in embedded software development, application software and tools to enhance development. Mentor Graphics is a leader in electronic design automation and enables companies to develop better electronic products faster and more cost-effectively. Egypt Team is a powerful technology drive within the Middle East region market. Company engineers published more than 150 technical documents and created more than 20 patents.
Part II — Egypt’s position relative to other countries

In order to assess Egypt’s position in innovation relative to other countries about its readiness to innovation, it is essential to analyze both the national and firm levels.

Assessing Egypt’s innovation readiness on the national level

a) Network Readiness Index (NRI)

A first assessment of Egypt’s current performance in the ICT ecosystem can be obtained from the Network Readiness Index (NRI). Because it is composed of both quantitative and qualitative sub-components, the NRI provides a unique way of observing how a particular country performs over time with respect to building a competitive information society. It also allows benchmarking national performance vis-à-vis competitors or similar economies. The NRI is published annually as part of the Global Information Technology Report, and relies on the collection and aggregation of some 68 variables. The following figure describes the main pillars (environment, readiness, and usage) and the nine sub-components of the NRI.

National Economies often chart a path from being “factor driven” to being “efficiency driven” to finally being “innovation driven”. In the factor stage, countries leverage basic endowments like labor and natural resources, commodities, and macroeconomic fundamentals. As economies transition to the efficiency driven phase they focus on the quality of education, efficient production processes, well-functioning labor markets, large domestic and foreign markets, and the ability to leverage technology (ICT specifically).

As economies transition to the innovation stage they are able to sustain higher wages and support high standards of living based on a national culture of generating endogenous innovation.

In the 2009-2010 edition of the Global Information Technology Report, Egypt was ranked 70th out of 133 countries, an improvement of six positions over the previous year, and of eight positions from 2006. Regarding Egypt’s strengths in a composite index like NRI, it is important to make a distinction between ICT-related variables on the one hand and those that are more inter-sectoral by nature. In the case of Egypt, a significant number of NRI strengths are ICT-related variables, like government prioritization of ICT (variable 6.01 — for which Egypt ranks 41st in the world), business internet use (variable 8.04, 45th) and laws relating to ICT (variable 2.02, 48th). On the other hand, some other strengths are non-ICT specific, yet of direct relevance to innovation. These include venture capital availability (variable 1.01 — for which Egypt ranks 34th in the world), state of cluster development (variable 1.04, 41st) and firm-level technology absorption (variable 8.02, 48th). The following table presents Egypt’s strengths in the NRI of 2009.

<table>
<thead>
<tr>
<th>STRENGTHS</th>
<th>Element</th>
<th>Index</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.08</td>
<td>Time required to start a business (hard data), 2009</td>
<td>20</td>
<td>6.74</td>
</tr>
<tr>
<td>1.09</td>
<td>Number of procedures required to start a business (hard data), 2c</td>
<td>32</td>
<td>5.33</td>
</tr>
<tr>
<td>1.01</td>
<td>Venture capital availability</td>
<td>34</td>
<td>3.37</td>
</tr>
<tr>
<td>2.05</td>
<td>Efficiency of legal framework in settling disputes</td>
<td>39</td>
<td>4.34</td>
</tr>
<tr>
<td>6.01</td>
<td>Government prioritization of ICT</td>
<td>41</td>
<td>5.16</td>
</tr>
<tr>
<td>1.04</td>
<td>State of cluster development</td>
<td>41</td>
<td>3.89</td>
</tr>
<tr>
<td>8.04</td>
<td>Extent of business internet use</td>
<td>45</td>
<td>4.86</td>
</tr>
<tr>
<td>8.02</td>
<td>Firm-level technology absorption</td>
<td>48</td>
<td>5.11</td>
</tr>
<tr>
<td>2.02</td>
<td>Laws relating to ICT</td>
<td>51</td>
<td>4.18</td>
</tr>
<tr>
<td>1.06</td>
<td>Extent and effect of taxation</td>
<td>52</td>
<td>3.68</td>
</tr>
</tbody>
</table>

Table 2: Egypt’s Networked Readiness Index strengths (2009)  
Note: Higher rank implies worse relative performance
Regarding Egypt’s weaknesses, an area in which Egypt has massive challenges to face is education. Although such problems are not uncommon among countries of the size, population and income level of Egypt, they represent a striking hurdle in Egypt because it affects its economic and social potential. However it may be worthwhile to mention this challenge is less severe due to the university entrance filtration, only allowing 5% of the high school graduates to enter school of engineering, followed by another level of filtration after first preparatory year in engineering allowing only the top 20% to enter computer engineering and electrical engineering disciplines. The net result is that those who graduate from such departments are considered among the top 1% of high school graduates. Some ICT-related weaknesses emerge from government success in ICT promotion (variable 9.01, 121st), high-tech exports (variable 8.07, 121st), personal computers (variable 7.02, 89th) and broadband Internet subscribers (variable 7.03, 88th). The following table presents Egypt weaknesses in the NRI of 2009.

When comparing the overall NRI performance of Egypt to that of various income groups, the following observations emerge:

- Egypt does better than most of the ‘low-middle income’ countries, where it was ranked as the 8th out of 31 countries in this group. In addition, Egypt was the only African country that progressed by more than 6 ranks.
- Egypt’s NRI performance (70th) is comparable to that of countries with higher income levels such as Turkey (69th), Indonesia (67th) or even Poland (65th) and Brazil (61st). It is also significantly better than that of Russia (80th).

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<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Europe</td>
<td>Sweden</td>
<td>5.65 HI 1 2</td>
<td>5.84 HI 1 2</td>
</tr>
<tr>
<td></td>
<td>Denmark</td>
<td>5.54 HI 3 1</td>
<td>5.85 HI 3 1</td>
</tr>
<tr>
<td></td>
<td>Switzerland</td>
<td>5.48 HI 4 5</td>
<td>5.58 HI 4 5</td>
</tr>
<tr>
<td></td>
<td>United Kingdom</td>
<td>5.17 HI 13 15</td>
<td>5.27 HI 13 15</td>
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<td></td>
<td>Germany</td>
<td>5.16 HI 14 20</td>
<td>5.17 HI 14 20</td>
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<td></td>
<td>France</td>
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<td>Estonia</td>
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<td></td>
<td>Italy</td>
<td>4.97 HI 39 45</td>
<td>4.16 HI 39 45</td>
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<tr>
<td></td>
<td>Poland</td>
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<td>3.8 UM 14 669</td>
</tr>
<tr>
<td></td>
<td>Turkey</td>
<td>3.68 UM 17 61</td>
<td>3.91 UM 17 61</td>
</tr>
<tr>
<td></td>
<td>Russian Federation</td>
<td>3.58 UM 22 74</td>
<td>3.77 UM 22 74</td>
</tr>
</tbody>
</table>

Table 3: Egypt’s Networked Readiness Index weaknesses (2009)

Note: Higher rank implies worse relative performance

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
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<td>5.84 HI 1 2</td>
</tr>
<tr>
<td></td>
<td>Denmark</td>
<td>5.54 HI 3 1</td>
<td>5.85 HI 3 1</td>
</tr>
<tr>
<td></td>
<td>Switzerland</td>
<td>5.48 HI 4 5</td>
<td>5.58 HI 4 5</td>
</tr>
<tr>
<td></td>
<td>United Kingdom</td>
<td>5.17 HI 13 15</td>
<td>5.27 HI 13 15</td>
</tr>
<tr>
<td></td>
<td>Germany</td>
<td>5.16 HI 14 20</td>
<td>5.17 HI 14 20</td>
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<tr>
<td></td>
<td>France</td>
<td>4.99 HI 18 19</td>
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<td></td>
<td>Estonia</td>
<td>4.81 HI 25 18</td>
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<tr>
<td></td>
<td>Russian Federation</td>
<td>3.58 UM 22 74</td>
<td>3.77 UM 22 74</td>
</tr>
</tbody>
</table>

Table 4: Overall NRI performance of Egypt to that of various income groups

*Income Groups: HI = High Income; UM = upper middle income; LM = lower-middle; LO = lower-income. Country classification by income group is from the World Bank (as of December 2009).
A more detailed assessment of Egypt’s performance over time in the three pillars of the NRI is shown in the following:

When assessing Egypt’s ability to move up the ladder of knowledge-based competition, to create higher value-added jobs, and to brand itself as a destination of choice for innovative companies, it is critically important to compare Egypt’s performance to that of other comparable economies, to identify possible best practices, and to identify areas in which Egypt should focus its energy, resources and creativity to be a regional leader in ICT and innovation.

Egypt compares favorably to the Philippines (a fast growing outsourcing destination) on almost all NRI sub-pillars.

For two other countries (India and China) additional data is considered below, which provides some interesting avenues for action.

Figure 5: Egypt’s performance compared to that of comparable economies

For two other countries (India and China) additional data is considered below, which provides some interesting avenues for action.

Figure 4: Egypt’s performance over time on the three pillars of the NRI.
Note: Higher rank implies worse relative performance
Table 5: India and China NRI additional data that suggests avenues for action

Note: Higher rank implies worse relative performance

The above charts show that most of the indicators included in the NRI for both India and China have witnessed significant improvement.

b) Global Innovation Index (GII)

The Global Innovation Index (GII), featured in the strategy, examines how countries benefit from innovation through the use of enablers that stimulate innovation. GII relies on five enabling parameters (input pillars), namely: institutions, human capacity, general and ICT infrastructure, market sophistication and business sophistication. The two output pillars of GII — scientific outputs and creative outputs and wellbeing — aim at assessing the impact of innovation within the economy.

The seven key parameters of GII can be listed as follows:

**Input pillars:**
- Institutions: Political environment; regulatory environment; conditions for business
- Human capacity: Investment in education; quality of education; innovation potential
- ICT and uptake of infrastructure: ICT infrastructure; general infrastructure
- Market sophistication: Investor and credit conditions; access to private credit
- Business sophistication: Innovation environment in firms; innovation ecosystems; openness to global competition

**Output pillars:**
- Scientific outputs: Knowledge creation; knowledge application; exports and employment
- Creative output and wellbeing: Creative outputs; benefit to society

A closer look at Egypt’s performance

The latest GII rankings show that it is not necessary to be a large economy to be an innovating one. Iceland topped this year’s GII ranking despite the difficult economic situation it has faced over the last two years. Sweden and Hong Kong follow in second and third positions respectively. Several of the most innovative countries from last year’s Report, including the U.S. (11th), U.K. (14th) and Germany (16th) have fallen in the ranks. The top 10 countries in the overall 2009-2010 GII ranking are: Iceland, Sweden, Hong Kong, China, Switzerland, Denmark, Finland, Singapore, Netherlands, New Zealand and Norway.

European economies performed particularly well, including the Nordic ones (Sweden, Denmark, Finland and Norway) which all ranked in the top 10 with Iceland. Beyond these top 10, a number of additional small and medium-size economies rank fairly high on the GII. Some of the Eastern European countries such as Slovenia (26th), Czech Republic (27th) and Estonia (29th) also performed well in this year’s rankings.

In the 2009 GII report, Egypt ranks 74th out of the 132 countries covered. On the innovation input index, Egypt’s rank was 84th. On the innovation output index Egypt’s rank was 68th.
Assessing Egypt’s innovation readiness on the firm level

Innovation Readiness Model

The Innovation Readiness Model (IRM) is a way to rank the ability of organizations to innovate successfully. The concept of a “readiness” ranking can be understood as the measurement of the ability of an organization to put into practice lead-edge thinking around a particular topic, in this case, collaborative innovation. Its importance derives from the concept that increasing the focus on innovation (such as employing more people, allocating more resources, and declaring an innovation strategy) is not sufficient if the organization is not ready to deliver innovation. In other words, resources can be wasted if the organization does not have the capabilities in place to use them effectively.

For the sake of implementing this model, D&L Partners carried out a survey of innovation factors within a limited sample of Egyptian ICT firms. Due to limited time, the survey was conducted on sample of local and MNCs in the ICT sectors. The survey indicated:

- A high level of confidence in employees being encouraged to learn and experiment (but little belief that good, innovative employees were easy to find).
- Relatively few “hard” metrics (data and indicators) around innovation or intellectual property creation being used.
- A strong focus on collaboration as a business practice.
- Low emphasis on using innovation as a way of “leapfrogging” the competition through new business models.

Comparing Egypt with Middle East countries, Egypt’s GII profile ranks better on the output pillars compared to input pillars. In particular, human capacity is an area in which Egypt possesses a strong base, but also needs to capitalize on and grow in a more dynamic fashion.

Regarding the “creative output” pillar, Egypt’s performance is relatively better. The “market sophistication” pillar is one in which Egypt is able to make progress that would enable Egypt to emerge as a regional lead, which may be the key to its success in attracting foreign investment and branding itself as an innovation hub.

On the other hand, Egypt’s relative performance on the institutions and creative outputs pillar remains relatively strong when compared to Asian countries such as China, India, Malaysia and the Philippines.

Areas that Egypt must target to strengthen its innovation input and output indices are its “business sophistication” and “scientific outputs” pillars.

The specific results from the Egyptian ICT survey are presented below:

Figure 7: Egypt’s position compared to Middle East countries
Note: Higher rank implies worse relative performance

Figure 8: Egypt’s position compared to Asian countries
Note: Higher rank implies worse relative performance

Figure 9: Intellectual property creation measures

Figure 10: Top benefits of innovation
Most of the Egyptian ICT firms surveyed look at innovation primarily as a way of improving productivity, which is a fairly common response across all companies and countries. As well, the survey results show very clearly that there is little or no measurement of intellectual property creation in Egypt. In general, firms find the measurement component of innovation to be extremely difficult, in part because there is no easy, well-accepted metric that can be used.

Two-thirds of Egyptian ICT firms surveyed have some form of innovation department, which is relatively high. Having an organizational set-up that acknowledges the importance of innovation is a good start.

Figure 11: Survey results regarding having a separate Innovation related department

As for new ideas generated, three-quarters of ideas come from departmental teams, showing that Egyptian firms are relatively more collaborative with their partners (suppliers, clients and third parties) than other firms.

Figure 12: Survey results regarding how new ideas are generated

Moreover, results from the Egyptian survey are compared below with results from a global database of responses from prior research, for the sake of deepening the analysis.

Table 6: Egyptian survey compared with results from global database of prior research responses

The previous comparison shows that 63% of the Egyptian companies have a separate innovation related department while 64% of the companies in the global survey had no chief innovation officer. In addition, 82% of the Egyptian companies have processes to gather learning and best practices while only 68% of the global companies’ survey does.
SWOT analysis and opportunities for Egypt

In Egypt, the landscape of ICT has largely been shaped by the efforts of governments. A number of indicators have now become available that allow for a relatively detailed analysis of how Egypt’s ICT sector has been performing over recent years. These indicators can be used as the basis of a preliminary “strengths, weaknesses, opportunities and threats” (SWOT) analysis of the ICT industry in Egypt. The SWOT analysis provides an attempt to quantify the benefits that Egypt can harness from deploying innovation-related strategies in the ICT sector.

The contribution of the ICT sector to Egypt’s GDP stand at 4% and the ICT industry employs 200,000 people. This current structure of the ICT industry reflects the support that the Egyptian government has provided on ICT as a key sector in the overall development of Egypt.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2006-07</th>
<th>2007-08</th>
<th>2008-09</th>
<th>2009-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT Sector Revenues (LE Bn)</td>
<td>30.55</td>
<td>35.95</td>
<td>40.97</td>
<td>44.7</td>
</tr>
<tr>
<td>ICT Sector GDP at constant Prices (LE Bn)</td>
<td>23.10</td>
<td>26.40</td>
<td>30.25</td>
<td>34.29</td>
</tr>
<tr>
<td>Contribution of ICT sector to real GDP (%)</td>
<td>2.4</td>
<td>3.5</td>
<td>3.8</td>
<td>4.0</td>
</tr>
<tr>
<td>ICT Sector annual growth rate(%)</td>
<td>--</td>
<td>14.3</td>
<td>14.6</td>
<td>13.4</td>
</tr>
</tbody>
</table>

Table 7: ICT sector economic indicators, November 2010. Source: MCIT

a) ICT sector in Egypt — Strengths

The ICT sector in Egypt currently benefits from a number of strengths, mainly:

- Attractive cost base, due to its skilled labor force with competitive wages and relatively low attrition rates.
- Large and young population with multi-lingual capabilities that can position Egypt as a destination of choice based on its current ICT and outsourcing strengths.
- Government support for the ICT sector through a number of initiatives and investing in highly developed infrastructure.
- Egypt’s unique geographical location in the center of the world.
- Qualified skilled graduates from engineering & computer science schools who are considered among the top high school graduates.

b) ICT sector in Egypt — Weaknesses

As for the main weaknesses of Egypt’s ICT sector:

- Insufficient number of qualified graduates in the ICT job market as growing ICT opportunities needs to be fuelled by a regular supply of quality graduates in relevant fields of study. Egypt is currently evaluating closely the quality of its education system in general, and trying to align it with the requirements of its ICT sector.
- Relatively low quality of education in the areas of management and lack of practical applications within some schools.
- Political instability, which has an important role regarding foreign.
- Developing capacity for innovation in local firms takes time and leadership. Accordingly, development of the local ICT industry in conjunction with FDI from global players is important to reap the full benefits of innovation.
- A large number of talented Egyptians leave the country for foreign jobs with better working conditions.
- High turnover at the multinational corporation level that look for the best deals.

c) ICT sector in Egypt — Opportunities

- Rising costs in other ICT destinations as traditional ICT-based markets like India are coming under increasing productivity pressures, due to the rising costs of labor and insufficient growth in the supply of talent. This trend offers significant opportunities for Egypt to position itself as a destination of choice based on its current ICT and outsourcing strengths.
- Increasing desire from multinational companies to move innovation globally.
- Working population decline in key economies, which provides an opportunity for developing countries like Egypt to benefit from the trend.
- Public-private partnership (PPP) with existing multinational corporations in Egypt like Valeo, Microsoft, IBM, etc. Also having partnerships and working with different countries under different scientific cultures will spur innovation.
- Small and medium size companies all over the world cannot afford to have in-house localization teams and will prefer outsourcing.
To fully benefit from such opportunities, Egypt now must firmly establish and brand itself as a hub for ICT innovation. Scanning promising technologies (such as mobile-based services, cloud computing, and social media applications), as well as identifying topics for joint value creation with international partners and creating a local culture of innovation, will all be critical ingredients in this respect.

As per the chart above, Technologies in early stages offer opportunities for inclusion in higher education curriculum and research initiatives. Technologies in advanced stages offer opportunities for adoption and implementation in ICT start-ups and government-led investment programs.

b) Innovation in ICT Lines of Business:
Potential revenues from innovation in ICT sector over the next decade. They are described in the following:

1. Capitalizing on the most innovative areas of the global outsourcing market, specifically Application Level Outsourcing (ALO), where high-end technology skills are needed for sophisticated design and application development. By considering the potential for innovation in global ALO and the given characteristics, strengths and weaknesses of Egypt, it is expected that the practical demographic dividend weight for Egypt should be around 20% of the theoretical dividend of 1.13% yielding a value of 0.226% for the dividend weight for this category.

2. Creating firms focused on new technologies. These innovative technology firms open new markets and generate new skills, often those that are most rare in the ICT sector. They inevitably will look to the export markets of the developed nations to sell their products and services. Despite the fact that education in Egypt is a big problem at large, that the ICT’s share of the problem in this type of innovation is less severe due to the university entrance filtration, only allowing the top 5% of high school graduates to enter schools of engineering, followed by another level of filtration after the first preparatory year in engineering allowing only the top 20% to enter computer engineering and electrical engineering disciplines. The net result is that those who graduate from such departments are considered among the top 1% of high school graduates. Hence, in this type of innovation the practical demographic dividend weight is much better than the above case and it should be around 50% of the 1.13% yielding a value of 0.565% for the dividend weight in this line of business.

3. Producing, by these new technology companies, Intellectual Property in the form of patents and copyrights that can then be further exploited as licenses.

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3. Producing, by these new technology companies, Intellectual Property in the form of patents and copyrights that can then be further exploited as licenses.
Combined together, the above three segments can open new export markets and significantly improve Egypt’s level of innovation within the ICT sector. We will be using the above lines of business to calculate the revenue opportunity for Egypt in ICT innovations as follows:

1. **Egypt’s Potential for Serving the Application Level Outsourcing (ALO) Market:**

   Analysts estimate that the global outsourcing market will reach $641 Billion for the year 2011 (source: Ovum Data monitor Projections). Out of this total market ALO represents around $292 Billion. A conservative estimate of an average annual growth rate of 3% can be used to calculate the market size over the next period. This yields an ALO market size of around $320 Billion by 2015.

   Egypt has laid the foundation in this area, especially with the partnership with MNCs like Valeo in the field of automotive embedded-software systems. It would be safely assumed that the revenues expected from adopting “Innovation in ALO” for Egypt would be calculated by multiplying the $320 Billion ALO total market size by Egypt’s practical demographic dividend weight of 0.226% to yield a value around $0.6 Billion by 2015. This represents Egypt’s opportunity in the ALO market by 2015. Based on the assumption that a job in this line of business generates around $40,000 per person, it is expected that this line of business would generate an additional 15,000 jobs by 2015. It is expected that the revenues generated from this line of business would reach $1.2 Billion in 2020 by doubling of the number of job opportunities created.

2. **Egypt’s Potential for Serving the “New Technologies” Market:**

   Egypt will drive “creation and licensing of new technologies” on Egyptian soil that are then sold and implemented in global markets. Egypt’s ICT sector will focus on three main technology areas over the next decade. The potential revenues out of this segment will be projected as follows:

   i. **Mobility Applications:** Targeting a 0.565% share (as per Egypt’s practical demographic dividend) of the Mobility Applications market would mean a revenue generation of $38 Million for Egypt.

   ii. **Cloud Computing:** Targeting a 0.565% share of the global Cloud computing market would mean a revenue generation of close to $254 USD for Egypt.

   iii. **Social Networking:** Targeting a 0.565% share of the global market of social networking would mean a revenue potential of $28 Million for Egypt.

   By adding up the potential revenue streams in this line of business, the potential revenue for Egypt in this segment is expected to reach $320 Million by 2015. Based on the assumption that a job in this line of business generates around $200,000 per person, it is expected that this line of business would generate an additional 1600 jobs by 2015. It is also expected that the revenues generated from this line of business would reach $800 Million in 2020 as it is expected that this segment would create an additional 4000 job opportunities by 2020.

3. **Egypt’s Potential for New Intellectual Property and Licensing:**

   Further revenues can be garnered by licensing new technologies created in Egypt. Considering OECD data, the average revenue per patented license is $73,000 (Source: Summary results of the OECD survey on patenting and licensing activities). Egypt is targeting a total number of 1000 licenses for filed patents by 2015 yielding a revenue potential of around $80 Million by 2015 and to double this number by 2020.

   The total revenues expected to be generated in Egypt from the above three lines of business is projected to reach $1 Billion by 2015 and $2.2 Billion in 2020. The Figure below sketches Egypt’s revenue potential from innovations in ICT up to 2020.

![Incremental revenues from ICT sector innovation by mechanism ($ Bn)](image)

Figure 15: Evaluating revenue potential to 2020

a) **Egypt’s Employment Potential**

   Based on the above calculations, the direct employment potential from innovations in ICT is projected to reach 16,600 by 2015 and 34,000 by 2020.

b) **Contribution of ICT to the GDP (projections for 2015 and 2020)**

   Egypt ICT sector contribution to the GDP is currently about 4%. Based on a trend analysis forecast for the GDP and for the ICT value-add, it is expected that by 2015 the total contribution of ICT to the GDP at current prices will reach about 5.5% and will reach 7.5% by 2020.
Part III — Strategic framework and initiatives

A strategic framework is adopted that presents concrete steps that the TIEC together with other stakeholders will undertake to significantly improve the level of innovation in the ICT sector, to build on work done over the last decade aiming to make Egypt an attractive destination for FDI in the ICT sector. Six strategic “pillars” cover a series of initiatives designed to make innovation and entrepreneurship the focus for Egypt’s ICT industry in the coming period.

These pillars cover the strategy axes that TIEC would adopt based on benchmarking Egypt to other countries in terms of its innovative capabilities, the SWOT analysis, and best practices adopted by highly innovative nations.

1) Creation and nurturing the innovation culture

Nothing happens in a vacuum. For innovation to flourish, the business culture needs to be supportive. The concept of a culture of innovation is meant to represent all aspects of developing an outlook that fosters and encourages innovation at all levels of business, with particular attention paid to education. Within this direction are measures designed to bring the idea of innovation to a wide public, and to provide services to those already engaged in creating the “next big thing”.

A strong local culture of innovation is the basis on which all success stories of innovation have been built. From the clusters of northern Italy in the 15th century to Silicon Valley, innovation in all sectors has developed through the steady growth of creative networks and communities, able to receive relevant education and training, and to benefit from mechanisms by which success stories and best practices can be gathered, shared, localized and improved. Although they are tightly interdependent, these goals lend themselves to a select number of precise actions, which can all be expected to deliver measurable results. For each, owners/leaders will need to be identified, and key performance indicators (KPIs) specified.

2) Branding Egypt as a hub for ICT innovation

Foreign direct investment (FDI) is of vital importance to the development of the ICT sector. To that end, the ICT innovation strategy seeks to promote Egypt as an “innovation hub”, highlighting the competitive nature of its infrastructure and the strong desire of government to assist companies in locating facilities in the country. A radical component of this is the “innovation prize series” — a collection of prizes on offer to entrepreneurs (both foreign and domestic) who can successfully solve ICT-related challenges.

3) Encouragement of intellectual property creation and exchange

The last few years have seen an explosion in the value of intellectual property (IP) to companies and the global economy as a whole.
As can be seen, the percentage of value ascribed to IP for companies that make up the S&P 500 Index in the U.S. has risen from less than 17% of total value in 1975 to almost 80% of total value by 2005. In this context, it can be appreciated why understanding, controlling and protecting IP is so important in today’s “knowledge economy”.

In any economy, innovation can only thrive if a proper regime and culture surrounds intellectual property, including patents, trademarks, copyright, and design and utility models. Failure to protect against software piracy, for example, can discourage potential investors, especially private institutions such as venture capital and private equity funds.

Egypt has already made significant progress in enhancing the level of IP protection and now compares favorably to other locales. But it is also essential for local innovators to understand the issues around protecting IP; both in the normal course of business and in case they enter into partnerships or joint ventures with foreign companies (especially if this partner is much bigger than they are). Potential innovators are also concerned (and potentially inhibited) by the perceived lack of institutional mechanisms by which they can get their inventions to market, i.e. to commercialize them. The initiative to organize a set of actions around an ‘Egyptian IP Exchange’ is a practical attempt to address such complex issues.

The IP Exchange serves as a unique clearinghouse and facilitator, reducing the costs of registering and using IP by serving as a central point for help and guidance as well as a place where IP can be bought and sold. By providing such an exchange, companies can quickly and efficiently develop their own IP strategies as well as identify and license those technologies they need for their businesses to thrive.

4) Developing technology specific clusters

Clusters are not only a way to generate economies of scale and scope by offering common infrastructure and housing to a significant number of companies, they also play the role of incubators for many SMEs and start-ups. Innovation clusters are difficult to create, and seem to have a dynamic of their own. Some fail, some succeed, some remain in-between, never achieving critical mass. A few years ago, research done by the World Economic Forum showed a striking view (see chart below) of how clusters tend to be born.

Out of so-called “hot springs”, some clusters grow in size and potential and become “Silicon Valleys” — i.e. large clusters with a high turnout of patents and IP creation. Yet, in the process, many clusters will not grow in size, remaining forever as they were, or disappearing. Others will grow in size but remain “under-achievers” in terms of patents granted: they will become part of the “silent lake” of ineffective clusters.

Some of the most successful innovation hubs are clusters that have developed spontaneously around resources such as universities, government grants and specific technologies. The question is how best to capitalize on the work already done in Egypt around the “Smart Village” concept, and how to replicate it elsewhere in the country as well as develop the robust associated industries needed to make a cluster self-sufficient (such as venture capital).

5) Creating the proper business environment

Making it easier to be an entrepreneur means examining closely the business environment in which firms operate. This direction focuses on the legal, fiscal and regulatory environment with a view to easing the burden on starting companies, and finding the talented people needed to operate and capitalize on their success to fuel the next round of start-ups. In its Doing Business Report of 2010, the World Bank listed Egypt as one of the “top reformers of 2008/09” (see table below).

6) Enhancing the innovation human resource pool

Both technology and people are cornerstones of a knowledge economy. Without the technology to provide connectivity and services wherever needed, it is very difficult to capitalize on the potential of an economy. Without smart, motivated and qualified people, companies cannot innovate and grow. This direction looks at both issues and how best to meet the challenge of providing sufficient quantities of both.
Strategic initiatives

The Technology Innovation and Entrepreneurship Strategy (TIES) is based on the “six-pillar” model discussed earlier:

1) Creating and nurturing a culture of innovation.
2) Branding Egypt as a hub for ICT innovation.
3) Encouraging intellectual property creation and exchange.
4) Developing technology-specific clusters.
5) Creating an appropriate business environment.
6) Enhancing the innovation human resource pool in terms of size and quality.

In addition, the TIEC has four main goals:
1) To enable ICT companies to establish, operate and innovate in Egypt.
2) To entice foreign and local ICT companies in Egypt to generate, enrich and expand innovative ideas.
3) To build Egypt’s brand as a regional innovation hub.
4) To engage the ecosystem of stakeholders in generating, financing, supporting and deploying ICT-related innovations.

For each of the six pillars, 13 initiatives have been identified and described, each contributing to one of the four main goals of the strategy. The 13 initiatives can be broadly categorized in three layers: Establishing the foundation of innovation and entrepreneurship; empowering businesses; and recognizing innovation and entrepreneurship. Each category is comprised of initiatives as follows:

ESTABLISHING THE FOUNDATION OF INNOVATION AND ENTREPRENEURSHIP: Policy acceleration and advocacy; developing Egypt’s ICT innovation and entrepreneurship platform; capacity building through education and training; innovation assessment and certification.

EMPOWERING BUSINESSES: Startup support; innovation support; public-private funding; technology-specific clusters; intellectual property exchange; multinational corporation attraction and collaboration.

RECOGNIZING INNOVATION AND ENTREPRENEURSHIP: Awareness and celebration of innovation and entrepreneurship; branding Egypt as an ICT innovation and entrepreneurship hub.

Ultimately, the 13 initiatives are guidelines according to which the TIEC will operate and collaborate with other partners. For each of the 13 initiatives, sample strategic programs and key performance indicators (KPIs) are defined.

Each of the 13 initiatives is based on one or more pillars. Figure 12 depicts MCIT’s 13 initiatives grouped in three layers, with each initiative being assigned to one or more pillars. Programs associated with those initiatives are targeted to be implemented starting 2011 for four years, the priority given to those programs that establish the foundation of innovation and entrepreneurship followed by other programs in the empowering businesses layer, and then by those in the recognizing innovation and entrepreneurship layer.

Figure 19: Strategy layered initiatives
Initiative 1: Innovation assessment and certification

Purpose of initiative:
The purpose of this initiative is to assist companies to develop their innovation management capabilities, to increase their competitiveness and to grow more effectively.

Examples of strategic programs to implement:

1) Assessing firms’ innovation capabilities

Specialized consulting organizations would undertake to help ICT firms identify their strengths and weaknesses using a number of innovation auditing tools. An independent entity should audit Egyptian companies on the basis of innovation readiness. The independence of this entity would help reassure foreign investors and corporations, demonstrating the true level of skills and innovation readiness within the sector. These types of innovation capability assessments are typically held at the strategy, culture, operations, and innovation-enablers (e.g., knowledge management and ICT infrastructure) levels. Conducting such assessments has multiple benefits:

- Pinpointing to firms areas of innovation weakness that require special training
- Allowing for standards to be established against which to assess innovation capabilities amongst medium and large ICT firms
- Allowing for innovation indices for the ICT sector to be developed, which consequently would provide pointers to effective policy decisions.
- Enabling the identification of firms that are highly innovative in order to provide additional training, incentives and recognition

A successful program that was implemented in Malaysia, which Egypt can adopt, is shown below. This program consists of a set of services that would enable local ICT companies to improve their innovation management capabilities, allowing them to build competitive and innovative products and services, and to transform new business models into new horizons of growth.

2) Offering certification in innovation

Consulting relevant government authorities, certificates could be granted to specific enterprises, certifying their degree of innovation maturity. Such certificates would be based on an independent evaluation of a company’s commitment to innovation, and innovation readiness. Certified entities would be eligible for specific aid and benefits as determined by the government’s innovation strategy and associated initiatives. Such certification would be of value to foreign companies seeking local partners among Egyptian start-ups and innovative SMEs. It would also complement the creation of a register of companies, technologies and people working in Egypt’s ICT sector.

Sample key indicators to measure performance:

<table>
<thead>
<tr>
<th>Sample KPIs</th>
<th>Source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of businesses that undergo innovation assessments and receive support</td>
<td>Survey of firms</td>
<td>Annual</td>
</tr>
<tr>
<td>Number of consultancy firms able to provide innovation support consultancy services</td>
<td>Survey of firms</td>
<td>Annual</td>
</tr>
</tbody>
</table>
Initiative 2: Egypt’s ICT innovation and entrepreneurship platform

Purpose of initiative:

The purpose of this initiative is to connect nodes in the national innovation ecosystem and to be a single point of access for businesses and entrepreneurs, whereby they can learn about innovation-related best practices, and find practical support.

Examples of strategic programs to implement:

1) Creating a repository of best practice in ICT innovation

   The repository would offer a single point of access to business (local and foreign) and to entrepreneurs (in incubators, universities and already operating business entities), whereby they can learn about innovation-related best practices (in Egypt and abroad) and find practical support for their innovation activities. Such a repository would also act as a gateway to other related innovation-supporting tools, such as innovation certification and innovation training, which would be easily accessible online to any interested entrepreneur or innovator. The repository could also fulfill several important additional functions (in totality or in part), namely:

   - Running idea creation sessions, encouraging employees and partners to develop new ideas that lead to innovations
   - Designing and promoting metrics to focus on top potential innovations, underlining on how firms can measure and manage innovation for successful market penetration
   - Generating an innovative environment, focusing on people and culture as well as on techniques for hiring employees with creative talents, for developing employees’ talents, and fostering a culture of innovation in the workplace

   The repository is also the ideal forum to encourage multinational corporations to participate as affiliates, expert speakers, and trainers (to transfer knowledge).

   In all countries around the world, entities and networks through which enterprises, experts and innovators can meet and exchange ideas informally have proven excellent “accelerators of partnerships”.

   In Egypt, some of these entities have been in existence for a long time, but interactions take place in a largely heuristic way. A coordinated and organized effort can now be made to replace serendipity with systematic and continuous interactions. A coordinated and organized effort can now be made to replace serendipity with systematic and continuous interactions.

   Inviting foreign companies to become affiliates (in local initiatives related to ICT and innovation), to participate as speakers (in local and international events related to ICT and innovation), and to contribute to curricula, courses and training programs in Egyptian companies and universities would all contribute to this objective.

   The repository can also act as a gathering space for thought leadership in innovation, both by local firms and as a platform for international experts. In the field of innovation, strategies are constantly updated, both on the basis of emerging best practices and under the pressure of available new technologies and services, and the emergence of new economic and business models. This is particularly true in the field of ICT, where technological change is faster and more disruptive than in any other field of activity.

   Global and regional investors are hence eager to be as close as possible to thought leadership in ICT innovation. Egypt has a strong part to play in that context by inviting its partners (especially in the Middle East region) to join in an effort to establish visible Arab/Middle East thought leadership in the field of ICT innovation. Egypt being both a Middle Eastern and African country could play the role of an inter-regional hub for ICT innovation leadership (for example through UNECA — United Nations Economic Commission for Africa — and UNESCWA — United Nations Economic and Social Commission for Western Asia — research and events).

   2) Formulating a network of companies, technologies and people working in the ICT sector, providing easy links to the best of Egypt’s best

   For foreign investors seeking to invest in Egypt’s ICT sector it is often difficult to know of the existence of potential local partners, and even more delicate to assess their reputation, record and potential. This results in lost opportunities for all sides. The creation of a database of companies, technologies and people working in Egypt’s ICT sector would hence be a powerful tool to attract foreign companies to that sector.
3) Creating social and project-based interaction between clusters and local communities
Clusters have the power to generate local interest and attention to innovation. For this, efforts should be made to enhance interactions between local communities and the people and companies working in individual clusters and smart villages. Social events (innovation nights, open door days) could be organized to that effect, possibly around specific projects. The concept is to transform the enthusiasm and hard work of entrepreneurs into positive impacts for the local communities around them.

4) Developing a local, regional and global network of stakeholders to support start-ups
Networking is considered critical to ensure support and sustainability for all activities. This will be done through a set of alliances with different stakeholders ranging from peer incubators, technology providers, granting agencies, mobile operators, government organizations, as well as NGOs, working actively to promote start-ups and trying to move this to a global collaborative platform that would further accelerate the development and success of Egypt’s growing ICT start-ups.

Sample key indicators to measure performance:

<table>
<thead>
<tr>
<th>Sample KPIs</th>
<th>Source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of firms/entrepreneurs utilizing the platform</td>
<td>Survey of firms/entrepreneurs</td>
<td>Annual</td>
</tr>
<tr>
<td>Number of collaboration tools available and success stories</td>
<td>The Innovation and Entrepreneurship Platform</td>
<td>Annual</td>
</tr>
<tr>
<td>Number of white papers published</td>
<td>The Innovation and Entrepreneurship Platform</td>
<td>Annual</td>
</tr>
<tr>
<td>Number of multinational corporations joining or accessing the repository</td>
<td>The Innovation and Entrepreneurship Platform</td>
<td>Annual</td>
</tr>
</tbody>
</table>

Initiative 3: Capacity building through education and training

**Purpose of initiative:**

The purpose of this initiative is to provide education and training to academics and researchers in the areas of innovation and entrepreneurship. This will enable university students and specialists to establish a foundation on which they would build innovative businesses.

**Examples of strategic programs to implement:**

1) Providing widespread innovation, entrepreneurship and emerging technologies courses and training for undergraduates and graduates based on best practices and lessons learned

All available research on innovation shows how critical (and difficult) is the objective of “growing innovators”. Egyptian universities and vocational training institutions will find valuable educational inputs from the repository and from lessons learned in dealing with potential investors. Courses in innovation and entrepreneurship would be considerably strengthened (and become more attractive to students) if such lessons and information were continuously used in curricula. Courses to be offered by the repository would be a good starting point for courses at the university level.

Also, young generations should be encouraged to pursue careers in ICT; this could be done through heralding role models in the ICT sector (successful Egyptian innovators and entrepreneurs) and encouraging ICT enterprises to discuss career opportunities with students and graduates. The inclusion of entrepreneurship courses for technology students will help them understand the critical factors in scoring success beyond having good ideas.
Stanford University has a similar course. Focused on engineers and scientists, students are put into groups that choose a certain business to launch. They then are guided through the process of creating a business plan, a business model, doing research on the marketplace, examining patents and so on. Finally, they have to bring it all together in a final presentation to real life venture capitalists that are tough and tear apart weak ideas. Students are graded on each aspect of the course. Many students go on to start the businesses they worked on. The synergy generated by the Silicon Valley cluster makes this course an easy one to put together, but it can be adapted and successfully run anywhere, including within teams from a company.

2) Bridging the supply-demand gap for qualified graduates

Analysis of the number of qualified candidates graduating from Egyptian institutions of higher learning indicates a potentially severe gap between the numbers of employees that will be needed in ICT business versus the numbers that will be available. Clearly, this will be a significant issue and a brake on Egypt’s ICT growth if left unaddressed. Three main steps should be pursued simultaneously in this regard:

- Public-private partnerships (PPPs) could be used to promote the creation of one or several world-class technology institutes in Egypt. Such institutes could be government owned initially and progressively opened up to the private sector (chairs, donations, etc).

- Using the example of India (Manipal, NIIT), Egypt could consider promoting a privatized model of profit-oriented engineering and technical education; this could be accelerated through partnering with relevant institutions abroad, as well as with existing Egyptian education businesses.

- Investing in distance education and lifelong learning (for example through a scaled-down version of the Indira Gandhi National Open University [IGNOU] or other Open University models, which contribute significantly to increasing the number of ICT graduates in India and the United Kingdom respectively). Life-long learning will also be a strategically important way to regulate the constant upgrading of Egypt’s ICT skills and e-skills.

In addition, careful analysis of the numbers of graduates in other disciplines that might be able to work in the ICT sector should be undertaken. In conjunction with an examination of those graduates who have voluntarily left the job market (who might be persuaded to re-join if offered the needed training and the prospect of an interesting and well-paid job at the end of it), a larger pool of potential candidates could be collected while other steps are working towards full efficiency.

3) Bridging the quality gap, especially in advanced (graduate) ICT education

As well as having to address the issue of the number of graduates available, the issue of quality must also be looked at. If Egypt is to expand the ICT sector into innovation, it will require top-tier innovators, entrepreneurs and employees. Typically these emerge from a variety of sources:

- Top-ranked universities — Institutions with strict entrance criteria, challenging and leading edge courses, and the highest standards when it comes to exams. By nature, the number of such graduates produced is relatively small as a percentage of the total graduate population, so steps to improve the percentage and the total number of graduates are required.

- Other educational institutions — Primarily extremely talented individuals in the field who for whatever reason have not been able to enter top ranked universities but nevertheless rise to the top of their class

- Mavericks — Those without formal education who turn to business or technology and prove to be excellent businesspeople and entrepreneurs

This action therefore requires close collaboration with the Ministry of Education to set goals around ICT-relevant education, looking at options to increase the intake of students and their quality, and to improve the identification of potential innovators and entrepreneurs across the education spectrum and beyond.

4) Enhancing the attractiveness of ICT education and careers to young Egyptians

Efforts should be made by the Egyptian government to entice young Egyptians to embrace ICT careers. A system of differentiated fees (based on family income and school record, for example) should be implemented across ICT education institutions (public and private). Tax incentives should be considered for ICT and innovation-focused training institutions, and their ability to levy income from IT and innovation certification should be enhanced.

5) Attracting experts from the region to courses/educational programs in Egypt on patenting, licensing and IP management

Sensitization and education/training efforts in the area of IP management should involve as many international and foreign experts as possible to enable the process of sharing experience and knowledge about IP management. It is also important to consider the possibility (in cooperation with other public and private entities) of organizing and/or hosting specific events in which local entrepreneurs could be exposed to the knowledge and experience of such experts. Given the fast-moving dynamics of the ICT world, learning from practical examples and the experience of those who have been successful themselves is an invaluable opportunity. Inviting such experts also promotes a positive image of Egypt among those experts, and is a message that they can share with their peers and colleagues in their own countries (for those who are sourced internationally).
6) Through PPPs, creating mechanisms for investment in skill development in the ICT sector

Government, business and universities should join forces to invest in the production of skills required to develop an innovative ICT sector in Egypt. For example, a common fund for e-skills could be created to finance training and education opportunities for promising individuals (through scholarships and low-interest loans, for instance). The example of European countries (e.g., Finland) could also be adapted to the Egyptian context to involve business in strengthening curricula in innovation, entrepreneurship and e-skills. PPPs are a good fit of this type of activity where both the profit motive and wider socioeconomic concerns are present. Educational institutions (such as universities, both public and private, vocational schools, and possibly even firms willing to create apprenticeships or similar roles) may then apply for incentives around specific skills they want to develop. They may then receive, for example, some combination of training at the IP Exchange or the Innovation Repository if appropriate; tax breaks on the social costs of hiring professors, experts, etc., to conduct training sessions on the skills in question. There may also be allowance for bringing foreign experts on a temporary or permanent basis to lead such training.

Sample key indicators to measure performance:

<table>
<thead>
<tr>
<th>Sample KPIs</th>
<th>Source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of training sessions/courses</td>
<td>TIEC/ITI and other organizations</td>
<td>Annual</td>
</tr>
<tr>
<td>Number of participants</td>
<td>TIEC/ITI and other organizations</td>
<td>Annual</td>
</tr>
<tr>
<td>The size of the pool available for industry</td>
<td>TIEC/ITI and other organizations</td>
<td>Annual</td>
</tr>
<tr>
<td>Level of satisfaction of local and international firms with given programs</td>
<td>TIEC/ITI and other organizations</td>
<td>Annual</td>
</tr>
</tbody>
</table>

Initiative 4: Policy acceleration and advocacy

Purpose of initiative:

The purpose of this initiative is to influence and advocate for significant policy changes that would boost innovation and entrepreneurship in Egypt. As strong policy advocacy system is the hallmark of successful agencies involved in any form of economic or technological development. The TIEC will provide the MCIT with continuous feedback on policy issues that affect the competitiveness of the entrepreneurial environment, actions required to attract innovation-driven FDI in new or existing sectors, and actions required to enhance the country’s innovation competitiveness relative to regional and international competition.

Examples of strategic programs to implement:

Developing the policy advocacy process

Developing such a policy entails three important phases, namely: information gathering, defining priorities, and resolution and follow-up. Policy advocacy may have a retroactive or forward-looking orientation. For instance, retroactive policy advocacy occurs if growing numbers of entrepreneurs and start-up investors are lodging complaints about a certain law or government practice. The MCIT via the TIEC should then work to have the inefficient practice or law changed. On the other hand, in terms of forward-looking advocacy, others can seek to change the regulatory environment to make the economy more receptive to innovation and entrepreneurship, like advocating for incentives that foster innovation and new regulations for supporting entrepreneurs’ operations, financing, and exit.

The following is a list of suggested actions:

i. General legal reforms targeted at firms
   - To develop flexible hiring laws conducive for start-ups.
   - To modernize and enforce IP law, competition law, and consumer protection law.
   - To simplify and standardize procurement policies across established firms and start-ups.
   - To simplify tax filing and collection procedures.
   - To streamline licensing processes, and lower the administrative costs that penalize start-ups.

ii. Incentives for innovation
   - To have a conducive tax policy encouraging strategic divestures and spin-offs to develop latest technologies.
   - To develop incentives/matching funds for commercializing state-funded research and for commercializing multinational research and development via entrepreneurial start-ups.
   - To establish incentives/matching funds for commercializing universities’ technologies via entrepreneurial start-ups.
   - To provide grants, matching funds, and financing plans for research and development equipment.
   - To support tax deductions against patenting costs, research and development costs, and in-house technical training for innovative firms and start-ups.
iii. Taxes and regulations in support of entrepreneurial financing and exit

- To develop favorable regulations for entrepreneurial firms relative to initial public offerings, listing, mergers and acquisitions, and buyouts.
- To develop favorable bankruptcy laws, promoting a balance between the interests of entrepreneurs, venture capitalists and creditors, and allowing for voluntary arrangements while dramatically shortening the bankruptcy cycle.
- To institute an enabling personal income tax system to ensure individuals are not discouraged from starting up their own firms.
- To deduct tax for investors in start-ups if companies fail or shares are sold at a loss.

Sample key indicators to measure performance:

<table>
<thead>
<tr>
<th>Sample KPIs</th>
<th>Source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of changes introduced to the existing law or regulatory environment that hamper growth</td>
<td>Survey of firms/entrepreneurs</td>
<td>Annual</td>
</tr>
<tr>
<td>Number of forward-looking changes/additions to the regulatory environment to make the economy more receptive to innovation and entrepreneurship</td>
<td>Survey of firms/entrepreneurs</td>
<td>Annual</td>
</tr>
<tr>
<td>Ease of starting a business</td>
<td>Survey of firms/entrepreneurs</td>
<td>Annual</td>
</tr>
<tr>
<td>Ease of issuing share options</td>
<td>Survey of firms/entrepreneurs</td>
<td>Annual</td>
</tr>
</tbody>
</table>

Initiative 5: Start-up support

Purpose of initiative:
The purpose of this initiative is to promote and empower entrepreneurship in the ICT sector by providing services such as incubating innovative and commercially promising start-ups, training, coaching, and incentives to attract entrepreneurs abroad to establish businesses in Egypt.

Examples of strategic programs to implement:

1) Launching business plan competitions open to mid-career professionals and recent graduates

In Egypt, the concept and practice of business incubation was introduced into the ICT sector from 2005, through business plan competitions. Business incubation programs entail a number of evaluation criteria and most importantly enforce a considerable amount of planning and commercial feasibility study by the project and its management team. The coupling of business planning competitions and business incubation programs should continue, whereby identifying innovative, commercially viable business plans is the main objective. Also important would be to launch a series of business plan competitions locally, to attract resident talent as well as Egyptian innovators residing abroad and that may return for incubation and funding opportunities.

2) Training for potential incubation

Understanding the different needs of each and every entrepreneur during all phases of their experience is important in spreading awareness on entrepreneurship and leveraging the entrepreneurial spirit within the ICT community at large. To that end, it is also important to develop a framework of training workshops and seminars to support individuals through Entrepreneurship Qualification Mechanisms (EQMs). EQMs typically cover training in the following areas: knowledge management, project management, financial management, and sales and marketing. As the MCIT believes that promoting entrepreneurship through targeted training courses is crucial to develop a pipeline of high quality and successful projects, more focus is being put on continuously enhancing and returning existing training programs.

3) Deploying a full-fledged incubation program

As part of its commitment towards supporting start-ups within the Incubation Program, the MCIT via TIEC must continue to provide a full-fledged incubation concept that comprises the following services:

- Fully furnished space allocation
- Utility support (broadband, LAN, telephony, fax)
- Providing hardware and software tools
- Consultation (technical/business)
- Training workshops (business, technology)
- Recommendations for financial support (subsidizing, working capital)
- Networking opportunities

4) Supporting returnee entrepreneurs and encouraging Egyptian expatriates to open satellite technology development operations in Egypt in conjunction with start-ups abroad

Supporting returnee entrepreneurs (reverse brain migration) is highlighted as a key goal of the MCIT. This may include the following:

- Targeting Egyptians residing abroad
- Outreach sessions and seminars conducted in North America and Europe to educate Egyptians residing abroad about the benefits and opportunities of investing in and starting up businesses in Egypt
- Establishing a soft landing program that helps returnee entrepreneurs to establish their start-ups in a favorable cost-effective environment
5) Enhancing and widening business plan competitions for university graduates/faculty

Egyptian universities (possibly in cooperation with business and government) should create new business plan competitions. This approach has been used successfully in a large number of universities and business schools internationally, and has received strong support from large global companies. Typically, business plans attached to a particular ICT innovation should include elements relating to market size, funding, timelines and intellectual property.

6) Developing a structured program for successful role model entrepreneurs

For those who have been supported by MCIT to act as mentors for younger start-ups to ensure that entrepreneurship is fed and grows organically.

7) Structured programs with international organizations to bring MBAs from world class universities as interns within Egyptian SMEs to work on solving acute problems

An example would be the Global Entrepreneurship Lab program of MIT.

Sample key indicators to measure performance:

<table>
<thead>
<tr>
<th>Sample KPIs</th>
<th>Source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock market capitalization of start-ups</td>
<td>Survey of firms/entrepreneurs</td>
<td>Annual</td>
</tr>
<tr>
<td>Incentives to start-ups and entrepreneurs</td>
<td>Repository of the ICT sector</td>
<td>Annual</td>
</tr>
<tr>
<td>Number of MBA deals</td>
<td>Survey of firms/entrepreneurs</td>
<td>Annual</td>
</tr>
<tr>
<td>Number of employees engaged in start-ups</td>
<td>Survey of firms/entrepreneurs</td>
<td>Annual</td>
</tr>
</tbody>
</table>

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**Initiative 6: Innovation support for businesses**

**Purpose of initiative:**

The purpose of this initiative is to promote and empower entrepreneurship in the ICT sector by providing services such as incubating innovative and commercially promising start-ups, training, coaching, and incentives to attract entrepreneurs abroad to establish businesses in Egypt.

**Examples of strategic programs to implement:**

1) Continuing to provide and enhance incentives, policies and streamlined processes for creation of innovative ICT businesses

Specific and targeted efforts (fiscal, legal, regulatory, such as IP protection) should be made to help the process of enterprise creation and operation in the ICT sector. It is likely that “exceptional treatment” will be required: a case will need to be made to relevant national authorities to underline the need for and potential of ICT innovation in Egypt:

- The ability of innovation in ICT to provide significant levels of employment and income for Egyptians, and to raise the expertise level of the workforce is unparalleled, and therefore a strong case can be made for incentives that allow ICT to grow in the country
- Coordinated policies with other ministries are important, because some elements that are critical to the success of the sector lie beyond the remit of the MCIT. Countries that have built large and innovative ICT sectors have rules and regulations in place to allow entrepreneurs to profit from their efforts. These regulations cover tax issues (such as the treatment of capital gains and stock options), employment law (for example, the ability to quickly increase or decrease the number of staff according to the needs of the firm and market demand), IP protection (sufficiently strong laws that balance the right of an innovator to profit from their invention but allowing society to also profit), and so on. Another important aspect of business policy is the ability to quickly set up a business without tiresome bureaucracy or expense. The General Authority For Investment (GAFI) is an excellent entity that encourages and helps foreign-owned firms to do just that, and this initiative can be extended and deepened to cover all ICT firm start-ups.

2) Supporting innovative firms through targeted public procurement

Public markets currently play a significant role in Egypt’s economy. The examples of successful countries such as Korea or France show how large-scale government-driven projects (broadband, high-speed trains, nuclear energy) can contribute to innovation-driven leadership. Egypt has the possibility to use public procurement as a way to encourage innovation in the ICT sector; this may include provisions requiring foreign bidders to join with local companies (especially SMEs) to submit a bid, or the constitution of smaller tenders and lots, allowing younger, smaller local firms to compete. For these smaller tenders, lowered requirements for capital adequacy, reduced paperwork, and reduced length of time in business are possible ways in which start-ups could be involved in more procurement bids. Additionally, a government focus on innovative solutions to procurement needs would naturally encourage smaller firms to be a part of the tender process, gaining valuable experience and potential contracts.
3) Providing incentives for investing in innovation

Incentives should be provided to encourage companies and individuals to invest in innovation (e.g., through research and development programs, or the acquisition of licenses). Such incentives can be of a fiscal nature (tax relief) or more economically targeted (e.g., through the provision of matching grants from the government). Any incentives offered should be focused on areas that have already been identified as of importance to Egypt’s ICT development and overall economic wellbeing. A possible example to examine is the Canadian government’s use of R&D credits as a way of encouraging research and job creation. This can also take the form of innovation/knowledge “vouchers” that enable local firms to access external sources of advice, expertise and information.

4) Enhancing and widening support to industry and academia

This would cover different stages in the innovation lifecycle starting from the pre-R&D stage to commercialization and the going-to-Market stage (pre-seed, science, pre-commercialization, commercialization, technology acquisition).

5) Creating curriculum of innovation courses for businesses

Courses should be created that ICT firms can attend. The goal is to increase the number of firms and employees who understand and can implement innovation within the ICT sector. Examples of topics to be included:

- What is innovation, why it is important and how to recognize it? Focus on innovation in products, services and process development, including real world applications.
- Innovation for specific disciplines — Using case studies and real world examples, focus on specific areas such as software, media, telecoms, etc, to examine how innovation occurs. Local and foreign experts in the field can be employed to bring practical, first-hand knowledge to the classroom.
- Innovation culture — How to create and foster a spirit of innovation and entrepreneurship within an organization. The actions, attitudes and incentives required to bring employees at all levels to a cultural viewpoint where innovation is considered an everyday part of their business goals and objectives.
- Collaborative innovation — Increasingly, innovation occurs across the boundaries of institutions, between companies, competitors, suppliers, universities, governments and so on. In a multi-stakeholder environment, innovation needs to be carefully managed to ensure that everyone’s objectives and goals remain aligned.

Initiative 7: Public-private funding

Purpose of initiative:

The purpose of this initiative is to attract foreign investors and potential partners to invest in Egypt’s ICT sector in order to minimize the equity gap.

Examples of strategic programs to implement:

1) Creating an attractive scheme of matching public-private funding that deliberately sponsors high-risk projects

The goal is to give grants in specific fields that are considered to be of highest priority to the nation. Rigorously specified and managed, winning such a grant is highly prestigious and highly sought after. The most pressing need is to create a list of projects the Egyptian government would like to sponsor. These projects would be listed online, and any institution could apply to win one. They would be open only to experienced European and US companies, in order to bring their expertise, networking, and global access to Egyptian start-ups.

2) Organizing Egyptian investment fairs/events in selected locations

Efforts should be made to launch a stream of regular Egyptian investment fairs/events distributed along the calendar year. Such events should be either national or regional and organized as much as possible in a way to promote potential destinations for investors and innovators in ICT (clusters, smart villages etc). The promotion of Egypt’s brand as a global and regional hub for innovation in ICT should also be organized systematically whenever Egypt is hosting a major international meeting (World Economic Forum, ITU or others). Combining a “global outreach program” with a regular “Egypt Innovation Fair” would seem worthy of particular attention in the short run, especially if focused on the following two target segments: a) global IT and OTES firms (e.g., IBM, Accenture, HP, Infosys); and b) global MNCs with large outsourcing activities and/or ambitions (e.g., Dell, GE, Citibank).

3) Creating a community of local business angels and sources of venture capital focused on specific clusters

One of the reasons for Silicon Valley’s success has been the geographical proximity between a critical mass of innovators and a critical mass of risk capital. Egypt can contribute to creating the same kind of environment of specific clusters, by helping the creation of a local community of individuals and companies able to and ready to provide venture capital to local innovators, and to play the role of business angels for local start-ups. Fiscal incentives and visibility could be provided to stimulate the emergence of such communities.

As additional clusters are developed in Egypt, giving each one a particular focus is a way of spreading risk and encouraging competition for resources, as well as providing opportunities across the country. In a similar manner, the types of investors most interested in particular technologies and risk profiles need to be encouraged to locate themselves close to a particular cluster — or clusters — in order to develop strong relationships with the entrepreneurs themselves.

Similar thinking applies to “business angels”. While they are individuals and not easily persuaded to move location, certainly they need to be encouraged to look at specific ICT
sub-sectors as potential investments. This can be done through the creation or promotion of networks for angels (similar to the Keiretsu or Band of Angels in the U.S.) that allow business angels wherever they are located to meet similar-minded investors, find and examine deals, and share the workload of due diligence and paperwork that can be powerful disincentives against investing. This concept also focuses on creating financial vehicles that can act as the intermediary for wealthy Egyptians to dip their toes into technology investing with a degree of confidence.

4) Targeting regional sovereign wealth funds to invest in Arabic/regional content and specific solutions

The Middle East (especially the Gulf Cooperation Council [GCC] countries) hosts some of the largest and most dynamic sovereign funds in the world. Several of them have been exposed to recent losses due to excessive concentration of investments in too few markets (typically OECD countries) and specific segments (banking, real estate, etc.). Since then, several funds have increased significantly their involvement in ICT-related activities. Egypt has a strong card to play vis-à-vis such funds that may have an interest in investing more in Arab economies, and to diversify, particularly towards the ICT sector. Approaching entities such as the Abu Dhabi Investment Authority or Kuwait Investment Office at the governmental level may produce results, especially if the focus is on solving regional issues where firms may be located both in Egypt and elsewhere (e.g., research in Egypt, sales offices in GCC countries).

5) Encouraging the creation of venture funds within local (large) firms to fund innovative ideas and spin-offs from own employees

The history of innovation is full of examples of “internal innovations” that remained dormant until they found an opportunity to spin-off from the company where they had been born. Egyptian firms should be encouraged to equip themselves with the structures required to take advantage of such opportunities by creating their own internal venture capital mechanisms to provide initial support for their employee’s innovative ideas, and (unless they prefer to develop such ideas internally) help these innovations to develop outside the company. Telecom Egypt has a significant stake in TDF, but could also look to sponsor the funding of ideas from within the firm that could then be co-sponsored by other firms and/or venture capital/angel seed money. In this manner, the number of innovative ideas being pursued is increased significantly (and the original sponsoring company has the potential of a good return without having to manage the new start-up within the firm’s own boundaries).

6) Providing vehicles for Egyptian citizens to invest in innovative ICT SMEs

Generating innovation as a mindset across Egyptian society and economy will receive a significant impetus if ordinary citizens are given the opportunity to invest in their savings in “innovation funds”, or directly in innovative local SMEs. Such investments could receive favorable fiscal treatment. An example would be to create financial instruments similar to mutual funds, or SICAVs that retail investors can participate in. Other options would include small venture funds that run on a local or cluster basis, and provide individual investors an opportunity to invest in the local economy (the local cluster perhaps) and to “be involved”, meeting start-ups, getting progress reports first-hand, and learning how entrepreneurship actually works.

7) Increasing funds to bridge the funding gap along the innovation process

Egypt has already put in place a certain number of public and private innovation funds (see below), addressing different parts of the innovation sequence.

The Largest equity gap currently resides at the critical stage between “prototyping” and “going to market” — specifically seed and early stage funding. This is the domain in which specific efforts have to be made to enhance and/or grow public/private innovation funding in Egypt. Various options are possible. The most attractive would be to convince venture capital funds that are already working in the “early stage”/equity gap in other countries to expand their activities to Egypt. This is low-cost and brings established and experienced talent to the table. Some level of change in terms of legislation and incentives may be required to convince such firms that it makes economic sense to do so.

At the other extreme, the government may decide to sponsor a venture capital fund itself (or indeed multiple funds) focused on investing in Egyptian ICT start-ups. Generally it has proven to be difficult to attract the highest caliber of people to operate such funds, given the high rewards that can be made in the private sector. Additionally, the government may not wish to be in the business of selecting “winners and losers” and may prefer that a competitive market do this instead.

A middle path would be to raise money to form public-private partnerships (PPPs) whereby the government acts as a seed investor in one or more private venture capital funds that are obliged to raise private money as well, and are free to operate as a private institution, only ensuring that the government is paid back from the successful outcomes of fund investments. Further analysis would be valuable in determining the prospects for such funds, and how to best attract the necessary capital and people to augment the current situation.
8) Targeting venture capital arms of existing global firms in Egypt to invest in early stage local ventures

Most large companies operating on an international scale are equipped with their own internal venture capital arm. Often, such arms have specific country entities: for example, Intel Capital India recently announced a total investment of $23 million in three Indian IT companies: July Systems Inc., KLG System Ltd and Multi-Commodity Exchange of India Ltd (MCX). Over the last five years, Cisco System’s corporate venture capital arm has committed over $200 million for venture capital investments in India (Cisco’s current venture capital investments in India include Nimbus Communications, gaming company IndiaGames, and mobile value added services company Bharti Telesoft). Siemens Venture Capital, Motorola Ventures, Bluerun Ventures (formerly known as Nokia Venture Partners), SAP Ventures, IDG Ventures, Reliance Technology Ventures (the investment arm of the Reliance ADA Group), Yahoo and Google (all active in India) should be approached in this context. In particular, firms already established in Egypt — such as Microsoft, IBM, Oracle and Vodafone — are obvious.

9) Providing platforms to bring together diverse groups (entrepreneurs, venture capitalists, academics, etc) to discuss and catalyze entrepreneurial activity

Platforms should be provided to allow all contributors to innovation (entrepreneurs, venture capitalists, universities, IP experts, etc) to discuss their problems and identify new solutions. This would be an efficient way to catalyze and stimulate Egypt’s clusters and innovation centers.

Sample key indicators to measure performance:

<table>
<thead>
<tr>
<th>Sample KPIs</th>
<th>Source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public versus private investment in venture capital</td>
<td>TIEC</td>
<td>Annual</td>
</tr>
<tr>
<td>Amount of venture capital financing targeting Egyptian ICT sector by stage and industry</td>
<td>TIEC</td>
<td>Annual</td>
</tr>
<tr>
<td>Average number of investors in venture capital deal</td>
<td>Repository of the ICT sector</td>
<td>Annual</td>
</tr>
<tr>
<td>Percentage of investment proposals worth setting up a meeting with</td>
<td>Survey</td>
<td>Annual</td>
</tr>
<tr>
<td>Percentage of exits created and the corresponding valuations</td>
<td>Survey</td>
<td>Annual</td>
</tr>
</tbody>
</table>

Initiative 8: Technology-specific clusters and technology observatory

Purpose of initiative:
The purpose of this initiative is to identify forward-looking ICT trends and assess their potential economic impact. To that end, technology-specific competency centers are established in promising technology fields.

Examples of strategic programs to implement:

1) Focusing each cluster on a unique set of forward-looking technologies, and foster cluster specialization

Egypt’s clusters will need time to grow. To avoid staying too long in the “hot springs” or “silent lake” zones, efforts must be made to allow them to reach critical innovation mass through a proper degree of focus. Each ICT innovation cluster should be identified with a specific theme of research and area of innovation. Among such themes, some appear particularly promising, including: social networking, mobile technologies, online markets/App stores/mobile stores, clean-tech, and cloud computing.

The top candidates for clusters would possibly be mobile applications, cloud computing, and e-content:

- **Mobility applications**: Currently a more than USD7 billion market, the focus here is on software that runs on mobile devices, typically smart-phones such as the iPhone, Android-based handsets and Blackberry. The applications use the unique aspects of such devices — they are highly personal, always with the owner, location aware and “presence” aware (who else is online). At the intersection of these areas is a lucrative market that can be exploited fully only by those developers that properly understand the target audience. Given Egypt’s large population, rich with younger consumers who are the heaviest users of such applications, and the relatively high penetration of mobile devices, this sector is very attractive.

- **Cloud computing**: Estimated to generate USD40-USD160 billion, this is one of the largest new ICT segments available. Cloud computing refers to the provision of services on remote ICT systems that can be “rented” by the minute, transaction or gigabyte, therefore saving clients huge amounts of upfront and ongoing ownership costs, not to mention upgrade costs and maintenance. As a relatively new area, it is yet to be dominated, although firms such as Cisco, Amazon, Microsoft and IBM are fast building strong positions. Allowing with such firms would be a possible entry point for Egypt’s ICT sector, especially if Egypt can demonstrate reliable, low-cost provision of computing that can be accessed anywhere the client happens to be located via the Internet or secure networks. The biggest contribution for Egypt in the cloud-computing stack can be in the top layer of the “Application-as-a-Service” sector. Egypt can assume a leading role by helping the region and neighboring countries move their applications and products to cloud computing.
Social networking: The online social networking market is emerging from an immature period of competitive dislocation to one of market maturity. It is a USD5 billion industry with very fast growth and specific localization requirements, in which clear user needs and platform value propositions have emerged, paving the way for incumbency, scalability and successful monetization. Online social networks have attained critical mass — already being used by 971 million unique users by end of 2009. Social network usage is not tapering off, it is growing; not only are more consumers joining social networks, but their level of involvement is deepening. According to a new report by eMarketer, the social networking market is expected to grow at 44.2% per year through 2013. Strategy Analytics data shows that mobile social networking facilitated USD4.4 billion in revenues in 2008, which is predicted to rise to USD17.1 billion in 2013. Egypt can certainly assume a leading regional role by developing multilingual new applications and/or services, and enrich existing ones in areas related to education, business, media, and government.

Embedded software: As the price of computing power decreases, new applications continually emerge at each price point. Reduced power consumption has a similar effect, particularly in applications requiring batteries. Only about 2% of 10 billion new processors produced per year are destined to become the brains of PCs, laptops and servers, as we traditionally think of computers. The other 9.8 billion are embedded in other kinds of products, from automobiles to GPS systems to cell phones. The future looks bright for processor manufacturers as well as software embedded systems developers, along with design engineers. The world wants smarter products in every geography and product category. And we need smarter products to help reduce pollution and energy consumption and lower the cost of healthcare.

2) Creating a network of linked clusters to share concepts on a national level
Technology-specific clusters should not lead to isolated specialization. Hence, the focus advocated earlier needs to be complemented by a strong sense that Egypt’s clusters belong to a single family, and can share experiences, ideas and visions at the national level. An Egyptian inter-cluster network needs to be established to that effect.

3) Creating a technology observatory to scan and identify key future trends and disruptive technologies for Egypt’s ICT industry’s development
Innovating successfully often requires being “in the right place at the right time”. This need not be left to luck. Keeping an eye on the latest developments in technologies, customer demands and business models is a strategic ingredient of successful innovation. Very often large firms have a superior advantage in scanning relevant information, and obtaining it before their competitors. Egypt can generate its own capacity in this domain by doing it at a national level and making it available to its own enterprises and innovators. This would be the raison d’être of an Egyptian Observatory of Emerging and Promising Technologies. Such a body would keep abreast of the latest technology trends from wherever they might come, and match them against the ICT sector’s competencies, and against the long-term aspirations of the nation.

4) Encourage and support formation of cluster specific business associations and NGOs
To mobilize the industry, foster a cluster ecosystem, facilitate exchange of information and technology, foster cooperation and shared beliefs amongst companies, avoid sporadic cooperation, foster definition of common standards, and facilitate the organization of common agendas and joint actions.

Sample key indicators to measure performance:

<table>
<thead>
<tr>
<th>Sample KPIs</th>
<th>Source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of start-ups total and per technology specific cluster</td>
<td>Repository of the ICT sector</td>
<td>Annual</td>
</tr>
<tr>
<td>Number of jobs total and per technology specific cluster</td>
<td>Survey</td>
<td>Annual</td>
</tr>
<tr>
<td>Technology adopted by local and regional markets</td>
<td>Repository of the ICT sector</td>
<td>Annual</td>
</tr>
</tbody>
</table>
Initiative 9: Intellectual property exchange

Purpose of initiative:
The purpose of this initiative is to serve as a unique clearinghouse and facilitator, reducing the costs of registering and exchanging intellectual property (IP). Also it seeks to provide practical guidance to technology companies on IP issues.

Examples of strategic programs to implement:

1) Helping Patenting is often a complex, expensive and uncertain way of protecting an innovation until it reaches its full potential market value. Most Egyptian firms and universities can find themselves at a disadvantage vis-à-vis their foreign counterparts, especially in industrialized countries. Offering Egyptian firms and universities an easy way to access knowledge about patents, and access cost-effective and simplified ways to patent their creations, would have a significant impact in terms of stimulating local innovation, especially in the ICT sector. Essential elements of this action would include:

- Partnerships should be created with Egyptian universities to promote technology transfer between them and the ICT community, dealing with the same patent-related issues as above but also — for example — how to form a start-up around university generated IP, the agreements that govern ownership and revenue-sharing.

2) Intellectual property exchange

When it comes to turning innovation into commercial and economic success, patenting is only a first step. Many patented innovations remain in the patent offices’ drawers without ever being translated into viable products or services. Licensing patents is one way by which innovation and competitiveness feed each other: if established firms (at home and abroad) can purchase licenses to exploit existing patents, they enhance the ability of innovators to gather economic benefits from their innovations; symmetrically, by purchasing licenses to use innovations patented elsewhere, Egyptian firms can jump to higher levels of competitiveness. Facilitating the process of patent licensing is hence a priority area for government action to stimulate innovation in ICT in Egypt.

Partnerships should be created with Egyptian universities to promote technology transfer between them and the ICT community, dealing with the same patent-related issues as above but also — for example — how to form a start-up around university generated IP, the agreements that govern ownership and revenue-sharing.

The IP Exchange would need to create an appropriate forum for such licensing and other exchange-related activities to occur; this could consist of both online and offline elements, possibly arranged as a marketplace where firms could offer and buy licenses in a structured manner. It would include, in particular: a) a collection of relevant IP; b) patent claims and related key players; c) offers to buy, sell and license IP; d) standardized processes to aid IP valuation; e) patent lifecycle help and explanation; f) guidance for start-ups on patents (creation and acquisition, management and protection, value extraction). It would also provide assistance to third parties looking for IP (including through the provision of paid services to retrieve information, patent searches etc.). In performing those functions, the IP Exchange would significantly reduce start-up costs and provide access to expertise with potential revenue generation. Egypt’s IP Exchange could also offer to host a specific regional repository and marketplace for Arabic-content IP.

The IP Exchange also has the advantage of allowing the level of activity in the sector to be easily measured, as well as the potential to generate fee revenue based on transactions handled. It is also a single place to access licenses, which is an administrative boon, especially for small start-ups with relatively scarce resources.

3) Creating education tracks focused on patenting, licensing and intellectual property management

For the same reasons, specific courses should be introduced in the curricula of Egyptian universities and business schools about all aspects of IP regimes and IP management, with a special emphasis on their economic dimensions and business impact. This would be especially relevant to students in the sciences and technology fields, and to students studying business. The courses would focus on the reasons why IP protection is important, the different methods of doing so, and the possible benefits.

4) Highlighting Egypt’s competence in patenting and IP management to external ICT partners and investors

Efforts made in Egypt to improve IP management should be publicized and shared with external ICT partners and investors. Action in this area potentially has two sets of positive effects: first, the relationship with such partners and investors would be strengthened if they feel that IP is respected, protected and valued in Egypt; second, those same partners and investors are likely to “spread the word” about Egypt’s attitudes and practices vis-à-vis IP. From a regional point of view, enhanced recognition of Egypt’s competence in this area will strengthen the country’s legitimacy as an “innovation hub” in the Middle East.
5) Educating entrepreneurs, SMEs and larger firms about the value of protecting IP

Available research shows that in a large array of countries, innovation remains low level because IP issues (patenting in particular) are perceived as complex and purely legal. It is hence important that Egyptian businesses (large and small) should be sensitized to the business and economic dimensions of IP. Public sensitization campaigns should be jointly organized by the Egyptian government (including MCIT) and local business entities (e.g., chambers of commerce). Focus would be put on the different aspects of IP protection, such as trade secrets, copyrights and patents, and the advantages and disadvantages of both. Such campaigns would act as a primer for small firms so that they achieve a basic understanding of why they should invest in IP protection, and how it can be done. The IP Exchange itself would be a resource that entrepreneurs can use to take action concerning their own IP. Tools can be developed such as an IP Exchange database that would be regarded by Egyptian enterprises as a "library of useful IP". In taking the lead to create such an IP exchange, Egypt would also significantly enhance its visibility as a thought leader in the field of ICT innovation. As a marketing tool, this unique concept would be an excellent addition to the other measures described here and already underway, and go a long way to demonstrating the country’s commitment to continually improving opportunities for ICT firms, both local and international.

Sample key indicators to measure performance:

<table>
<thead>
<tr>
<th>Sample KPIs</th>
<th>Source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of patents for sale</td>
<td>Survey</td>
<td>Annual</td>
</tr>
<tr>
<td>Average time from idea to first patent filing</td>
<td>Survey</td>
<td>Annual</td>
</tr>
<tr>
<td>Number of patents per year</td>
<td>Repository of the ICT sector</td>
<td>Annual</td>
</tr>
<tr>
<td>Number of licenses and total value of such licenses</td>
<td>Repository of the ICT sector</td>
<td>Annual</td>
</tr>
</tbody>
</table>
Initiative 11: Branding

Purpose of initiative:
The purpose of this initiative is to firmly establish Egypt as an “innovation destination” by developing an “Egypt equity brand”. Branding is crucial to gaining critical mass, along with visibility on the global map.

Examples of strategic programs to implement:

1) Continuing and expanding Egypt’s relationships with key global organizations
Continuous efforts should be made to enhance Egypt’s collaboration with global organizations, such as the ITU, GSMA and CeBIT, along with outsourcing organizations. The visibility acquired by Egypt in events organized by such organizations (in Geneva, Tunis, Hanover, Barcelona) should be leveraged. Close cooperation with such multilateral organizations offers the chance to position Egypt’s ICT sector at the forefront of the latest developments, giving Egypt influence over future policy directions. Speaking for the region and its concerns and priorities is an influential position to seek out. Additionally, hosting such organizations and their respective sessions and conferences is an opportunity to highlight Egypt as an ICT destination to prospective investors and employers.

2) Creating an Egyptian innovation brand to promote Egypt’s profile as an FDI destination for MNCs that have innovation and entrepreneurial development activities
This would collect, collate and disseminate accurate, comprehensive and current information on Egypt’s ICT sector. With the primary objective of building positive economic perceptions of Egypt globally.

3) Creating a brand strategy for each cluster
The focus identified for each Egyptian cluster (e.g., on social networking, mobile technologies, online markets, mobile apps, clean-tech, cloud computing) should be translated into a distinct brand strategy for each cluster. Obtaining instant regional and global recognition as an innovation hub for a particular product or technology should be an explicit goal assigned to each cluster. If successful, such efforts would significantly contribute to Egypt’s overall branding and Egypt’s overall recognition as a regional or global hub for ICT innovation. The MCIT has already gone far down this path, encouraging further development and linking the “smart village” concept to other elements in the ICT ecosystem, such as innovation fairs, in order to maximize the value generated.

4) Leverage Egyptian expatriates working in senior positions in MNCs to attract those MNCs to Egypt, like the successful experience of Ireland and India

Sample key indicators to measure performance:

<table>
<thead>
<tr>
<th>Sample KPIs</th>
<th>Source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of increase in FDI</td>
<td>Survey</td>
<td>Annual</td>
</tr>
<tr>
<td>Percentage of increase in the number of foreign MNCs participating</td>
<td>Repository of the ICT sector</td>
<td>Annual</td>
</tr>
<tr>
<td>Number of jobs created in start-ups and innovation-based companies</td>
<td>Survey</td>
<td>Annual</td>
</tr>
</tbody>
</table>

2) Follow a cluster approach in attracting FDI
One that is based on Egypt’s unique assets, and working closely with existing companies in clusters as they know best what activities could be targeted or gaps filled within their emerging market, and which companies would be most likely to make an investment in that cluster in Egypt.

3) Drive FDI policies by providing incentives that are earned over time
Such incentives would not be given in totality up front, would be tied to location, not the investor, and would be targeted to achieve higher productivity versus subsidizing input costs. All incentives should have the objective of fostering technology transfer, prioritizing clusters, creating highly skilled jobs, and local content and local R&D.

- Establish a close relation with MNCs to understand and work on issues hindering the opening of subsidiary technology labs, application development centers, and applied innovation centers in Egypt.
- Attract and support the opening of MNC innovation hubs that are dedicated to R&D and in particular testing and applications development.
- Attract and support the opening of jointly established innovation centers among technology and solutions providers, to boost development and innovation, and to tackle business and technological opportunities, trends and challenges.

4) Leverage Egyptian expatriates working in senior positions in MNCs to attract those MNCs to Egypt, like the successful experience of Ireland and India

Sample key indicators to measure performance:
5) Publishing white papers on “innovation success stories”

The repository is ideally placed to gather information about the state of innovation in the ICT sector. This rich source of data about how well firms are doing should be publicized to MNCs considering placing jobs in Egypt, as well in the sector itself and to the wider public. This is a way of establishing the level of activity underway and its success in Egypt, and would help inspire the sector and the public on how local firms and employees are making a difference to the country through their efforts. Such white papers would be powerful marketing tools at investment fairs as well as one-on-ones with prospective employers.

6) Collaborating with universities (Egyptian and foreign) to identify current and future successful Egyptians in the ICT sector (business and academia)

Heralding role models and involving business in innovation and ICT education require a better awareness of where Egyptians have been successful in ICT and innovation, or are soon going to be. Academic and alumni networks are powerful tools to help achieve this objective. Using role models the innovation fairs and marketing materials adds a human dimension that will appeal to executives making decisions about Egypt — especially if the role model in question has brand recognition themselves in other countries.

Sample key indicators to measure performance:

<table>
<thead>
<tr>
<th>Sample KPIs</th>
<th>Source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of new partnerships with key global organizations</td>
<td>Repository of the ICT sector</td>
<td>Annual</td>
</tr>
<tr>
<td>Percentage of increase in the number of foreign MNCs in Egypt ICT sector</td>
<td>Repository of the ICT sector</td>
<td>Annual</td>
</tr>
<tr>
<td>Number of articles or case studies issued about Egypt with regard to its technology innovation and entrepreneurship</td>
<td>Repository of the ICT sector</td>
<td>Annual</td>
</tr>
<tr>
<td>Improvement in Egypt’s ranking in international benchmarks related to innovation readiness</td>
<td>Repository of the ICT sector</td>
<td>Annual</td>
</tr>
</tbody>
</table>

**Initiative 12: Celebration of innovation and entrepreneurship**

**Purpose of initiative:**

The purpose of this initiative is to create a culture that celebrates innovation and recognizes key achievements.

**Examples of strategic programs to implement:**

1) Creating awards for celebrating ICT innovation for both large and small firms and public entities

To raise awareness of ICT and its positive benefits for the country, a series of awards can be created to highlight firms and entrepreneurs that have done the most to make a difference. Such awards could include “Innovation of the Year”, “Innovator of the Year”, “Entrepreneur of the Year”, and “Lifetime Achievement”. Although a small cash prize may be appropriate, the real benefit for recipients is positive publicity and recognition of their efforts. At a national level, it would also raise awareness of what ICT does, the type of people that are involved in entrepreneurship, and potentially create role models that people entering the workforce may aspire to emulate.

2) Creating innovation prizes to encourage innovation

The establishment of innovation prizes would stimulate entrepreneurs to submit ideas that can generate change. In a large array of countries, awards and prizes have been used as a cost-effective way to detect new ideas and stimulate innovation. Innovation prizes also attract popular attention to innovation, hence contributing to creating a local culture of innovation among entrepreneurs and the business community.

3) Stimulating innovation in selected fields

The Innovation Repository can play a central role in such an effort by offering a number of prizes aimed at producing innovation in fields most desirable for the Egyptian ICT sector, and for Egypt’s economy as a whole (clean-tech, mobile technologies, Arabic digital content, for example). One could consider creating a special prize for a period of one to five years, sponsored by public and/or private entities, and offering significant prize money on condition that intellectual property be developed and remain in Egypt in significant proportion.

4) Creating awards for celebrating ICT innovation in universities (possibly in collaboration with global firms)

Many successful ICT companies (Microsoft, Apple, Cisco, Google, Facebook etc) have been created by students or college dropouts. Around the world, however, many similarly creative young people regularly get discouraged because they lack the supportive intellectual, institutional or financial environment that exists around Silicon Valley. Celebrating innovation in Egyptian universities is hence a valuable objective, which can be pursued through the awarding of prizes. Large ICT companies should be interested in sponsoring such efforts, since it will also offer them a valuable channel to recognize and attract local talent and innovators. A good example of such an award is the Intel Science Talent Search. In Egypt, a prize sponsored by the government, possibly in conjunction with a large ICT firm, could act in a similar fashion — building the idea that students can be innovative at an early age, showing the diversity and depth of talent in the country, and offering prizes that are directly related to further learning.
and development. The award could be broad (focused on science or technology generally) or specific to a particular industry or segment. Additionally, there could be a set of awards covering many areas, with regional and national finals to widen the number of entrants and publicity generated.

**Sample key indicators to measure performance:**

<table>
<thead>
<tr>
<th>Sample KPIs</th>
<th>Source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of entrepreneurs who enter the competitions</td>
<td>Repository of the ICT sector</td>
<td>Annual</td>
</tr>
<tr>
<td>Number of solutions created</td>
<td>Survey</td>
<td>Annual</td>
</tr>
</tbody>
</table>

### Initiative 13: Awareness

**Purpose of initiative:**
The purpose of this initiative is to promote and raise awareness of innovation and entrepreneurship within universities and the ICT sector in Egypt.

**Examples of strategic programs to implement:**

1) **Orchestrating a campaign to showcase the success of innovative Egyptians as ICT role models**

   In relation to both the repository and brand equity body earlier proposed, various media (newspapers, magazines, TV, radio and Internet) should be used in a coordinated fashion to promote the emergence of local role models for ICT and innovation. This could be done in connection with the awarding of prizes for innovation or on the occasion of major achievements and benchmarks realized (e.g., jobs created at home, markets penetrated abroad, etc). Such an effort could be instrumental in generating interest for ICT and innovation among younger generations, and hence have a significant effect on Egyptian society as a whole.

2) **Engaging Egyptian society in contributing innovative ideas through web 2.0 platforms**

   Worldwide, crowd sourcing is playing an increasingly important role in all fields of innovation. The Egyptian youth are avid users of social networks. It would then be beneficial and possible to organize the rapid launch of one or several Web 2.0 platforms to allow all Egyptian citizens to contribute innovative ideas.

3) **Creating an “innovative ICT” campaign aimed at educating and encouraging usage in Egyptian public**

   A large scale multimedia campaign (press, radio, TV, Internet) should be orchestrated by the Egyptian government to inform Egyptian public opinion of: a) efforts being made to promote ICT innovation in the country; and b) the benefits expected from such efforts for the Egyptian economy as a whole (competitiveness, employment, standards of living, etc) and for the daily life of Egyptians (better services and quality of life in particular).

**Sample key indicators to measure performance:**

<table>
<thead>
<tr>
<th>Sample KPIs</th>
<th>Source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of Egyptian citizens that use innovative ICT tools and services</td>
<td>Survey</td>
<td>Annual</td>
</tr>
<tr>
<td>Number of innovative ideas contributed by Egyptian society</td>
<td>Survey</td>
<td>Annual</td>
</tr>
</tbody>
</table>
Part IV: Implementation approach

1. Refine and commit to the strategy
2. Programs: Monitor, control, and oversight
3. Programs: Implementation
4. Programs: Detailed definition and prioritization
5. Implementation: Teams and budget allocation
6. Programs: Revising the TIEC’s organization structure and hiring teams needed to carry out the implementation of the strategy. In addition, the required annual budget will be calculated and allocated for each of the specific programs.
7. Monitoring and controlling strategy implementation will be achieved by coordinating efforts among different stakeholders and utilizing TIEC KPI standards. Progress will be reviewed quarterly by the TIEC’s Board of Trustees, headed by the minister of communications and information technology, to ensure that strategy implementation is on track and that any obstacles are tackled.
8. Sharing with the ICT community progress made annually via the TIEC’s yearbook will ensure that the results achieved are aligned to agreed upon strategic goals and objectives.

Part V: Critical success factors

For Egypt to seize the opportunity of securing a leading position on the global innovation and entrepreneurship map, a few critical success factors are essential. These factors include:

1) Commitment of the government to treat the innovation and entrepreneurship strategy as a national priority and to provide the TIEC with the necessary support and funding to implement the initiatives and programs outlined in this document.
2) Commitment by the various stakeholder groups (government, private sector, academia and NGOs) to implement the strategy, including dedication of resources (both personnel and financial), to embrace the partnership model and its components.
3) Adoption of a market-driven approach, where the private sector takes the lead in identifying innovation in ICT and opportunities that can be commercialized. While government is considered as an enabler, academia is considered to be a partner supporting market-driven innovations.
4) The support of the government in providing the appropriate legal framework and environment conducive to innovation in the ICT sector. It should selectively intervene to complement market forces where the private sector and NGO’s cannot perform and where the potential benefits/spillovers are high enough to justify intervention.
5) Attraction of international collaboration brings benefits to Egyptian companies. Quality standards are driven upwards and engagement with best practices ensures that industries compete at the cutting edge of technology, ensuring optimization of returns on investment. In this context, Egypt should participate in many of the key networks and programs at regional and international levels.
6) A focus on specific technology areas and trends, determined by the TIEC, in the ICT field and its applications, and to provide incentives to spur innovations within them.
7) Commitment of the government to enriching the core enabler values to innovation and entrepreneurship across all other sectors.
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