Partners for a Competitive Egypt

MDI Phase 2

IT CLUSTER

ICT PENETRATION AND SKILLS GAP ANALYSIS

EXECUTIVE SUMMARY

JULY 2003

ACKNOWLEDGMENT

This study is the synergistic result of the collaborative work and contribution of over 250 professional. We would like to express our deepest gratitude and appreciation to everyone who participated in the study. Companies' executives allocated their companies' resources and time to share their knowledge and experiences with high level of transparency and cooperation. Industry experts provided continuous support to the team to analyze the dynamics of examined industries. The team exerted an outstanding effort to undertake the study and hopes that the result will prove useful to the community. The study team wishes to thank MCIT & USAID teams for their contribution in providing guidance and support to the study in its different phases.

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INTRODUCTION

Under its Strategic Objective 17 (SO17) the United States Agency for International Development (USAID) provided its contract to operate and implement *"Skills for Competitiveness Developed Initiative"*. The initiative that is being implemented by "Partners for a Competitive Egypt- P*f*CE" project was crafted to respond to the challenges of global competitiveness and workforce development. It aimed to build private sector coalitions, develop global thinking, and promote Egyptian leadership and innovative public/private sector partnerships.

A principal objective of P*f*CE project is to support the activities of the Ministry of Communications and Information Technology (MCIT) in implementing its National ICT Development Program as well as developing the IT Cluster in Egypt.

The ICT Penetration and Skills Gap Analysis (SGA) study was developed to respond to the immediate inquiries for information of MCIT and USAID on the needs for ICT skills covering the local, regional, and global markets. The outputs of the study will help alleviate the need for basic information on skills required by various planning activities undertaken by USAID and the MCIT. The results of the assessment and the related recommendations will add to the continuity of the ICT workforce development. The study will help in selecting the educational and training interventions supported by USAID and MCIT. It will provide the ICT stakeholders with the basis for continued ICT human resource and workforce development plans for maximum growth of the ICT sector. It will also serve as a basis for expanding the use and adoption of ICT practices and applications by Egyptian industries with the purpose of raising productivity and increasing Egyptian products competitiveness.

Full report: http://pdf.usaid.gov/pdf_docs/PNADA984.pdf

II. EXECUTIVE SUMMARY

The ICT penetration and skills gap analysis study is composed of three separate but related sections. The first section—SGA in ICT Industry—provides a comprehensive analysis of ICT skills currently used in ICT companies and the existing gap these companies face to respond to their market needs. This section focuses on identifying the gap between the skills needed by the industry and those currently existing. The methodology adopted was based on identifying and selecting the main ICT cluster segments, identifying the need and types of educational institutions to be included in the study, and setting the criteria to select targeted sample organizations and countries benchmarked.

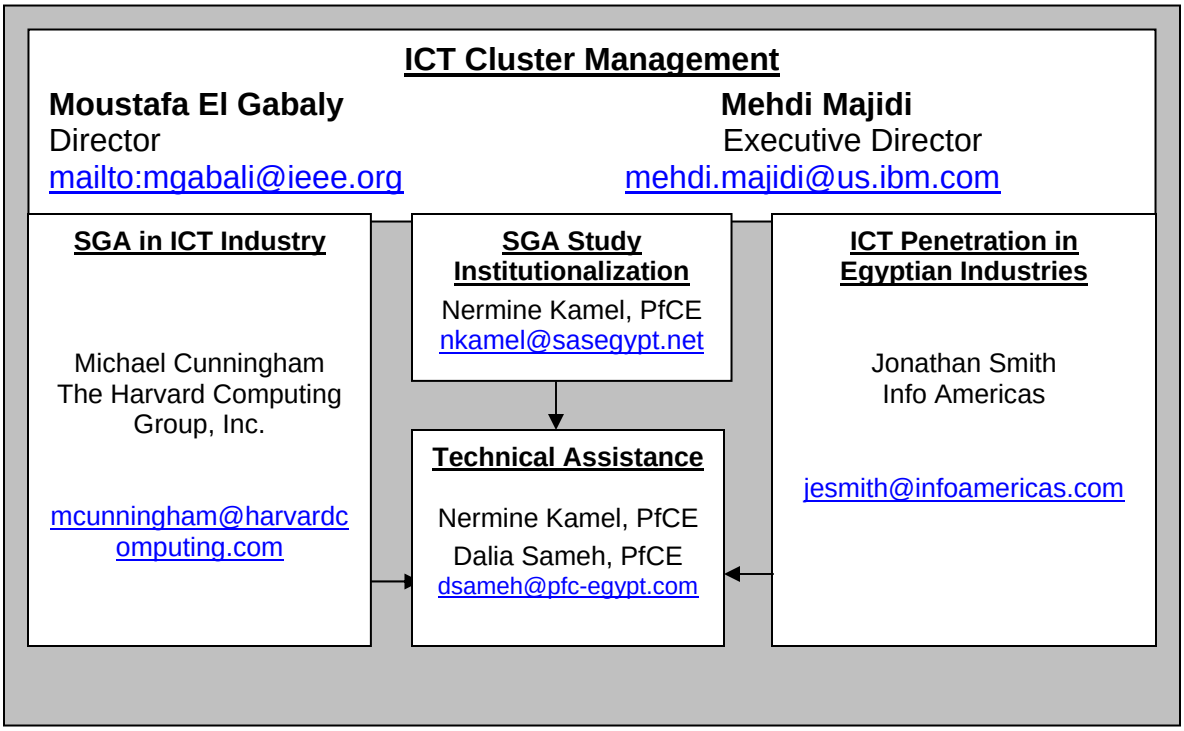
The second section—ICT penetration in Egyptian Industries—focuses on the demand side of the ICT industry. It analyses the level of ICT penetration and the ICT technologies required for enhancing their productivity and hence their competitiveness. On the other hand, the study will allow identifying the required skills needed for the ICT sector to help increasing the ICT penetration. This section examined pharmaceutical, ready-made garments, and food and beverage as potential industries for implementing ICT applications. It aims at providing an industry analysis and determining the level of ICT penetration gap within the industry's supply chain. It also provides benchmark data on the use of ICT in industrial development.

The third section—SGA Study Institutionalization—provides guidance and explanation on the way the study was conducted as well as suggestions and recommendation for repeating the study. The objective of this section is to ensure the continuity and usefulness of the study by defining the research process, methodology, and plan to repeat the study. As Also to share the lessons learned from the current experience and knowledge to be transferred to potential implementers of the study.

A .Study Team

The following diagram illustrates the structure of the team that implemented the study.

ICT Penetration and Skills Gap Analysis Structure



Following summary of each section provides an encompassing overview of the entire study.

B. ICT Skills Gap in ICT Industry

Egypt's ICT sector exhibits skills gaps in two primary areas. First, there are gaps within individual ICT organizations. Second, there are gaps in the external consulting support that is required for the development and management of a healthy sector.

For the most part, Egypt does not have severe skills gaps for technology-based skills, with the exception of significant gaps in advanced technologies such as Business-to-Business (B2B) and complex security and enterprise systems. In the telecom segment, wireless and mobile applications represent concerns. The advanced skills gaps are the result of "late adoption" of these technologies in the domestic and regional market, and are not a question of inherent ability in the workforce. These gaps will diminish as market demand increases in these areas and export activities increase.

The most significant gaps lie in business and personal communication skills and project management skills. It is difficult to hire employees with baseline skills such as Business

Writing and Technical Writing in both Arabic and English. For export-oriented firms, foreign language skills in English and French are critical. In general, most organizations feel that graduates from both the universities and the general education system are not equipped with the right skills.

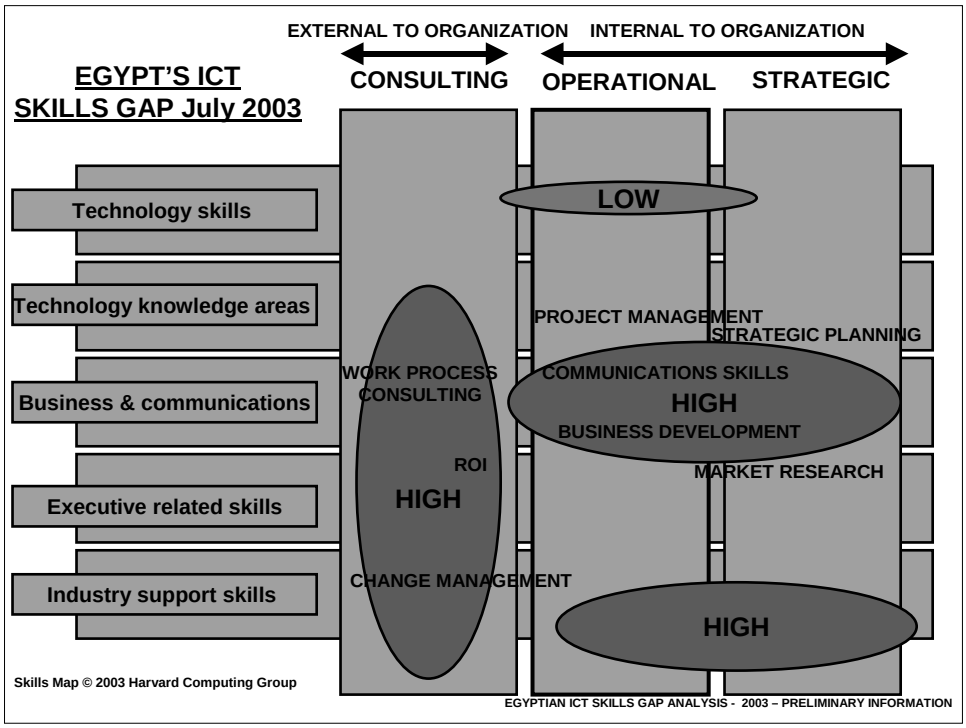


Figure 1 – Egypt's ICT Skills Gaps July 2003

Figure 1 shows the severity of Egypt's skills gaps in particular skill categories that are arranged from top to bottom on the left side of the figure. At the top, the figure also illustrates whether skills gaps are internal to the organization (such as an ICT firm), or external to individual firms but endemic to the industry.

In addition to the oval representing a huge gap in the area of business and personal communication skills, required industry support skills are also missing in the marketplace. This gap in particular causes a considerable problem for the sale, support and expansion of many markets. Increasingly, firms are realizing that this gap is placing severe limitations on the expansion of their businesses, and they are starting to change hiring policies accordingly. By having the right consultants and staff in place, for example, organizations can better serve their clients with industry-specific knowledge and solutions. Many ICT firms are trying to source specialists with financial, healthcare, manufacturing and other relevant industry experience to complement their technology and software skills. Technology gaps are today frequently filled by multi-national vendors who provide the specialist skills and software to implement many of the leading-edge systems being deployed. Unfortunately, this practice does little to transfer experience and knowledge to the local firms, aside from those few that are large enough to handle these projects directly.

The status of the Egyptian ICT industry can be described as having an excellent telecom and Internet infrastructure today, particularly compared with pre-MCIT status in 1999. The Internet and telecom environment now provides a foundation upon which new business platforms can be developed, including call centers, data centers, B2B systems and Virtual Private Networks using the Internet as a framework. However, the adoption of these new technologies creates challenges for the ICT sector in the future.

C. ICT Penetration Gap in Egyptian Industries

The study of the Gap Analysis of ICT Penetration in Egyptian Industries was carried out in three Egyptian industries: ready-made garments, pharmaceutical drug manufacturing and food and beverage industries, all three of which are strategically important Egyptian industries. Drug manufacturing is a strategic socio-economic sector for the country, producing 92% of the local market needs. Food and Beverage falls within the nation's agricultural sector, which occupies 29% of the nation's workforce and contributes to 16.4% of the nation's annual GDP. Ready-made garments industry, as part of the textiles industry, falls within a national economic sector that accounts for 30% of the nation's workforce and 49% of total Egyptian manufactured goods. All three industries are dynamic exporters.

While the three industries analyzed are smaller than the macro-economic sectors in which they are situated, all three themselves, as well as the larger industry contexts in which they are situated, play a vital role in future employment generation, safety, and economic security of the country. All three industries have large, committed corporate players who operate globally through joint ventures, associations and partnerships, as well as on the national market, and a large number of SMEs (Small & Medium Enterprises) as dynamically within regional and international markets, albeit on smaller scales.

All three industries will be significantly impacted when the GATT conditions change in 2005. There is little reason to believe that after 2005 Egyptian manufacturing sectors will not experience shake downs, such as what occurred with the Mexican food and beverage SMEs when the NAFTA (North American Free Trade Agreement) went into effect: about 50% of the SMEs in that industry disappeared through their outright failure to compete, much of that failure was attributed to not leveraging ICT for business competitiveness.

The findings from the Gap Analysis of IC Penetration in Egyptian Industries show what the current ICT use and needs are in the production, management and growth operations of the three industries. The study also presents important comparative information about how ICT solutions have importantly bolstered the ability of those same industries in other countries similar to Egypt, to compete on international markets and to perform efficiently in their own national markets. The findings in the particular case of Mexico emphatically underscores what the negative impacts on industry can be when it did not leverage the advantages and benefits of ICT for global and national competitiveness and growth. Inversely, when ICT is used to such ends (as in the cases of Portugal, France, Argentina, Brazil, and Turkey), competitiveness can be raised and growth stimulated.

There is openness to learn from these examples, as nearly 100% of the companies in the three industries stated that ICT is "very important" to their business performance and growth. Nonetheless, only 46% of the companies have dedicated ICT budgets (67% of pharmaceuticals; 44% of food and beverage; 27% of ready-made garments). This large gap between how ICT is perceived to be important versus what companies are actually doing to strategically address ICT solutions, is mainly due to three important factors:

1. General lack of management awareness concerning how leveraging ICT solutions impacts the bottom line.
2. General lack of management awareness concerning how leveraging ICT solutions impacts the bottom line.
3. Concentration of decisions concerning ICT in the hands of top management, who tend to not involve their ICT departments in the decision-making processes (30% of all companies analyzed do not even have IT departments).
4. The use of ICT in the three industries studied reflects the respective structures and characteristics of the industries' supply chains. In simple terms, the main differences of ICT use in the three industries are:

Food & Beverage

- The food and beverage industry is characterized by a heavy reliance on planning for crop planting and harvesting, quality farming and harvesting (even high-tech farming for hazard safety), and efficient inbound farm-to-plant logistics and efficient outbound logistics in general, but mainly concerning the demand for efficient outbound logistics for fresh products. The actual production operations in food and beverage are a mix of manual and automated, with a relatively low dependence on ICT solutions, given the relative low level of production line sophistication. This determines that much of the food and beverage ICT solutions are being leveraged on the farm, for safety and health controls, for crop quality and export market specs, for logistics and for complicated physical and information movement between (remote) farms and offices.
- Penetration of Internet, Intranet and Interactive Web-sites is low, particularly as compared to benchmark countries. Demand is highest for management and growth oriented ICT solutions.
- Food and beverage companies show a relatively healthy awareness of the importance of ICT for production management solutions, with 56% of the companies stating that over the coming twelve months they plan to migrate to more sophisticated ICT solutions for integrating production and management. At the same time, however,

all but one of the 19 companies analyzed admit to having insufficient knowledge for deciding what ICT uses would be best for which solutions.

Pharmaceutical

- The pharmaceutical supply chain has heavy reliance on inbound logistics for imports of 85% of their active ingredients, which are transformed in the high-tech drug production lines. Drug sales are subjected to cyclical demands from end consumers and intermediary buyers. Planning for sales and purchasing is thus a vital activity that kick-starts the supply chain operations, for which ICT applications are consequently found throughout much of the planning, sales and orders operations of the pharmaceuticals industry, linking broad production and management operations, including warehousing and distribution operations in addition to the aforementioned ones.

- Different from the private companies and multinationals, where ICT solutions are ubiquitous, the public firms are using ICT for production operations, but comparatively little in management and almost none for growth. None of the public firms are importantly enjoying the benefits of leveraging ICT for inter-/intra-communications and growth.

Ready Made Garments

- The ready-made garments industry supply chain is characterized by a complex production operation that depends on using cutting-edge textiles production machinery for meeting quality and quantity customer demands. That, plus the traditional reliance of the textiles industry on machinery, determines that ICT solutions in ready-made garments are mainly concentrated in the production areas.

- ICT solutions are relatively weak in management areas, particularly when it comes to ICT for communications systems and for global sales and markets sourcing. This is partially due to the inadequate penetration of basic infrastructure, particularly as concerns the stock of computers and use of corporate email.

- ICT solutions are sought for efficiency gains in production management, as well as for market development.

All three industries share the following trends:

- An increase in ICT expenditures and involvement of IT departments in decision making.
- A moderate improvement of basic ICT infrastructure.
- A slow tendency toward greater penetration and diffusion of ICT solutions.
- A growing interest in locally developed ICT solutions.
- An increase in the number of companies participating in sector market places and cluster initiatives.

The most important economic implications of these trends will be:

- Greater dissemination of ICT if supported by appropriate education and training.
- Greater dissemination of ICT if ICT suppliers and host industries collaborate in creating case studies, developing joint solutions, and propagating success stories.
- Higher adoption of ICT applications and infrastructures if industry and distribution clusters integrate further.
- Shared network initiatives if increased international competition prompts mergers and acquisitions in the industries.
- Short-term loss of jobs if labor saving technologies are adopted and as companies not adopting said technologies succumb to competition.
- Long-term job creation if the use of labor-saving technologies is more prevalent across the host industry, leading to general growth as a consequence of greater competitiveness.

Overall, although the industries perceive ICT as an instrument to increase efficiency and reduce costs, there is a ubiquitous lack of awareness as to what the optimum ICT systems and tools are for doing so. In each industry there is a clear demand for tailored ICT solutions, which many companies are commonly doing by adapting and customizing MSOffice applications. Most companies state that the ICT industry experts are too eager to push their solutions, and generally unacquainted with the particularities of their industry, thus not fully competent to advise them on best solutions.

The study's findings divulge that, to apply ICT strategically to improve business management activities, there is a serious two-way need for knowledge development: business2ICT and ICT2business. ICT use in industry depends on collective actions guided by strategic planning, drawn from a well-defined strategic market position. To this end the host industries, ICT industry, Government and NGOs/Associations, have

roles to play to foster an environment that will foster the uptake of ICT. These roles can be summarized as follows:

HOST INDUSTRY	■Create and provide aggregate industry information
	■Prepare for industry growth through use of ICT solutions
ICT INDUSTRY	■Develop consultancy skills to create tailor made ICT solutions for host industries
	■Develop Business and Financial Cases for ICT use
GOVERNMENT	■Encourage ICT uptake through use of e-Government
	■Facilitate and Promote Industry Growth through e-Marketplaces
NGOs& ASSOCIATIONS	■Raise Awareness
	■Promote ICT Education and Training