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## Chapter 7

# Information Technology Issues in Egypt



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### Summary

Egypt has attracted a large number of multinational organizations and become an information technology (IT) hub in the Middle East region.

This chapter presents the key issues in Egypt from organizational, technological, and individual perspectives. The top-IT issues in organizations are security and privacy, IT reliability and efficiency, and alignment between IT and business, while globalization, outsourcing, IT cost reduction, and “bring your own device” (BYOD) are the least concerns. The IT infrastructure in Egypt has been developed with recent upgrade of national networks, while networks and telecommunications, virtualization, and enterprise application integration are still highly ranked issues. Social networking/media appears to be the least important issue. The Egyptian IT workers are highly satisfied with their jobs, and they are confident and willing to accomplish their tasks successfully. Egypt has a healthy and growing IT workforce with higher education, strong interests, and both short- and long-term career plans in the IT field.

## 7.1 Introduction

Egypt has long been one of the regional leaders in the Middle East and North Africa. Since 1970s, its “open-door” policy has both encouraged domestic organizations to enter into global market and attracted multinational organizations to invest in Egypt. As an information technology (IT) hub in this region, the country has been attractive for IT outsourcing (Willcocks *et al.*, 2009). The government has continuously invested in the national IT infrastructure and e-government initiatives (Gebba and Zakaria, 2012; MCIT Report, 2015). The domestic organizations work closely with their international business partners to offer a wide range of IT products and services, from call centers and technical services to software design and research and development centers (MCIT Report, 2015). IT has become one of the key sectors driving economic growth in Egypt and contributing to the country’s GDP, revenue, export, and employment. According to the annual report (ITIDA, 2013) by the IT Industry Development Agency (ITIDA), the Egyptian IT sector represented 4.4% of the country’s GDP and offered 268,000 jobs in 2012. Egypt’s economy has been growing at an annual rate of 4–6%, and further expansion and structural reformation are expected by the year 2020 (World Bank, 2018).

## 7.2 Country Background and History

Egypt, officially the Arab Republic of Egypt, with a population of over 95 million, is the most populous country in North Africa, the Middle East, and the Arab world. It is a transcontinental country across those regions and has been considered as a regional leader. Due to the large areas of desert, the great majority of its people live near the banks of the Nile River (about

40,000 km<sup>2</sup>) and about half reside in urban areas and densely populated centers. A large number of Egyptians live abroad (about 2.7 million); about 70% of emigrants live in other Arab countries, and most of the remaining 30% reside in Europe and North America.

In Egypt, Islam is the official religion, and Arabic is the official language. It has one of the longest histories over the world, tracing its heritage back to the 6000–4000 BC (Midant-Reynes, 2000). From the 16<sup>th</sup> to the early 20<sup>th</sup> century, Egypt was ruled by foreign imperial powers. The country gained independence from the British Empire and formed a republic in the late 1950s. In its recent history, Egypt has endured challenges with political instability and economic underdevelopment.

Economic conditions have improved considerably after the implementation of liberal economic policies and major reforms. The “open-door” policy has also attracted a large amount of foreign investment, and the country has been rebounding from the recent 2011 revolution and its aftermath. Its economy is one of the largest and most diversified in the Middle East and is projected with fast and continuous growth (World Bank, 2018). The major industries in Egypt are agriculture, energy, and tourism. Exports of goods and services have contributed positively to its GDP, while the gas, telecom, and construction sectors are fast growing. The main economic activity is still driven by large public investment in state-led projects.

### 7.3 Information Technology in Egypt

Similar to other industries, the IT sector in Egypt has long been led by government investments. In 1854, the county launched its first telegram line connecting Cairo and Alexandria, followed by the first telephone line between the two cities installed in 1881. The government has committed to develop its IT sector since the national project for a technological renaissance in 1999. E-government initiatives have also been implemented despite the challenges and critics in public adoption (Abbassy and Mesbah, 2016; Gebba and Zakaria, 2012).

The IT sector has expanded rapidly in recent years, with many start-ups providing outsourcing services to multinational companies from North America and Europe. Egypt has become an attractive region as an IT hub for outsourcing, especially since the creation of the Smart Villages (Willcocks *et al.*, 2009). Initially, the IT outsourcing practice was mainly limited to call centers and technical services. Egypt’s most prominent multinational companies are Xceed BPO service with its 7,000+ work stations and the Raya Contact Center, which has more than 5,000 work stations

servicing global Fortune 1,000 companies in 25 different languages. Recently, the government has led several programs to diversify the outsourcing services and to support small- and medium-sized enterprises (ITIDA, 2013). More advanced products and services in IT outsourcing have been initiated and developed, including: business process, software design and development, and research and development.

The Egyptian IT sector is one of the most dynamic and vibrant employment areas. Skilled IT professionals are well-paid following the Egyptian job market standards. There are about 480,000 university graduates annually in Egypt; among them, 110,000 are foreign language graduates and 50,000 hold an IT-related degree. The government facilitates the Education Development Program for Egyptian Universities (EDUEgypt) that collaborates with universities and leading companies involved in business process outsourcing and multinational clients. They aim to create job opportunities and prepare the graduates with a range of technical competencies.

Social media has been widely used by Egyptian IT professionals, and this albeit a freedom of press limitation. A recent law granting public authorities the right to monitor social media users in the country has been ratified by the government (Channel NewsAsia, 2018). Egypt remains the first country in the Middle East and North Africa (MENA) region with 17 million Facebook users. Since November 2017, its citizens have enjoyed Twitter Lite, which is designed to make Twitter more accessible in developing regions where data plans are expensive. Snapchat expanded its Egyptian operations exponentially with the user base of approximately 3 million (Radcliff and Lam, 2018).

#### 7.4 Methodology

The country investigator (the first author) formed a local research team for data collection with Dr. Hisham Salah (a Research Scientist at Wadsworth Center, NYSDOH), Dr. Mahmoud Allam (the former Computer Engineering Program Director at Nile University), and a junior assistant researcher. The standard World IT survey instrument (Palvia *et al.*, 2018; Palvia *et al.*, 2017) was used, and it was translated into the Arabic language by a professional translator. The team then compared notes with the Saudi Arabia Arabic instrument, and minor adjustments to the wording of some questions were made. The team found that it was difficult to collect primary data on IT professionals in Egypt. Some of the common challenges included distrust of research objectives and reluctance to share information. Reaching out through key people or senior management did not prove to be an efficient approach.

At the initial stages of data collection, paper surveys were printed, distributed, and collected. The team found that people often refused to meet with the junior assistant for paper survey and appeared to prefer answering questions online anonymously. The team then created the survey on the SurveyGizmo online platform in dual languages (English and Arabic). An email campaign was launched on LinkedIn giving participants the option to respond to the survey in dual languages. The campaign started in December 2015 and ended in October 2017. Most of the data were collected during the summer of 2016. Responses reached a peak during the Ramadan period (June 6–July 5, 2016).

The research team used the SurveyGizmo platform for data entry consolidation, data aggregation, and data export. The researchers also created and used a Google sheet to manage the contacts and to track the data collection progress. In total, 284 responses were received, out of which 175 were completed. This reached a 61.6% completion rate, a high rate when taking into account the length of the survey. The average time for completing a paper survey was about half an hour, while the average time for finishing an online survey was approximately 23 minutes.

Table 7.1 shows the descriptive statistics of the IT professionals who took part in the study. Note that the total number with regard to the level

Table 7.1: Descriptive Statistics

Characteristics	<i>N</i>	%	Characteristics	<i>N</i>	%
Education:			Years of Work Experience:		
High School or Less	0	0	0–4 Years	24	13.7
Associate Degree	4	2.3	5–9 Years	44	25.1
Bachelor’s Degree	138	78.9	10–19 Years	76	43.4
Master’s Degree	30	17.1	20–29 Years	27	15.4
Ph.D.	3	1.7	30+ Years	4	2.3
Years of IT Experience:			Organizational Location:		
0–4 Years	33	18.9	IT Department Employee	132	75.4
5–9 Years	49	28	IT Worker in Non-IT Department	16	9.1
10–19 Years	68	38.9	Contract Employee	7	4
20–29 Years	21	12.0	Consultant	20	11.4
30+ Years	4	2.3	Vendor Employee	0	0
Work As:			In Senior Management		
Mostly Full Time	155	88.6	Not Part of Management	52	29.7
Mostly Part Time	1	0.6	In Lower Management	27	15.4
Mostly Over Time	19	10.9	In Middle Management	54	30.9
Been Laid Off from IT Job:			In Senior Management		
Yes	7	4.0		41	23.4
No	168	96.0			

of management is less than 175, which is due to one missing response to this question in the survey.

Most of the survey respondents held bachelor's degrees (78.9%), and more than 80% had at least 5 years of IT experience. The respondents were mostly working full-time (88.6%), and only one worked part time. Only a few (4%) experienced an involuntary loss of an IT job. In terms of their job positions in the organization, more than 75% worked in IT departments, and about 10% either worked in non-IT departments or were external consultants. They frequently worked at different levels of managerial positions.

## 7.5 Organizational IT Issues

The participants were asked to rank 18 organizational IT issues in order of importance. Table 7.2 presents the ranking result from the respondents from Egypt. Security and privacy was ranked as the most important issue, which also received the top position in the 2017 SIM IT Issues and Trends Report (Kappelman *et al.*, 2018). The other issues included in the top five were IT reliability and efficiency, alignment between IT and business, project management, and IT strategic planning. Among them, alignment between IT and business was also ranked among the top five in the SIM Report.

Security and privacy is ranked globally among the top issues as IT companies face more and more challenges with emerging technologies, such as cloud computing, mobile apps, and social networks. The respondents also indicated the importance of aligning IT and business models and strategies, and pointed out misalignment situations due to the discord between business needs and IT implementations.

A number of issues ranked in the top five in the present study were not listed in the SIM Report (Kappelman *et al.*, 2018). Many respondents reported a major concern regarding IT reliability and efficiency, particularly the IT infrastructure that failed to deliver accurate, timely, and reliable data and information for business decision-making. They also felt that IT was often not strategically planned and that project management was not undertaken professionally. As a result, IT investments and projects often failed to deliver their promises.

The top-five issues identified in the present study pinpoint to the fact that IT still performs a "separate" business function in the Egyptian organizations. The respondents noticed the important role of IT in cross-functional management. IT professionals lack a comprehensive understanding of the business mandates and requirements, while business professionals

Table 7.2: Organizational IT Issues in Egypt

Organizational IT Issues	Rank	Mean Rating*	Std. Deviation
Security and privacy	1	1.41	0.64
IT reliability and efficiency	2	1.43	0.58
Alignment between IT and business	3	1.49	0.58
Project management	4	1.50	0.60
IT strategic planning	5	1.54	0.59
Continuity planning and disaster recovery	5	1.54	0.61
IT service management (e.g., ITIL)	7	1.55	0.70
Knowledge management	8	1.58	0.63
Attracting and retaining IT professionals	9	1.61	0.69
Business agility and speed to market	10	1.63	0.68
Revenue-generating IT innovations	11	1.72	0.71
Business process reengineering	12	1.76	0.63
Business productivity and cost reduction	13	1.79	0.76
Enterprise architecture	14	1.80	0.74
Globalization	15	2.11	0.86
Outsourcing	16	2.29	0.80
IT cost reduction	17	2.31	0.97
BYOD	18	3.24	1.31

\*Rating scale ranges from 1 to 5: 1 as most important and 5 as no importance.

also need to know the various technical solutions and their implications. This may be partially due to the fact of the separation between pure IT degrees and pure business degrees in Egypt education. Currently, very few educational programs are offered to prepare future business professionals to manage IT in organizations.

It is interesting to note that globalization and outsourcing were not reported as major organizational IT issues in this study. Egypt has long been immersed in globalization. In recent years, the “open-door” policy adopted by President Sadat and his successors has encouraged local organizations to expose them to the global market. Egypt, as an IT hub, has been attractive for IT outsourcing (Willcocks *et al.*, 2009), and the local companies have often become suppliers and partners of international organizations. Hence, outsourcing has been managed without serious concerns.

Finally, IT cost reduction and BYOD appeared to be the least concerns in organizational IT issues in the present study. This indicates that the everlasting cost reduction efforts do not impact the IT function and its spending in Egyptian organizations. Although it has been observed that organizations tend to cut down their IT budgets with economic downturns, the respondents indicated that this did not constitute a major concern for their organizations. This may be possibly due to the budget increase for



IT infrastructure upgrades and investments, and thus there is no need for reducing costs and using own devices.

## 7.6 Technology and Infrastructure Issues

Table 7.3 shows a ranking of technology and infrastructure issues in Egypt, listed from the most to the least important ones. The top-five issues were networks/telecommunications, virtualization, enterprise application integration, business intelligence/analytics, and collaborative and workflow tools.

Networks/telecommunications was the highest-ranked technology and infrastructural issue in Egypt. In the SIM report (Kappelman *et al.*, 2018), it was among the top-10 IT investments but was not concerned as a top issue. In Egypt, the network structure remains shaky and unreliable despite a countrywide use of the Internet. At the national level, more effort has recently been announced to upgrade the existing Egyptian network infrastructure. At the organizational level, IT professionals seek more stable technologies and solutions to address the networks and telecommunications issue.

Virtualization and enterprise application integration (EAI) were highly ranked in the present study, while they were not reported as top issues by

Table 7.3: Technology and Infrastructure Issues in Egypt

IT Related Issues	Rank	Mean Rating*	Std. Deviation
Networks/telecommunications	1	1.37	0.51
Virtualization (Desktop or Server)	2	1.57	0.61
Enterprise application integration	3	1.64	0.71
Business intelligence/analytics	4	1.69	0.76
Collaborative and workflow tools	5	1.70	0.72
Mobile and wireless applications	6	1.72	0.69
Customer relationship management (CRM)	7	1.74	0.75
Business process management systems	7	1.74	0.76
Enterprise resource planning (ERP) systems	9	1.76	0.77
Software as a service	10	1.78	0.71
Service-oriented architecture (SOA)	10	1.78	0.75
Data mining	12	1.86	0.83
Big data systems	13	1.87	0.74
Cloud computing	14	1.92	0.90
Mobile apps development	15	2.12	0.93
Social networking/media	16	3.07	1.30

\*Rating scale ranges from 1 to 5: 1 as most important and 5 as no importance.

Kappelman *et al.* (2018). Many organizations in Egypt are migrating to cloud computing, which often requires virtualization implementations. The respondents also reported the importance and challenges in cross-functional integration of business applications. It indicates great effort is still required to bring together different functions of the organization with connected modules or applications. This may also require more intra-organizational collaborations, and thus appropriate collaborative and workflow tools would be essential.

Consistent with the SIM report, business intelligence/analytics was also highly ranked in this study. This shows that the Egyptian IT professionals acknowledge the importance and trend in the advanced usage of data and information. More advanced business intelligence platforms for data mining and big data, however, were rated relatively less important. This may indicate another technological area due for development in Egypt as it lacks infrastructure and support for larger-scale and complicated business intelligence practices.

It is worth noting that the least problematic area reported by the respondents was social networking and media, after other least important issues such as mobile apps development, cloud computing, big data systems, data mining, and service-oriented architecture. Social media has been widely used by the Egyptian IT professionals, mirroring a nationwide trend (Channel NewsAsia, 2018). Egypt remains the leading MENA country with 17 million Facebook users.

### **7.7 Individual IT Employee Issues**

The respondents were also asked to rate several individual IT issues related to their job and career. Table 7.4 presents the relative importance of these issues to the Egyptian IT professionals. Note that a lower average score means higher agreement with each statement in the survey.

Meanwhile, the respondents showed very high accomplishments in their work. They were confident and happy to make valuable contributions to their organizations. Also, the Egyptian IT workers did not find any threats to their jobs, neither due to technological advancements nor because of outsourcing practices.

In terms of their career plans, the respondents showed strong interests in working in the IT field. Whereas some indicated that they might move to other organizations, most of them would keep working in the IT field in both short and long term.

Table 7.4: Individual IT Employee Issues in Egypt

Individual Issues	Mean Rating*	Std. Deviation
<b>Job Satisfaction</b>		
In general, I like working here.	1.89	0.77
All in all, I am satisfied with my current job.	2.20	0.88
In general, I don't like my current job.	2.10	0.94
<b>Work Pressure</b>		
I feel that the number of requests, problems or complaints that I deal with at work is more than expected.	3.01	1.05
I feel that the amount of work I do interferes with how well it is done.	3.41	0.98
I feel busy or rushed at work.	3.05	1.03
I feel pressured at work.	2.88	1.04
<b>Work-Life Balance</b>		
There is a blurring of boundaries between my job and my home life.	3.10	1.12
My work-related responsibilities create conflicts with my home responsibilities.	3.38	1.06
I do not get everything done at home because I find myself completing job-related work.	3.16	1.10
<b>Workload and Burnout</b>		
I feel drained from activities at work.	3.00	1.10
I feel tired from my work activities.	2.88	1.05
Working all day is a strain for me.	2.72	1.08
I feel burned out from my work activities.	2.93	1.12
<b>Sense of Accomplishment</b>		
I feel I'm making an effective contribution to what this organization does.	1.73	0.62
In my opinion, I do a good job.	1.80	0.68
I have accomplished many worthwhile things in this job.	1.67	0.62
At my work, I feel confident that I am effective at getting things done.	1.70	0.64
<b>Threats to One's job</b>		
I am worried that future technology advancements may pose a threat to my job.	3.66	0.98
I am concerned that my job may be eliminated soon.	3.86	0.97
I am concerned that my job may be outsourced soon.	3.74	0.96
<b>Career Plans</b>		
I will be with this organization 1 year from now.	2.41	0.86
I will take steps during the next year to secure a job at a different organization.	2.94	1.04
I will be with this organization 5 years from now.	2.82	1.00
I will be working in the IT field 1 year from now.	1.76	0.82
I will take steps during the next year to secure a job outside the IT field.	3.67	1.03
I will be working in the IT field 5 years from now.	1.99	0.87

\*Rating scale ranges from 1 to 5: 1 as strongly agree and 5 as strongly disagree.

In summary, the result shows a very healthy workforce in the Egyptian IT sector. This may be attributed to the continuously growing IT industry in Egypt. On the demand side, the government invested in the IT infrastructure nationwide, and a large number of multinational companies were attracted to Egypt to offer a range of IT products and services. On the supply side, there is a large base of new IT graduates, and universities and colleges offer various IT-related programs. The Egyptian IT sector has thus become one of the most dynamic and vibrant job markets.

## 7.8 Conclusion

Unlike many other sectors of the Egyptian economy, the IT industry has remained remarkably resilient in the face of political uncertainty and macro-economic instability wrought by the 2011 revolution. Due to its established national Internet infrastructure, Egypt has a number of advantages to attract potential IT investors and outsourcing partners, such as strong support from government agencies and a large base of new graduates with multiple linguistic and technical skills.

In recent years, the IT sector has been expanding its existing IT infrastructure and outsourcing services. The present study reveals several important issues that exist in the IT sector, despite a healthy and growing workforce supporting its development. Currently, the Ministry of Communications and Information Technology (MCIT) is working on the IT 2020 Strategic plan. This plan focuses on IT infrastructure, digital content, electronics design and manufacturing, IT industrial programmes and initiatives, and legislative and policy frameworks. A number of technology parks and subsidy programmes will be coupled with initiatives such as the large-scale infrastructure upgrade and enhanced EDUEgypt programs. These efforts will help sustain Egypt's regional leadership in IT.

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