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# Information Technology in Auditing Firms in Egypt

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## ABSTRACT

*Information technology is effectively causing waves of change in the global economy with implications on different organizations, businesses, markets, societies, and economies at large. The accounting and auditing market and profession in Egypt witnessed major developments over the last decade in its processes, logistics, magnitude, and adaptation to various transformations taking place globally. However, unfortunately almost no information is available on how information technology have affected the accounting and auditing profession. This paper has an exploratory and descriptive nature that aims at exploring and understanding the extent of use of information technology by external auditors in Egypt, how it affects their work environment, its impacts on individuals and organizations, and the hurdles that might hinder the introduction, diffusion and use of information technology. The paper demonstrates the findings of a research-in-progress investigating the current status of information and communication technology in the sector and assessing the potentials and opportunities that could improve efficiency within a changing environment.*

## IT IN EGYPT

Egypt, a developing nation, is home to more than 70 million people and growing at an estimated rate of 1.9% (www.mcit.gov.eg). Egypt is one of the largest economies in the Middle East. It current economic growth rate to stand at 3.1% annually with an inflation rate of 6% (www.economic.idsc.gov.eg). It is undergoing privatization and liberalization of a number of its major economic sectors. Although, population is settling on 4% only of its land which extends to around 1 million square kilometers, infrastructure development and extension is reaching its 26 different provinces. Egypt has a large service sector mainly built around tourism and transportation. Its major exports are human resource capacities, petroleum products, cotton and leather products; its major imports are food, machinery and vehicles. Agriculture accounts for nearly 16% of the gross domestic product, industry 35% and services 49% (Kamel, 2003).

Information technology has been identified by the government of Egypt since the mid 1980s as a potential player and a platform for growth. In 2001, the information technology market was valued at 849 million US dollars with an annual growth rate of 16.3% and by 2004, the value of the market is expected to reach 1,315 million US dollars with a compounded average growth rate (CAGR) of 16.1% from 1998 (American Chamber of Commerce in Egypt, 2002).

The industry passed through an evolutionary approach since the early 1960s encompassing four main phases. The first phase took place during the period of the 1960s and early 1970s witnessing a huge industrial boom in various sectors of the economy and where computers were regarded as potential tools targeted by the government to boost its socioeconomic plans but it was faced with many cultural and social barriers. With the economic open door policy in 1974-75 coupled with the massive drop in the prices of mini-computers worldwide, the second phase of computing started and was characterized by using computers for increased effectiveness and management support provision in decision making after attempting to realize organizational performance and efficiency during the first phase. This phase witnessed the establishment of a large number of representative offices of most information technology multinationals transforming Egypt's image as the information center in the Middle East. By the early 1980s, personal computers became accessible to more individuals, universities, schools, research centers and private firms. While personal computers became more popular in the 1980s, a dramatic increase in their use seemed highly dependent on the Arabization of software applications since the majority in Egypt prefer to work on Arabic-based applications. There were 30 multinationals in the Egyptian market in the early 1980s (Lind 1986) as opposed to 3 in the previous decade. Today, most information technology multinationals are represented in Egypt in addition to over 700 local companies producing and serving different aspects of the industry.

The information and communication sector is one of the key sectors that attracted the attention of both the government and the private sector to contribute to development plans since the mid 1980s and various projects were initiated and implemented in Egypt's different provinces which reflected the beginning of the third phase of computing, information technology diffusion into Egypt. This phase represented a shift in the perception and use of information technology. The market was liberalized, leading to a vast increase in the number of multinationals, vendors and local software houses. Information technology was perceived as a tool to reposition the organization in a growing competitive market where the decisions taken and the resources allocated directly affected its status and position. This phase witnessed the involvement of a new and large customer in the market with new ideas, strategies and plans; the government. It is important to note that the third phase helped redefine the role of information technology within the context of socioeconomic development. The fourth and current phase could be marked with the establishment of the ministry of communication and information technology in September 1999 placing the industry as a support vehicle for development on the agenda of the government. Moreover, through a partnership with the private sector, the government developed a five-year plan aiming to establish an information and technological infrastructure that reflects vertical development to keep pace with the rest of the world and minimize the digital divide and at the same time proceed with the nation's horizontal development to be able to cater to the different needs of the community at large.

## AUDITING IN EGYPT

Egypt has a long and distinguished history in the field of financial management and accountability[1]. Prior to the Second World War, the Cairo Stock Exchange was the largest in the world, which led Egypt to have a strong stock market and robust financial and commodity markets. As a result, there was a large amount of foreign and local investments, which led to the development of a strong accounting and auditing private sector in the profession. However, most of the accountants and auditors

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during this period were foreigners, mainly from the UK. The foreign domination started to change by the passing of the first tax law in 1939, which encouraged Egyptians to penetrate the accounting and auditing profession. In an effort to regulate the accounting and auditing profession, the Egyptian Accountants and Auditors Society (EAAS) was established in 1946. Moreover, the government of Egypt passed the Accounting Practice Law #133 in 1951, and the Constitution of the Profession of Accounting and Auditing in 1958; both of which still currently set the framework for accounting and auditing in Egypt.

In the late 1950s, Egypt started a nationalization process that resulted in the government seizing almost all local and foreign private businesses from its owners[2]. As a result, the private sector accounting profession disappeared and the profession's organization and standards were left to the government. During this period, governmental ownership was the majority and the government initiated the Central Auditing Organization (CAO) which was established outside the statutory framework of the profession as an independent unit. The CAO further developed the Egyptian Unified Accounting System (EUAS) which changed accounting from a profession to a technical process and changed auditing from an attestation to an inspection process.

In the mid 1970s, Egypt started changing from the closed central market system to a more free market capitalistic economic system. The shift started with the issuance of the open door policy to revive and liberalize the economy. Respectively, the private sector activity resumed and private accounting and auditing firms started to re-establish themselves, which coincided with the second phase of the evolution of information technology in Egypt. This trend was further developed in the 1980s and 1990s to include more initiatives and activities to attract foreign direct investments coupled with a strong privatization program that led to the introduction of the private sector as a major player in the economy, and the reactivation of the Cairo Stock Market. The sustainability of these changes necessitated the development of the accounting and auditing profession in Egypt. In that respect, Egypt adopted the International Accounting Standards (IAS) and the International Auditing Standards (IAUS) as a base to produce the Egyptian accounting standards and the Egyptian auditing standards. The previous factors led to the re-establishment of the role of the private auditing firms again in the business market in Egypt that was further promoted by the entrance of the large international auditing firms in the market[3].

The auditing profession in Egypt consists of (a) private auditing firms, (b) the Egyptian Accountants and Auditors Society, (c) governmental regulatory agencies and bodies, (d) the Central Auditing Organization, (e) audited companies, and, (f) users of financial information. This paper focuses on the private external auditors firms in Egypt as one of the key members of the auditing profession.

## IT AND AUDITING

Today, auditing has the same objectives as it had in the past but there is no question that advances in information technology have greatly affected the audit process. The accounting and auditing profession's ability and willingness to use information technology is of considerable relevance to the auditing firms, its clients, and the society at large. The use of information technology in auditing can result in increased productivity, efficiency, reliability, and timeliness of auditing firms' outputs (Wilson and Sangster, 1992). Moreover, it can reduce audit costs, and consequently audit fees without loss of audit quality. For example, computing can be used to control the audit through software programs that track staff time and compute master budgets. The auditing profession is a sophisticated and expensive labor intensive activity and the auditing process involves activities like planning and managing the audit process, keeping records, and writing letters to verify balances in the clients' accounts. These tasks are expensive and time-consuming for the auditors who should dedicate their time to evaluate and assess given data and offer qualitative judgments.

Expert systems and auditing software can perform numbers testing and data validations in a shorter time span. For example, Computer Assisted Auditing Tools (CAAT) can be used to analyze clients' computer-based records and allow auditors to analyze all records instead of simply selecting a sample which improves accuracy. Respectively, information technology support gives the auditors time to concentrate on what is more important in the auditing process and decreases the cost of the process (Turban, 1990). Moreover, the use of expert systems can ensure that the same high professional standards are applied in all audits and that the skills that are present in one section of the auditing firm is available where it is required, on site, during an audit at a client's office (Wilson and Sangster, 1992).

In auditing, the term information and communication systems are commonly used to describe three different types of computer-related activities; (a) auditing around the computer, (b) auditing through the computer and/or (c) auditing with the computer (Wilkinson and Cerullo, 1997).

(a) Auditing around the computer treats the computer as a black box, focusing on the inputs and the outputs. The practice of auditing around the computer was in the early days of computing when the typical auditor was unfamiliar with computer technology, programming, and controls used in computer-based systems. The control and procedures used in processing the data were considered unimportant as long as the output generated by the computer could be traced back to the input, and the input was deemed valid. If the match proved to be accurate and valid, then it was assumed that the system of controls was in operation and that it was operating properly (Burch, 1978). The limitations of auditing around the computer became more significant, as newer and more sophisticated systems procedures were implemented, and as auditors became more knowledgeable in computer operations, and when auditing techniques began to change.

(b) Auditing through the computer focuses on processing steps and programmed controls through the process of reviewing and evaluating the internal controls in an electronic data processing system. It assumes that if the processing programs are soundly developed and incorporate adequate programmed checks then errors and irregularities cannot slip undetected. The auditing through the computer technique places greater emphasis on testing the computer system that produces the output rather than testing the output itself. The auditor tests and verifies the effectiveness of control procedures over computer operations and computer programs, and the correctness of internal processing. This audit technique requires two basic tasks including the review and verification of source transactions, and the actual testing of the computer program logic and program controls (Burch, 1978). One of the key tools in applying this audit technique is the preparation of a series of test transactions, normally referred to as a test deck that runs on the computer system using the same programs that were used to operate the particular application that is being tested. The test is designed to assess the effectiveness of the controls, its accuracy and the generality of the programs. The auditor cannot physically see the operations and controls within the computer, but he can see an output listing of the results of the test where, for example, some transactions that were supposed to be rejected were not, or where overflow conditions caused errors, or where out-of-limit transactions were processed as if they were correct (e.g., customer transactions exceeded credit limit). The auditor can also determine whether the computer is properly processing valid transactions. Use of the test deck opens up windows in the computer because the simulated transactions are processed through the computer system and generate results that are compared by the auditor with results he has already prepared by hand.

(c) Auditing with the computer is the utilization of the computer by an auditor to perform some audit work that otherwise would have been done manually. It is used to automate much of the audit process. It is important to note that computer software is utilized to perform a number of audit functions, such as testing of controls and substantive tests. Information technology with an emphasis on computing and networking provide most of the information needed by auditors. Therefore, auditors must use computers as an auditing tool, audit automated systems and data, understand the

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business purposes of the systems, and understand the environment in which the systems operate, in order to be effective in their audit. The other important uses of computers and networks in auditing are in auditing administration (Le Grand, 2002).

Focusing on external auditors, they use computing in auditing. Auditors can use Computer Assisted Audit Techniques (CAAT) to help them in various auditing tasks where there is a variety of software available. Examples include generic programs such as word processing, spreadsheet, and database management applications as well as specialized applications (Moscove, Simikin, and Bagranoff, 1999). Some of the potential benefits of using computing in an auditing includes, as indicated by Bodnar and Hopwood (2001), (a) more eligibility and consistency, (b) time saving by eliminating manual footing, cross footing, and other routine calculations; (c) accuracy in performing calculations, comparisons, and other data manipulations; (d) efficiently performing analytical review calculations; (e) easily generating and analyzing project information; (f) simplicity in modifying and storing standardized audit correspondences; (g) improving morale and productivity by reducing time spent on clerical tasks; (h) increasing cost-effectiveness by reusing and extending existing electronic audit applications to subsequent audits; and, (i) increasing independence from information systems personnel is realized. In the case of Egypt, virtually limited information is accessible about the use of information technology by auditing firms. The authors of this paper are unaware of any previous attempt to measure the degree of use of information technology by auditing firms in Egypt. Therefore, the nature of the paper is exploratory and descriptive trying to assess the degree of use of information technology by external auditors in Egypt.

## RESEARCH DESIGN

The paper reflects a research currently underway to examine and analyze the status of the use of information technology in Egypt and how the use of advanced and innovative technology can help improve the efficiency and effectiveness of the sector. The paper reflects a descriptive nature in response to the call of a large body of researchers and experts from the marketplace for the importance of the inspection of the relationship between information technology and auditing (Elliot, 2002; Hunton, 2002; Hermnson et al, 2000; and Wilson et al, 1992). The research aims at studying the market in Egypt and demonstrates the developments that took place in recent years including the strategies implemented and how the future is perceived within an environment that is not deterred by the barriers of time and distance and that is affected by a competitive global market. The research addresses a number of issues that relate to the use of information technology in auditing firms in Egypt including the resources invested, the degree of dependence of auditors on technology, and the quantity and quality of training and human resource development being offered. Moreover, the research assesses the attitude of auditing firms towards using information technology in their logistical and operational procedures and its willingness to invest in re-engineering its infrastructure around information technology although there are a number of barriers that might hinder the integration of information technology in the auditors' environment and its business cycle and processes.

## METHODOLOGY, DATA COLLECTION AND ANALYSIS

The research mainly relied on primary data collected through a set of interviews that were organized with various auditing firms, decision makers and users from different sectors of the society including the private and public sector. Moreover, the use of a survey questionnaire was extensively used to assess the most important elements of the use of information technology in auditing firms and how its implications is perceived by the community at large in terms of rendering the auditing cycle more effective and more efficient. Secondary data was used to explore the status of the information technology infrastructure in Egypt, as well as the strategies used and plans set. An empirical investigation was launched to answer these research questions. The research sample included 30 auditing firms where 10 interviews were conducted as well as the distribution of 80 questionnaires through electronic and snail mail pending availability of potential candidates in both categories[4]. The data collected was analyzed using statistical models, relating different independent and dependent variables. The analysis aimed at identifying the importance of each factor to individuals, and understanding the level of satisfaction held by individuals for the Internet service offered while focusing on the most important factors. Finally, the research attempted to examine and understand the implications of the use of information and communication in auditing related activities. It is important to note that the research is mainly conducted in Cairo reflecting a geographical limitation and auditing firms in the other 26 provinces where not part of the research. Moreover, the reluctance to disclose information by different local auditors showed discrepancy between them and the auditors of multinational auditing firms.

## RESEARCH FINDINGS AND ANALYSIS

When conducting the research a number of findings came out and where analyzed which yielded a set of outcomes. With respect to gender 25% of the sample was women mainly in lower managerial positions which was due to the need for long working hours which is not much appreciated culturally or women to work late. For education and computer literacy, 86 % of the sample had university bachelor's degree with professional training conducted but it was significant that very few had post-graduate degrees. 26.3% of the sample was not feeling comfortable using computers reflecting the huge volume of computer illiteracy existing which also implies the amount of awareness and training needed before embarking on promoting sophisticated software applications specialized in auditing accounting records.

In terms of computer domination within accounting and auditing firms, over 58.8% approved of the diffusion of information technology in their profession with a focus more on accounting. However, the majority complained because of the minimal capacity development programs provided where only 31.3% of the sample attended some form of training. With respect to the use of computing in the auditing process, the research indicated that it concentrated more in reporting rather than in the fieldwork. It is important to note that 62.5% of the sample indicated that there is a difference between computer-based auditing and the use of manual records where the quality of its readability is easier and the information is more reliable in the sense that there is less calculation errors in addition to the ease of tracing information and the ability to better organize, save and retrieve files. In terms of training and capacity development, it was perceived to be expensive when it comes to auditors' computer-based training in terms of fees and time needed. Additionally, the research showed that there were only three computer suppliers providing auditing firms with their needs in terms of computer supplies and software which again reflects the fact that computing is not well diffused in terms of critical mass in the industry otherwise more provided would have been interested to penetrate the market place.

The research findings in company A showed the full deployment of computing where all records are automated and the employees are using auditing software. Moreover, 30% of the clients are fully automated including their audit process. The clients are mainly banks and oil companies because they are relatively large corporations that can afford the cost of setting up the audit software and the required infrastructure. The senior partner in the company believes that the deployment of information and communication infrastructure provided his company with a competitive edge because they have all their audit processes automated as well as they can conduct online comparative analysis between the firms they audit in the Middle East. The senior partner indicated that one of the deterrents in the market in Egypt is the culture of not sharing information, except for banks, as well as the difficulty of allowing the auditing of the computer process. This also reflects the problem of lack of transparency. With respect to company B, one of the partners interviewed, confirmed that nearly all the companies in Egypt in the sector use computer-based records, he even went further to indicate that all companies do full automated audit around and through the computer. He believed that the main barrier was not the use of computing but rather the cost involved. The research results showed that

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41.3% of the firms that are affiliated with multinationals make auditing through the computer which is a low percentage that was confirmed by a partner in company D. Moreover, he does not see that he has a competitive edge by doing auditing through the computer because he believes that the market in Egypt does not value computing enough, at least not to date which leads to loss of investments allocated and training of staff that do not eventually implement what they are trained for.

Cost was identified as the main barrier against the diffusion of computing in the auditing process by 40.08% which was followed by inadequate training as indicated by 21.94 % o the sample surveyed. There was a confirmation of top management support with only 18.14% opposing such fact. Cultural barriers were also noted as well as lack of awareness and training. For example, 55% agreed that Egyptians do not feel comfortable about computers which make auditors reluctant to depend on computers. Moreover, 71% agreed that auditing software usage was limited because most packages are in English. 65% of the sample claimed that they do not fully trust the Internet and computing in general. Some other indicators showed that only 32.5% believed it could increase efficiency which indicates not much willingness to depend fully on computing. In the case of company C, the auditing manager indicated that they used a manual procedure which as he sees it the majority of the cases in firms in Egypt since automated auditing is very costly. He indicated that such situation was further affected by the devaluation of the Egyptian pound. He also agreed with others that the problem was not in people opposing the use of computing but it mainly because of the limited resources available. Moreover, the issue of transparency was a problem that needed to be addressed as indicated by the auditing manager.

## CONCLUSION AND RECOMMENDATIONS

The findings of the research provided highlights of the current status of the use of information technology in the accounting and auditing professions and its impacts and utilization in small firms as compared to large firms and mainly the representation offices of international auditing firms. Based on the preliminary analysis of the findings, it is safe to say that among the recommendations to be drawn from the research would be the need for more effective awareness campaigns, the importance to introduce more capacity development programs, the introduction of computing and information technology concepts in schools and universities and its integration in the educational cycle. However, some of these action plans will be faced with a number of challenges such as the limited availability of resources, the need for government subsidy to support the small auditing firms and the need for Arabic software applications to cater for the majority of the population in Egypt. Moreover, there is the belief of appreciation and fear from the use of information technology in general; accountants and auditors will not be an exception from a cultural perspective. The authors believe that the financial and language barriers are going to be the most important barriers that hinder the development of information technology in auditing since most of the programs and tools are expensive and available in foreign languages and the availability of software applications in Arabic is not that frequent in the local market. However, the use of information technology is expected to be larger and more developed in larger auditing firms, mainly those affiliated with foreign auditing firms. However, in the few years to come it is expected that more information technology will be diffused in auditing and accounting firms at large as its role will become more and more key for their effectiveness and efficiency as well as competition.

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## FOOTNOTES

[1] Dating back to 4000 BC where the invention of Papyrus enabled Egyptians to keep records that played a significant role in their ability to organize their society and maximize the benefits of their resources.

[2] The change was caused by the transformation in the political system in Egypt in 1952 from a monarchy to a presidential system.

[3] It is important to note that the laws and regulations in Egypt do not allow the operation of foreign auditing firms in Egypt unless they operate through Egyptian partners.

[4] The research focuses more on four firms; for confidentiality purposes it is referred to them as firms A, B, C, and D in which each of A, B, and D is an affiliate of a multinational auditing firm

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