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**ON**

***LEVERAGING TECHNOLOGY TO  
ENHANCE AUDIT QUALITY AND  
EFFECTIVENESS***

**General Auditing Bureau  
Saudi Arabia**

**Principal Paper**  
**On**  
**Leveraging Technology to Enhance Audit Quality and Effectiveness**

**1. Introduction:**

The recent developments in Information Technology (**IT**) have taken a giant qualitative leap in the field of Business development and increment of productivity which in turn will lead to a rising economic growth and achieving the desired economic and social development. As a result of the current IT revolution in the world, an e-government solution was established as a substitution for the conventional government. The e-government was found to allow the citizen gain "accessibility to such services without the constraints of time and space."(Principal paper) This will facilitate the provision of required services to citizens in locations with no accessibility to government agencies. Moreover we can all agree that this will inevitably "lead to a significant decrease in time spent transacting for the desired services and the ultimate improvement of customer satisfaction" (Principal paper). In realizing this electronic transformation, the General Auditing Bureau of Saudi Arabia (**GAB**) recognized the necessity of integrating technology in its businesses to promote the audit principal.

For these reasons GAB has promptly adopted Information Communication Technology (**ICT**) while considering the electronic audit controls to best utilize these new technologies in practicing financial and accountancy audits as well as Performance audits in the frame of a professional, developed, and safe environment. Furthermore emphasizing on Government agencies and institutions to prepare suitable technological environment to achieve full establishment of electronic linkage with GAB Headquarters. This link was established in a way which conforms with the systems adopted by the auditees, without affecting GAB's ability to perform its tasks.

In that context, the GAB has taken the initiative earlier back in 2004, when it had succeeded in obtaining the Council of Ministers' Resolution

**No. 235**, dated 5/10/2004, making the establishment of internal audit units in all government agencies mandatory. This was achieved as a result of the recommendations by GAB's annual seminar: "Promoting Cooperation and communication with the audited entities to correct irregularities on regular basis and contribute to improving performance". This seminar also recommended that all government agencies should expedite the utilization of new technologies in all relevant accounts as well as financial operations.

GAB also developed a set of unified internal audit regulations for all public sector entities, and secured its endorsement by the Council of Ministers' Resolution **No. 129**, dated 24/4/2007, where the Council furthermore approved GAB's initiative to adopt electronic techniques in all public sector departments for the purposes of book-keeping, preparing financial statements and closing accounts, in order to enable GAB in implementing its (IT) audit systems. Consequently, GAB took the initiative on November 30, **2008** by signing a Memorandum of Understanding with **(YESSER)** program which was initiated by the Ministry of Communication and Information Technology **(MCIT)** in 2005. Since then, GAB used computer systems in all its financial operations, and simultaneously worked on ensuring the positive progress in capacity building of its own staff through training programs on using the latest software systems and providing them with the most recent applications. GAB, similarly, was very keen to adopt this concept as one of its strategic goals in its **2<sup>nd</sup>** Strategic Plan for the period 2010-2014 which include objectives such as:

- 1.** Following-up the transformation of government agencies from traditional techniques of "book keeping" and "final statements" to the technological methods during a period of three years.
- 2.** Executing the adopted plans to transform to the Automated Audit in GAB.
- 3.** Working towards the establishment of an electronic linkage between GAB and its auditees, in order to exchange documents and financial data.
- 4.** Providing technical support to all related parties.

In that sense GAB sought to create an integrated IT environment which meets the international auditing requirements and contributes to improve

the quality its performance. GAB has intently sought to implement the Royal Directive by His Majesty the Custodian of the Two Holy Mosques (H.M. the King) **No. 4799**, dated May 24, **2009** requiring all government agencies to expedite the formation of an electronic link with GAB, in order to accelerate the exchange of data and information, and urging them to draw benefit from the e-government transaction programs. It is clearly evident that GAB has set this goal to obtain the most out of IT advantages in auditing and development processes, further constituting the following objectives:

1. Concluding GAB's "business process reengineering plan" and switching to computerized digital auditing at GAB.
2. Maintaining the implementation of the linkage connection with the audited entities to accelerate the exchange of documents and data electronically, in concurrence with the Electronic Governmental Transactions Program (Yasser).
3. Activating the safe use of digital communication tools and instruments, and exchanging data electronically among GAB's various departments and branches to create a paperless environment.

## 2. Usage of Technology in Public Sectors

The Government of Saudi Arabia attaches great importance to the transformation to the e-government due to the enormous benefits of the e-government to the national economy. Consequently, on March 19, 2003 a royal decree was issued by H.M. the King, mandating the Ministry of Finance with initiating the e-Government Program. Shortly after, on July 21, 2003 the Ministry of Communication and Information Technology (MCIT) was assigned the responsibility of supervision over the communication and technology aspects of the program, which cover establishing the developing plans to deliver the various e-government services, in addition to the procurement of necessary resources. Great importance is assigned to the cooperation between different fields, for the successful Government transformation to an e-government society.

The major strategic benefits from the e-government program, to the Kingdom of Saudi Arabia, remain the same as those identified in the first

action plan: which include Better services for citizens and businesses, increased efficiency and effectiveness, and Support for the transformation to an information society. The increase noticed in the understanding of the e-government initiative, compared to the past as well as the spread of its culture, in addition to the faith existing in government sectors, all provide support in achieving the strategic benefits from implementing the e-Government in the Kingdom during the second action plan. It is also clearly perceived that the fundamental critical success factor for the Second Action Plan has been the commitment and involvement of government agencies, and the engagement model which was developed to ensure inclusive participation from all stakeholders. This will increase the speed of implementation, to further improve the achievements of KSA in delivering e-government success.

Based on the achievements of the First Action Plan, Yesser developed the Second Action Plan 1433 – 1437 (2012 – 2016), in collaboration with the GAB, and other government agencies. Hence initiatives of human resources, communications, and change management, represent the most important part of the plan, and an essential element for the successful implementation of the plan. It is emphasized that this would be the outcome of joint collective efforts to meet a common national objective. It requires integration among government agencies in order to deliver better services to customers and to enhance efficiency of the government sector. Yesser provides consulting services and support to the shared national infrastructure. The implementation of this plan takes into consideration that it should be concerted and integrated to other national strategies (e.g. Development Plan, National Communications & IT plan, other relevant national plans).

There are three critical factors for the success of the Second Action Plan, which include The implementation of improved human, capital and communications practices, The leadership of e-government by government agencies, and The regular measurement of progress.

Therefore, GAB constantly prepares to handle massive volumes of data by receiving, identifying, and saving such data, which is later saved and transferred to the intended department, to be handed over to the auditors for auditing, and preparing these data packages for exportation. The department also is to ensure that all auditees are managing their applied systems and databases in an efficient and effective manner, which meets their established goals, and help protect audits of all fixed and current assets of the state. The preparation for the e-Government includes providing applicable communication media and applied systems. In addition, to the provision of competent auditors capable of handling and auditing these huge packages of data. So in a further prospective, GAB adopted, in its 3<sup>rd</sup> Strategic Plan for the period 2015-2019, the implementation of an audit information system called "Shamel System", as an objective which seeks the automation of audit procedures inside and outside GAB, and uses the available electronic channels in the integration of all procedures with audited entities in the audit mission according to the goals of the strategic plan. Shamel System is considered to be one of the most significantly important systems in the plan set for the transformation to an e-government.

Indeed there are numerous challenges facing governments in their journey of transformation to an e-government and expediting the use of technology, of which we mention the following:

- a. The low level of internet use due to the high cost of internet and communication services in some countries.
- b. Weak infrastructure and coverage of the communication network.
- c. Absence of information security for citizens.
- d. Weak legislation pertaining electronic applications in general.
- e. The lack of social and cultural awareness of the e-government and its applications.
- f. Absence of sufficient financial resources.
- g. Absence of creditability in financial electronic transactions.
- h. The lack of a national wide plan for information.
- i. The lack of qualified human resources.

The Government of Saudi Arabia is moving forward toward the application of e-government by, first, laying out and adopting a national plan for information which contains an important factors pertaining to the welfare of the community. This was the initiation of the real commencement to a digital world. Moreover, a number of government agencies were instructed to lay out policies, procedures, and laws in addition to the development of the necessary infrastructure assigned to communication and information.

As of the legal aspect of the e-Government Program, it requires a certain reasonable assurances in providing protection to the program from cyber-attacks. It is significant in this context to apply protection methods to guarantee safety and privacy of information and data. A cohesive structure should be realized to govern the technology of communication and information, supported by the necessary appropriate legislations complying with sophisticated legal demands of the information technology sector.

The experience of Saudi Arabia in organizing the information technology sector and laying out the necessary appropriate legislations in addition to cyber security, is consider to be one of the contemporary experiences in the Arab World. Nevertheless, the government of Saudi Arabia was preceded by many Arab Countries in this field, presenting it with a chance to benefit from their experiences and from other international backgrounds in acquiring various measurements such as providing security to its information network, which is also equipped with a categorization of the diversified attacks on networks.

In the aim of responding to the progress made in the field of information technology, a group of legislations and regulations were issued to define this domain, of which we mention the following:

- a.** Cyber Crimes Control Regulations: it is consider to be one of the pioneer IT criminal laws in the Arab Countries.
- b.** e-Government Regulations: this law aims to organizes e-signatures, control transactions, in addition to providing a legal framework for the e-transactions.

- c. A Unified Law Guide to Fight Cyber Attacks in Gulf Cooperation Countries (GCC).
- d. A Draft Law on Protection of Personal Data Privacy.

### **The Need for IT Audit**

The great dependence of organizations on IT systems necessitated the use of completely different approaches in processing, recording, and monitoring information. A number of functions which have been separated in the past are now grouped together which may lead to some error occurrences in the system, caused by the repetitive nature of the operations in most IT applications. These simple inaccuracies may cause financial losses such as errors in payrolls which are paid manually and repeatedly with the same mistakes. On the other hand, in IT systems it is noticed that as soon as errors take place, they affect each case. This in return requires the auditor to test the basic operations, and pinpoint the weaknesses in each IT system. The auditees using IT systems, must set the goals and outputs desired to achieve; as profit for investing in the field of technology. This might be one of the many reasons that normally drive auditees to use IT systems.

An example of one of the working systems used in GAB for risk management and auditing purposes during the process of developing the infrastructure of the e-Government, is Cobit which is known for its efficiency in IT audit. Cobit is a system which guides IT and helps in understanding and managing risks and any other related aspects and characteristics of information and IT.

### **3. Auditing e-Government Environment**

GAB has continuously achieved ascending levels of development over the years in the realm of auditing, and has attained higher capabilities to audit databases, operating systems, networks and programs, shaping GAB auditors' familiarization with an e-Government auditing environment. Auditors in GAB are now capable of making sure whether international standards are being applied in auditees' information centers or not.

The role of GAB in IT audit can be listed as follows:

- 3.1.** Eliminating risks related to the use of IT.
- 3.2.** Ensuring the conclusion of information centers infrastructures and readiness of audittees for the electronic linking with GAB.
- 3.3.** Ensuring the integrity between systems of audittees.
- 3.4.** Ensuring the application of International Standards related to the security aspects.
- 3.5.** Ensuring the complete documentation of policies and procedures related to all technical and administrative businesses of information centers.
- 3.6.** Ensuring the best use of resources and the value benefit of its use.
- 3.7.** Ensuring the availability of strategic plans for information centers in audittees which serve the goals of the organization.
- 3.8.** Examining systems to ensure the accuracy of its analysis, design, and system gaps.
- 3.9.** Examining the efficiency and effectiveness of IT network and that all the necessary precautions are taken to ensure its smooth operation by using examining programs.
- 3.10.** Examining databases to ensure that all procedures are taken and all operations criteria are fulfilled.
- 3.11.** Ensuring the documentation of the policies and procedures related to disasters and safeguarding data.
- 3.12.** Ensuring the automation of all systems.
- 3.13.** Ensuring that reports of the systems are all meeting the needs of the organization.
- 3.14.** Ensuring that all reports related to systems are covering all needs of the organization.

In this regard, GAB must guarantee that all financial or administrative applications used in audit are integrated to ensure having all outputs of any application, matching at the same time with the other application, and similarly reducing the manual inputs which may lead to the elimination of errors and manipulation during data entry. Emphasis should

be placed on the financial analysis of these applications, which may include:

1. Human Resources Application.
2. Inventory and Warehouses.
3. Procurement and Sales.
4. Bank Loans.

**Tools used in the audit of financial data:**

1. Modern computers.
2. Analysis program that the auditees are using such as: IDEA, ACL.

**4. Technology-based Approach Through the use of Audit Tools**

Data likely needs to be extracted from a central database or from individual departmental databases. In many organizations, the databases are controlled by the IT Department or Management Information System (MIS) Departments. So indeed "Cooperation from these departments is crucial to ensure Analytics implementation is successful" (Principal paper).

IT industries operate under multi platforms such as Oracle, SAP, Open source and etc. Analytics users need to have a good understanding of the host system to enable downloading of the correct data with the right format so that data is readable by the software. Constant usage of analytics has enable auditors to innovatively explore different ways and techniques in inter-departmental data matching.

**Data Security, reliability and confidentiality**

The base of information security comes from identifying risks, purposes and patterns of protection. The basics of information security which are based on different needs of each audit entity, can be categorized through three basic questions: What do I want to protect? From Whom? And How?

**Objectives of Protecting main Data**

**Confidentiality:** Making sure that information is not revealed to unauthorized personnel.

**Integrity:** Making sure that the information contents are correct and unaltered or tempered with, and particularly that the content is not illegally accessed or even destroyed.

**Availability :** Ensuring access to the information and preventing from the denial of services.

### **Different types of Information security:**

- Network Security
- Secure Network Infrastructure
- Secure Operating Systems
- Computer Security Software
- Data security

The most common form of identification is the username, while the password is the most common form of authentication. Other means include smart cards, biometrics authentication, key encryption (e.g. electronic lock).

Since audited entities are now increasingly relying on IT systems, GAB can gather and access data in two different ways:

- a. Data packages are provided on a storage media without accessing the auditee's system, such as:
  1. Raw data of the financial operations only, such as statements, payrolls, purchasing orders, or travel expenses without presenting any documents substantiating these expenses.
  2. Presenting financial statements with copies of the documents substantiating these expenses.
  3. Presenting financial data in different platforms that use electronic accreditation system and electronic documents.
- b. Granting auditors access to the auditees systems in order to access financial data. This access can either be online or directly through the network of the audited entity, usually taking two forms:
  1. Auditor browse files of the auditee's system where he can electronically track financial operations and access records and identifying the electronic accreditation, and final statements.

**2. Auditors have conditional access with limited queries where he is given access only to these queries.**

These two types of access can be applied on auditees whom are previously ready for the electronic linking with GAB.

In other words, the accessed data can change according to the variation of the way it is accessed, and accordingly, the audit tests of data done electronically can change in accordance to the way of accessing them.

Generally speaking, not all audit tests can be done electronically. For example, the auditor may have copies of the documents related to the financial operation, but in most of the operations the auditor must have the original documentations in hand, to enable him of proceeding with his audit missions. Moreover, the physical verification of assets can't be carried out electronically, such as: inventory or on site verifications of projects.

This doesn't mean that the electronic audit is useless, but rather there are some audit tests that cannot be executed electronically. Thereupon, we find that more supplementary steps are needed to be taken, in order to complete the audit mission professionally. So the recognition of electronic audit will allow SAIs to broaden their analytical audit. Though the availability of electronic data and analytical assisted tools, will substantiate the accuracy and speed of analysis, such as: **IDEA, Microsoft Excel, and Microsoft Access.**

GAB is using different analytical audit tools in analyzing data which include:

- **Specialized audit programs:** Programs that was developed specifically for auditors to use in different platforms, such as: IDEA.
- **SQL:** is a language widely used to process stored data in RDMBS.
- **Microsoft Access:** is a desktop relational database application. In addition to its regular use, it can be used with the smaller databases that can provide the auditor with a comfortable tool.
- **Other Tools:** e.g. spreadsheet applications like MS Excel.

There are numerous obstacles facing auditors during IT Audit, of which we mention the following:

- Auditees are not cooperating with auditors by providing them with the required data.
- Lack of awareness of the requirements of data and lack of expertise.
- Some employees take leaves without providing replacements.
- Delay in copying data packages for examination.
- Possibility of modifying the data packages by the auditee before it is provided to GAB.
- Concealing data for confidentiality reasons.
- Lack of cooperation received from the auditee's management.
- Lack of cooperation of the auditee, because of uncertainty of the accuracy of data provided and unawareness of the real goal of data analysis.
- Auditees delay responding to GAB's observation.
- Data are not provided in the required format.
- Encountering some audit entities with incomplete systems.
- The lack of qualified technicians in some audit entities.

## 5. Capacity Building

An e-government environment requires qualified IT personnel to conduct financial audits.

GAB's strategic plans (2005-2009), (2010-2014),(2015-2019) focused on developing institutional capacities and improving performance to serve as a model institution and assume its role as independently and efficiently, particularly in the area of IT through providing training and scholarship programs in IT organized by internal and external approved agencies:

### **1. Internal programs within the Kingdom in cooperation with local institutions:**

- Training programs in the Institution of Public Administration (IPA).
- Training programs in association with The Saudi Organization for Certified Public Accountants (SOCPA)

### **2. Internal programs within the Kingdom in cooperation with External Institutions:**

- Training programs in cooperation with Experts from the SAI of Pakistan.
- Training programs in cooperation with Experts from the SAI of India.

**3. Training programs and workshops prepared by The Arab Organization for Supreme Audit Institutions.**

**4. Training programs organized by SAIs of the Gulf Cooperation Countries**

**5. Training programs organized by ASOSAI**

**6. Training programs organized by INTOSAI**

In the meantime, the GAB has developed human resources and maintained internal training programs to meet the needs and cope with the latest developments in the area of IT. GAB has engaged in a number of IT training programs, which are the following:

- CAATs
- Auditing e-Government
- Cyber security
- IDEA
- TeamMate
- COBIT
- IT Audit
- e-Audit

**6. Impact of Analytics:**

Electronic audit is an evolution of traditional audit that serves to improve financial audits. One of the common forms of e-audit is CAATs which refers to computer-assisted audit techniques, and is widely utilized to improve audit processes.

**The functions of CAATs include the following:**

- Sampling.
- Statistical analysis
- Substantive tests
- Fraud detection
- Testing for specific risks
- Data extraction
- Creating of charts , graphs and pivot-tables.

For instance, if we are to detect fraud, we find that electronic sheets which are based on regression analysis, can be used to figure out illogical relations between network income and cash flow. Similarly with, unreal revenues, changes in inventory, accounts payables, sales, or costs of sold items may be due to inventory theft and embezzlement with lack of expertise in account manipulation or bad debts.

The auditor through a parallel simulation-based software such as ACL or IDEA can obtain the database of an audited entity to extract the required information. Another method available is developing an information system of the audited entity to gather for assessing and extracting results. Results will then be checked to determine risk levels and detect illegal acts in financial statements. After this, auditors can simply prepare a comprehensive audit report to provide their opinions.

Expert systems can be used by auditors to provide opinions around financial statements and reports prepared in compliance with adopted guidelines.

Audit software programs can generate different kinds of reports, and Auditors can inform the audited entity on the results of the audit based on Analytics. The audited entity is expected to respond by taking corrective measures.

The prevalence of technological solutions for the efficient and effective improvement of performance and provision of services, is vividly obvious. Thus, Introducing advanced technologies to audited entities definitely carries many benefits and certainly improves audit quality. Our view is that technology based audit should be introduced by auditors with professional care, which in turn will contribute to the improvement of the overall public sector services. The implementation of this e-Government does truly bring about a new role for SAIs that is rather unconventional, but undoubtedly innovative and promising.