IT-Strategy
National Audit Office, Malawi

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1. INTRODUCTION

This IT strategy has been developed as one of the first activities in the institutional co-operation between the National Audit Office of Malawi (NAO) and the Swedish National Audit Office (SNAO).

The main purpose of this strategy is to define how existing IT equipment and future investments should be best used to bring benefits to the audit work. The strategy will therefore be a guide to the allocation of additional funds that may become available.

2. EXECUTIVE SUMMARY

This strategy has two major focuses:

- Using IT to increase the efficiency and quality of regular audit work using standard software and infrastructure.
- Empowering the NAO to audit clients who use computerised financial systems.

A vision is described to present an ideal situation of a fully computerised audit office.

This vision is then broken down into five steps of priority that contain investments in equipment as well as training and organisational changes. These steps are:

1. Make use of the existing equipment to improve the regular audit process.
2. Enable the auditors to use computers when they are on audit missions at clients sites by acquiring additional laptops.
3. Basic training for auditors in understanding financial systems and the data that are stored in them. Build internal capacity to perform IT-audits.
4. Develop capacity to extract files from financial systems and analyse them using standard tools.
5. Use specialised audit software to analyse data from financial systems.

3. OVERVIEW OF THE PRESENT SITUATION

3.1 ICT AT THE NAO

3.1.1 General Overview

The use of IT at the NAO is presently very limited. Computers are used for typing various kinds of documents and to a limited extent for e-mail. In the audit process, the use of computers is limited to the final typing of audit reports.

3.1.2 Computers and Printers

There are 70 PC computers and 7 laptops of varying state and age. Some 40 PCs were acquired in 2004. There are a number of printers of which two are high-volume laser printers that are, at times, shared on the network.

The more recent computers are equipped with anti-virus protection but the subscription to updates has not been renewed. All computers must therefore be considered as unprotected.

3.1.3 Network and Connectivity

There is a local area network connecting all rooms of the Lilongwe office. A rather outdated server is connected and used for taking backup of certain files. A dial-up connection is connected to a PC that acts as proxy for the downloading of e-mail for the management.

3.1.4 Proficiency of Users

The IT proficiency among the staff is very limited. Most auditors have had very little if any experience or training in using computers.

3.1.5 Impact on the Audit Work

At this stage, only certain donor funded project and state owned companies use computerized accounting systems. Auditors from the NAO have not yet been in too much difficulty concerning the extraction of data from accounting systems. However, the computerisation process is moving fast within many organisations audited by the NAO.

3.1.6 Administrator Know-how

The Department of Information Systems and Technology Management Services (DISTMS) is providing the NAO with certain support services. A desk officer can be relied on for advice concerning IT issues. In addition, an officer from DISTMS is stationed full-time at the NAO and can perform administrator services.

3.2 THE CLIENTS AND OTHER GOV. ENTITIES

3.2.1 General Picture

Many of the clients still mainly rely on paper-based accounting. However, the situation is changing fast and it can be expected that within a couple of years, computerized financial systems will rapidly gain ground. It is therefore high time for the NAO to build capacity in auditing such clients.

Parastatals and donor funded projects are switching slightly faster but there are no great differences.

3.2.2 IFMIS and EPICOR

Without doubt, the most important information system to the NAO will be the EPICOR system that is about to be implemented at the Accountant General's office. The system will handle the payments for all Ministries and Departments within the Government. The EPICOR is being implemented by the IFMIS project (Integrated Financial Management Information System).

As the ministries and departments will shift their accounting to the EPICOR, it will be crucial for the NAO to be able to extract data from the system. This will become a central task in performing the audits.

The EPICOR contains a report generator that can render many files of interest to the auditors. In addition, the IFMIS project's engineers can customise reports to the requests of the NAO.

3.2.3 GWAN

Under the DITMS, a Government Wide Area Network has been established in Lilongwe connecting all ministries and departments. The GWAN allows computers at all these entities to connect to systems such as the EPICOR. The GWAN also has an e-mail service and has at times provided internet access. However, the reliability of the network and especially that of the internet connection is uncertain.

There are plans to widen the GWAN to include government entities in other parts of the country, but it is not clear when this may be accomplished.

3.3 ICT IN MALAWI

3.3.1 Internet Services and Connectivity

There are several internet service providers (ISPs) in Lilongwe providing everything from dial-up connections to reasonably fast broad-band. Acquiring fast enough internet access for the requirements of the NAO is therefore mainly a financial issue.

To connect an organisation's offices in different cities around Malawi, MTL provides leased lines, i.e. high-speed data connections from point to point. The price depends on the distance and the choice of cities but presently costs $200-300/month.

3.3.2 Suppliers

There are several suppliers of hardware, software and services in Lilongwe. Although varying, the quality of the services is generally acceptable.

3.3.3 Human Resource Availability

There are several training institutes in Malawi and, as is often the case, recruiting skilled IT personnel is mainly a matter of budget.

However, DISTMS will provide the NAO with IT support and IT services. Although the personnel provided by DISTMS is likely to have the necessary skills, it is questionable whether one person will be enough to support an organisation that is expected to reach 150 professionals plus management and support staff.

In addition, it poses a substantial risk to the NAO if only one person handles the IT environment as this person may get ill, be on leave or even quit, leaving the organisation in a difficult situation.

4. THE INTOSAI STRATEGY DEVELOPMENT PROCESS

INTOSAI's EDP Audit Committee proposes a process for developing and implementing ICT strategies for Supreme Audit Institutions such as the NAO. This is briefly described below (more details on the INTOSAI web page: http://www.nao.gov.uk/intosai/edp/itstrats.htm).

Due to the limited time available for the development of the NAO IT Strategy, the process applied has been a shorter version that makes use of the most important ideas from the version proposed by INTOSAI.

The main steps of this process have been the following:

- ~~Assess the present situation concerning ICT both within the~~ organisation and outside of it (auditees, infrastructure, suppliers)
- Analyse the business processes to understand how the organisation works and performs its tasks. Identify potential improvements and uses of ICT in the

organisation. These improvements are expressed primarily in terms of the benefits to the audit process and only then from their technical and training aspects.

- Rank the potential investments according to expected benefit and cost. Make final priorities.

Once the IT strategy has been adopted, the availability of funds will determine the exact implementation speed. Activities further on should therefore include:

- Developing an implementation plan including post-implementation activities to ensure sustainability.
- Implementation

5. A VISION OF A COMPUTERIZED NAO

This section describes a vision of a fully computerised NAO.

5.1 LAPTOPS FOR FIELDWORK

To facilitate the audit work, each auditor has access to a laptop that can be used during field-work to enter all working papers and start preparing the audit reports while on-site.

Whenever the audited entity offers internet or GWAN access, the auditors can directly access the NAO's servers to store the documents they have written and access other documents.

5.2 FULLY COMPUTERISED OFFICE

The NAO office offers a local area network (LAN) connecting all desktops and presents connection points for laptops. A file server ensures that all users may share documents within their audit teams and within the organisation as a whole.

All staff have access to personal e-mail address that are widely used for sharing information within the office as well as externally. E-mail has become the preferred means of communication to reach any colleague beyond the room next-door.

All computers and servers are equipped with working virus protection and routines in place to make sure that all servers are backed up to avoid data losses.

The GWAN connects the office to other ministries and departments. Further, there are permanent links to the offices outside Lilongwe bringing them too onboard the network.

5.3 THE AUDIT PROCESS

The audit process is supported by a series of document templates that guide the auditors through their work. All documents are stored in common folders for each audit project making it easy for managers to monitor the progress of the work. All calculations are made using spreadsheet software. Whenever auditors need to access a document, they can easily find it on the computer.

Whenever the auditees use computerised accounting systems, the auditors can easily connect to these and extract the data they need for further examination on their computers using spreadsheet or, when necessary, CAAT software.

5.4 IT AUDIT

Computer systems may be correctly built with control features in place yet wrong configuration or other human intervention may lead to faulty or even fraudulent use. IT Audit verifies that systems are properly installed, configured and used to make certain that the risk of fraud or errors is limited. There are specific manuals that guide the auditors in performing these audits.

5.5 TRAINING NEEDS MET

All staff with access to computers has received sufficient training in how to use IT in their work to increase its quality and efficiency. The staff is aware of the major security risks and of how they can act to minimise the risks to the organisation.

6. STEP-WISE IMPLEMENTATION AND INVESTMENT

The vision above describes the goal of a fully computerised NAO. However, this goal cannot be reached in one gigantic step. As any important changes in work processes, IT investments must be made step by step to be successful. It takes time to disseminate IT skills in the organisation. This section describes a step-by-step approach to reaching the vision described above.

6.1 STEP 1: INCREASED IMPROVEMENT OF REGULAR AUDIT WORK

6.1.1 Brief description

Common office infrastructure and software, much of which is already available at the NAO, is used to allow auditors to raise the degree of computer usage in their regular audit work. This requires broad training efforts but limited financial investments.

Correctly used, relatively simple IT tools can go a long way in increasing the efficiency and the quality of a work process. In this first step, the NAO will set out to reap the most possible benefits from technology that is to a large extent already available within the organisation. The target is to improve the regular audit process, independently of whether or not the clients are using computerised systems.

6.1.2 Expected results and benefits

- Documents produced are being typed on computer making it easy to share them within the section, or with whoever else they concern. This includes the transferring of documents among all four offices of the NAO.
- Documents of both on-going and older audits are easy to find and access.
- Tedious calculations presently done by hand are done on the computers resulting in important time gains.
- The structure of documents and methods applied in the audit work is stream-lined and the quality is enhanced by use of templates and checklists that guide auditors.
- The staff is confident in relying on the systems due to sufficient security measures.

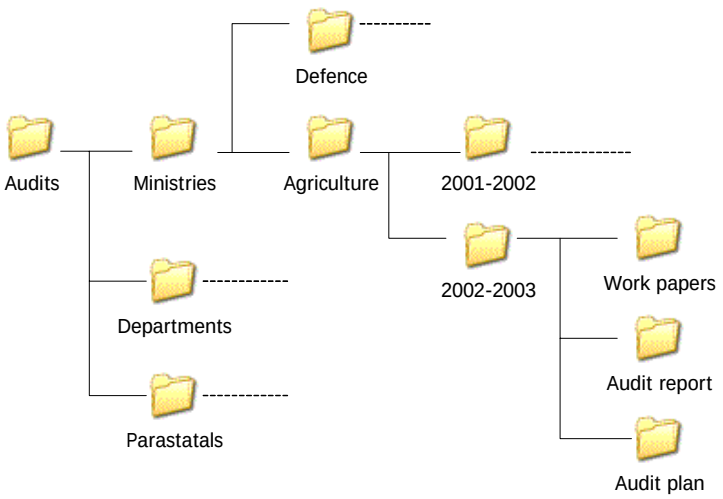
6.1.3 Description of the investments

Increase the usage of computers to type documents and make calculations

Description	The auditors use computers to type documents related to the audits. This includes the audit reports but also the many working papers produced in the course of the audit. Spreadsheet software (e.g. Excel) is used to make calculations and structure data.
Training needs	All auditors must undergo training in the use of word processing and spreadsheets.
Equipment needed	At present, the existing computers are sufficient if re-allocated to make enough of them available to auditors.
Organisational issues	The existing computers must be re-allocated to make enough of them available to auditors as raised skills will raise the need for and usage of the equipment. Instructions must be issued concerning which documents are expected to be written on computers.

Set up a common folder structure on a server

Description	A folder structure is set up on a server within the Lilongwe office. The desktops in the office (and the laptops when at the office) are connected to the server through the existing Local Area Network (LAN). Any documents stored within the common folders are therefore accessible to all users, although security restrictions may allow only certain people to access given folders (e.g. only the members of the section involved in auditing a specific client).



An example of a possible folder structure in which all documents related to audits are stored.

Access rights may be set so that only authorised staff may access individual folders. E.g. only members of section B access documents related to the ministry of Agriculture.

Training needs	All auditors and other staff expected to use the common folders must undergo introductory training in using the network and its resources. All concerned staff must further undergo training in basic security awareness (passwords, viruses, backup etc.).

Equipment needed	The **existing server** of the NAO can be used for the time being. However, due to its age, state and constrained capacity, it is highly advisable to acquire a **new server** as soon as funds allow. As the computers are networked, the need for updated **anti-virus software** will become a high priority. As important data will be stored on the server, it is imperative that a backup solution is set up. To start with, backup can be taken on one of the desktops but acquiring an **automatic backup** tape station should be a top priority. Configuration of the computers at the offices outside Lilongwe so that each office has one computer that works as server for the others and another that backs up the "server".
Organisational issues	The structure of the folders must be decided as well as reasonably manageable access policies. User accounts must be created with the accompanying security policies e.g. concerning passwords.

Introduce templates guiding the auditors

Description	Templates are text documents with pre-defined headings and short texts that guide the user to fill in the right text at the right place in the document. Templates for the most common document produced during audits will help to make all working papers, reports and other standard documents have the same structure. The templates will be adapted to follow the audit manuals that are under development. Templates will therefore also guide the auditors in applying the manuals.
Training needs	All auditors will have to be given an orientation in the use of templates.
Equipment needed	No additional equipment is needed.
Organisational issues	As the audit manuals are being developed, templates must be produced in parallel.

Introduction of e-mail

Description	The auditors and selected staff are given e-mail addresses that can be used for internal and external communication.
Training needs	All concerned staff must be trained in using e-mail and in the necessary security awareness concerning viruses etc.
Equipment needed	As a first step, the GWAN and the **e-mail service** provided on it should be used for the Lilongwe office. E-mail addresses for the other offices should be set up (these offices will connect using the existing dial-up internet connections). Depending on funding, **leased lines** to connect the other offices to Lilongwe should be considered. This would allow them to use the main server as well as access the same e-mail system as others.

	There is no need to provide the NAO computers with access to the World Wide Web.
Organisational issues	Procedures for e-mail usage, especially the security aspects, must be developed
	Mailing lists should be set up to allow easy e-mailing to all staff, all auditors or other interesting sub-categories.

6.2 STEP 2: MOBILITY FOR THE AUDITORS

6.2.1 Brief description

Audit work is to a large extent conducted at clients' offices. To really get auditors to use IT, it is necessary that they have laptops that can be used in the field rather than desktops that are stationary at the home office. The higher the penetration of laptops, the more intense the use of computers in the audit work is likely to be.

Note: The main limitation to the addition of laptops is funding. However, the NAO can proceed with steps 3-4 even if step 2 has not yet been implemented. The following two steps are not inherently dependent on laptops.

6.2.2 Expected results and benefits

An obvious first step of using computers is for writing documents. With the present equipment of the NAO, the desktop computers at the office can be used to type mainly the audit reports based on the hand-written notes prepared as the audit went along.

With an increasing number of laptops that can be brought to the clients' sites, additional documents such as the working papers can be typed. If too few laptops are available, the inconvenience of having to wait while colleagues use them will lower the amount of work transferred from paper to computer.

Regular spreadsheet software such as Excel lends itself very well to performing many of the calculations that are common in auditing. It can be expected that this will be one of the first uses of laptops when made available to auditors.

The following table describes the expected impact on the audit work of various numbers of computers.

Computer penetration	***Computerization of documents***
Mainly desktops	Reports are typed at the office after the field work.
1 laptop per team of 5-6 auditors	Reports begin being typed in the field. Most other documents are hand-written.
2-3 laptops per team	Reports and some additional documents are typed. Heavy calculations are performed electronically.

4+ laptops per team	The auditors are able to access a laptop frequently enough to perform most calculations on them and type most documents.

There are today around 100 auditors and the number is expected to reach 150. This gives 20-30 teams of auditors.

6.2.3 Description of the investments

Introduction of increasing laptops

Description	Laptop computers are acquired and distributed to the sections for use in the field.
Training needs	All auditors must be trained in applying the security routines necessary for the use of laptops. See organisational issues below.
Equipment needed	**Laptop computers**. The number will determine the degree of computerisation of the audit process. See above. With increasing numbers of laptops for each team, **USB-memories** (also called flash memories) may be necessary to easily transfer files among computers when used in the field.
Organisational issues	As laptops are brought in the field, thorough procedures must be established to make sure that documents stored on them frequently are brought back to the office and stored on the server. A plan for the allocation of laptops to the sections must be made as well as routines for their storage overnight and during the day, especially at client sites.

6.3 STEP 3: BASIC CAPACITY IN IT-AUDIT AND ACCOUNTING SYSTEMS

6.3.1 Brief description

As the number of clients with computerised accounting systems (financial systems) is increasing the NAO is facing two challenges. First, auditors must access the information in the systems to audit the clients. Secondly, it is necessary to make sure that the systems are implemented by the clients in such ways that the information in them is reasonably accurate.

The NAO will build basic capacity to audit clients using computerised financial systems. Further, the NAO will develop capacity to perform basic audits of the systems and their security.

6.3.2 Expected results and benefits

- ~~The audit of clients using computerised financial systems can~~ be performed using various degrees of computer support. A first step is to make sure that the NAO can audit them at all. In subsequent steps, the automation level of this process will be increased.

- As the accounting is transferred to computers, verifying that the systems are used properly with the expected security mechanisms in place becomes a necessary part of the audit. The auditors will undergo training in conducting such audits.

6.3.3 Description of the investments

Orientation in the features and data of financial systems

Description	All auditors should undergo training giving an orientation in modern financial IT-systems. The aim should be to understand what feature such systems have and what data is in them. The purpose is to allow auditors to select and specify the data they need for audits. This is a very important first step. Getting this data can then be made in different ways: asking the client for these reports (on paper or electronically), linking up to the system and accessing it etc. See next step.
Training needs	See above.
Equipment needed	No additional equipment or software.
Organisational issues	No specific issues.

Training in basic IT Audit

Description	All auditors should undergo training allowing them to conduct basic IT audits.
Training needs	See above.
Equipment needed	No additional equipment or software.
Organisational issues	No specific issues.

Advanced training in IT Audit for a core team

Description	A selected team of auditors who are skilled with computers and fast learners should be trained to perform more thorough IT-audits. This group will function as a resource that can be used whenever important financial systems must be audited. There should be representatives from the regional offices and from the Investigations audit team among those given this training.
Training needs	See above.
Equipment needed	No additional equipment or software.
Organisational issues	No specific issues.

6.4 STEP 4: ELECTRONIC ANALYSIS OF ACCOUNTS

6.4.1 Brief description

Understanding the data in financial systems is necessary to select the information needed for audits. However the obvious next step is to use computers to analyse the

data. A natural next step is for auditors to retrieve electronic copies of the accounting information and use spreadsheet software to analyse it.

6.4.2 Expected results and benefits

The amount of data that can be extracted from financial systems is large. Analysing it manually takes much time and restricts the types of analysis that can realistically be done.

Electronic extraction of the data and analysis even using Excel or other spreadsheet software greatly enhances the efficiency and capacity to analyse such data.

6.4.3 A note on extraction of data

Files must be extracted from the clients' systems. Although the idea of having auditors log into the systems of the clients and access the information at will, this is often not very practical, especially if it concerns a client that is seldom audited using a system that is not very common. This is because the auditors would then need training in the specific system and the client must configure the access rights to allow the auditors in.

On frequently accessed systems (such as the EPICOR when it will be implemented) however, it is worth the initial efforts and training to have certain auditors learning to access the system.

For the extraction, there are therefore several of methods that must be available to the NAO:

- Requiring the system administrator to extract data and send the reports by e-mail.
- Bringing a flash memory to the client site and requiring the system administrator to store the requested data on it.
- Direct access to the client's system. This may require the installation of the correct software at the NAO's computers, setting up user privileges for auditors and training selected auditor in using the system.

6.4.4 Description of the investments

Description	All auditors must be trained in using spreadsheet software (Excel) to analyse files extracted from financial systems. Selected auditors skilled with computers and who are fast learners should be trained in the extraction of files from financial systems and the import in Excel.
Training needs	See above.
Equipment needed	Flash memories (USB-memories) to facilitate the transfer of data files.
Organisational issues	No specific issues.

NOTE: The IFMIS project that implements the EPICOR system for the government accounting will offer the NAO training in using the system. Further they will

provide the NAO with workstations that can be used to connect to EPICOR. However, it is the time plan of IFMIS that will determine when this is done.

6.5 STEP 5: ANALYSIS USING ADVANCED TOOLS

6.5.1 Brief description

Spreadsheet software allows auditors to perform significant quantities of analysis of data from financial systems. However, there are limitations, some of which can be overcome with Computer Aided Audit Tools (CAAT).

6.5.2 Expected results and benefits

To make real use of the advanced feature of CAATs, the auditors using the software should be very skilled in using the software in question. To obtain this level of skills, it is important that the auditors using CAAT use it often. The responsibility of using such software must therefore be concentrated on a selected group of auditors who serve as a resource for other teams whenever these have reached the limit to what they can do using Excel.

6.5.3 Description of the investments

Description	A selected group of auditors that are fast learners and who have demonstrated good skills in using computers as well as good knowledge in financial auditing are selected to learn to use CAATs.
Training needs	The selected auditors must be given training in using the specific CAAT software that is acquired.
Equipment needed	A limited number of licenses of a CAAT software.
Organisational issues	It must be determined how the CAAT-experts will be used by other teams during the audits.

7. SYSTEM ADMINISTRATOR

DIFMIS is providing the NAO with a system administrator who will maintain the IT environment of the NAO. To avoid being completely stranded if the administrator is temporarily away, an auditor should be trained in performing the easier routine tasks of system administration. This may for instance include making backups, restoring backed-up information, adding new users, changing user access to specific folders etc.