# Country Focus - Oman

### *The Secretariat General for State Audit discuss their use of Information Technology in Oman*

## *Introduction*

### Background information about the SAI of Oman

The Secretariat General for State Audit (SGSA) came into being, in its present form, in 1991 through Royal Decree no.129/91, promulgating the State Audit Law, replacing Royal Decree no.36/85 which hitherto dealt with the State Audit Function. However, the State Audit Function in Oman dates back to pre-1970. From a Department under the Ministry of Finance, this office became an independent Department under the Ministry of Diwan Affairs in 1974 and was elevated to a Directorate General in 1981, followed by the Regulation in 1985 organising the State Audit Function. In 1989, the first Secretary General was appointed by a Royal Decree and in 1991, the State Audit Law was promulgated.

The State Audit Law enjoins the SAI to audit State Public Funds in order to (a) protect them, (b) ensure their proper and effective employment, (c) expose cases of financial irregularities, and (d) recommend means of redressing deficiencies in financial laws, rules and regulations.

Besides Government Ministries and Departments, SGSA's audit jurisdiction extends to Public Authorities and other bodies in which Government has a share and/or receives grants from the Government.

In addition to auditing accounts, stores and the financial dimensions of personnel-related decisions, the State Audit Law specifically requires the SGSA;

- to monitor the implementation and progress of projects falling within the Development Plan to ensure that financial allocations are properly employed, and
- to evaluate such projects to ensure that resources are used efficiently and economically.

In practice, our work has a predominantly compliance and VFM rather than attest audit focus.

Our reports are issued, usually after every audit, to the Ministry concerned. The results of our work throughout the year are summarised in an Annual Report that is mandated by law. This report, which is submitted to His Majesty the Sultan, includes a summary of our audit findings and the action taken by auditees, observations on the State Annual Accounts, an evaluation of development projects and observations on adequacy of financial laws & regulations, records, systems.

SGSA has at present 144 employees; a small managerial cadre is backed by a few technical specialists, and two main categories of personnel: auditors and administrative support staff. About 40 employees are expatriates. Our annual budget is about US $4 million; nearly 80% of it is spent on salaries. About 1.3% is spent on Information Technology (IT).

The main office is in the capital, Muscat. A branch office is located in the southern city of Salalah, which is about 1000 kilometers away and is the other significant centre of Government activity. We have a few resident audit offices in important/large Ministries and field audit groups for auditing other agencies.


*The broad goal is to ensure that, by the middle of 1999, every field audit team has dial-up access to audit support materials and other official data, and the ability to communicate electronically with the main office*

## Information Technology in SGSA

### IT in Oman

The use of IT in Oman is widespread, with Government probably being the biggest spender as most Ministries and Public Bodies use a lot of IT for their public services and internal operations. State-of-the-art information technologies are also rapidly being assimilated and deployed.

A significant aspect of the use of IT in Government is a centralised accounting system for the entire Government, which is run on an IBM mainframe computer in the Ministry of Finance. A large amount of information about all Government projects and the entire civil service of the Government of Oman is available through this system. All Ministries have terminals through which data can be entered and reports obtained.

## IT in the Secretariat General for State Audit

IT in SGSA can be discussed under the following broad headings:

- The Beginning (1989-96)
- The Big Push (Late 1996 - 1998)
- Future Direction

## The Beginning (1989-96)

IT is not new to SGSA. A Wang computer with 9 terminals was installed in 1989 primarily to meet our word processing requirements. The year 1992 saw a modest improvement, albeit an important one:

- 4 terminals were installed to provide on-line access to the Government's IBM mainframe computer and to the government-wide financial and personnel information in that system,
- a Local Area Network (LAN) was set up in our main office with a **file-server** running Novell Netware 3.11 and 8 PCs with 386 processors with Microsoft Windows 3.1, and
- an IT department was formed with 4 programmers and an IT specialist.

Microsoft Word and Excel gained popularity; applications like payroll, budget and correspondence tracking were automated with in-house programmes using Dbase for DOS. As IT skills developed, 6 more Pentium-based PCs were added in early 1996 to meet the demand for word processing and database applications.

## The Big Push (Late 1996 - 98)

### The IT Strategy

In October 1996, recognising that IT can play a significant role in achieving our mission, we changed our approach to IT. Drawing upon the INTOSAI EDP Audit Committee's "Guide to Developing IT Strategies for SAIs", we drew up a new IT Strategy with the following purposes in mind:

- Provide a statement of direction from the top management.
- Ensure that scarce resources are committed in line with the overall objectives of the organisation and not on pure technical considerations.
- Make the best use of resources in developing systems.

An IT Steering Committee was also set up, with a charter to monitor the use of IT and related resources.

SGSA's mission, like most other SAIs, is to strengthen the effective governance of the nation, by fulfilling its mandate with excellence. To achieve this, we need to improve audit quantitatively and qualitatively, and use audit insights to address deficiencies in financial laws and regulations. Shortage of resources, both financial and skilled manpower, makes it essential for us to derive the maximum value from those resources. The IT Strategy was formulated against this backdrop.

Our IT Strategy identified the following goals:

- **strengthen the audit function** through better management of resources, use of better audit tools and techniques, and improved information support to auditors;
- **improve administrative efficiency** in order to release scarce resources to audit, and provide superior logistic support to field audit teams; and
- **build and sustain an Information Systems Audit function**, in view of the large IT investments by auditees and the risks posed by such investments.

Some important guiding principles were also established at this stage:

- in-house IT services will be preferred over "outsourcing", in order to build skills internally to sustain the technological efforts and obviate dependence on external agencies for core operations, ensure confidentiality of information, and economise on IT spending;
- existing skills and investments in hardware and software would be protected as far as is practical; and

- IT skills needed by auditors to use audit support materials should be kept to the minimum possible, in order to promote widespread use of such tools, allow them to concentrate on audit rather than IT, and reduce the cost of re-training a floating population of expatriate auditors.

To implement the strategy, long and short term plans were drawn up. The broad goal is to ensure that, by the middle of 1999, every field audit team has dial-up access to audit support materials and other official data, and the ability to communicate electronically with the main office

## *Implementation of the IT Strategy*

This can be discussed under the following broad headings:

- Information Systems Auditing
- IT Awareness - Training
- Upgrading Infrastructure
- Applications
- Other Key Developments

### Information Systems Auditing

Recognising that building an IS audit function, which was one of the main goals of our IT strategy, is a long gestation project, we focused on it first. We decided that a systematic approach to building the IS Audit function called for a Strategic IS Audit Plan that would be rolled over once every 3 years. In its infancy, this Plan would have a training bias, as building skills would be the first step. The plan, therefore, addressed the following:

- assessing and documenting the IS Audit skills that we will need, based on a quick survey of IT systems in use among auditees;
- drawing up a training curriculum for IS Audit trainees;
- interviewing and selecting two batches (12 each) of relatively young Omani, graduate staff for IS Audit training; and
- drawing up an IS Audit approach based on potentially beneficial audit areas and the skills likely to be available in the near future.

As a formal survey of the use of IT by our auditees would have been time-consuming and taxed our limited resources, we interviewed key personnel in the Ministry of Finance to obtain an overview of the use of IT in Government. Those interviewed were usually involved in different capacities with IT-related matters across the Ministries and other agencies. Our discussions with them covered Government-wide plans for the introduction of new technologies including the establishment of standards, with sufficient information to identify the types of IS audit skills that we would need. We were also able to throw some light on potentially beneficial areas for audit scrutiny. While this was sufficient for us to move forward quickly, we recognised that it was no substitute for a formal survey so we decided that such a survey would be conducted as part of regular audits in future, when our audit staff are better equipped to perform it.

Based on our assessment of the IS audit tasks ahead of us, we decided to build a large cadre of generalist auditors who can undertake simple IT audit tasks, and a small group of specialist IT auditors. This approach was prompted by the following considerations:

- Due to the widespread use of IT among auditees, all auditors would benefit from basic exposure to IT audit; specialist assistance for each audit would not be practical.
- The IS Audit specialists have to be developed mostly from among the generalist auditors who show adequate promise, after their training and field experience. This would necessarily take time.

Though we are empowered by law to hire external consultants to provide expertise not available internally, we prefer to hire experts as staff or advisors, to work with our staff and to train them over time to be eventually self-sufficient. This approach is based on our conviction that an internal pool of IS audit skills is essential to achieve effectiveness.

We selected 24 young Omani graduates with a positive approach to work and trained them vigorously for over 8 months on both part-time and full-time courses depending on the course-content and their availability. The training, adapted from the INTOSAI EDP Audit Committee's course-ware, was arranged in two batches. The training for the first batch was delivered entirely in English to 12 trainees who were proficient in English. By the second course, we had translated all the presentations into Arabic; so, the second course was delivered entirely in Arabic, though some of the handouts continued to be in English.

We also decided that

- trainees showing promise and aptitude would be sponsored for qualifications like the Certified Information Systems Auditor (CISA), and
- on-the-job IS Audit training would be provided to trainees under expert supervision.

To fulfill the latter of these, two important IS audits were taken up where some of the trainees could apply their IS audit skills under expert guidance. Encouraged by the success of these audits, some of the trainees are now applying their newly acquired skills independently on other audits. We are confident that, with growing exposure, these auditors will provide the core group of IS audit specialists that we aim to build.


To aid IS auditing, in April 1997, we adopted ACL for Windows as the standard for audit interrogation software and developed an in-house training course. The use of ACL for computer-assisted audit techniques (CAATs) has gained popularity, especially among the IS Audit trainees.


In early 1998, we evaluated and decided to adopt the "Control Objectives for Information and Related Technologies" (COBIT) as a framework for IS audits as it provides detailed audit guidelines. By May 1998, we also evaluated and purchased "COBIT Advisor", a software based on COBIT that acts like an expert system for IS auditing, guiding IS auditors and providing electronic work-papers.

## IT Awareness - Training

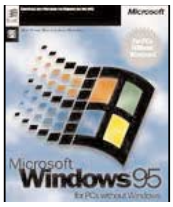

We were aware that achieving our goals would depend heavily on building and sustaining appropriate IT skills internally. As a prelude to a "training needs analysis" we established the standards for desktop software. As Microsoft Word and Excel were already popular, we decided to standardise on Microsoft Office Professional (English-Arabic) as the desktop suite and Windows 95 (Arabic-enabled) as the desktop operating system. A subsequent assessment of our training needs indicated a substantial demand for training. We explored various options including:

(a) sponsoring staff for standard courses offered commercially,

(b) providing customised training through established training institutions or IT business houses,

(c) licensing computer-based training course-ware from reputed organisations, and

(d) developing and delivering in-house courses.




The last option was selected as the most convenient and economical as large numbers of staff could be trained quickly through part-time courses, without unduly disturbing their regular work.

Beginner and advanced courses were developed for Windows, Word, Excel and Access.To ensure quality and consistency, course-ware was standardised. Learning objectives were formulated and time-tables developed to ensure their achievement. Each session followed the TELL-SHOW-DO methodology; a powerpoint presentation introduced the subject in Arabic, followed by a Lotus Screencam demo. The demo was available to the trainees for reviewing at their pace and to use as a reference on the job. Practical exercises were used to build and test their skills. The use of Lotus Screencam ensured consistency in the delivery of each session and enabled instructors to concentrate on delivery. We would greatly commend this approach to other SAIs; examples of


these screencams are available on our website (http://www.sgsa.com).

While course-ware was being developed, the training infrastructure was established. 12 Pentium PCs were purchased in late 1996 and distributed among users; their older PCs were acquired for training with a goal of one PC per trainee. A good integrated computer/video projection system was also purchased.

Over 9 months we endeavoured to keep the training room and PCs continuously occupied training staff! In April 1997 12 new Pentium PCs were added to the training complement, diverting the older PCs to selected novice-users to enable them to familiarise themselves with Windows.

As the formal training diminished with focus shifting to on-the-job training we passed most of the training PCs back to the users. Trainees are now grouped by need and focused short presentations provided, followed up by practice sessions on their own PCs.

As a result of the increased IT awareness, many employees purchased PCs for their homes. We assisted by guaranteeing the repayments of their loans through deductions from their monthly salary

## Infrastructure upgrading

Having set in motion a long process for building general IT skills and specialist IT audit skills, we focused our attention on building IT systems that would accomplish our goals and creating an IT infrastructure that would enable us to run those systems. With the IT strategy and plans lending clarity to our mission, we created a capital budget for 1997 that would provide us with a high-speed, reliable local area network as the foundation for our IT systems.

In order to achieve the goals of our IT strategy, we realised we would need inter-office electronic mail, workflow applications, a reliable relational database management system and an intranet for delivering content with a user-friendly interface. Our evaluation of different products suggested that Microsoft Back Office might be a very cost-effective solution. It would provide:

- Windows NT Server as a network operating system with a friendly interface,
- Exchange Server for e-mail, workflow and other messaging applications,
- Internet Information Server for web-based services,
- SQL server for database applications, and

- SNA server for replacing the existing IBM terminals with standard PCs connected to the IBM mainframe at the Ministry of Finance through our LAN.

To ensure that the migration to Back Office would be feasible and worthwhile, we signed up with a Microsoft Solution Provider for a free pilot run of Microsoft Back Office in April 1997. Using a standard Pentium 133MHz PC as a server, we ran NT server, Exchange Server and Internet Information Server, with 8 PCs connected to the LAN via the existing token-ring cabling. Satisfied about its friendliness and utility, we decided to buy Microsoft Back Office version 2.5. We floated a limited tender for a mid-range server, structured cabling and Back Office. By June 1997, we placed the order. By September 1997, our new LAN was operational with a Compaq Proliant 2500 server running Back Office on the server and a 100MBPS Fast Ethernet network. Voice lines were transferred smoothly to the new cabling system over a weekend. A fast Ethernet replaced the token-ring network. Users were generally unaware of the change except for the perceptibly higher response speeds and the new cable running from their PC to the wall outlet.

To take advantage of the new infrastructure we added 18 new Pentium PCs and 6 of the diverted training PCs that were hitherto off-line to the LAN. With this, a PC had reached virtually every desk in the main office by the end of 1997.

As the usage of our LAN and its criticality grew, we added new hardware; a UPS in January 1998, a stand-by server (a Pentium 166MMX PC with additional memory and disks) in March 98, and a third server (also a Pentium166MMX PC) in June 1998. In September 1998, we ordered another 24-port Hub to support new users in the main office. In order to improve performance and improve recovery in the event of a disaster, we distributed different services amongst the servers.

In 1998, we started the next phase of our infrastructure implementation. The first phase provided PCs with fax/modem capabilities to our resident audit teams outside the main building, to enable connectivity to our LAN through telephone lines. Three key units; Ministries of Finance and Defence, and the Taxation Department; are now connected. The next phase will involve supplying notebook computers for all field audit teams with connectivity to the main office; we expect to complete this phase by the middle of 1999.

## Applications



Having initiated action for IS audit and general IT training, and set in motion the processes for the creation of a substantial infrastructure to support IT operations by April 1997, we turned our attention to building the systems that would drive our organisation. **Budget, payroll and correspondence tracking** were already operating satisfactorily, so we decided to delay their migration to a new environment. Of the applications we had identified as potential candidates for automation, the **human resources management system** and the **audit management system** were given top priority for prototyping. Microsoft Access databases were quickly created, with a completely Arabic interface using Forms. These prototypes were used to familiarise the users with the new system and make a powerful case for pre-computerisation reforms. They also enabled us to capture historic data.

An **asset management** database was created to maintain an inventory of office assets. Databases for **hardware and software inventories** and manuals were also created. An **electronic technical library** also began to take shape with executive summaries of all internal orders from 1989 to date, with on-line retrieval of images of the originals.


With Exchange Server and Microsoft Outlook, we were able to offer e-mail and group scheduling, both of which were instant hits with staff - young and old. Simple electronic bulletin boards were also deployed but the concept did not catch on.

Another significant development was the **intranet**. We created a broad framework for departmental webs and started by building the web pages for the IT department. Distribution of work within the IT department, software standards, procedures for installing hardware and software, technical manuals, maintenance contacts were included. An Administration Department web page provides access to information about the building plans, visual phone & personnel directories, etc. The Audit Department web page provides access to texts of important legislation.

Creating web content in Arabic and indexing them for searching proved troublesome. In May 1998, we finally adopted "Nashernet" as the Arabic-English web authoring software. We expect our web services to gain popularity as more Arabic content becomes available.

## Key Developments

### The Internet

Not to miss out on the Internet Revolution, we acquired an internet account in November 1996, when these became available in Oman. With the experience gained in creating and managing webs internally, we set up an external Web site in December 1997 (www.sgsa.com). In February 1998, we extended Internet access to selected users on our LAN through a dial-up connection; we used Microsoft Proxy Server, which is part of Microsoft BackOffice. In August 1998, we decided to use the Internet as a vehicle for gathering data from auditees, field audit teams and the public. Our web site is being refurbished to meet this requirement.

### Remote Access to LAN

In March 1998, the first resident audit team outside our campus was connected to the LAN through a telephone link. Two more teams have since been connected. The Secretary General, a few managers and select IT department staff also have remote access to the network. This facility with appropriate controls will be extended to other users.

### Web-based Querying

Consistent with our goal of demanding minimum IT skills from users, we are progressively delivering more information through a browser interface. Personnel and technical library information is already being supplied from Microsoft Access databases dynamically and users can query the databases from their browser. Data-entry is not handled through browser interfaces.

### Workflow applications

After the initial lack of response to bulletin boards and shared public folders in Exchange, the concept of electronic workflow is catching on. Shared tasks, contacts, knowledge bases, etc. are now being used. Also issue and tracking of software media and paper files from the central archive are being done electronically through Exchange folders, using bilingual ( English/Arabic) forms.

### Systems Management


To simplify and streamline systems management tasks and improve the management of IT assets, we recently deployed Microsoft's Systems Management Server, which is again part of Microsoft BackOffice. With this, monthly upgrades of anti-virus software, systems audits for illegal or unauthorised software, inventory of hardware and software, etc. have become simple and manageable.


We have recently evaluated Microsoft Windows NT Workstation 4.0 (Arabic-enabled) for the desktop operating system and are considering this as a replacement for Windows 95 to provide greater reliability and centralised management of desktops.

### IT Security

Our growing dependence on IT has made security and business continuity planning important issues. To manage our IT better and to set an example for our auditees, we formalised an IT Security Policy in July 1998. We also set out detailed security procedures and drew up a detailed Business Continuity Plan that enables us to ensure continued availability of IT services in the event of disasters.

## *Future Directions*

To ensure that all key decisions within SGSA properly take account of the IT-related **aspects our road map is broadly defined**. Needless to say, this will be continually reviewed to take advantage of new technologies and user innovations.

## Framework for Applications

Our focus will be on increased web-based support for

- managers - including personnel, budgets and audit management
- mobile audit teams - for on-line access to knowledge databases, audit guidelines, laws and regulations issued through Royal Decrees and Ministerial Notifications, internal circulars, audit schedules, government-wide financial data, etc.

***The long term objective is to provide an "electronic briefcase/toolkit" for auditors and a relatively paper-free decision support system for managers.***

## Technological Architecture

Our aim is to provide the non-technical user with one or at most two interfaces; a web-browser and a personal desktop manager like Microsoft Outlook. Web-based querying of databases will be achieved through "ODBC connectivity" as at present; however, we expect to migrate from Microsoft Access databases to Microsoft SQL Server 7.0 which is expected to provide us proper support for Arabic data and greater security as well.

We foresee centralised management of IT assets using Systems Management Server and progressive use of workflow applications with interchange of data between Exchange (messaging database) and SQL Server or Access. SNA Server may be deployed to bring IBM Mainframe data to the user's desktop.

## *Conclusion*

We have come a long way in 2 years of sustained efforts. But **we realise that we still have a long way ahead**. Sustaining management commitment and increasing user acceptance remain our biggest challenges.

## *IT in SGSA - Important Milestones*

| Period | Networked PCs (Cumulative) | Strategic Framework and Skill Upgradation | Infrastructure | IS Audit |
|---|---|---|---|---|
| 1989 | | | Wang Computer with 9 terminals; mainly word-processing | |
| 1992 | 8 | | Novell Netware-based Token-ring LAN. Windows 3.1 clients<br>Terminals to Ministry of Finance's IBM mainframe | |
| October 1996 | 8 | New IT Strategy | | IS Audit Strategic Plan |
| November 1996 | 8 | Capital Budget for IT Infrastructure | Standardisation of Operating System (Windows95), Desktop Software (MS-Office Professional) | |
| December 1996 | 8 | In-house IT training started | IT Training Lab set up | |
| April 1997 | 8 | | Pilot project for migration to Microsoft BackOffice | Membership of ISACA; ACL chosen as audit interrogation software |
| July - September 1997 | 18 | Training for e-mail, browsing, etc. started for all LAN users | New Compaq Proliant 2500 server;<br>Structured Cabling in main office buildings;<br>Fast Ethernet LAN - 100 Mbps Hubs with fibre-backbone between buildings;<br>full-scale migration to MS BackOffice 2.5;<br>Wang phased out;<br>Novell Netware phased out. | Core modules of IT Audit Training commenced |
| October 1997 | 36 | | | |
| December 1997 | 42 | Internet Web site registered (www.sgsa.com) | | |
| February 1998 | 44 | | Separate server for remote dial up access and Internet proxy services | Choice of COBIT as IS audit methodology; Decision to sponsor candidates for CISA |
| April 1998 | 44 | Advanced training in desktop applications | | IS Audits commenced |
| May 1998 | 44 | | Third server set up as Backup Domain Controller for LAN | Purchase of "COBIT Advisor" |
| July 1998 | 46 | IT Security Policy<br>Business Continuity Plan | | |
| September 1998 | 46 | Training in workflow application development | Additional Hub to provide more network connections | |