

# Proposed Organization for the IT Department of the Trade Agreement Sector and the Foreign Trade Policies Sector



PREPARED BY  
Alvaro J. Garcia

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## EXECUTIVE SUMMARY

In order to effectively support current and future strategic programs of the Trade Agreement Sector (TAS) and the Foreign Trade Policies Sector (FTPS), the information technology (IT) department that supports the IT infrastructure of these two sectors needs to be reorganized. New technologies and the demand for consistent and reliable information, available when needed, require an appropriate IT organization. An effective IT Department requires the definition of appropriate organizational functions, policies, and procedures, as well as qualified and well-trained personnel. These attributes will support management decisions and business operations with reliable and secure information.

The Ministry of Foreign Trade and Industry (MOFTI), with the support for Assistance for Trade Reform project (ATR), is upgrading the IT infrastructure of several of its sectors. One activity under the current portfolio of ATR initiatives addresses the reorganization of the IT department of the TAS. The assessment conducted by the ATR consultant, and documented in this report:

- Analyses the support and maintenance requirements for the current and future IT infrastructure that supports TAS and FTPS,
- Defines a new reorganization for the IT department to ensure that those requirements are met, and
- Recommends a course of action to implement the proposed new organization for the IT department.

### **Major Findings:**

The analysis of the current IT Department identified the following issues:

- The new IT department will provide information support to all central and general Departments of TAS and FTPS. Current location of the IT department under the General Department of Trade Remedies Information is not consistent with the new role and responsibilities for the IT department to effectively support the IT infrastructure for the two sectors.
- No formal IT management function has been established. Currently the Development and Support Unit and the Information Center share the IT management function.
- Current functional units are not appropriate to effectively support current and future IT infrastructure. Management functions such as quality assurance, configuration management, defining security policy and IT standards, IT strategic planning, project planning and monitoring, quality assurance, and resource management have not been established.



under TAS and FTPS, the proposed new location for the IT Department is consistent with the its mission, and appropriate to meet its strategic objectives.

✓ The current Development and Support group will be absorbed by the new proposed Telecommunications and Operations Department. Current functions performed by this group are consistent with proposed roles and responsibilities for the Telecommunication and Operations Department.

✓ The current Information Center will be absorbed by the new proposed Application Support Department. The current role as providers of information to internal and external users is consistent with roles and responsibilities defined for the new proposed department, which will have a wider spectrum of information services once the portfolio of applications for TAS and FTPS is fully developed and deployed.

✓ Transferring the Translation Services as a Department under the ATR proposed General Department of TAS Management/Administration. Translation services do not belong strategically to the Information Technology Department and should be relocated under a General Department that provides services to all Departments of TAS and FTPS.

✓ Creating five (5) departments under the General Department of Information Technology.

- **Establish five (5) departments and associated functions.** The General Department of Information Technology will have five departments. The IT General Department will have its own budget to ensure that the IT infrastructure for TAS and FTPS is sound, secured, and reliable and that strategic programs and operations of the two sectors are properly supported with Information Technology. The internal organization follows.

✓ Applications Development

✓ Application Support

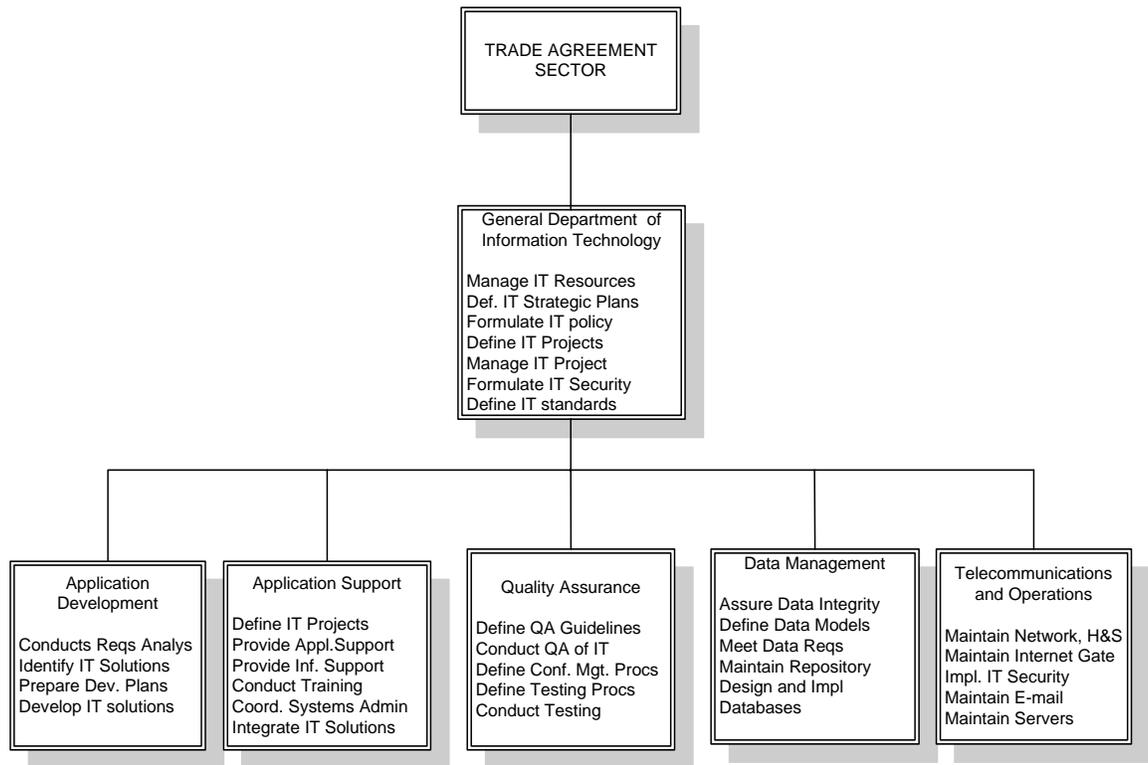
✓ Quality Assurance

✓ Data Management

✓ Telecommunications and Operations

Macro functions are included in the chart below.

## Proposed New IT Organization



- **Approve the management Mission and Objectives** for the IT Department included in this evaluation

### ***Mission***

*The IT department will maintain and support a reliable Information Technology infrastructure to effectively contribute to the business objectives, and strategies of the Trade Agreement and the Foreign Trade Policy Sectors.*

### ***Objectives***

1. *Implement a solid and reliable IT infrastructure and organization to effectively support TAS and FTSP strategic programs.*
2. *Make information to support business processes of TAS and FTSP reliable, available when needed, and accessible to internal end users.*
3. *Implement E-mail services to ensure that this capability is reliable and available to all TAS and FTSP employees.*

4. *Secure and protect the information infrastructure, with the appropriate confidentiality needed to prevent unauthorized access to sensitive data.*
  5. *Disseminate via Internet the information and services that TAS and FTSPS provide to support trade and policy information needs of importers and exporters.*
- **Staff the new IT Department** with the appropriate key personnel. All positions except the IT manager for the entire department can be filled with existing resources as long as they are reallocated based on interests, qualifications, motivation, and potential to grow. Key position descriptions and qualifications have been included in this report. Although it is likely that some required existing personnel do not meet qualifications, the consultant recommends conducting training in specific areas to fill the gaps.

Based on the preliminary assessment of current personnel, the following personnel strategy could be implemented:

New Department	Number of Employees	Current Group
Application Development	8 2	Information Center Development & Support
Application Support	18 3	Information Center Development & Support
Quality Assurance	2 2	Information Center Development & Support
Data Management	2 2	Information Center Development & Support
Telecommunications and Operations	5 7	Information Center Development & Support
IT General Department Support*	3 1	Information Center Development & Support
<b>Total</b>	<b>55</b>	

\*: Proposed staff for administrative/Technical support to the General Manager. It does not include the IT General Manager

The appointed heads of the new departments should staff their units using their personnel evaluations sheets and in accord to the numbers and source recommended in the table above.

- **Management Training.** Heads of all five new functional units should receive the following **management training** courses (as defined in the ATR training plan):
  - Leadership and Supervisory Skills
  - Delegation of Responsibility
  - Communications and Interpersonal Skills
  - Motivating Staff

- **Technical Training.** Proposed selected training courses for heads of the IT units as well as technical staff:

- Project management
- Advanced Information Security
- Advanced Incident Handling
- Managing Technology Change
- Security Policy formulation and drafting
- Security for Information technology infrastructure
- Technical security for windows-based applications
- Evaluation of security requirements for IT infrastructure
- Database security
- Network Security
- RDA (Rapid Development Application) methodologies
- SQL Design and Development
- Software Configuration Management
- Project Management for Software Development
- Quality Assurance Practices
- Relational Database Design
- Systems Analysis and Design
- SQL Design and Development

# Table of Contents

<b>1.0 BACKGROUND .....</b>	<b>10</b>
<b>2.0 SCOPE OF THIS REPORT .....</b>	<b>10</b>
<b>3.0 METHODOLOGY .....</b>	<b>11</b>
<b>4.0 FINDINGS.....</b>	<b>11</b>
4.1 CURRENT ORGANIZATION .....	11
4.2 CURRENT IT PERSONNEL .....	13
4.3 TRAINING.....	15
4.4 CURRENT PROCESSES AND FUNCTIONS .....	16
4.5 APPLICATION SUPPORT AND MAINTENANCE REQUIREMENTS .....	17
<b>5.0 RECOMMENDATIONS.....</b>	<b>20</b>
5.1 PROPOSED MISSION AND OBJECTIVES FOR THE IT DEPARTMENT.....	20
5.2 PROPOSED ORGANIZATION.....	21
5.3 FUNCTIONAL AREAS .....	23
5.4 INTEGRATE NEW TRAINING REQUIREMENTS WITHIN CURRENT TRAINING PLAN .....	28
5.5 STAFF THE NEW IT DEPARTMENT.....	29
5.6 IMPLEMENTATION APPROACH.....	30
5.7 ACTION PLAN AND EXPECTED RESULTS .....	30
5.8 CRITICAL SUCCESS FACTOR FOR THE NEW IT ORGANIZATION.....	31
<b>ANNEX I – JOB DESCRIPTIONS FOR KEY POSITIONS.....</b>	<b>32</b>

## **1.0 Background**

A successful modern IT department should focus on facilitating access to reliable information that supports the strategic programs of the institution. Support for business strategies requires an IT department with appropriate organizational functions, policies and procedures, as well as qualified and well-trained personnel, to ensure that information to support management decisions and operations is available, reliable, and secure. Rapid change in technology and practice has made the organization of many IT departments inadequate to support new trends in information management. In today's environment, the use of Internet allows information to be made available directly to the final user on an as-needed basis, and paper-based reports have been reduced significantly. The challenges today for systems administrators and IT managers focus on maintaining data networks operational, servers running smoothly, and applications delivering appropriate and reliable information to end users, through means such as intranets and the Internet. The appropriate organization of IT departments is crucial to meet these requirements.

MOFT, with the support of the Assistance for Trade Reform project (ATR), is upgrading the IT infrastructure of several Sectors. One project under the current portfolio of ATR initiatives addresses the reorganization of the IT department that supports the information needs of the Trade Agreement Sector (TAS) and the Foreign Trade Policy Sector (FTPS). This IT department currently has 55 employees with different backgrounds and technical skills. Though the ATR program, many of the IT department employees have received technical training aimed at supporting the technologies recently deployed in these sectors; however, the IT organization has been unchanged for a long time, making it inadequate to support the current and future IT infrastructure needed in these two sectors.

Although the three-year IT Strategic Plan prepared by a contractor (outsourced) in October 2002 addresses the major organizational changes needed to support the FTPS Sector, institutional changes have occurred since then. The TAS Sector was created with new functions as well as functions transferred from FTPS. The two sectors agreed to share the IT department as well as the IT infrastructure deployed in the two sectors. The new IT department requires an organization that effectively supports the two sectors, and detailed functional descriptions and key positions to staff it.

The ATR project contracted Alvaro Garcia to conduct an assessment of the current IT organization and propose the necessary changes to establish an organization that effectively supports the implementation of the three-year IT strategic plan.

## **2.0 Scope of this Report**

This report does not intend to document information needs of the FTPS or TAS Sectors; the contractor already identified those needs in 2002. This report documents the findings of an analysis of the current IT department, identifies current limitations of the IT department to appropriately support new technologies, and proposes a new organization

referred herein as “Target Organization” to be implemented gradually to allow the TAS Sector to make the necessary adjustments to absorb the new organization. The report also analyzes the current training program for IT personnel and identifies the training requirements to ensure that properly trained employees can be assigned to new roles and responsibilities. The report includes a strategy to implement the main recommendations, defines detailed description for new functions included in proposed target organization, and qualifications for key positions.

### **3.0 Methodology**

The consultant met with users from the two major IT groups to identify and evaluate current personnel infrastructure, identify support and maintenance requirements for existing applications; reviewed current IT plans, and evaluated functions that are performed by the IT department staff. A major component analyzed was the IT Strategic Plan prepared by the IT department almost two years ago. The implementation of this plan has been supported by the ATR project and needs a reliable IT infrastructure that can assure the sustainability of the support and maintenance for all systems in production. To minimize the dependency on contractors, the IT organization needs to strengthen its software development capability, and establish IT management practices such as quality assurance and project management. The consultant analyzed the IT plan and management requirements to proposed the new IT organization. The findings and recommendations are documented below.

### **4.0 Findings**

#### **4.1 Current Organization**

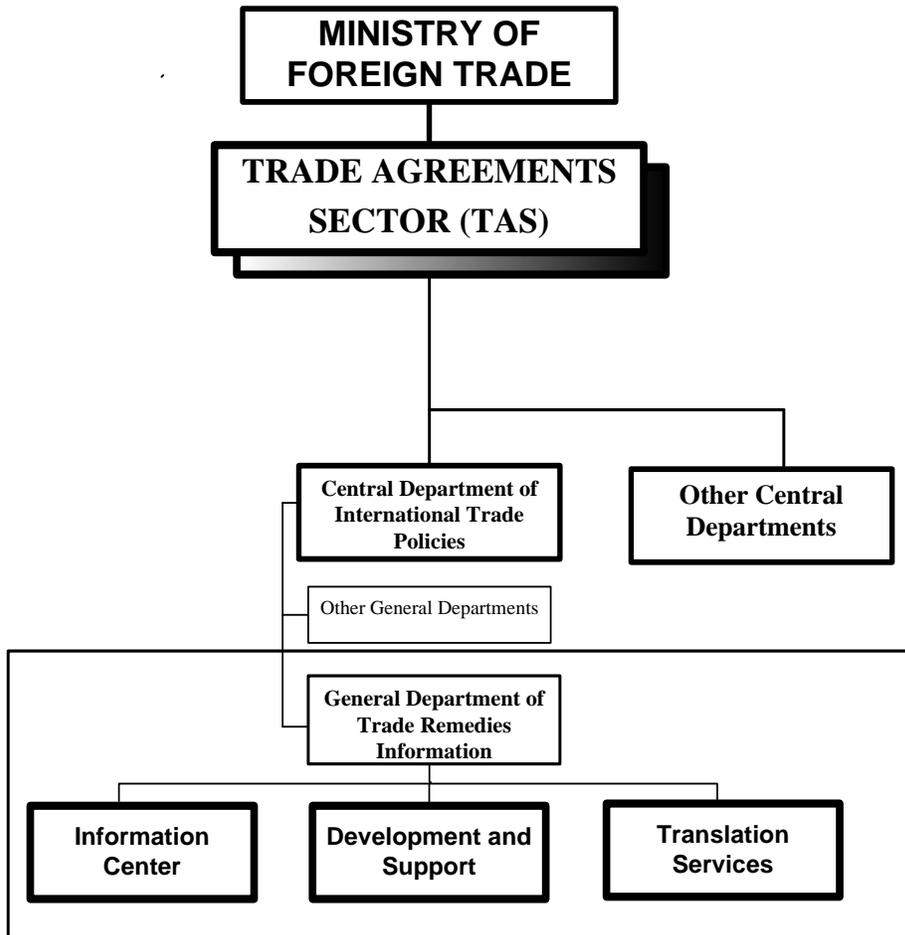
Current IT department functions are organized under the General Department of Trade Remedies and Information. The ATR Project submitted a proposal to reorganize the TAS Sector<sup>1</sup>; however, MOFTI nor TAS have approved this organization. The current IT department placement within TAS has two major functions and shown in Figure 4-1.

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<sup>1</sup> ATR report “Proposed Structure of TAS, February 19, 2004”

# Figure 4-1

## CURRENT IT ORGANIZATIONAL



**The Development and Support Unit** is led by Khaled Ibrahim Abdalia and has 5 groups and 26 employees. The unit supports the current IT infrastructure that serves the two sectors. It also provides hardware and telecommunications support to the Information Services Unit. The groups are:

- Data Entry Team (10 persons)
- Technical Support (4 persons)
- Network Administration (1 person)
- Database Administration (1 person)
- Support to other sectors/Office support (10 persons)

**The Information Center Unit** is led by Ahmad Fouad Dawod and has four functional groups:

- Database Management (6 persons)
- Technical support (3 persons)
- Hardware support (3 persons)
- Data Entry, retrieval, and information services (18 persons)

This unit is organized mainly to support users from the general departments of the International Trade Policy Central Department. It uses an Access-based application software using exporting capabilities to feed several spreadsheets models. Users believe the information from this system is not reliable; therefore, its real impact on supporting business strategies is low. The Development and Support group assists Information Services with support of hardware and software, and data entry (Word Processing needs). The one application software running in “production” was written in Access and Visual Basic and captures imports and exports data from the Customs Service. SQL is used to access the Access-based database to meet the sporadic report requirements coming from the head of the Sector.

**The Translation Services Unit** is led by Saied Abo Lila has 20 people and serves the foreign-language translation requirements of TAS and FTPS Central Departments.

#### **4.2 Current IT Personnel**

MOFT including the TAS and FTPS Sectors have two categories of employees:

- Management Category
- Executive Category

The Human Resources Department of TAS assigns grades based on qualifications. It also handles promotions for IT personnel. For the Executive Category, promotions are based on seniority, while for the Management Category promotions are based on seniority, merit, and/or recommendations for senior managers.

There is no mechanism established to apply administrative procedures for inefficient or difficult employees. There is no turnover and people like to work for the government because jobs are stable.

The executive category that could be also defined as the Professional Category has six levels (1 to 6). Promotions between levels vary from 6 to 8 years. Level 1 corresponds to the highest grade while Level 6 corresponds to the entry level.

Levels for the management category are assigned by title starting from General Managers (Heads of General Departments), progressing to Under Secretary (Heads of Central Departments), and First Undersecretary (Head of the Sector), and reaching the maximum position as Secretary (Head of the Ministry).

The current IT department is under the General Department of Trade and Remedies and three employees under the executive category share the IT management function.

Currently IT managers use training opportunities, level of responsibilities, special assignments, or participation in seminars and conventions as the way to motivate their employees. Current IT personnel roles and performance are shown in Figure 4-2.

**Figure 4-2**

**Functional Assignment and Ranking of IT Personnel**

Category	Number of Employees	Experience	Motivation	Qualification
Management	2	Adequate	Medium-low	Adequate
Database Support and Maintenance	5	Adequate	Medium	Deficient
Telecommunications	2	Adequate	High	Adequate
Data Entry/ Office Automation support	24	Deficient	Low	Deficient
Hardware and Software support	7	Deficient	Low	Deficient
User support	15	Deficient	High	Deficient

Ranking (experience and qualification):

Superior: fully meets position requirement

Adequate: fulfills the requirement but there is room for improvement

Deficient: Inadequate to meet the requirement

Ranking for Motivation

High: Highly motivated to meet the requirement

Medium: Average motivation

Low: Poor attitude to meet the requirement

The classification in Figure 4-2 shows the ranking based on the most frequent occurrence of the performance for a group of employees in the same job category. The consultant in conjunction with the TAS IT supervisor defined the methodology for this evaluation. Basically, all employees registered medium to poor compliance with the requirement due to insufficient experience or inadequate qualifications to perform assigned responsibilities. Virtually all levels of performance showed a need for improvement, which could be achieved through reassignments and/or additional training. This approach is likely to increase motivation and morale among employees.

### 4.3 Training

The ATR has defined a comprehensive training plan for all TAS and FTPS employees. For the IT department they included the following training:

#### -Training for Trainers

- MOUS (Microsoft Office User Support)
- MS Advanced Windows for Trainers
- MS Certified Trainer

#### -Training for IT Staff

- Network Management
- Server Management
- Security Management
- Website administration
- MS Desktop support
- MCSE
- Management Information Systems
- IT Project Management 1
- IT project Management 2
- MS SQL Server Administration
- Querying MS SQL with Transaction-SQL
- Programming with SQL
- Designing and Implementing OLAP solutions
- CIW Enterprise Developer
- MS Exchange Server
- MS Troubleshooting Exchange Server
- Cisco PIX Configuration Skills

The above training courses are appropriate to improve the *technical* skills of IT personnel under the current organization; however, IT managers have not taken the appropriate *management* courses and further training is needed to address new management and technical functions such as security, project management, quality assurance, and configuration management.

#### **4.4 Current Processes and Functions**

The current IT department performs the following functions:

##### **Management**

The management of the IT department is not formally established. Since management functions are shared among three supervisors, there is no coherent management style for IT functions. Furthermore, planning, organizing, evaluating, and controlling IT management functions have not been formally defined at the departmental level.

##### **Technical Support**

Technical support is currently provided mainly to internal users, resolving hardware and telecommunication problems. Application users of the Information Services Unit are also supported. Users report problems to the IT supervisor of the Development and Support Unit or his immediate collaborators. Based on the category of the problem, the IT supervisor assigns a technician to address the problem. No log of problems and solutions is maintained.

##### **Network management**

This function is informally established and performed by two employees of the Development and Support unit. The technicians install/enable telecommunications tools from the Windows operating system, monitor network performance, and conduct tuning of the network to increase network performance as needed. Also, the group configures, installs, and integrates servers with the existing Intranet configuration.

##### **Database Administration**

Information requirements from users are the basis for defining new data relationships or use existing ones in the SQL database. There is no overall policy on data names, business data relationships, and models. Most of the in-house development is carried out using client-based databases (in Access) or SQL/Access/Visual Basic or Excel-based data tables.

##### **Data Entry**

This function mainly provides word processing services to several users' departments. It also captures data from the Customs Service to prepare reports and data analyses using the Access-Visual Basic application and/or Excel-based reports.

The IT Strategic Plan proposed the establishment of three teams. This proposal was not formally implemented.

#### **4.5 Application Support and Maintenance Requirements**

The Automated Workflow System (AWFS) is the main application that TAS and FTPS will soon run. This application is in the final stage of implementation and will be ready for production within the next 30 days. AWFS includes processes for tracking procedures for the acceptance of petitions, processing, investigation, adjudication, and subsequent administrative actions in three main areas: Antidumping, Safeguards and Countervailing Duties. The same application will be customized to handle the correspondence and file organization applications' requirements of TAS and FTPS. The developer, an Egyptian software company, will provide the support and maintenance for this application.

SQL is the database management system selected by TAS and FTPS for future application development. Table 4-6 shows the support and maintenance requirements for the TAS & FTPS future applications portfolio.

**TABLE 4-6a**  
**Application Support and Maintenance Requirements**

Application	Software	Support and Maintenance
P1. Management System for tracking procedures for Antidumping, Safeguards and Countervailing Duties.	AWFS, Arabdox	Outsourced, Intranet support
P2. System for Accounting and Economic Analysis	Off-the-shelf	In-house user support in specific accounting package required. Support will be limited to customization of the application.
P3. Expert System on Worldwide Country Profiles	SQL, Application	In-house user support SQL Access/Visual Basic
P4. Case Decision Support System on laws, regulations	Document Management Systems, Arabdox	Outsourced, Intranet support
P5. Information System for management of bilateral, multilateral trade agreements	Arabdox	Outsourced, Intranet support
P6. Trade Agreement Database to manage agreements	SQL	In-house, SQL, Access/Visual Basic
P7. Library to support research and studies (TAS and FTSP)	Document Management System, Arabdox	Outsourced if Arabdox is selected as storage and retrieval engine.
P8. Management Information System and Website to support WTO	Website development tools	Short-term: outsourced Long-term: in-house, selected web development software. Intranet and Internet access.
P9. Library to support WTO	Document Management system, SQL	In-house. SQL, Access/Visual Basic
P10. Tracking system for files, and business correspondence in TAS, WTO	Arabdox, SQL	Outsourced
P11. Egypt obligations with WTO to manage tariffs	SQL	In-house SQL, Access, Visual Basic
P12. Management information system to record imports and exports policies and associated website	SQL, Website development tools	In-house SQL, Website development tool

P13. Track imports and export cases managed by branches.	AWFS, Arabdox, SQL	Combined Outsource and In-house support. SQL
P14. Database to manage policies and regulations related to FTSP	Arabdox, SQL	In-house, Access/Visual Basic, Storage/Retrieval software tool
P15. Expert system for problem solving regarding imports/exports	SQL, Arabdox	In-house, SQL, Access/Visual Basic
P16. Information system to support cotton imports/exports	SQL	In-house, SQL, Access/Visual Basic
P17. Management Information System to support the Commodity Counsel Department information needs. The system will support 17 committees on imports/exports of specific Egyptian products.	Intranet, Internet, SQL	Network support and maintenance, Virtual Private Network support
P18. Network to link Sector to branches.	Intranet, Internet	Network administration, Virtual Private networking
P20. Customs Tariffs Management Information system to ensure compliance with Trade Agreements and associated Website	SQL	In-house, SQL, Access, Visual Basic
P21. Data warehouse to support decision-making in foreign trade policy	SQL	In-house, SQL, Access, Visual Basic, Intranet
P22. Network security for foreign trade	SQL, Windows	In-house. Windows 2003, Monitoring software, intranet
P23. Financial, Administrative and Legislative system	Off-the-Shelf	In-house, selected Doc mgmt software.
P24. Reengineering of the IT department	None	None
P25. Email for TAS and FTSP	Exchange	In-house
P26. Establish and Maintain the Electronic Research Center	Arabdox	Outsourced, Search engine, doc mgmt software, intranet

From Table 4-6a, we can see that TAS and FTSP will depend on contractors (outsourcing) for technical support and maintenance of several applications. The IT department's role will be providing support to users in using and customizing applications and ensuring that data integrity is maintained.

## **5.0 Recommendations**

### **5.1 Proposed Mission and Objectives for the IT Department**

#### *Mission*

The IT department will maintain and support a reliable Information Technology infrastructure to effectively contribute to the business objectives, and strategies of the Trade Agreement and the Foreign Trade Policy Sectors.

#### *Objectives*

- Implement a solid and reliable IT infrastructure and organization to effectively support TAS and FTPS strategic programs.
- Make information to support business processes of TAS and FTPS reliable, available when needed, and accessible to internal end users.
- Implement E-mail services to ensure that this capability is reliable and available to all TAS and FTPS employees.
- Secure and protect the information infrastructure, with the appropriate confidentiality needed to prevent unauthorized access to sensitive data.
- Disseminate via Internet the information and services that TAS and FTPS provide to support trade and policy information needs of importers and exporters.

#### *Critical Success Factors*

The TAS and FTPS sectors have defined an IT Strategic Plan that includes a portfolio of 26 projects. The reorganization of the IT department is one of these projects and its definition is included in this report. The portfolio of projects includes several strategies to strengthen the IT infrastructure; however, the following critical success factors are needed to achieve the five proposed IT objectives and successfully implement the three-year IT Strategic Plan:

- Establish the Intranet to link all users of TAS and FTPS
- Establish e-mail services as way to communicate formally and informally among TAS and FTPS users and external users as well.
- Provide access to a PC to all TAS and FTPS employees. Individual PCs should be provided to each employee at the management and executive levels.
- Implement and administer websites to disseminate appropriate TAS and FTPS information among intranet and Internet users
- Implement the appropriate personnel infrastructure to support online services to FTPS and TAS users.



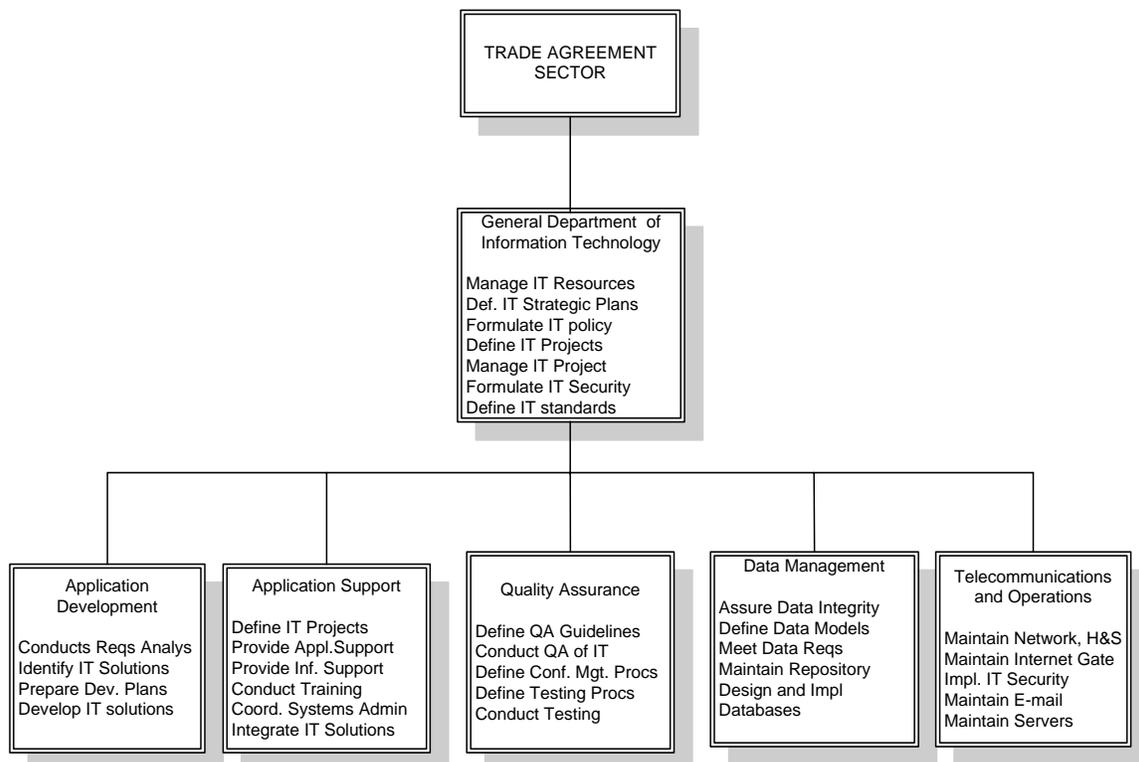
✓ The current Development and Support group will be absorbed by the new proposed Telecommunications and Operations Department. Current functions performed by this group are consistent with proposed roles and responsibilities for the Telecommunication and Operations Department.

✓ The current Information Center will be absorbed by the new proposed Application Support Department. The current role as providers of information to internal and external users is consistent with roles and responsibilities defined for the new proposed department, which will have a wider spectrum of information services once the portfolio of applications for TAS and FTSP is fully developed and deployed.

✓ Transferring the Translation Services as a Department under the ATR proposed General Department of TAS Management/Administration. Translation services do not belong strategically to the Information Technology Department and should be relocated under a General Department that provides services to all Departments of TAS and FTSP.

✓ Creating five (5) departments under the General Department of Information Technology.

Figure 5-2a  
Target IT Organization



## **5.3 Functional Areas**

### **5.3.1 IT General Department**

The IT General Department plans and monitors the use of IT resources to ensure they effectively support business strategies. It defines IT policies and standards, and ensures that business sectors, application developers, and in general all IT personnel, including information users, comply with those IT policies, standards, and regulations. In coordination with TAS and FTPS business managers, and observing MOFT's policies and standards, it defines, regulates, and monitors compliance of specific policies and standards for business processes and associated IT infrastructure. It conducts IT strategic planning to effectively support TAS and FTPS strategic objectives and programs, and periodically reviews this plan to ensure that necessary modifications are incorporated to reflect new or modified business objectives and strategies. The IT department has the following specific responsibilities:

- Define IT policies and standards in accord with MOFT institutional policies.
- Prepare and maintain up-to-date IT strategic plans to support TAS and FTPS strategic programs.
- Keep track of implementation plans in execution.
- Defines IT projects and defines plans for system implementation.
- Coordinate the deployment of IT infrastructure with the corresponding Unit under his/her supervision.
- In conjunction with the Application Support Unit, coordinates with TAS and FTPS management the establishment of new procedures and changes to integrate IT components with the organization.
- Ensure that the IT infrastructure is solid and effectively supports the implementation of the IT strategic plan.
- Define security policies and standards for businesses, applications, data, and telecommunications infrastructure.
- Define contingency plans to ensure continuation in services without disrupting critical information components that support TAS and FTPS.
- Define training plans to maintain IT personnel up-to-date with new technology trends and new software and hardware technologies that could be applied to improve effectiveness in information services.
- Define a preventive maintenance strategy for all IT components deployed in TAS and FTPS.
- In conjunction with the QA unit enforces compliance with IT policies and standards.
- In coordination with the Application Development Unit, oversees the process of requirements analysis, preparation of terms of reference, bids, procurement and installation of IT components.
- In coordination with the QA unit, oversees the compliance and QA of all IT components (hardware, software, applications, telecommunications), services and deliverables from contractors.

**Key Position:**

IT Manager  
Security Specialist

**5.3.2 Application Development Unit**

The Application Development Unit is responsible for analysis, design, development, and applications that support users' information requirements. This function includes the development of Web-based applications as well as client/server or PC-based applications that run on one computer or more PCs. Functions include systems requirements analysis, conceptual and detail designs, analysis of off-the-shelf software alternatives, development or customization, and delivery of systems to the Quality Assurance and Testing Group. The unit will handle the following main tasks:

- Receive the project definition from the IT manager and prepare detailed project plans for conducting requirements analysis, design concepts, prototyping definition, system development, and testing.
- Establish Configuration Management procedures to ensure that changes are properly documented and integrated within the system development cycle.
- Develop IT solutions using the appropriate programming tools, using the data models provided by the database administrator, telecommunications infrastructure managed by the Telecommunications and Operations Unit, and meeting programming development standards and policies provided by the Management / Strategy Unit.
- Prepare business and feasibility analysis to evaluate possible automation of manual processes.

**Key Positions:**

- Application Development Manager
- Web Developer/Administrator

**5.3.3 Application Support Unit**

The Application Support Unit receives applications that have been fully tested by the Application Development Unit and the Quality Assurance and Testing Unit. It ensures consistency and quality in the development, implementation, and support of applications or software requirements for TAS and FTPS. In conjunction with the Application Development Unit It will install the application in the appropriate application servers/PCs. It will conduct user training and pilot testing and will assist users with the

deployed applications. The Application Support Unit will also work with the users and the IT manager to analyze the necessary changes to policies and procedures to successfully integrate new systems/applications with the organization. The main functions for this unit are:

- Exercise administrative coordination and management authority over the design, development, implementation, and support of business and administrative application solutions.
- Serve as the primary contact for TAS and FTPS users in planning and defining IT solutions.
- Deliver or coordinate training of users to ensure effective utilization of business and administrative software solutions.
- Support the reporting and data-extraction needs of TAS and FTPS users from business and administrative systems and provide training and technical support in the preparation of ad hoc reporting/data extraction requirements.
- Administer security for business and administrative systems.
- Provide technical and functional services required for the administration of software solutions.

**Key Positions:**

Application Support Manager

### **5.3.4 Quality Assurance and Testing Unit**

The Quality Assurance and Testing Unit receives new applications from the Application Development Unit, verifies the alpha testing results and pilot-testing results, and applies the software/application criteria for final application acceptance. If software was contracted out (outsourced), the results from the preliminary testing and pilot testing will be evaluated. Functions include:

- Define guidelines to verify the quality of IT infrastructure including networks, servers, and software applications (developed in-house or outsourced).
- Conduct QA of IT components and report non-compliance/compliance in accord with QA guidelines and procedures.

- Subscribe to QA publications and upgrades in consistency to ISO 9000 series publications and customize guidelines as needed to make them suitable to TAS and FTPS policies and standards.
- Define configuration management procedures and guidelines to ensure that changes in IT components during the implementation cycle or production stage are accurately documented and modifications to the associated components in the Asset Repository are maintained up-to-date.
- Define testing procedures and guidelines and conduct QA testing of specific IT components. Document and communicate results to the appropriate IT Unit or outsourced contractor responsible for the development or customization of the IT product.

**Key Position:**

Quality Assurance Specialist

**5.3.5 Data Management Unit**

The Data Management Unit is responsible for data integrity, consistency, and availability. It will provide the necessary data relationships to support application development. It is responsible for database administration and security. It will define views and data relationships to maximize the storage and retrieval of data. It maintains data models to effectively support business information requirements of TAS and FTPS including Websites and Web-based applications. Specific responsibilities include:

- Participate in the definition of software and data architecture to support IT solutions.
- Define data models based on information requirements to support TAS and FTPS strategic programs.
- Define logical data relationships to support the implementation of the IT strategic plan.
- Define the physical design for the corporate database and rules to maintain data quality and data integrity.
- Maintain the Asset Repository up-to-date with respect to data models, data relationships, business relationships and associated data, and location of data.
- Define and implement policy and standards for data
- Implement security practices to ensure integrity, availability, and confidentiality of data
- Maintain data dictionaries and business rules to support implementation of system and applications.
- Define contingency plans to preserve data integrity and access (availability) to authorized users without significant interruptions
- Maintain audit trails to identify modification to sensitive data

- Facilitate the data management and requirement of Websites and Intranet web-based applications.

**Key Positions:**

Data Administrator

**5.3.6 Telecommunications and Operations**

The Telecommunications and Operations Unit will ensure that the telecommunications, servers, PCs, and operating systems are fully operational. It will manage the network and implement security initiatives to ensure that all security requirements are met. It will work with the Application Support Unit to successfully meet E-mail requirements. It monitors network performance and implements improvements as needed to maintain the IT infrastructure operational and suitable to meet the information requirements from the two sectors. The Unit will have the following functions:

- Prepare operational plans for applications in production to ensure that the operational requirements are effectively met.
- Administer and maintain the IT components that support the operation of applications in production.
- Implement security routines that comply with security policies to prevent unauthorized access to systems and networks.
- Ensure that systems in production and associated telecommunications infrastructure are operational
- Maintain backups for all systems/programs in accord with security policies and procedures defined by the IT department
- Maintain the backup library
- Ensure that data published in websites is accurate and up-to-date
- Maintain a log of operational problems. If problems are related to application functionality or data, refer the problem to the Application Support Unit.
- Implement the Help Desk to receive support or maintenance requests from users
- Preserve the physical integrity of all IT components deployed at the TAS and FTPS.
- Maintain the operational requirements of the E-Mail application assigning accounts and passwords to authorized users.
- Implement the network security requirements to prevent unauthorized access to the IT infrastructure.
- Define a plan to secure provisions for operational supplies of systems in production.
- Prepare contingency plans to ensure the availability and integrity of the IT infrastructure that supports TAS and FTPS

**Key Positions:**

- Manager of Telecommunications and Operations

#### 5.4 Integrate New Training Requirements within Current Training Plan

The training strategy for key IT personnel is included in Table 5-4-1. The new courses suggested herein should be incorporated into the existing ATR Training Plan. All IT managers (IT General Manager and managers of the units proposed in the new organization) should receive training in management. Courses in blue (bold for B&W) are new and proposed for specific key IT personnel.

Table 5-4-1  
Recommended Training for Key IT positions

IT Key Position	Training Requirements
IT Manager	Leadership and Supervisory Skills Delegation of Responsibility Communications and Interpersonal skills Motivating Staff Human Resources Development Team Building and Team Management Skills Problem Solving and Decision Making Organizing and conducting meetings Public speaking TQM principles <b>Project management</b> <b>Capability Maturity Model</b> <b>Advanced Information Security</b> <b>Advanced Incident Handling</b> <b>Managing Technology Change</b>
Security Specialist	<b>Security policy formulation</b> <b>Security for information technology infrastructure</b> <b>Technical security for windows-based applications</b> <b>Evaluation of security requirements for IT infrastructure</b> <b>Database security</b> <b>Network Security</b>
Application Development Manager	Leadership and Supervisory Skills Delegation of Responsibility Communications and Interpersonal skills Motivating Staff Human Resources Development Systems Analysis and Design <b>RDA methodologies</b> <b>SQL Design and Development</b> <b>Software Configuration Management</b> <b>Project Management for Software Development</b>

Application Support Manager	Leadership and Supervisory Skills Delegation of Responsibility Communications and Interpersonal skills Motivating Staff <b>Systems Analysis and Design</b> <b>SQL Design and Development</b>
Quality Assurance Manager	Leadership and Supervisory Skills Delegation of Responsibility Communications and Interpersonal skills Motivating Staff <b>Quality Assurance Practices</b>
Data Administrator	Leadership and Supervisory Skills Delegation of Responsibility Communications and Interpersonal skills Motivating Staff Human Resources Development MS SQL Server Administration Querying MS SQL Server <b>Relational Database Design</b> <b>Database security</b>
Telecommunications and Operations Manager	Leadership and Supervisory Skills Delegation of Responsibility Communications and Interpersonal skills Motivating Staff Human Resources Development Cisco-based Networks Cisco PIX Configuration Skills <b>Network Security</b> <b>Network Troubleshooting</b> <b>Contingency Planning</b>
System Analyst	<b>Systems Analysis and Design</b> <b>SQL Design and Development</b> <b>Advanced Information Security</b> <b>Advanced Incident Handling</b>
Web Developer	Website Administration Website Development Programming Language CIW Enterprise Developer

### 5.5 Staff the new IT Department

Staff the new departments with the appropriate key personnel. All positions except the IT manager for the General Department can be filled with existing resources as long as they are reallocated based on interests, qualifications, motivation, and potential to grow. Key position descriptions and qualifications have been included in this report. Although it is likely that some required existing personnel do not meet qualifications, the consultant recommends conducting training in specific areas to fill the gaps.

Based on the preliminary assessment of current personnel, the following personnel strategy could be implemented:

New Department	Number of Employees	Current Group
Application Development	8 2	Information Center Development & Support
Application Support	18 3	Information Center Development & Support
Quality Assurance	2 2	Information Center Development & Support
Data Management	2 2	Information Center Development & Support
Telecommunications and Operations	5 7	Information Center Development & Support
IT General Department Support*	3 1	Information Center Development & Support
Total	55	

\*: Proposed staff for administrative/Technical support to the General Manager. It does not include the IT General Manager

## 5.6 Implementation Approach

To implement the recommendations included in this report, the consultant suggests the following action plan:

- Translate the report into Arabic and present it to TAS and FTPS managers
- Approve the proposed reorganization
- Issue the executive order to formalize the organization
- Communicate the changes to affected departments
- IT general manager identified and onboard
- Match personnel requirements for key positions with qualifications of current employees
- Assign current personnel to key positions and work with HR to formalize these positions
- Define the proposed new training courses for IT managers and technical personnel
- Conduct training for IT managers
- Conduct training for technical personnel

## 5.7 Action Plan and Expected Results

- IT General Department formally created and fully functional
- IT Manager onboard
- Five managers for the Units identified and new positions assigned and formalized.
- Current personnel is reassigned to new departments
- Revised training approved and courses defined and ready to be offered.
- Managers fully trained
- Technical personnel subsequently trained.

## **5.8 Critical Success Factor for the new IT Organization**

- Identify the appropriate IT manager to lead the new IT General Department. If qualifications are not met by current personnel, a contracting mechanism should be used to hire the qualified person.
- Prepare the executive order to assign current IT personnel to key proposed positions.
- The newly designated IT manager should define the IT policies and standards as the first task for new position.
- Provide training for all key positions as needed to ensure that position requirements are met.

## **ANNEX I – Job Descriptions for Key Positions**

## **Job Title: IT Manager**

A senior IT expert in management with extensive knowledge in information technology leads The IT General Department. The head of the IT department plans and manages IT resources. S/he defines IT policies and standards, and ensures that business sectors, application developers, and in general all IT personnel, including information users, comply with those IT policies, standards, and regulations. S/he conducts IT strategic planning to effectively support TAS and FTPS strategic objectives and programs, and reviews periodically this plan to ensure that necessary modifications are incorporated to reflect new or modified business objectives and strategies. Main responsibilities follow.

### **Responsibilities**

- Manage the five departments within the IT General Department.
- Define IT policies and standards in accord with MOFT institutional policies.
- Prepare and maintain up-to-date IT strategic plans to support TAS and FTPS strategic programs
- Keep tracking of implementation plans in execution by all departments.
- Prepare plans for implementing IT projects including all stages of system development and implementation.
- Coordinate the deployment of IT infrastructure with specific departments as needed.
- Coordinate with TAS and FTPS management the establishment of new procedures and changes to integrate IT components within the organization.
- Ensure that the IT infrastructure is solid and supports effectively the implementation of the IT strategic plan.
- Define security policies and standards for businesses, applications, data, and telecommunications infrastructure.
- Define contingency plans to ensure the continuation in services without disrupting critical information components that support TAS and FTPS.
- Define training plans to maintain IT personnel up-to-date with new technology trends and new software and hardware technologies that could be apply to improve effectiveness in information services.
- Define preventive maintenance strategy for all IT components deployed in TAS and FTPS.
- Enforce compliance with IT policies and standards
- Participate in the process of requirements analysis, preparation of terms of reference, bids, procurement and installation of IT components
- Coordinate the QA of all IT components (hardware, software, applications, telecommunications), services and deliverables from contractors
- Conduct periodic performance evaluations of key IT personnel (heads of departments).

## **Qualifications**

### **Professional Requirements:**

- Engineering or Management Degree (mandatory)
- Master's Degree in Business Administration, or Management of Information Technology (desirable).

### **Experience:**

- At least 10 years proven experience as manager or IT organizations.
- At least 10 years of experience in implementing Information Technology solutions using web-based, micro-based, and three-tier architecture software technology.
- Database design.
- Knowledge on Enterprise Architecture concepts and frameworks
- Project Management
- Quality Assurance
- Configuration Management.

### **Skills:**

- Capability to manage large IT organizations (with 60 people or more)
- Effective communication skills verbally and in writing
- Leadership to organize and delegate work
- MS Project management
- IT policy drafting
- IT Strategic Planning
- Bilingual (English/Arabic)

## **Job Title: Application Development Manager**

The Application Development Manager plans, organizes, oversees, and administers the programs and activities of a major applications development function, involved in the development, installation, and testing of integrated computer programs for business and/or operation of TAS and FTPS sectors. Develops and implements IT Department operating standards and procedures, directs and administers a diverse team of programming and associated support staff, including a Web developer.

### **Responsibilities**

- Conduct requirements analysis and information needs assessments
- Identify data components using data models from the EA repository
- Interact with the data management to request new or existing logical models or data views
- Use rapid development methodologies to determine conceptual design applications and associated information requirements.
- Prepare project plans to develop software applications
- Create development team to be responsible for application development
- Test applications functionality to verify compliance with functional requirements
- Prepare cost/benefit analysis to evaluate application development alternatives
- Prepare terms of reference to outsourced development
- Identify possible commercial of the shelf (COTS) that meet information requirements
- Customize COTS to meet users requirements
- Conduct alpha and beta tests for developed or customized applications
- Implement the appropriate security layers in accord to TAS security policies and standards.
- Develop applications that meet IT standards and Policies defined by the IT General Department.
- Develop web-based applications
- Develop intranet and Internet websites

### **Qualifications**

#### **Professional Requirements:**

University Degree in Information Technology or related technical field

#### **Experience:**

At least 10 years of experience in supervising IT application development and testing.

At least 5 years of experience in micro-based systems analysis and design

At least three years of proven experience in analysis of developing Web-based applications

**Skills:**

Knowledge in developing three-tier application architecture

Knowledge in SQL, Access, Visual Basic

Ability to assess and maintain quality of programming structure, design, and coding

Ability to evaluate and interpret end user information requirements, and to develop appropriate systems and/or applications solutions

Ability to develop and deliver presentations

Ability to specify and develop computer programs using a range of programming languages approved by the IT department.

Knowledge of current technological developments/trends in area of expertise

Ability to interpret and evaluate client informational needs and to determine appropriate alternative solutions

Ability to plan, design, coordinate installation, test, and modify complex systems and subsystems

Knowledge of computer flow charts and of programming logic and codes

Knowledge of a broad range of relevant alternative computer systems, applications, and equipment

Employee development and performance management skills..

## **Job Title: Web Developer**

The Web Developer codes and constructs web front-end to an embedded web applications for Internet and Intranets. The Job Developer reports to the Manager of Application Development.

### **Responsibilities**

Analyze Web-based information requirements

Identify the appropriate data structure to support websites and Web-based applications.

Work with users to clarify information needs and feasibility of publishing information on the Internet

In conjunction with users, evaluate accuracy and reliability of information to be posted in intranets or the Internet.

Develop User Interface screens and Administrative screens using PHP (general purpose scripting language), Java and Macromedia Flash, package and transmit logged data from the local data store to remote Servers using XML

Code protocol programs to handshake and communicate with other local software processes

Code the “scheduler” program to maintain a pre-determined cyclical exchange with a remote Server.

### **Qualifications**

Experience:

At least two years of experience in Web Development and Web-based applications.

Skills:

Optimizing database transactions.

Familiar with building executables from source code

Working knowledge of ASP, VP Script, IIS, SQL Server and Visual Studio.

Familiar with full life cycle software development

Familiar with embedded development environment

## **Job Title: Application Support Manager**

The Application Support Manager plans, organizes, oversees, and administers the applications in production for the TAS and FTPS sectors. S/he is responsible for ensuring that information users are fully satisfied with services and functionality of deployed systems. Responsibilities also include support for application administration, pilot implementations, and training. The application support manager is the primary contact between users and the IT department and works in conjunction with the operations and telecommunications manager to address network, hardware, and/or operating systems issues. It also works with the IT manager and the Security Specialist to ensure that the IT infrastructure is operational, reliable, and secured.

### **Responsibilities**

- Verifies the output of the requirements analysis to ensure that users information needs are met.
- Ensures that users sign off for the system delivered in production.
- Maintains a log of application problems reported by users and identify the correct source to fix the problem.
- Prepare users training and associated documentation
- Conduct users training or coordinate outsourced training
- Prepare application deployment plans and monitor their execution
- Assign analyst to specific support of applications as needed.
- Prepare pilot testing plans.
- Conduct pilot testing to test operational requirements. Test applications functionality to verify compliance with functional requirements
- Prepare economic assessments of applications in production and suggest improvements to minimize operational costs.
- Prepare terms of reference to outsourced application support as needed.
- Ensure the compliance of security standards in deployed applications.
- Coordinate with the QA manager and Security Specialist the compliance of Application components.
- Coordinate with business managers the definition/modification of processes and functions to properly integrated deployed applications with organizational infrastructure.

### **Qualifications**

#### **Professional Requirements:**

University Degree in Information Technology or related technical field

**Experience:**

At least 10 years of experience in implementing and/or supervising IT applications

At least 5 years of experience in user support activities

**Skills:**

Excellent interpersonal skills

Knowledge of micro-based application design and implementation

Knowledge of Internet technology applied to Web-based application

Knowledge of SQL/Access/Internet as a research tool/MS Office products

Excellent writing skills

Extensive knowledge and use of MS Project, email

## **Job Title: Quality Assurance Specialist**

Under the supervision of the IT manager defines and coordinates the implementation of QA activities to evaluate the compliance with QA standards and regulations for all components of the IT infrastructure deployed at TAS and FTSP. The QA Manager defines QA policy and standards in accord to ISO 9000-2000 series. It defines a suitable QA manual based on the IT QA policies defined by the IT manager and the Management and Strategy Unit. The QA Manager implements QA procedures to be observed by the Application Development Unit and the Telecommunications and Operations Unit.

### **Responsibilities**

Evaluate QA standards and regulations based on ISO 9004-2000 series and select those applicable to the four layers of IT: business, data, applications, and IT infrastructure.

Prepare QA testing plans

Train IT personnel on QA methodologies, standards, and policies

Review IT implementation plans and embed QA activities to ensure that deliverables meet QA standards.

Review the guidelines for performance improvements

Establish the appropriate QA systems and associated QA requirements

Design and implement forms and procedures to conduct QA reviews and report non-conformance as needed.

### **Qualifications**

#### **Professional Requirements:**

University degree in Management or Engineering

#### **Experience:**

At least 5 years in developing and implementing information technology

#### **Skills:**

- Ability to investigate and analyze information and to draw conclusions.
- Knowledge of IT architectures and platforms
- Ability to write reports containing technical information.
- Ability to make evaluative judgments.
- Word processing, Excel, PowerPoint presentation skills.
- Knowledge of quality control practices and procedures for IT components
- Ability to communicate effectively, both orally and in writing.
- Bilingual (English/Arabic)

## **Job Title: Data Manager**

The Data Manager is responsible for the integrity, consistency, and availability of data that serves the information needs of TAS and FTPS. S/he will provide the necessary data relationships to support application development and is responsible for database administration and security. S/he will also define views and data relationships to maximize the storage and retrieval data requirements. Responsibilities also include maintaining data models to effectively support business information requirements of TAS and FTPS Websites and Web-based applications. The Data Manager also interprets data, and provides advice and consultation regarding implications of using data elements; S/he supports needs assessments, designs and creates databases, and participates in testing and implementation of new applications. S/he provides assistance and training to system users in data interpretation and data use.

### **Responsibilities:**

- Participate in the definition of software and data architecture to support IT solutions.
- Define data models based on information requirements to support TAS and FTPS strategic programs.
- Define logical data relationships to support the implementation of the IT strategic plan.
- Define the physical design for the corporate database and rules to maintain data quality and data integrity.
- Maintain the Asset Repository up-to-date with respect to data models, data relationships, business relationships and associated data, and location of data.
- Define and implement policy and standards for data
- Implement security practices to ensure integrity, availability, and confidentiality of data
- Maintain data dictionaries and business rules to support implementation of system and applications.
- Define contingency plans to preserve data integrity and access (availability) to authorized users without significant interruptions
- Maintain audit trails to identify modification to sensitive data
- Facilitate the data management and requirement of Websites and Intranet web-based applications.
- Support the development of n-tier application architectures that use multiple databases and servers.

## **Qualifications**

### **Professional Requirements:**

University degree in Management Information Systems or Equivalent

**Experience:**

- Analysis, interpretation, and manipulation of data
- Implementation of data management and retrieval methods;
- Ability to test and implement modifications and enhancements to database logical and physical designs
- Communicate and train staff on information resources and data.
- At least 5 years in database design and implementation of IT application solutions.

**Skills:**

- Ability to resolve data input, storage and/or retrieval problems and to design solutions and modifications.
- Ability to define data consistency rules and implement them in the database.
- Ability to define applications to collect, maintain, and analyze data.
- Ability to communicate effectively, both orally and in writing.
- Ability to supervise and train assigned staff.
- Knowledge of database construction, management, and retrieval methods using SQL, Access and other client support languages/databases.
- Ability to analyze operational data requirements and to create and develop data models to meet specific information requirements. .
- Ability to interact with other IT Units and understand their roles and responsibilities.
- Ability to maintain the data model repository that supports the Enterprise Architecture

## **Job Title: Information Security Specialist**

The position reports to the IT General Manager. The security specialist implements and supports information security initiatives throughout TAS and FTPS and is part of the MOFT security committee. Acts as a focus and resource for TAS and FTPS information security matters. Works with those in corresponding roles in other sectors. Investigates and recommends secure solutions that implement information security policy and standards. Coordinates information security activities and implements security policies recommended in ISO 9000 Series.

### **Responsibilities:**

- Maintains working knowledge of security policies and standards
- In conjunction with the manager of telecommunications and operations applies information security management knowledge to enhance the security of the open network and associated systems and services.
- Assists the IT manager in formulating security policy and standards
- Interprets and translates security requirements for implementation in the four IT levels of the IT infrastructure: business, data, applications, and networks and H&S infrastructure.
- Drafts appropriate information security policies, standards, guidelines and procedures.
- Works effectively with other information security personnel
- Prepares effective presentations and communicates information security objectives to IT personnel and TAS and FTPS business managers and users.
- Monitors Information Security Program compliance and effectiveness.
- Acts as a resource for matters of information security. Provides pertinent and useful information.
- Provide project management and operational responsibility for the administration, coordination and implementation of information security policies and procedures across TAS and FTPS
- Coordinates and performs reviews of contracts, projects and proposals
- Assists information technology proponents with standards compliance.
- Conducts investigations of information security violations and computer crimes. Works effectively with management and external law enforcement to resolve these instances.
- Reviews instances of noncompliance and works effectively and tactfully to correct deficiencies.

## **Qualifications**

### **Education**

- A university degree is required in IT or related field.
- Certified Information Systems Security Professional rating is desired

### **Experience**

At least 5 years in management and implementing information technology

### **Skills**

- Knowledge of Information Security principles and practices.
- Knowledge of all aspects of information security
- Knowledge of security policy formulation
- Excellent writing and verbal communications skills
- Prepares effective presentations and communicates information security objectives to IT personnel and TAS and FTSP business managers and users.
- Bilingual capability (English/Arabic)

## **Job Title: Telecommunication and Operations Manager**

The Telecommunications and Operations Manager manages the IT infrastructure of TAS and FTPS including the intranet, Wide Area Network, hardware (servers, printers, and PCs), operating systems, and electrical networks that serves the TAS and FTPS sectors. S/he ensures an efficient, stable, and reliable infrastructure to effectively support business strategies and operations for TAS and FTPS users. The Telecommunications and Operations Manager is responsible for managing and developing network integration, administration and maintenance policies, procedures and standards, and network and security standards and policies.

### **Responsibilities**

- Plans, organizes, manages and evaluates the work of the Telecommunications and Operations Department;
- Participates in establishing of IT strategic and operational plans and initiatives to meet IT General Department goals and objectives;
- Implements operational plans, processes, procedures and policies required to achieve overall department performance results;
- Participates in the implementation of the IT Strategic Plan for TAS and FTPS and coordinates and integration of operational procedures of the two sectors to achieve optimal efficiency and effectiveness;
- Plans and evaluates the performance of assigned staff; establishes performance requirements and personal development targets; regularly monitors performance and provides coaching for performance improvement and development;
- Provides leadership and works with staff to create a high performance, customer service oriented work environment that supports the department's mission, objectives and service expectations;
- Manages and participates in the design, implementation, configuration, upgrading, testing, troubleshooting, tuning and maintenance of the TAS and FTPS network infrastructure including a variety of network services such as: exchange mail services, web and proxy servers, print and file services and VPN services.
- Designs, plans, develops and maintains the network hardware and operating systems, including planning network topology, installations and changes; manages and may participates in the configuration of network routing and switching software.
- Serves as network security administrator, including administering the firewall rule base; monitors network intrusions; develops, recommends, implements and enforces the TAS and FTPS network security policy and remote access standards and guidelines; maintains security on network and server equipment.

- Manages and utilizes network management software and remote network management tools to monitor and analyze network traffic; analyzes network capacity and growth requirements and recommends network upgrades and enhancements to meet long-term District needs; develops and recommends specifications for network hardware, software and cabling upgrades and enhancements; develops and recommends cabling and connectivity standards, uses and levels; may participate in the most complex troubleshooting and problem resolution issues.
- Maintains and updates schematics and documentation of network structure and devices; develops and recommends network contingency and disaster recovery plans.
- Manages customer support services provided through the Application Support Services and the Help Desk function, including: installation, configuration, troubleshooting and maintenance of computer hardware, peripherals, devices and software; responses to customer requests for services and resolution of problems associated operational problems of computer hardware, standard and specialized software, peripheral equipment, devices, network connectivity and other technology tools; manages the development of help desk response and resolution standards and guidelines;
- Supports QA activities of the Quality Assurance Department to ensure that the IT infrastructure complies with QA policies, standards and procedures. Reviews new or revised projects for conformance to established technical, system and operational standards;
- Manages network administration tasks; designs and ensures the recoverability of lost data through proper and adequate backup and data recovery methods.
- Coordinates work with other departments' staff to ensure appropriate network availability to meet end user and operational information needs.
- Provides back-up support to users of TAS and FTPS as needed.

## **QUALIFICATIONS**

### **Education**

- University degree with a major in computer sciences, management information systems, computer engineering or a related field preferred; and seven years of progressively responsible experience in the analysis, design, development and administration of local and wide area network (LAN/WAN) infrastructures, including two years of supervisor or project management experience; or some combination of education, training and experience that produces the requisite knowledge and ability.
- Microsoft Certified Systems Engineer (MCSE); Cisco Certified Network Administrator or the equivalents.

## **Experience**

- Develop conceptual frameworks and apply state-of-the-art technology to the design and management of network infrastructures.
- Install, configure, maintain and manage the operations of IT infrastructure to achieve optimal technical performance and end user support.
- Analyze and troubleshoot complex computer system and network issues, identify the reasons for network and network device problems, failures and malfunctions and develop optimal solutions.
- Read, interpret and apply complex technical publications, manuals and other documentation.
- In conjunction with the IT General Manager and Heads of other IT departments Identify data communication and information management issues and opportunities, analyze problems and alternatives and develop sound conclusions and recommendations.
- Preserve the confidentiality of all proprietary and confidential data and information residing in TAS and FTPS databases, in accordance with IT General Department and Data Management security policies and standards.
- Communicate clearly, both orally and in writing.
- Exercise sound, expert independent judgment within general policy guidelines.
- Establish and maintain effective working relationships other Head Department Managers and end users.

## **Skills**

- Network architectures and theory and principles of local and wide area enterprise network design and integration, including topologies and protocols.
- Principles and practices of advanced network administration.
- Industry design and configuration standards for enterprise networks, including: hardware, network protocols and network operating systems.
- Network management systems, including principles and practices of security management and security design.
- Operating principles, parameters, uses, capabilities, characteristics and limitations of servers, network operating systems, PC's, mid-range computers and related equipment.
- Standard principles, practices and methods of project management.
- Principal and practices of effective management and supervision.