

User Requirements and Institutional Needs for an Electronic  
Document Management System at the Food and Agriculture  
Organization of the United Nations Regional Center for Latin America  
and the Caribbean (FAORLC)

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## Introduction

The Food and Agriculture Organization (FAO) of the United Nations maintains a Regional Office in Santiago Chile (RLC) which is the center for FAO activity in Latin America and the Caribbean (FAORLC). This report is an analysis of user and organizational needs and requirements for a computer system to manage the electronic storage of documents. More and more material in the office is being handled electronically. There is a pressing requirement to insure that electronic documents are preserved in the institutional memory, just as paper documents were previously. In addition, there is a strong need to rationalize the organization and storage of electronic documents to facilitate their sharing and retrieval.

The report begins with a brief summary of the features of computer software packages that manage electronic documents, termed electronic document management systems (EDMS). Following that is a discussion of the organizational and computing structure at FAORLC. The reason for describing the organization is to understand one alternative that could be used as a basis for organizing an electronic store of the organizations documents. Third, the structure and operations of two institutions within the organization are examined in detail. They are the Registry, where paper copies of documents are received and filed, and the Library, where FAO's technical documents and serials are maintained. Both these institutions are important in understanding how an EDMS might fit in the organization and how they could contribute to the operation of an EDMS.

Two electronic storehouses of information already exist at FAORLC. One is the collection of private files of information maintained by each user on his or her own workstation. A second is an area of disk space on one of RLC's central server computers devoted to storing electronic materials of general interest to the organization including material placed there by the Registry. This area of central disk space is termed the Q: disk. Its structure and problems are analyzed in the fourth section of the report.

If a computer system is to be successful in meeting the electronic document management needs of its users, those user needs must be assessed. The fifth part of the report presents the results of interviews with eight individuals at RLC whose job functions range from secretarial to technical to managerial. The interviews briefly describe each individuals activities, their use of computers in their job, and their requirements for an EDMS.

A number of pieces of software currently play an important role in letting users perform their work at RLC. They include the *Exchange Server*, *Outlook*, browser software (like *Netscape*) and the Microsoft Office suite of programs. The first two are described, and the features they provide that support the functions of an EDMS are presented with an evaluation of their usefulness. Three other programs are also discussed for their potential contribution to constructing and implementing an EDMS at RLC. They are

*Word*, Keyflow, and PCDocs. The Microsoft word processing program *Word* is discussed in relation to its capabilities for capturing data about the document being created (meta-level data). Keyflow is a program to automate the construction of electronic forms and the routing of these forms within an organization. The last allows a common store of information to be created, managed, and accessed and is an example of an integrated EDMS.

The report concludes with a discussion of design considerations as well as short, medium, and long term approaches for implementing an EDMS at RLC.



## Electronic Document Management Systems: Functions and Benefits

The creation, distribution, and management of documents plays a critical role in the functions of an organization. Documents include such things as a letter to an individual, an email message, a legal document, a travel expense form, a picture of a prospective employee, a digitized map of geographic region, a computer aided drawing of a building, a video clip of part of a meeting, and the like.

Until recently, paper was the preferred medium by which most types of documents were created, transferred and stored within an organization. With the advent of computers, more and more documents and forms were created using word processing and other programs, then printed, distributed, and filed in paper form. The current approach to the management of documents is to avoid printed documents, photographs, compact disks, or printed drawings when possible and to create, distribute, and archive the electronic form of the material in a computer systems' database.

The functions provided by an electronic document management system are similar to those provided by a well-organized office. They include:

1. **Electronic Working Environment.** An electronic environment within which documents can be created with the user's preferred electronic tools (e.g. Microsoft *Word*, *Excel*, *AutoCad*, *WordPerfect*, *Outlook*, *Access*).
2. **Repository.** A *repository* (or electronic file cabinet) into which materials are stored. This is often termed the *document database*, or *document store*. Benefit: With a properly maintained and organized repository, the organization does not lose its institutional memory of electronic documents.
3. **Search System.** Tools that allow a user to easily locate material in the document database. Among the standard methods available for finding an electronic document include searching by document name, author, tool used to create the document, subject information assigned to the document when it was created, and the text of the document itself. Benefit: A repository has little benefit without tools to find materials in it.
4. **Indexing System.** Tools that automatically create indexes to documents so that they can be located. See item 3 above. Benefit: If documents are not indexed, or their content identified in some systematic manner, it will be extremely difficult to find them in the repository.
5. **Version control.** When a paper or electronic document is created it often goes through a series of revisions before it reaches its final form. Users vary in their willingness to be careful of tracking different versions of a document. The consequences of laxity are multiple copies of a document with little knowledge of which document is the 'latest version', multiple versions stored on a user's

computer, and/or multiple versions stored on the user's computer as well as on a central computer. With an EDMS, *version control* is intrinsic. A user creates a document and stores it when finished working on it. The next time the document is changed, the EDMS keeps track of the changes. The EDMS manages the various versions that exist. Old versions are not destroyed or lost until an overt decision is made about their disposition. Tracking of versions is automatic. Benefit: Reduced duplication, reduced disk space, reduced storage cost.

6. Document Configuration Management. Some documents are more complex than others. An email message (without attachments) is relatively simple. It consists of one document. A technical report prepared by a Professional Staff member is more complex. It may consist of a number of sections or chapters. A document is made up of a group of chapters (a *configuration*), each of which may go through revision cycles. Benefit: A good EDMS has the ability to manage the versions of documents that are composed of a series of components, just like a user would manually keep track of the versions of a chapter and ultimately the versions of a report.
7. Document Distribution. Paper documents are generally routed within an organization by routing slips attached to them. The routing slips specify who is to receive the document, and sometimes indicate the order in which the routing is to take place, date of routing, and expected date of return of the routed document. EDMS' offer the same functionality. Electronic routing slips are created, and may be stored for future re-use. Once the routing is established, an electronic document can be sent to one or many users at the same time. Benefit: Provides an electronic version of paper routing slips but it provides substantially better control by tracking the location of documents and automatically following-up on delays in routing.
8. Workflow Management. Perhaps the most powerful feature of an EDMS is the ability to send electronic documents along a proscribed path, in a proscribed order, with requested due dates, and with confirmation and status reports to the sender of the documents status. For example, suppose a request is made to purchase a piece of equipment. The normal business practice may be for the requestor to complete a justification for the purchase, send it to a purchasing officer to obtain a quote, have the quote returned to the requestor, have the justification and the quote sent to the requestors manager for approval, and sent to another level of manager for final approval. With a *workflow management* system in place, an electronic path would be specified. The path would indicate the individuals to whom the electronic document should be passed, who to notify when the document had reached a particular point in the path, what the due dates were for the electronic document to be processed (if any). Once this was established, the requestor could initiate the purchase request electronically and receive confirmations of its status in the path as well as the status of the purchase request electronically. Benefit: Workflow management enforces business rules and practices about how processes should be performed.

9. **Image Management.** Certain types of documents are well suited to electronic document management the moment they are created electronically. They include word processing documents, spreadsheets, and email messages. Other types of documents arrive at an organization in a non-electronic form such as letters in the Post, paper faxes, brochures, photographs, and the like. Electronic document management systems have the ability to manage these non-electronic documents by electronically scanning them. A scanner connected to a workstation scans the images and they are identified and then stored in the repository. EDMS' include tools to include these documents in the repository and manipulate the images (such as translating the image of text to individual characters that can be manipulated by a word processor—Optical Character Recognition). Benefit:: Allows non-electronic documents into the system, thus capturing for the repository materials that would normally be outside the system.
10. **Support for Mobile Document Users.** Many users work with notebook or laptop computers which are not always connected to an organization's computer network. A user may want to work on a report at home in the evening. In this case the EDMS allows the user to check out a document from the repository just like one would check out a book from a library for a specific loan period. When the user returns the document after having modified it, the EDMS automatically maintains version control and stores the document in the repository with information about its latest modification. Benefits: Supports flexible work patterns and mobile users.
11. **Publish Documents to the Web.** Once documents are created, they may be printed or routed. But it is often the case they are transferred to the organization's Web site. The manual procedures to perform this transfer are simple but require a number of steps. Benefits: EDMS software support automatic publishing of documents. This is a labor-saving activity that results in increased productivity of the WebMaster and a more accurate and up-to-date Web page.

As can be observed, these functions provide an electronic equivalent to standard office procedures. They augment the procedures with functions necessary to support an electronic document management environment.

## Organizational and Computing Structure of the FAO Regional Office

An electronic document management system is intimately tied to its organization and organizational structure. For that reason it is important to understand the RLC structure so as to make sound decisions about the structure of an electronic repository of information.

Like most organizations, the FAORLC office in Santiago has an administrative and professional component. Table 1 is the author's approximation of that structure.<sup>1</sup> The administrative components consists of an information technology (computing, Web Support, Registry, Library) and management support unit (finance and personnel). The Professional consists of six major functional groups, Agriculture, Economic and Social Development, Policy Assistance, Sustainable Development, Fisheries, and Forestry. In addition there are country-oriented groups under the Operations for Latin America and the Caribbean Unit. This professional organization provides specialists, such as those in forestry, along with specialists for a particular country, like Bolivia. Since the area covered by the Regional Office is so large, there is a sub-regional office located in Barbados to cover the Caribbean area. This later office is not completely integrated into the data communications and software system at RLC, and some consideration must be given to completing this task. Obviously if an EDMS is to be complete, it must meet the needs of the sub-regional office as well, and integrate into the entire RLC system. This will be a complex undertaking but should be addressed.

### Computing Environment

Almost all users at RLC have personal computers on their desks which are connected through a local area network to server computers operated by the Information Technology Unit. Each workstation uses either the Microsoft *Windows 95* or *Windows NT* operating system. Workstations have a full suite of programs available to them including the Microsoft *Office* suite of programs (*Word*, *Excel*, *PowerPoint*, *Access*). They also use the Microsoft *Outlook* program (which will be discussed later) for much of their data communications and browsers like *Netscape* to access the Internet. A number of the personal computers are relatively old and need upgrading to meet user needs. Some machines have been recently purchased but replacement requirements exceed availability (March 1999).

There are a number of server computers, all of which use the *Windows NT Server* operating system. The servers perform a variety of functions, including managing data communications, centralized disk storage, fax services, scanning services, the modem pool, and the Microsoft *Exchange Server* system (discussed later).

The RLC building has four floors of offices. Workstations on offices on each floor are connected via data communications lines to a hub (a passive data forwarding device) on

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<sup>1</sup> The figure is not an official FAO Organization Chart

each floor, from which lines go to the servers on the ground floor of the building. The local network uses the TCP/IP (Transmission Control Protocol/Internet Protocol) to transfer packets of data between workstations and the servers. Most data transmission takes place at 10 Megabits per second, but the wiring and most of the interconnecting hardware (hubs, routers--intelligent forwarders of data messages) have been upgraded to operate at 100 Megabits per second.

Connection of the workstations via the server to the Internet and to FAO headquarters in Rome is accomplished via a leased line from FAORLC to the Entel Chile organization at 256kbps, a relatively modest speed. Traffic to Rome is encrypted for security purposes. Negotiations are under way to increase the bandwidth of this line in response to substantial traffic between Santiago and Rome for general data flow, for Oracle Database applications, and increased general use of the Internet. This is a necessity if RLC is to handle the traffic load placed on it. Two possible upgrade options are being explored, one is a T1 line and the other a dedicated terrestrial data line to Rome.

Additional thought must also be given to the implications of completely including the Sub-Regional office in the Bahamas into the communications network. This, too, will require additional data communications bandwidth.

Table 1

Organizational Structure of FAO Regional Office for Latin America and the Caribbean--  
Santiago, Chile

Office of the Assistant Director-General  
Public Information Unit

Deputy Regional Representative for Latin America and the Caribbean  
Management Support Unit  
Office of Finance and Administration  
Administration  
Training  
Accounting  
Legal  
Medical  
Personnel Division  
Information Technology Unit  
Email  
Web Master  
Registry  
Library  
Fax  
Post

Office of the FAO Representative in Chile

Group for Cooperation with the World Bank

Agriculture Department Group  
Land and Water Development  
Plant Protection  
Plant Production  
Animal Production and Health  
Marketing and Credit  
Animal Health

Economic and Social Development Group  
Commodities  
Food and Nutrition

Policy Assistance Group  
Agricultural Policy  
Agricultural Policy Economics  
Development and Planning

Sustainable Development Group  
Women and Development  
Agricultural Education and Extension

Fisheries Group  
Forestry Group

Operations for Latin America and the Caribbean  
Administration  
Country Project Officers

Sub Regional Office for the Caribbean (Located in Barbados)

## The Registry<sup>2</sup>

The Registry is a department of RLC under the Information Technology Unit which receives some categories of letters, faxes and email for the FAORLC archive. The staff in the Registry is composed of two clerks, one fax clerk, and one mail clerk. The position of Supervisor of the Registry is vacant.

Letters and some categories of faxes are registered, forwarded (if appropriate) for action, and returned back to the Registry after appropriate action has been taken. In early 1999 the Registry was handling about 30-50 letters, about 10 faxes, and about 40-70 email messages per day. The email messages are divided into two categories, one consists of messages sent to the Registry for filing purposes only (about 30-50 per day), and the other are messages (about 10-20 per day) for action or information that come from sources outside the Regional Office.

### Letters

When a letter is received at the Registry it is stamped as received and recorded using an electronic form in a system called DIRMAIL. Figure 1 shows the information recorded on the form. This form is an excellent example of the way in which all electronic correspondence could be described. Important information is captured about the document, such as a unique log identification number, a Registry Code, document type, status, deadline, and dates received and sent. A list of major subjects of the Registry Codes is given in Appendix 1. These codes provide a detailed method for classifying the material the Registry receives.

In addition, if the letter requires action, a second form is completed. See Figure 2. On this form the Registry personnel complete information on who is to take action and when the action must be completed. The electronic form information about a document is stored in a file which is only used and available by the Registry staff, not on the FAORLC's shared Q: disk.

As can be observed, the type of information the Registry is recording is very similar to the information that a Workflow Management system (such as one imbedded as part of Exchange Server, Keyflow, Documentum, or PCDocs) provides. In the case of the Registry, origination of the workflow is automatic, but all follow-up is performed manually, if at all. If the process were under the control of an EDMS, follow-up would be managed automatically by the software which would send email reminders if necessary.

### Faxes

Some Regional Office departments have their own fax machine but there is also a central fax service computer at the Registry. The Registry's fax machine receives two categories of faxes, faxes for the Project Offices (like FAO/Japan or the Forestry Project)

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<sup>2</sup> I was aided in the preparation of this section by Monica Hales.

and faxes for the Regional Office. The latter category of faxes are registered and processed just like letters (see above).

## Email

The Registry receives certain categories of email. They include email addressed to the Regional Office itself (FAORLC) rather than individuals, and email that is sent by staff members in RLC to the Registry for archiving. The email addressed to the Regional Office is coded just like letters and are logged in the Registry email file by date.

The email that is sent by staff members to the Registry are coded according to subject, printed out, and filed in their printed form according to subject in the Registry.

If an email message addressed to FAORLC contains an attachment, the message itself is delivered together with the attachment to the individual designated to handle the message. In addition, the message and attachment are given to a former member of Registry staff for filing and indexing in an Access database.<sup>3</sup>

## Registry Standard

The structure of the registry offers a great deal of potential for organizing an EDMS. The Registry staff is performing functions that have to be performed in an EDMS, namely receiving and logging materials. However, with the advent of an increase in electronic communications, the Registry is not receiving much of the material it should in order to maintain an institutional archive. This problem can be remedied by developing and promulgating standards that all staff should use for sending electronic material to be registered.

Some relevant standards do exist. One of particular relevance is Administrative Circular 94/34 on email policies and procedures. Selected sections of it are reproduced as Appendix 2. The Circular gives a good classification system for email messages, and guidance on when messages should be forwarded to the registry, what information should be filled in on them to facilitate identification, and what constitutes proper and improper use of email. The information is as relevant now in the design of an EDMS as it was when written in 1994.

Appendix 3 and Appendix 4 give two examples. The first is the partial contents of the FAO Manual Section 601 Appendix D which gives specific rules for handling electronic mail. Many of these rules are applicable at FAORLC. The second is the partial contents of FAO Manual Section 601.4 which describes the way in which mail (in general) is handled by the registry. Again, many of these rules as well, are applicable.

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<sup>3</sup> Logically, the processing of attachments should be done within the registry. But the person who was assigned to this task changed jobs. She kept this one responsibility because the remaining registry staff did not have the skills nor training to perform it.



## Recommendations for Reorganization of the Registry

1. The system presently used at the Registry has been functioning for a long time with efficiency. Presently the major problem is that electronic communications are received directly by the addressees who rarely send copies of them to the registry. Not only does the Registry not receive copies of the incoming message but also copies of the reply. The Registry was reorganized about one year ago in response to present needs. Professionals and secretaries should be instructed to send copies of relevant messages to be kept in a central file.
2. Modify the existing operations of the Registry to accommodate the receipt of electronic materials. The new electronic Registry would have the same properties as the current registry: materials can be read, but not changed or deleted.
3. Develop a computer program which analyze the content of the electronic messages and attempt to assign a Registry Code to them automatically.
4. RLC must establish standards and guidelines for electronic filing of documents. The standards must include examples to help staff with operational problems. It is recommended that FAO guidelines, such as that found in MANUAL Section 601, and Section 601 Appendix D be examined. They clearly indicate that every official communication should be sent to the central registry. They even indicate that the message should include a Registry code.
5. It is important to inform staff about the Registry Codes with the corresponding subjects in such a way that each person can understand where they can find the subject with which they are concerned. The codes themselves should be available on-line and easily searchable.
6. When the Registry forwards documents for action, workflow management tools should be employed to insure that proper action has been taken.
7. In conversations with some staff members, it was found that most of them keep their own personal files, some in hard copy, some electronically. They would be willing to send documents to the Registry if they had a clear vision of how the Registry functions, that they could easily find materials they had previously sent to the Registry, and that materials they had sent were secure. A well-organized Registry would contribute to facilitating important information to all staff.
8. It is reasonable that selected groups or units maintain their own files, such as Personnel and Finance. But if a well organized and secure Registry exists there is no reason why individual stores of information and project information can not be moved to the Registry.

9. Staff in the Registry needs to be reorganized. There needs to be one person responsible for the work done by the staff assigned to the Registry. This person must understand the structure of RLC, and be able to make intelligent decisions about how information should be organized, filed, routed, and discarded. The person must be familiar with working procedures within each of the Technical Offices, must be in constant contact with all members of RLC in order to be informed of all ongoing activities.
10. A unit within the Registry should be established to electronically scan certain categories of materials such as hard-copy letters. This group (or individual) would have the responsibility to take incoming hard-copy materials, and based on a Procedures Manual, scan document, forward them to the Library (if appropriate), enter a description of the contents of the scanned image into a database, and scan the materials.
11. Procedures must be developed to decide what part of the current holdings of the Registry should be scanned into the electronic registry.
12. Staff in the Registry must undergo training in Electronic Document Management System concepts and operations.
13. RLC members should be thoroughly informed of the organization of the Registry and how their participation, by forwarding materials to it, contributes to its success.
14. A highly trained and professional head of the Registry Unit is essential if the Registry is to move forward to take a leadership role in organizing and maintaining an EDMS repository. The position is currently vacant. The job description has been drafted so that it gives emphasis to the person's new role in the EDMS. The individual also needs some good computing skills to be able to take a principal role in the EDMS, such as the ability to work with database management systems, understand and program in *Visual Basic*, and participate in the management of the *Exchange Server*.

Figure 1

Electronic Form Used by Registry to Record Receipt of Electronic Documents

The screenshot shows a Windows-style application window titled "Director's Office Mail Logging". The menu bar includes "File", "Logging", "Query", "Reference", "Options", "Window", and "Help". Below the menu is a toolbar with icons for various functions. The main area is titled "Incoming Mail" and contains several input fields and buttons. The "Document" section includes "Log Number", "Doc. Type", "ODG Log No.", "Status", "Reg. Code", "Deadline Type", "Dates Received" (with a date of 10/3/99), "Sent", and "Deadline". The "From..." section includes "Name", "Organization", and "Division". The "Addressee" section includes "TO", "CC", and "Through". There are also "Subject" and "Comments And Remarks" text areas. At the bottom, there are buttons for "No Action.", "For Action...", "Add", "Modify", "Clear", "Search...", and "Cancel". The user's name "ojeda" is visible in the bottom right corner.

Document		Dates	
Log Number		Received	10/3/99
ODG Log No.		Sent	
Reg. Code		Deadline	

From...		Addressee	
Name		TO	
Organization		CC	
Division		Through	

Subject

Comments And Remarks

No Action. For Action... Add Modify Clear Search... Cancel

ojeda

Figure 2

Electronic Form Used by Registry to Manage Routing of Electronic Documents

The 'For Action' dialog box contains the following fields and controls:

- For Action....**: A label for the main section.
- Name**: A text input field with a dropdown arrow.
- Action**: A large text input area with up and down arrows on the right.
- Reply**: A checkbox.
- Due by**: A text input field.
- Completed**: A label for the completion status section.
- Completed**: Radio buttons for **Y** and **N**, with **N** selected.
- Date**: A text input field.

Below the fields is a table with the following data:

Name	Reply	Due By	Comp.	Date Comp.	Action
BRIGNOL, R.	N		N		
GORDILLO, G.			N		
LOPEZ-RAMIREZ, T.			N		
REPRESENTACION			N		
ROJAS, G.			N		
SCHEJTMAN, A.	Y	24/3/99	N		FOR ACTION

At the bottom of the dialog are five buttons: **Add**, **Modify**, **Delete**, **Clear**, and **Cancel**.

## The Library

FAORLC maintains a Special Library at its facility in Santiago. This library has been recently downsized from a normal collection of books, periodicals (*serials*), leaflets, and documents to exclude all but reference books in its book collection. The library is staffed by one full-time librarian (Adriana Paul) and one library assistant (Luis Avila).

The physical space of the library has been reduced and the hours that the library is open to the public have also been reduced. Before the collection was reduced in size, roughly 10 clients per day came to the library from outside FAORLC. Now the number has been reduced to three. In addition, the library receives requests from RLC staff members who physically come to the library and also send their requests electronically to the library. Individuals outside RLC also phone or send requests to the library for information. The total number of requests received by email per month is in the range of 20-30.

Currently the library receives several types of materials: FAO technical reports (known as *documents* within the library), FAO serials, FAO pamphlets, and some general reference books. Serials are received from Rome in an English and Spanish version (two copies of the later—one retained by the library). The serials are checked in using a standard manual serials check-in system, and cross-references are maintained between the English and Spanish title of the serial. The serials check-in system is well maintained and provides a very accurate indication of the library's holdings.

FAO documents are received from Headquarters and information about them is entered on a 4"x6" cards to record the title, author, and other bibliographic information. A computer database of holdings of books edited by FAO but published outside the organization, leaflets up to 100 pages, and books are also maintained using the *ISIS* software package developed by UNESCO in Paris.

Extensive use is made of bibliographic databases for answering user questions and managing the collection. These databases are available through the Internet and on locally-held Compact Disks. Among the databases used are AGRIS, BIBA (Bases de Informacion Bibliografica Agricola (<http://www.inia.ci/biblioteca>) an agricultural database maintained in Chile, Food Science and Technology Abstracts (FSTA), Aquatic Science and Fisheries Abstract (ASFA). The library also uses two commercial database services Proquest (a general source of US scientific journal citations and text) and ScienceDirect (consisting mostly of documents published by Elsevier). See <http://www.umi.com/proquest/global.html> and <http://www.sciencedirect.com>.

Very few of the serials and documents that the library receives are in both paper and electronic form. The vast majority are in paper form. It appears that the number of electronic documents is increasing, but at the moment (early 1999) only 1-2% of the documents arrive electronically. Some revisions of documents now arrive electronically, but the entire documents themselves are never produced and disseminated

electronically. The librarian feels that the percentage of electronic documents received will grow over time but it is not clear how soon.

The librarian disseminates information about new materials on a daily basis. These email messages are tailored to individuals with specific interests within RLC.

Bibliographic control over the FAO publications is almost impossible to achieve for the librarian in Santiago and for most agricultural librarians around the world. FAO does not seem to exercise any bibliographic control and does not seem to maintain a union catalog of its publications. The librarian would like to be able to fully use some of the bibliographic resources at the Headquarters library, but many of them (such as CD's) are not available easily through the Internet.

### Potential Contribution of the Library to an EDMS

The library offers FAORLC several services that can be important to an EDMS. The main one is bibliographic control. Libraries are in the business of organizing information and providing access to information. The RLC library is no exception and the RLC librarian understands bibliographic control. All documents stored in an EDMS must be identified, organized, and indexed. The RLC library uses tools that provide a systematic organization of agricultural literature on a daily basis and could apply these tools to electronic documents. Among the tools for organizing information are AGROVOC [1]<sup>4</sup>, a multilingual agricultural thesaurus, the *CAB Thesaurus* [6], and a translation of the later thesaurus between English and Spanish [5]. Figure 3 presents a very small example of entries from the *CAB Thesaurus* to illustrate the nature of a structured indexing system. In the Figure there are four main entries (Acer Saccharum, Acer Spicatum, Acer Tataricum and Acetic Acid). Under each entry are a series of other words preceded by a code such as BT, rt, etc. For the entry Acer Saccharum, there are five terms that are considered broader, acer, aceraceae, forest trees, ornamental plants, and sugar crops. If one was trying to describe a document more generally than saying it was about Acer Saccharum, one could pick one of the five broader terms. If one was trying to describe some document that was similar to Acer Saccharum, the thesaurus would suggest a related term (rt) such as maple syrup or syrups.

It may appear that this structure or the example chosen to illustrate this section is too complex. But in a recent report on their EDMS work in Rome, Headquarters reports that they believe that indexing of documents in an EDMS should use AGROVOC and similar thesauri for identifying the content of FAO documents.

### Requirements for an EDMS

Most of the materials the library currently receives are in printed form and it would be costly to scan and store them in an EDMS. Some categories of items such as

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<sup>4</sup> Numbers in square brackets refer to items in the Bibliography.

announcements of new publications or new items received by the library could benefit by being stored in the EDMS repository. Similarly the responses to specialized information requests could be saved and stored in a classified FAQ (Frequently Asked Questions) section of the repository. As more and more RLC documents are produced electronically, the library should be involved in organizing them on the RLC Web site.

## Requirements for a Library Automation System

The library currently uses manual methods and modest library automation tools to maintain its collection. General database management tools are not sophisticated enough to be used for library applications. See Cooper [3] for details. The library needs to acquire a small personal-computer based library automation system to handle its needs and provide a Web interface to its holdings.



Figure 3

Sample Entries from *CAB Thesaurus*

**ACER SACCHARUM**

**BT1** acer  
**BT2** aceraceae  
**BT1** forest trees  
**BT1** ornamental plants  
**BT1** sugar crops  
**rt** maple syrup  
**rt** syrups

**ACER SPICATUM**

**ST1** acer  
**RT2** aceraceae  
**BT1** forest trees  
**BT1** ornamental plants

**ACER TATARICUM**

**BT1** acer  
**BT2** aceraceae  
**BT1** forest trees  
**BT1** ornamental plants  
**BT1** weeds

**ACETIC ACID**

**BT1** preservatives  
**BT1** volatile fatty acids  
**ST2** fatty acids  
**BT3** lipids  
**BT2** volatile compounds  
**NT1** dichloroacetic acid  
**NT1** fluoroacetic acid  
**NT1** peracetic acid  
**NT1** tca  
**NT1** 2,4,6-trichlorophenoxyacetic acid  
**rt** acetamides  
**rt** acetates  
**rt** acetic acid additives  
**rt** tca  
**rt** vinegar

Source: Adapted from [6].

## The Q Shared Disk

One of the principal electronic data stores in current use at RLC is the so-called Q: disk, which is a general repository of electronic information. The Q: disk is really a section of disk space on one of the RLC server computers named Rlc\_s02. The Rlc\_s02 server has many folders and files in it. One of the main categories of folders is called CORP (Rlc\_s02\CORP) and when users refer to Q: they are referring to this path. Below the CORP folder are a number of subdivisions, one called Corpinfo (Rlc\_s02\CORP\Corpinfo) which contains two other subfolders of major significance. They are FAOCORP (which is Rlc\_s02\CORP\Corpinfo\FAOCORP) and RLCCORP (Rlc\_s02\CORP\Corpinfo\RLCCORP). The former contains files downloaded from Headquarters on a daily basis, and later contains files organized and maintained by the Information Technology Group and the Registry Unit. The RLCCORP directory contains material of general interest to RLC and can be read by anyone in the organization. At the same level as Corpinfo, (namely Rlc\_s02\CORP\...) are a series of public working directories that have been created to serve as a repository of information for RLC units. Access to these directories generally is restricted to the group involved, such as Forestry or Publications), whose members can read, write, or delete materials from them, as well as create new folders below them. One other directory which is also at the same level as Corpinfo is Registry. This is the folder into which the Registry Unit files electronic materials and its contents are under Registry Unit control.<sup>5</sup>

### Problem Areas

In essence, the Q: disk represents a repository of electronic information at the regional office. The disk's structure has expanded since its initiation and currently has a number of problems.

1. Materials are duplicated between folders.
2. The names of folders are incomprehensible.
3. Many RLC users do not know about other folders with useful information that are outside the Q:\Corpinfo disk.
4. When users need to locate materials on the disk, they often have to call others to find its location.
5. There is no working index to the materials in the disk.

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<sup>5</sup> The contents of the Q: disk were analyzed by Jeannette Catalan [4] in a report prepared for the Information Technology Officer on March 2, 1999.

6. There is no systematic attempt to associate meta-level data with material stored on the disk. If there were meta-level data, such as subject, registry code, keywords, or content description there would be some possibility of finding materials.
7. User rights to create, access, edit, or delete files and folders are ill defined.
8. User groups (i.e. groups of users who should have the same rights to access, etc. folders and files) are not well defined. This inhibits inter-group collaboration and access.
9. Security has not been well-defined or strictly enforced. Thus some users are reluctant to use the store to file sensitive information.

## Recommendations

RLC needs something equivalent to the current Q: disk if it is to electronically store documents. To this end it needs to take a number of steps.

1. Develop a rational organization scheme for the Q: disk or its equivalent. The Information Technology Officer has already convened a task force consisting of representative members of the RLC user community to review the problem and make recommendations.
2. Consider as an interim step establishing a series of folders for each major organizational group (See Table 1) on the drive.
3. Create User Groups consisting of members of each Group and/or Department in RLC.
4. Assign User Groups the rights to create, access, maintain, and delete all folders and files below the Group level.
5. Begin working on a form that a user will be required to complete electronically when a document is filed in a folder on the disk.

## User Needs and Requirements

An important aspect of the design and implementation of an EDMS is an assessment of the way in which users currently work with paper and electronic documents. Previous sections of this report looked at the institutional organizations of Registry and Library as repositories and access points to information. This section presents the results of eight interviews with individuals in the RLC organization:

- Carlos Arellano. Animal Production and Health Officer. Agriculture Group (AGA)
- Nancy Ayub. Secretary Forestry Department Group
- Carol Chatterton, Personnel Clerk, Personnel Unit (formerly of the Registry Unit)
- Angela Elgueta, Programming Assistant, Management Support Unit (RLCX)
- Roberto Samanez Chief of Operations for Latin America and the Caribbean Unit (RLCR) and Mitzi Fabregat (Secretary to Roberto Samanez)
- Marcela Sanguinetti, WebMaster, Information Unit
- Jan Steverlynck. Senior Policy/Programme Officer. Policy Assistance Branch
- Moises Vargas. Animal Health Officer in the Agriculture Group (AGAH)

Carlos Arellano. Animal Production and Health Officer. Agriculture Group (AGA).

Dr. Arellano has two major job functions. One is group leader in the Agriculture Group, consisting of Land and Water Development, Plant Protection, Plant Production, Animal Production and Health, and Marketing and Credit. The other is as Secretary to the Livestock Development Commission for Latin America and the Caribbean. Approximately 50% of his time is spent in the preparation of project documents at the request of governments. Twenty percent is devoted to technical assistance to governments, and the remainder to operational activities. He is in communication with approximately 20 Regional FAO representatives in Latin America and the Caribbean, government technical officers, peers, consultants, and project staff.

The majority of Dr. Arellano's correspondence is conducted electronically. Approximately 70% of all his correspondence with government officials and others in the field is performed electronically. All his correspondence with Rome is done electronically. He uses Microsoft *Word* and *Excel* in the normal course of his business and is beginning to use Microsoft *Access* for database applications. Many of the technical documents he prepares or are prepared for him are reviewed and disseminated electronically. Interdisciplinary teams formed to address specific issues, such as a core team addressing food security issues in one country, hold their meetings electronically (a *virtual* meeting).

Electronic mail is saved and organized in Personal Folder by subject using the Microsoft *Outlook* software system. Dr. Arellano has developed a directory structure for the documents which grows according to his needs. He also has created a Personal Folder in which he manually stores all the messages he receives from a list server (*listserv*), called ProMed, dealing with worldwide human and animal epidemiological news. He maintains hardcopies of documents that require signatures or authorizations, and other miscellaneous items.

Like others interviewed, Dr. Arellano is worried about effectively storing and retrieving electronic materials. He believes that his storage structure is good, but as the volume of material he handles grows he will be unable to find items. He would like to see standardized criteria developed for identifying electronic messages, and guidelines for deciding which electronic documents should be forwarded to the Registry. He suggests that a default be established when email is created in FAORLC, which would have a carbon copy sent to the Registry. If the creator did not think this appropriate, the person could delete this cc from the message window.

#### Requirements for an EDMS

Develop guidelines for when electronic messages should be sent on origination, or forwarded on receipt, to the electronic registry.

Be able to easily search the EDMS archive to find stored messages.

Establish forms that will allow automatic forwarding of messages to the electronic registry.

Employ a staff member to verify that items are stored properly in the electronic repository.

## Nancy Ayub. Secretary Forestry Department Group

Ms. Ayub provides secretarial support to members of the Forestry Department Group. This group consists of about 6 professional staff members, one other secretary and one library assistant. She performs much of her work using email. She sends and receives email messages from her group, drafts email messages that are forwarded by the professional staff, manages the translation of documents with consultants, and manages the production of documents for a biannual conference of the Latin American and Caribbean Forestry Commission. She is also the recipient of email messages addressed to the group from FAO in Rome.

She makes extensive use of *Outlook* to manage her electronic files. The material is stored in categories by letters, faxes, memorandum, and documents. It is further classified by year (in some cases), officer in charge, and project. She uses forms from Microsoft *Word* to produce some documents such as personal histories of staff.

Significant changes are taking place in the way an office handles its communications. Before the introduction of electronic communications, a secretary was a gatekeeper, a person who received phone calls, letters, faxes, documents, and the like, and forwarded them to appropriate individuals for handling. The secretary knew what information was flowing through the group and knew who was handling or in charge of materials. With decentralization of communication, communications bypass the secretary. The only way in which she can continue her previous role is for those who receive communications to forward them to her for either filing, information, or action. This places a new role on the other members of the group to keep her informed. Ms. Ayub is experiencing this problem.

Very few, if any, of the documents that Ms. Ayub processes are forwarded to the Registry. In addition, she makes very little use of the shared Q: disk for storing documents of general interest to the Regional Office.

### Requirements for an EDMS

1. Automatic routing of email messages from her group members to her based on predefined rules.
2. Managing workflow for translation and editing of technical reports by passing them to contractors for work, receiving the completed materials, and revising the materials.
3. Managing workflow involved in the preparation of technical reports: from creation at RLC, review in Rome, revision at RLC, correction at RLC, printing of the final report, and publishing the final report to the RLC Web site.

4. Design of an efficient filing system in the EDMS store that would allow the same functionality as currently is available in her personal directory.



Carol Chatterton, Personnel Clerk, Personnel Unit

Ms. Chatterton has two principal job functions: processing contracts and travel arrangements for consultants, and maintaining the electronic Registry structure and filing some materials in it.

As Personnel Clerk, Ms. Chatterton receives requests from the Operations Unit to initiate administrative procedures to obtain consultant services under different types of agreements. These requests are accompanied by a Personal History Form which contains information necessary to process the appointment in PERSYS. PERSYS is part of a computer software package in Rome system which manages financial, personnel and travel-related activities for FAO staff and consultants. A post (position) must first be established in the PERSYS system, and then the necessary actions for the consultant's appointment entered. All hardcopies of documents pertaining to the consultant services are printed in Santiago. If necessary (e.g. payments), they are signed, and, in the case of travel, forwarded to the travel unit in Santiago.

As well as consultants, she assists with the handling of other requests from the Regional Officers and field staff regarding entitlements, etc. This often involves the use of the FAO MANUAL (partially available in WordPerfect format), and other circulars or official notices. Many of the standard Personnel/Administrative forms are available as *Word* templates sent from Headquarters.

Some Personal History Forms are received electronically, and some in paper form. Ms. Chatterton does not believe it useful to scan the paper versions of the forms since the material in them changes frequently and often must be updated before a consultant is hired a second time.

Many different forms are needed for all aspects of the process. Ms. Chatterton has created an extensive library of Word templates on the Q: disk (Q:\Personnel\Templates) which she calls up as needed, completes information in them, and either prints or electronically forwards them to the appropriate party. After the template has been filled in electronically, its completed version is filed as a document labeled with the consultant's name. The process of handling most actions is simple enough that Ms. Chatterton feels little need for EDMS workflow management. Almost all of her activities are handled electronically, the exceptions being contracts which are sent by fax as they must have the appropriate signature.

The Registry receives electronic mail sent to the general FAORLC mailbox. The email is handled by two parties, the registry staff and Ms. Chatterton, as part of her former post. Once an email message is received, it is opened by the Registry staff, and forwarded to the appropriate parties for handling. If the message contains an electronic attachment, Ms. Chatterton takes certain actions: she reviews the content of the attachment and the message body, decides where the attachment should be filed in the \\Rlc\_s02\CORP\Corpinfo\Rlcinfo

directory, removes the attachment from the email message, inserts a line into the message indicating where the attachment was filed, files the message, files the attachment, and updates an Access database with information about the attachment and where it was stored. The volume of these transactions was 20-30 per day but recently has declined to 1-5 per day. Some attachments, which are of specific use for only one particular group, are saved specifically in that area and not in the general use RLCInfo folder.

The folder structure of the Registry is entirely of Ms. Chatterton's making. It is an effective arrangement for her but is not well documented. The result is that others would find it quite difficult to find things in it. There has been a proposal that the database be incorporated in the internal Web site to enable easy access to these documents. However this was not completed with the initial release of the Web site.

Requirements for an EDMS.

1. Meta-level data attached to documents to support their storage.
2. Excellent search capabilities to locate stored documents.
3. Improved workflow management to handle Registry email.

Angela Elgueta, Programming Assistant, Management Support Unit (RLCX).

The Regional Office has its own programs and also projects (field program). Ms. Elgueta coordinates the Regional Office budget and planning functions for its work programs. This includes assembling general and financial information about a program and the biannual work plan. Examples of components of a budget for a program include consultants, travel, training, seminars, courses, meetings, special studies, preparation of technical documents, technical assistance to governments.

The process of managing a budget for a program involves tracking financial data as the project continues. Before expenditures are incurred, they must be approved according to the budget for the program. As expenses are incurred, the Programming Assistant receives reports on expenditures and updates the budget for the program. Information from individual activities is synthesized and forwarded in a different type of format to Headquarters for monitoring purposes.

Almost 80% of all documents handled in this office are electronic. The remaining 20% of the documents require signature or authorization are processed in paper form. There is almost no reason why most of the paper documents need to exist in this form if adequate electronic signature methods could be implemented. Further, there is little or no need to scan documents into an electronic system.

Numerous forms are used to manage program budgets, and Ms. Elgueta has thoroughly systematized and automated the electronic production, distribution, and receipt of forms. Forms are available as shared resources on the Q: disk, and also by clicking on the *FAO icon* at the top left corner of the Microsoft Word toolbar.

In addition to systematically using forms, Ms. Elgueta has developed a number of flowcharts for each activity. Figure 4 is an example for Officer Duty Travel. The flowchart is an excellent example of a systems analysis of a process. It gives a clear and detailed example of how a particular operation is performed.

#### Requirements for an EDMS

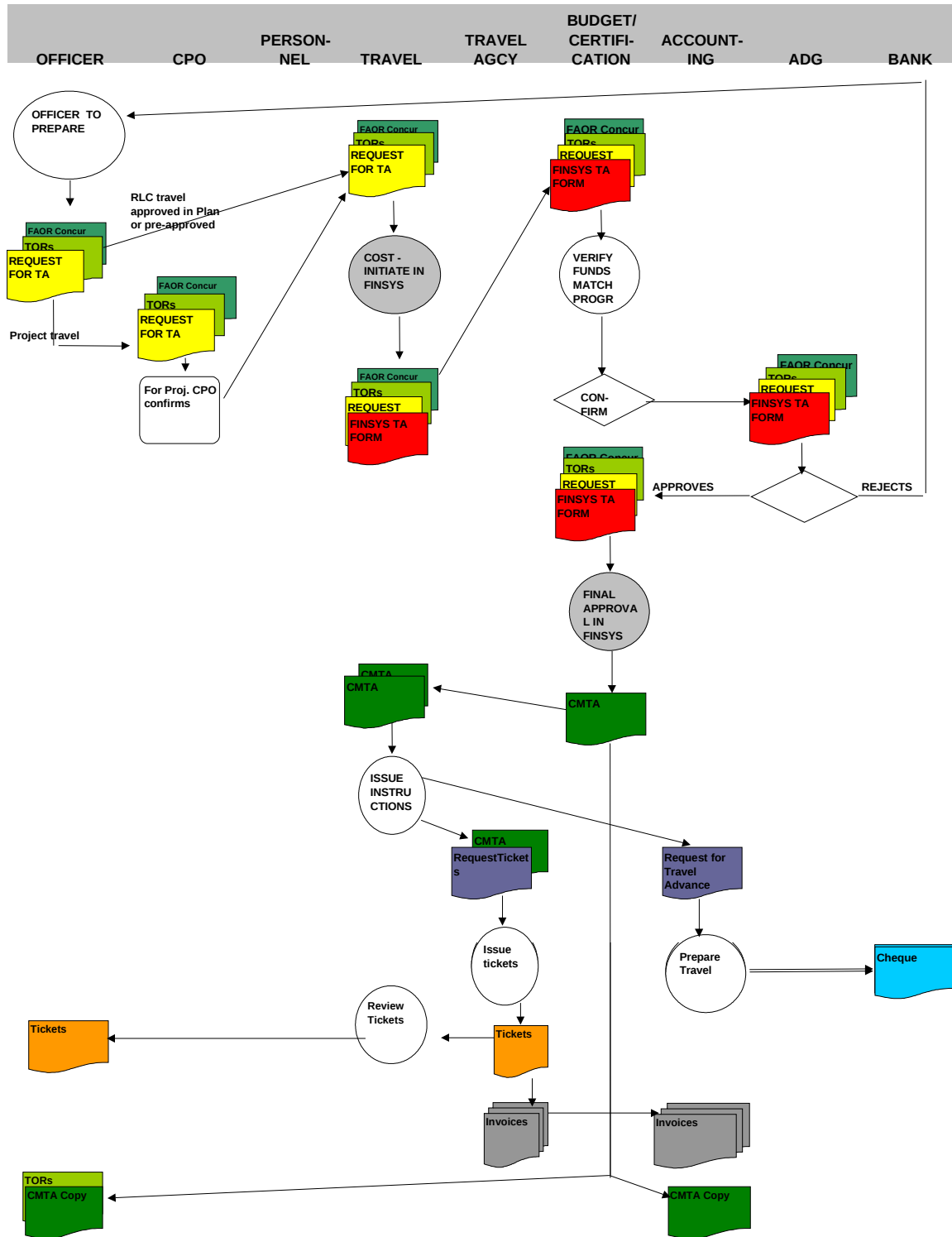
The program and budget functions performed in this unit are excellent candidates for the use of an EDMS in a number of areas.

1. **Standardized Form Identification.** Numerous electronic forms are already used effectively by the unit. But there are many forms, some of which overlap in function. The unit needs to eliminate duplicate forms as a precursor to switching over to an EDMS.
2. **Form Version Control.** Too many copies of forms exist. An EDMS could deal with this problem by tracking the latest version and eliminating duplication.

3. Form Storage. Forms are currently stored in multiple locations on the shared disk storage system and on local workstations. An EDMS could rationalize form storage.
4. Search Capability. Forms are not easily located. With an EDMS' search capability they could easily be found when needed.
5. Workflow Management. The units flowcharts can be easily adapted to electronic workflow management. This is a natural application of an EDMS which could easily increase unit effectiveness.
6. Repository Manager. The unit believes that if an EDMS is to be effective, a person must be delegated to manage the storage of materials in it.
7. Electronic Signature. The unit could benefit from the ability to electronically sign documents and have that electronic signature meet all legal and auditing standards. Implementation of a *Key Server* system (a server computer that could authenticate and dispense electronic signatures and keys) could be done, but is somewhat outside the scope of the design of an EDMS. Nevertheless it should be evaluated.

Figure 4

# RLC Officer Duty Travel Flowchart



Roberto Samanez Chief of Operations for Latin America and the Caribbean Unit (RLCR) and Mitzi Fabregat (Secretary to Roberto Samanez).

The RLCR unit is responsible for the financial, administrative, and logistical matters related to projects that take place within the Region. Currently (early 1999) there are about 200 ongoing projects (each with a unique project code) in 33 countries with many other ideas for projects, project proposals, and projects awaiting funding. The unit has seven country project officers who divide their responsibilities geographically and manage multiple projects within the region. Some projects are regional and are handled by the Chief of the Unit.

According to Mr. Samanez, the unit handles a very large volume of both paper and electronic documents. He has indicated that on a typical day close to 500 email messages are received, and in a typical week 3000 pieces of paper are received. Paper copies of documents are filed in a registry that the unit maintains (separate from the central Registry) according to projects. This room is approximately 24 square meters in size and filled to capacity. One person spends about half her time maintaining this registry.

Electronic documents (including email) are filed in a Private directory of the Unit Chief. A second copy of electronic documents is also maintained. Email messages originated by the project officers are copied to the chief of the unit, who files the messages by country, then project, then project code.

Project-related materials are sometimes received in paper copy or via fax. These documents are filed in their RLCR registry.

Since the unit handles legal and financial documents it has defined record retention requirements. It must keep copies of certain documents for at least five years, but at least five years beyond the end of a project. The unit is subject to audit and must be able to substantiate the disbursement of funds. Thus it has considerable safeguards in place to protect its documents. For this reason and others, only certain documents are transmitted electronically; others are printed, signed, and a copy retained.

Because of the volume of material received, the unit has little space left in its physical registry. It also rapidly uses available space on its computer workstations for filing electronic documents. The registry and email files have a well-defined structure. The volume of material stored in the email files makes it extremely difficult for the staff to quickly and efficiently locate items.

#### Requirements for an EDMS

For an EDMS to meet the needs of this unit, it needs to meet certain requirements. They include:

1. Security. The system must be extremely secure since the unit is handling materials that are considered confidential (such as personnel information) and involves money.
2. Capacity. The volume of transactions that are handled is high relative to other units in RLC. A system must be able to meet the electronic storage needs of the unit and response-time requirements.
3. Automatic email routing. Email messages are filed by country, project, and project number. When a message originates, the unit wants a mandatory requirement that the message be identified with these three pieces of information. If the items are not supplied, the sender would not be allowed to initiate and/or forward the message. Once the message is received at a central repository, the EDMS system should be able to automatically file the message.
4. Scanning. Some project reports and fax messages arrive in paper copy. A comprehensive EDMS solution for the unit is to have the capability to electronically scan the material and file it in the electronic registry.
5. Change Project Status: The EDMS must allow the unit work on project proposals and when the proposals become accepted, change the labeling of the proposals from *proposal* to *project*.
6. Identification of project status. Projects move from being ideas to proposals seeking financing to approved projects. The EDMS must support the migration of the electronic documents from one status to another.

Marcela Sanguineti, WebMaster, Information Unit.

Ms. Sanguineti has several major job responsibilities: maintaining the RLC Web page, coordinating the work of RLC's Publication Committee, other information management tasks, and publications support for the biannual Regional Conference.

RLC recently initiated its own Web site, making available a complex variety of information via the Internet. This was a significant undertaking and the task of maintaining and augmenting the Web site has been given to Ms. Sanguineti. Since the site is new, it is undergoing many changes with the addition of more materials, the introduction of a search engine, and continual reorganization. This activity takes about 70% of her time.

With the introduction of the Web site, Ms. Sanguineti is beginning to receive email messages addressed to the WebMaster at RLC requesting a variety of information. While some of these messages probably fall within her job, most are likely general information questions which should be referred to others. The volume of mail received this way is bound to increase over time, and procedures must be put in place to handle it.

The Publications Committee was established for a number of reasons, including to develop policies on which RLC-generated materials should be printed, and/or made available on the Web site. Ms. Sanguineti sits on this committee and coordinates the Web publishing of materials selected for dissemination. Since Web publishing is just in its infancy at RLC (about five documents per year as of March 1999), the workload is small. But Ms. Sanguineti expects the number of documents made available over the Web to increase substantially and must build an infrastructure to support it. The capabilities of an EDMS to automatically publish documents from the EDMS repository are extremely attractive since they would automate a cumbersome manual process that is repeated with each change to a Web page.

Every two years RLC conducts a Regional Conference. Ms. Sanguineti coordinates the editing of approximately ten documents (averaging about 30 pages per document) with about 8-9 different authors. This activity takes about 20% of her time and requires constant document revision, workflow management, and coordination with Headquarters for approvals of various types. For her, version control of evolving documents and workflow management of the production of the reports are extremely attractive features of an EDMS.

In response to her present and previous jobs, Ms. Sanguineti maintains a constantly evolving set of Personal Folders in Outlook which she adapts to changing requirements. At the moment they are divided into three major categories, editing (a former responsibility), the Web, and Regional Conferences. Many subfolders help her organize materials by individual, project, or publishing program. In Public Folders on the Q: disk she maintains documents related to the Publications Committee.



Some synergy is possible between the Publications Committee and the Library since the plans of the former seem to be shifting toward electronic publishing. A liaison should be established between the two groups to work toward a common goal of more accessible RLC publications.

#### Requirements for an EDMS

1. Version control over complex documents that are prepared by a group of individuals.
2. Workflow management to route materials to Publication Committee members for review.
3. Automatic publishing of completed documents to the RLC Web site.
4. Improved indexing of electronic documents, especially those received from Rome.

Jan Steverlynck. Senior Policy/Programme Officer. Policy Assistance Branch.

The Policy Assistance Branch has two categories of activities: policy assistance to member countries on request by member governments, and program development at the country level. Both Program development and Policy assistance begins with a request from a country for technical assistance. Policy assistance requests are initiated from the governments for specific types of help. These programs are usually funded by FAO. Program assistance begins with a mission to the country to find fields of interest. If there is common interest in a program, a proposal is formulated, and then there is attempt to obtain financing from a variety of sources such as the Technical Cooperation Program (TCP) for short programs, the Government Cooperative Program (GCP), or the Unilateral Trust Fund (UTF).

The government makes a request through the FAO country representative, who forwards it to Headquarters for preparation of a project document. This request is sent automatically to RLC. Project documents are prepared and sent electronically by the Staff Member and sent to the Technical Officers for review, clearance, and comments.

Dr. Steverlynck is heavily involved in preparation of these materials, and uses Word and Excel (when appropriate) to prepare them. His Policy Assistance Branch recently moved from Rome to Santiago for decentralization purposes, and he uses email to keep in touch with his colleagues at Headquarters and RLC (approximately 20-25 messages per day). He electronically exchanges documents that need creation and revision. Each of the documents he handles requires at least two or three clearances before release, and these are processed electronically.

The email and other documents that he receives are filed in Personal Folders coded by country. He makes little use of the Q: shared disk, except occasionally reading administrative circulars or the *FAO Manual*.

In contrast to most of his colleagues, Dr. Steverlynck contributes materials to the Registry on an ongoing basis. When he feels it is appropriate, he sends hard copies of materials he receives. He also uses the Registry, but lately has been finding that materials are not current and he is forced to rely on colleagues to give him needed information. The following memorandum he prepared summarizes his views on the operations of the Registry (quoted with permission).

The RLC-Registry is seldom used and therefore it does not provide the required information for RLC work.

Many Officers are not used to utilise the RLC-Registry files in their daily work. They do not know how the RLC-Registry is organised and therefore there are not in a position to retrieve the information they require.

Not knowing how the RLC-Registry is organised, they are not able to decide what kind of correspondence and documents need to be copied for filing in the Registry. In general, outgoing correspondence or working documents prepared by individual Officers are not copied to the RLC-Registry.

Each Officer keeps the information he uses in his own office and, in consequence, the information is not readily available for other colleagues and administrative staff. This has become worse with the introduction of electronic office equipment. The information is stored in individual PC's or diskettes and nobody else knows it.

In my view there should be only one RLC-Registry at RLC to keep the record of all correspondence and documents handled at RLC. The files concerning ongoing projects operated by RLCR could be decentralised in a sub-registry at RLCR, but under direct control of the central RLC-Registry. The same could be applied for personal files decentralised at RLCX.

Dr. Steverlynck is also finding it increasingly difficult to locate materials in the library because it now houses only FAO documents. He has to resort, again, to colleagues, and to a small personal collection of materials to support his need to find current materials on countries, and other topics.

#### Requirements for an EDMS

1. Employ workflow management tools to route program documents for review.
2. Use version control to track the creation and editing of electronic documents.
3. Take advantage of the electronic repository in an EDMS to store country-related projects.
4. Employ EDMS search tools to find materials that formerly would be located in the paper-copy Registry.

Moises Vargas. Animal Health Officer in the Agriculture Group (AGAH).

Dr. Vargas is responsible for FAO's animal health projects in Latin America and the Caribbean. He is concerned with prevention, treatment, and epidemiological impact of the trade in animals or animal products. He also acts a coordinator for FAO with six international organizations in the region and exchanges information with their staff (35-40 people) through email. He recently moved from Rome to Santiago and he continues to exchange a significant amount of information with Headquarters.

Among the tasks he performs using computers are to send and receive email (20-25 messages per day), prepare forms, write correspondence, prepare technical reports, and electronically collaborate on the preparation of technical materials. He recently (March 1999) worked with six or seven other professionals using electronic document interchange techniques to prepare a 60-80 page document requesting a bid for a vaccine for foot and mouth disease. He uses the computer in his own office, his own laptop computer, and his own computer at home to effectively perform his professional activities. Among the software he uses are Microsoft Word, Excel, PowerPoint, WinZip (to compress files), and Adobe PhotoShop (on his home computer). He makes use of graphic files (such as drawings, maps, photographs, icons) to assist in presentation of technical materials. He occasionally wishes to scan materials to include in electronic documents.

His Personal Folders in Outlook are organized in two ways, by Department then Group, and also by Country. Within a Country folder are each of the project documents with which he is concerned. He uses Outlook's Calendar function to schedule his time and finds it a reasonable method given the decline in secretarial support. He stores some materials on the Q: disk (such as PowerPoint presentations and maps) when he thinks they may be useful to others, and also to alleviate a severe disk space crisis on his own workstation. He finds it extremely difficult to find appropriate forms on the Q: disk. He makes little use of the Registry, and infrequent use of the Library.

In all, Dr. Vargas is a very competent user of computing at RLC, taking advantage of almost all software products available to him.

#### Requirements for an EDMS

1. Workflow management. There are a number of collaborative projects that would substantially benefit from an EDMS.
2. Version control. Many people collaborate on the production of technical documents. The group uses *Word* facilities to include electronic Post-It Notes on a documents to keep others informed of comments. Version control would be another tool that would add significantly to cooperation.

3. Scanning. Dr. Vargas needs scanned images for his reports and PowerPoint presentations.
4. Mobile User Support. Dr. Vargas has a computer at home and a notebook computer. He works on documents at home and on the road and needs the synchronization, check-out, and check-in features of an EDMS.

## Conclusions from User Interviews

The individuals interviewed at RLC were generally highly articulate in describing the way in which they use the RLC computing environment, how they tailor that environment to their own working needs, what benefits they see from the shared computing structure, and what EDMS requirements they have.

Without exception, the users could all benefit from some component of an EDMS, and many of the interviewees could benefit from all components. Many immediately saw how an EDMS could change the way they do business and increase their productivity. No user interviewed expressed any reluctance to participate in an EDMS once it was installed and most realized they needed the system yesterday.

Of all the components of an EDMS, most interviewees wanted a well organized and well maintained repository. They realized the necessity of identifying the materials they deposited in the repository and the slight extra workload required to perform this identification. They understood that the payoff of identification was ease of locating items, and realized that their current methods of electronic storage could not be sustained as the electronic age moved forward and paper communiqués became less frequent. With minor exceptions, the users realized that they were going to have to rely on electronic documents and wanted to improve their lives by being able to manage them effectively.

## Software Components of an EDMS

This section discusses several pieces of software that currently are in use at RLC, software that has potential in providing a solution to the EDMS problem at RLC, and an example of an integrated EDMS system. The software discussed include:

- Microsoft Exchange Server
- Microsoft Outlook Client
- Microsoft Word
- Keyflow
- PCDocs

One piece of software, SourceSafe, was examined as a possible manager of the EDMS repository and found to be more of a programming source code control system than an EDMS. Keyflow is an example of software that provides form design and routing. PCDocs is typical in its functionality of many integrated EDMS packages.

Due to time limitations, a number of other pieces of software were not reviewed. But they could play a part in providing EDMS functionality to RLC. These packages include (but are not limited to) Document Management Extensions for Exchange from 20-20 Software (<http://www.80-20.com>), index and search software packages including Verity (<http://www.verity.com>), Microsoft Index Server (<http://www.microsoft.com/ntserver/web/exec/feature/indser2.asp>), and integrated EDMS systems such as Documentum (<http://www.documentum.com/>), Xerox Corporation's Docushare (<http://www.xerox.com/products/docushare>), and Eastman Software's DMX (<http://www.eastmansoftware.com/products/pr-index.htm>).

## Microsoft *Exchange* Server and *Outlook* Client

One of the major components of the FAORLC computing environment is a piece of software called the Microsoft *Exchange* Server (or *Exchange* for short)<sup>6</sup> As the name implies, *Exchange* runs on a server computer and provides services to individual user workstations, or clients, at RLC.

The client computer communicates with *Exchange* with another piece of software, Microsoft *Outlook*. *Outlook* provides an interface to the functions available in *Exchange* as well as other features. *Outlook* provides a view of the Public and Private folders so essential to *Exchange*'s functions without the client user knowing on what server or client machine the folders reside. It also provides an interface to the email system, to global and personal address books, and schedule and calendar functions. Users can compose and receive email, add and receive attachments (such as *Word* or *Excel* documents) to email messages, and store documents of all types in *Exchange* folders.

Not only is *Exchange* used to communicate with clients but with FAO Headquarters in Rome (another server) from which data is automatically transferred constantly.

### Folders

The major functions of *Exchange* are as a tool for communicating and sharing information. It does this by providing the services that the *Outlook* interface presents to the client. The folder structure allows centralized (server) and decentralized (client) storage of information, tools for automatically filing electronic documents, tools for workflow management, and tools for automatically generating forms. Administrative tools maintain backups of the repository of information, logging of transactions, replication of repositories, and performance evaluation tools.

Two key aspects of the *Exchange* repository are the Public and Private folders. Folders in *Exchange* are no different than folders in a file cabinet or folders on ones Windows desktop. The difference here is that the contents of Public Folders (which reside on the server computer) can be shared between users and between server computers. Electronic mail for a user is stored in Private folders on a user's workstation, while user documents are stored in folders on the *Exchange* server.

In an EDMS, the software takes change of storing, indexing, and facilitating retrieval of documents. These systems generally make use of commercial database management systems to manage the repository. Thus once an EDMS is implemented there is little need to worry about the structure of Public and Private folders as they exist in *Exchange*. Until an EDMS is implemented at RLC, the problem will be to develop a

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<sup>6</sup> Previous to the release of the Microsoft *Exchange* Server, Microsoft had available a client program called *Exchange*. That product is not the same as the *Exchange* Server.



good storage structure to replace the current Q: disk design. After an EDMS comes into existence, this will not be of any concern.

### Properties of Public Folders

The administrator of an *Exchange* system can create user groups which have capabilities like individual users. An example of a group could be all the members of the Forestry Unit. The administrator can create public folders or allow individual users or user groups this privilege. When a public folder is created, certain properties of it can also be established. Many of the properties relate to who, and in what way the folders can be accessed by a client. They are summarized in Table 2 and Table 3. Table 2 shows that many specific permissions can be set, such as allowing a user to create items in a folder, create a new subfolder, and edit or delete items or folders. Establishing these permissions currently is critical to the design of a good EDMS repository.

Table 3 gives some predefined roles in *Exchange*. It shows how the permissions could be set so that some individuals can be limited in what they can do in a folder while others are not. Obviously the permissions in Table 2 can be customized in any way to establish new roles.

### Rule-Based Message Filing

At the heart of an EDMS is the repository. Information is moved into the repository in several ways: automatically, semi-automatically, or manually. Manual methods are simple. The user selects a document from the inbox and moves it to a folder. Semi-automatic filing can occur when a message is automatically sent to one folder by a user. Then an individual intervenes to insure proper classification and forwarding to its proper location. The most interesting and relevant automatic method insofar as an EDMS is concerned is Rule-Based filing.

*Exchange* offers the user the ability to automate the filing of messages with simple-to-define rules. The user specifies a specific rule to use to examine a message, such as *Move the message based on its content*. Then the user specifies what condition to check in order to make the decision, like *Where there are specific words in the subject*. Next the user decides what the disposition of the message is to be, like *Move the message to a specified folder*. And finally, the user can mention any exceptions, like *Except if the message is from a specific person*. Figure 5 lists examples of each category of rule. Needless to say this capability offers significant benefits to RLC and to individual users. For the institution, it requires the rules be developed in a consistent and understandable manner. It is well worth undertaking.

## Associate Forms with Folders

Exchange offers the capability of creating forms that can be transmitted between users. It also allows a connection between a form and a folder. The process works by the administrator creating a form, say one specifically designed to describe the contents of documents stored by Registry staff. The administrator can then tell *Exchange* that every item stored in the *Exchange* Public Folder called *Registry* must have this form completed before the document can be placed in the folder. This feature offers considerable control over what is placed in a folder. In this example it forces the user to identify the content of a document before it is filed in the Registry folder.

## Forms Design and Workflow Management

A number of RLC's administrative units make extensive use of Microsoft *Word* Templates for creating forms, and many others initiate administrative requests using these forms. *Exchange* has the ability to create forms with its Forms Designer using a full-screen interactive design process like that used in Microsoft *Access* forms and Reports creation. This feature is very powerful. For example, a form could be created which appears to look exactly like the one users employ to send email messages. However this form could be augmented with several additional fields, like a space where the user could fill in a Registry Code, space to include a description of the content of the message, or space to include keywords. With these additions, the message or document could more easily be filed in the Registry, if appropriate.

In addition, *Exchange* allows workflow management of the forms, but at the base level the process of implementing routing is relatively complex. RLC needs forms design and workflow management as part of its EDMS. But there may be products on the market that are easier to deploy than *Exchange* for this purpose. *Keyflow* is one such product and it will be discussed later.

## Can *Exchange* be Used as the Basis for an EDMS?

Any useful expansion of the functionality of *Exchange*, through the creation of electronic forms, rules, custom folders, or the like, would have to be done on many levels to be effective and usable. If you create a new form, for example, this form needs to be included in the standard set of forms available to users. If the new form contains new fields for classification, these fields would somehow need to be included in the Rule options in order to act on them. In trying to mould *Exchange* into a full function workflow system, all of this could become an enormous support and maintenance burden. Take this example: you create a form for requesting new office stationary. The form contains a number of custom fields, which identify the type and quantity of stationary needed. In order to have the message routed automatically you create a set of rules in the accounts

of the various managers in FAO, and another set in the mailbox of the Office Supplies Clerk. In addition, you create a number of special public folders which record all this information and feed an inventory control system. This would be a considerable task to set up in the first place. If there should be any change, it would involve--at least--visiting every client to install the revised form, every manager to revise the rules, the Office Supplies Clerk to revise his/her rules, and the shared folders to update properties. *Exchange* does have its role in an EDMS, but some EDMS capabilities can not be easily implemented with it.

Table 2

Public Folder Permissions

Name of Permission	Description/Interpretation of Permission
Create Items	Create files in the folder
Read Items	Read existing items in the folder
Create Subfolder	Create subfolder below this folder
Folder Owner	Become the owner of the folder
Folder Contact	Who should be notified about the folder
Folder visible	Specify whether the folder will be shown on a list of all folders in the system
Edit item	Can the person edit all, none, or only the items she or he owns in the folder
Delete item	Can the person delete all, none, or only the items she or he owns in the folder

Table 3

## Public Folder Predefined Roles

Name of Predefined Role	Permissions Associated with Role
Contributor	Read items, edit none, delete none
Reviewer	Read items
Non-Editing Author	Create items, read items, edit none, delete own
Author	Create items, read items, edit own, delete own
Publishing Author	Create items, read items, create subfolders, edit own, delete own
Editor	Create items, read items, edit all, delete all
Publishing Editor	Create items, read items, create subfolders, edit all, delete all
Owner	Create items, read items, create subfolders, folder owner, folder contact, edit all, delete all
Custom	Any combination of permission types that are not defined in a predefined role

Note: Adapted from Todd, et. al, p. 673-674.

Figure 5

Categories of Rules that can be used in Microsoft Outlook to Implement Rule-Based  
Filing of Messages

Rules to Apply

- Check messages when they arrive
- Check messages after sending
- Move new messages from someone
  - Apply this rule after the message arrives from
    - People or distribution list
  - Move it to the
    - Specified folder
- Notify me when important messages arrive
- Move messages based on content
  - Apply this rule after the message arrives
    - With specified words in the subject or body
  - Move it to the
    - Specified folder
- Delete a conversation
- Flag messages from someone
- Assign categories to sent message
  - Apply this rule after I send the message
    - Sent to people or distribution list
  - Assign it to the
    - Category
- Assign categories based on content
  - Apply this rule after the message arrives
    - With specific words in the subject or body
  - Assign it to the
    - Category
- Move messages I send to someone
  - Apply this rule after I send the message
    - Sent to people or distribution list
  - Move a copy to the
    - Specified folder
- Stop processing all following rules

---

## Conditions in a Message that can be Checked

1. Specific words in the subject or body
2. Sent directly to me
3. Sent only to me
4. Where my name is in the Cc box
5. Where my name is in the To or Cc box
6. Where my name is not in the To box
7. From people or distribution list
8. Sent to people or distribution list
9. With specific words in the recipient's address
10. With specific words in the sender's address
11. With specific words in the subject
12. With specific words in the body
13. With specific words in the message header
14. Flagged for action
15. Marked as important
16. Marked as sensitive
17. Assigned to category
18. Which is an Out of Office message
19. Which has an attachment
20. With selected properties of documents or forms
21. With a size in a specific range
22. Received in a specific date span
23. Uses the form name form
24. Suspected to junk e-mail or from junk senders
25. Containing adult content or from Adult Content Sources

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## What to do with the message

1. Move it to the specified folder
2. Move a copy to the specified folder
3. Delete it
4. Forward it to people or distribution list
5. Reply using a specific template
6. Notify me using a specific message
7. Flag message for action in a number of days
8. Clear the Message Flag
9. Assign it to the [category] category
10. Play a sound

11. Mark it as important
12. Perform a custom action
13. Stop processing more rules

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### Any Exceptions to Apply to the Handling of the Message

1. Except if sent directly to me
2. Except if sent only to me
3. Except where my name is in the Cc box
4. Except if my name is in the To or Cc box
5. Except where my name is not in the To box
6. Except if from people or distribution list
7. Except if from people or distribution list
8. Except if sent to people or distribution list
9. Except with specific words in the recipient's address
10. Except with specific words in the sender's address
11. Except if the subject contains specific words
12. Except if the body contains specific words
13. Except if the subject or body contains specific words
14. Except if the message header contains specific words
15. Except if it is flagged for action
16. Except if it is marked as important
17. Except if it is marked sensitive
18. Except if assigned to category [category]
19. Except if it is an Out of Office message
20. Except if it has an attachment
21. Except with a size in a specific range
22. Except if received in a specific date span
23. Except if it uses the form [form name]



## Microsoft Word

The Word program is used extensively in the preparation of all types of documents at RLC. Little need be said about the program in general. The focus here is on how one part of a Word document has considerable benefit to the electronic storage of documents. That component is the Document Properties screen. See Figure 6 for an example of this screen.

The screen is used to identify the content of a document. It is accessed from the File Menu, in the Properties option, from the Summary tab. The screen lets the user fill in descriptive information about the document, including title, subject, author, manager, company, category, keywords, and comments. If this information were completed on a consistent basis for all users filing documents in an electronic repository, later identification and retrieval of documents would be greatly facilitated.

### Recommendations

1. Train users about the existence of the Document Properties screen.
2. Formulate and promulgate a policy about completing the screen for documents that will be filed in the registry.
3. Investigate how the screen can be made to automatically appear when the user first saves a document.
4. Examine the characteristics of a similar screen used by FAO Headquarters to see if it meets the needs of RLC.

Figure 6

Document Properties Screen Associated with a Microsoft Word Document

The image shows a Windows-style dialog box titled "Document1 Properties". It has a tabbed interface with five tabs: "General", "Summary", "Statistics", "Contents", and "Custom". The "General" tab is currently selected. The dialog contains several text input fields and a text area. The fields are labeled as follows: "Title:" (containing "User Requirements for an EDMS"), "Subject:" (containing "Electronic Document Management Design"), "Author:" (containing "Michael Cooper"), "Manager:" (empty), "Company:" (containing "University of California, Berkeley"), "Category:" (containing "EDMS"), "Keywords:" (containing "User Needs; EDMS Design; FAO; RLC, Santiago"), "Comments:" (containing a multi-line text description), "Hyperlink base:" (empty), and "Template:" (containing "Normal.dot"). At the bottom left, there is a checkbox labeled "Save preview picture" which is currently unchecked. At the bottom right, there are two buttons: "OK" and "Cancel".

**Document1 Properties** [?] [X]

General | Summary | Statistics | Contents | Custom

Title: User Requirements for an EDMS

Subject: Electronic Document Management Design

Author: Michael Cooper

Manager:

Company: University of California, Berkeley

Category: EDMS

Keywords: User Needs; EDMS Design; FAO; RLC, Santiago

Comments: Discusses the requirements at FAO RLC Santiago for an electronic document management system. Consists of user needs assessment. software considerations.

Hyperlink base:

Template: Normal.dot

☐ Save preview picture

OK Cancel

## The Keyflow Software Product

*Keyflow* is a software product from the Keyfile Corporation (<http://www.keyfile.com>). The product is designed to manage electronic document workflow and has a number of features that are representative of its class of software.<sup>7</sup> As discussed earlier workflow is an intrinsic part of an EDMS.

### Workflow

The Keyflow software allows a user to define the flow of an electronic document, message or form through an organization. With simple drawing tools a user creates a graphical representation of the flow of a document through the organization. For example, if a user were to have a travel expense form processed, the form would be prepared by the traveler, forwarded to an analyst for verification and computation of certain amounts (per diem, mileage rates, etc.), and forwarded to a manager for approval or denial. If the form was approved, the manager would send a notification to the traveler of the fact, and forward the approved form to the accounting office for payment. If it was disapproved, it would be returned to the traveler for adjustments. This flow has certain conditional actions in it: depending on the manager's approval or disapproval the form travels one direction or another. Keyflow allows the user and/or selected administrators to draw a flow and specify the conditions under which a document and its attachments (request for reimbursement/travel expense form) will travel electronically.

### Organizational Structure

A flow is a generic representation of the way the document will travel through the organization. The flow is initiated for a specific situation; one person initiates a travel reimbursement request. That one person's place in the organization governs who will receive the travel form because each person may have a different manager and may send travel forms to a different person for verification. Keyflow has the ability to understand who manages whom by consulting tables that are maintained in the Outlook Server software. Thus the originator need only specify to whom the expense form is to be sent for checking and Keyflow will know to whom the form should be sent for approval after checking.

### Time Constraints

Keyflow lets the user set constraints on the time individuals have to process a document. If a manager is requesting a series of individuals to help prepare a presentation for a Board of Directors meeting, the manager may establish a workflow to his or her

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<sup>7</sup> The Keyfile Corporation does not have a marketing nor sales representative in Chile.

subordinates and specify that the document must be processed by a certain date or time or processed within a certain interval of time.

### Monitoring of Workflow

When a workflow is created, a user may be designated to monitor the flow of a document. The monitoring function results in an email message being sent to the monitor as the document passes from one point to another in the workflow. The monitoring allows the user to see where a specific document is in the flow and see what the next task is to be performed. In addition, Keyflow uses color to indicate on the workflow diagram to indicate the location of the document in the path. A green color for a step at a particular point in the flow indicates the document has passed that point and a red color indicates the document has stopped at that step.

### Internal Structure of the Software

Keyflow works by having a server program manage the flow of the document. When a client program initiates a document flow, the server takes over all the tracking tasks and sends updates to the client to inform it of the status. The server program is *event-driven*. It makes a master list of all events and the times and dates they are due to happen. When an event occurs, information about it is updated in the server and information distributed to the client. When events should occur, but do not, it issues email notices about the situation and updates its database accordingly.

### Strengths and Weaknesses of the Keyflow Product for RLC

The Keyflow system major strength is in workflow automation. It does an excellent job of this task, offering a multitude of options to handle the most sophisticated routing problems. Its notification system is excellent, and it integrates well with the Outlook client program and the Exchange Server. Since it is closely coupled with Outlook and Exchange Server it makes use of the public and private folders in the Exchange Server. Its strength is in workflow management.

However, it lacks capability in some of the other areas that are necessary for a comprehensive electronic document management solution. These include indexing, searching, version control, document configuration management, image management, and mobile users.

If FAORLC decided that the major thrust of its EDMS activities should be in the area of workflow management, Keyflow could be a sufficient product. But it does not provide a comprehensive EDMS solution, and is not marketed as such.

## PCDocs

PCDocs is one of many integrated software packages available for Electronic Document Management. It is discussed here **not** because it is proposed as a solution to the RLC EDMS problem, but rather to indicate the functions and features of one product in the class. It is produced by PCDocs of Burlington, Massachusetts USA (<http://www.pcdocs.com>) and is sold and supported by a representative in Santiago.

The product has most of the features discussed in the second section of this report. It has a central repository into which documents can be stored and retrieved, it offers indexing of the content of documents as well as indexing meta-level information (document description block), and document search and retrieval tools. It supports version control, routing, imaging, and publishing to the Web.

Several different versions of the basic EDMS product are available. One provides its own interface to the EDMS functions, another provides an interface through a Web Browser such as Netscape Navigator, and the third provides an interface to the Microsoft Exchange Server. The current version of PCDocs does not seem to have a strong and seamless interface with Exchange Server, the primary RLC workgroup management software. It seems likely that the product will improve in this area, since Exchange Server is a popular product.

The PCDocs approach to workflow management uses its own proprietary means of managing the flow of documents through an organization and is not implemented through the Exchange Server. This approach has pros and cons. As an EDMS cannot generally take control over an email system, this separation ensures system integrity. On the other hand, for the users it may mean dealing with two messaging systems and two interfaces. This issue needs further exploration before any definitive statement can be made about the usefulness of PCDocs for workflow management within RLC.

Documents stored in the PCDocs repository are filed in a database. The database management system software that provides access and retrieval from the database is generally the Microsoft *SQL Server* product. Thus when one installs PCDocs, one also must install *SQL Server*. In all probability the installation of PCDocs and *SQL Server* will require another dedicated server computer installed at RLC. The implication of running two additional pieces of software at RLC can not be minimized. With each addition, the technical workload increases. It can not be expected that software runs by itself, there will always be requests for modifications, technical problems, upgrades to the software, requirements for new hardware, and the like. Database management systems are complex products, as are EDMS'.

## Conclusions from Software Review

The previous section has reviewed four pieces of software to examine how they are used and what potential they have for meeting the needs for an EDMS at RLC. They were *Exchange Server*, *Outlook*, *Keyflow*, and *PCDocs*. This concluding section summarizes the evaluation of those pieces of hardware.

Exchange Server is a mature product that offers a considerable number of features that are valuable for RLC including Public and Private Folders, and a strong networking component that allows sharing of files locally and with Rome. It also has considerable potential to implement some aspects of an EDMS without purchasing a full EDMS product. They include customized forms, associating forms with folders, limited routing, rule-based email filing, and good document sharing. It lacks good version control, support for mobile users, scanning control, and good workflow management.

Outlook is a good front end to Exchange Server and integrates well with Exchange Server. At the client side it offers many of the same features of Exchange Server and is relatively easy to use.

Word is the principal word processing program used at RLC. It was discussed here to introduce an important component, namely the Document Properties box. If properly completed on a consistent basis, this form offers considerable potential for retrieval of electronic documents.

Keyflow is typical of a category of products that do a very good job of extending Exchange Server's limited routing and workflow management. Keyflow makes it easy to develop routing schemes, and manage the work process by sending documents to individuals, receiving reports on their status, and sending reminders on pending work automatically. It makes a significant addition to Exchange Server in this area. But it is not a full EDMS, simply one additional piece of an EDMS.

PCDocs is a fully integrated EDMS and typical of its class. It has all the features mentioned at the beginning of this report and does almost all tasks well. Unfortunately it does not have a very good interrelationship with Exchange Server at the moment. It seems to duplicate things that Exchange Server does well, and its interface could lead a user to wonder why some things are done using Outlook and others using PCDocs. It would require that a database management system be installed, such as SQL Server, and this would take personnel resources. However, PCDocs is not alone in such a requirement and all EDMS' have such a need.

## Summary of EDMS Design Issues

This section of the report addresses a number of issues that must be solved in designing and implementing an EDMS. They include Public Repository Structure, Indexing, and Standards.

### Public Repository Structure

RLC currently uses the Q: disk as a public repository. If an EDMS is installed at RLC there will be no need for the Q: disk because all filing will be managed by the EDMS system and the logical structure of the repository will not matter. In the meantime, the current organization of the Q: disk is not acceptable and a task force has been appointed to work on its reorganization.

Until an EDMS is implemented, changes must be made to the Q: disk organization. The question is: what should its new structure be? Three alternatives are presented below.

1. Programmatic Structure. Base part of the structure on the four current priority programmatic areas. See Table 4.
2. Organizational Structure of Management Support Unit. Base part of the structure on the major groups within the Management Support Unit.
  - Personnel
  - Finance
  - Budget
  - Information Technology
3. Organizational Structure of Professional Units and Sub Units. Base part of the structure on the organizational structure of the professional units. See Table 5.

### General Considerations in Repository Structure Design

It is impossible to predict how a file structure will evolve or need to evolve over time. It may be useful to subdivide areas by year, by type of material (email, contractor reports, project reports, faxes, etc.), individuals, or other areas. The best strategy is to have a representative group of individuals try and arrive at a reasonable solution, try using the structure by filing a few hundred documents in it, and see if it needs adjustment. As mentioned in the section on the Registry, a task force has been convened by the head of the Information Technology Group to investigate this problem.

## Indexing

Documents that are stored in an EDMS are put there for archival and retrieval purposes. The archival function assures that the institution will not lose information on what has happened in the past. The retrieval function assures that documents can be made accessible to all who need them and shared amongst users.

Neither of these functions have much value unless each document that is stored in the repository is identified in some way that will insure it can be located in the future. The identification can be made by meta-level data such as the Document Properties screen of Figure 6, or by the content of the document. In both cases, when the document is stored in the repository, the meta-level data and/or the content of the document is indexed by automatic routines, just like an index is created for a book. When a user wants to locate a document, a query is formulated, and the indexes are searched. If there is a match between the query term and the index entry, a list of documents matching is displayed and the user picks those that are relevant.

The design question in implementing an EDMS is whether it is necessary for a user to manually describe the document using, for example, the Document Properties screen. Isn't it sufficient to let a machine index the content of the document rather than force the user to assign codes, fill in the screen, and the like? Both options can be used together. There is no professional consensus as to which is better. Certainly it is less expensive if there is no manual intervention in the indexing process, but one only has to consider the number of hits one receives back from a Web search to see where a lack of manual indexing can lead.

The first time a document (of any type) is moved to a Public Folder or repository the ideal course of events would be to require that it be identified according to certain standards. If the standards are not met, it could either be rejected for filing or sent to the Registry for manual identification and subsequent filing. See the previous section of this report on Microsoft *Word* for a further discussion of this problem.

A number of alternative structures could be used for meta-level keyword identification:

- Use Registry codes from Appendix 1
- Use Use Agricultural Thesaurus Terms from Figure 3
- Let RLC devise its own identification system

At a minimum the filer would be required to supply a descriptive subject line, author, date, and organizational unit filing the document.



## Standards

Standards need to be developed in a number of areas.

1. Document Description. The previous section described the necessity of using uniform and consistent terms to describe a document. For this to happen, RLC must develop and promulgate standards for content identification.
2. User Permissions. There needs to be agreement on which individuals or groups will be given rights to create, edit, or delete folders or files. See Table 2 for examples of these permissions.
3. Scanning. Guidelines must be developed to decide on what materials should or should not be scanned and stored in the repository. These guidelines can be based on frequency of expected use, or likelihood the document will never be available in electronic form.

FAO Headquarters has made some progress in developing guidelines for scanning. They have examined the appropriate types of file formats to use and have recommended GIF or JPEG as a standard. They also recommend initial scanning at 300 dots per inch resolution, saving scanned documents that have been OCR'ed (Optical Character Recognition--conversion from image to individual characters) in Microsoft Word/Rich Text Format. These are reasonable guidelines and as they are adopted RLC should review and consider using them.

4. Archiving and Weeding. The lifecycle of an FAO document includes creation, registration, archiving, and destruction. Guidelines must be developed to determine when material in the repository is moved to an archive, and when materials are permanently removed from the archive.
5. Document filing. What types of documents, email, reports, and the like should be sent to the repository and what types excluded.
6. Document form. In what form should documents be stored in the repository? Some likely standards include using Word format, Rich Text Format, HTML (Hypertext Markup Language), or SGML (Standard Generalized Markup Language). For graphic files should RLC use GIF, JPEG, or other similar standards?

Table 4

FAORLC's Four Priority Programmatic Areas and Sub Areas

Food Security

- Animal and plant production
- Plant protection
- Animal health
- Agricultural research and extension
- Agroindustry
- Rural income and employment
- Income support programs

Agricultural Trade Enhancement

- Multilateral trade negotiations
- International norms and regulations related to agricultural products
- Codex alimentarius
- Convention of pesticide use
- Regional and Bilateral Agreements related to Agriculture
- Impact of trade liberalization on domestic agricultural markets
- Competitive aspects of agricultural activities: marketing, information, quality control
- Trade related infrastructure and services

Sustainable management of natural resources

- Soils and water
- Forests and trees
- Genetic resources
- Fisheries
- Local management of natural resources
- Common pool resource management

Rural development

- Reform of agricultural institutions
- Decentralization programs
- Reconstruction of public instances
- Support to local institutions
- Property rights
- Process of privatization
- Land tenure and water rights
- Cadaster, Land Information System
- Conveyance institutions
- Agricultural, water and forestry legislation

Table 5

Organizational Structure of RLC's Professional Units

- Agriculture Department Group
  - Land and Water Development
  - Plant Protection
  - Plant Production
  - Animal Production and Health
  - Marketing and Credit
  - Animal Health
- Economic and Social Development Group
  - Commodities
  - Food and Nutrition
- Policy Assistance
  - Agricultural Policy
  - Agricultural Policy Economics
  - Development and Planning
- Sustainable Development Department
  - Women and Development
  - Agricultural Education and Extension
- Fisheries Department
- Forestry Department

## Strategies for Implementing an EDMS at RLC

This section of the report summarizes a number of possible short, medium, and long term strategies that could be employed for implementing an EDMS at FAORLC. It examines the advantages and disadvantages of developing an EDMS in-house, buying a completely integrated package, and/or obtaining pieces of an EDMS system gradually. It also examines how EDMS development at RLC should be interrelated to EDMS development in Rome.

### A Partial Registry is **NO** Registry

The RLC Registry is not performing a useful function at the moment. Paper documents coming into RLC are minimal. Most communications coming into RLC from outside the building, communications within the building, and communications going out of the building are electronic. Where is the record of those transactions? There is none. Immediate action is called for to stem the loss of the institutional memory of what RLC does and how it does it. This is a major problem and must be addressed immediately. It will take training, resources, and the participation of all involved to overcome the problem, but it must be done now.

What is the solution? There are several different paths and steps that can be followed. One approach is to begin building a new foundation for an electronic registry by developing standards, training users, and making small procedural changes in the way users do their work. The second is to use existing tools and some new pieces of software to build a partial EDMS. The third is to implement a full-featured EDMS. Each will be discussed in turn.

### Build the Foundation for an EDMS

Whether or not a complete EDMS is installed at RLC, there are certain steps that must be taken to insure that electronic documents are not lost. These steps can begin today and they will begin to form the foundation for further advances. They include:

1. Develop and implement standards and guidelines for describing the content of all documents be they email messages, *Word* documents, or *Excel* spreadsheets. The section of this report on the Registry and the Library both presented ideas that can be used to identify document content. These included using existing Registry Codes (Appendix 1), using existing thesauri such as the *CAB Thesaurus* [6], using classification schemes based on RLC programmatic areas (Table 4), or using classification schemes based on the RLC organizational structure (Table 5).
2. Specify when and what types of documents should be sent to the EDMS registry. The FAO Administrative Circular 94/34 (Appendix 2) makes it clear what types of

email messages should be forwarded to the Registry. This policy should be enforced at RLC. What remains is to develop a policy for what types of other documents should be forwarded to the Registry and at what stage in their development. For example, a policy could be developed in which only final drafts of letters, project reports, or proposals are sent to the Registry. Intermediate-stage documents would be kept on the user's workstation until they reached a more mature stage. If a full-featured EDMS were installed with version control this policy would need to be amended to encourage drafts of reports to be stored in the repository so that collaborative work would be supported.

3. Institute a unit within the Registry to electronically scan documents and implement a policy on what materials are to be scanned. There are bound to be documents that are not received electronically at RLC. A comprehensive electronic registry must have the capacity to include electronic images of paper materials. This activity can begin now so that the Registry can gain experience in handling the scanning process. Just as with email messages and documents, policies need to be developed as to what materials will be scanned and which simply filed without scanning. A good example might be a 400 page report. The time to scan and disk space used to store the item might exceed its value as an electronic image in the repository.
4. Re-establish the Registry as the place in the organization where electronic and paper documents must reside.
5. Train users in EDMS concepts including filing documents, describing document content, and searching the EDMS store.
6. Constantly maintain awareness of the activities that are taking place at Headquarters with respect to EDMS development to insure compatibility.

#### Costs of Building the Foundation for an EDMS

The six tasks described above are straightforward to understand, but will take time, personnel, and financial resources to accomplish. Like any new undertaking, startup effort is high and if the individuals in charge are already fully committed, some other tasks are going to slip as a result. Hiring of new personnel, or engaging consultants to do the work all take time and paperwork to accomplish, let alone train to come up to speed on the tasks. Further, some of these activities require strong Executive support to accomplish--they imply that the highest levels of leadership at RLC are willing to make public statements that RLC must proceed in this fashion and back up those statements with support for the standards and guidelines.

## Small-Scale Software Development without Implementing an EDMS

The steps described above require staff time to develop standards and receive training. A modest amount of resources is needed to establish a scanning unit, but this appears to already be available. Aside from that, the activities can begin any time. If RLC were to decide to invest a small amount of funds, other steps could be taken which could make a significant difference and begin to force users to make active use of the Registry. They include:

1. Develop a system whereby the user is forced to fill in a Document Properties screen (Figure 6) before a document can be saved. This will begin the process of making users think about access points to the document now. This will require a programmer to use the Visual Basic programming language to modify the current Document Properties screen to capture additional descriptive data about the document and insure that this screen is presented to the user and completely filled in before the user is allowed to save the document.
2. Modify the design of the form a user completes to send an email message. The current email message form asks the user for the name of the recipient, the subject of the message, and where any additional carbon copies of the message are to be sent. This form should be modified to ask the user for much of the same information as a *Word* document, including descriptive subject information (not just the message subject line), Registry codes (if appropriate), organizational unit of the sender, and the like. Appendix 2 presents valuable ideas on how to approach the design of this form. This form could be developed using tools currently available in the *Exchange Server* software.
3. Change the default characteristic of email messages so that a 'carbon copy' of the message is automatically sent to the Registry unless the user specifically decides that it is not appropriate.
4. Begin introducing users and the Registry staff to rule-based methods for automatically filing of email messages. Figure 5 gave an extensive list of the ways users could set up automatic methods for filing messages. While this list appears complex, the user-system interaction to accomplish it is well designed and easy to use.

## Costs of Small-Scale Software Development without Implementing an EDMS

The suggestions in the preceding section are not risk-free. Each time one begins some software development, even as small as the ones described above, there are potential problems. These problems generally manifest themselves when new releases of software (such as *Exchange Server*) are made available, or when changes to existing modifications must be performed. There is no guarantee that when a software update is

installed, the customization will continue to work. Worse still, if a new update is installed, a feature that the customization relied upon may not be present, and the changes can not even function. In summary, some of these ideas can and should be pursued, but they should be pursued with one's eyes open about the downside risks as well as the benefits.

### Build an EDMS from Software Components

Section II of this report outlined the major components of an EDMS. If it were desired, it is possible to build a number of the parts of an EDMS without purchasing a full EDMS package. This process would begin by developing the standards, procedures, and forms described above, and continue by acquiring specific pieces of software to implement other EDMS features. For example, the document repository must be indexed and searchable. Software packages such as the Microsoft Index Server, and the Verity search and retrieval system provide that capability. There are tools available outside the EDMS framework that automate the maintenance of a Web site and these could be acquired. The later category of tools would not provide the close link with the repository but would expedite Web site maintenance.

Workflow management is a key facility for moving from a paper-based organization to an electronic organization. Workflow management lets electronic forms be sent to users and groups of users based on flowcharts of how work is performed by members of the organization. Users are notified when new electronic work arrives, senders are notified of the status of items sent for processing or review, electronic reminders are issued, and the like. The implementation of workflow management software is a key step in making users perform work electronically and re-engineering processes that were performed in a paper-based world. If desired RLC could acquire a software system to manage this part of an EDMS, such as the Keyflow product (discussed earlier). The advantage of doing this would be that re-engineering would have to begin now. The disadvantage would be that if RLC decided to purchase a full-featured EDMS, some of the work and cost of implementing a separate workflow management product would be lost. An intermediate step could be for RLC to fashion its own workflow system by using features that exist in Exchange Server. This might be a reasonable alternative, but would require personnel with experience dealing with workflow with Exchange Server, plus maintenance of the software over time.

This general approach of building an EDMS from components is not necessarily ideal, but does provide considerable EDMS functionality without the initial cost of purchasing an EDMS. There are, however, several limitations. One is that once the construction of the system is completed, several key features of an EDMS are still missing. It still does not provide control over different versions of the same document unless strict rules were enforced about labeling documents. It does not support the facility of allowing documents to be checked out of the system, used outside of the repository, and then checked in when the off-line tasks are completed. It does not support a Web interface to the EDMS store. Finally, such a system is likely to take additional personnel to maintain.

## Buy a Complete EDMS

The final alternative is to purchase a full EDMS. This solution will take time, personnel, hardware, software, communications systems, and funding. As a first step, a comprehensive review must be made of the major EDMS software products and a number of characteristics of them and the vendor organization evaluated. They include the systems functions, features, costs, hardware requirements, database management system requirements, and communications system requirements. Vendors must be evaluated on their financial stability, installed base of systems, training ability, local support for the product in Santiago, and financial capability of the local support organization. RLC must also make a decision on the extent to which it wants to contract for the installation of the system or have the vendor install it.

## Summary

RLC needs a full-featured EDMS. A complete EDMS system is ideal and is the action to choose. But there is much that needs to be done before any form of EDMS can be installed. And those activities can begin now. Standards must be developed. The staff position must be filled for the new EDMS manager. New staff positions can not be established immediately. Some EDMS systems may require additional hardware on which to operate, and additional software such as a database management system to manage their repository. If interconnection with Barbados is to be part of the plan, additional communications line capacity will need to be established. And, needless to say, all this will take money to implement.



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## **Appendices**

## Appendix 1

### Major Subject Codes Used in the Registry to Classify Materials

#### ADMINISTRATIVE MANAGEMENT

- ADMINISTRATIVE AND OPERATIONAL ISSUANCES
- DATA PROCESSING
- RECORDS ADMINISTRATION AND ARCHIVES MANAGEMENT
- SALARIES AND RELATED REMUNERATION
- ESTABLISHMENT AND CLASSIFICATION OF POSTS
- ORGANIZATIONAL PLANNING
- MANAGEMENT INFORMATION SYSTEMS AND TECHNIQUES
- COUNTRY/REGION AND FIELD PROJECT INFORMATION
- INSURANCE

#### AGRICULTURE AND ECONOMIC DEVELOPMENT ANALYSIS PROGRAMM

- STATE OF FOOD AND AGRICULTUR

#### AGRICULTURAL SERVICES PROGRAMME

#### ANIMAL PRODUCTION AND HEALTH PROGRAMME

- TRIPS AND TOURS
- TECHNICAL CONFERENCES, MEETINGS, TRAINING CENTRES, SEMINARS, etc.
- TECHNICAL PUBLICATIONS AND DOCUMENTS
- EUROPEAN COMMISSION FOR THE CONTROL OF FOOT AND MOUTH DISEASE
- ANIMAL HEALTH
- MEAT AND DAIRY
- MEAT DEVELOPMENT
- ANIMAL PRODUCTION
- ANIMAL GENETIC RESOURCES
- ANIMAL FEEDING AND NUTRITION
- PROGRAMME AGAINST AFRICAN TRYPANOSOMIASIS

#### INVESTMENT CENTRE

- INVESTMENT SUPPORT PROGRAMME
- FAO COOPERATION WITH INTER-AMERICAN DEVELOPMENT BANK
- FAO/WORLD BANK COOPERATIVE PROGRAMME

#### BUDGET OF FAO

- REGULAR PROGRAMME BUDGET AND SUPPORT COSTS

#### CONFERENCE, COUNCIL AND PROTOCOL AFFAIRS

- CONFERENCE PROGRAMMING AND FACILITIES
- LIAISON AND PROTOCOL WITH GOVERNMENTS
- HANDLING OF MEMBERSHIP APPLICATIONS TO FAO
- CONFERENCE OF FAO
- COUNCIL OF FAO

#### COMMUNICATIONS AND SERVICES

- MAIL OPERATIONS
- TELEPHONE AND TELECOMMUNICATIONS

#### SPECIAL SERVICES

MAINTENANCE AND UTILITIES  
 OFFICE SPACE  
 CONTRACTUAL SERVICES

COMMODITIES AND TRADE PROGRAMME

COMMITTEE ON COMMODITY PROBLEMS

COMMODITY POLICY AND PROJECTIONS

- AGRICULTURAL RAW MATERIALS
- TRIPS AND TOURS
- TECHNICAL CONFERENCES, MEETINGS, WORKING PARTIES,  
TRAINING CENTRES, SEMINARS, etc.
- SUGAR AND BEVERAGES
- FRUIT, VEGETABLES, TOBACCO AND SPICES
- GRAINS AND RICE
- LIVESTOCK AND POULTRY PRODUCTS
- FATS AND OILS

COMPUTER SERVICES

CREDIT UNION

JOINT FAO/WHO FOOD STANDARDS PROGRAMME - CODEX ALIMENTARIUS

UNITED NATIONS DEVELOPMENT PROGRAMME

- PROGRAMME/PROJECT IMPLEMENTATION

POLICY ANALYSIS PROGRAMME

- POLICY AND PLANNING
- ECONOMIC POLICY INFORMATION CENTRE
- STATE OF FOOD AND AGRICULTURE
- ENVIRONMENTAL INFORMATION MANAGEMENT SERVICE

RESEARCH, EXTENSION AND TRAINING DIVISION

- RESEARCH AND DEVELOPMENT
- DEVELOPMENT SUPPORT COMMUNICATION

FAO PROGRAMME (Matters of General Concern)

- WORLD FOOD AND AGRICULTURE SITUATION
- TRIPS AND TOURS BY THE DG, DDG, ADGs, AGO STAFF, DDF STAFF, OCD STAFF
- FAO MEETINGS
- REGIONAL CONFERENCES OF FAO
- NATIONAL AND INTERNATIONAL PRIZES, AWARDS AND MEMORIALS
- AGRICULTURAL COMMISSIONS AND COUNCILS
- FOOD SECURITY ASSISTANCE SCHEME

WORLD FOOD SUMMIT - FOLLOW-UP

FISERIES INDUSTRIES PROGRAMME

- TRIPS AND TOURS
- TECHNICAL CONFERENCES, MEETINGS, WORKING PARTIES,  
TRAINING CENTRES, SEMINARS, etc.
- FISHING VESSELS
- FISHING TECHNOLOGY
- FISHERY EDUCATION, TRAINING AND EXTENSION
- FISH UTILIZATION AND MARKETING

FISH UTILIZATION  
FISH MARKETING  
QUALITY CONTROL, FISH INSPECTION AND CODES OF PRACTICES

FISHERIES PROGRAMMES

FISHERIES LAWS AND REGULATIONS

COMMITTEE ON FISHERIES

TRIPS AND TOURS

TECHNICAL CONFERENCES, MEETINGS, WORKING PARTIES, TRAINING CENTRES AND

SEMINARS

TECHNICAL PUBLICATIONS AND DOCUMENTS

POLICY AND PLANNING

EUROPEAN INLAND FISHERIES ADVISORY COMMISSION

INDO-PACIFIC FISHERIES COMMISSION

GENERAL FISHERIES COUNCIL FOR THE MEDITERRANEAN

FISHERY COMMITTEE FOR THE EASTERN CENTRAL ATLANTIC

INDIAN OCEAN FISHERY COMMISSION

REGIONAL FISHERIES ADVISORY COMMISSION FOR THE SOUTH CARPAS WEST

ATLANTIC

WESTERN CENTRAL ATLANTIC FISHERY COMMISSION

COMISION DE PESCA CONTINENTAL PARA AMERICA LATINA

FISHERY INFORMATION, DATA AND STATISTICS

RESEARCH INFORMATION SERVICES

FISHERY MANAGEMENT INFORMATION SYSTEM

COUNTRY SUMMARY

FISHERY STATISTICS

FOLLOW-UP TO FAO WORLD CONFERENCE ON FISHERIES MANAGEMENT AND

DEVELOPMENT

FISHERY RESOURCES AND ENVIRONMENT PROGRAMME

ADVISORY COMMITTEE ON MARINE RESOURCES RESEARCH

TECHNICAL CONFERENCES, MEETINGS, WORKING PARTIES,  
TRAINING CENTRES, SEMINARS, etc.

TECHNICAL PUBLICATIONS AND DOCUMENTS

MARINE RESOURCES

RESOURCES ASSESSMENTS

USE OF RESOURCES

INLAND WATER RESOURCES AND AQUACULTURE

AQUACULTURE

INLAND WATER RESOURCES

IMPROVEMENT OF AQUATIC ENVIRONMENT

POLLUTION

FINANCIAL ADMINISTRATION

CONTRIBUTIONS

GENERAL ACCOUNTS

FIELD ACCOUNTS (IMPREST ACCOUNTS)

TRUST FUNDS POLICY

CURRENCY MATTERS AND EXCHANGE RATES

FORESTRY PROGRAMME

FOREST RESOURCES

FOREST PRODUCTS

POLICY AND PLANNING

FOREST ECONOMICS AND STATISTICS

TRIPS AND TOURS

TECHNICAL CONFERENCES, MEETINGS, TRAINING CENTRES, SEMINARS, etc.

TECHNICAL PUBLICATIONS AND DOCUMENTS  
 LATIN-AMERICAN AND CARIBBEAN FORESTRY COMMISSION  
 INTERNATIONAL POPLAR COMMISSION  
 NORTH AMERICA FORESTRY COMMISSION  
 NATIONAL FORESTRY ACTION PROGRAMMES  
 COMMITTEE ON FORESTRY

WORLD FOOD PROGRAMME  
 PLEDGES AND CONTRIBUTIONS  
 MISSIONS, PROJECTS, EMERGENCY FOOD NEEDS  
 FAO/GOVERNMENTS COOPERATIVE PROGRAMME

LIAISON WITH INTERNATIONAL, NATIONAL ORGANIZATIONS AND GROUPS  
 EUROPEAN COMMUNITIES  
 ORGANIZATION OF AMERICAN STATES AND PAN AMERICAN UNION  
 INTER-AMERICAN STATISTICAL INSTITUTE  
 NORTH-WEST ATLANTIC FISHERIES ORGANIZATION  
 SCIENTIFIC COMMITTEE FOR ANTARCTIC RESEARCH  
 THE WORLD CONSERVATION UNION  
 INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS  
 REGIONAL AGRICULTURAL CREDIT ASSOCIATIONS

INFORMATION PROGRAMME

PRESS ACTIVITIES  
 RADIO  
 VISUAL MEDIA PROGRAMME (EXHIBITS, FAIRS, CEREMONIES)  
 PHOTOGRAPHY  
 FILMS AND TELEVISION  
 SPEECHES, LECTURES, FEATURES AND TEXTS FOR PUBLICATION  
 REQUESTS FOR GENERAL INFORMATION  
 FAO PUBLICITY AND PUBLIC RELATIONS  
 INTERNAL OPERATIONAL FUNCTIONS

LAND AND WATER DEVELOPMENT PROGRAMME  
 TRIPS AND TOURS  
 TECHNICAL CONFERENCES, MEETINGS, TRAINING CENTRES, SEMINARS, etc.  
 REGIONAL COMMISSIONS  
 SOIL RESOURCES, MANAGEMENT AND CONSERVATION  
 SOIL SURVEY AND DATA INTERPRETATION  
 LAND EVALUATION AND CLASSIFICATION (incl. LAND USE PLANNING)  
 AGRO-ECOLOGICAL ZONES  
 SOIL MANAGEMENT AND FERTILITY  
 SOIL QUALITY/SOIL SALINITY AND RECLAMATION  
 SOIL CONSERVATION (incl. EROSION, DEGRADATION AND LAND HUSBANDRY)  
 WATER RESOURCES, DEVELOPMENT AND MANAGEMENT  
 HYDROLOGY - SURFACE WATER  
 GROUNDWATER - HYDROLOGY  
 WATER QUALITY (SUPPLY, SANITATION, WASTE)  
 WATER DEVELOPMENT, HYDRAULIC ENGINEERING  
 DRAINAGE AND RECLAMATION (FLOOD PROTECTION, SALINITY, WATERLOGGING)  
 IRRIGATION AND WATER MANAGEMENT  
 FERTILIZERS AND PLANT NUTRITION

LIBRARY AND DOCUMENTATION SYSTEMS PROGRAMME

LEGAL MATTERS

STANDING COMMITTEES OF THE COUNCIL  
FORESTRY, WILDLIFE AND FISHERIES LEGISLATION

FOOD POLICY AND NUTRITION PROGRAMME

TRIPS AND TOURS  
TECHNICAL CONFERENCES, MEETINGS, TRAINING CENTRES, SEMINARS, etc.  
TECHNICAL PUBLICATIONS AND DOCUMENTS  
FOOD QUALITY AND STANDARDS  
NUTRITION PLANNING, ASSESSMENT AND EVALUATION  
NUTRITION PROGRAMMES  
INTERNATIONAL CONFERENCE ON NUTRITION

UNITED NATIONS FUND FOR POPULATION ACTIVITIES  
PROJECTS

PERSONNEL ADMINISTRATION

RECRUITMENT, APPOINTMENT AND CONDITIONS OF EMPLOYMENT  
ANNUAL, HOME AND SPECIAL LEAVE  
SOCIAL SECURITY MATTERS  
TRAVEL AND REMOVAL ENTITLEMENTS  
STAFF RELATIONS AND ACTIVITIES  
DISCIPLINARY MEASURES  
PERSONNEL MATTERS  
PERSONNEL RECORDS AND STATISTICS  
STAFF DEVELOPMENT AND TRAINING

PLANT PRODUCTION AND PROTECTION PROGRAMME

TRIPS AND TOURS  
TECHNICAL CONFERENCES, MEETINGS, TRAINING CENTRES, SEMINARS, etc.  
CROP AND GRASSLAND  
FIELD FOOD CROPS  
HORTICULTURAL CROPS  
INDUSTRIAL CROPS  
GRASSLAND AND PASTURE CROPS  
SEED PRODUCTION AND UTILIZATION  
PLANT PROTECTION  
PLANT DISEASE AND QUARANTINE  
PESTICIDES AND WEED MANAGEMENT  
COOPERATIVE ACTION FOR PLANT HEALTH  
INTERNATIONAL PLANT PROTECTION CONVENTION  
PLANT GENETIC RESOURCES (GERMPLASM)

PROGRAMMING AND COORDINATION OF FAO ACTIVITIES

PROGRAMME FORMULATION/EVALUATION  
PROGRAMME COMMITTEE  
CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH  
INTER-DIVISIONAL/INTER-DEPARTMENTAL WORKING GROUPS, WORKING PARTIES, TASK

FORCES

FAO ACTIVITIES ON FERTILIZERS  
PREVENTION OF FOOD LOSSES PROGRAMME  
PROGRAMME LIAISON - FAO REGIONAL, LIAISON AND REPRESENTATION OFFICES -

POLICY AND GENERAL MATTERS

PROGRAMME LIAISON - AFRICA  
PROGRAMME LIAISON - ASIA AND THE PACIFIC  
PROGRAMME LIAISON - LATIN AMERICA AND THE CARIBBEAN  
PROGRAMME LIAISON - NEAR EAST

PROGRAMME LIAISON - NORTH AMERICA  
PROGRAMME LIAISON - EUROPE

AGRICULTURAL POLICY SUPPORT  
TRIPS AND TOURS  
TECHNICAL CONFERENCES, MEETINGS, TRAINING CENTRES, SEMINARS, etc.  
TECHNICAL PUBLICATIONS AND DOCUMENTS

PUBLICATIONS PROGRAMME  
DISTRIBUTION AND SALES OF PUBLICATIONS AND DOCUMENTS

RURAL DEVELOPMENT AND AGRARIAN REFORM DIVISION

RESEARCH AND TECHNOLOGY DEVELOPMENT PROGRAMME  
TRIPS AND TOURS  
TECHNICAL CONFERENCES, MEETINGS, TRAINING CENTRES, SEMINARS, etc.  
TECHNICAL PUBLICATIONS AND DOCUMENTS  
RESEARCH AND DEVELOPMENT  
REMOTE SENSING  
ENVIRONMENT  
ENERGY

HUMAN RESOURCES, INSTITUTIONS AND AGRARIAN REFORM PROGRAMME  
TRIPS AND TOURS  
TECHNICAL CONFERENCES, MEETINGS, TRAINING CENTRES, SEMINARS, etc.  
AGRICULTURAL EDUCATION AND EXTENSION  
AGRICULTURAL EDUCATION  
AGRICULTURAL EXTENSION  
AGRARIAN REFORM AND LAND SETTLEMENT  
WORLD CONFERENCE ON AGRARIAN REFORM AND RURAL DEVELOPMENT - FOLLOW-UP  
WOMEN IN AGRICULTURAL PRODUCTION AND RURAL DEVELOPMENT  
HOME ECONOMICS  
WOMEN IN FOOD SYSTEMS  
FAO PLAN OF ACTION ON INTEGRATION OF WOMEN IN DEVELOPMENT  
RURAL DEVELOPMENT ANALYSIS AND ORGANIZATION  
COOPERATIVES AND OTHER RURAL ORGANIZATIONS  
RURAL DEVELOPMENT ORGANIZATION  
COMMITTEE FOR THE PROMOTION OF AID TO COOPERATIVES

ENVIRONMENT AND SUSTAINABLE DEVELOPMENT COORDINATING UNIT

SPECIAL PROJECTS/SPECIAL ACTION PROGRAMMES  
FAO PROGRAMME ON ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

STATISTICS PROGRAMME

SUPPLIES AND EQUIPMENT  
OFFICE EQUIPMENT, SUPPLIES, etc.  
CONTROL OPERATIONS  
IMPORT AND EXPORT

TECHNICAL ASSISTANCE/COOPERATION  
DEVELOPMENT PROGRAMMES/PROJECTS  
TECHNICAL COOPERATION PROGRAMME  
GOVERNING BODIES, COMMITTEES, WORKING PARTIES AND MEETINGS

TECHNICAL TRAINING



UNITED NATIONS, SPECIALIZED AGENCIES, BODIES, etc.

DIVISION ON WOMEN AND PEOPLES PARTICIPATION IN DEVELOPMENT

## Appendix 2

### Selected Sections of FAO Administrative Circular 94/34 on Electronic Mail Policies and Procedures Dated November 29, 1994

#### PREAMBLE

Further to Administrative Circular 93/26 dated 5 July 1993, staff members are reminded of the procedures to be followed when using Electronic Mail (also known as E-mail) communications within Headquarters, with field offices, or with other correspondents.

As a matter of policy, the Organization recognizes E-mail under the conditions specified below as capable of functioning both as an official, formal communication medium, bearing information which has documentary (record) value, and as a means of informal communication to be utilized for the benefit of the Organization. E-mail has been deployed widely throughout Headquarters, to all the FAO Regional Offices, and to many of the FAO Representations, Liaison Offices and Joint Divisions. Whenever available, E-mail is to be considered the preferred medium of inter-office communication, in accordance with the provisions outlined below, with the exception of communications where any financial transactions or legal commitments are involved. It is hoped that this exclusion will be temporary and that adequate verification procedures and technology can be provided in the not-too-distant future. The ability to utilize electronic communication is a strategic advantage. Soon it is likely to become a functional necessity.

Please use these procedures in conjunction with the provisions set out in Manual Section 601 - Maintenance and Disposition of Records, and Manual Section 602/603 - Correspondence Handbook. (Note: Manual Section 601, Appendix D, "Handling and Storage of Official Electronic Mail" will be issued shortly.)

#### PURPOSE

E-mail messages are not automatically routed to Registries. It is a matter, therefore, of individual responsibility to determine which messages should be saved and filed, and to ensure that they are sent to the Registry for this purpose. This Administrative Circular sets out the policies, procedures and responsibilities for the use of E-mail so that important communications, necessary for the integrity of the institutional memory of the Organization, will be properly retained.

E-mail messages are divided into three categories: official, unofficial, and private.

## OFFICIAL ELECTRONIC MAIL

Official E-mail can be:

- internal (exchanged among Organization staff), or
- external (exchanged between Organization staff and outside organizations or individuals.)

It may take the place of communications previously sent on paper, with the exception of communications where any financial transactions or legal commitments are involved, and can have long- or short-term retention value. Official messages may be subdivided into:

(a) Official: Substantive in nature. These messages are defined as communications which provide a basis for individual or institutional accountability, ensure operational continuity or protect legal interests. They will generally refer to mission-related or programmatic functions, e.g., project proposals, status reports of ongoing activities, official projections. They contain information of legal, administrative, or historical value, and are subject to long-term retention. Such messages must be copied or forwarded to the Registry.

Attachments are an integral part of a message. Attachments to messages which are Substantive in nature must also be copied to the Registry.

(b) Official: Administrative in nature. These messages are defined as communications which serve to facilitate the carrying out of substantive tasks, e.g., arranging meetings and travel, non-confidential personnel matters, travel requests, inquiries about the pouch, etc. These messages and their attachments generally are necessary to the story sequence of the substantive record. In this sense, they are used for messages which previously may have been conveyed via fax, telex or Transmittal Slip. Such messages should be copied or forwarded to the Registry.

(c) Official: Preparatory/Working in nature. These messages are defined as communications of an official or business-relevant nature, which are probably destined to become information of type (a), e.g., a project proposal, or type (b), e.g., drafts of a travel request, and are expected to have short-term value, because they usually are superseded by official communications of type (a) or type (b). These messages and their attachments are generally ephemeral in nature, and need to be kept only temporarily, unless they are necessary to the story sequence of the substantive record. In this sense, they are used for messages which previously may have been conveyed via the telephone or a Transmittal Slip. Such material must be stored in an electronic folder (or on a diskette) by the individual for at least 30 days, and should be reviewed before being deleted. In cases where an E-mail message is substituting for a telephone communication which would not have been recorded as a note to the file, the message should not be copied to the Registry. When in doubt about whether to delete a message or forward it to the Registry, consult the Registry.

To maintain the integrity of the Organization's institutional memory, all outgoing substantive and administrative electronic correspondence must include the information listed below. Some of this information will automatically appear, in whole or in part, in the header. It is not necessary to repeat manually information which is provided electronically.

- The name of the recipient

When the E-mail address is that of an organization, or someone other than the intended recipient, the text should bear the information: "Attn: Name of Individual" at the beginning of the text

- The subject of the message

Always fill in the Subject: field of the header

In electronic correspondence it is important to attempt to limit each message to only one topic

- Cc:

All substantive and administrative E-mail messages must be copied to the Registry. Only those individuals interested in, or involved, with the matter under discussion should be copied. The names of any individuals not connected to the network who will receive hard-copy versions of the message should be noted at the foot of the text.

- The full name, title, and division of the sender must appear at the foot of the text
- The subject filing code(s)

The appropriate subject filing code(s) must be noted at the bottom left-hand section of the text. Any questions about coding may be directed to one's Registry, or to the Records and Archives Unit

Substantive and administrative electronic mail constitute Organization records and should be retained and disposed of in accordance with existing Organization retention schedules.

At present, there is no provision for "electronic signatures" to authenticate messages, therefore, staff are advised that E-mail should not be used for the transmission of a formal approval, authorization, delegation or handing over of responsibility, or similar transaction. Such transactions should be accomplished on paper and sent, when possible, via pouch. In these cases, E-mail may be best utilized to provide speedy

notification that such decisions have been reached, and that the proper paperwork is on its way.

If the decision is made to send such transactions via E-mail, utilize Priority: R in DOS, Return Receipt in Windows. Within Headquarters, this will generate a return receipt so that the sender knows that the recipient has read the message. However, for messages sent outside Headquarters, recipients of such messages are advised to acknowledge receipt via the Reply command. These utilize a feature known as the "Return Path". This is a code which is attached to the message which indicates the "electronic route" taken by the message and cannot be changed. When a message is sent Priority: R or Return Receipt or an acknowledgement is sent via the Reply command, the response is sent to the mailbox which originated the original message.

Staff should be aware that at present it is impossible to guarantee the confidentiality of any electronic message, particularly one transmitted via the Internet. No information of a confidential nature should be sent via E-mail, which is no more nor less secure than a fax or a telex. This is because texts of E-mail, but not attachments, are stored on servers in an encrypted form. However, when the message is transmitted over the network, e.g., to a printer, this is done "in clear" (not encrypted).

Staff should be aware that their electronic communications, by nature, represent and reflect on the Organization as such, regardless of any disclaimers included in messages; therefore, they should ensure that their messages do not harm the Organization's reputation in any way.

E-mail messages in French or Spanish containing special characters, such as accented letters, are transmitted successfully within Headquarters. However, staff intending to send such E-mail outside Headquarters should be aware that these characters are stripped when the message is sent through the Internet. Documents containing special characters should be sent as attachments, which will arrive intact, and may be read provided the receiving software is able to read the format written by the sending software and interpret its codes. Staff may be assured that the competent services of the Organization are working to turn E-mail into a fully satisfactory multi-lingual medium. However, in some respects, the problem is not entirely under the Organization's control.

Specific procedures regarding the handling of substantive and administrative electronic communications will be contained in Manual Section 601, Appendix D, which will be issued shortly.

## UNOFFICIAL ELECTRONIC MAIL

Unofficial E-mail communications are those which have an indirect, supportive relationship to Organization business. They can be internal (exchanged among Organization staff) or external (exchanged between Organization staff and outside organizations or individuals). They may take the place of messages previously conveyed

via telephone, fax, telex, or transmittal slips, or they may be communications previously unavailable to staff. In most cases, they should not be copied to the Registry.

Unofficial communications may be subdivided into:

Informational communications, which are those wherein information needed for one's work is exchanged. These may involve queries between colleagues, or access to electronic bulletin boards.

Informal communications, which may convey information of a general interest or individual comment nature, or may be of a business/social nature, as when confirming an appointment or suggesting lunch with a colleague.

Informal electronic messages, which are related to the service conditions of international civil servants, are permitted; examples include: using E-mail to communicate with family in one's home country or with a dependant abroad on study, to make arrangements relating to the education of children, to contact a bank abroad to verify credit for payroll or work-related reimbursements, or to make arrangements for the administration of property abroad. Such communications should be limited to the strict minimum, both in length and frequency, and in most cases should not include attachments.

Once again staff are reminded that such messages should not be considered secure.

#### PRIVATE ELECTRONIC MAIL

Private communications differ from unofficial communications in that they have no relationship whatsoever to the Organization or to the service conditions of its international staff and are, therefore, not permitted; examples include: frivolous communications, e.g., transmitting jokes or chain mail; or utilizing E-mail to pursue employment elsewhere or to conduct private financial enterprises.

#### APPROPRIATE USE

Through the provision of appropriately secured and managed gateways to the E-mail services of other organizations and networks, the Organization has provided staff with the ability to exchange E-mail quickly and less formally with individuals and organizations throughout much of the world. This capability is intended for official use. To burden E-mail transmission (except for substantive and some administrative communications) with levels of authorization would diminish many of the strategic advantages inherent in this technology. Therefore, the Organization expects its staff to handle this capability with care and responsibility.

The E-mail system is distributed and supported by AFC. The software should not be modified or replaced by other software, nor should E-mail-enabled applications be installed or developed, without consultation with AFC.

The following uses of E-mail are prohibited:

- Use of E-mail for personal gain.
- Use of E-mail for frivolous purposes (e.g., passing along "chain messages").
- Use of E-mail to send any message which would harm the Organization's reputation should the message be deliberately or inadvertently disclosed.
- Use of E-mail to send defamatory comments about individuals or organizations. Users are reminded that, unlike telephone conversations, there is a record of E-mail conversations.
- Use of a mailbox assigned to another to fraudulently transmit a message which appears to be from the person or office to whom the mailbox is assigned.
- Accessing or attempting to access the Inbox or stored folders in another individual's mailbox without the permission of the individual.
- Within Headquarters, when both the sender and the recipient are equipped with E-mail, E-mail messages must be transmitted electronically. To do otherwise, except in exceptional circumstances, is an abuse of resources and is prohibited.
- The use of E-mail for private purposes, except those of the type described in the section "Unofficial Electronic Mail: Informal Communications" (page 5).

The following are discouraged:

- Sending E-mail messages containing spelling or grammatical errors.
- Sending, copying or forwarding E-mail messages to individuals outside one's channel of communications.
- Sending, copying or forwarding E-mail messages to too many, or to uninterested, individuals.

The following is encouraged:

- Taking great care when transmitting messages which normally would require a signature, until such time as electronic signatures and encryption have been implemented.
- Use of E-mail because it is the most cost-effective means of communication available. Furthermore, messages arrive in a form which may be quickly and easily manipulated for other uses.

- Use of E-mail to save time (e.g., instead of re-typing information, or repeatedly attempting to send a fax or place a call to an engaged line).
- Use of E-mail in order to have a record of information, and of the date and time it was transmitted.
- When the primary reason for assigning a mailbox is to facilitate E-mail access by Organization staff to a particular unit, rather than to an individual, the mailbox should be in the name of the unit, e.g., AFS-Registry.

## RESPONSIBILITIES

### INDIVIDUALS

The authorization of an electronic mailbox for a staff member is an implicit statement of trust in the staff member's judgment and professionalism and the expectation that the staff member will accept the responsibilities inherent to such a powerful tool.

The Responsibilities of individuals who may send or receive official information by E-mail include, but are not limited to the following:

- Each individual will be responsible for using E-mail in accordance with the guidelines set out in the section "Appropriate Use".
- Each individual who accepts the responsibility of a mailbox in her/his name, and whose name appears in the Global Address List must check the Inbox daily when she/he is in the office, and make arrangements for the handling of her/his E-mail when she/he expects to be away.
- Each individual must respond promptly, in some manner, to all messages containing her/his name within the To: field of the header. All such messages should be acknowledged within 24 hours, and a final reply sent within one week, whenever possible, unless the text of the message makes it plain that no response is required, e.g., an E-mail message sent for information.
- Each individual is responsible for copying to the Registry any E-mail messages necessary for the completeness of the Organization's institutional memory. This must be done as soon as it is read by the recipient. Depending upon Registry capability, this may be done electronically or in hard copy.
- Each individual is responsible for the messages sent out from her/his mailbox. Therefore, each individual is responsible for the security of the password, and for the use of it; passwords should be guarded carefully and changed periodically.



## Appendix 3

### Partial Contents of FAO MANUAL Section 601 Appendix D

#### HANDLING AND STORAGE OF OFFICIAL ELECTRONIC MAIL

(To maintain the integrity of the Organization's institutional memory, all external outgoing substantive and administrative electronic correspondence must include the information listed below. Some of this information will automatically appear, in whole or in part, in the header. It is not necessary to repeat manually information which is provided electronically.)

#### **Definition - Substantive Administrative**

##### **Substantive:**

These messages are defined as communications which provide a basis for individual or institutional accountability, ensure operational continuity or protect legal interests. They will generally refer to mission-related or programmatic functions, e.g., project proposals, status reports of ongoing activities, official projections. They contain information of legal, administrative or historical value, and are subject to long-term retention. Such messages must be copied or forwarded to the Registry.

Attachments are an integral part of a message. Attachments to messages which are **Substantive** in nature must also be copied to the Registry.

##### **Administrative:**

These messages are defined as communications which serve to facilitate the carrying out of substantive tasks, e.g., arranging meetings and travel, non-confidential personnel matters, travel requests, inquiries about the pouch, etc. These messages and their attachments generally are necessary to the story sequence of the **substantive** record. In this sense, they are used for messages which previously may have been conveyed via fax, telex or Transmittal Slip. Such messages should be copied or forwarded to the Registry.

##### **The name of the recipient:**

When the E-mail address is that of an organization, or someone other than the intended recipient, the text should bear the information: "Attn: Name of individual" at the beginning of the text.

**The subject of the message:**

Always fill in the Subject: field of the header  
in electronic correspondence it is important to clearly indicate subjects covered.

**CC:**

**All substantive and administrative E-mail messages and attachments must be copied to the Registry.**

Only those individuals interested in, or involved with, the matter under discussion should be copied.

The names of any individuals not connected to the network who will receive hard-copy versions of the message should be noted at the foot of the text.

**The full name, title, and division of the sender must be included at the end of the text.**

**The subject filing code(s)**

The appropriate subject filing code(s) must be noted at the bottom left-hand section of the text. Any questions about coding may be directed to one's Registry, or to the Record and Archives Unit (53590/54039/52247).

**Substantive** and **administrative** electronic mail constitute Organization records and should be retained and disposed of in accordance with existing Organization retention schedules.

## Appendix 4

### Partial Contents of FAO Manual Section 601.4 Pertaining to Maintenance and Disposition of Records at FAO Headquarters

Section 601.415. All mail is delivered to the registry of the division to which the communication is addressed. The registry staff opens, processes and routes incoming mail to the appropriate office on the basis of routing instructions provided by the division in which the registry is located.

Envelopes marked *confidential* are routed unopened to the addressee and if their contents are official, the registry is so notified.

Section 601.416. All correspondence is returned to the registry when action has been taken, for placing on the official files.

Section 601.417. Exceptionally, current files in a divisional registry may, with the agreement of Records and Archives Unit, be loaned for specific periods to offices within the division which need such material continuously and exclusively. Such offices are responsible for the complete and proper maintenance of the files on loan.

Section 601.418. Records and Archives Unit classifies the Organization's records by a subject-numeric system, and issues codes for all subject matter files. The same system is applied to regional and field offices....

Section 601.419. Up-to-date lists of files held in each registry are issued regularly by Records and Archives Unit for the use of staff members in the division concerned.