Case Study

Managing Information in an Office Systems Environment: The IMOSA Project

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Abstract: This paper is reprinted from John McDonald, "Information Management and Office Systems Advancement," in *Information Handling in Offices and Archives*, edited by Angelika Menne-Haritz (New York: K. G. Saur, 1993). It describes a public-private-academic partnership project that was led by the National Archives and that investigated the impact of office systems technologies on the management of electronic records. Prototype software for managing electronic records was tested, and functional requirements and other related products were developed. This paper describes the project and summarizes the findings.

IMOSA represented an important milestone in the evolution of the National Archives' guidance in this area. The consultation drafts of this guidance, which were made available by the National Archives in June 1995, are shaped largely by the findings of the IMOSA project. For a description of this guidance and a more recent perspective on the management of electronic records in the office systems environment, please see John McDonald, "Managing Records in the Modern Office: Taming the Wild Frontier," *Archivaria* 39 (Spring 1995):7–79. Copies of the IMOSA reports and the consultation draft of the *Guide to the Management of Electronic Records in the Electronic Work Environment* are available from the National Archives of Canada, IMSP, 395 Wellington Street, Ottawa, Canada, K1A 0N3.

The IMOSA project was managed by Susan Gillies of the Canadian Workplace Automation Research Centre of Communications Canada and supported by Christiane Desautels of the National Archives of Canada. Many of the points raised in this paper resulted from their observations during this project. The author is grateful to David Bearman, Terry Cook, Margaret Hedstrom, and Lisa Weber for helping to shape many of the ideas expressed in this paper.

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THE PENETRATION OF networked computer-based information technologies into the Canadian workplace over the past ten years has been dramatic. From stand-alone microcomputers with limited processing power and memory, today's organizations are procuring sophisticated high-performance multipurpose workstations that permit users to create, use, transmit, and store a bewildering array of information types and forms. Text, graphics, data, and voice are being used in increasingly sophisticated ways to record and communicate information. Although the products are often referred to as "documents" their shape and even their existence can be in sharp contrast to the traditional paper-based concepts with which we are most familiar. Compound documents, dynamic documents, virtual documents, and hypertext are no longer theoretical constructs—they are real things being created in today's business environment. On an increasing scale, and as the use of networked office systems grows in sophistication, electronic documents, regardless of their form, are being recognized as an important component of corporate memory[1].

Unfortunately, as much as electronic information in office systems is growing in importance as a valuable corporate resource, it is also a fragile resource. Archivists have known from years of hard experience that electronic information can be rendered inaccessible if

- the magnetic and optical media upon which it is stored are not maintained
- it is stored in environmental conditions that are subject to extremes in heat and humidity
- it lacks sufficient documentation to

permit ongoing intellectual understanding of its content and context
- its access is dependent on software and hardware that can be expected to change over time
- accountability has not been assigned for ensuring that such information is identified and protected.

As a result of these factors, there has been a growing concern that the corporate memory required by government agencies and by the Canadian government as a whole could be lost.[2] A closely related concern has been that the National Archives of Canada may not be able to carry out its role to preserve and make available that portion of the government's corporate memory that has long-term archival value.

It was to address these corporate memory management issues that the Information Management and Office Systems Advancement (IMOSA) Project was established in December 1989. IMOSA is a collaborative initiative between the Department of Communications and the National Archives of Canada in partnership with several other departments and private sector organizations. It is based on earlier work that was conducted as part of the federal government's Office Communications Systems (OCS) Field Trial Program. As part of that program, the National Archives

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[1]For the purposes of this paper, *corporate memory* is the information required by organizations to support the delivery of their programs and to permit them to hold themselves accountable pursuant to law and policy.

[2]Concerns such as those described in this paper have been raised in a number of reports, such as the following: National Academy of Public Administration, *The Effects of Electronic Recordkeeping on the Historical Record of the U.S. Government* (Washington, D.C.: January 1989); Advisory Committee for the Coordination of Information Systems, *Management of Electronic Records: Issues and Guidelines*, prepared by David Bearman (New York: United Nations, 1990); *Taking a Byte Out of History: The Archival Preservation of Federal Computer Records* (Washington, D.C.: Committee on Government Operations, U.S. House of Representatives, 1990); *Research Issues in Electronic Records* (St. Paul, Minn.: published for the National Historical Publications and Records Commission, Washington, D.C., by the Minnesota Historical Society, 1991).

(NA) was invited to participate in a field trial at the Department of Communications where a local-area network linked seventy users in the policy sector. This provided a rich milieu for studying the impact of technology on the management of information from both the archival and the corporate perspective.[3]

Based on this experience, the National Archives developed preliminary functional requirements for managing electronic information generated on the office system used for the field trial. The NA further refined these requirements, with the participation of the Department of Communications (DOC), Comterm Inc., and later, Provenance Systems Inc. As a result of these activities, the National Archives produced *Managing Information in Office Automation Systems: Final Report of the FOREMOST Project* in 1990.[4] The FOREMOST (FOrmal REcords Management for Office Systems Technologies) report described the functional requirements for managing information in the office systems being planned for and installed in the National Archives and the Department of Communications.

Although the FOREMOST report was initially prepared to respond to the needs of the two departments (NA and DOC), interest in and demand for the report from other organizations was substantial, and copies were eventually distributed to more than one thousand organizations, both in Canada and abroad. As the requirements were attracting a high level of interest, it became increasingly evident that there was a need to test the validity of the FOREMOST requirements in an office setting, using a prototype application.

A meeting between representatives of the Government Records Branch (GRB) of the National Archives, the Canadian Workplace Automation Research Centre (CWARC) of the Department of Communications, and Provenance Systems Inc. resulted in an agreement to develop and test a prototype application based on the functional requirements. A joint venture agreement was established, and, through CWARC's industry exchange program, IMOSA was launched in December 1989.[5]

The Prototype Application

The prototype application was installed on the Novell local-area network (LAN) in the Government Records Branch where users created and exchanged electronic documents using the software available on the LAN (such as WordPerfect, Harvard Graphics, and electronic mail). The prototype application was available through a list of LAN menu options and provided end users with a tool to file, browse, search, and retrieve electronic documents in a corporate database server. The database application was designed to protect the corporate holdings of the organization, while also providing functions allowing the records manager to control and manage both electronic and nonelectronic holdings. Much of the departmental subject classification system (which was automated) was downloaded to the file server to ensure that consistency could be maintained between the hard copy and electronic corporate holdings. The electronic holdings could comprise documents created using a variety of software available on the LAN. A document could, for example, be in the form of a spreadsheet, a graphic, or an

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[3]The report of the National Archives' experience in the DOC project is described in *Report of the PAC/ DOC Information Management Working Group* (Ottawa: National Archives of Canada, 1985).

[4]*Managing Information in Office Automation Systems, Final Report on the FOREMOST Project* (Ottawa: National Archives of Canada, 1990).

[5]*The IMOSA Project: Information Management and Office Systems Advancement—Overview* (Ottawa: National Archives of Canada/Canadian Workplace Automation Research Centre, November 1991).

electronic mail message as well as text generated by a word processing package.

The following paragraphs describe the main functions and associated features of the prototype:[6]

Filing: The "Submit" Function. Users could store their documents in two locations: in the user's own personal workspace or directory or in corporate holdings (the database application managed by the organization). For the purposes of the prototype assessment, the filing of documents into corporate holdings was at the discretion of the user. At the time of filing into the corporate holdings, a document profile was completed and appended to each document for indexing and retrieval purposes. The profile consisted of fields of information or attributes relating to the document being filed. At the point of submission, the document moved from the personal workspace to the corporate holdings. Once the document was submitted, the user could not delete it from the corporate holdings. Profiles of nonelectronic documents could also be filed in order to provide a linked, integrated view of all documents contained in files regardless of the medium on which they were recorded.

As a new document was submitted to the corporate holdings, the DOS name (eight-character name plus three-character extension) was replaced by a number assigned by the application to provide a unique identification for the document. The document number also included a version number; through this numbering method several versions of the same document could be identified. Each time a document was retrieved from corporate holdings and edited, it could be resubmitted only under a new version number—ensuring preservation of the previous version. The name of

the user submitting a document was automatically recorded as part of the document profile for each version.

The document was also described by a "document subject" field (part of the document profile), a sixty-character field which the user filled in with an abstract of the content of the document. The "document subject" field and document number were displayed on the screen during the search and retrieval process, providing a much more useful description of the document than would be possible with an eleven-character DOS name. (The use of a controlled vocabulary, however, would have further enhanced the effectiveness of the search and retrieval function.)

Retrieving and Searching: The "Retrieve" and "Search" Functions. After a document was filed, it would be accessible to other network members. According to assigned security levels, users could browse, search, and retrieve from the database any documents submitted by their colleagues. Although users could not delete or remove a document from corporate holdings, they could add a copy of a document to their personal space. Users could retrieve documents directly by the document number, or indirectly via the search function. While the "retrieve document" function required the user to know the document number (the unique number assigned by the system), the "search document" function offered three different ways of searching the corporate holdings, as follows:

- *A search by file number* of the departmental subject file classification system if the number of the file or group of files containing the required document(s) was known.

- *A search on any one of the fields in the document profile.* This included attributes entered either by the user or automatically at the time of filing, such as document name, title, file number, subject, to, from, security

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[6]*IMOSA Project: Functional Requirements—Corporate Information Management Application (CIMA)* (Ottawa: National Archives of Canada/Canadian Workplace Automation Research Centre, 1991).

level, and document type, as, for example, graphic or spreadsheet.

- *A full-text search* of the document summary field (which forms part of the document profile). This latter search method was provided as an interim tool until it would be possible to integrate full-text search of entire documents. (This feature was slated for inclusion in a future version of the prototype software.)

Editing Corporate Documents: The "Work On" Function.   Once the document was retrieved from the corporate holdings into the user's personal workspace, the application provided an option to "work on" the document. The application retrieved the software program originally used to create the document, such as WordPerfect, allowing the user to edit the document (as long as the software was one of the packages—*and the appropriate version of the package*—available to the user on the LAN, such as WordPerfect or Harvard Graphics). The application then flagged the document that had been retrieved from the corporate holdings to inform potential users that another user was working on the document at that time.

Records Management: The "Verify" and Other Functions.   The application also provided the records management specialist with functions to manage and control the corporate holdings at both file and document levels. For instance, when a new document was submitted to the corporate holdings, a "verify submissions" function permitted the records manager to verify the various fields of the document profile that had been completed by the user to ensure that the information was accurate. Traditional functions performed by the records manager, such as "create a file" and "bring forward management," were also automated. Other functions were designed to allow records managers to bring new users into the system and assign them se-

curity access levels that mimicked the paper file access scheme.

Document Classification: The "Lookup" Function.   The file classification index was fully automated. Using key words from the subject field or section titles, users could find the appropriate file number in the index—allowing them to classify documents regardless of their knowledge of the classification system. User access to various files was limited by the security access level assigned by the records management specialist. The design of the application prototype was based on the block numeric file classification system and could be adapted to any one of the six variations of this system currently used by the federal government.

The prototype application was assessed by a small user group that comprised project officers and managers from the site as well as records management staff. The results served to highlight issues that were already known in an impressionistic sense but that were brought into greater focus through the experience gained in using the prototype and in contemplating its use on a broader scale by larger and more complex user groups and organizations.[7]

Lessons Learned

Two general observations have emerged from the IMOSA experience. The first is that archival considerations can be addressed successfully only if they are considered in tandem with the information management considerations of creating organizations. Organizations will not tolerate the imposition of rules and procedures that are not in line with their own direction and/or implementation timetable. The successful archival program will be the one that

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[7]*The IMOSA Project: Information Management and Office Systems Advancement—Phase I Report* (Ottawa: National Archives of Canada/Canadian Workplace Automation Research Centre, 1991).

incorporates its appraisal, acquisition, and preservation requirements (identification, description, conservation, and others) into the corporate memory management requirements of the organization.

The second observation is that the efforts to address electronic records issues in the modern office have revealed the need to reexamine traditional approaches to the corporate filing and retrieval of office-generated information. As will become clear in the more detailed discussion to follow, existing approaches to the management of records may not be adequate in an office systems environment. This is particularly true in organizations concerned with "reengineering" their functions and activities and using their information holdings to deliver their programs more effectively and to hold themselves accountable.

More detailed observations led to the conclusion that the incorporation of corporate memory management considerations in an office systems environment would depend on six major factors: (1) a policy to assign accountability; (2) rules of the road that, within the policy framework, guide users in managing information from the corporate perspective; (3) an understanding of how the office works in order to set the policy and rules of the road in context; (4) functional requirements to assist industry in building appropriate technical solutions; (5) the information technologies themselves; and (6) the information technology standards that promote a consistent approach to implementation. These factors are described in greater detail in the following discussion:

1. Policies that clearly assign accountability for the management of corporate memory. None of the issues raised in this essay can be addressed by organizations without someone being held accountable. In the Canadian federal government, accountability at the highest level is normally assigned through Treasury Board policy. Prior to 1989, however, the infor-

mation management policy framework was fragmented, and the only policy that addressed the life cycle of records was the Records Management policy[8] which assigned accountability to the heads of government institutions, but only for nonelectronic records under the control of only one information management jurisdiction (records management).

Treasury Board's Management of Government Information Holdings (MGIH) policy, which was approved in 1989, provided the comprehensive framework that was missing under previous policies. It required institutions to manage their information holdings (regardless of their physical form) throughout their life cycle. While assigning responsibility for policy implementation to the head of the institution and even requiring a senior official to be named "for the purposes of the policy," it left the development of individual implementation strategies to each institution. Faced with fragmented and uncoordinated approaches to information management, many institutions, while welcoming the comprehensiveness of the policy, have as a result been struggling with its implementation ever since its promulgation.

In the world of office systems, where control over the life cycle of information (particularly electronic) generally rests with individual users, efforts to extend a policy such as MGIH, and related efforts to assign accountability to appropriate individuals, are particularly challenging. As long as users consider the electronic records they are generating to be their own, and as long as users have full discretion over the creation and disposal of such records, efforts to hold individuals accountable at this level will be nearly impossible—even if someone at a higher

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[8]*Records Management (Chapter 460 of the Treasury Board Administrative Policy Manual)* (Ottawa: Treasury Board Canada, 1983).

level has been assigned accountability pursuant to a governmentwide or even departmentwide policy.

From the IMOSA experience, it was determined that users generally will resist any outside interference with what they considered to be their own information "turf." As a result, records managers probably will experience considerable problems in selling the idea of managing electronic records from a corporate perspective. Users will resist change unless they can see some benefit and unless they can be convinced that managing information from a corporate perspective will not mean that they will lose control (i.e., their autonomy in carrying out the work of the organization will be respected even as the organization's interests in its corporate memory are met). As for the information systems specialist, the issues surrounding corporate information management are relatively foreign. Until a user requirement is expressed that will cause them to pay more active attention, their involvement will be limited to the provision of technical support.

The issue of accountability may likely be resolved as organizations learn to migrate their office systems from utilities, using them to automate basic tasks such as creating a document or spreadsheet, to corporate support tools—using them to automate processes, such as the executive correspondence application, the policy development application, or, in an archives context, the processing of records disposition submissions. In this latter environment, the assignment of accountability for the business application will dictate who is accountable for the associated information. As a result, and in considering existing office systems environments where it is difficult to identify direct links between information holdings and specific business applications (i.e., creation, storage, and transmission of information is ad hoc), it might be useful to turn to the accountability frameworks for existing and emerging

business applications. These frameworks offer a starting point for understanding how accountability might be assigned to other unstructured areas of a given office network as, for example, electronic mail messages forwarded in a seemingly ad hoc manner, or versions of electronic text transmitted to a seemingly arbitrary set of individuals for review purposes.

Ultimately, a greater interest in the application of more disciplined approaches to the management of electronic information should follow from an individual's increasing reliance on the electronic versions of documents, spreadsheets, and other such records for decision making, for the delivery of their programs, or for holding themselves accountable for decisions made. Such an evolution should foster a greater sense of accountability in much the same way as government officials currently feel a sense of accountability for financial and human resources. The result (in an ideal world) is users who feel a natural sense of accountability (linked directly to their program responsibilities) rather than a sense of obligation imposed by some outside source.

2. Corporate "rules of the road" that provide guidance to users in generating, using, and storing information. It is insufficient to provide users with a corporate information management software application (such as the prototype described in this paper) and then ask them to begin filing and retrieving "corporate" records to and from the application without also providing them with a set of rules and procedures. Users need guidance concerning interacting with such an application. On a broader front, the planners and designers of office systems need to know what the application is supposed to support from a business perspective, and how the organization and its employees (regardless of their level) are supposed to interact with it.

As a result—and again, similar to the policy issue—corporate rules of the road

need to be developed in accordance with the needs of the business, be it a social benefits delivery program or a policy office. When should the records of transactions associated with the business be captured? How much contextual information is needed to support the requirements of the business function or process? What security considerations need to be addressed? How long should captured records of transactions be kept? In what form and format should they be kept, and why? The absence of clearly defined business functions and activities in the office system in which the IMOSA prototype software was assessed was a major roadblock to the development of responses to such questions and to the development of a comprehensive set of rules and procedures.

3. An understanding of how work is performed in the "office" in order to identify business functions and activities to which both information management and information technology solutions can be applied. One of the main objectives of the prototype application was to permit the management of both electronic and nonelectronic records according to paper-based records management practices. The prototype succeeded in harmonizing the electronic system with the corporate paper-based records system. This was based on the concern that compatibility between the existing hard-copy records system and the emerging electronic system be maintained. In the task-automation environment in which the prototype was being assessed, this was a sensible approach. Users were concerned that they had a corporately defined repository application into which they could file and retrieve the electronic documents they had generated through the use of the software (word processing, spreadsheet, graphics, and so on) supported on the local-area network. The prototype supported this basic functionality and, moreover, ensured compatibility with the hard-copy system. Given the current

level of office systems maturity (i.e., task transformation), this transitional approach to corporate information management in office systems will likely become a norm over the short and medium terms.

As previously indicated, however, office systems eventually will evolve beyond the automation of tasks to the transformation and automation of business processes. In progressive organizations, this evolution will occur in tandem with steps taken to analyze traditional processes and, through the innovative planned introduction of information technologies, to reengineer these processes to the strategic advantage of the organization.[9]

Given that existing records management approaches were established before the days of the computer, office systems, and business reengineering, it is highly likely that, as part of this evolution, these approaches may be transformed to support more directly the delivery of government programs and services. The growing need by users to use information within the context of business functions, activities, and processes (particularly in those organizations using office systems technologies as strategic business-related resources) will have a profound impact on the shape of future "filing" systems. As indicated in the descriptions of the other factors described in this essay, future filing systems will be molded around the transactions that comprise the business processes of the organization. Although unstructured, seemingly ad hoc work flows will still exist (i.e., the transmission and storage of electronic documents according to user-defined criteria), the shift to structured corporately defined applications, such as the development of policy, responses to executive corre-

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[9]See Michael Hammer, "Reengineering Work: Don't Automate, Obliterate," *Harvard Business Review* 68, no. 4: 104–12, and Shoshana Zuboff, *Age of the Smart Machine: The Future of Work and Power* (New York: Basic Books, 1988).

spondence, and so on, will become more pronounced. As a result, the criteria for defining when a record of a transaction needs to be captured, how it should be captured, and for how long it should be captured will be easier to develop than would be the case if such applications were not in place. The reengineering of the records management function will likely be commonplace as organizations guide their office systems through the business process transformation stage. It is at this stage that the corporate rules of the road referred to earlier will become particularly relevant.

4. Functional requirements for the management of corporate information that would guide (and even leverage) the development of appropriate technology solutions. The functional requirements that emerged from the IMOSA Project are intended to give expression to the needs of federal government institutions with respect to the management of their corporate memory. The IMOSA experience indicates that, over the long term, functional requirements should be developed within the context of the needs of the business requirements of the organization. As most organizations are still at the task-transformation stage, it may be some time before organizations evolve to the point where the requirements reflect this direct connection between information holdings and corporate business applications. In the meantime, most organizations will likely try to ensure that their evolving corporate electronic filing systems can be related to their hardcopy systems. As structured corporate applications are defined, however, adjustments to both the hard copy and the electronic filing systems are expected. This will lead to systems that are more relevant to the needs of the business.

5. Information technologies that enable institutions to respond to the challenges described above. The technical solutions that respond to the functional requirements developed as part of the IM-

OSA Project are emerging from existing computer-assisted records management systems (CARMS). This follows from the natural inclination of organizations to apply easily understood and increasingly available "records management" solutions to their information management in office systems problems. Such solutions are sufficient in helping organizations to take the initial steps required to bring their electronic information holdings under corporate control (based on the assumption that existing, albeit, traditional records management approaches should be adopted to maintain consistency and continuity between hard copy and electronic holdings). Over the long term, however, these will evolve as the use of office systems moves from the automation of basic tasks to the automation of corporate processes.

Consequently, as organizations manage the evolution of their office systems to the point where they are being used to transform and automate processes, they will be able to benefit from the emergence of automated techniques that incorporate object-oriented approaches in which both process steps and associated information entities are seen as a single entity or object which, when combined with other objects (building blocks) can lead to the development of corporate applications.

The future vision will be a fully automated set of corporate applications where corporate procedures, tasks, and processes will be combined with communicated transactions to form applications. The repository or "filing system" will be more than a database containing documents organized according to a subject filing system. Rather, it will be a repository containing objects that comprise information on tasks, described in context with business processes and functions, as well as communicated transactions (the corporate information that needs to be retained for business delivery and accountability purposes). As a result, individual tasks and

their associated information entities will be bolted together and placed within the context of the business processes of the organization. Emerging technologies such as computer-assisted software engineering (CASE) tools and, in particular, the integration of CASE and repository management tools (such as IBM's AD/CYCLE) will begin to provide organizations with such possibilities.

6. Information technology standards (including data standards) to ensure that technology solutions are in line with the government's direction toward enterprisewide open systems. The first technology solutions to the requirements expressed as part of this phase of the IMOSA Project will be proprietary or, at the very least, based on de facto standards. A portfolio of nationally or internationally approved standards for the corporate management of information in an office systems environment has yet to be developed. While the building blocks (e.g., Open Document Architecture/Open Document Interchange Format [ODA/ODIF], Standard Generalized Markup Language [SGML], and the Information Resource Directory System [IRDS]) are emerging, it will be several years before such a portfolio comes into clearer view. The growing significance of object-oriented approaches to applications development may also have a strong influence on the nature of the standards that are developed to address corporate information management requirements, particularly over the long term. Consequently, while existing standards for automated repositories, such as the IRDS standard and the de facto repository standards that could emerge from the current efforts of IBM, Digital Equipment Corp., and others, will concentrate on the management of information about information (also known as *metadata*), future repository "standards" will manage information about objects—processes and related data as single entities—and about the business

functions to which they relate. A number of CASE tools are pointing in this direction.

For now, however, the development of standards-compliant technical solutions to the issues raised in this essay is only beginning to be considered. Although the prototype software developed as part of the IMOSA Project was proprietary, future development efforts will be undertaken within the context of the enterprisewide open systems model advocated by the Canadian federal government (see figure 1). This model places the seven-layer Open Systems Interconnection (OSI) model within the context of standards that promote the interchange of both contextual information (the information itself) and the logical and physical processes that use this information to support the business of the organization. The element entitled "Information Elements" refers to the descriptive and data standards that need to be in place if such a comprehensive exchange of information is to occur. For archivists the enterprisewide systems model offers an excellent view of a technology landscape to which all archives should subscribe. It promotes the exchange of information not only across space (spatial point to spatial point at a given point in time) but also across time (time point to time point within a given space).[10]

Conclusion

The results of the first phase of the IMOSA Project served as a catalyst to the establishment of subsequent projects that are under way. Some, such as the project to identify relevant software packages that

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[10]In fact, the distinction between archival and corporate memory requirements is difficult if not impossible to identify. For example, what is so different between the needs of an organization to maintain the integrity of its electronic records and the needs of an archives to maintain the integrity of its electronic archival holdings?
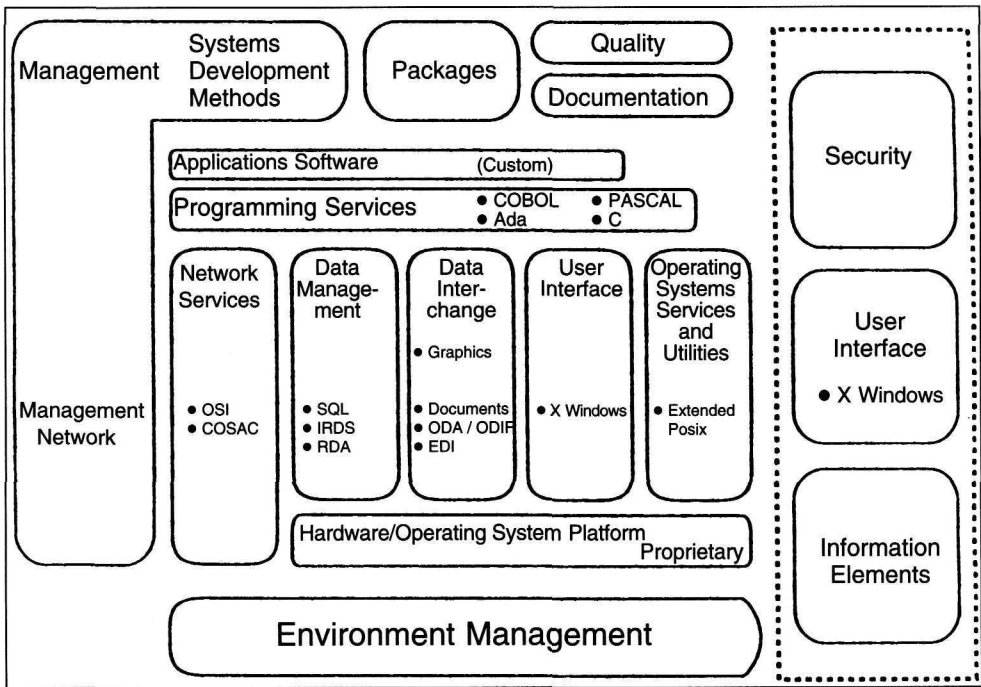
Figure 1. Standardization Framework for Enterprisewide Open Systems (Source: Treasury Board Canada, Through the Treasury Board Information Technology Standards Program).

meet the existing functional requirements, are intended to further the development of technical solutions that address current information management issues. Others, such as the project to study the redesign of work processes, are intended to pave the way for the development of technical and procedural solutions that will respond to the information management needs of the emerging office. The following projects comprise the current phase of IMOSA:

- Design and validation of requirements that address retention, disposition, and archival considerations. (Neither the FOREMOST requirements nor the requirements that emerged from the prototype addressed these considerations.)
- Assessment of the extent to which the requirements are reflected in existing and emerging software products

- Assessment of the extent to which the requirements conform to the Treasury Board's MGIH policy
- Study of the redesign of work processes and their impact on the management of information
- Development of core guidelines for the management of information in office systems (addresses ''good rules of the road'' that should be followed in integrating corporate memory management issues in office systems environments)
- Development of a quick reference guide to information technology standards that are relevant to corporate memory management in the office
- Development of a guideline on the management of automated user directories (based on the premise that if a *consistent* approach to user directory management is established at the out-

set, then—as the office system evolves from one that is based on individual approaches to document management, to a system that supports the sharing of information within and across corporate applications—user migration to an environment that is subject to corporate information management conventions will be easier).

- Assessment of the retrieval capabilities of a number of existing software applications (addresses emerging issues surrounding the use of full text, key word, subject classification, and other retrieval strategies and conventions)

- Assessment of the integration of image-processing and multimedia systems with the kinds of corporate information management applications that emerged from the IMOSA experience

- Review of the relevant information management issues being addressed by various government working groups (to ensure that the direction set by IMOSA is consistent with these issues and the direction set by the groups)

These projects are being sponsored by a number of Canadian federal government and private sector organizations. The results will be reviewed by the Treasury Board Office Systems Standards Working Group before dissemination to a wider audience.[11] The involvement of other organizations as stakeholders is one of the major characteristics of the IMOSA Project. Given the enormity of the issues and the extent to which the issues are commonly shared by most modern organizations internationally, it follows that, as much as possible, the solutions should be based on collaborative initiatives or partnerships. It is within this spirit that individuals and organizations are encouraged to contact the author to find out more about the IMOSA Project and to share opinions and ideas.

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[11]The Treasury Board Office Systems Standards Working Group comprises representatives from over twenty federal government institutions concerned about the impact of office systems on the management of information. To provide context for its work, the group developed a report (*Issues and Directions: Treasury Board Canada, Ottawa, 1990*) describing the issues that government was facing and the direction that the group intended to take to address the issues. This was supported by a study, commissioned by Transport Canada, that described the characteristics of the modern office and the relationship between the use of technology and information resources in an office systems environment and the business functions of organizations.