

SECTION II

Policy Guidelines



CHAPTER THREE

**Electronic Records Guidelines:
A Manual for Policy Development
and Implementation**



CHAPTER FOUR

**The Implications of
Armstrong v. the Executive Office of the President
for the Archival Management
of Electronic Records**

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Electronic Records Guidelines: A Manual for Policy Development and Implementation*

Policies for management of electronic records must be tailored to management requirements of each organization and must define electronic records in a way that can be implemented by people and machines. Record retention decisions are risk management decisions. Immediate responsibility for appropriate retention and ongoing accessibility of electronic records must be clearly assigned to line management. Information managers -- including archivists, records managers, telecommunications and data processing staffs -- all need to contribute through systems design and implementation, technology assessment, and ongoing technology monitoring. A sound program will be based on a systems life-cycle approach that logically integrates records without respect to media. Information Resource Directory Systems can help bridge disciplines and organization units. Line units should retain physical control over electronic records and should be required to ensure retention, preservation of functionality, security, and confidentiality. These policy objectives can be achieved by focusing on application systems as the loci of records policy implementation and practicing documentation as a means of control. Increased awareness of technical obstacles to adequate management of electronic records must be achieved throughout the organization.

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INTRODUCTION

Managing large, complex organizations and ensuring that they are accountable for their actions requires that administrators have access to records documenting official activity. Increasingly, a substantial proportion of these records are created, maintained, and disseminated by electronic information systems.¹ Naturally, administrators want to ensure the same level of access to records in electronic form that they have historically had to paper records.

Electronic information systems have made the complex, modern international organization possible.² Beginning with the introduction of telegraphy in the middle and telephony at the end of the nineteenth century, these technologies have transformed the office by defining the means by which decisions are made and communicated. Since approximately 1960, the computer has been introduced into organizational activity with similar revolutionary effect. The wide variety of silicon chips are driving this computing and telecommunications technology into all recesses of contemporary office functions.

The automation of human activity, especially those activities defined by or dependent upon recording, retrieving and communicating information, is everywhere driven by the rising cost of relying upon people and the falling cost of electronic information systems. Even in parts of the world where the reduction of manpower is not a requirement, the introduction of computerized information systems is accelerating and is likely to extend automation into organizational programs that have previously been impervious to it because of their complexity and sophistication. Substantial investments will continue to be made in information systems to support all aspects of operations and program administration. Archivists and records managers must, therefore, accept the inevitability of these operational decisions. At the same time they must learn to shape them through policy, because although ongoing operations may well be managed less expensively and more

efficiently with electronic information systems, the costs of archival and records management of machine-readable data will be much greater than those associated with traditional records.³

Reliance upon electronic information systems is not without substantial risk. Computer and telecommunications technologies are created and sold in a highly competitive marketplace into which new products and services are being introduced regularly and from which older products and services are being displaced. Competition has increased the importance of standards to users, but managers who are trying to establish policies for information resources management are still faced with markets they cannot control, or predict with any reasonable degree of certainty.⁴ As a consequence, managing information created in electronic systems after the active life of those systems will continue to require careful planning, prescient technology assessment, and ongoing data manipulation.

New functional capabilities are being added to information systems on a regular basis as the costs of memory plunges. New capabilities can be added without driving up costs of the whole system. Each generation of new capabilities is seen as a minimum foundation requirement by users, who demand systems with these powerful features. Hardware is becoming obsolete after no more than five years; some feel that software obsolescence takes only three or even fewer years. Migration from one system to another is becoming a full-time activity for data processing and telecommunications units. The most serious challenge to continuing access is, and will continue to be, technological obsolescence.

Changes to storage formats and layouts employed in electronic information systems pose more severe challenges to continued access than does the (admittedly short) life of the still dominant magnetic media. Since the earliest introduction of magnetic tape storage as a medium for digital data, dozens of incompatible formats have been developed and discarded. The most ubiquitous medium of the 1960s, punched cards, has

virtually disappeared, along with the de facto 8-inch PC floppy disk standard of the late-1970s. Increasing density of magnetic storage, the absence of standard layouts or structures for most optical media and the tyranny of the consumer market in areas of sound and image recording formats and media ensure that records managers will have to continue to incur costs of recopying electronic records once an organization adopts non-human readable forms of records as long as access to the records is desired. Unless methods can be found to provide the functions embodied in the original software-dependent systems to generic processing environments, records managers may also find themselves forced to maintain operating computing museums!⁵

Even such "museum" environments could not replicate the systems of the past. As most astute managers now realize, computing has become an invisible glue in all systems of communication and control. Smart switches, remote and memory communications devices, and all forms of information collection equipment depend on instructions recorded in silicon chips. In the large interconnected telecommunications networks we rely on daily, messages are written from one buffer to another, "addresses" are decoded and read, and their instructions acted upon. One effect of the convergence of these technologies is that a very large part of the information created by any organization today exists, at least for any instant, in electronic form (as either analog or digitally encoded signals), even if it resides only in paper storage. Even very simple devices, like the electronic typewriter, have small buffer memories to store character correction information from one carriage return to the next; facsimile transmitters which we are coming to employ even for internal communications, have substantially larger buffers to store the bit-mapped image of a page.

Because change is one of the few constants in the equation that management faces as it seeks a means of controlling the effects of electronic technologies, any approach to managing electronic information will need to be sufficiently flexible to

accommodate substantial change. No viable approach can be based on rejecting change, even if it does require that the social consequences of some technologies be channelled. Nor can a management approach itself be just another technology. Finally, the method must make sense within the overall mandate and mission objectives of the organization. Thus, by definition, a strategy for this kind of control will be based in policy, not in expedient or technological solutions.

POLICY ISSUES

Criteria for Policies

Guidelines for policy must meet a number of tests. They should be generalizable to the range of agencies and problems being addressed. They should pose clear alternatives with sufficient basis to support judgment. And they should be implementable, flexible, and cost-effective.

The test of any policy is whether it can be put into day-to-day practice or operationalized in the organization. Therefore, this chapter does not propose approaches that depend on waiting for some not yet realizable technological means, though numerous promising technologies are mentioned. It also discards solutions that depend on people to have knowledge, sophistication, and analytical skills that they are unlikely to possess. The recommendations made relate to the process of policy formulation and do not depend on any particular organizational structure. Proposed solutions are likewise as free of implications for internal organizational arrangements as possible and should be read as speaking about business functions not about specific units assigned responsibility for those functions.

Policies should derive from goals. These guidelines acknowledge the legitimacy of a wide range of possible ends, and therefore they address policy issues from the broad principles which inform them and identify options so that management can define policies and procedures to meet its objec-

tives. They do not, therefore, require any particular policy choices, though some specific tactics for implementing policies are recommended.

Defining Records and Non-Records

ISSUE: Policy must define the concepts of record and non-record electronic information in a way that can be implemented by people and systems.

Electronic information consists of pulses or signals representing text, data, image, or sound. Electronic information may be transmitted and stored in digital (discontinuous) or analog (continuous) signals. Whether digitally encoded or represented by analog signals, these modalities (text, sound, and image) are indistinguishable except to software and hardware constructed to decode them for the human senses. Electronic information may exist only for an instant as it passes across a switch during transmission, or it may be recorded on relatively permanent magnetic or optical storage media. It may be disseminated in finished products such as Compact Disc Read Only Memories (CD-ROMs), floppy diskettes, or videodiscs, or accessed by users from a remote source using telecommunications. The products themselves may be finished and edited, such as an electronic journal or a television broadcast; volatile, like document drafts and online databases; or continuous, as are those generated by sensing and monitoring equipment or videotape.

Policy must distinguish between record and "non-record" information. The purpose of such a policy is to ensure that anything which might be important to retain will not be destroyed, while permitting the greatest quantity of information of no value for continued retention to be declared non-record.

One such broad definition holds that information sent or received in the conduct of an official activity is considered a record. By this definition, to be used in the conduct of an official activity, information must be communicated to a person or database as part of such an activity. Information which re-

mains in the head, the home, or the pocket of one individual and is not available to any other is not considered an institutional record. By extension, information that remains in the personal computer of one employee, but is not communicated to another or others, is not a record.

Another common definition holds that information created in the course of official business is a record. By this definition, information received from outside an organization would not be a record but that created on the job but not communicated to others would constitute a record.

When program managers ask for policy guidance to define an electronic record, they are seeking to distinguish between information in electronic form that is official documentation of organizational activity and electronic information which is non-record material by virtue of being transient, personal, or external to the organization. Management needs to articulate policy criteria that can be operationalized and which are sufficiently clear cut for staff (and information systems) to implement them easily. These criteria should apply equally to documents and to data.

Assigning Responsibility

ISSUE: Policy must identify which organizational entities should have what specific responsibilities for management of electronic records.

Electronic information has largely escaped records management control despite the fact that it can, in principle, be documented. The proximate cause is the absence of organizational policy directed at capturing electronic records, but this is only a reflection of more complex physiological, organizational, and sociological barriers.

Electronic information has no meaning to the human senses without first being transformed by a technological intermediary into a modality which is humanly sensible. Whether electronic information exists in digital encoding or as analog signal, it must be translated to be readable/viewable,

hearable, or touchable. Because it exists without our knowing it directly or being able to extract its meaning without an intermediary device, the designers of an electronic information system are held responsible for the kinds of records it creates. Also, because electronic records are at some point managed by an electronic information system, and because they are inseparable from that system except by means of facilities integral to the system itself, records managers must be involved in the design of those systems to ensure that records passing through them serve organizational needs for accountability. Records managers and archivists must therefore develop close working relationships with, and play part of the role of, systems designers.

Historically, electronic records have been transmitted through systems which generated hard-copy products. Because records were by-products of the communications process, the transmission system of the information was ignored by records managers and archivists because its only function was to accurately represent its contents at a distance. This was reasonable because even though they held information in electronic form for a time in buffers prior to batch dispatch or after receipt, transmission systems did not process it. Now, however, many of these same systems are capable of altering and analyzing information; digital copying machines do not necessarily produce "replicas"; facsimile transmitters may enhance the images they scan; computers may "read" incoming telecommunications to forward or even answer them; and database management systems automatically index, update, back-up and even delete records based on the contents of the record or the total state of the database.⁶ These trends to ever more intelligent transmission networks are accelerating. As a result, records managers and archivists need to cultivate close relations with telecommunications systems managers.

In electronic information systems, where records are "views" of a larger data pool -- defined by permissions granted by the system -- and functions of the system are likewise re-

stricted to those with permission, defining a record system has direct programmatic consequences. The involvement of archivists and records managers in design decisions concerning the structure and content of electronic information within an organization -- including responsibility for the means of accessing information in these systems and the format and medium of information storage -- presents an organizational challenge. Program staff must understand that records managers and archivists can exercise this responsibility without being involved in defining the values of data in the system or the processing functions the system provides to users other than the records management staff. Records managers and archivists must be involved with program managers in their roles as records system designers.

Information resources managers and data processing and telecommunications systems staffs must not feel that archivists and records managers are challenging their authority over the operation of the system or its integration with other electronic systems. All other participants in the design process must feel that records managers and archivists are bringing useful skills and institutional policy objectives to the table. These conditions will not be met unless management clearly defines the roles of each group and establishes the areas of shared responsibilities.

Adjusting to Cultural Change

ISSUE: Policy must accommodate shifting behaviors and attitudes, as well as changing technologies.

The social and cultural impacts of electronic communications are not yet fully apparent. Electronic information management technologies are undergoing rapid change. Somehow policies must be tied to continuities that can be relied upon to remain relatively fixed or employees will not be able to execute the policies without continual re-education.

For example, there are substantial sociological barriers to capturing electronic mail communications. Like other forms of

interpersonal communications at a distance, electronic intercourse follows complex social rules. Telephonic communication is considered private and is not captured verbatim even when the subject of the conversation is a public policy matter; individuals in modern societies universally regard recording of telephonic communications as a breach of privacy equivalent to recording interpersonal face-to-face conversations. Some written forms of electronic communication, such as intra-office uses of electronic mail, are currently undergoing cultural definition and could come to be perceived as private in the absence of institutionally defined etiquettes and records policies. Indeed, because electronic communications are technically easy to capture at the point at which they pass across a communications switch, the issue at the heart of electronic records management is policy with respect to the *capture* of electronic records and the mechanisms by which these policies will be enforced.

Similarly, new electronic information technologies are introduced daily. If the policies we adopt are specific to particular technologies, they will become obsolete rapidly and will leave confusion in their wake. Managers must tie their policies to characteristics that lie beneath the implementation of the information system, characteristics that define the function the technology plays for the organization. In this way the policy will be tied to a business purpose and not to a transient implementation, and employees will be able to see the rationale and carry it out across technologies and time.

Assuring Legality

ISSUE: Policy must require taking actions that will safeguard the legality of the electronic record.

Records are being created in electronic form. Are they legal evidence? Would the format in which they are retained contribute to or diminish their legal value? Would any methods of managing these records during their active and archival life threaten or enhance their legal status? These questions

arise because even though electronic records are generated by operational organizational information systems and are used in the conduct of organizational business, they are perceived to be less real, more ephemeral, than hard copy. There is very little statutory or case law anywhere in the world that clearly defines their status.⁷

However, despite the lack of precedent for the introduction of electronic records as legal evidence (except for analog audio-visual recordings), there are *prima facie* reasons to accept such records under the same terms as other formats of evidence, subject to authentication.⁸ The problem presented by the caveat "subject to authentication" is familiar to those involved in the admissibility of microforms where admissibility has come to depend upon the record being generated in the normal course of business.⁹ The basis for these rulings, which is likely to find expression with respect to electronic records as well, is that if the normal procedures are followed, the likelihood of planting disinformation on an ongoing basis for some yet-to-be discerned future purpose is low.

Because there is no "original" record in electronic information systems (it is impossible to distinguish physically between the "real" record and a modified electronic copy), policy will have to dictate designing systems for electronic records that can be shown to be secure from tampering and maintain audit trails for authentication, rather than relying upon physical inspection of outputs. The legality of electronic records will depend on evidence that creating records electronically was normal operating procedure and that appropriate care was exercised during the life of the record to ensure continuity and inviolability of the records system.

Scheduling

ISSUE: Policy must ensure timely disposition of records (retention of records for only as long as required by law, organization objectives, and scholarly needs).

Traditionally, records managers and archivists have established "schedules" calling for the retention of inactive records for stated periods, after which disposal or transfer to archival custody is authorized. Such schedules can be implemented because records in the same "series" share the retention periods and are filed together. Thus physical location supports the physical disposition. Equally importantly, the scheduling of records can take place after the records are created through visual examination and evaluation of their significance.

Because active storage space (online memory) is expensive, electronic records are less likely to be waiting for records management review and scheduling if they are not scheduled at their creation. At the same time, because electronic records can be conveniently acted upon under the control of the software that created them -- as a "set" without physically bringing them together -- if they can be scheduled at creation, it will be simple to carry out the proper disposition at the right time.

Therefore, policy must establish, and systems must implement, means of scheduling electronic records at (or even before) their creation.

Appraising

ISSUE: Policy must dictate criteria or bases for retention that will yield acceptable results for electronic records and yet be consistent with criteria (if not the results of applying them) for eye-readable records.

Policy needs to address whether there should be a difference between what was kept in paper form and what is retained electronically. Arguments have been made that because electronic information can be easily manipulated and analyzed, disaggregated information should be kept electronically that would have been discarded in paper formats.¹⁰ Arguments have also been made that the nature of the costs of electronic retention should force us to reconsider whether we have been retaining too much information in the past because

the costs of retention in paper formats are less apparent. Who should bear the costs of accessing data in electronic form in the future?¹¹

Integrating Access

ISSUE: Policy must require actions that will prevent the format of records from being a serious barrier to access.

Organizational operational requirements insist that electronic and hard copy records must be integrated, physically or intellectually. While it is possible to transform paper records into electronic information by scanning (and may be possible to transform some paper records into full-text searchable electronic information by subsequent Optical Character Recognition or OCR) and it is possible to transform electronic information to hard copy (paper or microform), neither practice can be recommended without reservation at this time, for both economic and technological reasons. Conversion of all paper records to digital-coded form is not cost-effective at prices which in the U.S. today are over \$1 per page. Conversion to digital bit-maps forces us to decide on acceptable resolutions at a time when image quality compromises are still economically and technologically necessary. At the same time, most electronic data is much more usable as electronic information than it would be in paper, so conversion from electronic to paper formats is also generally inadvisable.¹² Two interim solutions seem viable:

(1) Paper records can be bit-mapped when called for and be transmitted to users in this form with the electronic copy either being discarded or held for future reference. This adds no effort to the reference process, delivers the user an electronic (but not text-searchable) copy, and can select for storage only the 5% or so of documents that are likely to be reused.

(2) Electronic records can be output to Computer-Output-Microfilm (COM), and then input back into electronic systems by Computer-Input-Microfilm (CIM) which includes Optical Character Recognition (OCR) when needed and when elec-

tronic manipulation of ASCII is valuable.¹³ The electronic file can then be discarded.

In any event, as long as we have mixed systems of paper and electronic records, records managers and archivists -- together with information managers and program offices -- need to find means of integrating hard copy and electronic records from different systems within the same organization. As long as physical integration is inadvisable, intellectual approaches must be developed that can make the linkage. This has implications both for the control of electronic information and for the description and control of conventional records. Attributes of hard copy that are difficult and expensive to capture in manual systems, such as item-level data about date, place of origin, author, and natural language content indexing, are trivial problems for electronic records archives. Attributes of hard copy that are easier to capture -- such as provenance, organization and arrangement, and record type or form-of-material -- are often difficult to document, or even meaningless in electronic information systems. Policy must guide managers to use the needs of future users as criteria in providing integrated intellectual access to mixed systems as long as integrated physical and intellectual access is impractical.

Documenting

ISSUE: Policy must prescribe intellectual control and documentation standards for electronic records.

Consistent methods of describing records from their creation to their destruction will save energy and improve access. Because records are under control of different offices and professions during their lifetime, policy must dictate what standards should be followed. The methods traditionally employed by archivists and records managers to describe records systems are not much different in intent from those used by data administrators and data processing configuration management, but they produce a result that is considerably less usable than that of a fully implemented information resources

directory system. Approaches to filing in program offices meet some, but not all, of the requirements for future access by others. Policy should take into account national and international standards for the collection-level description of archival materials that have been developed over the past few years and consider the organizational requirements for data element and report-level information. At the same time, policy must encourage records managers and archivists to explore the possibilities of employing automatic document marking based on figural aspects of documents, self-documenting systems, artificial intelligence, and other means of substituting machine documentation for human description.

Storing

ISSUE: Policy must state who should have physical custody of archival electronic records.

Records managers have traditionally transferred records to archives long after the records become inactive. Unlike hard copy records which are essentially unaffected by sitting dormant (as long as they are stored under constant environmental conditions that are reasonably easy to achieve), electronic records require much more attention for three reasons: the media on which they are stored is less stable; the format of the medium is subject to rapid obsolescence; and the information itself is under control of software that is usually short-lived and owned by an organization other than the licensee.

Records centers and archives were established for the physical control of hard copy records because it is more cost-effective to store such materials centrally and in low cost facilities than to have them in office environments. Efficient retrieval argues against decentralization. Similar cost/benefit analysis for electronic records and archives suggests that they should remain in, or be transferred to, the physical custody of information systems departments which already maintain the equipment required for their continuing management and must in any case migrate active records systems across new

technologies and configurations. If these implications are accepted, the responsibilities of records managers and archivists will shift from physical custody to administrative and intellectual control.

Because this represents a fundamental redefinition of the operational role of records managers and archivists, it is worth examining how we are forced to make this fundamental tactical choice not to physically transfer archival electronic records from the offices that maintain the active systems to an archive. First, we confront the fact that if the records were to be transferred, they would need to be copied on an ongoing basis out of record systems appraised for archival retention or acquired when those systems became obsolete. In the first case, accessioning scheduled records as they are created has significant implications for the role of archives and records centers as off-line storage to active systems, because, unless means are found to keep software-independent data which retains the necessary evidential values (and at present such means are lacking),¹⁴ the archives would have to possess the capability of migrating data and systems to subsequent generations of software. In the second case, the archives would need to be in a position to provide equivalent functional capabilities to those of the active records system and import data from those obsolete systems to such an environment. In either case, such complete systems redundancy would be an unjustifiably costly proposition.

As a result, policy needs to consider decentralized electronic records storage, with responsibility for regular migration of systems being assigned to the department that maintains active information systems. The burden of continuously migrating archival information systems will then become part of the requirement to upgrade active information systems, which is a necessary business expense for which the expertise and technologies will be provided. Archives will not run the risk of having records "left behind" by several generations of technology changes.

Preserving Media

ISSUE: Policy must establish standards for care and storage of electronic records and address the basis upon which storage media decisions are to be made.

When electronic information systems were only data transmission facilities -- such as the telegraph -- that did not alter or process the information they transmitted, records managers and archivists treated their hard copy output (if any) as records. Responsibility for turning printed records over to archives could be successfully assigned to those who created the records. In theory, all text and data in electronic form could be printed out and scheduled in its printed form. In practice, all the reasons why electronic data processing systems came to replace paper-based systems prevent us from simply printing out their contents: the volume of paper would be preposterous, the information would not be organized in all the ways that users wished to access it, the processes executed by the system would each have to be captured as well, etc. Yet the information is at great risk in electronic form because of the fragility of the medium on which it is recorded, the rapid obsolescence of the technologies it depends upon to be read, and the connection between the information content and the way the system in which it was implemented delivered that content.

Data archivists have developed standards of storage and procedures for "exercising" magnetic tapes to ensure that electronic records will be readable if stored without activity for a considerable time. Standards for handling other media are being developed by testing and standards bureaus. Data archivists, along with information systems administrators, pay careful attention to migration of media to ensure that information being kept in an organization can be read by devices maintained by its data processing facility. In this respect it should be noted that traditional archivists have often retained electronic media -- such as sound recording cylinders or reel-

to-reel magnetic sound recordings -- that they do not have the facilities to "read" and should reconsider such practices.

Probably the most pressing issue involving transfer from active records systems is not addressed by media preservation standards or media migration procedures because it has no analogy in conventional records. Electronic records must be retired from active systems by the system itself, under software control. They can only be communicated elsewhere through the telecommunications facilities (software and hardware) of the system in which they are operating. The hardware environment in which they run will determine the media upon which they can be recorded. The hardware and software environment of the archival facility will determine what data layout formats can be supported.

Preserving Functionality

ISSUE: Policy must define to what extent original functionality is to be replicated or documented when migration of data and systems is necessary to ensure continuing access .

Regardless of who houses electronic archives, the burden of justifying a budget for archival retention of electronic records will fall on archivists and records managers. These costs, already considerable, are likely to increase despite the rapid decline in the costs of information system hardware. The source of these costs will be the need to continuously migrate records across media and records systems to ensure that they can be used in a constantly changing technological environment. Because archives cannot afford to become museums of obsolescent hardware or software, they will need to move the data to newer devices. Because the evidential value of information resides in the way it was used in the organization, not in its information content alone, archivists will be forced to re-create software capabilities as well. When archivists can rely upon standard media, standard operating systems, standard methods of recording data in storage devices, and

standards at every other level of the Open System Interconnection Reference Model, systems migration-related expenses will be substantially less. At present they cannot, and the continuing migration of records and systems will be expensive. Archival management of electronic records promises to be an increasing programmatic investment even if the costs of all other aspects of information management continue to decline. This forces records managers and archivists to make the case for an institutional requirement for electronic records management or face a diminishing capability to cope with a growing challenge.

Ensuring Security

ISSUE: Policy must ensure the security of electronic information and preserve the rights of individuals and the confidentiality required of the organization.

The security of electronic information systems is a serious concern to management for a number of reasons that are not applicable to paper records. Like paper records, one must secure against unauthorized viewing of information of a confidential nature, but in electronic systems the opportunities to alter data without leaving a trail and to make massive deletions of information with little effort mandate a higher profile for security concerns. In addition to security concerns driven by the opportunity for mischief and criminality, management needs to be aware of security concerns of the normal operating environment in which data can be easily lost through accident, non-specific acts of sabotage such as computer viruses, and acts of nature. In addition, the very nature of the integrated information system raises the issues of permission management that only infrequently accompany paper records that are normally stored in distinct areas for different purposes.

Providing for Use

ISSUE: Policy must dictate how the organization and others entitled to access will be enabled to use electronic records.

Traditionally, archives have been accessible only to those authorized and willing to go to them. Search methods have emphasized recall over precision, requiring users to read through volumes to obtain information pertinent to a query. Electronic records -- selected with considerable precision -- can be sent to users in whole, or in part for those who lack authority to see the whole. Archival electronic record systems can be made to maintain interest profiles and alert users to the acquisition of new electronic records of potential interest. Knowledge of electronic records can be integrated into active work environments so as to retrieve relevant archival documents automatically. Electronic records could be automatically translated into other languages, be spoken or reproduced in braille by machines for the blind, or be combined so that appropriate texts, sounds and images are delivered in response to queries from program officers or school children, whether in the next office or a remote area of the world. One of the most significant policy challenges of electronic records will not be to plan for their acquisition and maintenance, but to adjust to the potential of their use. If electronic records are to be preserved (and that preservation demands their early identification, appraisal and transfer), then archives and records must be integrated into the active, operational information system.

Electronic records are most useful in electronic form and in the software environment in which they were created. Many questions cannot be answered unless both these requirements are met. Therefore, archives should provide users access to records systems, not simply deliver records. If the records systems have been lost or discarded and the data is in software-independent format, it will be most useful to provide the data in a medium and format in which the user can manipulate it on a local system. These and other issues about the

nature of reference services in electronic archives must be addressed as policy issues.¹⁵

Controlling Costs

ISSUE: Policy must address how the organization will avoid unnecessary costs and target essential expenditures in the management of electronic records.

The unit costs of preserving electronic information are only somewhat higher than those for preserving information on paper, but the costs of identifying and subsequently culling appropriate records and the expenses involved in preserving their functional characteristics and thereby their evidential value are substantially greater. The potential costs of bad planning and failure to control electronic records throughout their system life-cycle are substantially higher than those involved in temporary loss of control over paper records. Management inattention in the sphere of electronic records will prove extremely costly and is likely to result in complete loss of significant documentation. On the other hand, careful technology forecasts and adherence to standards can be combined with internal vigilance and good systems design procedures to limit costs and target expenditures in areas that will generate the best possible return.

RECORDS MANAGEMENT FRAMEWORKS

Goals: Organizational Accountability

Records and archives management are housekeeping functions of an organization. The necessity for them reflects the very basic truth that organizations must keep certain records in order to account -- to themselves and to society -- for their actions. The job of records managers and archivists is to ensure that all the records necessary to document the actions of the organization -- but only those records -- are retained as long as they continue to have value.

By returning to the fundamental goal of accountability, we can find reason to adopt a particular definition of records and non-records that will serve better in the electronic world than that which has been used in paper-based systems. Traditionally records have been defined as information, usually in any format, created (and sometimes including received) by an organization and its employees in the conduct of business. This definition usually contained two clauses intended to capture the entire universe of information and one operational clause that distinguished records as part of that universe.

The first clause included all forms of information, either by using the phrase "in any format" or by enumerating and then providing a way out, such as "or any other medium." The second clause sought to incorporate information made (or received) anywhere and by anyone in any capacity, so as to ensure that business conducted from the home or on the road would create records. The definition itself revolves around the activities of the organization; it emphasizes that records flow from official actions and are evidence of such actions.¹⁶ The United Nations, for instance, defines records as "documentary materials, regardless of physical type, received or originated by the United Nations, or by Members of its staff . . ." The U.S. federal government definition of a record as an "item that documents the actions of an agency in the conduct of its business," is broader but may be less useful to the average employee.¹⁷

One problem with these definitions is that they depend in the first instance on our being able to see the items at hand and recognize how they came about and what official import they had. In practice, records managers and archivists are not in a position to see electronic records as they are created and transmitted because the documents themselves exist only under software control. Determining the source and function of an item or document, even when we do have the data of which it is comprised, is impossible except within the context of the system out of which it arose.

In fact, content-based definitions have proved impractical with paper records as well, so records managers and archivists have adopted a more operational definition that serves equally well: records are recorded transactions. Recorded transactions are information communicated to other people in the course of business via a store of information available to them. While this definition is more explicit than the one archivists have traditionally used with paper records, it is consistent with the concept that a record is created by an official action of receiving or sending information. Both paper-based records management and electronic records management must distinguish between the hour-to-hour or day-to-day changes in a draft of an official document and records sent or received by the organization. In both situations making an entry in a bookkeeping journal, a case file, a database, or even a "memo to the file" is creating a record even though the information is not "sent," because others are intended to receive this communication at a later date. Each system must distinguish official from purely private information; thus jotting a note about an expenditure or change of address on a loose slip of paper or in an electronic memo pad to remind ourselves to make such an entry at a later time is not a record-transaction, and, hence, not a record.

Throughout this chapter, recorded transactions, called record-transactions, will be taken as a basic building block of an electronic records management policy. Applying the definition of record-transactions in electronic information systems environments will often prove more complicated than it has been for paper-based contexts because we cannot see electronic data, because it is stored randomly, and because electronic systems were installed precisely because of the ease of updating and recalculating within them.

Strategies: Applications Systems

Archivists and records managers confront vast quantities of records created in their organizations. For practical reasons alone they must usually manage these records in some aggregate manner or be overwhelmed by their volume. But there

are also sound intellectual reasons for managing records collectively which relate to the nature of organized work and the structures of communications within organizations. Both work and communications are conducted by individuals, but they take place within well understood -- if not always well defined -- systems. Systems for work and communication lead to regularized, predictable, and accountable outcomes. The informational systems that support communication and work in an organization may be thought of as either infrastructural systems or application systems. Electronic information systems can also be categorized in this fashion.

Infrastructural electronic information systems have presented problems to records managers and archivists for 150 years, but these problems have only been recognized as belonging to a class of electronic information issues since the widespread introduction of the computer and associated microprocessors into office environments in the past decade. Telegraphy is the oldest infrastructural electronic information system, but the telegraphic record is delivered to the user as a printed output, even when the information it contains is first telephoned. As a result, records managers and archivists have been able to treat telegraphic traffic as a form of correspondence within conventional record systems rather than confronting the issues it raises as an electronic information system. About 100 years ago, the telephone system, another infrastructural electronic information system, introduced analog transmission of sound, but for historical and sociological reasons this form of electronic information has been (reluctantly?) accepted by records managers and archivists as non-record material. It is important to note, however, that for most of the past 100 years this form of electronic information could have been recorded on disk and tape recorders and could have been appraised by archivists and records managers along with other documentation. Infrastructural systems for transmission of images, employing telegraphy technologies, have been used heavily for newspaper photography and military purposes for

almost 100 years. Thus infrastructures supporting electronic transmission of text, sound, and image are hardly new. Indeed, as radio, the telephone, and television illustrate, infrastructural electronic information generation and reception facilities are among the most conspicuous features of our current civilization.

Electronic information application systems are not very new either. Routine sensing and control devices, often using paper tape for data storage, were introduced fifty years ago for numerous applications, but because their information product was considered non-record material, many records managers and archivists simply ignored these devices. Since the introduction of mainframe computing in routine organizational information processing applications in the 1950s, records managers have been unable to ignore applications generating electronic information. In most large organizations, applications such as inventory, personnel, and accounting, are now automated. More recently, non-routine, decentralized, and programatically important aspects of organizational activity are being assisted by automation. The introduction of these systems, with their inherent ability to capture electronic information locally and retain it in an electronic form, is transforming contemporary organizations.

Organizational application systems are not the same thing as applications software. General capabilities such as word processing, spreadsheets, electronic mail, project management, and statistical analysis are often referred to as applications software, but in the context of an organization these facilities are infrastructural tools, not applications. The existence of word processing and an electronic mail utility within an organization no more defines the kinds of records that will be created and sent than does the installation of typewriters and postal meters. Organizational applications of electronic mail may include its use for the dissemination of directives, policies, and procedures and its use for making personal lunch dates. Word processing can be used to keep private notes of

meetings or to write organizational reports. Spreadsheets reflecting departmental or sub-unit budgets kept by line managers for day-to-day control purposes do not substitute for the accounting system. However, spreadsheets developed for the purposes of submitting proposals or rescheduling debt for the organization may be of long-term value for accountability and of historical interest. Records management policies have always taken the organizational application system as their focus and will need to continue to do so in the electronic information systems environment.

A basic tenet of the remainder of this chapter is that the object of records management and archival control is organizational applications systems, the nature of activity in the organization that remains the focus of records management attention. In the electronic environment, it is often easy to lose sight of this critical focus both because of the terminological confusion arising from the concept of a software application and because the tactics for implementing records management control are necessarily dependent on exploiting aspects of the way infrastructural systems work.

Tactics: Systems Management

The primary conceptual framework of paper records management and archives is the life cycle of records. Paper records were obviously created, filed and sent, consulted, annotated and refiled, scheduled, and removed from active files according to schedule, disposed of by destruction or retention in an archives or records facility, maintained by that facility, described and accessed. Each stage in the life cycle of the records was marked by an activity in which people with different job responsibilities participated, and each resulted in a new status for the records which was evident from physical examination.

At first it seems that the concept of the life cycle of records must be discarded in the electronic environment. The record itself has lost physicality, in being stripped of the corporeal manifestation of a record. Records managers and archivists

have also lost their most fixed bearing. In place of a simple progression from creation to destruction, the electronic record partakes in a multitude of independent acts of information acquisition, manipulation, and production, each of which creates new records for some user, potentially without changing the original or generating any (retained) copy. None of the familiar life cycle landmarks is unaltered by the advent of electronic records, and many stages appear to have conflated. For example, the creation of a document using word processing, whether or not it is a record, involves copying it from RAM and filing it on a disk. It may also involve sending it to a printer or a remote disk. Thus the steps of creating, filing, and sending a document are collapsed into one. Consulting a document (and even refiling it after use) does not necessarily involve moving it, but it does involve making a temporary copy in RAM; copies can also be made and filed elsewhere without the document moving. Annotations to the document, and updates, are both actually made in a separate physical place from the rest of the document; "deletion" does not actually erase the text that is deleted, but only changes the links between segments of the text. Disposition is likely to involve a change of status, not place, and description and access is largely determined prior to the creation of the record by the design of the system in which it was created.

Indeed, as we examine the electronic records landscape, it becomes increasingly evident that the life cycle of the records (application) system, not the record, must be the new focus of attention. And, on reflection, we can see that it was, or should have been, the focus of attention in paper systems as well, but the physicality of the individual paper item once again led us astray. In practice, making item-level disposition decisions for all records (e.g., deciding first whether any given item of documentation is a record and then whether it should be retained as evidence) has always been impractical. Organizations cannot have a 1:50, or 1:20, ratio of records managers and archivists to staff able to create records. Therefore, records

managers and archivists have always relied upon user discretion and aggregate decisions in making retention and disposition decisions. They may decide, for example, to keep all the records filed in the policy files and the case files and discard client correspondence after five years. These decisions employ the intervening records system (in this case a file clerk) to aggregate records of common character and make retention decisions affordable. In some international organizations, especially in Europe, item-level control over records received and sent from an organization is exercised by a central registry or records and communications section.¹⁸ Even with substantial manpower commitments, such offices do not provide item-level control over all internal memoranda and exchanges, the internal reports, project case files, financial transactions data, or information generated or used in internal decision making.

Instead, records managers and archivists have perfected means of collectively appraising all records generated by a specific application and then controlling records within applications at levels determined by the character of the application. In paper record environments, these methods involved defining segregated files (records series) for each discrete type of records generated by the application, establishing filing procedures to ensure that records were filed in the appropriate file and in a sequence required by the office of origin, and determining disposition for the entire series in a single appraisal, either before or after actual records were filed. Records managers and archivists have had much greater difficulty making bulk appraisals of record types generic to all activities such as the correspondence, memoranda, and internal draft distributions. In controlling such materials, they have relied most successfully on organizational source/destination of these documents to make determinations about whether and how they should be filed and upon where they are filed to make determinations concerning their retention. Thus, we must acknowledge that while records managers and archivists make appraisal decisions at the item-level as rarely as possible, and

often only in the case of special categories of records, such as vital records, they are dependent on personnel of line offices (or in central registry offices) who make filing decisions and who decide what application any given information was part of, for the validity of appraisal decisions made at the series level.¹⁹

Electronic information systems present records managers and archivists trying to extend these tactics to electronic records with some significant challenges. The first is to sculpt the application software so that the user interface presents itself as a number of distinct organizational applications, rather than simply as a set of tools. For example, when the user saves a word processing document, the application provides a dialog screen that enables the user to assign it to the appropriate organizational file (which requires, of course, a word processing software application with the necessary escape to a programming language and a programmer to write the necessary organizational interface). Similar special interfaces would be constructed to subdivide generalized software applications that serve as organizational utilities such as electronic mail, spreadsheets, or statistical analysis packages.

The second challenge is to sculpt the record-transaction itself. This also will by necessity involve records managers and archivists in the design of the application system before their implementation. The objective of their involvement here is to harness software capabilities to generate (and segregate) records required for organizational accountability. Unlike the paper environment, electronic records may need to be "created" in order to be retained because many records that would have existed in manual systems contain substantially redundant information and would normally be "designed out" of automated applications. For example, electronic building permits and electronic certificates of occupancy would be defined in a modern database management system as "views" of a database, not as separate records. If the information in one was scheduled for archival retention and the other was con-

sidered a routine working document, an electronic information system would need to "create" the permanent record and discard the temporary record.

The focus on systems management as the primary strategy to effect records and archival control rather can be seen throughout this chapter. For example, in discussing the problems of legality of electronic documents, the emphasis of tactics is on the authenticity of the record which can only be ensured through management of the system continuity and internal procedures, much as it has been with microform. In the discussion of preservation and storage concerns, and the longevity of electronic media and formats, the emphasis is on the life of systems that will continue to provide access to data and on preservation of system functionality, rather than on the physical conservation of the medium, because in a world of rapid hardware and software obsolescence, a perfectly preserved disk can contain data which cannot be read by existing equipment. In the discussion of integration of hybrid systems, it is acknowledged that mixed paper and electronic systems are not an anomaly of our historic moment, but a reflection of the fact that today's technologies permit records created in both paper and electronic forms to be electronic in many systems at a number of points in their life cycle and hard copy at other stages. Thus all tactics for management of electronic records must, in the end, be tactics for systems management.

Objectives: Information Content and Context

Records managers and archivists seek to ensure the retention of information required for organizational operation and accountability. The information may be contained in documents and databases or it may be contained in the way those documents and databases were used. In this sense, records managers and archivists have always recognized the validity of Marshall McLuhan's famous dictum that "the medium is the message."

One way that records managers and archivists preserve the informational content of context is to establish files and

filing procedures that reflect the communications systems of the organization by leaving a trail. In the paper-based organizational and technological context, a transaction is conveyed only to those offices which need to know its contents, and it can be assumed to become part of their activity by the fact of its transmittal. If stored within their files, it will be organized with respect to the role it played in their activity, so that correspondence will be organized in a chronological or subject file reflecting the needs of the office, and documents about individuals and events will be organized into case files. In such an organizational and technological milieu, the file is a records system that adequately reflects activity.

Preserving the context of use of records in an organization is more difficult if the records management system is centralized in a registry office, but the difficulty of tracking use is offset by the convenience of reduced redundancy. Indeed, since the advent of convenient means of copying documents, beginning with carbon paper, we have witnessed the demise of the recipient's incoming file as a non-redundant source of information, because the record creator could file the copies of one original document in a number of separate files. With the introduction of photocopying machines, numerous copies could be readily made after the creation of the original, making it possible for the recipient to generate additional copies for his files or those of others in the organization. Files soon became crowded with many items of marginal interest, sent "For Information." It was no longer possible to ascertain from the files whether items they contained had been seen by the recipient or used in an important decision process. The introduction of automation in the creation of documents added two more dimensions to the problem: now we no longer have an "original," so it is even less evident what "copies" might be discarded without loss of accountability or information content,²⁰ and, because we can view documents remotely without transferring them to our own files, the "copy" used in any given decision-making process need never have been physically

"copied" to the recipient's file. The fact that machine-readable files lend themselves to ready manipulation and on-the-spot analysis, is, of course, one of the primary reasons that spreadsheets (and word processors) have taken over the office. It also means that important decisions can be made based on analysis of information from a variety of electronic files without altering the saved versions of those files or creating a saved version of the new manipulations.

Files have also become less useful as means of documenting accountability as decision making has shifted from the hierarchical organization, with its relatively permanent organizational units which create and file records, to the realm of ad hoc working groups and task forces and inter-organizational entities. These types of organizational constructs tend not to maintain offices or keep records of their own, but live instead on borrowed staff time and facilities. Their records, therefore, are usually dispersed through the organization, reflecting the roles played by individuals. As we come to rely more and more on decision making in group settings, the role played by visual aids (overhead transparencies and business graphics) and by what people say in those situations is critical to reconstructing how and why a decision was reached. The approach archivists have relied upon for the past hundred years assumes that decisions are made and promulgated through the kinds of textual documents in our files. The disjuncture between reality and the theory has been appreciated by others, but the technological facility for merging text, image, and sound in digital stores will dramatically affect our recordkeeping systems. We will need to consider the potential for the visual and oral message to be archival.

The coup de grace to traditional file-based rather than systems-based records management has been delivered by the database management system, which by definition manages information in more than one file. None of the files alone contains the information that might have been in a "record," because a record is defined by a function supported by the sys-

tem that enables users to find information in a variety of files and view it in a variety of formats. Databases whose files are all physically on one device have been perplexing enough to records managers; now we need to develop strategies that will also work for databases and database management systems that span many physical devices, either because a networked architecture is employed (in which physically separate computers, strung together by a dedicated cable or bandwidth on a cable, act as a unit), or because a variety of devices interact according to strict information protocols using telecommunications.

In any database, individual "record segments," may change independently of each other, but in traditional systems one could in principle reconstruct the state of the database from a full transaction log. In distributed databases, which may employ different kinds of audit trail facilities and backup strategies, and fall administratively under different records management and archival jurisdictions, it is not reasonable to imagine reconstruction of the state of the database as a documentation tactic. The individual files, even with time stamped transactions, will not support reconstruction at a reasonable cost, and reconstruction would need also to reflect the software facilities and data access permissions and views available to any given user in order to provide evidence for purposes of accountability. If a record is the information used from a given source at a given time (a record-transaction), in a database environment it may only exist as that particular constellation of information for one user. At the price of substantial redundancy, record-transaction capture -- in which all information seen by an individual as part of an activity must be copied as it was viewed -- appears to be the only acceptable method of unobtrusive records retention.

Throughout this chapter the emphasis is on organizational accountability as the ultimate goal of records management and archives. As a result, the objective of documenting how information was used in an organization will be consid-

ered of equal importance to the objective of documenting the information content of organizational communications.

Methods: Documentation

Archives and records management are information management activities which carry out their functions by acquiring or creating documentation concerning records and record systems and acting upon the basis of that documentation to destroy or retain records and to provide access. The central premise is that the fundamental method of records management and archives is documentation. The specific methods of documentation that archivists and records managers have employed must, therefore, be understood if we are to develop viable approaches to the electronic information environment.

Unlike most other information service providers, records managers and archivists do not describe or classify items. Records managers almost never document holdings at the item level, except in registry offices which serve an active information retrieval function more than a life-cycle management role. Archivists reject classification as an approach to managing records at the document level because classification is linked in paper-based practices to physical reorganization of records and archivists feel strongly that the original order of records should be preserved as evidence of the way in which they were created and used. Archivists may occasionally prepare indexes to the records themselves or to finding aids.

Yet users have an interest in getting access to specific documents. The way that records managers and archivists traditionally provide for such access is to exploit the "original order," which is to say the filing order, of the records. Sometimes, if they are fortunate, archivists and records managers may be able to point users to a series of records that is itself an item-level index to another records series. In either case, item-level access to records is obtained by actions of the record creators (and the staff their offices).

In the electronic environment, archivists and records managers must depend even more upon the creators of

records and records systems for documentation. While they have displayed some enthusiasm for full-text retrieval of electronic records, the primary method for identifying information in records systems retained for continuing value will be exploiting information created by others. Some of the tactics discussed in this chapter relate to, and depend on, capturing information about information systems in what data processing personnel call "metadata systems." Metadata systems document much more than the information content of records systems. They document the input and output products, the relations between files, the nature of software facilities, and the functions supported by the systems. Traditional records management and archival practice has also collected much of this information in building collective-level, contextual, records system descriptions (usually at the file level) to provide access by provenance. Approaches at the systems level, including system design data administration and configuration management, are necessary if records managers and archivists are to adequately document the informational environments of contemporary organizations. These approaches, using the tools of information resource management, will also enable archivists and records managers to provide information of value to their organizations, not just references to records that might be of value.

Throughout this chapter, systems documentation using the approaches of data administration and the tools embodied in metadata systems (called Information Resource Directory Systems or Data Dictionary/Data Directory Systems) is advanced as a primary tactic for control of information about records. The reason for this focus is found in the emphasis placed on applications as the focus, and systems management as the tactic, of records management and archives in an electronic environment.

Investments: Staff

Because the management of the records of an organization is an activity in which all staff are engaged, one of the central

issues in implementing any policy is how the organization can mobilize its personnel and use their skills. Throughout this chapter, skills and knowledge essential to controlling electronic information are identified and described which are rarely found on present archives and records management staffs.²¹ It is an essential conclusion, therefore, that records management is not the sole responsibility of the records management staff, and that the introduction of electronic records will demand a distribution of responsibilities (one which, in the view of the author, is long overdue in the paper records world as well).

In addition, the demands of electronic records will require that archivists and records managers acquire new skills and competencies. For instance, to present useful and credible systems requirements, the records managers and archivists sent to participate in the design process must be conversant with the capabilities and limitations of database management and telecommunications systems. They should be able to articulate logical designs and suggest physical implementations for them. Indeed, they should become partners with the systems development and systems implementation teams. This expertise could be acquired by substantially retraining present records managers and archivists, hiring new staff with these skills, or assigning staff with these skills who are presently attached to units responsible for systems development to archives and records management responsibilities. Because team work is essential to achieve the ends of records administration through systems management, the last option of bringing staff with different skills together in one administrative unit will probably prove the best means of combining the skills needed and can serve as a vehicle for a subsequent union of the responsibilities. In any event, major investments in staff training must accompany the introduction of electronic systems and some of this training should be directed at teaching staff throughout the organization about their responsibilities for management of electronic records. Some should also be

targeted for retraining professional records managers and archivists to deal with the new environment as a long-term investment.

No amount of staff training, however, will substitute for the absence of a sense of responsibility for records on the part of line managers throughout the organization. In the paper record environment, line managers took a relaxed view of their responsibilities and were largely permitted to do so by the organization except when accountability was an essential element of their jobs, as in financial and personnel offices where data integrity, security, access, and retention were audited and were clearly recognized as professional and organizational obligations. In the electronic environment, the same passive disinterest will result in the organization losing its memory, which cannot be condoned. Management expectations will need to be dramatically altered so that line managers understand clearly that they are accountable for the record of actions taken by their units. Of course the organization will need to provide not only policies that are clear but also guidance in how to apply them and tools with which to implement the policies. Ultimately, however, the fate of electronic records will depend on the degree to which line managers perceive records management as their responsibility rather than the future responsibility of a records management and archives staff.

Promoting an Electronic Records Culture

While records managers and archivists can occasionally be heard wishing that the electronic information revolution bypassed their institutions, they need to recognize that many of its problems result from the immaturity of the implementations and the lack of experience of our culture in treating the new cultural forms that the technology is making possible. Attempting to stand in the path of implementation desired by program managers to improve their productivity is a futile position. Just as records managers failed in restricting distributions of documents by trying to control copying machines,

they will fail in restricting access to automation if they attempt to limit the number and capability of computers, limit the iteration of document drafts, or establish corporately determined draft stages in the electronic mail process or centrally control topics for bulletin boards and teleconferences. Records managers and archivists who attempt to limit electronic mail to make it look like Telex, or to limit spreadsheets so definition of cells cannot be shared between offices, will, very simply, lose both the battle and the war. The option of standing firm is not even suggested here, because it is not a real option.

On the other hand, archivists and records managers can help to shape the electronic culture within their organizations. They can play a role in defining its explicit rules and implicit etiquette, and they can be perceived as promoters of cautious utilization of the best in information technology.²² For example, by teaching users about the problems they might have as a consequence of lost records and lost access opportunities, records managers and archivists can help themselves.

Policy aimed at developing a management culture open to new technologies and yet sensitive to their risks, is a consistent theme of this chapter.

GUIDELINES FOR IMPLEMENTATION

A practical methodology for establishing an electronic records management program has four stages, each of which returns to policy refinement before going on to the next. The four stages are: (1) establishing goals and objectives of an electronic records management program; (2) defining the scope of the program; (3) identifying strategies and tactics to be employed; and (4) securing necessary staff support and other resources.²³

Goals and Objectives

The first step of any policy development process is to define, as clearly as possible, the goals and objectives of the organization. Records managers and archivists may begin by

searching through existing organization policy and mission statements -- as well as through any discussions that have led to the attempt to formulate an electronic records management policy -- for statements of purposes. They should convene an internal working group consisting of staff from data processing, telecommunications, and other information management areas to draft a preliminary statement of policy. The draft should address all the issues identified in the policy section of this chapter. By selecting sample electronic records systems, the working group can assess the adequacy of existing policies within the organization and establish a baseline against which to test their proposed policy recommendations. In the process, the working group can identify areas of organizational culture that may prove most resistant to various policies -- and thereby find ways of implementing the resultant policy that stand the greatest chance of succeeding.

If necessary for reasons of the corporate culture, the initial statement can be broad so as not to require redefinition. The ultimate policy statement, on the other hand, should be explicit, written, and as detailed as possible and should try to set limits based on costs and benefits. As new issues arise in the formulation of policies, the statement of goals and objectives should be reviewed. If it does not adequately reflect the decisions being made as concrete policies, the objectives or the policies should be revised. Objectives will vary somewhat from one part of the organization to the next. They must take into account individual missions and resources.

Scope

The scope of an electronic records program has several aspects: the types of electronic information systems to be covered, the organizational functions to be included, and the degree of authority to be vested. The best way to clarify these issues is for the policy working group to undertake an analysis of the existing and planned electronic information systems in the organization. The analysis should be informed by procurement records for equipment and supplies, records of

telecommunications charges, and documentation from the information management function. In addition, it should include surveying the staff (in part to alert them to the policy review and in part to acquire information about the applications view of systems under the control of an individual or small group of individuals). With a profile of the present situation in hand, archivists and records managers should examine budgets, plans, and public statements of senior organization officials for evidence of future systems plans.

These profiles should be gathered together and recommendations should be forwarded concerning which systems ought to be included within the scope of the program (if not all) and what criteria should be employed. The scope statement should address the desired assignment of responsibilities for creation and identification, appraisal, control and use, and disposition to each system. Particular attention should be paid to whether additional resources will be required in the short term and over the next five years, and the purposes to which these resources would be put. External sources of information used by organization staff should be examined and determinations made whether to include them, and if so, in what way.

Strategies and Tactics

Once objectives and scope have been defined, management should review a number of strategic and tactical alternatives that might well lead to substantial revision of both. For example, if an objective is to ensure that archival records retention decisions reflect a ten-year cost-of-retention, then models will need to be developed that can be used to estimate these costs. If an objective is to provide access to electronic information through media or access methods requested by users, then it will be necessary to determine which media the function would be prepared to provide and what types of security would need to be established to permit access to duplicate databases as well as the cost implications of such a policy.

Of course, strategies will not be sufficient to enable staff to implement policy. Management needs to provide some guidance, in the form of administrative requirements, to shape action. This can be achieved if all statements of policies have clearly defined responsibilities and if a number of implementation methods are suggested as examples of the way organization staff might satisfy the policy.

In implementing the electronic records policies, the institution needs to be realistic about the degree to which it will be able to save data and documents from past and present electronic information systems. Only the most important of such systems should be evaluated unless adequate resources exist to appraise all such systems and to implement proactive tactics, including educational programs and system design involvement simultaneously.

Securing Support

The most important aspect of adopting a policy with respect to records management and archiving of electronic records is to ensure that the policy is understood throughout the organization. Records management and archives will need to act through records creators and managers of the computer and telecommunications infrastructures since they can no longer act as a line function due to the character of electronic information itself.

Dissemination of the policy is the first step in its implementation, but simply promulgating the rules will not lead to their successful implementation. Archivists and records managers will have to meet with staff throughout the organization to express their enthusiasm for electronic information systems, explain the problems these systems pose for organizational accountability, and help to develop a culture of electronic information comparable in effect to that in the paper world. This will include definition of types of documents, database access and use rules, and electronic information dissemination etiquette. It will be important in these sessions for both staff and management to understand that -- even if the records manager

or archivist were in full control -- the implementation of electronic information systems is likely to so transform the "culture" of the office. It will be difficult to predict what records might exist and only ongoing dialog with users will determine what is valuable to keep.

The next step in implementing the policy will be working out concrete agreements with other information managers in the organization to ensure that they understand their roles in helping to identify and document, maintain, and provide access to electronic records.

Finally, it will be necessary to return to senior management with a plan that includes the costs and staffing implications of moving forward following the accepted strategies and tactics to achieve the articulated goals and objectives. It would be useful to have examples of existing information systems which satisfy the requirements of the electronic records management policy. These examples will demonstrate that it is possible for program office line management to take responsibility for electronic records and to implement adequate procedures to safeguard records. If no fully adequate examples exist from traditional applications environments -- such as financial or personnel systems -- the best approaches available should be used for illustration and their shortcomings identified. Senior management should be encouraged to praise the managers of these exemplary systems, if possible in public in conjunction with the introduction of the new policies.²⁴

NOTES

- ¹ Committee on the Records of Government (sponsored by the American Council of Learned Societies, the Social Science Research Council and the Council on Library Resources), *Report* (Washington, D.C.: Council on Library Resources, 1985). Oklahoma State Archives, *Report to the Archives and Records Commission on Machine-Readable Computer Records in Electronic Format* (Norman: Oklahoma Department of Libraries, 1986) reports "a significant portion" of records are electronic.
- ² Alfred Chandler, *Strategy and Structure* (Cambridge: Massachusetts Institute of Technology Press, 1972).
- ³ Paule Rene-Bazin, "New Archival Materials Principles: Creation and Acquisition," unpublished paper, 11th International Congress on Archives (Paris 1988).
- ⁴ National Archives of Canada, *Data and Document Interchange Standards and the National Archives*, Project No.1-6465 (Ottawa, June 1987); Charles M. Dollar and Thomas E. Weir, Jr., "Archives Administration, Records Management and Computer Data Exchange Standards: an Intersection of Practice, unpublished draft, National Archives and Records Administration, 1988 (later published in Steven Spivak and Keith Winsell, eds., *A Sourcebook of Standards Information* (Boston: G.K. Hall, 1991): 191-211).
- ⁵ Too many discussions of this issue still treat the problems of continued access to machine-readable information as a traditional medium/signal preservation issue, as does Feodor M. Vaganov, "Conservation of New Archival Materials," unpublished paper, second session, 11th International Congress on Archives, Paris 1988. Useful warnings are being issued by some, like Margaret Hedstrom, "Optical Disks: Are Archivists Repeating Mistakes of the Past?," *Archival Informatics Newsletter* 2:3 (1988): 52-53.
- ⁶ Ithiel DeSola Poole, *Technologies of Freedom* (Cambridge: Harvard University Press, 1983).
- ⁷ U.S. National Science Foundation, Electronic Records Committee, *Electronic Records: Legal and Policy Considerations, Report of the Electronic Records Committee* (Washington, D.C.: National Science Foundation, April 1987).
- ⁸ Douglas P. Allen, "Optical Disk and the Law -- Texas Style," *Inform* (April 1988): 43-44.

⁹ Richard Barry, Chairman of ACCIS TP/REM, informs me that "The United Nations has accepted microform as evidence in the case of the Palestine Land Registers (made by the British in 1948) and the closed portions of the United Nations War Crimes Commission Files."

¹⁰ Charles M. Dollar, "Appraising Machine Readable Records," in *A Modern Archives Reader*, Maygene Daniels and Timothy Walch eds. (Washington, D.C.: National Archives and Records Administration, 1984): 71-79; Harold Naugler, *The Archival Appraisal of Machine-Readable Records: A RAMP Study with Guidelines* (Paris: Unesco, 1984).

¹¹ David Bearman "Editorial Commentary," *Archival Informatics Newsletter* 1:4 (Winter 1987): 71-72.

¹² Too little research has been conducted into data-strips and other such compact methods of storage of electronic data on paper that permit rapid recovery of electronic files, but it seems likely that the specialized nature of the readers for bulk reading of such media would render them less than competitive.

¹³ C. Lee Jones, "Microform vs. Optical Disc," *Archival Informatics Newsletter* 2:1 (Spring 1988): 16-17.

¹⁴ Thomas Elton Brown and William A. Reader, "The Archival Management of Machine-Readable Records from Database Management Systems: A Technical Leaflet," *Archival Informatics Newsletter* 1:1 (Spring 1987): 9-12.

¹⁵ Thomas E. Brown, "Standards for Machine-Readable Records Reference Service," *Archival Informatics Newsletter* 2:2 (Summer 1988): 34-35.

¹⁶ ST/AI/326/28 December 1984. More narrowly, a record according to Florida statute is a "written memorial made by a public officer . . . one required by law to be kept, or necessary to be kept in the discharge of duty imposed by law, or directed by law to serve as a memorial and evidence of something written, said or done." (Florida State Legislature, 1985).

¹⁷ Planning Research Corporation, Inc., *Army Implementation of DOD & Federal Standards: Annex C - Records Management* (6 May 1988).

¹⁸ Brian Denton and Charles Dollar, "Draft Report on TP/REM Interview with Staff of the International Atomic Energy Agency" (23-24 February 1989).

¹⁹ In one sense, the approach proposed for management of electronic records by the National Archives of Canada in *Management of Information in Integrated Office Support Systems*, (Canada, National Archives of Canada, "Management of Information in Integrated Office Support Systems [IOSS]: Preliminary Functional Requirements," Third Draft (24 May 1988) is to extend these same responsibilities for item-level identification to the creators of records within the application for electronic document filing.

²⁰ Oklahoma State Archives, *Report to the Archives and Records Commission*, 1986. The legal definition of an original in Oklahoma is: "If data are stored in a computer or similar device, any printout shown to reflect the data accurately, is an 'original'."

²¹ Patricia Aronsson and Thomas E. Brown, "Government Archivists and Government Automation," *Government Publications Review* 13 (1986):561-570.

²² Norman Z. Shapiro and Robert H. Anderson, *Toward an Ethics and Etiquette for Electronic Mail*, Rand Report R-3283-NSF/RC (Santa Monica: Rand Corporation, July 1985).

²³ David Bearman, "Developing Guidelines for Electronic Records: Report of a Project to Test the ACCIS TP/REM *Electronic Records Guidelines: A Manual for Policy Development and Implementation*," in Advisory Committee for the Co-ordination of Information Systems, *Management of Electronic Records: Curriculum Materials* (New York: United Nations, 1992): 137-147.

²⁴ The full TP/REM report includes, on pp. 35-65, the actual recommended policies and practices for implementation.
