ELECTRONIC RECORDS MANAGEMENT AND ARCHIVES

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I. INTRODUCTION

This article is adapted from a report prepared for the Administrative Conference of the United States in 1990,[1] which resulted in the adoption of several recommendations.

A. *Viewpoint*

More and more records of federal agencies are created, used and stored in electronic rather than paper form. For example, President Bush reportedly used a personal computer to sketch American policy goals in the early hours of the Soviet coup.[2] As this occurs, legal requirements and management efforts designed around paper records are progressively less satisfactory to ensure an adequate legal and historical record of government decisionmaking.

Administrative Conference Recommendation 88-10[3] and the accompanying report address public access and dissemination of electronic information. The 88-10 effort considered statutes and policies that contemplate agencies releasing information they already have to the public.[4] The recommendation and report also considered agency ac-

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1. The Administrative Conference of the United States [hereinafter ACUS] was established by the Administrative Conference Act, 5 U.S.C. § 571-576 (1988 & Supp. II 1990). The Conference "stud[ies] the efficiency, adequacy, and fairness of the administrative procedure used by administrative agencies in carrying out administrative programs, and make[s] recommendations to administrative agencies, collectively or individually, and to the President, Congress, or the Judicial Conference of the United States. . . . 5 U.S.C. § 574(1).

2. *Again Bush Was In His Element*, PHILA. INQUIRER, Aug. 22, 1991, at 14A (President worked up list of goals for handling Soviet coup on his personal computer before meeting with aides).

3. 1 C.F.R. § 305.88-10 (1991); Henry H. Perritt, Jr., *Electronic Acquisition and Release of Federal Agency Information: Analysis of Recommendations Adopted by the Administrative Conference of the United States*, 41 ADMIN. L. REV. 253 (1989) [hereinafter Perritt, *Electronic Acquisition*]; Henry H. Perritt, Jr., *Federal Electronic Information Policy*, 63 TEMP. L. REV. 201 (1990) [hereinafter Perritt, *Electronic Information*].

4. Information release can occur at three levels: access, disclosure, and dissemination. *See* 1 C.F.R. § 305.88-10 (1991) (glossary); HENRY H. PERRITT, JR., ELECTRONIC ACQUISITION AND RELEASE OF FEDERAL AGENCY INFORMATION, REPORT PREPARED FOR THE ADMINISTRATIVE CONFERENCE OF THE UNITED STATES 9-10 (1988) [hereinafter PERRITT, ACUS REPORT]; 1 C.F.R. § 305.88-10 (1991) [hereinafter ACUS Recommendation 88-10]. Perritt, *Electronic Acquisition*, *supra* note 3, at 256; Office of Management and Budget Circular A-130, 50 Fed. Reg. 52730 (1985). Circular A-130 distinguishes between "access" (§ 6(f)) and "dissemination" (§ 6(g)), and an appendix explains the distinction in essentially the same terms as those used in ACUS Recommendation 88-10. *See* 50 Fed. Reg. 52730, 52745 (Appendix IV). *Access* is the lowest level, representing the most passive form of release. The agency must release information upon request but takes no affirmative steps to release information in the absence of a request. Paper information subject to access is kept in regular agency files and indexed and packaged for routine agency use; not for public availability. The ACUS Recommendations use the term electronic access to refer to

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quisition of information in electronic form. The 88-10 effort did not consider internal agency use of information in electronic form, nor did it consider the circumstances under which agencies should create electronic information systems or the characteristics of such systems. The 1990 report and this article complement the 88-10 effort. This article focuses on internal agency electronic records management.

The basic legal framework contemplates that agencies must retain certain records of public decisions so that there will be a historical record. As electronic technologies become the predominant media through which decisions are recorded, faithful application of the policies embodied in the records statutes requires assessment of whether electronic records should be treated the same or must be treated differently from paper records. An idea shared widely among information systems professionals is that the best way to ensure retention of electronic records having archival value is to design information systems with inherent archival features. Accordingly, this article also considers electronic information system design.

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the lowest level of electronic release; the ability to obtain agency information through ad-hoc demands. Electronic access usually is accomplished by releasing bulk information on tapes or disks, in the format used by the agency. Information covered by the miscellaneous records provisions of the Freedom of Information Act, 5 U.S.C. § 552(a)(3) (1988), but not by other release obligations is an example.

Disclosure is an intermediate level of release, involving some affirmative effort by the agency to make the information easily available to the general public. Regulatory dockets, SEC filings, and indices of adjudicatory decisions all are examples of information that is disclosed. Most agencies meet disclosure requirements by providing public reference rooms. Electronic disclosure involves making terminals and suitable retrieval software available in public reference rooms, and possibly at other fixed locations. The ACUS Recommendations use the term electronic disclosure to refer to an intermediate level of electronic release; making information available electronically to the public at one or only a few places.

The highest level of information release involves the most agency activity: *dissemination.* This involves a high degree of affirmative agency action actually to publish the information and to distribute it. The National Library of Medicine and the Federal Register are examples of this activity. The ACUS Recommendations use the term electronic dissemination to refer to the highest level of electronic release; using electronic means to make information widely available to the public at places where it is used. Electronic dissemination involves making available dialup links or disks containing data structures and software for easy retrieval on small computers. *Electronic publishing* is the same thing as electronic dissemination.

It is difficult technologically to draw clear lines among the three levels once information is computerized, (*see* PERRITT, ACUS REPORT, *supra*, at 121-22 explaining why), but the distinctions nevertheless are useful in evaluating policy options. Paragraph C of ACUS Recommendation 88-10 makes use of these three levels of release.

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B. Relevance to Private Sector

It is erroneous to suppose that electronic records and archives management present issues solely of concern to creators and managers of government information. The private sector should be concerned with electronic records management issues for three reasons. First, the government imposes certain record keeping requirements on the private sector that may or may not be met by electronic record keeping strategies. Second, private entities want to maintain records for their own archiving and litigation support functions. Third, some of the same issues regarding reliability of official records kept in electronic form also are raised in connection with private electronic contracting methods.[5]

The federal government imposes diverse records keeping requirements on private sector entities. These requirements include aspects of economic regulation by the tariff regulatory agencies, aspects of environmental, health and safety, and food and drug regulation, and regulations imposed on defense contractors.[6] The Occupational Safety and Health Administration (OSHA) requires that hazardous substance exposure records for employees be maintained for 50 or more years.[7] The same technologies that permit electronic archiving of government information also permit electronic maintenance of private sector information subject to governmental requirements. Most of the same policy issues concern both private and public information, and the same procedures that make sense for government records managers also may make sense for private sector records managers operating under governmental requirements.

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5. A growing number of private companies are using electronic messages to conduct commercial business affairs, for example electronic invoices and purchase orders exchanged directly between computers. These electronic contracting activities use a family of format standards developed by ANSI (American National Standards Institute) accredited standards organization X12 and commonly known as Electronic Data Interchange (EDI).

6. *See* NATIONAL ARCHIVES AND RECORDS ADMINISTRATION GUIDE TO RECORD KEEPING REQUIREMENTS IN THE CODE OF FEDERAL REGULATIONS (published by Office of the Federal Register, National Archives and Records Administration, as a guide to record keeping requirements that the federal government imposes on private identities).

7. 29 C.F.R. § 1910.1001 (1991) (requiring employers to keep records of exposure to certain substances like asbestos for period of employment plus thirty years); 29 C.F.R. § 1910.1029 (1991) (requiring employers to keep records of employee exposure to coke oven emissions for 40 years, or for the period of employment plus 20 years, whichever is longer); 29 C.F.R. § 1910.20 (1991) (requiring employers to maintain employee exposure and medical records for 30 years); 29 C.F.R. § 1904.6 (1988) (requiring employers to keep records of reportable occupational injuries and illnesses for five years). *See also* 29 C.F.R. § 1951.47 (1991) (permitting state agencies to keep certain OSHA mandated records in microform).

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Purely private incentives also raise electronic archiving issues for the private sector. Private sector entities have an incentive to maintain records in connection with potential litigation, such as medical records, OSHA-related hazardous substances records and banking records.

A growing number of private and public entities are using electronic messages to make and administer contracts and to engage in other legally significant transactions. One important requirement for these electronic contracting systems is that reliable records of the transactions be maintained in the event of a dispute over whether the transaction occurred, whether a contract was formed, or over the terms of the contract.[8]

C. *Goals and History*

Records management and archives have the following purposes:

- to maintain an institutional policy memory;
- to enhance the body of knowledge in a factual and scientific sense;
- to maintain official records for possible use as evidence in legal proceedings;[9]
- to maintain the nation's history;
- to promote efficiency and effectiveness of agency operations; and
- to increase the return on investment from information in government records which has long-term value.

Realization of the last goal would be enhanced by expanding access to archived information at reasonable costs. Other conceivable purposes would engender more controversy, such as a goal of providing expanded electronic public access to public information on demand.

A 1988 National Archives and Records Administration (NARA) Report[10] proposed that agencies systematically maintain documents containing data having informational value[11] or that:

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8. MICHAEL S. BAUM & HENRY H. PERRITT, JR., ELECTRONIC CONTRACTING, PUBLISHING & EDI LAW ch. 6 (1991); Electronic Messaging Services Task Force, *The Commercial Use of Electronic Data Interchange—A Report and Model Trading Partner Agreement*, 45 BUS. LAW. 1645 (1990) [hereinafter *Electronic Messaging Report*].

9. The National Archives and Records Administration guidelines for documents to be preserved primarily reflect this goal.

10. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION, NARA AND FEDERAL RECORDS: LAWS AND AUTHORITIES AND THEIR IMPLEMENTATION: A REPORT OF THE TASK FORCE ON NARA RESPONSIBILITIES FOR FEDERAL RECORDS AND RELATED DOCUMENTATION (Feb. 1988) [hereinafter NARA REPORT]. This effort also is known informally as the "CAPA Report."

11. NARA REPORT, *supra* note 10, at A-5. Authority for the guidelines is provided by 44 U.S.C. §§ 2104(a), 2904(a), 2904(c).

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— facilitate action by agency officials and their successors;[12]
— make possible scrutiny by Congress and other institutions "and other persons properly and directly concerned" about the manner in which public business has been discharged;[13]
— protect financial, legal and other rights of the government and of persons affected by governmental actions;[14]
— contain essential information on formulation and execution of basic policies and decisions or on major actions;[15]
— document significant decisions reached orally, face-to-face, by telephone, or in conference;[16] and
— document important board, committee or staff meetings, or matters considered at or resulting from such meetings.[17]

The evolution of the National Archives shows the emergence of these goals from a starting point that concentrated on permitting agencies to throw away records no longer needed for their operational missions, while giving someone with an historical perspective a chance to preserve some of the records before they were destroyed.

The Disposal of Records Act of 1939[18] authorized agencies to submit schedules of records[19] not currently needed "that appear . . . to have no permanent value or historical interest"[20] to the archivist, authorized the archivist to report to a joint Congressional committee lists of records to be destroyed, and authorized agency heads to destroy records, when the joint committee had no objection.[21] Legislation enacted in 1940[22] authorized the destruction of records that had been microfilmed in accordance with technical standards developed by the National Bureau of Standards, and made the microfilm records admissible into evidence.[23] Legislation originally enacted in 1943[24] author-

12. NARA REPORT, *supra* note 10, at A-5 (citing 36 C.F.R. § 1222.20(a) (1991)).

13. *Id.* The scrutiny guideline is worded so as to support an inference that scrutiny by the general public is not a consideration.

14. *Id.*

15. NARA REPORT, *supra* note 10, at A-5 (citing 36 C.F.R. § 1222.20(b) (1991)) (emphasizing importance of working papers).

16. *Id.*

17. *Id.*

18. Ch. 481, 53 Stat. 1219 (1939).

19. "Records" was subsequently defined to include all "books, papers, maps, photographs, or other documentary materials, regardless of physical form or characteristics. . . ." Act of July 7, 1943, ch. 192, 57 Stat. § 1, 380, 380-81 (repealed 1968). 44 U.S.C. § 3301 (1988) now defines records to include machine readable materials.

20. 53 Stat. at 1219 (enacting clause).

21. *Id.* §§ 3-5 at 1219-20.

22. Act of Sept. 24, 1940, ch. 727, 54 Stat. 958-959 (repealed 1943).

23. *Id.* § 2 at 959. 44 U.S.C. § 3312 (1988) now makes "certified reproductions" admissible in evidence.

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ized the archivist to promulgate regulations establishing procedures for preserving[25] and disposing of records,[26] and required agencies to submit records disposition schedules to the Archives, in accordance with Archives regulations.[27] Executive Order 9784[28] required agency heads to establish programs for effective management and disposition of agency records.

The Federal Property and Administrative Services Act of 1949[29] transferred the National Archives Establishment to the General Services Administration[30] and authorized the Administrator of General Services to obtain reports from federal agencies on records management and disposal practices, to "promote, in cooperation with the executive agencies, improved records management practices and controls . . . including the central storage or disposition of records not needed by . . . agencies for their current use," and to report to the Congress and to the Director of the Bureau of the Budget on the subject.[31]

The Federal Records Act[32] authorized the Administrator of General Services to promote standards for improved records management[33] and to "establish standards for the selective retention of records of continuing value."[34] It required agency heads to develop records management programs,[35] to preserve records "containing adequate and proper documentation of the organization, functions, policies, decisions, procedures, and essential transactions of the agency,"[36] and to establish safeguards against removal or loss of records under regulations promulgated by the Administrator of General Services.[37] The Act authorized

24. Section 2, 57 Stat. at 381, 380-83 (repealed 1968). The source of the Archivist's authority is not found in 44 U.S.C. § 3302 (1988).

25. Preservation was handled implicitly by authorizing the disposition of records not having "sufficient administrative, legal, research, or other value to warrant their further preservation." Section 3, 57 Stat. 381 (repealed 1968).

26. *Id.* § 2 at 381 (repealed 1968) (authorizing National Archives Council) the Archivist's authorization is currently found in 44 U.S.C. § 3302 (1988).

27. *Id.* § 3; 44 U.S.C. § 3304 (1988) (repealed 1970). Congressional involvement was deleted from the Act in 1970. *See* Act of June 3, 1970 Pub. L. No. 91-287, § 3, 84 Stat. 322.

28. Exec. Order No. 9784, 3 C.F.R. § 569 (1943-48).

29. Chapter 288, 63 Stat. 377.

30. *Id.* § 104(a) at 381.

31. *Id.* § 104(c) at 381.

32. Federal Records Act of 1950, ch. 849, 64 Stat. 583-591 (Sept. 5, 1950) (adding §§ 501-511 to the Federal Property and Administrative Services Act of 1949).

33. *Id.* § 505(a) at 585.

34. *Id.* § 505(b) at 585.

35. *Id.*

36. *Id.* § 506(a) at 586.

37. *Id.* § 506(e) at 586.

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the Administrator to accept for deposit with the National Archives agency records determined by the Archivist "to have sufficient historical or other value to warrant their continued preservation . . . ."[38]

The Federal Records Management Amendments of 1976[39] reorganized and codified the records management statutory provisions[40] to clarify the objectives of records management to include:

— accurate and complete documentation of government policies and transactions;
— control of quantity and quality of government records;
— simplification of records management activities, emphasizing the prevention of unnecessary paperwork; and
— judicious preservation and disposal of records.[41]

Legislation enacted in 1978 made application of general records schedules to agencies mandatory.[42]

The National Archives and Records Administration Act of 1984[43] removed the National Archives from the General Services Administration and set it up as an independent establishment in the executive branch called "The National Archives and Records Administration."[44] The Act authorized the archivist to issue regulations, and required agency heads to "issue[] such orders and directives as such agency head deems necessary to carry out such regulations,"[45] thus preserving the divided responsibility between the National Archives and individual agencies.

The Presidential Records Act of 1978[46] is a product of Watergate and the Nixon resignation. It established governmental ownership in presidential records, and obligated the president to implement records management controls to "assure that the activities, deliberations, decisions, and policies that reflect the performance of his constitutional, statutory or other official or ceremonial duties [were] adequately documented."[47] The Act permits the president to dispose of presidential

38. *Id.* § 507 at 587.
39. Pub. L. No. 94-575, 90 Stat. 2723.
40. *Id.* (revising 44 U.S.C. §§ 2901-2907, 3103 (1988)).
41. 44 U.S.C. § 2902 (1988).
42. 92 Stat. 1063 (1978) (amending 44 U.S.C. §§ 1503, 3303a(b) (1988)).
43. Pub. L. No. 98-497, 98 Stat. 2280-2295.
44. 44 U.S.C. § 2102 (1988).
45. 44 U.S.C. § 2104(a) (1988).
46. 92 Stat. 2523 (1978) (codified as amended by 98 Stat. 2287 at 44 U.S.C. §§ 2201-2207 (1988)).
47. 44 U.S.C. § 2203(a) (1988).

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records no longer having "administrative, historical, information, or evidentiary value," but only if the Archivist of the United States has no objection, or over the objection of the Archivist if the President submits a schedule of records to be destroyed 60 days before the destruction.[48] Upon the conclusion of a presidency, the Act makes the Archivist the custodian of the presidential records of the departing president, and obligates the Archivist to make the records available to the public, subject to restrictions on access imposed by the president under specific categories set forth in the Act.[49] The categories of authorized restrictions closely track the Freedom of Information Act (FOIA) exemptions.[50]

The Act's provisions were written to follow the guidelines established for congressional regulation of presidential records by the Supreme Court in *Nixon v. Administrator of General Services*.[51] These provisions included affording interested persons, including former Presidents, notice and a meaningful opportunity to assert legal constitutional privileges, including executive privilege, privacy, and association with political party; guarding against disclosures barred by defenses or privileges available to former presidents; and ensuring that private materials were returned. Under such circumstances it was not a violation of separation of powers for the Congress to authorize screening of presidential papers by the Archivist.

D. *Vision of the Long-Term Future*

In the long run, wider use of electronic information technology will change administrative agency structures and application of traditional administrative law concepts.[52] Agencies will use electronic information

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48. 44 U.S.C. §§ 2203(c)-(d) (1988).

49. 44 U.S.C. § 2203(f)(1) (1988) (making Archivist custodian and imposing obligation of public access); *id.* § 2204 (authorizing Presidential restrictions under enumerated categories). *See* Exec. Order No. 12,667, 3 C.F.R. § 208 (1989), *reprinted in* 44 U.S.C.A. § 2204 (1991) (providing for coordination among Archivist, present and former President on release of records of former President).

50. *Compare* 5 U.S.C. § 552(b)(1)-(6) (1988) *with* 44 U.S.C. § 2204(a)(1)-(6) (1988).

51. 433 U.S. 425 (1977). *See* H.R. REP. No. 1487, 95th Cong., 2d Sess. 6, *reprinted in* 1978 U.S.C.C.A.N. 5732, 5737 (discussing case and justifying provisions of bill that became Presidential Records Act).

52. The phenomenon is not limited to administrative agencies. *See generally* Henry H. Perritt, Jr., *The Electronic Agency and the Traditional Paradigms of Administrative Law*, 44 ADMIN. L. REV. 79 (1992); James I. Cash, Jr. & Benn R. Konsynski, *IS Redraws Competitive Boundaries*, HARV. BUS. REV., Mar.-Apr. 1985, at 134 (penetration of information systems into internal business processes); BENN R. KONSYNSKI & F. MCFARLAN, INFORMATION PARTNERSHIP:

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technologies for adjudication, rulemaking, internal management and to deliver important services. In electronic adjudication, hearing and pretrial procedures all would be electronic. Record keeping and filing obligations imposed in aid of enforcement[53] also would be electronic, as in Electronic Data Gathering, Analysis and Retrieval (EDGAR) and the IRS Electronic Filing Project.

EDGAR is a system for automating the Securities and Exchange Commission (SEC). Under EDGAR, all corporations covered by the federal securities laws are required to file documents such as prospectuses and 10K and 10Q forms electronically with the SEC. EDGAR will be fully operational by 1994. The IRS Electronic Filing Project permits taxpayers to file their individual income tax returns electronically through third-party tax preparers.

The rare exception to electronic methods for adjudication would be a contested matter in which the credibility of witnesses is at issue. Even there, videotaped depositions could be taken in advance, digitized and presented to the administrative law judge through hypermedia electronic filing and data base techniques. There would be a much more complete and much more accessible record of all adjudications than with paper processes. Because of the basic similarity of the adjudication process regardless of agency, certain format and software standards would emerge that would make it easier for adjudication records to be transferred among agencies and the National Archives. Appellate review of agency adjudications would be facilitated by development of judicial capacity to handle the standardized electronic formats.

Using electronic information technology for rulemaking has an even greater potential to change the way in which government operates. Rulemaking is supposed to involve the general public rather than only parties to a particular case. Electronic information technology greatly facilitates timely public involvement and reduces burdens on agencies affording that involvement. The notice and comment process could be made largely electronic, with notices being posted on electronic bulletin boards and comments being submitted via dialup telephone links. The electronic record of a particular rulemaking decision would be all of the entries in the appropriate table of the rulemaking data base. In April,

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SCALE WITHOUT OWNERSHIP (Harv. Bus. Sch. Case N1-191-023) (information technology allows enterprises to cooperate in new ways).

53. Record keeping and filing are grouped with adjudication because both involve individual compliance with pre-existing rules, and produce raw materials from which adjudicatory enforcement proceedings may spring.

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1992, the Office of Management and Budget used electronic methods like this to provide notice of and opportunity to comment on a proposed revision in its guidelines on information collection and dissemination.

The record on petition for judicial review would be a set of electronic pointers to appropriate places in the table.[54] Electronic pointers are references in one document which specify the place in another document where material can be found. By selecting an electronic pointer, a user can automatically retrieve the referenced material. A reviewing court simply would access the appropriate table though the pointers. The rulemaking process might become less discrete and more in the nature of a dialogue. In the long run, there would be a tendency for the interactive capability to blur the distinction between incomplete and complete rulemaking decisions. The technology permits a dialogue between regulator and regulatee, reducing the need for communications between the two to occur by means of formal, written documents in the form of petitions, comments and final rules.

Internal management practices would build on concepts developed for the United States Forest Service. Electronic management of agency resources[55] would work primarily by relaxing the need for official paper documents to record and communicate instructions and decisions to lower levels in the organization. Rather than signing a new delegation of authority, a memorandum making a change in organizational structure, or a directive reallocating enforcement resources, an agency head would post a notice directly from her desktop workstation electronically changing a data base record. The state of the organization, of delegations, of authority and of resource allocations would be defined officially by the state of the data base.

Electronic information technology also can be used to deliver some governmental services: dissemination of public information and electronic transfers of money in connection with public welfare and subsidy programs. Electronic food stamps, direct deposit of social security checks and electronic management of Medicare and Medicaid benefits all are examples. Such electronic information technology applications

54. The component of the data base associated with a particular rule could be thought of as a record. As one considers adding more and more to the file for a particular rule, however, it may be more appropriate to think of the file for a particular rule as a table containing many records, in which case the regulatory agenda for a particular agency would be a data base composed of many tables.

55. One could view management of agency resources as involving weak forms of rulemaking and adjudication, not involving the same degree of legal formality aimed at ensuring political accountability, but involving the same types of decisionmaking processes.

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use well-proven electronic funds transfer techniques, combining them with EDI standards in the case of Medicare reimbursement. (EDI standards are formats agreed to in advance which permit commercial information, like the elements of an invoice, to be represented by fields in an electronic transaction record, which can be processed by a receiving computer without human intervention.) The advantages are faster availability of funds, and improved ability to audit. The problem to be solved is that of electronic contracting and electronic funds transfer potentially increasing risk of forgery.[56]

E. Some Basic Concepts

1. Classes of Agency Information

Four different types of agency information present somewhat different records management and archives problems: policy documents; scientific and technical information (e.g., satellite-collected data); agency administrative records; and social data (e.g., census information).

Electronic policy documents only recently have presented records management problems. Because such policy documents must get distributed on paper, and because of uncertainty about electronic signatures, such policy documents virtually always are printed on paper before they are signed by the highest level decision maker. The paper medium is the archival record. But this practice will change, as decision makers increasingly have access to documents in electronic form, and as electronic transactions become a regular feature of life. Soon some agency officials may make choices by electronically checking a box on an electronic option paper sent by electronic mail.

The Forest Service System,[57] where directives from the agency head to the field offices do not necessarily exist in paper form at any time, is another good example of changing practices regarding decisional documents. As electronic mail becomes more pervasive, and as electronic publishing of government information becomes more common, the paper version of many official documents may disappear. As electronic mail is used more widely by a greater variety of agency deci-

56. Forgery, broadly conceived, involves misrepresenting the author of a message, and also involves unauthorized alteration in the contents of a message.

57. *See* BAUM & PERRITT, *supra* note 8, § 6.23; CATHLEEN STASZ ET AL., RAND CORP., INFORMATION TECHNOLOGY IN THE U.S. FOREST SERVICE (1990) [hereinafter RAND REPORT].

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sion makers below the top level, the part of public decisionmaking covered by paper documents shrinks.

There also is a need for better records management plans to capture "prefinal" communications to preserve the content of the decision process. Such predecisional electronic transactions likely are protected by FOIA exemption 5,[58] but they are an important part of the historical record. FOIA exemption 5 states that internal agency memoranda subject to a deliberative privilege need not be made accessible under the Act.

Scientific and technical data present very different problems. One problem is the large amount of data collected, particularly the quantities of data collected by satellite. New technology such as weather satellites enormously increase the amount of information that is collected and used by agencies like the National Oceanic and Atmospheric Administration (NOAA), which is responsible for weather forecasting. The other problem relates to the interpretation and analysis of such information. An unskilled person cannot use satellite weather information in its raw forms even if presented on paper media. Even a meteorologist cannot use the raw information without software and careful documentation compatible with the data.

To some extent, scientific and technical data share a general problem with electronic records: a need for compatible hardware and software to retrieve the information. In another respect, however, the interpretation and analysis problem with scientific and technical data is different. Scientific and technical data is specialized and its consumers will always be specialists in particular fields such as meteorology and climatology. The specialized nature of this information justifies handling archives of such information separately from the general archives. Indeed, separate handling of NOAA information implicitly is the result of a NARA inability to accept large quantities of satellite data from NOAA.[59]

Administrative information includes purely internal information like information pertaining to agency personnel and contracting. It also includes mission-related information such as claims files for the Social Security Administration (SSA) and the Veterans Administration (VA), and tax records of the Internal Revenue Service (IRS).[60] Agencies

58. 5 U.S.C. § 552(b)(5) (1988).

59. Discussions between the author and NARA personnel occurring in August, 1990.

60. NARA distinguishes "administrative" or "housekeeping" information from mission related or program information.

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have their own incentives to maintain administrative information for extended periods of time, independent of obligations imposed by the records statutes. These mission-related incentives relate to a potential for litigation over contested claims, or contested personnel actions. Agencies are aggressively automating the processing of such information simply to meet the increasing burden of claims. Agencies also have incentives to apply new archival technologies to increase storage density for large volumes of information. The SSA, VA and IRS have been aggressive in exploring optical storage technologies.

Social information has received the greatest attention in terms of electronic records management. Census information was the first type of archival information made available to the public. Furthermore, the private sector invests much effort to ensure the utility of electronic records formats for academic researchers and others.

A basic crosscutting distinction must be made, under present technology, creation and use patterns, between data base information and word processing documents. Word processing documents are fixed in form, though they may exist in different versions. Data bases are inherently dynamic. A document is more likely to have decisional significance than a snapshot of a data base, "taken" at a time when no one happened to be retrieving information from the data base. Moreover, the data base itself is not what people consume or ultimately use. A data base is analogous to a dictionary out of which users extract pieces of information to assemble into documents with significant information value.

2. *Value in Information*

An important part of what makes information useful is value that has been added to form the information. The dimensions of new information technologies can be explored more carefully by thinking about ten discrete characteristics or attributes of information products, or "types of value." These types of value can be unbundled from each other and supplied and assembled by various agents through high-speed digital networks, or CDROMs, for eventual presentation to the end user. Vertically integrated publishers, adding all ten types of value, may be less appropriate as consumer preferences shift toward electronic formats and away from paper ones.

The value-added analytical framework says that information products are bundles of ten types of value added through creation, organizing, retrieval-and-assembly, and marketing processes:

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Process	Type of Value	Print Examples
Creating	1. authorship	Content generated by original author
Organizing	2. chunking-and-tagging	Organization boundaries: sections, paragraphs, pagination, chapter boundaries; headings and titles, running headers and footers, page numbers
	3. internal-pointers	Tables of contents, indexes
	4. external-pointers	Bibliographies
Retrieval & assembly	5. presentation	Print on paper; video displays
	6. duplication	All copies after the first
	7. distribution	Getting the information from the generator to the consumer
Marketing	8. promotion	Advertising; inclusion in lists, product reviews
	9. billing	Identifying users; assessing prices, collecting money
	10. integrity-assurance	Guaranteeing the accuracy, expertise of suppliers of each type of value; guaranteeing against forgery or tampering

A modern print publisher is a broker or assembler of all of the types of value. The publisher arranges with an author to supply authorship value, and has designers and copy editors on staff or under contract to supply chunking and tagging value. Authors also supply substantial chunking and tagging value, typically determining the boundaries of paragraph, section and chapter chunks. Publishers supervise extractors who prepare internal pointers value in the form of tables of contents and indexes; arrange with the Library of Congress for the cataloging-in-publication information and with *Books in Print* and reviewers for external pointers value; contract with printers and binders to supply duplication and presentation value; work with advertising agencies for promotion value; and handle distribution and billing value through warehousing and order fulfillment. Publishers traditionally also play an important quality control function, not only in the sense of editing and checking for clarity and accuracy, but also in the sense of se-

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lecting material, deciding which authors communicate well, and which authors or concepts of information packaging are sufficiently authoritative to be useful to user communities.

Chunking-and-tagging value, internal pointers value and external pointers value, increase utility to consumers because they reduce the cost of human browsing, searching and retrieving. With print technologies, chunking-and-tagging value involves all basic typographic design features. Scanning a newspaper is easy because the material has considerable chunking-and-tagging value, primarily headlines. It also is easy because newspapers with state-of-the art design features have indexes (internal pointers value), which point to particular pages and story headlines (chunking-and-tagging value). Researchers make use of external pointers value when they consult the *Index to the New York Times* or the *Readers' Guide to Periodical Literature.* These also have pointers to human-processable tags and chunks, the call numbers, volume and page numbers, and titles of the articles referred to.

Information products are bundles of these different value types. For example, a typical book is a bundle of authorship value reflected in the raw text, chunking-and-tagging value reflected in its structure of articles, sections, pages, and paragraphs, internal pointers value in terms of tables of contents and indexes, and presentation value in terms of printing all of this on paper bound between two covers. Unbundling separates these aspects of added value, possibly supplying them separately to consumers.

This ten-type, value-added concept framework is as useful for evaluating the electronic archives issues.[61] Agencies are likely to strip value from electronic records submitted to the archives for different reasons than they may strip value from information released to the public.[62] In both cases, however, it is appropriate to understand the nature of the value lost.

The National Archives can provide for all ten types of added value, or none. For example, the information transferred to the National Archives could include authorship, chunking-and-tagging, internal and external pointers value types,[63] and the National Archives itself

61. *See* Perritt, *Electronic Information, supra* note 3, at 208 (explaining utility for evaluating federal electronic information policy in general).

62. They would strip value from information transferred to the National Archives in order to transfer a standard format, like ASCII. They might strip information offered to the public in order to avoid competing with private vendors of value-added products, as discussed in the report supporting ACUS Recommendation 88-10, *supra* note 4.

63. Examples include pagination, typefaces, indices and tables of contents.

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could add presentation, duplication, distribution, promotion, billing, and integrity-assurance value types as desired by National Archives users.[64]

Alternatively, agencies could provide only the raw content (authorship value) of the information to the National Archives. Then, the National Archives system could provide for adding presentation value, but nothing else. Image presentation is necessary for a person to use information and therefore presentation value is an essential part of any information system including a National Archives system.

Standards are a necessary prerequisite to transferring authorship, chunking and tagging, and internal and external pointers value to the Archives.[65] These standards relate to the interface between an agency and the Archives. Such standards would permit the structure of a text document, and its formatting, to be tagged in a way that receiving computers could understand. Standard Generalized Markup Language (SGML) is an example. Standards also are necessary if an archival system is to add duplication and distribution value.[66] Here, standards relate to the interface between the archives and the user. Standards relating to presentation on a printer or a video screen, such as Postscript page description languages, are examples.

II. Legal Impact of Technical Issues

A. *Technical Issues with Legal Implications Raised by Electronic Media*

A 1990 report of the National Historical Publications and Records Commission[67] identified the following problems and issues for electronic records:

— System dependencies;
— Storage media;

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64. Examples of this include presentation on screen or paper, making copies, distributing the presentation images to users, and publicizing availability.

65. For example, the added value represented by an index cannot be meaningfully transferred unless the transfer protocol preserves pagination or other references in the index. Footnotes cannot be transferred meaningfully unless there is some kind of standard to link the content of the footnote to the footnote reference.

66. Standards translating attributes in a text file to video display attributes are necessary to display fonts and attributes such as bold facing and underlining. Standards also are necessary for any kind of data communication, and thus are necessary for adding duplication value.

67. National Historical Publications and Records Comm'n & National Archives and Records Admin., Electronic Records Issues: A Report to the Commission (March, 1990) (Report No. 4) [hereinafter Commission Report No. 4].

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— Easy changes and easy loss of information;
— Difficulty in defining a record; and
— Difficulty in distinguishing originals from copies.[68]

The Commission concluded that the following solution alternatives are worthy of attention:

— System design to provide for electronic records management and archival needs from the beginning;
— Development of appropriate standards to reduce fragmented system dependency; and
— Interdisciplinary projects.[69]

The following sections in this subpart elaborate on the issues raised by the new technologies. They generally agree with the Commission as to the nature of the problems posed. First, however, the background of records construction is addressed.

1. *Background*

What Constitutes a Record?

Electronic records management concepts are based on the concept of a *record copy* of a document. It is natural to assume that information comes in packages called *documents*. But this has not always been so. Until the thirteenth or fourteenth century, information was primarily oral, although much valuable information, especially official records of church and state, was inscribed on a variety of media, ranging from clay tablets and papyrus to hand-written parchment. Information creation, transfer and preservation all were oral. Written information became important in the legal reforms initiated shortly after the Norman invasion of England, especially by Henry II. The printing press, once it was widely accepted, transformed social and cultural concepts of information again, leading to new packages such as newspapers and books. Gradually, new typographic forms emerged to facilitate the use of information by a broad range of consumers. Current cultural and social institutions have grown up around printing press technology, and consequently it is natural to think of information issues only in terms of that technology.

The electronic information revolution is, however, as profound as the printing press revolution in its potential impact on cultural and so-

68. *Id.* at 3-5.
69. *Id.* at 6.

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cial patterns for creating and using information. While new information paradigms have not yet emerged with sufficient clarity to be widely accepted, policy makers and designers of long-term information policies should be wary of accepting printed information paradigms uncritically.

The appearance of on-demand publishing technologies[70] presents major challenges for any archive policy. If books and newspapers can be produced in many different versions, with press runs on the order of a dozen per version, should one archive all versions, and if not, which version should be archived? A compromise possibility is to archive the most extensive version, or possibly a master copy of all fragments that were included in any version, along with a kind of control document that would correlate document sections with particular versions, showing which section was included in which version.[71] The problem, of course, is the same problem associated with archiving any data base: Which state of the data base is the archival copy?

Electronic records can be thought of as analogs of paper memoranda and reports, or they can be thought of as analogs of telephone conversations. The latter analogy obviates concerns with preserving electronic records because telephone conversations are not preserved as a part of records management and archival activities[72] even though the technology exists for recording telephone conversations and saving the recordings.[73] It may be that some electronic information volatility characteristics impose such challenges to records retention efforts that the telephone conversation analogy is the best place to end. On the other hand, the paper memoranda and report analogy is clearly appropriate for electronic information possessing reasonable permanence in content, even though the final content may have evolved through many versions.

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70. McGraw Hill is phasing in a new textual data base and book manufacturing technology that can vary the content of a textbook for press runs of as few as ten copies. *See* Edwin McDowell, *Facts to Fit Every Fancy: Custom Textbooks are Here*, N.Y. TIMES, Oct. 23, 1989, at D1. This is a major development toward on demand publishing, representing a convergence of data base and print media. In 1992, McGraw Hill's Premis system published BUILDING INFORMATION INFRASTRUCTURES (Brian Kahin ed., 1992), to which this author contributed.

71. This blends the publishing-on-demand issue with the compound document issues discussed in the next few paragraphs.

72. Of course, it is overreaching to characterize broad classes of electronic records as analogous to telephone conversations. Moreover, 36 C.F.R. § 1222.20 (1991) requires that significant decisions reached and commitments made over the telephone be documented.

73. Voice recordings are completely sequential in character, so retrieving an item of interest is very time consuming. In other words, voice recordings have no chunking and tagging, internal pointers or external pointers value.

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A more profound example of the inadequacy of customary information concepts is the impracticability of applying them to compound documents created by electronic technologies. In the future, the prevalent means of accessing information may be through a kind of master document which really is little more than a set of pointers to textual, graphic and sound information stored in diverse places. Presently, a single query from a relational data base is a precursor to that kind of compound document, although all elements selected by a data base query usually represent similar forms of information.[74] Perhaps the most important long-term objective is to develop conceptual frameworks and strategies for dealing with compound documents.

The Patent Office system[75] is an actual example of a compound document system. In this system, text and images are stored separately and put together into a compound document only when an examiner requests. United States Geological Survey (USGS) maps may be another useful example, because of the desirability of representing maps as modules of small geographic areas. A large map would be a series of pointers to smaller area modules. The USGS publishes maps that cover small areas in great detail, and larger areas in less detail. Through a compound document approach, maps of larger areas would not have the detail, but instead would have pointers or references to maps of smaller areas, which would contain the detail. A map user could "zoom" in on a particular area, causing the more detailed map to be retrieved and presented to the user.

Hypertext is another clear example. Hypertext is a technique for linking different documents or materials with pointers that can be activated by a user. The linked materials may include graphical images and sound, as well as text. Compound documents are collections of related materials, the content of any one of which can change independent of the other materials in the collection. Both hypertext and compound documents are analogous to a master contract, all of the terms of which are incorporated by reference, as they may be amended from time to time.[76]

Several questions arise regarding the future meaning of "record"

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74. *But see* Double Helix and other products that permit data base fields to contain graphical images as well as text or numeric information.

75. *See* PERRITT, ACUS REPORT, *supra* note 4, at 44-49 (describing patent office system); Perritt, *Electronic Acquisition*, *supra* note 3.

76. *See* HENRY H. PERRITT, JR., HOW TO PRACTICE LAW WITH COMPUTERS ch. 6 (2d ed. 1992) [hereinafter PERRITT, HOW TO PRACTICE LAW].

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for historical purposes. For example, what is the relevant information for historical purposes to show: the state of the data base against which pointers were executed? A collection of pointers is one unambiguous representation at a point in time. But pointers alone lack meaning unless one can restore their referents.[77] Should the strategy be to save transactions rather than data bases?[78] These issues are not unique to federal electronic records management; they will be pervasive as compound documents come into wider use.

One possibility, of course, is that new information technologies require people to abandon their preoccupation with the state of information at a particular point in time as being usually represented by a paper document. But if this concept is abandoned, it is not clear how historical developments and changes can be recorded. On the other hand, the new technologies permit more information to be captured about the processes of using information than is possible with paper documentation, which shows only what the information was, not how it was used or by whom.

2. *Records Disposal*

A major problem with paper records is storing them. If everything is saved, storage requirements become too great. Moreover, effective access for legal, policy development, or historical reasons becomes much more difficult with larger inventories of paper records, because finding the desired record requires one to review many more records. Thus, an important objective of a sound records management policy governing paper records is to ensure that a substantial portion of records without historical value are destroyed.

Electronic technologies mitigate this need to some extent. The space required to store information in electronic form is several orders of magnitude less than the space required to store paper information. Moreover, electronic retrieval techniques make it less burdensome to search for a particular record through many undesired records.

Nevertheless, there is a practical need for considering records disposal as a part of system design. Electronic storage technologies have finite capacities. Frequently insufficient attention is paid to getting in-

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77. To some extent this issue is discussed in terms of preserving data base and on-demand publication information earlier in this section.

78. The author served on a panel of the National Academic of Public Administration which contracted with NARA to develop a preliminary assessment of the types of electronic data bases used by federal agencies and a plan for their archiving. The panel reported in the Fall of 1991.

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formation out of a system. As occurred with the Forest Service System when information is not removed from electronic system, storage requirements soon exceed design assumptions.

3. *Records Retention*

Records retention requires deciding what records should be retained and then actually keeping those records when other records are destroyed. These two acts, deciding and keeping, can be done at the same time or they can be separated. In an extremely simple hypothetical agency, a decisionmaker could review records, making judgments on the spot as to what records are of historical value and setting those records physically aside for retention while throwing other records in the waste basket. In the real world, however, the decision about what to retain is made in the abstract, through the articulation of criteria for retention. Then the act of keeping records meeting the criteria is made by someone else (perhaps a computer) at a later point in time.

Electronic technologies raise two generic problems with records retention. First, they make it much easier to destroy records. Second, they also make it easier to apply predeveloped criteria for records retention.

There is no question that text and document management systems are appropriate adjuncts to a sound electronic records management plan. Otherwise, dispersal of electronic documents on decentralized computer systems, and cryptic file names, make capture of appropriate official records even more difficult in an electronic regime than in a paper regime. Moreover, electronic document management approaches may make it easier to discover and capture official records using electronic techniques than is possible with paper techniques.

Agencies usually assign a relatively low priority to records management activities. It is not likely to be feasible, therefore, to impose additional burdens on agency employees to code working documents for eventual archival purposes if the coding requirements impose any significant cost, in terms of time or inconvenience. Certainly a post hoc requirement to reformat word processing documents with archival value would impose significant costs. Therefore, the best approach for textual documents is either to design archival coding into the document management system at the outset, or to have an overinclusive schedule that causes most textual documents to be transferred to the Archives on increasingly inexpensive storage media. This strategy assumes that free text searching techniques can only improve and, even with the pre-

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sent state of the art, these techniques would permit appropriate retrieval precision when someone wants to access the documents.

The ultimate goal should be making records management transparent to agency employees. For example, official correspondence could necessitate an accompanying code that must be sent before the system would recognize it as official correspondence. The code would cause the document to be saved and processed for eventual archiving.

Designing agency information systems to provide adequate records management capability, transparent or otherwise, implicates a tension between centralized and decentralized automation strategies that is pervasive in office automation.[79] Centralizing information system administration makes it easier to ensure that records management policies are followed. But centralization deprives individual users of the autonomy they have come to expect as a result of the PC revolution. Autonomy in using computing resources is not only an expectation; it is a technological capability that enhances individual productivity.[80]

There are two points to be made about this tension. First, the tension should be recognized. It is unavoidable. It also is not new; the conflicting desires for centralized control and decentralized entrepreneurial energy is a central issue of organization design.[81] Second, a really good electronic records management program permits substantial amounts of user autonomy with respect to software selection and use patterns.

A concrete example may be helpful in illustrating this point. Suppose an agency adopts ODA/ODIF as the standard for its textual documents. Office Document Architecture/Office Document Interchange Format (ODA/ODIF) is an international standard for representing the structure and format of office documents. It might consider three alternative strategies for ensuring that agency personnel comply with the standard. One strategy would be to develop new word processing, document management and desktop publishing systems that comply with the standard. A second alternative would be to procure commercially available products that comply with the standard and to permit personnel to use no other products except a single selected product, say

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79. *See* PERRITT, HOW TO PRACTICE LAW, *supra* note 76, ch. 8.

80. Individual users having reasonably autonomous control over their own computing resources can develop macros, select their own software, and otherwise be innovative in matters that help them get their own work done better.

81. *See* ALFRED D. CHANDLER, JR., STRATEGY AND STRUCTURE (1962) (describing centralized and decentralized approaches followed as railroads pioneered large scale organization design, and General Motors and Dupont followed different strategies).

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Microsoft Word. A third alternative would be to identify a preferred product, say Microsoft Word, and allow users to use any other product as long as files can be transferred from the non-preferred products to the records management system.[82] Of these alternatives, the first is the worst, and the third is the best. The public interest is not served by sacrificing agency effectiveness and productivity in the interest of long-term archives enhancement. Electronic records management practices must serve both goals.

Considering management of electronic records forces planners to think about a choice that regularly confronts designers of document management systems for office automation systems. Should one invest effort at the beginning in formats and indexing for an eventual retrieval, or should one simply save the information in whatever format is best for its original use, and burden the individual archive user with search and retrieval efforts?[83]

Historically the National Archives took the latter approach. Information was, for the most part, simply forwarded to the National Archives in whatever formats existed, with only limited effort expended toward indexing. Computer data base techniques, however, generally focus on front-end investments in tagging aimed at reducing the cost of eventual retrieval. To the extent that front-end formatting and tagging imposes avoidable human costs, the protocol for records retention is less likely actually to be followed by document generators and receivers. On the other hand, some features aimed at records management can be built into data base systems at a relatively low cost. Data base approaches frequently are preferred by agencies, not for any reasons having to do with record management, but simply to facilitate accomplishment of the agency mission.

Document management systems that associate profiles with specific textual documents apply some of the data base design approaches to free text documents. The reworked Forest Service system provides virtually immediate dissemination of agency head documents to some 300 field offices by automatically designating appropriate documents as official records and referring them electronically to the archives.

The philosophy expressed by the NARA guidelines envisions individual microcomputer users following records management plans while creating files within word processing, data base and spreadsheet appli-

82. Microsoft's RTF and IBM's RFT might be examples of transfer methods.

83. This is another way of raising the publish-on-demand possibility.

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cations, and ensuring that an appropriate official copy exists before erasing files. Ensuring compliance with such guidelines is extremely challenging. Decentralization of computer file management associated with the microcomputer revolution obviously increases the challenge.

On the other hand, ensuring compliance with this electronic records management philosophy is no more challenging than ensuring compliance with paper records management philosophies, given the reality that important subsets of agency records exist in filing systems (which may not be all that systematic) under individual control, and not only in centralized agency file rooms.

Indeed, it may be easier to capture appropriate records when the records exist in electronic form than when they exist in paper form. A paper document existing only in the personal files of the author and the addressee may never be known to an agency's official records management system. An electronic equivalent of the same document is likely to exist on a computer network and can be discoverable by an appropriately designed electronic protocol for electronic records management. Electronic technology permits draft management, because a well-designed office automation system can track who looked at, and commented on, a document and when.

Automating capture of drafts and of decisionmaking records is much easier on networked computer systems, as compared with free-standing microcomputer systems. On networked systems, the records management functions can be designed into the host or the file server, which keeps most of the files for an entire system of users. On free-standing microcomputer systems, in contrast, the only way to implement automated records tracking functions is to rely on the user of the particular microcomputer periodically to transfer documents via floppy disk or other transferable medium, or to rely on a management function that periodically copies documents from the hard disk of each microcomputer.

Indeed, Local Area Networks (LANS) force a degree of electronic records management on users and LAN administrators that is not absolutely necessary in standalone computing environments. If users are to be able to find files on a LAN, some attention in designing and running the LAN must be given to electronic records management.[84]

Despite these technological capabilities, the goal of capturing draft

84. John McDonald, Record Management and Data Management 5 (Oct. 1988) (Closing the Gap, Paper Presented to the Society of American Archivists).

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documents in order to record the process of policy-making is, to a considerable extent, unrealistic.[85] Draft documents do not necessarily reflect the policy deliberations, and forcing the retention of drafts may be impracticable.

The author has had considerable experience in negotiating labor agreements and participating in policy formulation at the cabinet and sub-cabinet level of the United States government. Both of these processes produce many draft documents. Many of the most important ingredients in the policy development process, however, are oral, and are never reflected in discrete changes between two identifiable draft documents. Moreover, many drafts are never seriously considered, because they were written at lower levels not informed by the most current discussions among decisionmakers, or were drafted by interested parties and submitted to the decisionmakers, or reflected efforts to make more concrete the options at the margin of what policy-makers were willing to consider. Not only do such draft documents not capture the main parts of policy deliberations, preserving them may affirmatively mislead historians as to what was seriously considered.

Requiring that personal computer users keep all drafts of their documents on a central network server is somewhat like requiring office workers to keep no papers in their desks, but only in centralized filing cabinets. The likelihood of compliance is low. Of course, one could design personal computers so that they do not have disk drives, just as one could design desks so they do not have drawers. Such an approach, however, sacrifices worker convenience and productivity in the interests of records management, and this may not be a sensible organizational strategy.

The policy formulation process is as much oral as it is written. The new technologies do not change that reality, unless electronic mail induces decisionmakers to deliberate less face-to-face and over the telephone and more via electronic mail. Significant investment or distortion of agency practices is not warranted in order to capture draft documents.

The NARA guidelines may be too limited in requiring structured and field-based approaches to automatic document retention. It is a mistake to limit thinking about automation retention selection to struc-

85. In reviewing an earlier draft of this report, NARA staff disagreed with the conclusion that the goal of capturing draft documents in order to document the process of policy making is unrealistic. NARA believes that the public has a right to know about the evolution of policy and that it is realistic to demand that agencies make an effort to document the evolution of policies.

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tured headers. Effort should be invested to develop free text algorithms (probably on an agency-by-agency basis) for selecting documents as candidates for retention.[86] Free text searching technologies available now would permit development of reliable algorithms for individual agencies, based on key words likely to be contained in archival records. Thus, the full text of working documents could be searched at appropriate intervals, with the algorithm deciding what records should be archived. NARA's Center for Electronic Records is working on free text retrieval approaches.

4. *Records Integrity and Accessibility*

Records retention in archives is ineffective unless the archived records can be accessed. Three technical issues with legal implications relate to accessibility: ease of alteration, physical deterioration, and retrieveability. All have to do with integrity in some sense. Electronic records are easier to alter than paper records if they are stored on magnetic media. Meaningful access to electronic records requires that formats be processable and readable. Paper records that physically survive remain readable as long as one understands the language in which they are written. Electronic records present larger hardware, software and format compatibility problems. Some electronic records deteriorate more rapidly than paper records.[87] Large quantities of records impede practical retrieval unless records are indexed.

a. *Easy Alteration*

Magnetic media is easier to alter and there is less likelihood of detecting the alteration than in paper media. If one changes something on a piece of paper, the eraser or the white-out correction is usually evident—at least on the original. Because the physical changes involved in changing the content of magnetic storage are not visible, the possibility of undetected alteration of magnetic records is appropriately of concern. It should be noted, however, that information stored on optical media cannot be altered as easily—at least on CDROM media. Information recorded on CDROM is permanent because it is represented by

86. There is room for debate about whether the development of such algorithms is practicable. The state of the art in natural language processing is still rather primitive.

87. FAX messages on special paper probably deteriorate more rapidly than some magnetic media. Some electronic media such as materials for optical recording may deteriorate less rapidly then paper.

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bits burned into the surface of a plastic disk by a laser beam. Especially for information that is used for evidentiary purposes in legal proceedings, procedural or technology techniques must be used to reduce the risk of alteration.

b. Deterioration of Media

Paper. Environmental control[88] is important to protect paper and bindings.[89] All post-1840 paper is subject to acid deterioration which cannot be halted, except for freezing or helium atmosphere storage.[90] In 1986, the *Law Library Journal* included an updated report on the lifespan of paper.[91] It concluded that twentieth century paper possesses a lifespan of thirty to eighty years, depending on the production quality of the book and of the individual paper (in the case of photocopies or unbound works).[92] Another report indicates that the maximum longevity of twentieth century paper is fifty years.[93]

Microfilm. Microfilm exceeds all other recording media in terms of longevity. Estimates range upwards to three hundred years for silver microfilm and to one hundred years for diazo microfilm. Silver film, however, is more easily destroyed by fungus and scratches than its diazo counterpart.[94] Microfilm requires particular storage conditions, and appropriate processing and packaging in order to avoid quick deterioration.[95]

Magnetic Tape. Conservative estimates concerning the archival lifespan of magnetic tape range from five to ten years.[96] There are other estimates asserting that the tape may last up to twenty years.[97]

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88. Especially temperature and humidity.

89. *Preservation of Law Library Materials & Disaster Planning*, 73 LAW LIBR. J. 831, 835-36 (1980) [hereinafter Preservation of Law Library Materials].

90. *See* Establishing a National Policy on Permanent Papers, H.R. REP. No. 101-680, 101st Cong., 2d Sess. at 3 (1990).

91. Linda Nainis & Laura A. Bedard, *Preservation Book Survey in an Academic Law Library*, 78 LAW LIBR. J. 243, 258.

92. *Id.*

93. *Library Collection Deterioration: A Study at the University of Illinois at Urbana-Champaign*, 50 C. & RES. LIBR. 577 (1989) (citing WILLIAM J. BARROW, DETERIORATION OF BOOK STOCK, CAUSES & REMEDIES 15 (1959)).

94. Fungus can destroy film in a matter of days.

95. Preservation of Law Library Materials, *supra* note 89, at 835-36 (requirements: 70 degrees Fahrenheit and 40% humidity).

96. Telephone Interview with Dana Grubb, Representative from the National Institute of Standards and Technology (Oct. 19, 1989) [hereinafter Grubb Interview]. There is no difference between 7 and 9 track tape with respect to lifespan and storage.

97. *Id.*

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Reliability of estimates are questionable, however, because of the wide use of the Arrahenius test,[98] which incorrectly presumes that accelerated testing produces the same or similar results as actual long-term exposure.[99]

Like any recording medium, the better the quality of the product, the longer it will last.[100] Additionally, appropriate storage conditions extend the lifespan of magnetic tape. The key to successful storage is the retention of the tape at least every two years.[101] This presents a burden for constant retentioning on a records custodian like the National Archives, which may possess millions of tapes.

Magnetic Cartridges. Magnetic cartridges are better for storage than magnetic tape. An accelerated test performed by IBM indicated that the 3480 class tape cartridge (3480) has a life expectancy of over thirty years.[102]

From an archives institutional perspective, cartridges are better than magnetic tapes because no attention need be given to retentioning of cartridges.[103] Also, the binder (i.e., casing) of the cartridge prevents many of the dangers associated with handling of tapes.[104] For example, there is less danger of dust or fingerprints damaging the tape because it is sealed in the binder, unlike the magnetic tape on exposed reels. While cartridges require ambient storage conditions similar to those of magnetic tape, they can withstand more severe conditions than magnetic tape.[105]

In order to ensure reliability, vendors suggest that cartridges be exercised annually or semiannually.[106] Archivists must consider which type of tape to use in cartridges. Chromium oxide tape is less stable

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98. *Id.*

99. *Id.* The test attempts to create ordinary storage conditions but applies them at an accelerated rate so as to illustrate the long-term effects on storage media. This test has not been shown to produce accurate results. *Id.* The problems of this test are equally applicable to all recording media which is tested using the Arrahenius system.

100. *See* 3M, 3M BLACK WATCH: BLACKCOATED COMPUTER TAPE (1989) (corporation's advertisement pamphlet). Blackwatch computer tape evidences little wear after 2,000 passes while conventional tape is scratched after 500. *Id.*

101. Grubb interview, *supra* note 96. Retention is simply the rewinding of the tape at approximately 13 ounces. *See* 3M, *supra* note 100 (corporation's advertisement pamphlet).

102. T. Weir, 3480 Class Tape Cartridge Drives and Archival Data Storage: Technology Assessment Report 6 (June, 1988) (National Archives Technical Information Paper No. 1).

103. *Id.* at 13 (3480 drive compensates if there is a tension problem).

104. *Id.* at 18.

105. *See id.* at 8.

106. *Id.* at 9.

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than iron oxide tape, particularly in the long run.[107] "If archivists use a chromium dioxide medium, they must monitor it rigorously for deterioration and insure proper storage and handling."[108]

Diskettes. Neither the American National Standards Institute (ANSI) nor the National Institute of Standards and Technology (NIST) has compiled data on the archival life expectancy of magnetic diskettes, though ANSI currently is conducting tests on diskettes to determine their longevity. Regardless of the type of diskette,[109] the archival life expectancy of a magnetic disk allegedly is forever.[110] Diskettes possess an estimated 1,600 hours of usable life; that equates to over 32 million revolutions.[111] Under the proper storage conditions, a diskette may never lose its stored information due to non-use. These conditions should be approximately 75 degrees Fahrenheit and 40% relative humidity.[112] The main problem with diskettes is their susceptibility to damage caused by improper storage or handling.[113]

Compact Disk Read Only Memory (CDROM). There are no confirmed data on the lifespan of CDROMs.[114] The CDROM technology is so recent that there has not been ample opportunity to conduct tests on its reliability and storage life expectancy.[115] NIST agrees with this proposition but notes that there is an industry consensus that information stored on a CDROM is secure for at least three to five years, with some estimates reaching as high as twenty years.[116] The relatively short estimates for CDROM at least superficially are inconsistent with the virtually unlimited estimates for magnetic disks and WORM.

Write Once Read Many (*WORM*). WORM technology is an optical disk technology, in which user drives permit information to be recorded permanently on a plastic disk. Once the information is recorded

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107. *Id.* at 9. The short-term reliability of chromium oxide cartridges is better than that of iron oxide cartridges. The problem is that there are little data on the long-term chemical stability of chromium oxide. Additionally, there is fear that chromium oxide is more likely to adversely react with the binder, thereby destroying the tape. *Id.*

108. *Id.* (report indicates that risk of long-term problems with chromium oxide is probably small).

109. The common types of disks include 5.25" high and regular density, and 3.5" high and regular density.

110. Telephone Interview with Susan Michaud, Representative from Kodak, Inc. (Nov. 6, 1989) [hereinafter Michaud Interview].

111. *Id.*

112. *Id.* (disks can survive in temperatures ranging from 50-125 degrees).

113. *See* 3M, 3M DISKETTE REFERENCE MANUAL 62-5 (1988).

114. 1 Bowker's Legal Publishing Preview No. 6, 77-79 (Sept./Oct. 1989).

115. *Id.*

116. Grubb Interview, *supra* note 96.

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it cannot be erased, but it can be read an indefinite number of times. Like CDROMs, there are few available data on WORMs because testing is currently being performed. Kodak, however, offers a thirty-year warranty on Kodak WORM products, though it claims that information stored on the WORM can last forever.[117] Like all other computer readable media, the longevity of a WORM depends on the product's quality, on careful storage and handling, and on the amount of use (more use leads to shorter life expectancy).

B. Retrieveability from Diverse Storage Formats

The major issue confronting an increasingly electronic National Archives is how to maintain hardware and software necessary to access electronic records, which over time will embody a diverse universe of storage technologies. Even now, in the infancy of electronic technologies, it would be difficult in an ordinary office environment to find a computer and the necessary software to read a document stored on an eight inch floppy disk used by a mid 1970s Wang word processor, or a Radio Shack Model II microcomputer. Similarly, it would be difficult to access a document saved in 1984 by the Perfect Writer word processing software running on a CPM microcomputer and saved on a low density 5.25 inch floppy diskette.

Generally, there is concern that any storage medium may become outdated by the quick advances of technology in computer hardware. Already, the federal government is having problems finding computers to read tapes from the 1960s.[118] There is a report, perhaps apocryphal, that there are only two computers left in the world that can read 1960 census data, one in Japan and one in the Smithsonian Institution. The potential for adaptability should be taken into account when selecting a computer readable medium for long-term storage of information. The Internal Revenue Service requires that corporate taxpayers who submit electronically must maintain not only the electronic records supporting the filing, but also a complete copy of the system that can retrieve the information and the operating system.

Mass electronic storage is not the problem; the problem is ensuring access to electronic information over periods exceeding thirty to forty years. Several years ago, a NARA advisory committee said the only

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117. Michaud Interview, *supra* note 110.

118. Timothy Egan, *The Art of Burying a Century Alive*, N.Y. TIMES, Oct. 10, 1989, at A20.

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way to assure permanent accessibility was to record information in human readable form. It expressed confidence that conversion between human readable form and electronic forms would be nearly transparent. NARA rejected that conclusion, believing that technologies would develop to the point that accessibility of information would not depend on the availability of the same hardware and software that created it. The current solution, and an acceptable one for the future, to impermanence of electronic information in various media is to recopy or "refresh" electronic information at periodic intervals. One simply recopies magnetic tape or files on magnetic disks. Recopying is a solution not only to impermanence but also to technological obsolescence. When a format standard is becoming obsolete, information can be recopied to a new format standard. Of course this recopying requires resources and effective implementation of a program that ensures the copying and appropriate intervals.

NARA Bulletin Number 88-8[119] rejects optical disks as media for NARA excision of permanent records "because of the hardware and software dependence of current optical disk systems and the absence of standards that ensure affordability of data to one system to another." Paragraph six of the Bulletin reports that industry standards for optical disk systems are now under development. The Bulletin also explicitly permits agencies to use optical disk media for storage and retrieval of permanent records while the records remain in an agency's legal custody, although no permanent records may be destroyed after copying onto an optical disk without NARA's approval.

The current staff thinking at NARA is that appropriate standards are the best way to assure infinite accessibility notwithstanding changes and hardware and software platforms. What is needed is a new richer standard to serve the function now served by flat file ASCII.

C. *Impact of Emerging Freedom of Information Act Policies for Electronic Records*

The Freedom of Information Act (FOIA)[120] influences electronic records management in two ways. It indirectly can require the preservation of files that otherwise might be destroyed, and it permits near-term public access to electronic files.

The FOIA does not directly require preservation of agency

119. September 19, 1988, scheduled to expire September 30, 1990.
120. 5 U.S.C. § 552 (1988).

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records. The FOIA requires that the public be given access to records but does not require them to be maintained, preserved, or created in the first place. However, the FOIA arguably can be used indirectly to require the preservation of electronic files or paper. If an FOIA requester requires access to a large number of electronic files, a reasonable inference is to require the agency possessing the records to preserve them until its FOIA access obligations are determined. Those files that are exempt from public access under the FOIA could be destroyed.

The requester would argue that the Freedom of Information Act would be defeated by permitting an agency to destroy records that eventually would be subject to access under the Act. Under this argument, an injunction against destruction or erasure would be necessary to permit FOIA rights of access eventually to be realized. This is essentially the rationale adopted by the D.C. Circuit Court of Appeals in *American Friends Service Committee v. Webster*.[121]

The absence of explicit linkage between the FOIA and records statutes creates problems for sound records management. Agencies are concerned that declaring something to be a record for records management purposes will increase the likelihood of access under the FOIA. They tend, therefore, to be underinclusive in their records management practices. Ironically, the FOIA definition of "agency record" has been interpreted more broadly than NARA interprets the "records" definition under the records statutes.

The Privacy Act[122] has little effect on electronic records management practices, except that it has marginally improved agency practices by creating an additional incentive to designate certain electronic information systems as containing records, thus making NARA aware of them.

Administrative Conference Recommendation 88-10[123] was developed in part to consider the treatment of electronic records under the FOIA. Recommendation 88-10 impacts electronic records management in four major ways.[124] First, Recommendation 88-10 strongly embraces

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121. 720 F.2d 29 (D.C. Cir. 1983) (affirming district court order compelling development of adequate records disposal plan and enjoining destruction of records until plan developed; finding standing and reviewability). *See* NARA Report, *supra* note 10, at 20 (suggested language).

122. 5 U.S.C. § 552a (1988).

123. 1 C.F.R. § 305.88-10 (1991); Perritt, *Electronic Acquisition*, *supra* note 3, at 310; Perritt, *Electronic Information*, *supra* note 3.

124. The electronic FOIA portions of Recommendation 88-10 subsequently were adopted in slightly revised form as a policy statement by the American Bar Association in 1990. American Bar Association, Reports of Sections 499 (1990) (text of Recommendation 102, recommended by

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the proposition that electronic information should be treated as agency records for FOIA purposes. The basis for this conclusion supports treatment of electronic information as records for records management purposes.

Second, it encourages agencies to design FOIA retrieval capabilities into their information systems. Designing FOIA capability into systems is one aspect of designing records management capabilities. The major difference between FOIA and archival needs is that identification of information desired in connection with an FOIA request is made at the time of the request by the consumer of the information. Designation of information for records management purposes is done in advance, as a part of classifying types of information to be contained in a system, or as a part of the authoring step.

Third, Recommendation 88-10 encourages agencies to experiment with electronic techniques for improving public participation in agency rulemaking and adjudicatory proceedings. As this occurs, more of the public record public input to agency decisions will exist in electronic form. Moreover, the data base structures necessary for effective management of public comments also will facilitate management of this information for archival purposes.

Finally, Recommendation 88-10 encourages agencies to use accepted standards for formats and implicitly encourages agencies to participate in improving standards. This is consistent with the need for better standards for agency electronic records.

D. Copyrights

One difficulty in moving toward electronic archives is the possibility that intellectual property rights in public data, data structures, or retrieval processes will inhibit appropriate levels of public access. Two underlying intellectual property issues are involved with this concern: Whether public information can become private intellectual property when it becomes part of a compilation authored by a private entity, and whether intellectual property interests in retrieval processes (software, formats and indexes) may be used to retrieve public information with

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Administrative Law and Regulatory Practice Section and adopted by House of Delegates in 1990). The electronic dissemination portions of Recommendation 88-10 were adopted in revised form by the American Bar Association in 1991. American Bar Association, Annual Report No. 109C (adopted by House of Delegates August 12-13, 1991). The author of this article participated in the drafting of the 1990 ABA electronic FOIA statement and was the principal drafter of the 1991 ABA electronic dissemination statement.

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which they are associated without infringing private sector intellectual property interests.

Opposing these concerns about intellectual property impeding public access are concerns to stimulate private sector investment in making electronic public information more readily accessible. In some cases federal agencies create incentives to stimulate investment in electronic publishing of public data. In such cases, as Administrative Conference of the United States (ACUS) Recommendation 88-10, paragraph F recognizes, a sponsoring agency may consider protecting markets for private sector providers prepared to make a commitment to appropriate product features. Such arrangements may permit a private entity to reserve a copyright[125] or other proprietary interests in specific value added features,[126] but not in the raw agency information or in value-added features developed by the agency.

These intellectual property interests should not be protected in a way that eliminates public benefits from government-funded development or restricts the public availability of public information. For example, members of the public should be permitted to use value-added features to facilitate disclosure-level information release, much as libraries disclose copyrighted works to consumers while not interfering with copyright owner rights.

The potential conflict between protection of intellectual property and ensuring public access to archived electronic information is especially acute when new formats are involved. It is important, on the other hand, for agencies to embrace new formats so that the public can have the benefits of the new format. The new formats can be embraced only by respecting intellectual property. Intellectual property protection can impede public availability to new formats in three ways. First, the existence of the intellectual property may prohibit agency release of the information to the public. This is unlikely because copyright interests alone should not exempt information from accessibility under the FOIA.[127]

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125. Under the Copyright Act of 1976, an information provider under contract to the government is entitled to obtain a copyright in the public information. *See* H.R. REP. No. 1476, 94th Cong., 2d Sess. 58-59 (1976), *reprinted in* 1976 U.S.C.C.A.N. 5659, 5671-72 (construing limitation on copyright of government works not to prohibit copyright of government-commissioned work produced by a contractor; recognizing that "denial of copyright protection [might, in some cases,] hamper the production and publication of important works").

126. The value added concept is recognized in copyright law through the eligibility of derivative works for copyright protection.

127. *See* Perritt, *Electronic Information*, *supra* note 3, at 234-40 (explaining treatment of

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Second, the agency or the user may not be able to get the proprietary software needed to use the information, either because it is no longer in print, or because it is too expensive. Finally, the proprietary software needed to use the information may be incompatible with the user or the agency's current hardware or operating systems.

E. Use of Electronic Records as Evidence

Public records serve an important evidentiary role in resolving disputes among citizens, and between citizens and the government. It is important, therefore, that public records be accepted by dispute resolution tribunals. Changing to electronic formats should not impede the acceptability. There is no reason to be concerned that well-designed electronic records systems present any new problems with admissibility of electronic records under the rules of evidence.

A major difficulty in appropriate records management strategies is a lack of familiarity by the government's lawyers with the technology, and conclusions reached about legal treatment of the technology. For example, agency lawyers repeatedly "reinvent the wheel" regarding admissibility of electronic information and the internal procedure necessary to authenticate electronic information offered as evidence as well as electronic signatures.

There is a natural tendency when a new technology raises legal concerns to forget basic principles and to embark on unnecessarily difficult and complex de novo searches for legal principles to govern the technologies. This natural tendency should be resisted. A de novo inquiry is not necessary; the areas of concern unique to electronic methods can be addressed best by narrowly focusing on the differences between electronic techniques and conventional techniques.

Reliability of computer records is suspect due to the inherently greater volatility of computer and telecommunications data, as compared with written data. But relative reliability of different means of proving legal facts is not a new problem for the law. Historically contract law promoted reliability of contract proof by insisting on written documentation of certain contracts under the Statute of Frauds[128] or of other signature requirements. The same underlying issues are ad-

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copyright protection under FOIA exemption 3, 5 U.S.C. § 552(b)(3) (1988)).

128. *See generally* RESTATEMENT (SECOND) OF CONTRACTS ch. 5 statutory note (1981) (reviewing state statutes and text of original statute); BAUM & PERRITT, *supra* note 8, ch. 6; *Electronic Messaging Report*, *supra* note 8.

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dressed by the parol evidence rule[129] and by rules of evidence pertaining to the inadmissibility of hearsay, subject to exceptions for business records.[130] The standard for the business records exception to the hearsay rule is not necessarily the same as the standards for the Statute of Frauds or the parol evidence rule. Nevertheless, all three legal concepts share a common concern with reliability. All three recognize that some forms of evidence have greater reliability than others.

Document authentication[131] or proof of the inclusion of particular terms in documents requires that the communications making up the transaction be recorded and retrievable in some reasonably permanent way. Statutes of frauds require a "writing" as the permanent means of recordation. Statutes of frauds also require signatures, which also are intended to serve an evidentiary purpose.

Writings and signatures serve somewhat different purposes, although their purposes also overlap to a considerable degree. A signature protects against outright disavowal of a document by a party who denies authorship of a writing. A writing memorializes the terms of a document and thus protects against disputes over the terms of a document, admitting that a document exists. Reliability and authentication issues are related to the signature requirement under the Uniform Commercial Code, although the relationship is not altogether clear.[132]

Hypertext and compound documents are emerging concepts that represent a high level of incorporation by reference, and major challenges in terms of creating a reliable transaction record.

The Justice Department has not provided recent official guidance on the admissibility of electronically filed federal records as evidence. The most recent effort by the department seems to be a November 6, 1986, draft memorandum.[133] The points made in the draft are relatively non-controversial. The provision of the draft NARA regulations

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129. The parol evidence rule bars evidence of prior or contemporaneous oral statements to vary the terms of an integrated written contract. *See* Gatins v. NCR Corp., 349 S.E.2d 818, 820 (Ga. App. 1986) (interaction between parol evidence rule and Statute of Frauds barred parol evidence to supply duration term of written employment terms).

130. Standards for admitting business records despite the rule against hearsay evidence focuses judicial attention on inherent reliability. BAUM & PERRITT, *supra* note 8, § 6.27.

131. Authentication is proving that a document is what it purports to be, that the proffered writing is not a forgery.

132. BAUM & PERRITT, *supra* note 8, § 6.23 (explaining relationship among authentication, best evidence rule, business records exception, and parol evidence rule).

133. GEORGE S. KONDOS, U.S. DEP'T OF JUSTICE, ADMISSIBILITY OF ELECTRONICALLY FILED FEDERAL RECORDS AS EVIDENCE: A GUIDELINE FOR FEDERAL RECORDS MANAGERS OR CUSTODIANS (1986).

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concerning judicial acceptance of electronic records is a step in the right direction; to give clearer and more official guidance on evidentiary treatment of electronic records.

Despite the applicability of these general legal concepts, however, because electronic records are particularly susceptible to purposeful or accidental alterations, or incorrect processing, authenticating them may be more difficult than for paper records using the same standards of authentication.[134]

III. Institutional Arrangements

A. *Institutional Responsibility*

1. *National Archives and Records Administration*

The National Archives and Records Administration was created by the National Archives and Records Administration Act of 1984[135] as an independent executive agency of the United States Government. NARA succeeds the National Archives Establishment, which was created by act of June 19, 1934.[136] The National Archives Establishment was subsequently incorporated into the General Services Administration (GSA) and renamed as the National Archives and Records Service by section 104 of the Federal Property and Administrative Services Act of 1949.[137]

Under existing law, the Archivist of the United States has the authority to accept federal records and private materials that the Archivist has determined to have sufficient historical or other value to warrant their continued preservation by the United States government. The Archivist then causes the transfer of accepted records[138] to the Na-

134. See United States v. Scholle, 553 F.2d 1109 (8th Cir.), *cert. denied*, 434 U.S. 940 (1977) (computer storage requires more comprehensive foundation for admissibility, including testimony of procedures for input control such as tests for insuring accuracy and reliability); United States v. Vela, 673 F.2d 86 (5th Cir. 1982) (implying disagreement with Scholle; computer data should be treated like any other record of regularly conducted activity); United States v. Russo, 480 F.2d 1228 (6th Cir. 1973), *cert. denied*, 414 U.S. 1157 (1974) (authentication of computer records requires establishing reliability and trustworthiness of information put into the computer such as showing the input procedures used, tests for accuracy and reliability, showing that an established business relies on the computer as records in the ordinary course of carrying on activities, subject to opponent cross-examination concerning input and accuracy); United States v. Fendley, 522 F.2d 181 (5th Cir. 1975) (preparer of record not required to authenticate).

135. Pub. L. No. 98-497, 98 Stat. 2280.

136. Ch. 667, 48 Stat. 1122.

137. Ch. 288, 63 Stat. 377. *See generally* U.S. Government Manual 612 (1988-89).

138. A common term for the acceptance and transfer process is "accession."

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tional Archives. As a general matter, NARA handles records according to agency instructions, subject to FOIA obligations imposed on NARA.[139] Only permanent federal records defined as such on an SF115 (request for records disposition authority) and approved by the Archivist, are transferred to the National Archives.[140] Records already deposited into the National Archives may be designated for transfer to educational institutions or associations.[141] The Archivist is authorized to promulgate regulations establishing procedures for preserving records.[142]

2. *Agencies*

Federal agencies work with the Archivist to determine what records will be deposited into the National Archives. Each agency has a records manager who is responsible for inventorying all records in the agency, proposing disposition instructions for approval by NARA, and creating a comprehensive agency records disposition schedule. This schedule is submitted to NARA for approval.[143]

The current text of the Paperwork Reduction Act makes records management a part of information resources management and gives the Office of Management and Budget (OMB) authority to review compliance with records management laws and regulations.[144] The version of H.R. 3695 that passed the House amends the federal records act to authorize the Archivist of the United States to issue regulations establishing standards for interpreting the term "records."[145]

The OMB has directed that "[a]gencies should incorporate records management and archival considerations in the design, development, and implementation of electronic information collection systems in accordance with the Federal Records Act."[146]

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139. See 36 C.F.R. § 1250.16(b) (1991) (if NARA received request for records that are the primary responsibility of another agency, NARA refers the request to the agency); 36 C.F.R. § 1228.198(a) (1991) (NARA will observe restrictions lawfully imposed on the use of records transferred from other agencies "to the extent that they do not violate 5 U.S.C. § 552").

140. 36 C.F.R. § 1228.190 (1991).

141. 44 U.S.C. § 2107 (1988). This provision has been used only when institutions already had collections of federal records that were approved for deposit, and NARA allowed the records to remain where they were as "satellite archives." *Id.*

142. 44 U.S.C. § 3302 (1988).

143. 36 C.F.R. §§ 1228.12 (1991).

144. 44 U.S.C. §§ 3504, 3513 (1988).

145. Section 205(a), H.R. 3695, 136 Cong. Rec. H11895 (daily ed. Oct. 23, 1990), adding 44 U.S.C. § 3302(1) (standing for interpreting definition of "records").

146. 52 Fed. Reg. 29,454, 29,457 (1987) (referring to 44 U.S.C. §§ 29, 31, 33 (1988)).

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On May 8, 1990, NARA published a final rule revising its regulations on electronic records.[147] The rule established procedures for management of electronic records, for selection and maintenance of electronic storage media and for compliance with legal requirements for disposition of electronic records. Identical regulations were issued simultaneously by the General Services Administration.[148]

The new NARA rules, like longstanding statutory and regulatory records management policies, impose on individual agencies the primary responsibilities for development and implementation of electronic records management plans. Under the regulations, the head of each Federal agency must ensure that his or her agency manages its electronic records so as to satisfy certain requirements:

— (a) Assigning responsibility to develop and implement an agencywide program for the management of all records created, received, maintained, used, or stored on electronic media; and notifying [NARA] . . . of the name and title of the person assigned the responsibility.
— (b) Integrating the management of electronic records with other records and information resources management programs of the agency.
— (c) Incorporating electronic records management objectives, responsibilities, and authorities in pertinent agency directives and disseminating them throughout the agency as appropriate.
— (d) Establishing procedures for addressing records management requirements, including recordkeeping requirements and disposition, before approving new electronic records systems or enhancements to existing systems.
— (e) Ensuring that adequate training is provided for users of electronic records systems in the operation, care, and handling of the equipment, software, and media used in the system.
— (f) Developing and maintaining up-to-date documentation[149] about all electronic records systems that is adequate to: Specify all technical characteristics necessary for reading or processing the records; identify all defined inputs and outputs of the system; define the contents of the files and records; determine restrictions on access and use; . . . describe conditions and rules for adding . . . changing . . . or deleting [system] information; and ensure the timely, authorized disposition of the records.
— (g) Specifying the location, manner, and media in which electronic records will be maintained to meet operational and archival requirements, and maintaining inventories of electronic records systems to facilitate disposition.
— (h) Developing and securing NARA approval of records disposition schedules, and ensuring implementation of their provisions.
— (i) Specifying the methods of implementing controls over national security-classified, sensitive, proprietary, and Privacy Act records stored and used electronically.

147. 55 Fed. Reg. 19,216 (1990) (revising 36 C.F.R. § 1234).
148. 55 Fed. Reg. 19,221 (1990) (to be codified at 41 C.F.R. § 201.45).
149. *See* 36 C.F.R. § 1234.20(b) (1991).

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— (j) Establishing procedures to ensure that the requirements of this part are applied to those electronic records that are created or maintained by contractors [and] . . .
— (*l*) Reviewing electronic records systems periodically for conformance to [legal requirements] . . . [and to] determine if the records have been properly identified and described, and whether the schedule descriptions and retention periods reflect the current informational content and use. . . .[150]

Revised 36 C.F.R. § 1234.22 specifically addressed creation and use of text documents. It requires that systems maintaining the official file copy of text documents on electronic media to meet the following requirements:

— identify electronic versions of documents appropriately;[151]
— Provide a method for all authorized users of the system to retrieve desired documents, such as an indexing or text search system;
— Provide an appropriate level of security to ensure integrity of the documents;
— Provide a standard interchange format when necessary to permit the exchange of documents on electronic media between agency computers using different software/operating systems and the conversion or migration of documents on electronic media from one system to another; and
— Provide for the disposition of the documents including, when necessary, the requirements for transferring permanent records to NARA. . . .[152]

The NARA regulations show strong concern about the permanency of record media. Revised § 1234.28(b) (Selection and Maintenance of Electronic Records Storage Media) requires consideration of the following factors in selecting a storage medium or converting from one medium to another:

— (1) The authorized life of the records, as determined during the scheduling process;
— (2) The maintenance necessary to retain the records;
— (3) The cost of storing and retrieving the records;
— (4) The records density;
— (5) The access time to retrieve stored records;
— (6) The portability of the medium (that is selecting a medium that will run on equipment offered by multiple manufacturers) and the ability to transfer

150. 36 C.F.R. § 1234.10 (1991).

151. Appropriate identifying information for each document maintained on the electronic media may include: office of origin, file code, key words for retrieval, addressee (if any), signator, author, date, authorized disposition (coded or otherwise), and security classification (if applicable). Agencies shall ensure that records maintained in such systems can be correlated with related records on paper, microform, or other media. *Id.* § 1234.22(b) (1991).

152. 36 C.F.R. § 1234.22 (1991).

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the information from one medium to another (such as from optical disk to magnetic tape); and

— (7) Whether the medium meets current applicable Federal Information Processing Standards.[153]

Agencies must "ensure that all authorized users can identify and retrieve information stored on diskettes, removable disks, or tapes by establishing or adopting procedures for external labeling."[154]

Agencies must "ensure that information is not lost because of changing technology or deterioration by converting storage media to provide compatibility with the agency's current hardware and software. Before conversion to a different medium, agencies must determine that the authorized disposition of the electronic records can be implemented after conversion."[155] NARA declined to amend § 1234.30(b) (retention of electronic records) to require transfer of a copy of the software and operating system in order for the records to be read at the Archives. Transfer of the software and operating system, whenever necessary, can be specified by NARA when approving a records schedule.

NARA had received comments from 18 federal agencies, two private organizations, and one Member of Congress on its draft regulations. Most commentators supported the concepts embodied in the regulations, while suggesting less detail. Because the detailed requirements apply only to unscheduled or permanent electronic records, NARA noted in its preamble that agencies could reduce the burdens of compliance by scheduling records as soon as possible, thus reducing the universe of records subject to the detailed requirements. Furthermore, NARA also urged agencies to transfer permanent electronic records to NARA as soon as possible after their creation, further reducing burdens on agencies.

NARA rejected a comment recommending a new paragraph related to electronic signatures, on the grounds that it was premature to issue regulatory guidance on this subject. NARA noted objections to its proposed ban on floppy disks for permanent storage and modified the language to give agencies more discretion,[156] while expressing contin-

153. 36 C.F.R. § 1234.28(b) (1991).

154. *Id.* § 1234.28(d) (1991).

155. 36 C.F.R. § 1234.28(e) (1991).

156. "Agencies *should* avoid the use of floppy disks for the exclusive long-term storage of permanent or unscheduled electronic records." 36 C.F.R § 1234.28(c) (1991) (emphasis added). This contrasts with more mandatory language in other section of the regulation.

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ued concern about careless handling leading to loss of data stored on floppy disks.

B. Schedule Twenty

NARA has created general records schedules, which govern the disposition of certain records common to many agencies.[157] General Records Schedule 20 deals with the disposition of Machine-Readable Records.[158] Instructions as to how to transfer and handle machine-readable or other magnetic media are contained in 36 C.F.R. §§ 1228.188 and Part 1234 (1991). These records include magnetic tape, disk packs, magnetic drums, punch cards and optical disks. The general schedule classifies records for disposition as master files, processing files and documentation files.

Master files are data bases containing statistical, scientific and other information. Data bases include economic, social and political data as well as natural resources data, emergency operations and national security information. Other master files include indexes, summary files, backup files, technical reformat files and housekeeping files that facilitate use of the substantive content of master files. If information is created or received by an agency of the government in the performance of its duties under federal law, the material must be maintained in accordance with the instructions of the Archivist. Similar types of information created under contract and in the possession of the contractor must be transferred to the National Archives.

Documentation files are generally maintained to facilitate the use of processing files. The files are maintained if the corresponding master file is to be maintained. These types of files include data systems specifications, user guides and information retrieval.

Processing files are intermediate files used in creation of master files and generally do not qualify for long-term retention. These files include work, input and valid transaction files.

NARA Bulletin 87-5 offers guidance to agencies on management of electronic records, noting that information maintained in electronic form makes no difference in the operation of records management obligations, but it may heighten the risk of data loss, while at the same time creating the potential for more transparent and easier extraction of records of historical value for eventual transfer to NARA. The bul-

157. 36 C.F.R. § 1228.22 (1991).
158. General Records Schedule 20, § 20.

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letin recommends including records management objectives as a part of information system design, and offers practical suggestions for agency users of electronic technologies to minimize data loss and facilitate continued accessibility of information as technologies change. It contains a chart comparing various media, and notes that information must be written onto magnetic tape or paper before it is transferred to NARA.

NARA Bulletin Number 89-2[159] reminds agency heads of their legal responsibilities to ensure the security and integrity of federal records and to safeguard against unauthorized disposition, including guidance for personal papers.

NARA Bulletin 88-5[160] provides guidance to agencies regarding acquisition and authorized disposition of data created or maintained on behalf of the government by contractors. The Bulletin suggests that agencies write contracts to require the delivery "of all pertinent documentation of how the contractor carried out the program, which may include transaction or case files, handbooks, directives, procedural statements, and other information created by the contractor," to the agency. The Bulletin also suggests that agencies obtain contractor-created data that may have "reuse value to the government." In this category are background data to statistical analysis reports that represent the official position of the agency or that are required by statute, production elements needed for reproduction of audiovisual products including negative and magnetic soundtracks, original drawings and other research data.

C. *Individual Agency Responsibility and Archivist Authority*

The most difficult problem in implementing any electronic records management policy is that records management responsibility is dispersed throughout government agencies. The increasing adoption of microcomputer systems increases this dispersal. There are no technical impediments to design standalone PC-based systems to meet records management needs and to enhance records management on such systems by making it transparent to users. But every standalone PC user is the ultimate records manager for the files on her PC, and education is even more necessary compared to time sharing host computers or network file servers which are controlled by fewer decisionmakers.

It is important for everyone to realize that the main problem in

159. November 14, 1988, scheduled to expire November 14, 1990.
160. (May 20, 1988), scheduled to expire May 31, 1990.

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effective records management and archives enhancement is not too little information, but too much information. The more an agency or an archives entity keeps, the less likely are users to be able to find what they need. The major challenge is in defining classes of records that should be destroyed in sufficient quantity, not increasing the already excessive legal tendency to encourage people to keep everything forever.

NARA has an inspection program that reviews agency practices at the rate of two to three agencies a year, potentially providing encouragement to senior agency officials, possibly reinforced by the Congress or OMB, to meet records management responsibilities.

NARA's reluctance to play a stronger enforcement role is motivated by an unwillingness to jump into the middle of politically sensitive issues and by the practical unenforceability of over-ambitious and mandatory requirements that are not "owned" by responsible agencies which impose burdens without meeting immediate agency needs for information.

Most agencies do not defy NARA explicitly, but sometimes they make promises they do not keep. Some agencies are, however, forceful in refusing to transfer records to the national archives, frequently when they have a strong sense of their own institutional history and constituencies that want direct access to archival documents.

In many respects, the states are ahead of the federal government in taking a leadership role in solving these problems and recognizing the potential of electronic technologies for records management. Leadership at the national level would be enhanced if NARA continues its recent inclination to take a leadership role in developing concepts and proposing solutions, and if the library community would abandon its defensive focus on protecting historic roles and become more creative in defining new roles for librarians.

D. Long-Term Federal Government Arrangements

The existence of agency archival records in electronic form, the availability of copying electronic storage media and potential accessibility via telecommunications links, suggest eventual national archives systems that blur traditional institutional boundary lines.

For example, duplication of an optical disk containing archival information at the request of an archives user implicates printing functions historically within the jurisdiction of the Government Printing Of-

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fice.[161] Maintenance of agency records already overlaps jurisdiction of NARA and General Services Administration (GSA). Collecting information for research use historically was within the jurisdiction of the Library of Congress as well as the NARA. To the extent that telecommunications links and new storage media facilitate distributed maintenance of archival information and remote retrieval of such information, the depository library system or something performing the same function has an obvious role to play. Some of these agencies have not been very effective in playing a leadership role with respect to electronic information. NARA, GPO and the library community are examples. The library community has been particularly parochial and unhelpful, protecting its traditional turf and existing institutional arrangements rather than formulating solutions.

Eventually, it may be appropriate to merge the National Archives and GSA to manage physical storage, including particularly the computer systems on which a growing proportion of agency archival records would be maintained. GSA also would manage telecommunication links integrated appropriately with new high-speed research communication systems and the new federal government telephone system. The Government Printing Office would be responsible for duplicating archival media, and the Library of Congress would be responsible for facilitating user access to archival information. In concept, this would be more efficient than having each agency performing all of these functions.[162] The disadvantage would be less flexibility to respond to differing needs of agencies and the communities that use information generated by them.

E. Ensuring Long-Term Accessibility Through Standards

In the long run, the greatest problem associated with electronic formats is that they will not be accessible as technology changes. The National Archives cannot become a museum with one each of every type of hardware and software possibly used to create agency records.

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161. Duplication of records, and making single copies on demand, is not, of course, the same thing as mass production printing functions traditionally associated with the Government Printing Office. NARA has made paper and microfilm copies of records for many years. 44 U.S.C. § 2307 (1988) gives the National Archives Trust Fund Board special authority to duplicate records and print publications.

162. NARA disagrees with the idea of merging the National Archives and GSA and of giving GPO responsibility for duplicating archival materials or giving the Library of Congress responsibility for facilitating user access to records. Such an approach would be tantamount to abolishing functions of the National Archives, in NARA's opinion.

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Standards are important because they reduce the burden on the archives to maintain multiple retrieval hardware and software systems, and because they facilitate agency design of records management components of information systems.[163] Information in electronic form can be transferred in two basic ways: by exchanging physical media such as tapes or diskettes, or by communication links. Exchange of physical media requires more standards than communication links, but generally offers higher bandwidth.[164]

At the present time, flat file ASCII is an acceptable standard for text information exchange. Increasingly, however, agency information systems accommodate higher levels of typographic format information and compound documents. Soon, losing these value enhancements when information is transferred among agencies and are transferred to the National Archives will be unacceptable. More sophisticated text standards already are available in concept. For example, Standard Generalized Markup Language (SGML), the subject of an NIST FIPS,[165] can save agencies the costs of developing text structuring formats from scratch. Use of SGML and standard CDROM format and retrieval conventions could increase public access to electronic information in the archives greatly.

Present methods for transferring data base information already are inadequate. One can transfer data base information in three ways: (1) in the limited form of reports on query results through query languages such as Structured Query Language (SQL);[166] (2) from active data base to active data base, which makes transfer dependent of proprietary software and hardware; or (3) through flat files accompanied by detailed documentation.[167]

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163. *See generally* Canadian ODA/ODIF Report, at 3, 5 (ability of archives to perform mission depends on ability to access formats maintained by agencies).

164. Bandwidth is the rate of information transfer. One can transfer 1.6 megabytes of information almost instantaneously by handing you a 3.5 inch diskette. The same quantity of information would take somewhat more than an hour to transfer on a 2400 baud communications link.

165. FIPS Pub. 152, 53 Fed. Reg. 37,332 (1988).

166. Structured Query Language ("SQL") is a data base programming language, designed to implement the relational data base model faithfully. It permits a data base structure to be specified unambiguously, and for queries to be expressed generically. Microcomputer and mainframe computer software developers are rushing to include SQL compatibility in their products.

167. *See generally* MARGARET H. LAW & BRUCE K. ROSEN, NATIONAL ARCHIVES AND RECORDS ADMINISTRATION, NATIONAL COMPUTER SYSTEMS LABORATORY NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, FRAMEWORK AND POLICY RECOMMENDATIONS FOR THE EXCHANGE AND PRESERVATION OF ELECTRONIC RECORDS (1989) [hereinafter Framework]; JUDI MOLINE, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, RECOMMENDATIONS FOR DOCUMENT TRANSFER STANDARDS AND THEIR INTEGRATION INTO NATIONAL ARCHIVES POLICY

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It is not, of course, easy to specify a standard that accommodates future, unforeseeable technologies. But the challenge has been met in the past. Standards for magnetic tape storage developed in the 1950s served well for thirty years, and the flat file ASCII standard for text and data bases has been adequate until recently. While there are major uncertainties about the best ways to represent, display, transmit and store graphical images,[168] good federal government standards can drive the market and create economic incentives for vendors to adhere to the standards rather than diverging on proprietary approaches to obtain competitive advantages.

The National Institute of Standards and Technology prepared background papers for NARA in the fall of 1989 addressing such things as standards for transfer of textual documents.[169] The purpose of the NIST report was to identify a logical architecture for the representation, transfer, storage and access, for electronic records to be accessioned by NARA.[170] The NIST report notes that "records that have been adequately preserved and physically maintained may still be lost due to lack of indexing information." To be accessible, electronic information must have record indexing, cross-referencing and descriptive information available.[171]

NARA responded and commented on the NIST recommendations in June, 1990.[172] NARA agreed on the utility of standards, though it was somewhat less optimistic than NIST about the utility of moving quickly to adopt standards for either text or data bases. NARA expressed a preference, explaining the basis for its preference, for working with standard setting organizations to refine the evolving standards for text and data base transfer, for waiting until existing standards are reflected in commercial products, and for affirmative steps to encourage agency experimentation and demonstration programs for the more promising standards.

(1989) (Attachment C. to Framework, *supra*) [hereinafter Transfer Recommendation]; WILMA M. OSBORNE ET AL., NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, RECOMMENDATIONS FOR DATA BASE AND DATA DICTIONARY STANDARDS AND THEIR INTEGRATION INTO NATIONAL ARCHIVES POLICY (undated) (Attachment D to Framework, *supra*) [hereinafter Integration Recommendation]. *See* NIST Report § 3.2.1.1 at 16-17.

168. It should be noted that optical storage does not mitigate the need for standards; it increases it.

169. *See* Framework, *supra* note 167; Transfer Recommendation, *supra* note 167; Integration Recommendation, *supra* note 167.

170. *See* NIST Report § 1.3 at 3.

171. *Id.* §§ 1.2, 2.

172. NARA Technical Report No. 8 (June, 1990).

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A major impediment to the adoption of standards by commercial software vendors is uncertainty with respect to the market for products embodying the standards. Federal agencies and the archives represent a substantial market. An aggressive approach by the federal establishment can hasten the maturation of standards. A wait-and-see attitude, on the other hand, actively discourages the maturation of standards.

It well may be enough, for example, to stimulate word processing software vendors like Microsoft and WordPerfect to add ODA/ODIF features to their leading products or to add an SGML conversion feature if the federal establishment were to embrace these standards.[173]

The movement toward non-proprietary standards has been hastened by the federal government's adoption of the International Standards Organization's Open Systems Interconnection (ISO/OSI),[174] and interest in standards is growing because of the apparent efficiencies available from use of electronic contracting techniques popularly known as Electronic Data Interchange (EDI).[175]

While the National Archives is correct not to rush to a standard that has not been tested and for which software is not available, it may not be appropriate for the National Archives to wait until comprehensive records management procedures are put in place. As other parts of this article note, appropriate records management procedures require

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173. Substantial trade press attention has been given, for example, to the GOSIP standard, and further elaboration of this standard to embrace SGML as well as ODA/ODIF could be expected to encourage private software development. *See generally* National Archives, A National Archive Strategy for the Development and Implementation of Standards for the Creation, Transfer, Access, and Long-Term Storage of Electronic Records of the Federal Government 15 (June 1990) (National Archives Technical Information Paper No. 8) (reviewing status of GOSIP and its inclusion ODA/ODIF but not SGML) [hereinafter Technical Information Paper No. 8].

174. The International Standards Organization's Open Systems Interconnection (ISO/OSI) is a widely accepted conceptual framework for thinking about specific standards and conventions for communicating and transferring information among different computer systems. ISO 7498-1984, Information processing systems, Open systems interconnection Basic reference model, available from Sales Department, American National Standards Institute, 1430 Broadway, New York, NY 10018, (212) 642-4900.

175. Electronic Data Interchange (EDI), is a set of standards generally grouped under ANSI X12. Under the standards developed by EDI and ANSI X12 groups, a growing proportion of businesses contract with each other electronically by exchanging prescribed data sets between their computers. These prescribed data sets or data structures are called *transaction sets*. A purchase order might be issued electronically, or a request for bids and responding bids exchanged electronically. EDI standards development is moving toward accommodating document types of interest to federal agencies. Transaction Set 864 for text messages encompasses contracts. Transaction Sets 848 (Materials Safety Data Sheet), and 841 (Product Data) move EDI away from strictly commercial purchase transactions to encompass a wider universe of structured documents. EDI may be well suited for administrative records.

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reforming organization structures and cultures. This is a process that is difficult in the best of circumstances and probably never can be achieved perfectly. While shortcomings will continue to exist in records management procedures, agencies continue to turn out large amounts of information, more and more of it in electronic form. The National Archives must develop an interim strategy to preserve and accession this mass of electronic data while it works to improve the organizational environment within which the information is generated and recorded in the first place.

F. Agency Practices

1. NARA

NARA already has made some regulatory changes in connection with documentation of electronic records. More detailed requirements are not likely to be developed by NARA in the near future because of its philosophy that archival uses are secondary to operational agency uses of information, and agencies rather than NARA should decide what information to create and use and retain.

2. Department of the Interior Bureau of Land Management

The Bureau of Land Management (BLM) within the Department of Interior is developing an Automated Land and Mineral Records System (ALMRS), as part of a larger Land Information System (LIS). LIS will integrate BLM's land and natural resource records, using a public land survey system to manage land resource and status information at the legal land parcel level. The LIS will integrate spatial information from a geographic coordinate data base with cultural and natural resource information.[176] The result will be an automated resource data system and land conveyance, and land and mineral use authorization information system administered in ALMRS. BLM and NARA both expect ALMRS to be a model for federal agencies as they develop similar systems for managing, protecting and providing disposition for records superseded by the system, the records created by the system, and the records that document system implementation. ALMRS will provide experience in identifying record types in which flat ASCII files do not work. A major goal of ALMRS is to permit graphical informa-

176. ALMRS has three major data bases, based on case recordation, land description, and status.

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tion (pictures) as well as alphanumeric data (letters and numbers) to be managed.

A BLM/NARA work group developed system capability specifications to be contained in an eventual RFP for the system itself. The draft specifications require records retention capability to:

— designate and implement retention periods for any data set, record, or file;
— delete designated temporary records only at specified times according to approved records retention and disposition schedules; and
— transfer unneeded records to storage media and facilities.

Records preservation capability to:

— preserve permanent records, both documents and data;
— transfer designated permanent records to the National Archives; and
— accommodate record format established for the National Archives.

Record integrity capability to:

— restrict totally the editing of a specific file, legal transaction, or document at a given time;
— restrict or block editing of specific data except by specific password assignment; and
— leave an audit trail of entry into data bases tracking when alterations were made and by whom.

During 1990, BLM transferred manually maintained information to electronic formats, and worked through a pilot program in its New Mexico offices. The pilot program classified records and provided disposition standards for each category. It established record keeping requirements to ensure that legal, administrative, and archival needs were met, and tested the transfer of permanent records to the National Archives. The pilot developed recommendations for standards, policies, and procedures for BLM to use during the transition from the manual to an electronic system, and developed governmentwide guidance that might be issued by the National Archives.[177] The New Mexico test was planned for 1991, at which point test results were to evaluated by the work group.

3. *World Bank*

The World Bank has 6,000 people using electronic mail (EMail). Presently, it commits to paper matters of an official nature, but gradu-

177. January 31, 1990 NAPA draft at 6.

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ally is moving toward an environment in which EMail is used for official communications. The tendency is for EMail to be used for most communications until someone says, "I want your signature," and then the author of the document prints a hard copy, signs it, and sends it. There is a growing recognition that EMail constitutes an important part of the historical record, the record of the debate in the policy formulation process.

The World Bank is committed to work out a set of "cues" or templates for EMail, including specifications for informal memoranda, official letters and letters to and from clients. In addition, there is an effort to develop naming conventions so that retrieval of documents can be more precise. The World Bank is fortunate to have good programming resources for its proprietary DEC system. Other agencies, however, may be better off using communications and word processing environments that are more accessible to off-the-shelf indexing and library or archives retrieval software.

4. *Forest Service*

The Rand Corporation has studied information technology in the U.S. Forest Service.[178] The study concluded that the Forest Service has successfully internalized information technology, enabling it to become the first federal agency to employ electronic documents as its official record. Generally, an early commitment to information technology paid off in user satisfaction with applications for word processing, electronic mail and data analysis. Nevertheless, there are problems integrating local and centralized systems and problems with excessive data in central data base systems.[179] Electronic mail was identified as the most valuable feature of electronic information technology, surpassing even word processing.[180] The only problems with electronic mail, which was made more flexible to permit communicating across chains of command, had to do with "junk mail."[181]

Problems exist with data base management, including unpredictable updates, "inability" to find needed data and too many duplicated files.[182] Generally, Rand recommended that the Forest Service provide

178. RAND REPORT, *supra* note 57.
179. *See id.* at vi-ix.
180. *Id.* at 31-32.
181. *See id.* at 32.
182. *See id.* at 41-43.

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more flexibility for effective use of microcomputers and off-the-shelf software.[183]

5. *Nuclear Regulatory Commission Licensing Support System*

The Nuclear Regulatory Commission's (NRC) Licensing Support System (LSS) is intended to manage information related to the licensing of receipt and disposal of high level radioactive waste, an area expected to be one of the largest administrative litigation matters ever to come before the NRC. The LSS was reviewed in the report accompanying ACUS Recommendation 88-10, and is notable also in connection with the electronic records management and archives issues addressed in this article. To a considerable extent the LSS rule[184] sidesteps the direct question asking whether its electronic records and electronic records practices satisfy the requirements of the records statutes and the NARA regulations. For example, proposed section 2.1013 establishes procedures for the electronic submission of pleadings, and provides for the electronic transmission of board and commission issuances and orders, as well as for online access to the LSS during the hearing. It leaves the Secretary of the Commission with discretion to determine if the record copy for records act and archives purposes is the paper copy or the electronic version. As another example, the LSS avoids obtaining the "record" version of some documents, instead entering copies into the page-image and parallel ASCII components of the system, leaving the "record" copy under the control of the submitter.

The LSS is a good example of an electronic records system that has been built to duplicate the "official" paper information system. If the system works as it is supposed to, however, no one in her right mind would seek to retrieve the paper counterparts of the electronic files; thus LSS may serve to build confidence that, over time, requirements for paper versions of information safely can be eliminated.

G. *Other Practices*

1. *Canada*

The National Archives of Canada has invested considerable energy in developing electronic records management and archives initiatives. For twenty years, the National Archives has supported a simple

183. *Id.* at 54-56.

184. 53 Fed. Reg. 44,411 (1988) (proposed rule developed by rule negotiation committee; proposing amendments to 10 C.F.R. §§ 2.1-2.1117 (1989)).

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machine-readable archives program. The program's initial implementation is relatively simple. Archivists appraise machine-readable records for archival value, after which the records are copied onto archival quality tapes. The data are verified against documentation. The tapes are rewound each year, and the data are recopied every five years to fresh tapes. Catalogues and bulletins advertise the availability of machine-readable information on tapes, and the data are maintained in a form and format which minimizes conversion costs over the long term.[185] John McDonald, Director, Automated Information System, National Archives of Canada, has written extensively on electronic records management issues from an archivist's perspective,[186] and has generally encouraged frequent interaction and sharing among professionals concerned with archives and electronic records management.[187]

The files maintained by the Canadian archives in electronic form have been relatively small (a few thousand cases stored on single tapes), and typically contain survey and other statistical data. The standard acquisition practice has been to convert data to rectangular format, recorded in EBCDIC (an IBM data representation method) at a density of 6250 BPI, in IBM readable formats.[188]

The Canadians are actively involved in a number of initiatives to improve the sophistication of their approaches to electronic records. For example, the Treasury Board (the Canadian OMB) has issued a government-wide directive confirming the adoption of the OSI reference model as a Canadian government standard. A preference for OSI-based systems and products will become mandatory in procurement requests in the early 1990s.[189] As a follow up, the Treasury Board is

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185. John McDonald, Building the "Front End" to a Machine Readable Archives Program: The Experience of the National Archives of Canada 1 (Nov. 1989) (unpublished manuscript) [hereinafter Building the Front End].

186. *See* John McDonald, Data and Document Interchange Standards: A View from the National Archives of Canada (Oct. 1987) (unpublished paper presented to The Society of American Archivists, New York) [hereinafter McDonald 1987 Archivists Paper]; John McDonald, Records Management and Data Management: Closing the Gap (Oct. 1988) (unpublished paper presented to The Society of American Archivists, Atlanta) [hereinafter McDonald 1988 Archivist Paper]; John McDonald, The Information Resource Director System (IRDS) and the National Archives of Canada (Oct. 1989) (paper presented to The Society of American Archivists, St. Louis) [hereinafter McDonald 1989 Archivists Paper]; Building the Front End, *supra* note 185; John McDonald, The National Archives of Canada and Office Systems: A Status Report (Nov. 1989) [hereinafter Canadian 1989 Status Report].

187. *See* Building the Front End, *supra* note 185, at 6 (encouraging information sharing).

188. McDonald 1987 Archivists Paper, *supra* note 186, at 1.

189. *Id.* at 2.

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developing an Application Portability Profile (APP), based on work by NIST.[190]

The National Archives of Canada envisions a possible applications portability approach based on a UNIX environment such as POSIX, permitting the receipt and/or conversion of electronic records to international exchange formats such as ODA/ODIF, SGML, and GKS.[191] In addition, the National Archives of Canada believes an information resource dictionary system (IRDS) is of particular importance because it permits an archives organization to maintain intellectual and physical control over electronic and non-electronic holdings.[192] The National Archives has a working group on office system standards bringing together twenty-five government agency representatives involved in the design, installation and use of integrated office systems. A major project of the working group is to test ODA/ODIF by exchanging information among the Treasury Board and some four or five other agencies to demonstrate ODA converters, applications portability and other related questions. The working group also plans to develop a refined set of functional specifications for managing information in an office systems' environment.[193]

A report prepared in early 1990 proposed functional requirements for managing information in networked agency office systems.[194] The requirements focused on capabilities to be provided in application software:

— 1. Collect all required records and ensure that they are stored safely without altering the original form and content in any way.
— 2. Implementing a properly organized formal record system. . . .
— 3. Be compatible with software likely to be used in an office.
— 4. Allow retention or disposition of records, as required by the organization.
— 5. [Including] . . . a full text search . . . capability.
— 6. Allow the Records Manager . . . to grant or revoke access to records.[195]

The automated records management system (ARMS) offers the capability for managing electronic and non-electronic records, includ-

190. *Id.*

191. *Id.* The United States has adopted aspects of the POSIX standard. 55 Fed. Reg. 11424 (1990) (approving FIPS Pub. 151-1 and explaining standards referred to in text).

192. Canadian 1989 Status Report, *supra* note 186, at 2-3.

193. *Id.* at 4.

194. NATIONAL ARCHIVES OF CANADA, GOVERNMENT RECORDS, MANAGING INFORMATION IN OFFICE AUTOMATION SYSTEMS: FINAL REPORT ON THE FOREMOST PROJECT (1990) [hereinafter FOREMOST REPORT].

195. FOREMOST REPORT, *supra* note 194, at 5.

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ing electronic mail records and word processing records.[196] The program envisions converting every document sent to the records system to ODIF standards.[197]

The report envisions a life cycle of electronic documents beginning with creation of a document in a user's "personal work space," followed by transfer of the document to another user or to the records system, at which point a document profile would be created, assessment of the utility of blocks of files to the National Archives, and actual transfer of documents to the archives in media that can be read by the archives and in formats provided by the ODIF standard.[198]

2. *Optical Storage Initiatives*

Optical storage, despite the hardware and software dependency motivating NARA's reluctance to accept optical storage formats, is an attractive technology to agencies confronted with large volumes of paper records. Optical storage offers great information density. Transferring paper records to optical media reduces storage requirements. The Internal Revenue Service, the Veterans Administration and the Social Security Administration are all actively using optical storage systems. The Department of Army also is transferring service records to optical disk.

3. *State Archives*

State archivists face many of the same problems as NARA. A conference of government archivists in June, 1989,[199] concluded that the common problems are finding an appropriate definition of electronic records, failure of information policy makers to consider archives issues, inadequacy of laws and regulations covering electronic records either because of inadequate coverage or conflicting provisions, lack of legislative interest in information management issues, and decentralized standards for hardware and software.[200] No model electronic records program has emerged at the state level because state archivists tend to look to each other for solutions and no one has taken the

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196. *Id.* at 6.
197. *Id.* at 21.
198. *Id.* at 37.
199. School of Library and Information Science, University of Pittsburgh, Archival Administration in the Electronic Information Age: An Advanced Institute for Government Archivists (June 4-16, 1989) (summary of proceedings) [hereinafter Pittsburgh Proceedings].
200. *Id.* at 4.

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lead.[201] The conference concluded that attention should be given to the following principles:

— Archivists may use approaches for electronic records that have not worked well with paper records.
— Archival principles like provenance[202] and original order apply to entire electronic information systems, and not to electronic records.
— Effective access to electronic records may mitigate in favor of allowing the records to stay with their creators rather than being accessioned to archival repositories.[203]

In addition, the most appropriate role for archivists may change. Archivists may provide leadership in developing appropriate office information standards and in developing archival profile standards to be used in designing electronic information systems.[204] Archives may provide a public service by providing a directory of where various information systems are located and how the public can use them.[205] Archivists also may be able to help design better information systems, because of their unique perspectives.[206]

The National Historical Publications and Records Commission is funding electronic records projects in Wisconsin, Kentucky, New York and Florida, and several state archives have produced white papers concerning various aspects of managing electronic records.[207] The Commission made certain recommendations, in its 1990 report for the types of research activities that should be supported.[208]

IV. Conclusion: Recommendations Adopted by ACUS

Based on the report from which this article is derived, the Administrative Conference of the United States adopted the following recommendations at its December, 1990, plenary session:[209]

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201. *Id.* at 5.
202. Provenance is defined as the origin, or source.
203. Pittsburgh Proceedings, *supra* note 199, at 6.
204. *Id.* at 8.
205. *Id.* at 8.
206. *Id.* at 8.
207. Commission Report No. 4, *supra* note 67, at 7.
208. *Id.* at 8-9.
209. 1 C.F.R. § 305.90-5 (1991).

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A. Text of Recommendation 90-5

1. Preamble

Section 305.90-5 Federal Agency Electronic Records Management and Archives (Recommendation 90-5).

Federal agencies increasingly create, use and store records in electronic rather than paper form. As this occurs, legal requirements and management efforts designed for paper records become progressively less satisfactory to ensure an adequate legal and historical record of government decisionmaking. Administrative Conference Recommendation 88-10 and the accompanying report addressed electronic acquisition of information and public access to and dissemination of electronic information. These recommendations complement Recommendation 88-10, and are not intended to amend that recommendation.[210] They focus on internal agency electronic records management, affecting long-term accessibility of public records through the National Archives. They are intended to make agencies sensitive to the issues involved.

Recommendation 1(a) parallels part A of Recommendation 88-10. It starts with the premise that the basic policy balances have already been struck and does not seek to reopen them. Existing policy reflected in the records statutes[211] and in National Archives and Records Administration (NARA) and General Services Administration regulations and guidelines should be applied to the new electronic formats, with the objective that changing from paper to electronic media should not diminish the historical record of the government or its accessibility. There are some instances in which a rule designed for paper information, when applied to electronic information, may produce significant differences in result. In other instances, electronic formats present entirely new issues for records management, as with relational data bases,[212] whose content is constantly changing, and whose use is different in character from traditional documents.

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210. These recommendations do not address such important issues as protection of trade secrets or privileged commercial information, invasion of personal privacy, or the need for Congress and agencies to consider allocating budgetary resources. Nor do they address computer security issues, which constitute an important, complex and specialized subject deserving independent consideration. Nothing in these recommendations is intended to diminish access to agency records through depository libraries.

211. *See, e.g.*, The Federal Records Act, 44 U.S.C. §§ 2101-3324 (1988).

212. A "relational data base" is composed of separate tables from which are extracted and

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In these instances, NARA and other agencies should identify explicitly the records management and records preservation issues presented and seek to resolve them in accordance with the basic purposes of a government-wide records management and archives system. The recommendation is not intended to discourage agencies from taking advantage of an enhanced ability to preserve additional records that may result from technological change.

Recommendation 1(a) also states that shifts toward electronic formats should not have the effect of changing the substantive legal rules or the opportunity for, or scope of, judicial review. This means that the evolution of rules concerning standing to enforce the requirements, and of the relationship between the Freedom of Information Act and the records statutes should continue, and that agency treatment of records in electronic formats should be subject to the same scrutiny as is applied to records in paper formats having the same content. In sum, the guiding principle should be that the content of the record, and not the format of its storage, should control the rules governing its retention and accessibility.

Recommendations 1(b) and 1(c) extend the basic principle of Recommendation 1(a) to public access. Electronic information formats have the potential to permit enhanced public access even as the volume of information grows, because of the potential for better indexes that are computer searchable and the possibility of free-text search. However, a great threat to long-term public access to electronic information formats is technological obsolescence, the possibility that, by the time someone wants to read information stored on electronic media the information will not be available. This threat must be avoided—not by refusing to accept electronic information formats, but by working to develop and adopt standards for information exchange. Such standards must also accommodate newer more sophisticated document and data base structures such as hypertext—or other compound documents composed of graphical, audio and video, as well as textual components—and relational distributed data bases. Otherwise, solutions to technological obsolescence will themselves become obsolete as agencies adopt future technologies.

Recommendation 1(d) urges that records managers and archivists avoid archival practices that impair the use of electronic information

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presented to a user as though they came from one data base. A relational data base is sometimes also a "distributed" data base, meaning that it is made up of tables physically located at different places on a network.

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technology in carrying out the agencies' programmatic activities. For example, it might not necessarily serve the public interest to prohibit stand-alone microcomputers on the grounds that records management functions can be accomplished with greater effectiveness on time sharing or other network systems.

Recommendation 1(e) encourages agencies to coordinate their use and development of electronic record-keeping technology and standards with the private sector to the fullest extent possible, and to avoid technologies and standards that, because of proprietary restraints or other limitations, would impede access to agency information and transfer to the National Archives.

Recommendation 2 addresses problems relating to preservation of the electronic records of agencies and commissions that are established on a temporary basis. Recommendation 3 urges that NARA take a more active role in showing agencies how to harmonize records preservation objectives with agency modernization, and in exploring standards that can mitigate potential problems of incompatibility and technological obsolescence. While NARA's reluctance to adopt document transfer or data base transfer standards that do not have an established commercial base is appropriate, NARA should also take the initiative in promoting the development of appropriate standards through private standard-setting organizations,[213] and should encourage agencies to make use of available commercial products embracing the most promising standards.

Agencies also need guidance with respect to questions relating to admissibility of electronic records as evidence and other reliability issues.[214] The Conference encourages the Department of Justice and the Office of Management and Budget to expedite their current efforts in this regard.[215]

In carrying out these recommendations, agencies are reminded to comply with the Federal Information Processing Standards.[216]

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213. *See* 1 C.F.R. § 305.78-4 (1991).

214. Legal issues relating to reliability include signature requirements and contract documentation. *See, e.g.*, 31 U.S.C. § 1501 (1988) (federal statutory counterpart to the Statute of Frauds).

215. The Conference is prepared to work with the Department of Justice and the Office of Management and Budget to provide appropriate guidance for agencies.

216. "FIPS" Publications are issued by the National Institute of Standards and Technology after approval by the Secretary of Commerce, pursuant to section 111(d) of the Federal Property and Administrative Services Act of 1949, as amended by the Computer Security Act of 1987, Pub. L. No. 100-235, 101 Stat. 1724 (1988).

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2. *Recommendation*

1. Federal agencies, including those responsible for archival and records policy, should ensure that:

(a) Changes in the technology of record-keeping, including the use of electronic systems in creating records and the transfer of records from paper to electronic formats, do not (i) alter the criteria for identifying material to be retained as a temporary or permanent record for eventual transfer to the National Archives, (ii) have the effect of altering the opportunity for, or scope of, judicial review of agency compliance with records law, or (iii) otherwise alter the substance of records law;

(b) Changes in the format of agency information from paper to existing and future electronic media do not reduce the accessibility of information to the public;

(c) Accessibility is not degraded by technological obsolescence of electronic formats;

(d) Policies and procedures aimed at enhancing records management complement and, in any event, do not impair the utility of information systems for the performance of agency missions; and

(e) Maximum use is made of generally available technology and, whenever feasible, that agencies conform to standards that are widely agreed to and in use in the private sector.

2. Temporary agencies and commissions should, in consultation with the National Archives and Records Administration (NARA), manage their electronic record-keeping (consistent with the agency's mission) in such a way as to ease the transfer and preservation of their records upon the agency's dissolution.

3. NARA should promote the development and implementation of standards for text, data base, and other forms of electronic records, and should seek out opportunities for pilot and demonstration projects, covering candidates for standards for text and data base information that can ensure the transferability of such information from agencies to NARA and ensure long-term accessibility to the public. NARA and the White House Office of Administration should develop concepts for a turnkey presidential records system that could go to a presidential library along with electronic presidential records, providing immediate public access to records to which access is permissible.

B. *Conclusion*

ACUS recommendation 90-5 defines a path between the paper

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archives of the past and the electronic archives of the future. Without prejudging the details of future formats or architectural configurations for computer systems, it implicitly recognizes the appropriateness of building archival records out of electronic information formats. Implemented appropriately, the recommendations benefit agencies because they permit archives to be developed from the forms in which agencies actually create and use information. They benefit the public because they make available information searching, retrieval, and assembly techniques that are impossible with paper formats. They benefit the archives because they reduce storage problems because of the higher density of electronic formats. They benefit the public because they make it possible in the long run for the archives to be decentralized and remotely accessible via desktop computers, modems and ordinary telephone connections.

For these potential advantages to be realized, however, more work is needed on ensuring against technological obsolescence of formats and building archives features into agency information systems. Systems designers need a clearer understanding of the types of non-final textual documents suitable for archiving, and better concepts for preserving representative versions of data bases and publishable-on-demand textual documents.

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