The "Paperless Office": A Case Study of the State Department's Foreign Affairs Information System[1]

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AS ARCHIVISTS, WHAT DO WE DO when one of our major archival sources no longer maintains its principal records on paper? The word "panic" comes readily to mind, and well it should. The United States General Accounting Office has predicted that by 1990 the paperless office will be commonplace in federal agencies. The federal government, however, is generally years behind in adopting state-of-the-art technology; many nongovernment archivists will be confronting the practice of maintaining the records of a paperless office well before the end of this decade.

A case in point is the United States Department of State. In July 1973 the Department implemented a new record-keeping system for its Central Foreign Policy File, which is the permanent record of American foreign policy. Under this unprecedented full-text information retrieval system, reliable high-speed collection, search, and retrieval of information are possible because texts of documents are stored both on microfilm and digitally in a computer, rather than on paper. The Foreign Affairs Information System (FAIS) is of vital concern to the National Archives and the research community because the records it contains constitute the major unpublished sources in the field of American foreign relations, and because State Department records are among the most extensively used in the National Archives. More important for the archival profession, the FAIS serves as an excellent case study of the paperless office. The purpose of this paper is to describe the FAIS and some of its implications, and especially the impact on archivists of this and similar records systems created in the paperless office.

The FAIS developed out of a need better to control the proliferation,

[1]This article is based on the authors' presentations at the SAA annual meeting at the University of California, Berkeley, 4 September 1981. The transactions of the paperless office can be carried out without the use of paper; however, paper copies can be made, and often are, at many points. Hence the quotation marks around the term in the title of this article.

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storage, and retrieval of records in the Central Foreign Policy File. The records for the period January 1970 through June 1973, for example, amount to nearly 1700 cubic feet of paper files and occupy a substantial portion of available storage space in the Foreign Affairs Information Management Center (FAIM). In the late 1960s an ad hoc data processing group designed user specifications for an automated information retrieval system to replace the paper files, which are arranged through 1963 by decimal classification and thereafter, until July 1973, by subject-numeric classification. The Department concurrently established an electric digital switching system for official incoming and outgoing telegram traffic, which is the major element of the Central Foreign Policy File. It then purchased a commercial software package known as ORBIT to support the new system.

The FAIS was designed to contain all the substantive documents of the Department—that is, in Department terminology, "all documents that establish, discuss, or define foreign policy." Telegrams comprise about 87 percent of the system. Nontelegraphic material, comprising the remaining 13 percent, consists of airgrams, correspondence (including Congressional inquiries), diplomatic notes, and memoranda originating in or received by U.S. diplomatic or consular posts or the Department bureaus in Washington, D.C. The FAIS now accumulates more than 800,000 documents each year, approximately three times the average annual accumulation of paper documents during the period 1954–1973.

In this mixed-media system, texts of documents are stored in two microfilm files: a Computer Output Microfilm (COM) file containing all official telegrams entering or leaving the Department; and a separate file of nontelegraphic documents filmed manually as they are received in FAIM. Access to microfilm texts is through a machine-readable index, stored on disc and consisting of a master index file of subject terms and other reference data, and a citation file containing for each document in the system a listing of bibliographic identifiers. Also stored on machine-readable disc are the texts of telegrams for the most recent 20-month period. Access to these machine-readable files is on-line: that is, data are stored in the computer and are immediately accessible through cathode ray tube (CRT) computer terminals and high-speed printers. When all available disc space in the system is filled, the disc pack containing the oldest telegram texts on-line is purged, the data are transferred to machine-readable magnetic tape, and the empty pack is used to store texts of the latest telegrams to enter the system.

This is how the FAIS works (see Figure 1): As each document enters the system it is microfilmed, indexed, and the full text is stored on machine-readable disc. Because of their electronic transmittal medium, telegrams enter the system by passing through a computer in the Department's Office of Communications, which automatically routes a copy to another computer in the Foreign Affairs Data Processing Center, which in turn creates a copy on COM of all telegrams except those whose dissemination is restricted to the Office of the Executive Secretariat. Telegrams copied on COM are forwarded through a mainframe computer for indexing by FAIM. Nontelegraphic documents are filmed manually as they are received in FAIM and are maintained in a microfilm file separate from the COM.

The index is the key feature of the system. For each document entered in the FAIS—both telegraphic and non-

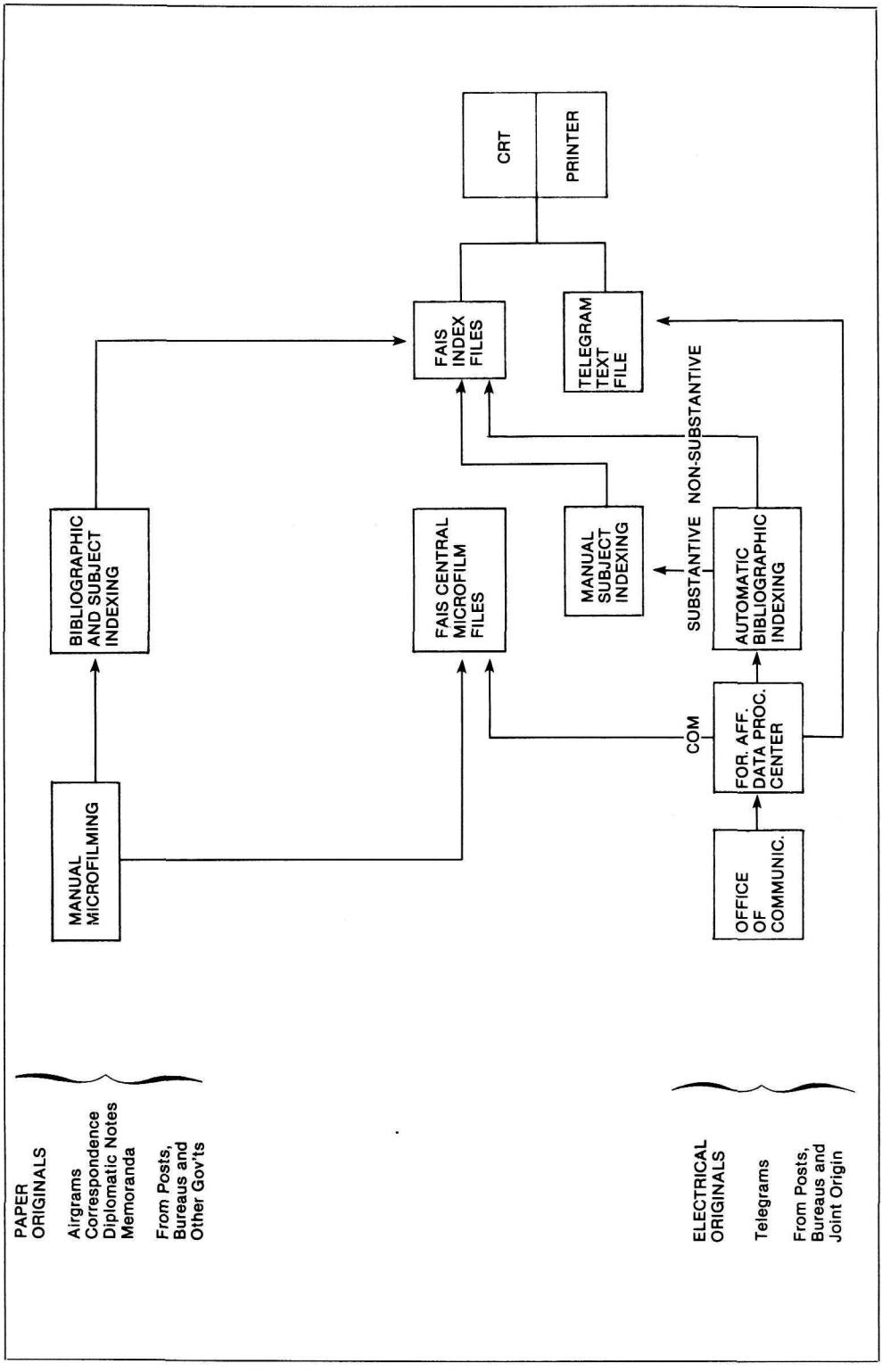

Figure 1. FAIS Document Input

telegraphic—an index citation is created and stored on-line in the computer (see Figure 2). The system automatically builds part of the index citation for each telegram, including the message reference number (which is a sequential number arranged by year and place of origin); date and place of origin; microfilm roll and frame number; security classification; special handling instructions (such as restrictions on dissemination); addresses; references; title line; and the TAGS line contents.

TAGS (Traffic Analysis by Geography and Subject) is a scheme of abbreviated notations used by message originators to describe the information content of their communications. Initiated in March 1973, TAGS is an integral element in the FAIS indexing and retrieval processes. TAGS consists of four-letter major subject codes grouped into nine subject-matter fields, standard two-letter geographic codes, and organizational names or acronyms. The first letter of the four-letter code denotes the subject field and is followed by a three-letter primary subject indicator code. In a document containing the TAGS line "PINT, XL," the "P" refers to the subject field Political Affairs, "INT" to the primary subject Internal Politics, and the "XL" to the geographic region of the Caribbean. This document thus concerns the internal politics of the Caribbean region.

Messages containing the subject field TAGS that begin with "A" (Administrative), "B" (Business Services), "C" (Consular Affairs), and "O" (Operations) are considered to be nonsubstantive documents—according to the State Department definition of "substantive"—requiring no further indexing beyond that which the computer automatically builds. These citations are stored in the computer for future reference. Messages containing subject field TAGS that begin with "E" (Economic Affairs), "M" (Military and Defense Affairs), "P" (Political Affairs), "S" (Social Affairs), and "T" (Technology and Science) are considered to be substantive documents. After the computer builds the bibliographic portion of the citation for these substantive telegrams, the message text is printed out on a report. Indexers in FAIM use

	SEQ—1		
2	RL	11410322	
3	AN	D800805-0054	*(microfilm roll and frame number)*
4	OR	STATE	*(originating office)*
5		AGR	*(originating office)*
6	TP	TE	*(type of document: telegram)*
7	AD	NEW DELHI	*(address: US Embassy at)*
8	CL	UN	*(security classification)*
9	PG	003	*(number of pages)*
10	DO	801220	*(date of origin)*
11	MR	80 STATE 335452	*(message reference number)*
12	TI	REQUEST FOR EMBASSY DISCUSSION WITH GOI ON	
13		CURRENT PEANUT/VEGETABLE OIL SITUATION	
14	SC	EAGR	*(TAGS identifier)*
15		PEANUTS	*(subject concepts)*
16		VEGETABLE OILS	*(subject concepts)*
17		IMPORTS	*(subject concepts)*
18		US	*(subject concepts)*
19		IN	*(subject concepts)*

Figure 2. Sample FAIS Citation. (Explanation of codes added.)

DISPLAY TERM REQUESTED: PEANUTS
ADDITIONAL INFORMATION ABOUT THIS CONTROLLED TERM IS GIVEN BELOW

1		PEANUTS		100—	150
	UF	GROUNDNUTS	*(UF: use for)*	—	
3	BT	OIL PLANTS	*(BT: broad term)*	60—	70
4	RT	FORAGE PLANTS	*(RT: related term)*	20—	30
		KWOC TERMS	*(KWOC: key word out of context)*		
	UF	GROUNDNUTS		—	

(numbers above indicate approximate times term used in FAIS)

Figure 3. Display of Thesaurus Terms. (Explanation of codes added.)

this printout to identify specific subjects; they then manually enter appropriate terms using the CRT computer terminal to input citation data. Indexers also create a full citation for all substantive nontelegraphic documents entered in the system. The index citation format permits up to 16 subject descriptors for each document. Index terms entered in the citation include controlled subject concepts taken from a printed thesaurus currently containing about 4100 frequently used terms and from a list of less frequently used terms, mainly names of individuals (see Figure 3). This compilation of index terms is known as the Master Index. It is arranged alphabetically by index term. The Master Index currently consists of nearly one million terms and is stored on-line in the computer.

The nucleus of the retrieval function of the FAIS is the CRT computer terminal (see Figure 4). If a user sitting at the terminal wishes to retrieve the text of a telegram that is on-line and in which the message reference number is known, he or she simply keys in the message reference number with the proper command and the text of the telegram will appear on the screen; a second command will produce a hard copy printout of the document from a high-speed printer. If the user does not know the message reference number, the computer will conduct a search, which may be as specific or broad as the user desires, by consulting the Master Index of controlled terms (see Figure 5). Suppose, for example, that a user requires all documents concerning official Department statements about the American hostages in Teheran. The Master Index would indicate for each index term how the term is used in the FAIS (e.g., as a name, address, subject concept, or organization) and the number of documents in which it was used as a particular type of term. In this case the combination of terms used to satisfy the query might be "HOSTAGES," "DIPLOMATIC MISSION TAKEOVER," "PRESS RELEASES," and "TEHERAN," which are all subject concepts. By keying in these terms at the CRT, the user commands the computer to scan the Master Index and produce a list of documents indexed by all the requested terms. If the list is too long, the user may narrow the search by

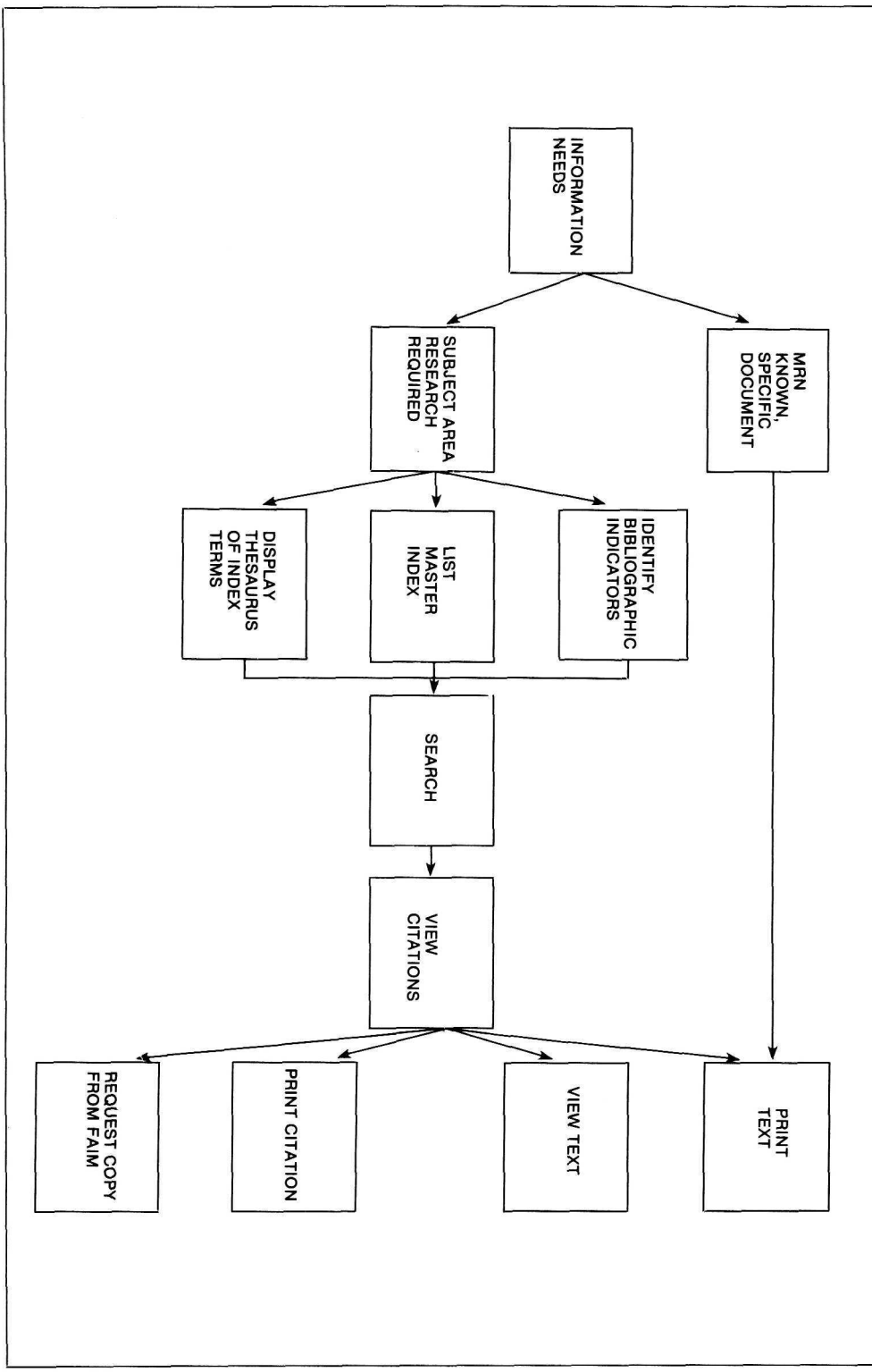

Figure 4. FAIS Information Retrieval

LIST TERM REQUESTED: PEANUTS
CONTROLLED AND UNCONTROLLED TERMS LISTED BELOW

1	PEANG KAMARIA		(SP)	2
2	PEANG SARIFAH		(SP)	1
3	PEANG SARIN		(SP)	1
4	PEANG SARUN		(SP)	1
5	PEANG-METH		(SP)	1
6	PEANG, HAVIAE		(SP)	1
7	PEANG, NARIMAS		(SP)	1
8	PEANG, ROHIMAS		(SP)	1
9	PEANG, SAMIRAS		(SP)	2
10	PEANUTS	*(requested term)*	(SC)	124
11	PEAPPLES, GEORGE A		(SP)	1
12	PEAR, JAMES L		(SP)	1
13	PEAR, ROBERT		(OR)	2
14	PEARCE, ALLISON		(SP)	2
15	PEARCE, AMBASSADOR		(SP)	2
16	PEARCE, AMANDA		(SP)	1
17	PEARCE, BEATRICE W		(SP)	1
18	PEARCE, BILL		(SP)	1
19	PEARCE BYRON ST PETER		(SP)	1

(Two-letter code indicates the type of term, i.e., SP: subject personality; SC: subject concept; OR: originator, etc. Numbers on right indicate precise times term used in FAIS.)

Figure 5: Alphabetic List of Index Terms

requesting only those previously listed documents created during a specific period or those dealing with a specific individual, such as the Ayatollah Khomeini. When the list of documents is manageable, the user may view the citation for each document to determine the extent of its relevance to his or her topic. If it is a telegram created within the most recent 20 months, the researcher may view at the CRT the actual text. For those document texts not stored in the computer, the user can consult the citation at the CRT and determine the microfilm roll and frame number of any document text. Copies of texts are provided by the computer-generated printer for all on-line data and by Recordak microprinters for data on microfilm. Depending on the complexity of a query, the search may take mere seconds or several minutes; computer response to each phase of the search and retrieval process is, however, usually instantaneous.

Although the FAIS neither was devised nor is maintained by the Department primarily to save storage space, that certainly is a considerable benefit of the system. Total accumulation of the FAIS microfilm since July 1973 is about 45 cubic feet; the nearly 1700 cubic feet of paper files for the period 1970 through June 1973 contain fewer than half the number of documents now in the FAIS. The machine-readable magnetic tape amounts only to an additional 20 cubic feet of storage for the FAIS.

From the standpoint of Department historians and future users of State Department records, the principal benefit of the FAIS is its capacity to provide swift document-level access to

foreign policy information through use of the automated index and on-line telegram text retrieval. Historical Office experience has repeatedly confirmed the speedy review and retrieval time for topically identified documents in the FAIS.[2] A search in central paper records taking hours or days—and often ending with the discovery that important items were missing—is replaced by quick, sure subject retrieval. With paper records, virtually each instance of research use leads to a disarrangement of records due to charge out or misfiling. This cannot occur with the FAIS. The convenience for the Department's historians in working efficiently in one small area with the complete range of FAIS digital and microform records is a tremendous advantage over attempts to search scattered Department records, some stored in file cabinets and cardboard boxes in the central file area, others still hoarded by various bureaus and offices. As the FAIS has matured and Historical Office historians have used and come to accept the system, a sense of its versatility for use in research analysis has also emerged. A full FAIS search on a variety of specific research topics can be promptly and efficiently conducted on the computer terminal, and an idea not only of substance, but of frequency, periodicity, volume, and scope can quickly be discerned in a manner never even attempted with the paper records.

Despite the considerable benefit of the system to the Department, the FAIS has its share of deficiencies, the most serious of which is its inability to capture all the substantive records of the Department. Certain documents—a minority but an important minority characterized as NODIS[3]—are considered to be so highly sensitive that dissemination of and access to them are prohibited throughout the Department until the Office of the Executive Secretariat, which manages the flow of information to and from the Secretary and other principal officers of the Department, downgrades them. Access to these records is possible only through a separate on-line retrieval system known as SADI (Secretariat Automated Data Index), maintained by the Office of the Executive Secretariat. The high-level nature of the information makes it the more likely repository for the policy-formulating records of particular concern to Department historians. These separate highly sensitive records and systems lose their sensitivity as time passes and eventually should be integrated into the FAIS. The speed and comprehensiveness of this integration are of great importance to Department historians and to future users of the records at the National Archives.

The FAIS remains incomplete also in

[2]The State Department's Historical Office includes some 28 professional historians, who divide their time between selecting and editing the official foreign policy record published in the series, *Foreign Relations of the United States,* and preparing policy-related historical research papers. The *Foreign Relations* documentary editing remains more than 20 years behind: currently the volumes for 1958–60 are being prepared. Unless present compiling procedures are revised, the *Foreign Relations* series will not be affected by the FAIS until at least 1995. The policy-related research program, generally deep in the most classified records, ranges across all the Department files, from those 100 years old to those created last week. The FAIS has affected this program for over five years, and the relationship is growing closer with every passing week.

Use of FAIS records in historical research projects prepared for high-ranking "principals" of the Department—the Secretary of State and his closest advisers—has provided the Historical Office with valuable insights into the FAIS.

[3]In most cases, large numbers of copies of each State Department telegram are produced and sent to various offices within the Department and to other foreign affairs agencies. NODIS documents are usually of such importance and sensitivity that they are not distributed to anyone but the listed recipient, usually the Secretary of State.

terms of records and files, types of correspondence, and other documents—sometimes known in the Department as "official informals"—not fully gathered from the geographic bureaus. Department of State bureaus are run almost as if they were semi-autonomous principalities. A centralized record system—whether for paper or computerized records—is only as centralized as these bureaus allow it to be. No order, regulation, or pronouncement will cause these bureaus to surrender their jealously guarded bodies of information. In the case of paper records, a central archives was successfully circumvented by the maintenance of decentralized records in bureaus, offices, and the files of particularly powerful individual officers. The so-called office "lot files" are testimony to this compromising of the central paper files.[4] The automated FAIS has so far had no greater success in acquiring the complete record than had the centralized paper systems before it, but this problem should gradually dissipate with the passage of time. The efficiency of the system, and the means of protecting information in the computer to the satisfaction of the bureaus, are persuading them to yield their stranglehold on a wider variety of records. Even now historians and archivists can look forward to using a more comprehensive system than Department historians originally encountered. Complete success, with the FAIS embracing all Department records, is not an immediate likelihood, but the trend is in the right direction.

A second serious problem with the FAIS is inconsistency in indexing. Indexers may use any of the nearly synonymous controlled terms in the thesaurus to index documents. This practice often necessitates longer, more complex search statements to assure maximum access to records pertaining to a particular subject. At the same time, a shortage of indexers in FAIM and periodic heavy backlogs of documents to be indexed sometimes causes indexers to enter only two or three general index terms in each citation instead of the customary five to ten terms, which has the effect of restricting search potential. The Department currently is rethinking the FAIS thesaurus with an eye to devising a more automated system of indexing, one which will be more dynamically attuned to the current needs of Department policy research and the long-term demands of research in the permanent foreign policy record.

There is also the problem of system software, not only for the FAIS but for other such systems. Archivists must be aware of potential problems in the changeability of the system software and its compatibility with the computer hardware available to the archival institution. If the software is proprietary in nature—that is, leased by the agency from a private vendor—as is the FAIS index, archivists must determine whether and to what extent this will hinder the use of the records in their repositories. In the case of the FAIS, the State Department and NARS have established an advisory group to monitor development of the system and to deal with these and other substantive and technical matters.

A final problem encountered by the Department since the inception of the FAIS has to do not with the system itself but with many of those who use it. An outmoded reluctance of Department historians and other officials—only sometimes conscious—has colored early

[4]Special decentralized paper files of bureaus, offices, or individual officers are called "lot files." These files contain important segments of the Department's foreign policy record. They are, however, disparate and often poorly organized, and they generally lack useful finding aids.

Department experiences in using the FAIS for research purposes. Historians tend to be conservative about adopting modern technology or adapting it to their research strategies or practices. Most historians past a certain age have been accustomed to using paper records. Paper records arranged in some traditional topical series and stored in boxes or file drawers are a familiar norm from which several generations of historians cannot easily depart. Earlier generations of American scholars have written studies of post-World War II diplomatic history using what were then generally orderly and understandable Department of State records. But in recent years the quantity of records has greatly expanded while their physical state has declined. They are messy, often unreadable, incomplete, and disorganized. No system or reasonable quantity of resources can possibly cope with the historical records of the Department of State exclusively in such paper. The effectiveness of what future archivists and other users find in Department records depends on the success and speed of the Department's historians in taking the lead in shaping digital records for current and future research.

From the perspective of Department historians, archivists, and future researchers, the FAIS offers potential applications that will enhance research in the field of American foreign affairs. In the months and years to come the compiling of the volumes of the official publication *Foreign Relations* will become a critical step in developing the long-term content of the FAIS. At present, volumes of *Foreign Relations* are prepared on the basis of the retired paper files of the Department of State and other agencies and compilation is 20 to 25 years behind currency. Official Department historians select, edit, annotate, and review electrostatic copies of original documents. The digitalization of the records of the Department of State in the FAIS will permit the preparation of the *Foreign Relations* series within months of the events chronicled rather than 20 or more years later. In fact, the work of Department historians in identifying and organizing the most important segment of the official foreign affairs record becomes increasingly necessary if Department policymakers are to have the soundest, most comprehensive, and most current information on the history of policy. The FAIS facilitates the early identification and organizing of such records, which may be in part classified, in part unclassified, and in part declassified. With certain program developments, Department historians will be able to use the computerized FAIS to select, compile, annotate, and edit *Foreign Relations* on-line at a very early date. They will also be able to update, improve, and supplement the original version until declassification allows publication. This *Foreign Relations* on-line editorial process will provide a most authoritative and comprehensive method of assuring fullness and depth to the FAIS. Early compilation will also allow Department historians to insert into the system a range of documents that, by accident or by design, are not routinely included. Compiling *Foreign Relations* on-line with the FAIS is simply the logical method of developing an authoritative, high-level, official foreign policy record that is always available to policy makers and eventually, when declassified, available to the public as a whole.

The FAIS illustrates the capability of automated full-text retrieval systems to circumvent a significant access problem presented by document text storage on microfilm: namely, the matter of restricted records. In the case of State Department records the problem is principally one of security classification. Although many security-classified FAIS

documents will be eligible for declassification under provisions of Executive Order 12065[5] by the time they are transferred to the National Archives, other FAIS documents will remain classified beyond the time of transfer. A conservative estimate is that 20 percent of the records will remain classified at the time of transfer. Considering the nonsubject arrangement of records on the microfilm, it is likely that each roll of film will contain at least one classified document, and this would be sufficient to necessitate closing the entire roll of film. In such a situation the overwhelming majority, and perhaps all, of the FAIS microfilm rolls would remain closed to researchers for a minimum of 30 years. National Archives staff would then be faced with the choice of providing electrostatic copies of unclassified documents from the microfilm for the use of researchers, or producing separate microfilm rolls of unclassified documents; both processes would be expensive and time-consuming.

The problem of restricted records has been substantially reduced because the largest portion of FAIS records—the official telegrams—are available in machine-readable format. The computer is able to sort classified documents from nonclassified; this capability will enable the National Archives to make available to users any nonclassified telegram text through the CRT if the data are maintained on-line. The Department has been working on a software package that would have the ability to revise index citations to show not only if and when a document has been declassified but, when applicable, the criteria under which declassification has been denied in response to requests made under the Freedom of Information Act. Although the computer cannot alter the text of a document, it can print out copies of declassified or sanitized texts requested by a researcher, and these copies can be stamped "declassified" and released in much the same fashion as records currently held by the National Archives. While these considerations do not at present apply to nontelegraphic documents in the FAIS, they will greatly reduce the burden on the National Archives in screening, declassifying, and providing access to FAIS records by removing classification problems from approximately two-thirds of the microfilm rolls. In a similar manner, automated text retrieval can facilitate access to records restricted for reasons other than security classification.

The ultimate solution to the problem of restricted microfilm records would be to convert the texts of all nontelegraphic documents to machine-readable format, which would permit complete and continually updated separation of classified records from nonclassified. One conversion method has been developed in the Automated Document Storage and Retrieval System (ADSTAR) at the Central Intelligence Agency. In this system existing microfilm will be converted to specially designed 16mm microfilm cartridges stored in modules containing up to 300 cartridges. Documents are retrieved at work stations, each containing a CRT and keyboard connected to a mini-computer. A researcher keys in the document request at the CRT; the computer automatically locates the item in the microfilm cartridge and activates the storage module to pass the appropriate frames of the microfilm over a scanner located in the module, which converts the data to digital mode in the form of light and dark images. When the frames

[5]President Jimmy Carter signed E.O. 12065 into effect in 1979. The primary intent of the drafters was to stiffen criteria for initial classification, strengthen protection of foreign government information provided in confidence, and speed up processes for declassifying information, including reducing systematic review from a 30 to a 20 year line in most cases.

have been scanned, the cartridge returns to its location in the module and is available for use by other researchers. The scanned images appear one page at a time on a document viewer located adjacent to the CRT at the work station. A high-speed printer can then produce a hard copy of each page as needed. Conversion of information from microform to digital form may be the most promising method of accelerating transfer of foreign policy records to permanent storage at the National Archives; it will permit the accurate identification of documents that have been properly declassified and the efficient handling of documents sanitized for reasons of security content. The phasing out of microform records may also be a step in more fully exploiting the Department records in their most usable form.

Another consideration is the question of purging nonsubstantive records from the FAIS. If we measure the contents of the FAIS by the State Department definition of "substantive," about 60 percent of the telegrams and 20 percent of the other documents, or approximately 55 percent of all FAIS records, are nonsubstantive. Some of the records the State Department considers to be nonsubstantive, however, might well be considered by archivists to contain information of permanent value. Records identified by the subject field TAGS "A" (Administrative), for example, are considered to be nonsubstantive; but they include claims against the U.S. Government, an area of considerable legal and informational value. Clearly, it would not be advisable for the National Archives to accept a solution involving the wholesale purge of all records in the "A," "B," "C," and "O" TAGS categories. Yet the truly nonsubstantive records should be removed from the FAIS. Purging such records from the microfilm would be a costly process, but they can be purged from the discs because the computer can sort telegrams in the machine-readable text file not only by their subject field TAGS but also by the four-letter primary subject code. Archivists must determine which four-letter subject codes are used for topics not of permanent value and see that these documents are purged from the system. This will result in additional computer storage for on-line telegram texts, which in turn will facilitate research.

How will archivists meet the unique reference requirements of records systems such as the FAIS? Archivists must be prepared to accession and use to the fullest extent the machine-readable components of such systems in addition to paper or microfilm texts. A recent study by the State Department showed that reference service using document texts retrievable on-line was seven times faster than that for microfilm. It would be advisable, therefore, that reference services be based if possible on on-line access to the machine-readable files (and at this point the purging of nonsubstantive records becomes a factor by freeing additional disc space). This means that the archival repository would have to have the hardware capable of retrieving a massive volume of data in on-line mode.[6] Information would be accessible in the research room through remote CRT terminals connected to the computer by a secure call-in system. Services would be provided by archivists thoroughly trained in the use of the CRT and index terminology. These archivists would assist users in performing searches at the CRT, provide printouts

[6]Although the cost of such hardware may at this time be excessive for many repositories, current technological and marketing developments probably will provide cost-effective mass storage of digital information in the near future. For an analysis of the technology, see Charles M. Dollar, "Problems and Procedures for Preservation and Dissemination of Processed-Produced Data," paper presented at the QUANTUM-SSHA Conference, University of Cologne, West Germany, 9–12 August, 1977.

of index citations, produce printout copies of on-line texts (such as FAIS telegrams) from high-speed printers or electrostatic reproductions of microfilm or paper texts, and provide printout lists of restricted documents and other pertinent data from the system. If the archival repository can employ a microfilm conversion process like the one being implemented at the Central Intelligence Agency, access to virtually all system records will be on-line. Other reference services could include the creation of special machine-readable subject subfiles and similar subfiles for index citations and, perhaps most important, the training of researchers in the use of the system. Such training could be in the form of publications, seminars, or on-site personal instruction.

The State Department is in many respects a pioneer in the field of "paperless office" technology. The FAIS continues to evolve. Hundreds of changes, large and small, have been made in the system software since its inception in 1973. Hundreds or thousands of changes, some probably quite important, will continue to be made. Modification and perfection of function are the great advantages of digitalized information. The Department knows that continuing development and ultimate perfection (if that is possible) of the FAIS depend in large measure on cooperation with archivists and other specialists. The Department also acknowledges its need for the cooperation of "private" scholars, for their special subject-matter expertise and for their insights into the operation of the system. Continued advice and cooperation are being sought from outside the Department and will over the months ahead help bring the FAIS to the expected level of utility.

What of the impact of systems such as the FAIS on the archival profession? Archivists accustomed to textual records, like historians, have resisted the introduction of automated records and techniques in their repositories. They have said, or thought, "Who needs a computer? I'll take a printout of the index," or "Automation is fine as long as it comes to this institution after I retire." This brand of myopia seems gradually to be dissipating, as made evident by the work of the National Information Systems Task Force, sponsored by the Society of American Archivists, and by the increasing number of archival institutions that are developing repository, collection, and even document-level automated finding aids.

The profession as a whole, however, has yet to come to grips with the archival realities of the paperless office. The State Department's FAIS serves as an example of the type of records system that virtually all archivists will be faced with in the years and decades ahead. If archivists continue to adhere solely to traditional forms of appraisal, description, and reference services, before very long they will no longer be capable of meeting their archival responsibilities. Archivists must recognize and accept the vast potential of computer technology in the field of information management and archival research, and study carefully the development of paperless office technology among their respective sources of archival records. The manner in which archival institutions deal with records of the paperless office—especially in this time of fiscal restraint, when front-end cost outlays often seem prohibitive despite long-term cost-efficiency—is for archivists one of the principal challenges of the 1980s. With a growing understanding of the issues, and of the considerable advantages of automation for archivists and their clients, there is every reason to believe that we will meet the challenge.