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REPORT BY THE U.S.

General Accounting Office

Better Management Needed In Automating The Federal Judiciary

Through fiscal year 1981, the Federal Judicial Center will spend about \$24 million to develop new computer-based systems, evaluate and acquire ready-made systems, and operate them in support of the U.S. Courts. These systems will not reach their full potential until systems development and implementation problems and management planning, coordination, and control problems are resolved.



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GAO recommends that the Director, Federal Judicial Center and the Director, Administrative Office of the U.S. Courts work together to improve the planning, management, and control of data processing operations.



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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

GENERAL GOVERNMENT
DIVISION

B-193697

The Honorable A. Leo Levin
Director, Federal Judicial Center

The Honorable William E. Foley
Director, Administrative Office
of the United States Courts

This report questions some of the Judicial Center's systems development and transfer practices and discusses the need for increased Center-Administrative Office coordination and planning to automate the Federal judiciary.

This report contains recommendations to you on pages 16 to 17 and 31 to 32. As you know, section 236 of the Legislative Reorganization Act of 1970 requires the heads of Federal agencies to submit written statements on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agencies' first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the Director, Office of Management and Budget; the Chairmen, Senate Committee on Governmental Affairs, House Committee on Government Operations, Senate and House Committees on Appropriations, and Senate and House Committees on the Judiciary; the Chief Justice, Supreme Court of the United States; and the Attorney General.

W. J. Anderson

William J. Anderson
Director

D I G E S T

The Federal Judicial Center--the research and development arm of the Federal judiciary--is developing and implementing computer-based systems, collectively known as Courtran, to automate various activities of Federal courts. Through fiscal year 1981, the Center will spend about \$24 million to develop new systems, evaluate and select ready-made systems, and operate these systems. As of July 1980 all district and appellate courts were using one or more Courtran systems including those acquired commercially such as a word processing system. However, only 35 out of 95 district and 4 out of 11 appellate courts were testing or using one or more systems developed by the Center.

Although providing benefits to the Federal courts, these systems will not reach their full potential until certain management problems are resolved. These problems have resulted in (1) uneconomical and inefficient software development practices, (2) the inability to determine when systems are operational and provide for orderly transfer of operational systems to the Administrative Office of the U.S. Courts, and (3) the inability to determine future information needs and the resources required to meet those needs.

SOFTWARE DEVELOPMENT PRACTICES
NEED IMPROVEMENT

The Federal Judicial Center has not used good software design, development, and implementation practices and has not performed all of the steps essential to properly develop and implement software systems.

The Center has not always fully identified and analyzed users' needs, alternatives, benefits, and costs before undertaking software development work. The largest system developed, the Criminal System, did not initially fulfill all users' needs and design expectations. Extensive modifications were required, yet the system can only be effectively used in a small percentage of the courts for which it was designed. (See pp. 8 to 12.)

Conversion to automated systems has not been as smooth as it should have been because conversion plans, procedures, and necessary operations and maintenance manuals have not been prepared. Although systems have been tested and operated in parallel at great length, progress toward moving systems out of the developmental stage and into full operation remains negligible. (See pp. 12 to 15.)

The Center has taken some steps to (1) determine which Courtran systems are cost beneficial, (2) identify which courts should use the various systems, (3) determine the most effective hardware and communication configuration for the systems, (4) require courts to prepare conversion plans and procedures before implementing new systems, and (5) require Clerks of the Court to formally approve all requests to modify automated systems.

These actions address some problems and show the Center's willingness to make improvements. They do not, however, address many of the fundamental systems development and implementation problems GAO identified nor do these actions formally establish processes to prevent the problems from recurring.

MORE COORDINATION NEEDED

Although the Congress expected the Federal Judicial Center and Administrative Office of the U.S. Courts to work together to improve and support Federal court operations, little coordination has occurred. They have not

worked together to plan, develop, and implement automated systems to support court operations. (See pp. 24 to 27 and pp. 30 and 31.)

As a result, the Federal judiciary's automatic data processing needs are supported by two separate organizations, and neither the Center nor the Administrative Office is prepared for the transfer of operational and maintenance responsibilities for Courtran systems. (See pp. 27 to 29.)

A newly established Joint Development Planning Committee has started to address the difficult questions and problems concerning Courtran systems which face the Center and Administrative Office. In GAO's opinion, it is imperative that these questions be resolved to comply with the wishes of the Congress. (See pp. 29 and 30.)

RECOMMENDATIONS

GAO recommends that the Director, Federal Judicial Center, and the Director, Administrative Office of the U.S. Courts, work together to:

- Establish a written system design, development, and modification process.
- Delay any extension of Courtran systems to additional courts until cost benefit studies are completed and show the extensions to be cost effective.
- Ensure development and implementation of a plan for the orderly transfer of automated systems to the Administrative Office.
- Determine whether two fully equipped computer organizations are needed to design, develop, and implement automated systems to support the Federal judiciary.
- Establish a formal planning process and long-range plan for directing, coordinating, and controlling data processing activities and resources.

In view of the concern expressed by the Congress over the development and operation of Courtran systems, GAO recommends that the Director of the Federal Judicial Center and the Director of the Administrative Office of the U.S. Courts jointly inform the Congress of the Joint Development Planning Committee's operations and of the progress made toward implementing a long-range planning process, a cost accounting system, and coordinated computer operations.

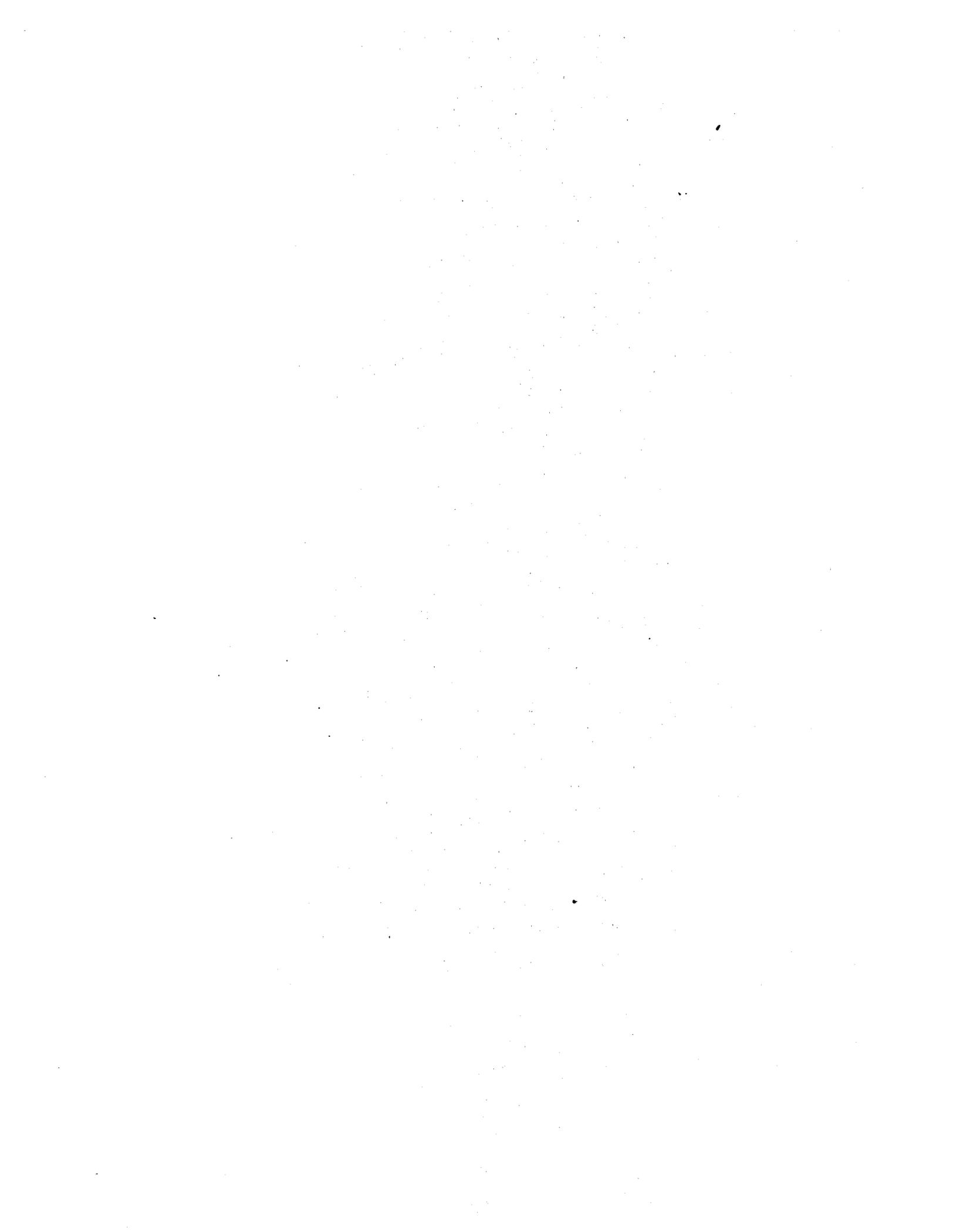
AGENCY COMMENTS

The Directors of the Federal Judicial Center and Administrative Office of the U.S. Courts agreed with GAO's recommendations and said that they are consistent with sound management practices.

The Directors expressed concern over and took exception to various GAO observations. Due to the volume of the Directors' comments, GAO did not append them to the report. The Directors' concerns and exceptions, however, have been summarized and included in the text of the report.

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CHAPTER 1

INTRODUCTION

The Federal judiciary has two agencies which support the courts--the Administrative Office of the United States Courts and the Federal Judicial Center.

The Administrative Office performs the administrative duties of the Federal judiciary. Among its duties are to (1) provide operational support to the courts, including operating automated systems such as Courtran, (2) prepare and distribute various court activity reports and statistics, and (3) supervise administrative matters relating to court clerks and other clerical and administrative employees of the courts.

The Center was established to carry out research and development activities for the Federal judiciary. As such, the Center is responsible for researching court operations and developing more efficient ways to manage court affairs. This includes determining ways in which automatic data processing may be applied to court administration.

Courtran is a term that refers to the Federal Judicial Center's computer-based systems to support Federal court activities. The Courtran systems, which are in various stages of development, testing, and operation, are designed to help Federal courts manage criminal, civil, appellate, and minor Federal offense cases. For example, the Criminal Case-Flow Management System automates criminal docket inquiries, produces statistical reports for courts to use in monitoring compliance with the Speedy Trial Act, and prepares court calendars. To cite another example, the District Court Index System (INDEX) enables courts, lawyers, and citizens to quickly obtain case identification data so that they can determine the status of criminal, civil, and bankruptcy cases. The system also helps courts produce caseload statistical reports for each judge as well as for the entire courts. 1/

1/The major Courtran systems are described in Appendix I.

In addition to developing systems, the Center also evaluates potentially useful systems which are available in the marketplace. Two such systems have been evaluated, acquired, and deployed to a large number of courts. The Computer Assisted Legal Research System designed to improve the quality and efficiency of legal research is used by 106 Federal courts. Word processing systems are used by 101 courts to improve the productivity and efficiency of producing court documents.

Through fiscal year 1981 the Center expects to spend about \$24 million developing, testing, and operating Courtran. The following table indicates the actual expenditures for Courtran through fiscal year 1979, estimated expenditures for fiscal year 1980, and estimated appropriation for fiscal year 1981.

<u>Fiscal year</u>	<u>Equipment and supplies</u>	<u>Rent, communications, maintenance and other services</u>	<u>Salaries</u>	<u>Total</u>
1972	\$ --	\$ 29,517	\$ 82,000	\$ 111,517
1973	708	144,813	107,000	252,521
1974	164,251	80,245	168,000	412,496
1975	1,034,476	147,468	291,000	1,472,944
1976	4,129,222	542,582	601,000	5,272,804
1977	2,820,050	734,650	744,000	4,298,700
1978	369,023	1,393,529	916,000	2,678,552
1979	1,080,000	1,315,400	1,232,000	3,627,400
1980	236,200	1,488,500	1,301,900	3,026,600
1981	<u>98,000</u>	<u>1,665,000</u>	<u>1,408,400</u>	<u>3,171,400</u>
Total	<u>\$9,931,930</u>	<u>\$7,541,704</u>	<u>\$6,851,300</u>	<u>\$24,324,934</u>

As of July 1, 1980, all district and appellate courts were using one or more Courtran systems including those acquired commercially such as the Computer Assisted Legal Research System and the word processing system. However, only 35 of the 95 district and 4 of the 11 appellate courts were testing or using systems developed by the Center.

Each Federal court determines which, if any, Center computer systems it wants. However, the Center is beginning to take on the responsibility for determining when a court is ready to use a system.

Since the Center's inception, the Congress has intended that once computer systems become operational, they are to be turned over by the Center to the Administrative Office.

PRIOR REPORTS

In a report to the Directors of the Judicial Center and Administrative Office (FGMSD-79-30, June 21, 1979), we noted that the Center did not comply with the General Services Administration's approval process under Public Law 89-306 (the Brooks Act) or with Federal procurement regulations regarding automatic data processing procurements. We also noted that the automated system designed to help facilitate compliance with the Speedy Trial Act of 1974 had not been widely implemented in the courts; and that automation of the fiscal operation in the courts was being considered for only one U.S. District Court and that such a decision might not result in competitive acquisition of a standard system for use nationally.

A Comptroller General's Decision (B-193861) issued on March 27, 1979, held that the Federal Judicial Center must comply with the Brooks Act and the General Services Administration's implementing regulations in all ADP equipment and services procurement.

OBJECTIVES, SCOPE, AND METHODOLOGY

The objectives of our review were to assess the: (1) developmental and operational status of Courtran, including the costs and benefits of the various Courtran systems, (2) software 1/ development process, (3) adequacy of the

1/Software is the computer instructions or programs, as well as the data files and descriptive manuals, that have to be provided to make computer equipment perform useful services.

Administrative Office and Center coordination efforts,
(4) adequacy of long-range data processing plans, and
(5) Center's efforts to develop data processing support to help courts monitor their compliance with the Speedy Trial Act of 1974 (P.L. 93-619).

Our work was performed at the Federal Judicial Center, the Administrative Office of the United States Courts, nine Federal district courts, and one State court. We interviewed Center and Administrative Office officials and reviewed their records to determine the status of Courtran, determine the status of any Center long-range data processing plans, assess the Center's software development practices, assess the development of Courtran systems to aid courts in compliance with the Speedy Trial Act, and identify coordination efforts.

We visited the district courts because they were using the Criminal Case-Flow Management System. We interviewed court officials and reviewed court records to obtain an understanding of the courts' experiences with automated court systems. We also attended a conference of the Clerks of the U.S. District Courts to obtain their general perceptions and comments on their satisfaction with automated support.

AGENCY COMMENTS AND OUR EVALUATION

By letter dated November 7, 1980, the Directors of the Federal Judicial Center and the Administrative Office of the U.S. Courts jointly commented on our report. Because the comments were voluminous, we did not append them to the report. The Directors' comments, however, have been summarized and included in the text of our report.

The Directors agreed with our recommendations to improve systems development and coordination efforts but expressed concern that our report does not recognize the full range of Courtran benefits, uses numbers of courts supported by automation instead of the national case load supported in measuring the extent of implementation, and leaves the impression that \$24 million was spent only for systems development.

The Directors expressed concern that our report does not discuss the breadth of or benefits derived from Courtran, since it deals primarily with only one system, the Criminal System. The Directors said that only occasional references are made to other systems developed and commercial technologies evaluated, including the Computer Assisted Legal Research Systems, word processing system, and 36 more modest systems including a system developed in a few days to index and monitor claims to

Iranian assets. Overall, the Directors believed that Courtran represents a modern time sharing system to provide much needed service and support to the Judicial branch of the government. Attached to the Directors' comments were letters from judges and clerks of eight courts citing benefits they had received from different Courtran systems.

In the introduction of and attachment to our report, we provide background information on the seven major Courtran systems developed by the Center and discuss some of the benefits provided by these systems to introduce readers to Courtran and the organizations discussed in the report. As the Directors point out, there are smaller systems and applications which have also been developed and acquired by the Center that are not discussed in the report. We did not discuss or evaluate the acquisition of commercially available technologies such as the Computer Assisted Legal Research System or word processing systems. Our objective was to assess the systems development process as it related to the major systems developed by the Center. For the same reason, we did not address small one-time projects such as the system to index legal claims to Iranian assets.

The Directors stated that, with regard to utilization of various Courtran systems by the Federal courts, our report referred only to the number of courts using the system and not to the national caseload supported. The Directors pointed out that, for the year ended June 30, 1980, Courtran applications provided support to over 50 percent of the Federal criminal felony and civil case filings and over 30 percent of the Federal appellate case filings.

We agree that caseload statistics are also useful data in assessing the support provided by Courtran systems. Our report notes that all district and appellate courts use one or more Courtran systems, although only 35 of the 95 district courts and 4 of the 11 appellate courts were testing or using Courtran systems developed by the Center. Our report also cites, for example, the number of courts supported by the Criminal System because the same was used by the Center to plan for and justify that system. As discussed on page 9, the Criminal System was expected to help up to 65 courts monitor compliance with the Speedy Trial Act, automate the manually prepared dockets, and help the courts manage their criminal cases. However, as discussed on page 10, only 11 courts use the Criminal System because of the deployment and usability limitations. Had all 65 courts been able to use the Criminal System for the year ended June 30, 1980, about 85.9 percent of the Federal criminal felony case

filings would have been supported by that system. As it is, about 28.1 percent of the Federal criminal felony case filings were supported by the Criminal System.

According to the Directors in their joint comments, the Courtran costs shown on page 2 leave the impression that \$24 million was spent only for systems development. The Directors stated that \$12 million was spent to establish an on-line computer facility to support the Federal courts and the Center, while approximately \$10 million was spent on systems definition and development and commercial systems evaluation. Also, part of the \$24 million was spent for a document flow analysis in two courts, a telecommunications analysis, and a district court studies project. The Directors stated that Courtran expenditures, when contrasted with the total cost of Federal courts operations, is minimal.

Our report stated then, as it does now, that through fiscal year 1981, the Center expects to spend about \$24 million developing, testing, and operating Courtran. The table on page 2 shows the details of costs in three categories by fiscal year. We were not able to include costs for each Courtran system because Center officials said, and our examination of their records showed, that they did not have and did not accumulate the costs to develop, implement, operate, and maintain the different Courtran systems (also see p. 31).

CHAPTER 2

A FORMAL SOFTWARE DEVELOPMENT SYSTEM

IS NEEDED TO SATISFY THE COURTS' INFORMATION

AND DATA PROCESSING NEEDS ECONOMICALLY AND EFFECTIVELY

Because the Federal Judicial Center has not used good system development practices, millions of dollars have been spent for systems without firmly establishing their need, and many systems development activities have been conducted inefficiently.

Computer software systems development is typically described by the functions performed during each phase of development. The systems development life cycle begins with the identification and definition of an information problem and/or need, a feasibility assessment, and a cost benefit study (definition stage); continues as a system is designed and software is programmed and tested (physical design and programming stage); and ends with the implementation, validation, and operation of software which solves the information problem and/or satisfies the information need (implementation stage).

The Center has not (1) adequately defined the Federal courts' information needs, (2) performed feasibility assessments and cost benefit analyses, (3) prepared plans and procedures for converting to new automated systems, (4) formally validated new systems to assure completeness and accuracy, and (5) conducted post-implementation audits of operating Courtran systems. As a result:

- Software pilot tests were inappropriately used to identify and address courts' information needs.
- Extensive software modifications were needed to satisfy courts' information needs not initially identified.
- Additional software systems were developed because an existing system required substantial computer capacity and because courts did not need this system as initially developed.

--Some courts experienced procedural and data base problems when they converted to an automated system.

--Expensive parallel operations lasted much longer than necessary because officials had not addressed an important court records rule.

Center officials said they recognized that problems existed with some of their development and implementation practices. To correct these problems, Center officials told us that they are taking measures to (1) identify which Courtran systems are cost beneficial, (2) identify which courts should use the Courtran systems that have been and are being developed and, (3) determine the most effective telecommunications configuration for Courtran. Center officials told us they are now requiring courts to prepare implementation plans and procedures before allowing them to use some of the new systems being developed. The officials also said they will require Clerks of the Court to formally approve all requests to modify automated systems. In addition, the Center and Administrative Office have agreed that future automated systems development work by the Center which may ultimately involve operation by the Administrative Office, should be undertaken jointly by the two agencies.

These actions address some problems and show the Center's willingness to make improvements. They do not, however, address many of the fundamental systems development and implementation problems we identified nor do they formally establish processes to prevent the problems from recurring. The actions cited above, for example, do not establish the methods, techniques, and procedures to be used during systems development and implementation to ensure adequate management and user participation and good software design, programming, testing, validation, implementation, and audit.

THE CENTER SHOULD IDENTIFY USERS' NEEDS,
ALTERNATIVES, BENEFITS, AND COSTS BEFORE
DESIGNING AND DEVELOPING NEW SOFTWARE SYSTEMS

The Center designed and developed major segments of Courtran before it adequately identified the courts' information needs, alternatives to satisfying these needs, and the benefits and costs of these alternatives. Expensive pilot tests were inappropriately used to identify the information needs not met by the new software and to identify which courts could use the systems. In addition, the Center has spent millions of dollars developing software systems and acquiring hardware without knowing whether the benefits were worth the cost.

Courts' information needs have
not been adequately defined

The initial stage in developing computer software systems is to define user needs and objectives. The Center did not adequately define the courts' information needs before it designed and developed major software systems. Instead, the Center inappropriately used pilot tests to identify the courts' information needs. As a result, many software modifications have been needed, and the courts may still have information needs which have not been satisfied.

The Criminal Case-Flow Management System, the largest system developed by the Center to date, was designed to help up to 65 courts monitor their compliance with the Speedy Trial Act of 1974, automate the manually prepared dockets, and help the courts manage their criminal cases. A Center official told us that work on the Criminal System began in 1974 before enactment of the Speedy Trial Act. On January 6, 1977, the first automated docket sheet and Speedy Trial Act reports were produced. The Center then started testing the Criminal System at six pilot courts. As the pilot courts began using the system they discovered mistakes, system requirements which did not match local procedures, problems in terminology, and features they wanted added to the system. A Center official said that during 1977 the Center released approximately 130 new versions of the Criminal System containing 2,000 changes to the software. A Center official told us most of the software changes were made to meet the information needs of the pilot courts, and the pilot test was used to identify and address users' needs as well as to test the system.

Because the Center does not have a cost accounting system as discussed in chapter 3, we were unable to identify the unnecessary costs incurred by inappropriately using pilot tests. It is clear, however, that it is not cost effective to develop a major system and put it into operation before identifying user information needs.

Additionally, although court information needs were identified and addressed during the pilot test, other needs may exist. For example, a Northern District of Illinois court official involved in the development and pilot test of the Criminal System told us that the Center should have designed a labeling and mailing feature into the system. Such a feature would help courts because it would automatically prepare the various notices that are sent to parties involved in court actions. Center officials agreed and said court personnel

spend a lot of time mailing notices. Although they believe the courts could save time if the notices were prepared automatically, this feature was not included in the Criminal System design.

Center officials agreed that it is important to define user needs before starting system design and programming work. A Center official said they now expend much more effort studying user needs and requirements so that they can avoid the same problems they experienced with the Criminal System. For example, the Center developed, in cooperation with many different court officials, a functional description of the Appellate Information Management System. The functional description specifies the system in terms of user requirements. The functional description should help to eliminate many of the problems encountered when the Center pilot tested the Criminal System because terminology, docket entries, reports, and activity sequences are now standard. A Center official said that by reaching positive and detailed agreements early, the system can be developed much more efficiently.

We believe that this is a step in the right direction. However, the Center should incorporate this identification of user requirements in written, standardized system development procedures to ensure that future user needs are adequately identified at the beginning of the system's development process.

Formal feasibility and cost benefit studies have not been made

Once the system design is proposed, a feasibility assessment should be made to determine the system's technical and operational feasibility. Then a cost benefit analysis should be performed to ensure that the system will produce the desired results economically. The Center has not performed feasibility assessments or cost benefit studies of proposed systems. As a result, the Center discovered during pilot testing that it was practical to install the Criminal System in only 11 of the originally expected 65 courts, and not all of the courts needed the full capability of the Criminal System.

Center officials told us that, on the basis of the pilot tests, they have found the Criminal System to be excellent for large courts. Although they have not defined "large courts," they expect the Criminal System to be used by only 11 courts instead of the 65 courts for which it was originally intended. The decision to offer the system to a smaller number of courts, according to Center officials, was based on the fact that the current computer hardware could not support all courts, and all courts do not need the full Criminal System.

After realizing that the Criminal System could not be widely deployed, the Center took action to provide more courts with the capability to monitor their compliance with the Speedy Trial Act. The Center modified the part of the Criminal System which accumulated and reported Speedy Trial Act information to form the Speedy Trial Accounting and Reporting System (STARS I). The STARS I system is being used by four courts. The Center then, using a different design approach, developed a new system called STARS II. Center officials said STARS II produces basically the same reports as STARS I, but STARS II is more specialized and more efficient.

A Center official said STARS II was developed to permit rapid deployment of a system to support the requirements of the Speedy Trial Act of 1974 (P.L. 93-619). The act required that effective July 1, 1979, criminal cases be processed within specified time limits ^{1/}. STARS II was offered to 30 courts in May 1979, shortly before the effective date of the act. As of July 1, 1980, 18 courts had STARS II, with additional expansion expected in the future.

Center officials have never made any cost benefit studies of Courtran as a whole or any of its individual systems prior to designing and implementing them. Several million dollars have therefore been spent developing Courtran software and acquiring hardware without knowing whether they would be cost effective. The effects of not determining costs and benefits before developing a software system can lead to uneconomical systems.

For example, had feasibility and cost benefit studies been done on the Criminal System prior to its development, Center officials would have known that it could not be deployed to all 65 target courts. With this knowledge, Center officials might not have developed the system and would have explored alternative means of satisfying courts' requirements. For example, one of the main objectives of the Criminal System in 1974 was to help courts monitor compliance with the Speedy Trial Act. The ability to achieve this objective was finally

^{1/}Basically, the act, as amended, provides for a maximum of 30 days from arrest to indictment and a maximum of 70 days from indictment or the defendant's first appearance before a judicial officer in the court in which such charge is pending, whichever event occurs later, to the disposition of the case. Either period may be extended by excludable periods of delay permitted by the act.

realized in May 1979 when the Center announced that STARS II would be made available to 30 courts. Prior to this, only nine courts had been receiving speedy trial reports. Had Center officials known the deployment limitations of the Criminal System, they might have decided to develop STARS II instead of the Criminal System.

Center officials agreed that there is a need to make a full cost benefit study of Courtran. They said they are conducting such a study because of the concern we expressed during our review and because several Administrative Office officials were concerned that Courtran's cost may outweigh its benefits.

LACK OF GOOD IMPLEMENTATION PRACTICES
CAUSES EXPENSIVE TEST PERIODS TO BE LONGER
THAN NECESSARY

The Center has no policies or procedures to fully validate, implement, and audit the computer systems it develops. Consequently, the major systems developed by the Center, though used widely, have never progressed from a testing phase. Courts have experienced problems converting their manual operations to the automated systems; courts have had to operate parallel manual and automated systems for long periods of time; and there is no assurance that systems are operating as intended.

Conversion plans and
procedures not prepared

Before pilot testing an automated system, plans and procedures must be prepared to convert manual operations to automated systems and to build automated data files. The Center began pilot testing the Criminal System without preparing these plans and procedures. As a result, courts experienced conversion problems because manual procedures were not revised to allow their efficient automation. Although the Center sent its employees out from time to time to help the courts, some courts still experienced problems building automated data files and changing operating procedures in preparation for automation.

We learned from our visits to pilot courts that some did not revise their paper flow procedures before converting to the Criminal System to assure that entries were recorded on the computerized docket in the sequence required by the computer. As a consequence, many entries were rejected by the computer, and this resulted in incomplete criminal dockets

until corrections could be made. Center officials said extensive editing of the data bases was required to make the automated court records complete and accurate. Center officials acknowledged that the incomplete dockets could have jeopardized the courts' use of the Criminal System.

Other courts studied and revised their paper flow procedures before converting and generally had fewer problems implementing the Criminal System.

Officials have recognized that conversion plans and procedures are critical and have begun requiring appellate courts to submit their plans and procedures to the Center for approval before they will be allowed to implement the Pre-Appellate Information Management System. This system is operating in two courts and plans are to expand it to five more courts. Requirements for submitting plans and procedures have not been established for all systems being implemented.

We believe this is an improvement. However, to ensure that conversion plans and procedures are developed for all systems, we believe the Center should develop written procedures establishing the submission of plans and procedures as a prerequisite to implementing all automated systems.

Systems were not validated before
being placed into extensive use

Validation procedures are used to determine whether new systems and related documentation are complete, accurate, and ready for full implementation. Employees charged with the validation function test and certify those systems to ensure that they meet (1) all functional and performance specifications, (2) users' needs and procedures, and (3) software documentation, operations, and maintenance standards.

The Center has neither developed validation procedures nor formally validated Courtran systems before placing them into extensive use. As a result the Center and courts are operating and using automated systems which are not certified as being accurate and complete.

Parallel operations have lasted
too long and been too costly

Parallel operations are conducted to assure the accuracy of a new system's output products by comparing them with outputs of the manual system being replaced. Since it is obviously not cost effective to operate redundant systems, the old and new systems should be operated in parallel only long enough to assure the accuracy of the new system.

Most of the pilot courts have operated the manual and automated Criminal Systems in parallel for periods much longer than necessary. As a result, operating costs and court workloads have been unnecessarily increased. Courts have had to acquire additional personnel to operate both systems for long periods of time. In addition, the Center has incurred hardware, personnel, and communication costs to support the automated operations.

The following chart shows that 8 of the 11 courts had conducted parallel operations of the criminal system for 21 months or more and that pilot testing lasted 29 months or longer at 10 of the 11 pilot courts. As of July 1, 1980, four courts continued to operate parallel manual and automated systems, and all courts were still in the pilot stage.

Criminal Case Flow Management System

Testing Time Frames

(As Of July 1, 1980)

<u>Courts</u>	<u>Months of parallel operations</u>	<u>Months in pilot testing</u>
Northern District of Ill.	32	39
Northern District of Cal.	a/29	35
Central District of Cal.	21	34
Eastern District of Mich.	a/23	34
Southern District of Cal.	19	34
District of Ari.	a/11	33
Northern District of Ga.	25	29
District of Ore.	24	29
District of D.C.	21	29
Southern District of N.Y.	a/21	29
Western District of Tx.	6	11

a/As of July 1, 1980, parallel operations were still being conducted.

According to Center and court officials, the primary reason for the extended parallel operations was the uncertainty as to whether, under existing court rules, manually prepared dockets could indeed be eliminated. By letter dated October 26, 1979, the Administrative Office ruled that the manual dockets could be eliminated provided the Center would guarantee public access to complete and current dockets.

Although one of the chief purposes of the Criminal System was to replace manual dockets, the question remained unresolved for nearly 3 years after the first automated docket was produced. Had this question been addressed early--before funds were spent to develop the system--the operation of parallel manual and automated systems could have been minimized.

The Center has not conducted post-implementation audits of operating systems

Once a system has been placed into operation, it should be allowed to operate for several months at which time a post-implementation audit should be conducted. This audit is a review of the entire system, both the manual and automated processes, to insure that the system maintains the necessary controls to consistently produce reliable results and also operates in accordance with applicable agency and Federal standards and approved design specifications.

The Center has not conducted post-implementation audits of systems. Therefore, there is no assurance the systems (1) meet objectives in a cost beneficial manner, (2) consistently produce reliable results, and (3) operate according to approved design specifications and applicable Center, Administrative Office, and court standards.

CONCLUSIONS

The Federal Judicial Center's informal and unstructured approach to developing software systems has resulted in costly developmental and operational problems. Several important developmental steps have been inadequately performed or have not been performed at all.

The Center has not always fully identified and analyzed users' needs, alternatives, benefits, and costs before undertaking software development work. The largest system developed, the Criminal System, did not initially fulfill all users' needs and design expectations. Extensive modifications were required, yet the system can only be effectively used in a small percentage of the courts for which it was designed.

Conversion to automated systems has not been as smooth as it should have been because conversion plans, procedures, and necessary operations and maintenance manuals have not been prepared. Although systems have been tested and operated in parallel at great length, progress toward moving systems out of the developmental state and into full operation remains negligible.

The Center has taken some steps to (1) determine which Courtran systems are cost beneficial, (2) identify the courts that should use the various systems, (3) determine the most effective hardware and communication configuration for the systems, (4) require courts to prepare conversion plans and procedures before implementing new systems, and (5) require Clerks of the Court to formally approve all requests to modify automated systems. Although these actions will help correct some problems, they must be incorporated into a formal and comprehensive software design, development, and implementation process to prevent the same problems from recurring in the future.

RECOMMENDATIONS

We recommend that the Director, Federal Judicial Center, in concert with the Director, Administrative Office, establish written processes for the orderly development and implementation of computerized information systems in support of the U.S. Courts. Such processes should include:

- Methodologies, techniques, and procedures for performing user need studies, feasibility assessments, cost benefit studies, and program and system testing plans and activities.
- Procedures to insure that management and users participate in and approve of each phase of the system design, development, and modification process.
- Requirements for the Center and courts to develop system conversion plans and procedures.
- A system validation process to thoroughly evaluate programs and systems before they are placed into operation.
- Procedures for pilot testing and parallel operations to limit their duration and to insure swift implementation of successfully tested systems.

--Procedures for conducting post-implementation audits of systems to determine whether all system objectives are being met and to assure that internal controls are being maintained.

Our recommendations to develop these processes in concert with the Administrative Office are based on the need for close cooperation between the system developer--the Center--and the system operator--the Administrative Office--which is discussed more fully in chapter 3.

Until the above processes are established, we further recommend that any extensions of Courtran systems to additional courts be delayed until cost benefit studies are completed and show the extensions to be cost effective.

AGENCY COMMENTS AND OUR EVALUATION

In commenting on our report, the Directors of the Center and Administrative Office agreed with our recommendations to improve the Center's systems development practices but took exception to our treatment of the Center's systems development efforts. The Directors had general comments in the areas of systems development philosophy, the intrinsic differences in court management, and the research nature of the Center's systems development efforts. Also, the Directors took exception to our observations in the areas of defining users needs, analyzing costs and benefits, validating systems before installing them, and completing systems definition and design before installing systems.

In their general comments, the Directors said our report reflected no awareness of the range of legitimate and accepted developmental approaches; did not recognize the variation in management practices and styles that are endemic to the judicial system; and did not take into account the Center's research mission.

We disagree with the general comments. The systems development process, by its very nature, requires both researching information needs and problems, proposing methods to satisfy needs and solve problems, and, if appropriate, developing automated systems. Although Courtran is a research and development project of the Center, the major Courtran systems have many characteristics of data processing systems found elsewhere. Several developmental approaches are accepted and used by the data processing community. Certain systems development activities, however, such as determining users' needs and performing feasibility and cost benefit

studies before deciding to design and develop systems, are common to the various systems development approaches. Our discussion of and recommendations to improve the Center's systems development practices reflect our concerns that these fundamental activities need attention. Although providing automated support to courts is still somewhat new, the major systems developed by the Center perform the common data processing functions of logging, maintaining, and reporting on various events or transactions. The function of automating manual recordkeeping and reporting, such as automating manual dockets or party index cards, is typical of most automatic data processing organizations and in most cases automation expands the ability to provide reports and statistics which could not or would not be produced by the manual operations. We realize that courts employ different management styles and practices but believe that obstacles arising from this can be overcome by taking the necessary steps to identify needs and obtain operating agreements before developing systems. The Center has begun to do this in its determination of user requirements for the Appellate Information Management System and as a result has been able to obtain agreements from courts concerning uniform terminology, docket entries, reports, and activity sequences.

In commenting on our observation that the Center has not adequately defined users' needs before designing and developing major software systems, the Directors said the Center tried at every step in the definition and design effort to totally involve the users in specifying needs that the systems were designed to meet. The Directors added that the Center said it did not know the totality of federal court information needs when the Courtran project was begun and does not know nor does the Center need to know this to design systems. The Directors pointed out that as the pilot courts used the various Courtran systems, they identified additional potential benefits and provided the Center with additional specifications and requests for modifications of existing systems or development of new systems.

We agree that the Center does not need to know the totality of courts' information needs to design and develop systems. We continue to believe, however, that the Center should define the courts' information needs concerning proposed systems before designing and developing them. As we discuss on pages 9 and 10 of our report, the Center has not adequately defined courts' needs before designing and developing systems. Center officials told us they used pilot tests to identify information needs and that as pilot courts began using the Criminal System--the largest system developed by the Center--they discovered mistakes, requirements which did

not meet local procedures, problems in terminology, and features they wanted added to the system. As a result, many changes were needed to satisfy information needs which had not been identified and the courts may still have information needs which may not have been addressed. For example, as noted on pages 9 and 10, the Criminal System did not originally contain a time saving feature to automatically prepare mailing labels.

Center officials told us they recognized that it is important to define user needs before starting design and programming work, and one senior official told us the Center now spends much more effort studying user needs and requirements to avoid the same problems experienced with the Criminal System. The Center has, for example, prepared for the Appellate Information Management System a functional description which standardizes terminology, docket entries, reports, and activity sequences. A Center official said by reaching positive and detailed agreements early, the system can be developed much more efficiently. We recognize the Center's increased effort to identify user needs and obtain operating agreements before designing and developing systems as an improvement in the systems development process (see p. 10). We point out, however, that the Center should incorporate the process of identifying users' needs and requirements in written, standardized system development procedures to ensure that user needs are adequately identified at the beginning of all future systems development projects.

In commenting on our observation that cost benefit analyses have not been made before deciding to develop systems, the Directors questioned the value of performing cost benefit analyses. Also, the Directors said that at the outset of each systems development project, the Center took every reasonable step it could to quantify the benefits that would accrue from the project. The Directors added that the Center has also completed followup benefit analyses to document that expected benefits had in fact been realized.

The Directors said the Center had done much to identify the benefits of the various Courtran systems and the entire Courtran effort as a whole but questioned the value of cost benefit analyses. We believe and it is recognized throughout the data processing community that cost benefit analyses provide valuable information which is used to decide whether a system is worth developing. In making this decision, the issue is whether the proposed system is worth the cost to develop, implement, operate and maintain. Cost benefit analyses provide the essential information for this decision and are a proper part of the research effort that should be

done before investing personnel, capital, and operating resources in developing systems. Although the Directors said the Center has tried to identify the benefits of specific systems and Courtran as a whole, the Center has not made cost benefit analyses for any systems before deciding to commit its resources to develop, operate, and maintain them. Identifying benefits alone is not enough. An analysis of the monetary investment in relation to the anticipated benefits is necessary for management to determine whether a system is worth developing. In addition, the lack of cost information may limit consideration of more attractive, less costly alternatives.

In commenting on our observation that systems have not been formally validated before implementing them, the Directors stated that the systems developed by the Center have been thoroughly validated. The Directors said the users have thoroughly validated applications as they have used them by working with the systems and Center staff and by comparing computer produced reports with manually prepared records. The Directors added that the Center has validated those aspects of Courtran systems that serve national accounting or reporting needs. The Directors believe the Courtran systems have been validated and that we are elevating form over substance by putting total emphasis on the word "formally."

The Directors' comments on our report state that users in using the various systems have validated them. Systems were not validated before implementing them in the various courts. We disagree with this practice and state on page 13 of our report that the purpose of validating systems is to ensure that the systems are complete, accurate, and ready for implementation. We also disagree that we elevate form over substance by emphasizing the need for formal systems validation because validation is in effect the last quality control check for systems before they are placed into use. For this reason, validation requires thorough testing of the systems' performance, functional specifications, documentation, outputs, operating procedures, and users' procedures. In short, validation is essential to ensure the integrity of systems. The Center's practice of allowing the courts to do its quality control work is risky. When users implement systems, they expect those systems to function properly and produce accurate information. If systems do not operate as expected or produce inaccurate information, users will not rely on them. Many organizations have learned this hard lesson and have had to abandon expensive systems. For these reasons, we have recommended and the Directors have agreed that systems should be thoroughly validated before they are placed into operation.

In their comments, the Directors disagreed with our approach to developing and implementing systems. The Directors said the Center prefers its approach of building core systems, installing them in courts, subjecting them to widespread testing and use, and refining them based on user experience and operating conditions. According to the Directors, the policy of releasing systems incrementally allowed early support of court needs. In addition, a senior Center official subsequently sent to us a memorandum which discussed the Center's development approach.

The Directors, in their comments, also implied that the parallel operations of the Criminal System were not unnecessarily long and stated that the shift to the electronic docket did not hinge solely on the question as to whether manually prepared dockets could be eliminated. The Directors added that because of the importance of court records, each court had to assure itself that the computer prepared records were as reliable as the manually prepared records.

We believe, as discussed in our report, that the approach of identifying users' needs and requirements and analyzing the feasibility, cost, and benefits of a proposed system before deciding to commit expensive resources to design, develop, and maintain it has much merit. We also believe this approach is completely compatible with the Center's practice of developing and implementing the core of a system and then incrementally releasing the remainder. The studies and analyses are used to define the system and provide management with the information needed to decide whether the system should be developed. If a decision is made to proceed with development, officials can also decide whether to develop and implement the system as a whole or incrementally. The Center's practice of deciding to develop and implement systems without having conducted the necessary studies and analyses has caused problems. For example, as discussed on page 11, had the Center known that it would be feasible to deploy the Criminal System to only 11 of the targeted 65 courts, it might have decided to explore other means of satisfying user needs rather than deciding to proceed with developing the system. Similarly, as discussed on pages 9 and 10, had users' needs been adequately identified before designing and developing the Criminal System, pilot testing would have been conducted to test the system rather than using it as a vehicle for identifying users' needs, and the need to modify the system to meet users' needs would not have been as great.

In our discussion of the parallel operations of the Criminal System on pages 13 to 15, we point out that Center and Administrative Office officials attributed the uncertainty of replacing the manual docket as the primary reason for the extended parallel operations. We believe this question should have been addressed before funds were spent to develop the system. We also point out that the objective of parallel operations is to assure the accuracy of a new system's outputs by comparing them with the outputs of the manual system being replaced. Since operating two systems in parallel is expensive, use of parallel operations should be limited only to its intended purpose--assuring the accuracy of the output. We believe that conducting parallel operations for 21 months or longer at 8 of the 11 pilot courts was excessive.

CHAPTER 3

LACK OF COORDINATION HAS RESULTED

IN ORGANIZATIONAL, DEVELOPMENTAL AND OPERATIONAL PROBLEMS

Because the Center and Administrative Office have not coordinated their systems development and support activities, basic developmental problems such as deciding when a system is operational and drawing up the operational responsibilities have not been solved. There are two separate organizations to support the automation needs of the courts. A plan is needed to resolve the organizational, developmental, and operational problems associated with this lack of coordination.

Although the Congress expected the Center and Administrative Office to work together to improve and support Federal court operations, little coordination has occurred. There is, for example, (1) little interaction during systems development, (2) no criteria for determining the point at which systems are operational, and (3) no process to transfer operational systems. The Center and Administrative Office have acted independently over the years and have planned, developed, and operated systems with minimal interaction or coordination.

The Administrative Office's data processing resources are both insufficient and incapable of operating some Center developed software systems. As a result, the Center has assumed the Administrative Office's function of operating and maintaining automated systems and operating four large-scale computer systems which support Federal court activities.

The Center and Administrative Office have recently started coordination efforts because of congressional and GAO concern. These efforts are preliminary as they have only begun to address the many difficult questions and problems they face. Much more needs to be done to correct the problems which have resulted from a lack of coordination and to establish a process to assure continuous coordination.

ROLES OF THE CENTER AND THE ADMINISTRATIVE OFFICE

The Federal Judicial Center is responsible for researching court operations and developing more efficient ways to manage court affairs. This includes determining ways that automatic data processing may be applied to court administration.

These responsibilities were reiterated in the Senate and House Appropriation Committee reports concerning the fiscal year 1979 appropriations for the judiciary. Specifically, both reports state that "the Center should remain the research and development arm of the judiciary and should serve to test innovative approaches to dealing with the workload and problems of the judiciary." The Committees also stated in their reports that the Center should consider phasing out operational support of the courts.

To support its responsibilities, the Center as of July 1, 1980, had 4 large-scale computer systems and 35 ADP personnel. The Center uses the resources to develop, maintain, and operate the Courtran systems.

The Administrative Office is responsible for providing operational support to the Courts. This includes operating automated data processing systems; directing the work of administrative personnel of the courts; examining the state of court dockets; paying necessary office expenses of courts, judges, and other court officials; and providing equipment and supplies for the courts. The Administrative Office also had 4 computers and 46 ADP personnel as of July 1, 1980, to develop, maintain, and operate administrative systems.

THE CENTER AND ADMINISTRATIVE OFFICE
HAVE NOT WORKED TOGETHER TO DEVELOP
AND IMPLEMENT SYSTEMS

The Center and Administrative Office have not worked together to develop and implement automated systems to support court operations. Consequently, software developmental and operational problems have occurred and basic issues, such as determining at which point systems operations and maintenance responsibilities should be transferred and a process developed to accomplish the transfers, remain unresolved.

Administrative Office was not
involved with the Center's
system development projects

The Administrative Office was not involved with developing the automated systems which the Center created to support court activities. Administrative Office computer personnel are not familiar with the design, logic, and programming of systems for which they, sooner or later, will be responsible for operating and maintaining.

Because systems have been retained by the Center, the full impact of this problem has yet to occur. However, the Administrative Office and the Center have experienced some of the effects of not working with each other during the systems development process. For example, the Center developed the Administrative Office's Division of Financial Management Accounting System in the FORTRAN language. Since October 1979, the Center has had to maintain the system because the Administrative Office had a difficult time finding a programmer familiar with the language. Partly because of these continuing maintenance problems, the Administrative Office began to replace the accounting system in a language which the Administrative Office could use. According to an Administrative Office official, the cost for this duplicated system was estimated at about \$125,000. Subsequently, the Administrative Office decided to stop developing a replacement system and use the system developed by the Center because Administrative Office officials expect some Center computer equipment to be turned over to them.

The Center and the Administrative Office have recently agreed to work together on the development of the Probation Information Management System. To this end, the organizations have signed a written agreement for division of responsibilities to ensure the participation of both organizations in developing the system. The Center is responsible for the system's technical design and development and testing in three pilot courts. It will be assisted by two Administrative Office computer specialists. The Administrative Office is also responsible for developing a statement of user information requirements and obtaining resources for implementing the system. Subsequently the Center and Administrative Office have agreed to jointly undertake future automated systems development work for systems which may ultimately be operated by the Administrative Office. The agreement to work together is a step in the right direction. The Center and Administrative Office need to work together on all developmental efforts to avoid further problems.

Criteria are needed for determining when systems are operational

The Center has not turned over any systems it developed to the Administrative Office, although some have been "operating" in courts since 1977. As previously discussed, when systems become operational they are supposed to become the Administrative Office's responsibility.

Because the Center and the Administrative Office have not worked together to develop criteria for determining at which point systems become operational, there is confusion as to whether any of the systems are operational. The confusion over whether systems are operational can be illustrated by statements made by Center officials regarding the Criminal Case-Flow Management System. In March 1977, the Director of the Center testified before the Congress that "Our criminal package is now completed and we have it operational in Chicago and perfected in Chicago." In April 1977, he testified that the system was in operation in three district courts. In August 1978, a Center official stated that "The criminal case flow management system is now operational * * *. Based upon decisions made jointly by the clerks of court and the Federal Judicial Center at our last meeting, development work on the criminal system will stop in September of this year."

However, in March 1979, the Center advised the Congress that the Criminal System "is very far from being operational. The user will probably perceive this application as remaining relatively stable during the next several years, but, from the Center's viewpoint it will be in a major process of development and revision." Although the Center stated that the Criminal System was not operational, we noted that as of July 1, 1980, 7 of the 11 pilot courts were relying on it entirely, having stopped their manual systems.

Several other systems are also possibly operational, but they have not been designated so by the Center. For example, the Pre-Appellate Information Management System is operating in two circuit courts of appeal, and plans have been made to expand the system to five more courts. The Speedy Trial Accounting and Reporting System and the District Court Index System are in a total of 35 district courts in either a testing or full functional stage. Further expansion of these systems to additional courts is expected.

Procedures are needed to transfer systems to the Administrative Office for operation

The Center and Administrative Office have not developed procedures for transferring operational systems to the Administrative Office for operation. These transfer procedures should generally provide for (1) transferring formal system data including a description of the entire system, software documentation, user manuals, and software maintenance manuals, (2) determining specific responsibilities during transfer to ensure continuity of system operations, and (3) developing a plan for transferring system programs and data files.

In May 1979, the Director of the Center stated in a letter to the Director of the Administrative Office that a joint Administrative Office and Center coordination capability was needed to anticipate and plan for the transfer of computer functions. He indicated that establishing turnover procedures presented a problem since the Center was running an operational system--the Administrative Office's accounting system--on its computers. One year later, however, the Center was still operating the accounting system, and turnover procedures had not been developed. Instead, the Administrative Office began redesigning and reprogramming the accounting system for its own equipment. Subsequently, the redesigning and reprogramming effort was halted. Although, as previously discussed, the Center and Administrative Office have agreed to jointly develop the Probation Information Management System, they did not address system transfer procedures.

THE CENTER CONTINUES TO OPERATE
SYSTEMS BECAUSE THE ADMINISTRATIVE
OFFICE CANNOT

Because of the continuing lack of coordination between the Center and Administrative Office, the Center has assumed responsibility for operations and has increased its data processing resources to assure the continued operation and maintenance of existing systems while concurrently developing new ones. In essence, two complete and separate computer organizations have evolved to support court operations and administrative functions. Each organization has developed its own automated systems and the capability to operate and maintain them.

Administrative Office has insufficient
resources to operate and maintain all systems

Since the Administrative Office does not know when it will obtain systems from the Center or what the systems' equipment requirements will be, it has not acquired the computer hardware and software capabilities necessary to operate and maintain systems developed by the Center. In the fall of 1979, for example, the Administrative Office purchased a computer and data base management system to replace its existing computer system. This equipment, however, is only capable of satisfying the Administrative Office's own internal computer needs. In addition, the Administrative Office has not trained its personnel to maintain the Courtran software written in scientific computer languages.

A May 3, 1980, report of the new Joint Development Planning Committee to the Directors of the Center and Administrative Office explained this dilemma. According to the report,

transferring Courtran or any of its subsystems from development to operation would be difficult, disruptive of operations in both organizations, and expensive in terms of new manpower and equipment required. The report also stated that Administrative Office personnel were not familiar with the type of computer equipment used by the Center; were not trained in the principal languages used in developing programs now operating on the Center's computers except COBOL; and had limited experience with the on-line, real-time concept of operations utilized by the Center in developing Courtran applications. As a result, the immediate transfer of a portion of the Center's operations and programming staff to the Administrative Office would require the Administrative Office to conduct day-to-day computer operations utilizing two different computers and to support software programmed in different computer languages.

The Center has assumed operational responsibilities

The Center has assumed the responsibility for operating and maintaining Courtran systems. Since 1975, the Center has obtained and operated four large-scale computer systems (one of which has two central processing units) to support its operations and development efforts. Although some of this computer capacity is used for research, at least half of it is used to support computerized systems in 35 district courts, 4 appellate courts, and the Administrative Office's accounting system.

The following table shows the major Courtran systems operated by the Center and the number of courts supported by them as of July 1, 1980:

<u>Courtran system</u>	<u>Number of courts supported</u>
Criminal System	11
STARS I	4
STARS II	18
INDEX	33
Central Violations Bureau	17
Appellate Record Management System	1
Pre-Appellate Information Management System	2

As previously discussed, while none of the Courtran systems developed by the Federal Judicial Center have been declared fully operational, some systems support day-to-day court operations. For example, as of July 1, 1980, the Criminal Case-Flow Management System had been supporting 10 of the 11 pilot courts for between 29 and 39 months. Seven of these courts had eliminated their manual operations as of July 1, 1980, and were relying exclusively on the automated system.

SERIOUS COORDINATION
EFFORTS ARE JUST BEGINNING

The Center and Administrative Office are just beginning to address the many difficult questions and problems concerning Courtran systems. Although the Center, and thus the requirement to coordinate with the Administrative Office, has existed since 1967, a forum for coordination was not established until late 1979. In November 1979 the Directors of the Center and Administrative Office created the Joint Development Planning Committee and appointed top-level staff to be members of the Committee.

The Committee, according to officials, has met regularly to consider (1) when and how the Courtran systems may be determined to be operational, (2) how Courtran systems may be turned over to the Administrative Office for operations, maintenance, and potential installation throughout the judicial system, and (3) how development efforts and projects in the future may be coordinated from the outset to assure proper and easy transition from the developmental to operational stage.

It will apparently take some time to decide these issues. A May 3, 1980, Committee report stated:

"In short, it is clear to your Committee that the transfer of any Courtran application to the Administrative Office will require very careful planning over an extended period of time. We do not believe it is possible to make a single transfer of equipment and personnel, from the Center to the Administrative Office within the next twenty-four months without adversely affecting the operations of the Center and the Administrative Office, as well as adversely affecting the service provided to Courtran users. Additionally, we are not yet persuaded that such transfer is in the best interests of the Judiciary, although we certainly do not mean to indicate that complete transfer might not ultimately be recommended."

The Congress has for some time been concerned over the growth of the Center's data processing resources and the fact that Courtran systems have not been transferred to the Administrative Office for operations and maintenance. This concern was most recently expressed in a report by the Committee on Appropriations, House of Representatives, which accompanied the fiscal year 1981 Departments of State, Justice, and Commerce, the Judiciary and related agencies appropriation bill. With respect to the Administrative Office, the report stated that:

"* * *. The Committee has also denied a request for additional automatic data processing equipment and supplies for fiscal year 1981. The Committee will, however, be pleased to reconsider the request in fiscal year 1982 in conjunction with a plan for the transfer of operational responsibility for certain COURTRAN applications from the Federal Judicial Center to the Administrative Office of the United States Courts."

In our opinion, the plan requested by the Committee provides the necessary framework within which to establish criteria for determining when systems are operational, the procedures needed for transferring systems, and a process for jointly developing new systems.

LONG-RANGE DATA PROCESSING
PLANNING AND COST ACCOUNTING
ARE NEEDED

The Federal judiciary has no formal long-range data processing plan or planning process to identify its information needs and the strategies and resources required to meet those needs. In addition, the judiciary has no data processing cost accounting system and therefore has little cost information for decisionmaking and cost control purposes.

Without long-range planning and a cost accounting system, courts' information needs, projects' priorities, projects' costs and benefits, systems' financial objectives, and hardware and personnel needs remain unknown. Millions of dollars have been spent automating court operations and administrative support activities. It appears that much more will be spent developing new software systems, acquiring more computer hardware, and hiring and training additional personnel. It is important, therefore, that these expensive activities be planned and that the full financial implications be understood.

The Center has spent about \$21 million through fiscal year 1980 to develop and operate computer systems without knowing the full financial implications of its decisions. Because the Center does not have a cost accounting system, it does not know the full cost of developing and operating any of the systems it has or will develop. The Center only accumulates computer hardware and communication usage data. This equipment usage information can be used to determine users' hardware operation and communication costs, but this is not usually done. The Center does not systematically accumulate costs of system development activities, system maintenance activities, or computer processing. Therefore, little cost data exists for decisionmaking and cost control purposes. To make prudent decisions, management needs to know the full cost of providing data processing services.

Good cost accounting and reporting should, for example, enable managers to be in a position to compare costs among activities, operations, and projects; evaluate the cost of work done and measure productivity; measure cost performance; make users and top management conscious of the costs of data processing systems and services; and provide the accounting basis for budget justifications and reports to the Congress.

CONCLUSIONS

The Center and Administrative Office have not worked together to plan, develop, implement, and account for automated systems to support court operations. As a result, the Federal judiciary's automatic data processing needs are supported by two separate organizations, and neither the Center nor the Administrative Office is prepared for the transfer of operational and maintenance responsibilities for Courtran systems.

The Joint Development Planning Committee has just started to address the difficult questions and problems concerning Courtran systems which face the Center and Administrative Office. In our opinion, it is imperative that these questions be resolved to comply with the wishes of the Congress.

RECOMMENDATIONS

We recommend that the Directors of the Federal Judicial Center and the Administrative Office of the U.S. Courts work together to:

1. Develop and implement a detailed plan to ensure the orderly transfer of automated court systems to the Administrative Office of the U.S. Courts as envisioned by the Congress. This plan should include

- criteria for determining when computer systems are fully operational;
 - procedures specifying the steps required for the Center to turn systems over to the Administrative Office including requirements for software documentation, user manuals, operation manuals, and software maintenance manuals;
 - provisions for Administrative Office personnel involvement in system development efforts to ensure the capability to operate and maintain the systems;
 - provisions for Administrative Office involvement in developing software and software documentation standards; and
 - provisions for turning over to the Administrative Office Center equipment and personnel not needed for research and development.
2. Establish a coordinated planning process and prepare a joint long-range plan which is updated at least annually. The plan should show the judiciary's needs, proposed projects, costs and benefits, priorities, workloads, and equipment and personnel required to support the workload.
 3. Establish an automatic data processing cost accounting system to aid in decisionmaking and in preparing internal and external reports.
 4. Determine whether two fully equipped computer organizations are needed to design, develop, and implement automated systems to support the Federal judiciary.

In view of the concern expressed by the Congress over the development and operation of Courtran systems, we also recommend that

- the Director of the Federal Judicial Center and the Director of the Administrative Office of the U.S. Courts jointly inform the Congress of the Joint Development Planning Committee's operations and of the progress made toward implementing a long-range planning process, a cost accounting system, and coordinated computer operations.

AGENCY COMMENTS AND OUR EVALUATION

In commenting on our report, the Directors of the Center and Administrative Office agreed with our recommendations in chapters 2 and 3 for the two organizations to work together to establish a written process for the orderly development and implementation of computerized information systems; develop and implement a detailed plan to ensure the orderly transfer of automated systems to the Administrative Office; establish a coordinated planning process and prepare a joint long-range automatic data processing plan; establish an automatic data processing cost accounting system; and determine whether two fully equipped computer organizations are needed to support the Federal judiciary. However, the Directors expressed concern over our characterization of the extent of their cooperation and the degree to which the Center has turned over operational systems to the Administrative Office.

In their comments, the Directors stressed that the Congress went to some lengths to insist on separation of the Center and the Administrative Office. They said that the two agencies have acted independently over the years, but to state there has been "minimal interaction or coordination" between the two agencies in developing and operating computerized systems is an overstatement.

According to their comments, numerous forms of coordination and cooperation between the Center and Administrative Office were not discussed in our report including:

- The Director of the Administrative Office serves on the Board of the Federal Judicial Center and thus is in a position to stay abreast of the Center's work.
- For almost a decade, the Center and Administrative Office have held monthly joint staff meetings to provide for the regular exchange of information.
- The Deputy Directors of the two agencies have for many years held meetings regularly.

The Directors added that Administrative Office personnel have been involved in Courtran development work. For example:

- The Chief of the Administrative Office's Statistical Analysis and Reports Division worked with Center officials to insure cooperation in Courtran services specifications to meet the division's needs.

--The Administrative Office provided temporary court positions to facilitate testing and development of Courtran systems.

--Two Administrative Office staff have been involved since the start of the Appellate Information Management System planning group to insure broadscale cooperation in this definitional effort.

The Directors note that the Center and Administrative Office do have different forms of coordination and cite some examples of working together. However, we believe as discussed in chapter 3 of our report, that the extent of coordination has not been enough to assure the most efficient and effective automated support of the Federal judiciary. We believe that the Center and Administration Office acceptance of our recommendations reinforces this position. The need for increased coordination has also been documented in some of the Center's correspondence with the Administrative Office and in the May 1980 and September 1980 reports of the Joint Development Planning Committee.

In his May 18, 1979, letter to the Director of the Administrative Office, the Director of the Center raised the issue of creating a joint coordination committee because questions were arising concerning the implications of determining whether systems are operational and also concerning the actions which must be taken to turn over systems to the Administrative Office. The Director suggested that there was a pressing need for some type of joint Center-Administrative Office coordination capability to be able to anticipate and plan for the transfer of systems. Similarly, in his October 29, 1979, letter to the Director of the Administrative Office, the Director of the Center said he was very pleased to know that Administrative Office personnel were designated to serve on the joint coordination committee. The Director also stated, "* * * Informal discussions between our staffs can be helpful, but they cannot substitute for a standing joint committee with an explicit mandate to maintain whatever regular AO-FJC coordination may be necessary to move Courtran applications to operational status, within the Center or within the Administrative Office * * *."

Also as discussed on pages 27 and 28, the Joint Development Planning Committee's May 3, 1980, report, with regard to transfer of systems to the Administrative Office, stated that Administrative Office personnel are not familiar with

the operation of the type of computer equipment used by the Center, are not trained in the principal languages used in developing programs now operating on the Center's computers except COBOL, and have limited experience with the on-line, real-time concept of operations utilized by the Center in developing Courtran applications. Similarly the Committee's September 19, 1980, report's discussion of the current situation, clearly shows that coordination has been lacking. The Committee report said the next major task was to develop a detailed plan concerning the transfer of operational Courtran systems. According to the report, work should begin immediately assuming that the plan must be completed in time for full coordination and approval and presentation to the Congress in January or February 1981. The report said, "* * *. Your committee believes that this plan should also focus on the broader issue of how best to provide computer support services to the Courts, the Administrative Office and the Federal Judicial Center. We recommend that a working level team be formed to actually begin the detailed work on the plan * * *."

Our discussion of coordination and cooperation in chapter 3 and the above excerpts show the need for close cooperation between the systems developer--the Center--and the systems operator--the Administrative Office, that the past efforts to coordinate and work together have not been enough, that the organizations have begun to improve coordination and address the problems resulting from not working together to provide automated support to the judiciary, and that a joint planning process is essential to properly support the Federal judiciary's needs.

In their comments, the Directors of the Center and Administrative Office said the two organizations did work together in developing the Financial Management Accounting System to meet the needs of the Administrative Office and that developing the system in the FORTRAN language did not preclude the system's transfer to the Administrative Office. According to the comments, the Administrative Office maintained the system until October 1979, when its two FORTRAN programmers suddenly left. At that point, the Center took over the software maintenance.

The Directors of the Center and Administrative Office said their organizations worked together to meet the needs of the Administrative Office. However, the Administrative Office was not involved in the development of this system nor did it have programmers who were conversant with FORTRAN.

When the Center asked the Administrative Office to take over software maintenance responsibilities, the Administrative Office had to hire qualified staff. Administrative Office officials told us they had difficulties maintaining the system because the newly hired programmer had to learn the system, a task made more complicated because the system's documentation was inadequate. An Administrative Office official also told us that over 500 changes were made to the system during the 16-month period in which the Administrative Office had a FORTRAN programmer. With regard to this system, it is apparent that the organizations did not work together sufficiently to properly meet all of the needs of the Administrative Office.

In their comments, the Directors stated that our report inadequately characterizes the degree to which the Center has turned over operational systems to the Administrative Office. With regard to the discussions in our report that the Center and Administrative Office have not developed criteria for determining when systems become operational and that the Center has not turned over any systems it has developed to the Administrative Office although some have been operating in courts since 1977, the Directors commented that

- defining the operational status of Courtran projects is difficult and complex,
- although systems are in daily use, their central development is still undergoing refinement and improvement,
- determining when systems are operational must be done on a system-by-system basis,
- when a system reaches the point where further refinement and development needs are minimal at best, operational authority for them will be transferred to the Administrative Office, and
- Courtran systems and evaluated technologies that have become operational, including the computer-aided legal research application, the word processing-electronic mail system, and the Financial Management Accounting System, have been turned over to the Administrative Office for operational maintenance, expansion, and support.

We believe that we have not inadequately characterized these issues. As we discuss on pages 25 and 26, because the Center and Administrative Office have not worked together to develop criteria for determining at which point systems

become operational, there is confusion as to whether any of the systems are operational. The Center has not turned over any of the systems it developed to the Administrative Office. The Administrative Office has become responsible for the commercially-acquired and contractor-developed systems mentioned above although all are being operated on a day-to-day basis by the Center.

In their comments, the Directors stated that although our report mentions the establishment of the Joint Development Planning Committee, it does not mention the significant computer development goals which were recommended by the Committee and which were accepted by the Directors of the Center and Administrative Office.

The goals referred to were contained in a September 9, 1980, memorandum signed by the Directors of the Center and the Administrative Office. They are:

"(1) The A.O. and the F.J.C. should take the necessary action to achieve a single technological (computer hardware and software) environment.

(2) That the appropriate amount of computer hardware and supporting personnel required to support those Courtran applications determined to be operational should be transferred to the Administrative Office. All other computer equipment and personnel will remain under the control of the F.J.C. to meet their ongoing research and development needs.

(3) The Administrative Office should plan to operate a single computer facility to support both Administrative Office and operational court systems.

(4) All future planned systems development projects by the A.O. for its internal purposes should be reviewed for possible development on DEC-10 computers."

In their comments, the Directors stated that the report incorrectly asserts that the lack of coordination between the Center and the Administrative Office has resulted in "two complete and separate computer organizations * * * to support court operations and administrative functions." They added that for many reasons, including organizational autonomy, it is to be expected that the Center and the Administrative Office would each have a computer capability.

We believe our assertions are correct. As we discuss on pages 23 to 29, although the Congress expected the Center and Administrative Office to work together to improve and support Federal court operations, little coordination has occurred. The Administrative Office is expected to operate and maintain systems developed by the Center, but it does not know when it will obtain systems from the Center or what the systems' equipment requirements will be. As a result, the Administrative Office has acquired and developed data processing resources without due consideration of the equipment and personnel capabilities needed to operate and maintain Courtran systems. We believe this clearly illustrates that the computer organizations are acting independently in an area where the opposite is required.

In their comments, the Directors said the Center has maintained since Courtran's inception a cost accounting system that shows the complete amount of computer resources and telecommunications costs for each Courtran application used by each court. The Directors' comments added that this cost accounting system, coupled with other Center financial records, is entirely capable of showing the total cost for developing the Courtran applications.

We disagree that the records referred to above represent a cost accounting system. As we discuss on pages 30 and 31, the judiciary does not have a data processing cost accounting system and therefore has little cost information for decisionmaking and cost control purposes. With regard to the Directors' comments above, we reviewed the computer hardware and communication usage data that they refer to. This usage data can be used to determine, by system, users' hardware and communications costs; but this is usually not done. Regardless, this system only provides information on computer hardware and communication usage and is not part of a cost accounting system which accumulates and reports to management all significant elements of cost directly related to acquiring, developing, and operating automatic data processing resources. As noted in our discussion of the joint Center-Administrative Office comments on chapter 1, we were not able to include in our report the cost of each Courtran system because the Center does not accumulate the cost of developing, implementing, operating, and maintaining the different Courtran systems.

BRIEF DESCRIPTION OF MAJOR
COURTRAN SYSTEMS

CRIMINAL CASE-FLOW
MANAGEMENT SYSTEM

This system was designed to support court monitoring of compliance with the Speedy Trial Act requirements and replace manual criminal dockets with automated dockets in courts. The Criminal System is the largest automated system developed by the Center to date.

Criminal dockets are maintained for each case and serve as a summary and index of actions taken by and papers filed with the court. Dockets are the primary source for statistical reports, answering public inquiries and court management of cases. They are also important because the time limits described by the Speedy Trial Act are calculated based in part on information recorded on them.

The Criminal System is being operated in 11 courts, with no expansion to other courts expected. These courts are using the system for monitoring all criminal cases to assure compliance with the Speedy Trial Act and to automatically prepare criminal case statistical reports.

SPEEDY TRIAL ACCOUNTING AND
REPORTING SYSTEM (STARS I AND II)

These systems were designed to support court monitoring of compliance with the Speedy Trial Act requirements. They are narrower in focus than the Criminal Case-Flow Management System and are designed for use in courts that do not have the full Criminal System. Unlike the full Criminal System, STARS supplements rather than replaces existing court recordkeeping and reporting procedures.

DISTRICT COURT INDEX SYSTEM

This system is designed to replace the manually prepared card indexes used as an aid in answering public inquiries and from which most courts derive their lists of pending cases. It records, for civil, criminal, magistrate, and bankruptcy

cases, information on parties' names, case filing dates, the number of defendants in any specific case, and the judge to whom the case has been assigned. Additional information, such as termination date, judge reassignment, and attorneys of the respective parties, can also be entered into the system. This information is used to prepare monthly statistical reports on case activity and judges' pending cases. This system was being operated in 33 courts as of July 1, 1980.

APPELLATE INFORMATION MANAGEMENT SYSTEM (AIMS)

This system, though not yet developed, is designed to automate the docketing function in each Federal Court of Appeals. Since all appellate cases have common processing stages, the system is supposed to (1) permit grouping of appeals by their current case-flow status for management and statistical purposes, (2) permit the status of any particular appeal to be retrieved, and (3) check to see that new event entries are consistent with the current appeal status. The Center is testing a PreAIMS subsystem of AIMS in two circuit courts of appeals and plans to expand its use to five more courts.

PreAIMS

This system, a subsystem of AIMS, is a nondocketing system designed to track scheduled case actions and provide lists of due and overdue actions. In addition, it tracks motions and provides lists of assigned motions. It produces a party index report as well as nine other standard reports. A Center official indicated that user satisfaction with PreAIMS will dictate whether the complete AIMS system will still be needed by the courts.

CIVIL SYSTEM

The Center is designing a system for District Courts to statistically monitor their civil action caseloads. The system closely resembles PreAIMS and is intended to supplement the current manual civil system. Like AIMS, the Center intends to test this initial system to determine if a full docketing civil system similar to the Criminal Case-Flow Management System is warranted. The Center plans a test operation of the initial system in late 1980.

CENTRAL VIOLATIONS BUREAU SYSTEM

The Center developed this system to automate district court Central Violations Bureau operations. In fiscal year 1978, the Bureaus processed over 500,000 relatively minor offense cases, such as traffic violations on Federal land, which resulted in fines of over \$6 million.

This system monitors offense citations issued by Federal agencies, from receipt in the clerk's office until disposed of by payment of a fine or action by the court. When payment of a fine is not received, the system automatically generates a warning letter to the violator and any other followup action required. Eliminating manual citation monitoring reduces the amount of clerical effort required to deal with citations. This system was being operated in five courts as of July 1, 1980.

PROBATION INFORMATION MANAGEMENT SYSTEM

This is a proposed system which is in the planning stages. Its goals are to: (1) establish an information system for field managers, (2) provide up-to-date information to guide district judges in selecting sentences for convicted defendants, (3) generate national statistics for budget, planning, and management control purposes, and (4) create a data base for research.

Development of this system is unique in that the Administrative Office of the U.S. Courts and the Federal Judicial Center have entered into an agreement for the division of responsibilities associated with the development of the system.

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