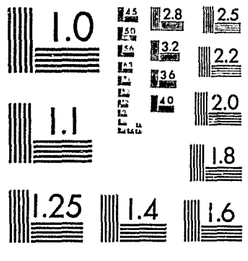

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AUTOMATED INFORMATION SYSTEMS:

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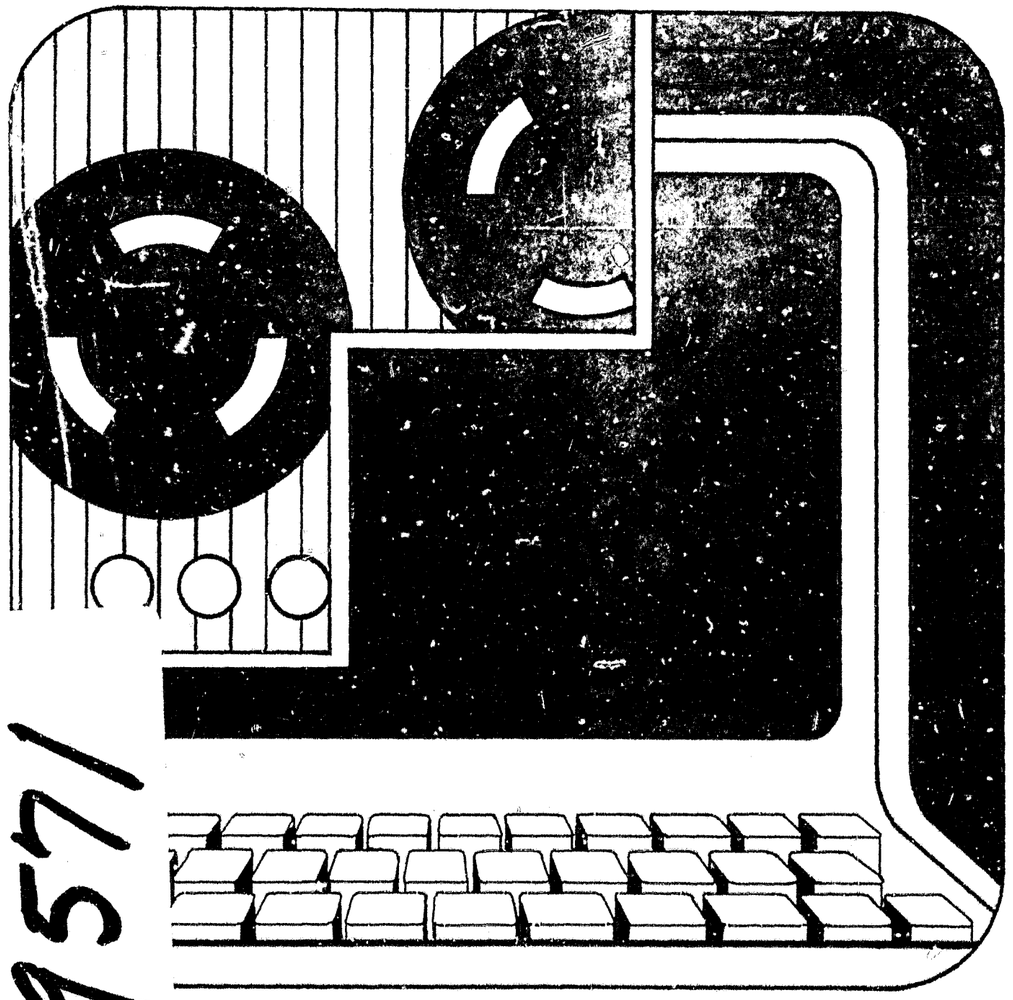

nal Center for State Courts

AUTOMATED INFORMATION SYSTEMS: PLANNING AND IMPLEMENTATION GUIDELINES

A Monograph for Court Users
Written by the Staff of the
State Judicial Information Systems Project

A Publication of the National Center for State Courts

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Part I. Deciding whether an automated information system is the answer

Introduction

Data processing activity has been historically one of the most casually managed activities in business as well as in government. Managers have been awed by the mystique of automation and have tended to accept the judgment of computer specialists as to the efficiency and cost-effectiveness of data processing activity.

Management ultimately bears the responsibility for establishing the policy and direction for every business and governmental activity. The data processing activity is no exception. Management should participate in the development of an expressed philosophy that includes, at a minimum, a statement of purpose for an information system (be it manual or automated), an explanation of the organizational relationships within data processing and between data processing and the court administrators (i.e., clerks, judges), an indication of the process by which the information system is expected to meet the objectives of management, and basic guidelines for the day-to-day operation of the information system. The establishment of a management philosophy for an information system will strengthen the relationship between all parties involved and ensure a smoother path for the accomplishment of the stated goals and objectives of judicial administration at every level.

This monograph will discuss the essential steps that judicial managers should take in developing and implementing an automated information system. The level of discussion is intended to be nontechnical in nature, and does not purport to be a definitive treatise on computer technology or management science.*

What is data processing?

Data processing is the performance through manual or automated means of a planned sequence of operations upon data. In the court context, "data" might mean case-related information such as defendant's name, case number, and next event; a listing of eligible jurors for jury duty; or merely accounting entries such as fees paid, citations paid, and payroll.

The growth of the computer industry has resulted in part from the paperwork explosion, which threatens to debilitate both large and small organizations. Courts find themselves in the same paperwork dilemma; in addition, caseloads are increasing, procedures are inadequate, and personnel and financial resources are limited. Although courts have turned to computers much later than most organizations, many court officials now see the computer as the best means for resolving court information problems. Many court operations such as preparing calendars and notices, tracking case progress through the court process, and preparing statistics are amenable to computerization.

The growing availability of lower-priced computers, coupled with increasing court information-processing problems, leads to the expectation that courts will continue to develop and utilize computer technology. In developing new systems, however, a court needs to avoid pitfalls already encountered in other jurisdictions. Although much has been written about the general field of data processing and specifically about information systems in the courts, court managers seldom have the time or the expertise to wade through volumes of information and extract relevant materials.

This monograph attempts to bring together in one place the basic and relevant instructions that court managers will need in developing and implementing an automated information system.

When does a court need an automated information system?

When court efficiency lags, the court manager recognizes that he has problems. Although the real problems may be unknown, the symptoms are easily recognized. Such symptoms may surface as the inability

- to respond to requests for certain types of information,
- to predict the workload of the court,
- to comply with speedy trial statutes or rules of court,
- to comply with privacy and security regulations in the dissemination of caseload information.

If these problems can be corrected by changing procedures, the court manager can study his needs and issue the necessary revised procedures to the operating personnel. With periodic monitoring and control, the problems should disappear.

More complex problems become apparent when long-standing needs go unfulfilled. Lack of detailed, accurate, and current management information, for example, could make the court manager aware of the following needs:

- There is a need for information about all the record-keeping activities within the court; solutions such as the addition of more judges and clerks may have reached the saturation point.
- There is a need for information about the volume and movement of cases and people through the system.
- There is a need to evaluate the performance of personnel involved in the expediting of cases through the court.
- There is a need to measure the court's performance against standards or against other courts' performance.

When enough of these problems exist and their solution is not readily apparent, the court manager should undertake an evaluation of whether alternate techniques for managing information—either new or enhanced manual procedures, or an automated system—are needed in this court.

The systems approach

The systems study. The key for developing an adequate, workable information system is the systems study. Through careful analysis of the information flow—where information comes from, who needs it, what is done with it, and what happens because of it—the proper system can be developed to meet the court's needs.

The "systems approach" is a process by which the systems analysts and the court manager determine the court's needs and recommend the most appropriate system. It is a method for integrating people, machines, and procedures into a system designed to attain specific goals and solve specific problems.

Each step of the systems approach is important in bringing the court closer to attaining its goals. Shortcuts and deviations generally lead to errors in the decision-making process; in fact, most court information systems failures have resulted because one or more steps were omitted or circumvented. Because of the high cost and complexity of data processing

*Much of the material presented in this book is adapted from several previous publications of the National Center for State Courts. It comes largely from *Data Processing and the Courts—Guide for Court Managers* and *Data Processing and the Courts—Reference Manual; Cost-Benefit Methodology for Evaluation of State Judicial Systems; State Court Information System and Statistical Reference Series,* Vols. I, II, and III; and *Guidelines for Development of Computer Training Curricula for Court Personnel.* Details of publication will be found in the Bibliography.

systems, courts must require the systems analyst to adhere closely to a methodology that includes the following steps:

feasibility study
identification of problems and alternate solutions
selection of systems approach
cost-benefit analysis
staffing, organization, and planning
software development
procurement process
field testing and modification
implementation and training
ongoing monitoring and evaluation
refining the system

These steps constitute the sections of this report.

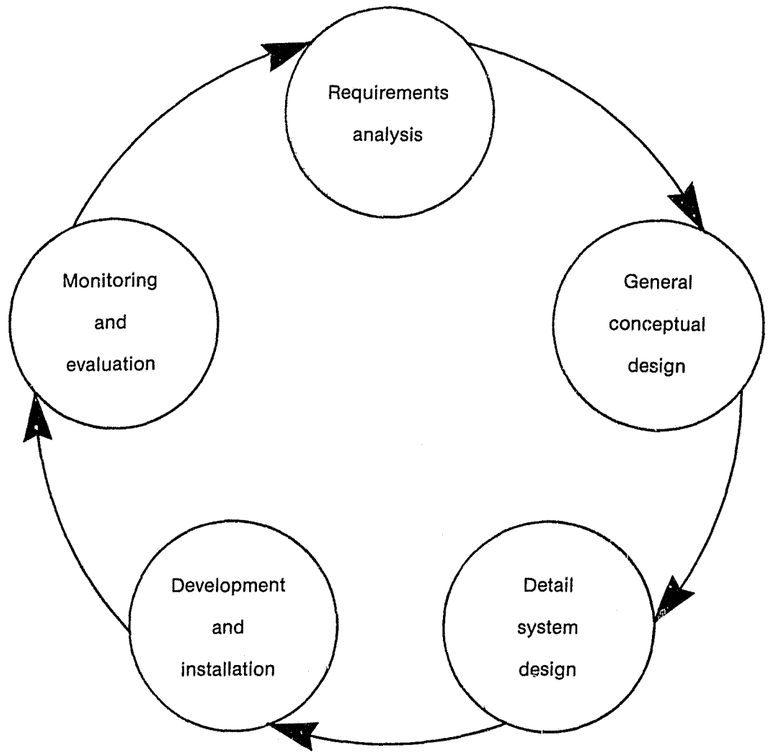
The systems approach outlined here follows a sequence of steps, but the planning and implementation of an automated information system is actually a cycle and a continuous process, as illustrated in Figure 1. Even as the system is being installed and refined, needs should be reanalyzed and necessary modifications planned to meet them.

Who performs the systems study? The systems study should be performed by qualified systems analysts, preferably with substantial court experience. Such people may be available within the court system. If not, then qualified outside assistance must be obtained. The competence of outside consultants should be carefully investigated.

Any consultant performing the systems study must first become familiar with the court's operation, and the court manager or an experienced member of his staff must work closely with the consultant to speed this process. Not only is the study enhanced by interested participation and informed guidance but the court representative will develop skills in systems analysis and gain a thorough background in the proposed system.

Regardless of who performs the systems study, the court manager (perhaps assisted by a qualified member of his staff) and the various department or division heads must actively participate in the study to ensure that the court's needs and requirements are fully considered. This is especially important when the court is involved with other agencies in a cooperative venture such as the development of a criminal justice information system or a state judicial information system.

Figure 1: The information system planning and implementation cycle



Feasibility study

The preliminary step in the systems approach is to state clearly the objectives of the court information system as they relate to the overall goals of the court. Many systems fail because they are designed to meet the wrong objectives. Other systems are developed in a vacuum because the objectives stated were not directly attainable or measurable. An objective such as "the improvement of the administration of justice" provides little direction for designing a computerized system. More immediate objectives, such as reducing delays caused by continuances, bringing defendants to trial within 90 days, and removing civil cases from the court calendars when there has been no progress for one year, are all measurable and attainable objectives.

Ordinarily, all the objectives cannot be completely formulated at the beginning of the study. Often they will change with time. As new conditions are encountered during the study, the objectives may have to be modified.

Requirements analysis

A requirements analysis must be conducted to identify the functional requirements of the system and the possible approaches to satisfying these requirements. The analysis involves both decisions and supporting documentation in the following areas.

System purpose. What is the purpose of the system? Will it provide operational support (e.g., calendars, dockets, jury notices, subpoenas)? Will it be an information system (e.g., provide summary statistics)? Will it be both?

Modules in system. What combination of civil, criminal, appellate, financial, personnel, and other modules should be included in the system?

System participants. The suppliers of data to the system and the users of system reports must be identified. Normally, they are easily identifiable if the system purpose is known. Usually the suppliers of data are clerks and staff in the judicial districts. The users of system reports are normally clerks and staff in the courts, personnel in the court administrative offices, and judges in the court system. Reports normally go through interoffice or U.S. mail or through remote computer peripheral equipment (e.g., printers, display terminals) in their offices.

System life span. For most automated systems, the expected operational life of the system is between five and eight years.

Levels of output information. Will the system provide detailed outputs (e.g., at the case level), summary outputs (e.g., summary statistics), or both?

Frequency of output information. How often will the system provide outputs? Daily, weekly, monthly, quarterly?

Levels of input data. Will the system require detailed inputs (e.g., at the case level), summary inputs (e.g., summary of all cases of a given type in a judicial district), or both? If detailed inputs are required, will they include all data or predefined subsets of the data (e.g., all cases, a sampling of cases, all cases that exceed a given level of seriousness)? Similarly, will all, or only a subset of, summary data be required (e.g., summary of all cases or of only certain types of cases)?

Quantity of input data. How much input data are expected annually over the system life span? For example, what are the projected annual case filings over the next eight years and how is the projection obtained? It should be noted that the actual quantity of input data is usually higher than the expected quantity.

People involved

It is very important to gain courtwide agreement on the areas that should be analyzed. Organizational support and assistance in defining needs and goals must be solicited not only from top management but also from all working-level personnel of the system. In a court environment, the people involved with the system include those clerical personnel in various types of courts and in the court administrative offices who supply data to the system. Also included are system users such as court clerks, judges and justices, local court and administrative office management personnel, and any others who use system reports (e.g., justices of the peace, quasi-judicial officers).

Additional involved groups may include state judicial officials, who may be users of some of the system outputs, state legislators and planners, who may fund and approve the system, and executive branch personnel, who may run the system on their computer or whose systems may interface with the court's system. A major factor in gaining the support of the disparate people and groups who are involved in the system is to have continuing contact with them throughout the development process. This liaison should be followed by periodic contact when the system becomes operational.

Continuing contact will accomplish two things: First, it will permit a thorough appraisal of what those involved with the system want it to accomplish; second, it will permit them to be apprised of what computers in general and the system in particular can and cannot accomplish. This will promote mutual understanding and minimize the chance of surprises and disappointments when the system becomes operational.

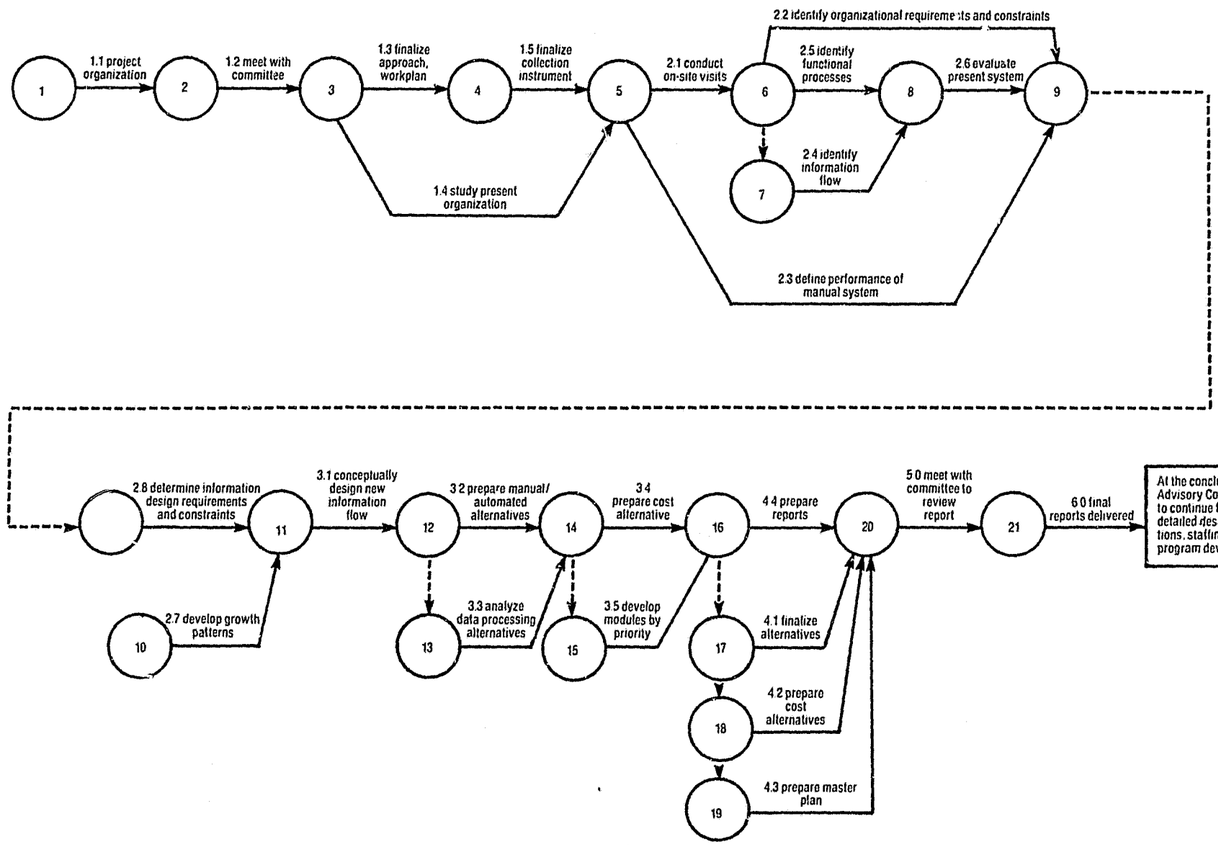
What does continuing contact mean? For the users it means frequent, sometimes daily, contact to identify their requirements and ensure that the developing system meets their needs. For the chief justice it would mean considerably less frequent contact, although he or she should be as aware of how the system is progressing as he or she needs to be and wants to be. Other people and groups should also be involved in accordance with their needs and desires.

Gathering and analyzing information

Once the general objectives have been defined, the systems analysts must gather all the relevant information. This is accomplished by interviewing court personnel, funding sources, and outside agencies; inspecting court records and facilities; and monitoring workflow operations and forms usage. Statutes and court rules must be examined to determine legal requirements relating to court records, information, and procedures. Other possible legal, political, economic, and sociological constraints that may affect the ultimate use of data processing must also be examined. For instance, it is unlikely that a court funded by the county will receive funding for an in-house computer system if the county has time available on its own system. Such an impediment may alter the focus of the study and cause the court to restate goals and objectives in more practical terms.

The systems analysts must combine the individual pieces of information into a description of the actual flow of information through the court and the processes that affect this flow. One general approach is to collect and analyze the output documents; determine how many of each document are produced daily, weekly, or monthly; and indicate who receives the document, why it is needed, and what decisions are made based on its content. Then the analysts determine how the document originates, what calculations are performed, and what information is added, deleted, or changed on the document. In this way, the systems analysts obtain the necessary information to prepare a flow chart, matrix, listing, or narrative to help describe the functions performed by court personnel, the types of information needed to perform those functions, and the sources and entry points of the information to the court. The result is a description in graphic or narrative style which logically and concisely depicts the current systems flow. (See Figure 3.)

Figure 2: Example of workflow in planning stage of an automated information system



Source: National Center for State Courts, *Oklahoma Court Information System Study, 1981*

Careful analysis of the current records systems will often reveal inefficiencies within the system and the presence of superfluous or duplicate records maintained by the court. One of the most common mistakes, however, in considering the use of any technology in the courts—especially data processing—is to assume that the records maintained by the courts are properly the court's responsibility and that the form and content are suited to their functions. Often these assumptions are inaccurate. Conversion to a data processing system often highlights the failures of the underlying records systems; unfortunately, the new system is often blamed for the shortcomings inherited from the old one.

General system overview/conceptual design

At this stage the systems analysts should examine the current system to determine whether information paths and processes can be streamlined. The presence of every item of information in a court record or filing system should be traceable to some legal or practical court requirement. The goal of the system development process is to reduce, where feasible, the type of records kept by the court and to minimize the time required to process them.

A preliminary system design will provide information such as the nature of system input and output, the types of information processing, the types of files required, the magnitude of processing, and the cost of project development and operation. This preliminary description should be detailed enough to describe clearly and accurately how the new system will function. At this critical stage, the court should be certain that the preliminary system design describes a system that corresponds with the court's assessment of its needs. Too often the court fails to evaluate the system design during the planning stages, with the result that much higher costs must be sustained for modifications at a later date.

The conceptual design may be a redesign of the information flow and process. This redesign is a description not of what is, but of what ought to be—a court information system streamlined and modified as efficiency and needs dictate.

This preliminary system design should be reviewed by all the groups who may use the system. The limitations, omissions, or distortions that the systems analysts might have inadvertently designed into the system should be noted and corrected. All principal users should formally indicate satisfaction with the proposed design. Only then should additional development effort be undertaken.

Identification of problems and alternate solutions

No single data processing design is appropriate for all courts. The type of system designed will depend upon a wide variety of factors, including the political environment of the court, the need to share information with other courts or criminal justice agencies, the requirements of the agency controlling the computer, the availability and capabilities of computer facilities, and the requirements for information privacy and security. Each design consideration must be carefully examined and weighed in order to ensure that the system developed will meet the defined need.

In many cases, an individual court can develop a computer system without coordinating its efforts with other criminal justice agencies. However, the courts do not operate in a vacuum; other governmental agencies and courts are dependent on information generated by the trial court. Therefore, courts must be cognizant of the information needs of others when developing a data processing system.

In some cases, the requirements of other agencies can be accommodated directly by an integrated computer system. In other cases, the court can develop a computer system independently and then exchange data with other agencies through either manual or computerized methods.

Data processing support

The need for courts and other criminal justice agencies to share information is one factor in determining whether they should develop a computer system jointly. Court participation is also influenced by who controls the budget for the computer, who has the strongest political influence, and who has an available computer. Data processing may be centralized, decentralized, or a combination of the two in a distributed network. (Descriptions of how each functions will be found under "Selection of a systems approach," page 10.) Each has advantages and disadvantages.

Centralized data processing. Centralized data processing means that the computer facilities, the operations, and most systems staff are at one central location, or that the same centralized judicial processing is being performed at several sites. A trial court may participate (or may be required to participate) in one of three types of centralized computer systems: government systems, criminal justice information systems, and statewide trial court information systems.

Government computer systems. City, county, or state governments often operate large centralized computer systems to serve the needs of their agencies. The court is often required to utilize the existing capacity of the government computer rather than an outside source.

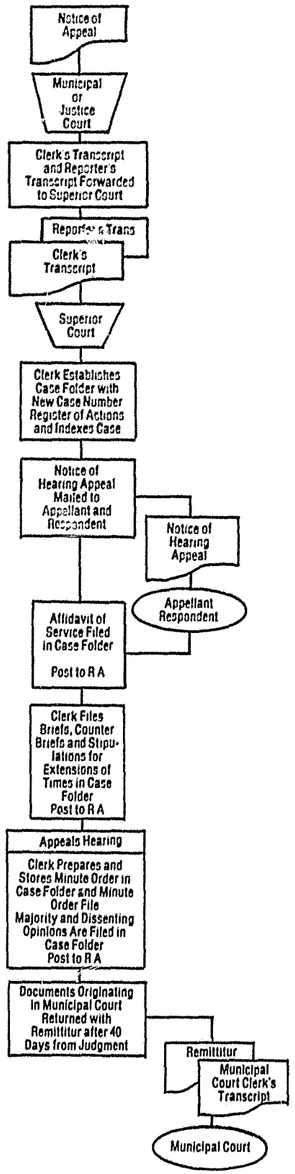
Courts forced to use nonjudicial-branch government computers for cost-saving reasons may find that these systems are not adequate to meet their needs. Courts are often given a low priority for systems assistance and are frequently assigned data processing personnel who may not be knowledgeable in court applications. Lacking the leverage needed to select other types of consulting and data processing services, many courts throughout the country are locked into local government systems that do not meet their needs.

Criminal justice information systems. Many courts participate in criminal justice information systems, which facilitate the sharing of information between courts, law enforcement agencies, and prosecutors. Courts already exchange information with police and prosecutors through manual methods; computers merely facilitate this exchange by reducing redundancy in the recording and storage of information.

Unfortunately, these systems have often been designed for law enforcement needs (the emphasis is put on criminal cases, which are only a small part of court caseload) and not specifically to meet court requirements, although the courts still have the major responsibility for providing most of the common data. The cost to the courts in manpower, when compared with the benefits received, often negates the system's value to courts.

Statewide trial court information systems. A statewide trial court information system allows all courts in the state to perform trial-level operations and to provide local and state-level statistics. In 1980 there were eighteen states that had developed or were developing automated trial court modules as part of a state-level judicial information

Figure 3: Typical workflow schematic for the appeals case category in superior courts in California



Source: Court Equipment Analysis Project, *Data Processing and the Courts*, page 7.

system.[1] Several others have developed batch processing systems for gathering state-level statistics only.

A totally centralized statewide trial court information system precludes the independent development of computerized systems by local courts. Existing trial court systems may have to be terminated and operations transferred to the statewide system.

Decentralized data processing. Decentralized data processing permits a local organization to develop and operate a data processing system independently, either with its own data processing equipment or through a contract with a service bureau. The proponents of decentralization often cite as benefits improved effectiveness, responsiveness, and control. Above all, the system may be designed to meet precisely the unique needs of the court.

A court developing a decentralized data processing system can still effectively exchange information with the state-level judiciary and other criminal justice agencies by exchanging computer-readable tapes (or other media) between computer facilities.

Local data processing tied into a larger network. Fortunately, the court manager need not choose between the apparently mutually exclusive alternatives of centralized or decentralized data processing. With distributed data processing, the court controls its own small computer system and can exchange information over communication lines with a much larger host computer.

With distributed processing, courts benefit from decentralized operation while retaining a significant amount of autonomy. The state-level judiciary or the criminal justice community, on the other hand, still receives required information from each trial court. Distributed data processing may cost more because of the increased amount of computer hardware required. The cost disadvantage, however, is often outweighed by the improved services offered by this approach.

Privacy and security

Privacy and security problems exist in both manual and automated data processing systems. However, the widespread use of data processing for bringing together large quantities of data has resulted in increased concern for privacy and security.[2]

Data privacy has been defined as "the right of the individuals to determine when, how, and what information about themselves may be transmitted to others."[3] Data security refers to the protection of data in its environment and to the prevention of unauthorized alteration and destruction of information. Both security and privacy considerations affect systems design, computer implementation, operational procedures, and administrative rules and policies.

Public vs. private information. Although privacy regulations protect individual rights, these rights are not absolute.

1. See *SJIS State of the Art 1980* in Volume I of the State Court Information Systems and Statistical Reference Series (Williamsburg: National Center for State Courts, 1980) for a detailed description of SJIS activities.

2. More detailed information on privacy and security is contained in *Privacy and Security Planning Instructions, Criminal Justice Information Systems* (Washington, D.C.: LEAA, 1976); *Standards for Security and Privacy of Criminal Justice Information*, Technical Report No. 13 (Sacramento: SEARCH Group, Inc., 1975); *System Review Manual on Security* (Montvale, N.J.: American Federation of Information Processing, 1974).

3. Alan F. Westin, *Privacy and Freedom* (New York: Atheneum, 1967).

To meet particular public needs and requirements, selected information must be available.

Some information clearly must be excluded from public access. Traditionally, juvenile records and expunged records have fallen in this category. In 1976, however, the Department of Justice issued revised rules and regulations affecting the collection, storage, and dissemination of criminal history record information by federally funded criminal justice agencies.[4] These regulations preclude access to criminal history information except for law enforcement, criminal justice, and other lawful purposes.

While courts currently use special procedures to protect juvenile and expunged records, many courts may not have addressed the problem of criminal history information because individual criminal case information such as complaints, judgments, and similar documents have been considered public record. In fact, these are still considered public records. However, through the power of the computer, criminal history information on a single individual can be collected now from a variety of cases and brought together through a computerized index to form one comprehensive criminal history record.

The 1976 rules affect the way computer systems may be designed when criminal history information will be stored in the system. Courts may still share a computer with non-criminal-justice users provided the control, audit, and security procedures are defined and rigidly followed to ensure the completeness, accuracy, security, and privacy of the criminal justice information. Courts may select either an in-house or a service-agency approach; however, when nonjudicial service companies are used, the court must make certain that the programs and data are protected from unauthorized access.

Another issue relating to data privacy is the use of public information for purposes other than those for which the information was acquired. A computer system that maintains information on parties to divorce cases or settlement of estates could be used by commerical enterprises for their own purposes. Clearly, each individual case component of the final summary report, i.e., judge, defendant's name, case type, and disposition, is public information. However, some question exists as to whether the public has an absolute right to use this computerized information in ways other than those for which it was originally intended.

Data security and integrity. The issue of data security is mainly one of procedures and safeguards to ensure that data will be available when needed and accessible only to authorized persons. Data security measures, therefore, are not designed solely to enforce privacy regulations, although they perform that function while also ensuring data integrity.

Some data security measures protect data integrity during natural disasters and system failures. Appropriate measures are required and should be incorporated into the computer facility and system design to protect data and equipment.

The more difficult security issue, however, is the protection of data from hostile action, such as theft, sabotage, and fraudulent alteration and use of data files. Individual privacy and rights can be severely affected by hostile actions. Courts must therefore ensure that appropriate measures exist to thwart any attempts to compromise data integrity.

Funding

Any information system must be planned in accordance with the amount of funding that will be available and the period during which this funding will be available. Plans for funding must be coordinated among various funding sources (e.g., state, local, federal) so that adequate funding is available throughout the system's life span. If there is no reasonable assurance that the funds necessary to implement and run a system will be available when they are needed throughout the life span of the system, then there is little point in proceeding beyond the preliminary analytical tasks. The prospect of an initial grant to cover front-end and implementation costs is not enough. Any cost-benefit analysis should examine expenses over the span of years that automated equipment can be expected to operate, and the planning process should assess the costs and ability of the court to keep any information system operating indefinitely.

Federal funds in the 1970s helped develop a great many automated information systems, but this source was reduced in 1980. Some federal money may continue to be available, although in limited amounts, and the court manager should investigate the status in his jurisdiction of Bureau of Justice Statistics funds, of federal or state funds for traffic systems, of federal funds for URESA programs, and the like.

Local court units, which supply quantities of data to state court administration, should be able to share in state funds provided for information gathering. Local criminal justice information systems also rely on courts for large amounts of data, and local court managers should negotiate for court information services in return.

Other ways of financing judicial information systems should be examined. A committee appointed to study the matter in the state of Washington, for example, has recommended that the legislature enact a direct fee schedule for litigant users to cover the continuing cost of the Judicial Information System.

Impact on the court

Numerous staffing, environmental, and operational changes can be precipitated by a new system. Adequate technical staff must be available to operate the system at each user site. Court managers must devote thought and effort to training users and preparing them to accept any operational and procedural changes associated with the system. People and workloads must adjust to the computer in order for a system to be successful. If people are coerced to adapt to a computer, resentment is likely to occur.

Management must ensure that the people who are designing the computer system recognize the human element involved in the development process. Without this recognition by the technician, the most sophisticated computer equipment and best design efforts are doomed to failure.

Court administration should ensure that system analysts learn as much as they can about the procedures and terminology peculiar to the local courts before entry into the court to begin design work. They should develop an understanding of procedures and terminology to the point that they can relate to the feelings and needs of the court personnel involved in the functions that will be automated. When this level of understanding is achieved, a system can be developed that will serve the needs of the court to the maximum extent possible. Analysts who make no effort to familiarize themselves with court operations before contact with court personnel will be quickly rejected.

Changes in data processing facilities must also be considered, including providing the necessary space, air conditioning, and power for computer hardware and accommodating any security and privacy requirements.

If, after these types of impact on the court have been considered, an automated information system no longer looks like the most viable approach, the idea should be abandoned.

4. "Criminal Justice Information Systems," U.S. Department of Justice Rules and Regulations, *Federal Register*, Vol. 41, No. 55, p. 11714.

Selection of systems approach

Three basic alternatives exist with respect to problems and shortcomings in the records system that provides the court with management information. They are not mutually exclusive, since combinations may be applied to various aspects of a given records or information system.

Maintaining the status quo. Occasionally the problems are so minor in relation to the cost of correcting them that no corrective action is justified. In these situations the records system is reasonably well suited to its intended function. In other cases, the court lacks the funds to implement the system, even if the results of the study show that the system would be justified.

Improving the present system without new technology. Usually the records system is less than ideal, and some beneficial changes may be instituted without great cost or effort. Some courts may avoid or at least postpone the relatively higher initial cost of a new technology by improving current manual methods, procedures, or standards.

Improving the present system with new technology. Many courts will find that the total present and future benefits to be realized from the use of a new technology clearly outweigh the initial cost. All alternative technological solutions should be compared in terms of the advantages and disadvantages of each. The technology selected may be relatively simple, such as a new type of filing system, or it may be sophisticated, such as a computer information system.

Types of automated systems

If new technology appears to provide a solution to existing problems, then court managers should consider which type of computer system is appropriate and cost-effective for the required processing. Basically, the computer system consists of a central processing unit and main memory, auxiliary storage devices (e.g., disk, tape), peripheral input/output devices (e.g., terminals, card readers, printers), and communications devices (to connect remote input/output devices to the central processing unit and main memory). The computer system also consists of system software to control the equipment.

Some judiciaries are not confronted with a decision on computer system selection because they already have a computer or are required by state statutes to use a computer run by another state agency. For those who can select a computer system, however, the selection is probably one of the major decisions in the entire automation process. This is because the system represents a substantial commitment and investment, which becomes even more costly if the user later discovers that the computer system did not really fit the need. There are several possible alternatives.

Totally centralized. All data processing activities (e.g., data entry, file update, report generation) are performed at a centralized computer site. Typically, in a judicial application, case data are entered on standard forms by clerks in the trial courts and mailed to a computer facility where they are entered into the computer. Similarly, reports are generated at the computer site and distributed by mail to the judicial districts or trial courts.

Several possible alternatives are encompassed in this totally centralized concept. The central computer could be either a large-scale or a small-scale (i.e., mini or small business) computer. Moreover, there could be multiple computer sites performing the same centralized judicial processing around the state.

Centralized processing with remote input/output. Some input/output (e.g., data entry, on-line query/response) is performed remotely, using terminals in the judicial districts and trial courts, and all remaining processing (e.g., file update, printed report generation) is performed at the centralized computer. This is like the totally centralized concept except that case data would be entered by the trial court clerks using their terminals and then transmitted over telecommunications lines to the central computer site instead of being sent through the mail.

There are variations of this approach depending on the capabilities of the remote terminals. "Dumb" terminals can perform only preprogrammed data entry and transmission to the central computer. Other terminals can perform functions that vary in complexity depending on the capabilities of the terminal: key entry of data onto disk and transmission to the central computer, remote report printouts, remote batching of computer "jobs" for subsequent transmission to and processing by the central computer, and so on.

In some cases, there may be computers at remote sites that are not part of the central system under consideration as a system alternative. Yet these remote computers may already contain information and perform processing needed by the central system. Every effort should be made to use these existing remote computers to transfer the data. This could take place over telecommunications lines or by mailing a magnetic tape or disk cartridge. For example, if a trial court in a metropolitan area was automated prior to development of a statewide computer system, case data for that court could be written onto magnetic tape and the tape mailed to the administrative office and read into the statewide computer system.

Distributed processing. This increasingly popular concept utilizes the theory that some functions lend themselves to efficient processing at remote computer sites and that some are better processed at a central site. Distributed processing, therefore, involves a central computer joined in a communications network with remote computers. In such a network, some functions are done on the central computer and some on each of the remote computers. The central computer can be either a large- or small-scale computer, and the remote computers can range from large-scale through small-scale computers (e.g., minicomputers) to intelligent terminals. If intelligent terminals are used, they normally provide a comprehensive range of processing capabilities.

As above, every effort should be made to use existing computer facilities in judicial districts or trial courts.

Totally decentralized. A separate computer exists in each major remote site, and all processing for a given site is done there and is independent of the other sites. This approach may be appropriate in a judicial system that provides only operational support for each trial court. Such a system could produce, for example, indexes, dockets, and calendars for each court; and all processing (e.g., data entry, file update, data files, report generation) would be self-contained in computers in the judicial districts or trial courts.

Method of acquisition

There are several methods of acquiring the types of automated systems described above. Moreover, there may be a time-phased acquisition of parts of the computer system based on a gradual build-up of system capabilities.

In order to evaluate methods of acquisition, it is necessary to develop all costs that are directly or indirectly related to computer system acquisition over the system's life span. This is the only way that the full costs of the various purchase, lease, lease-with-option-to-purchase, and service-bureau arrangements can be clearly seen.

In developing these costs, consideration must be given to actual procurement of the computer equipment. Procurement costs can be substantial, particularly for alternatives that involve an on-site computer (i.e., purchase, lease, lease-with-option-to-purchase). This is because detailed procurement specifications must be developed and extensive vendor negotiations must be conducted to ensure that the acquired computer can accommodate all anticipated processing.

Another consideration in the case of an on-site computer is whether staff are available to operate and maintain the computer hardware and system software. If such staff are unavailable in-house, they must be recruited or obtained through a facilities management contract. In any event, these costs must be considered with acquisition costs.

Purchase. It may be advantageous to purchase a computer system. After purchase costs are projected over the system's life span, its residual value should be included as a final-year value.

Lease. Lease arrangements are common with large-scale computers, small-scale computers, and minicomputers. Intelligent terminals and other terminal devices are usually purchased.

Lease with option to purchase. This is a combined lease and purchase where, during some predetermined period, the lessee could exercise an option to apply some of the previously paid rental toward purchase of the computer system.

Commercial service bureau. Computer processing time is available from service bureaus in most localities. The general heading of commercial service bureau encompasses commercial batch-processing and time-sharing services, university data processing facilities, and county or city government data processing facilities.

The basic advantage of this approach is that powerful computers are available without the substantial investments in money and time required for procurement, installation, operation, and maintenance, because costs are distributed among all users. The main disadvantage is lack of complete user control over privacy of data and processing priorities.

Service bureaus normally provide access to large-scale computers at a centralized location. A wide variety of remote terminals can usually interface with the service bureau computer. A user who wanted to develop a distributed processing network, however, would probably be somewhat inhibited using a service bureau computer, although computer-to-computer interfaces are possible. This means that, for example, if individual judicial districts were automated, case data could be entered for district processing and then transferred directly to the service bureau computer.

State service bureau. One of the options may be a service bureau run by a state agency that provides data processing services to other state agencies. The same considerations enumerated above for commercial service bureaus apply here, and the cost can range from nothing (i.e., all state agencies support it indirectly in their budgets) to amounts that far exceed costs of commercial service bureaus. (It is a fallacy to assume that state data processing services are cheaper than those available commercially.)

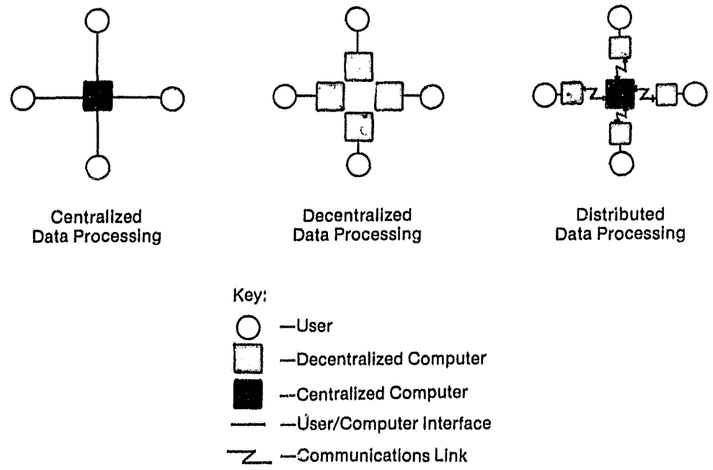
Judiciary computer. In some cases, the judiciary will already have a computer that is suitable for the planned processing, and this in-house computer will probably emerge as the cheapest alternative. Such a computer could provide centralized processing without terminals and if communications-handling facilities exist, with terminals. Depending on the characteristics of the computer and the control exercised over it, a distributed network may also be a possibility.

Operational Approach

Various operational approaches (i.e., on-line remote inputs, batch inputs, batch outputs) can accomplish the required functions. Any of the following basic operational approaches may be feasible.

Method of input. Inputs involve two steps. First, data are entered; then these transactions are used to update the data files. Entry can be done from a place that is co-located with

Figure 4: Computer configuration of centralized, decentralized, and distributed data processing



Source: Court Equipment Analysis Project, *Data Processing and the Courts*, p. 27.

the computer (i.e., locally) or from a remote location. Entry and update can be done in batch mode or with the computer on-line, in a number of combinations:

- Local batch entry and batch file update
- Local on-line entry and batch file update
- Local on-line entry and on-line file update
- Remote batch entry and batch file update
- Remote on-line entry and batch file update
- Remote on-line entry and on-line file update
- System to system interface
- Combinations of the above

Assume, for example, that a centralized computer is to be used for judicial processing. Assume that individual case data are mailed from the judicial districts to the centralized computer site, where they are keypunched onto cards and batched for later entry and file update. This would be local batch entry and batch file update. If the data had been entered at the central site using a display terminal and then accumulated within the computer and held for later file update, this would be local on-line entry and batch file update. If the data had been entered using the terminal and immediately used to update the file, this would be local on-line entry and on-line file update. Now suppose that each district has a display terminal for data entry and that these data can be transmitted to the central computer. If the data are accumulated at the remote terminal (i.e., if there is a remote batch terminal) and later transmitted to the central computer for file update, this would be remote batch entry and batch file update. If the data are entered at the remote terminal, immediately transmitted to the central computer, and accumulated there for file update, this would be remote on-line entry and batch file update. If the data are entered at the remote terminal, immediately transmitted to the central computer, and immediately used for file update, this would be remote on-line entry and on-line file update.

A variation of these examples would be transmission of inputs from computers already installed in the judicial districts to the central computer. These inputs could be used for batch or on-line file updates. The remote computers may be there for processing of judicial data, or they could be used for nonjudicial processing, but be capable of providing judicial data. An example of the latter situation would be the Prosecutor's Management Information System (PROMIS), which is installed in some prosecutors' offices but contains some of the case data that would be used in judicial processing.

Method of output. In order to produce outputs, the requisite data must be retrieved from storage, compiled into the proper groups for collection of totals and subtotals, and written in the proper output format. The first two steps (i.e., output creation) are done internally by the computer; the third step (i.e., output production) involves a printer, display terminal, or some other type of output device, which either can be co-located with the computer or located at a remote site. Outputs can be created and batched for later printing or display, or they can be produced as they are created in an on-line environment. These are the possibilities:

- Local batch output production
- Local on-line output production
- Remote batch output production
- Remote on-line output production
- Combinations of the above

Assume, for example, that a centralized judicial computer is to produce monthly statistical reports on district court caseloads. Voluminous reports such as these are usually batched for off-line printing. If the printer is co-located with the computer, this would be local batch report production. Now suppose the system can accommodate inquiries from display/ keyset terminals that are co-located with the computer, as well as from those located at selected trial court clerks' offices. These inquiries are serviced on-line by the computer, and responses (i.e., output production) are generated immediately at the appropriate terminals. This would be both local (from the terminals that are co-located with the computer) and remote (from the other terminals) on-line output production. If the system also provides operational support, it may print documents such as calendars and notices on printers located in the trial courts. If these outputs were created and batched for later transmission and printout in the trial courts, this would be remote batch output production.

Cost-benefit analysis

Once the preliminary conceptual design is complete, court management must make some important decisions. The preliminary conceptual design depicts a court information system that is more nearly ideal than the current one. Changes from the current system are envisioned, but the court is not yet obligated to proceed. The essence of this decision-making process is to weigh the values or levels of importance of the problems against the estimated cost to solve them. The more critical a problem, the more desirable an appropriate solution, even at a higher cost. Conversely, a relatively minor problem that can be solved only at a considerable expense might be ignored.

Each court, generally with expert assistance, must balance the value and benefits of making a change against the cost of doing so; or, to put it differently, each court must ask, "Can we afford to do this; can we afford not to?" This process is called "cost-benefit analysis." Only when the current cost, space, money, and personnel efficiency are weighed against the corresponding cost of alternative information systems will the court have a reasonable basis for selecting the most cost-efficient solution.

The analysis should take into account the widest possible variety of ways of solving the problems. Complete costing should be done, for example, to determine the comparative cost of developing systems in-house as opposed to contracting with commercial data processing experts; of leasing or leasing-to-purchase equipment as opposed to outright purchase; or of developing a software application program from scratch as opposed to modifying an already existing program.[5]

Cost and benefit categories. A series of activities takes place during any cost-benefit study. One of the primary activities is the establishment of cost categories. There are four basic categories to be analyzed in establishing and completing the cost-benefit study: fixed costs, variable costs, tangible benefits, and intangible benefits.

5. Experience to date has demonstrated the utility of separating court data processing activities into modules, both to make them manageable and updatable and to permit implementation in segments. One of the important current activities of the SJIS Project is the documentation of existing operational court modules to aid in their transfer between jurisdictions. A description of this activity and its advantages can be found in Volume II of the State Court Information System and Statistical Reference Series, *Technology Transfer: Guidelines and Selected Modules.* Modules documented in 1980 included appellate, general jurisdiction (civil and criminal), juvenile, and financial accounting. In 1981 a limited jurisdiction traffic module and a probation-receipt accounting-system module were added.

Fixed costs. These costs, which can be either one-time or recurring charges, are relatively static throughout the period that a cost-benefit analysis should cover. (They may also be variable cost categories, depending upon the growth anticipated in the size of the computer system.) The following are examples of fixed-costs items:

- Consultants used in completing design work or developing computer software (one-time or recurring)
- Rental space for computer equipment and personnel (recurring)
- Office supplies and furniture (one-time, recurring)
- Site preparation for computer (one-time or recurring)
- User and staff training (one-time, recurring)
- Initial computer hardware and associated peripherals (if purchased, one-time; if leased, recurring)
- Expansion of system, hardware, and peripherals (recurring)
- Computer maintenance fees (recurring)
- Personnel (recurring)

Several of the examples above fall under both the fixed and the variable cost category. For example, personnel costs for year one could be calculated as being a fixed cost, yet this cost item can become a variable cost over a period of time because of increases in staff size, cost-of-living raises, and other inflationary factors.

Variable costs. The variable cost items are probably the most difficult to identify and project in completing the cost-benefit analysis. Such costs will vary according to the anticipated expansion of the system, increases in personnel, and enhancements to the overall quality of the system. Examples of variable cost items are as follows:

- Expanded purchase or lease of computer hardware and peripherals
- Expansion of rental space
- Office and computer supplies
- Personnel costs
- Data collection and storage (as the need for expansion and other applications develops)
- Additional analysis and programming, either through contracts or the addition of temporary staff

Tangible benefits. Tangible benefits include reductions in cost estimates where savings can be projected with some degree of certainty as a result of implementing a computer system. The cost savings under tangible benefits should be translated into specific values and factored into the overall cost-benefit analysis. Examples of tangible benefits are as follows:

- Reduction in redundant paperwork (i.e., multiple filings, notices, and associated reports)
- Cost avoidance by limiting staff expansion as a result of decreasing personnel needs through the implementation of a computer system
- Reduction in case processing time spent because precise and accurate information can be provided to the court by the computer system
- More efficient production of court calendars, assignment of jurors through jury pools, notification and payment of witnesses, and other repetitive tasks

Intangible benefits. Intangible benefits are items to which a specific dollar amount cannot normally be assigned. These intangible benefits may in the long run be the most important benefits to be derived from an automated information system. Intangible benefits should not substitute for specific dollar figures in assessing the cost of various alternatives, yet they should be considered in selecting the most viable alternative as shown by the cost-benefit analysis. Examples of intangible benefits are as follows:

- Improvement in the basic information that court management uses in operating the court system
- Improvement in the quality of administrative management of the court
- The enhanced image of the court to the public as being more efficient, accurate, and timely in adjudicating court cases
- Improvement in the efficiency and morale of court personnel
- Assistance and savings to non-court agencies that use court data

Cost-benefit methodology

The basic sequence in developing cost-benefit analyses is to identify various alternatives that will satisfy needs identified in the requirements analysis, to develop costs and benefits for each alternative, and to suggest the most cost-beneficial alternative over the system's life span. The alternatives may involve manual procedures, automated procedures, or a combination thereof.

There are two distinct approaches that can be used to identify alternatives. One approach is used when a computer must be procured, and the viable alternatives are drawn from a group of possibilities that includes the feasible types of computer systems (e.g., central computer, central computer with remote display terminals, distributed network) and procurement approaches (e.g., purchase, lease, use of state computer).

The other approach addresses the identification of viable alternatives in an operational court environment. The alternatives are drawn from such possibilities as (1) how source data (e.g., on cases) are to be gathered and recorded in a manner that least disrupts current operations but facilitates entry into the system; (2) how inputs are to be sent to the computer site (by mail, by telecommunications) and entered into the computer for file update; and (3) how outputs are to be generated and distributed (e.g., by mail, by telecommunications). This group of possibilities also includes various strategies for achieving the ultimate functional capabilities and geographic scope of the system (e.g., whether to implement the full system at the outset or to plan a phased build-up to a full system).

Overall considerations. The objective of a cost-benefit analysis is to identify, from among a number of system alternatives, the one that seems to offer the best combination of cost and performance over a prescribed period. It is important to note, however, that the analysis portrays the situation at a given point in time and that this situation may change during the period.

Before the beginning of a cost-benefit analysis, an overall plan for conducting the study and interpreting the results should be developed. For different levels of cost and performance, different benefits accrue. The approach in a cost-benefit analysis is to evaluate costs, evaluate benefits, and relate costs and benefits for each system alternative. The results are then compared in order to identify the most cost-beneficial alternative or alternatives.

Costs can be evaluated with relative ease. This evaluation is, of course, expressed in dollars. The most obvious way to relate benefits to costs is to evaluate benefits in dollars and devise a mathematical relationship between costs and benefits. This is often impossible to do in a realistic manner because of the subjective, intangible nature of many benefits and the fact that a major benefit is often cost savings. Although cost savings can be evaluated in dollars, it is often unrealistic to relate them mathematically to costs because they actually are costs expressed in a different manner.

This, then, is the challenge of most cost-benefit analyses: how to evaluate benefits and relate them to costs in the most meaningful way. Throughout the entire analysis, emphasis is placed on systematically developing costs and benefits in a step-by-step fashion and on complete supporting documentation, with text augmented by tables and graphs.

Cost evaluation. Costs are evaluated over the system's life span for each system alternative. This includes data processing costs, user costs, and a composite cost formed by adding data processing and user costs.

Data processing costs are connected with centralized processing of data received from various sources. For example, at court administrative offices data may be received from district courts, recorded, stored, and compiled into summary statistical reports; costs associated with these activities would be data processing costs. The processing may be manual, automated, or some combination thereof.

Such costs involve the development, implementation, operation, and maintenance of manual processing and of computer hardware and software for each system alternative. These costs are established for the system's life span.

User costs are connected with decentralized processing of source data. For system alternatives that involve caseload reporting, these costs usually include those incurred by court clerks in receiving and recording case data and then sending the data to a central location.

The cost item (e.g., clerks) for which costs will be computed and the units (e.g., "man" hours) in which costs will be expressed should be established at the outset. Then costs are computed by forming the product of the dollar rate per unit of cost item and the number of cost items. Sometimes rate per unit of cost item and number of cost items are readily available. It is often necessary, however, to obtain one or both of these factors indirectly through intermediate steps. This is particularly true of the number of cost items, since these must be projected over the system's life span.

In developing a separate set of costs for each alternative, costs for the current (e.g., manual) system are usually developed first. Then costs for the other alternatives are usually developed using the current system costs as a basis and incrementing or decrementing individual cost items as appropriate.

Composite costs are then developed for each system alternative and each year of the system's life span by adding data processing and user costs.

Benefit evaluation. As previously stated, the ideal way to evaluate benefits is to assign dollar values to them so that they can be mathematically related to costs. This is often impossible to do in an accurate way, because many benefits are either cost savings or unquantifiable items (e.g., increased data accuracy, improved report timeliness, increased user confidence, and so forth) that are inherently unsuitable for dollar evaluation.

If there are quantifiable benefits that can be mathematically related to costs, the question arises whether they are significant enough to make such a relationship worth computing. If the most significant benefits are cost savings and unquantifiable, then numerical relationships between costs and the other benefits (i.e., benefits that are neither cost savings nor unquantifiable) are meaningless.

An alternate method of quantitatively evaluating benefits in a manner that permits them to be mathematically related to costs is to devise a weighting scheme for benefits. This approach is based on the theory that all benefits can be ordered according to their relative importance to a composite group that can include system users, system developers, and those who fund, monitor, and manage the system and related activities. Then, for each system alternative, a rating of how well the alternative provides each benefit is assigned. These values are then used to determine a benefit score for each alternative.

Cost-benefit relationship. This is dependent upon whether a mathematical relationship exists between costs and benefits. If quantifiable benefits permit such a relationship, it is usually formed by subtracting costs from benefits. If a weighting scheme is used, the relationship is formed by dividing costs into benefits.

Unquantifiable and cost savings benefits cannot be easily related mathematically to costs, but various documentation techniques can be devised that permit the reader to correlate easily the costs and benefits of each system alternative. For example, benefits could be shown in a table that, for each system alternative, gives a textual summary (including cost savings for quantifiable benefits) of each applicable benefit juxtaposed with the annual cost of that alternative over the system's life span.

Results. Ideally, the cost-benefit analysis should identify the single most cost-beneficial system alternative. The "bottom line" will not always be so conclusive, and even when it is, extraneous factors that cannot be included in the analysis (e.g., political considerations, structure of the court system, availability of funding) may influence the result.

What will be gained is an identification of several cost-beneficial system alternatives and, by rigorously going through the analytical steps, a deeper insight into the cost-benefit attributes of each alternative. A cost-benefit analysis is, therefore, a necessary step in the development of any automated or manual system.

Part II. Developing and implementing an automated system

Introduction

Ideally, the cost-benefit analysis has identified the single system alternative that should be adopted. In many instances, this ideal situation may not be realized. One reason for this is that the cost-benefit analysis reflects the situation at the time the analysis is conducted, and this situation may change over the system's life span. Another reason is that it may be unrealistic to identify a single alternative as the most cost-beneficial. And even when a single alternative emerges as most cost-beneficial, other considerations (e.g., structure of the court system, political considerations, and availability of funding) may dictate that other alternatives remain under consideration.

Excluding these other considerations, the cost-benefit analysis should at least reduce the choices to the two or three most cost-beneficial alternatives.

If several alternatives are identified in this manner, the selection among them becomes a more subjective process into which the other considerations must once again be interjected. In a situation such as this, the top two or three alternatives may be forwarded to the appropriate group (e.g., the legislature or supreme court), with a discussion of positive and negative points for each alternative.

Another benefit derived from the cost-benefit analysis is that the rigorous development of cost and benefit evaluations forces the judiciary to focus on the cost-benefit attributes of each system alternative. As a result, the alternatives will probably be viewed from a somewhat different perspective than would have been possible if the analysis had not been done. This should greatly enhance the credibility of the judiciary in the selection process as well as the selection itself, and it should produce a greater cost-benefit payoff over the system's life span.

Staffing, organization, and planning

Users group

A representative users group should actively participate in any information system development or transfer project. The users group should exist from the start of the project, be aware of the basic system objectives, and actively voice the interests of the judiciary (including support personnel). The users group and the project manager should work closely together.

Data processing staff

Technical staff for an automated information system should be acquired as soon as the decision to automate has been made. The staff should include a project director who is designated when the scope and direction of the project are outlined. The project director should know computers and courts and understand judicial processing needs. System analysts and data processing programming personnel should be directly involved throughout the system implementation.

Project planning

Documented project planning should be completed by the judiciary as soon as management selects the most cost-beneficial alternative. Failure to plan adequately may result in a system that costs too much, is not accepted by its users, or does not meet all functional requirements.

The system objectives identified prior to the feasibility study should be reviewed and refined. Optimally, the entire judiciary should participate in the definition of objectives, which should be compatible with the overall goals and objectives of the judiciary. Any effects and problems associated with these objectives, especially in areas involving cooperation among elements of the judiciary and among the judiciary and other agencies, should be identified and resolved. The resulting system objectives should be incorporated into the project plan.

In addition to providing an instrument for project management, a project plan should describe the probable benefits an automated system can bring the judiciary and should assess and enlist the judiciary's readiness to absorb the impact of the changes that will result from automation. The plan should document these considerations for circulation to and endorsement by the total judiciary.

Software development

If the decision is made to implement an automated information system, a selection team should be formed to identify the criteria and make choices among the viable alternatives. This team should be composed of management, functional user, and data processing personnel. Its members should have a thorough understanding of all operations and user functions, system requirements and impacts, and constraints and resources associated with system installation and operation. Selection criteria should be listed and understood by all team members.

Method of software development

Application software (programs that comprise the judicial information system) can be acquired in several ways. The decision will depend on considerations such as the systems-development capabilities of the judiciary (i.e., analysis, design, programming) and, in the absence of some or all of these judicial capabilities, any statutes or other regulations requiring that such work be done through a state data processing agency. The choice is among developing the software in house (i.e., by judiciary personnel), having it developed by nonjudicial state data processing personnel, having it developed by a private contractor, obtaining preprogrammed software (i.e., software packages or transfer modules), and combinations of the above approaches.

Transfer modules. Systems or modules that have been developed, implemented, and proven in another jurisdiction or state may be suitable for transfer, saving considerable time and cost, permitting the recipient actually to see the system in operation, and thus easing the implementation and training procedures. The decision to opt for transfer rather than original development should be based on a careful weighing of the various advantages and a detailed analysis of the pros and cons of the systems or modules available. Guidelines for system transfer are contained in Volume 2 of SCISSRS, *Technology Transfer: Guidelines and Selected Modules* (National Center for State Courts, 1980).

In house. Sometimes the judiciary has, or plans to build, a data processing staff. This can include people who will perform some or all of the following developmental tasks:

requirements analysis, cost-benefit analysis, software design, programming, system testing, and user and operator training.

The minimal staff should include analysts to perform some or all of the initial tasks in systems development (requirements analysis, cost-benefit analysis, conceptual design) and to monitor the later tasks (detail design, programming, testing, implementation). This would at least ensure direct judicial participation in the stages when judicial systems are being justified and functionally defined, and it would provide adequate monitoring of later stages of systems development.

If systems designers exist in the judiciary, the analysis and design work will normally be done in house. Similarly, if the judiciary includes programmers, this work will normally be done in house.

Nonjudicial state agency. Often, if the requisite capabilities do not exist in house, the judiciary may be required by statute to obtain the needed work from a state or county agency that provides data processing services. In this case, programming is most likely to be provided by the agency; depending on capabilities within the judiciary, system design may also be provided. Sometimes the judiciary is required to obtain programming services from the agency but can obtain systems-design assistance, for example, elsewhere.

If services are needed and no requirement exists that they be obtained from the state or county agency, the judiciary should closely compare costs of private contractors and public agencies. It is fallacious to assume that a state agency is cheaper than a private contractor; often the opposite proves to be the case.

Private contractor. These groups specialize in all stages of software development, and they are hired to augment the in-house data processing staff. This can be for areas where the judiciary has no capability (e.g., programming) or where an objective evaluation would be helpful (e.g., requirements analysis) to guard against possible accusations that the judiciary was biased in its desire to automate.

Software package. These are preprogrammed application programs that are sold or leased by a commercial software vendor or are available as transfer modules from other courts. In addition to programs, software packages usually include documentation, installation, and ongoing maintenance.

At the present time, there are few commercial software packages that provide court summary statistics or operational support programs. Packages are more common in the resource areas, such as the various financial operations and personnel systems. Transfer of design concepts, actual systems design, and programs from other jurisdictions should be investigated as an important source of cost-effective systems development.

Combinations. The previously described approaches can also be used in combination. For example, it is not uncommon for the preliminary analyses (e.g., requirements, cost-benefit) to be done within the judiciary, the detail system design to be done by a private contractor, and the programming and implementation to be done by a nonjudicial state data processing agency.

Refinement of conceptual design

The preliminary system design or conceptual design, which was done as part of the preliminary analytical tasks and feasibility study, will be expanded considerably to include a greater level of detail once a decision has been made to proceed with automation.

Detail system design

This document should specify for analysts and programmers the requirements, operating environment, design characteristics (i.e., inputs, outputs, processing, data files, interfaces), and program specifications for the system and its composite modules. The detail design document should be used in the software development to supplement the general system overview in the initial cursory review and to assess the quality and level of system design. The document should be heavily used in system implementation and maintenance because it is the primary means by which recipient technical personnel will be able to understand the information system. This means that the document is, in itself, a major factor in system selection.

An outline format for a detail design document is found in *Technology Transfer: Guidelines and Selected Modules* (Volume II of SCISSRS) on page II.1.19.

General system specifications

Documentation must include an overview of the system for management-level understanding and initial technical review. Source program listings should be available to permit an appraisal of program logic and coding during system selection and to facilitate program modifications during system installation and maintenance. The general system specifications should contain the following descriptions of the system:

- Management overview
  - basic functions
  - operational status
  - users
  - scope
  - processing volumes
- Technical description
  - general procedural and data flow
  - major modules
  - basic inputs and outputs
  - processing mode
  - database structure and basic content
  - computer hardware and software requirements
  - programming languages used
  - security and privacy considerations
  - documentation

A detailed outline for a general system specifications document is found in *Technology Transfer: Guidelines and Selected Modules* (Volume II of SCISSRS) on page II.1.13.

Documentation of system

It is very easy to plan, install, and implement an information system without documenting it. "Funding constraints, tight scheduling, and general programmer distaste for writing have generally relegated program documentation to the lowest priority. The courts have been no exception. In court management, system documentation is extremely critical."[6] The effort takes time and costs money, but documentation is the tool that makes it possible for new staff to work with the system, to modify or refine it, to expand or replace parts of it. Documentation provides the understanding of the system that is critical to initial selection, implementation, testing, and training, as well as to the continuing maintenance of the system.

The following system documentation should be completed and available.

- *Requirements analysis:* to identify the functional requirements of the system and the possible approaches to satisfying these requirements.
- *General system description:* an overview of the system for management-level understanding and initial technical review.
- *Detail system design:* to specify for analysts and programmers the requirements, operating environments, design characteristics (i.e., inputs, outputs, processing, data files, interfaces), and program specifications for the system and its composite modules.
- *Program specifications:* to define the technical requirements of each program to be developed for the system.
- *Users manual and training procedures:* to define responsibilities, actions, frequencies, and special instructions so the manual can be used as an effective training and reference device.
- *Operations manual:* to provide computer personnel with a description of the software, the operational environment, and the computer procedures needed for the software to run.
- *Implementation plan:* to consider the impact on internal court operation and on relationships with other criminal justice agencies, as well as the hardware, software, and back-up operations associated with the computer system.

6. *Operational Perspective of SJIS Documentation,* SJIS Systems Documentation Subcommittee Final Report (SEARCH Group, Inc.: March 1978).

Procurement process

When the preliminary system design is complete, the source of funding confirmed, and the court users committee pledged to support the new system, the court manager must then invite vendors to bid on the new system.[7]

Three types of solicitation are used to acquire computer equipment: invitations for bids (IFB), sole source procurement, and requests for proposals (RFP). For reasons outlined in the following paragraphs, RFPs should be used in acquiring data processing systems.

Invitations for bids are rarely used to acquire complete data processing systems. Instead, they are frequently used to procure individual equipment components, such as plug-compatible peripherals, where the primary difference among vendor equipment is cost. Unlike the RFP (which solicits ideas on how to meet requirements), the IFB specifies the minimal criteria to be met. The contract award is almost invariably made to the lowest bidder who is both able to fulfill the contract and responsive to the technical requirements of the IFB.

Sole source procurement is generally unacceptable for acquiring data processing equipment and systems with public funds, since it fails to permit desirable competition. Sole source procurement is justifiable only if it can be proven to be in the court's "best interest." This "best interest" may be established in either of two ways. The first is to establish that the vendor's service or equipment is unique, e.g., uniquely qualified management or personnel, unique knowledge of court needs, or unique in responsiveness to court need. The second method is to show that time and cost constraints mandate sole source procurement. Because data processing systems are rarely unique, and proper planning assures timeliness, the court's "best interest" is rarely served by sole source procurement.

The request for proposal

The request for proposal (RFP) is the best method for acquiring data processing systems. The following are some reasons for this.

- Vendors may propose better solutions than those envisioned by the court.
- RFPs solicit more than just equipment, e.g., services and support.
- Proposal evaluation permits the court to recognize the more competent vendors.
- Better terms may be available in a competitive market; an RFP enlarges the bidder group.
- Trade-offs can be obtained, even though no single vendor may have all features.
- System requirements may be met in many ways, so that compromises and negotiations are necessary.

The essential elements of an RFP are discussed in detail in Appendix A.

The RFP should be distributed to as many vendors as possible, even to those who the court thinks may not be capable of winning the contract. Once the vendors have responded with proposals, the selection process may seem time-consuming and costly, but this cost is minimal compared to the penalty of installing a system that does not meet the court's needs. The court manager should assemble the court users committee to participate actively in the systems evaluation and selection process, which consists of four main steps: (1) identifying selection criteria; (2) classifying criteria according to importance; (3) evaluating each vendor's proposal; and (4) selecting the vendor.

Identifying selection criteria

The intent in developing a list of criteria or elements to be used in the selection process is

- to focus on those elements that are crucial to a well-informed, unbiased decision,
- to inform the vendors of the importance of each element so they can present their best system,
- to serve as a basis for evaluating the vendor's proposal.

Classifying criteria according to importance

After the criteria are specified, an appropriate weighting of the elements should be agreed on. Both the mandatory and the desirable criteria must be considered.

Mandatory criteria. Mandatory criteria represent the absolutely essential requirements that the vendor's proposal must meet in order to be considered. Some examples of mandatory requirements might be the following:

- *Hardware:* On-line printer must print 132 character positions at a rated speed of not less than 600 lines per minute.
- *Software:* Vendor must supply a 1974 American National Standard Institute (ANSI) COBOL compiler.
- *Vendor capability:* Vendors must respond to equipment failure within two hours of notification.
- *Contract:* Equipment must be delivered by October 1, 1983.
- *Miscellaneous:* Equipment must be new.
- *Cost:* Purchase price for all equipment proposed should be within a range of x to x dollars.

The inclusion of mandatory requirements in a request for proposal is beneficial to both the court and the vendor. The court benefits by avoiding a lengthy evaluation of a proposal that cannot possibly satisfy the court's needs, while the vendor benefits by avoiding the preparation of a costly

7. An excellent discussion of this topic is contained in Larry P. Polansky, *Computer Use in the Courts* (Washington, D.C.: The American University Criminal Courts Technical Assistance Project, June 1978).

proposal that the court will not consider. Occasionally, an overly optimistic vendor will submit a proposal that does not meet the mandatory requirements with the hope of changing the specifications or simply to show his interest. A court that waives its mandatory criteria in response to these ploys is unsure of its needs and is not prepared to begin the bidding process.

Desirable criteria. While mandatory criteria are of absolute importance, desirable criteria may be judged on relative importance. Those individuals specifying the criteria to be used in the evaluation should also determine how important each element is. In other words, what relative weight should be assigned to each element? A sample array of values is shown below:

Degree of importance	Weight
Extremely important	9
Very important	7
Moderately important	5
Not very important	3
Minimally important	1

Obviously, the values and their assigned weights constitute subjective judgments. Evaluators should agree on terminology so that all members will be attuned to the meaning of the values.

An example of the application of this ranking procedure for a disk system is shown below:

Criteria description	Weight	Interpretation
Storage capacity	9	Extremely important
Average access time	7	Very important
Appearance	1	Minimally important
Floor space occupied	3	Not very important
Transfer rate	7	Very important

Evaluating each vendor's proposal

Each court will develop its own criteria and weighting scheme based upon its unique circumstances and its selection process. It is necessary in the RFP to indicate to the vendor how the court values each element so that he may assemble his equipment or system in a manner that will precisely meet the specifications.

Mandatory requirements are judged first to separate the valid from the invalid proposals. Failure to meet these absolute specifications eliminates the vendor's proposal from further evaluation.

The specifications for desirable criteria are less precise than those for mandatory criteria. Each element is judged according to the degree of desirability that is met by the vendor's response. Points are awarded according to the pre-established guidelines developed by committee consensus.

Figure 5: Vendor evaluation worksheet

Vendor	Title	Max. score	Evaluator and date
A B C Corporation	Vendor Capability	Normal 900	Judge I. M. Morris 7/15

MANDATORY CRITERIA

Description	Criteria met		Comments
1. Maintenance response—2 hours or less	YES	NO	3 local servicemen
2. Delivery date—10/1/77 + 2 weeks (max)	YES	NO	On-site by 10/25
3. Ability to demonstrate equipment	YES	NO	Local court using
4. Other	YES	NO	

DESIRABLE CRITERIA

Description	Wgt.	Score	Wgt. Score	Comments
1. Financial strength	7	9	63	One of fortune 500—ok
2. Systems support	5	5	25	One "pro" for one month
3. Maintenance support	7	5	35	Users report "fair"
4. Educational facilities	5	3	15	Nearest—20 miles
5. Acquisition plans	7	5	35	Purchase only—make own arrangements for lease
6. Delivery date	9	10	90	One week ahead
7. Time in business	7	7	49	5 years
8. Court expertise	5	5	25	A few court systems
9. Vendor interest	5	9	45	Very responsive
10. Customer opinion	7	9	63	Customers report "excellent"
11. Early delivery	1	10	10	Extra award
12. Other				
TOTAL			455	

Source: Court Equipment Analysis Project, *Data Processing and the Courts—Reference Manual*, p. 12-21

The ability of the vendor to meet the criteria might be assigned according to the following guidelines.

Excellent	9-10 points
Good	7-8 points
Fair	5-6 points
Poor	3-4 points
Very Poor	1-2 points

The above point ranges provide for a high degree of precision in the evaluation. Although a 9, 7, 5, 3, 1 sequence is basic, the even points provide a degree of refinement when the vendor's capability does not fit neatly into one category or another.

Evaluation forms are usually prepared to expedite the evaluation process. A worksheet of the type shown in Figure 5 is often prepared to aid each evaluator in exercising his judgment independently of the committee.

Each member of the evaluation committee should value each proposal independently of the other members. Any significant deviation in ratings among individual committee members should be resolved before the system selection is made.

Selecting the vendor

After a period of negotiations, the highest-ranking vendor (according to the predetermined selection formula) will be awarded the contract. Before a contract is signed, final clarification of terms and conditions should be made. Verbal assurances of machine performance, delivery dates, maintenance, etc., should be put into writing. Furthermore, it should be specified that the vendor's proposal constitutes part of the contract, because the decision was based on the vendor's proposal.

Many court users of data processing equipment will ask a very basic question: "Should we sign the vendor's standard contract?" The answer is "No—not until it has been modified to meet the terms and conditions required by the court." Standard vendor contracts generally serve the vendor's best interests, not the court's. Contract terms that the court should detail are displayed in Figure 6.

The court should conduct final negotiations with the vendor to obtain the best possible terms and conditions. This is not to say that other vendors may change their proposals and begin negotiations. That would be unethical. Instead, it is an opportunity for the court and the best bidder to resolve any remaining difficulties. Without such resolution, the court may have no choice but to reject all offers and to initiate the bidding cycle anew.

No court can be criticized for its selection if it has objectively and methodically sought to obtain the best data processing system for its needs.

Figure 6: Sample contract terms

Section	Purpose
1. Term of contract and contract termination	To present the contract duration and conditions of early termination.
2. Installation and delivery date	In addition to general statements about defining delivery dates, riders detailing the program schedule or timetable should be prepared.
3. Liquidated damages	To present damage assessments for delayed installations or late performance. A contract without such remedies for vendor failures is an invitation to abuse. Terms should be carefully detailed.
4. Standard of performance and acceptance of equipment	To present the procedures and conditions under which equipment will be accepted before payments will accrue. Performance levels should be carefully detailed. Equipment that does not meet acceptable performance levels over an acceptable time period should be replaced by the vendor.
5. Terms of use	To detail how various levels of use are defined and charges assessed (e.g., extra use charges).
6. Maintenance of equipment	To define and assess different maintenance categories (e.g., on-call and on-site maintenance, preventive and remedial maintenance, principal period of maintenance, replacement parts). Also to detail the maintenance requirements and remedial actions.
7. Substitutions, additions, and conversion	To provide the basic terms under which equipment may be substituted or added to the system. It is important to provide for substitution. Historically, a major problem with rental has been vendor refusals to permit users to update their systems (e.g., to replace an outdated, expensive unit with modern, less expensive units).
8. Major field modifications	To detail the terms during any field modifications by the vendor.
9. Alterations and attachments	To detail the conditions under which users may alter equipment. These protect vendor interests.
10. Program testing and compiling time	To describe the terms of vendor testing and program compiling.
11. Training and technical services	To detail the terms of training and technical services (e.g., training courses, technical skills, costs).
12. Site preparation	To detail site preparation terms. Usually the vendor provides specifications (after the user's request), and the user must bear the cost of meeting them.
13. Transportation, installation, relocation, and return of equipment	To detail the terms and conditions of equipment delivery, installation, relocation (if any), and removal.
14. Risk of loss or damage, and contractor liability	Usually to relieve the user of (and assign to the vendor) liability for most damages not due to user negligence or equipment modifications.
15. Supplies	Usually separately contracted, but must meet vendor specifications.
16. Title	To detail ownership or transfer of title.
17. Purchase option	To detail any provisions for applying rental credits toward a purchase price. Usually part of proposal.
18. Incorporation of proposal	The vendor's proposal (response to RFP) should be made part of the contract.
19. Warranty	To detail any warranty. Obtaining a warranty is recommended.
20. Taxes	To detail tax payments, if any.
21. User's obligation, approvals	To explain user's funding procedures. A few courts will be constrained by not being able to commit money over extended periods of time (e.g., unable to make long-term legal commitments).

Source: Court Equipment Analysis Project, *Data Processing and the Courts—Reference Manual (Denver: National Center for State Courts, 1977), Appendix B, pp. B-11, 12.*

Site preparation

When a particular system configuration has been decided upon, detailed plans must be drawn for installing the system in a given location. The plans may require the construction of a new building, or the computer may be installed in remodeled existing buildings. The vendor must supply the instructions and specifications for his equipment so that a detailed plan can be developed. Typically, this information is provided in the vendor's proposal. The major environmental considerations involved in preparing for a computer installation are the following:

Air conditioning. The heat that is generated by the computer equipment must be carried away, or it will build up and cause machine problems. The major sources of heat in a computer room are—

- the computer and its components: components use electricity, which in turn creates heat;
- people: a clerical worker generates as much as 500 BTU's an hour;
- the building: the structure in which the computer and people are located also creates heat: the sun heats the roof, which, in turn, radiates heat into the building; solar heat comes through unshaded windows;
- the heating plant: the boiler room obviously adds heat when it is operating; in older court structures, there may be no method of adjusting the heat or air conditioning in a given location.

Without air conditioning, the combination of the above factors could create unbearable working conditions for personnel and cause the computer to malfunction.

Because of the many variables that must be considered, the amount of air conditioning that is required should be determined by a qualified heating/air conditioning consultant.

Humidification. The control of humidity in the computer facilities is necessary. For instance, paper, whether punched cards or in the form used in the printers, can be adversely affected by humidity. To the human eye the damage is not evident, but to the machines it is. On the other hand, low humidity can cause static electricity on the paper.

With the proper humidity monitoring and control equipment, a higher degree of reliability can be expected from the computer.

Raised flooring. Not all computer systems require raised flooring. A raised floor is, however, the most satisfactory means of carrying the power and signal cables to the individual computer units, since it allows greater flexibility in layout and improves appearance by concealing the wires beneath the floor. Further, the floor can be used as an air supply plenum to provide better air distribution. Local wiring regulations should be consulted for the requirements governing wiring and cable protection.

Fire protection. Fire protection is a necessity; a computer room will require its own fire protection zone. Walls, floors, subfloors, raised floors, and ceilings should be fire resistant, with at least one-hour fire rating. Where possible, fixtures and furnishings should be fire resistant as well.

Some equipment on the market has the capability, based on ionization fire/smoke detection, of detecting combustion before either heat or smoke is detected. This type of fire-detection equipment is ideally suited to computer installations. By detecting a potential fire before flame or smoke appears, such equipment can give the advance warning necessary for finding the malfunctioning components before serious damage results to the computer center.

Electrical power/circuitry. A computer and other computer components must have their own circuits. They cannot share the electrical load with other equipment such as lights, air conditioning motors, and elevators. The computer requires a constant voltage, which would not be possible if it were sharing the power with other equipment. Electrical current fluctuations will inevitably cause problems. Consequently, voltage regulators built into the vendor's equipment, or auxiliary voltage regulators, are needed.

Lighting. Lighting requirements for the data processing center should be established by considering the requirements of the operating and maintenance personnel. Proper office and computer area lighting is necessary because visual work is performed for long periods of time. Therefore, a sufficient level of illumination and proper environmental brightness should be provided to ensure optimum operating efficiency.

In general, lighting suitable for a general office will be sufficient for the data processing center. Those areas in which personnel will be called upon to operate switches, read CRTs, and review documents should be free from undue glare.

Area planning. The final processing center layout should emphasize overall operating efficiency. This entails considerations such as

- adequate facilities for employee and user parking; the possibility of expansion should be kept in mind;
- entrances and exits for employees, visitors, and delivery services located so they do not interfere with the processing center's normal business operations;
- a special viewing area if numerous visitors or public relations tours are expected through the data processing center; this should be located so it will not affect normal operations;
- arrangement of the processing room, which is usually dictated by the manner in which work will flow through the center and which can be ascertained only after careful consideration of the intended operating procedures;
- a storage area for storing paper stock and other supplies and media needed in the data processing center's operations, preferably located adjacent to the processing room for easy access;
- adequate desk and table space within the computer room for review and handling of input and output documents;
- complete janitorial facilities; this consideration should be emphasized, for a clean data processing room will directly contribute to operational efficiency.

Field testing and modification

The programmer translates the final system design into a set of instructions which the computer can interpret and execute. Normally the programmer exercises a great deal of discretion in determining the exact logic of the program. Courts are advised, however, to develop programs so that they can be easily changed. One recent improvement in programming which accommodates change is called "structured programming." This technique imposes a rigid structure upon the programmer, which results in a series of easily understandable program modules.

After the programs have been written, they are tested before they are actually placed in operation, to ensure that they will function properly. It is most desirable that all "bugs" (errors or omissions) be located during this testing stage. Programs should be tested using actual court data and court personnel. However, since not every contingency can be anticipated during testing, bugs may be discovered months or years later when some unusual condition occurs which was not provided for in the program. Adequate procedural controls must exist to ensure that any inaccuracies resulting from the bugs are corrected. For example, a deviation report should be developed that records all deviations from expected standard operating procedures. The cause of each deviation must be identified and, if practical, corrected.

Implementation and training

Unlike most other technologies, the implementation phase of a data processing system often requires a year or more. The court manager must appoint a qualified person to serve as project manager for the remainder of the project. Frequently, one systems analyst who directed or conducted the feasibility study and system selection becomes the project manager. However, since the qualifications needed for systems analysis and for project management are not necessarily the same, the court manager may select another qualified person, perhaps someone with better management skills and a more thorough court orientation. The project manager will then direct the following steps of the implementation phase.

Planning and monitoring schedules

Because of the complexity of the implementation effort, a plan must be developed which details the cost and time milestones that must be met. One such tool for planning and monitoring schedules is called "Program Evaluation and Review Technique (PERT)." PERT is often used to determine such information as the number of people required to complete the project, the sequence in which operations must be performed, and the cost associated with each portion of the project. Periodic meetings between the project manager and the court manager will help keep the implementation phase on schedule.

Conversion

A smooth conversion of existing procedures to computer procedures is not only desirable from a cost standpoint, it is the user's first in-depth encounter with data processing. Prompt and error-free results will assure continuing enthusiasm and support for the computer project.

Direct conversion. A direct conversion entails the implementation of the new system and immediate discontinuance of the old system. Direct conversion of the court records and files may be feasible if the intended application is not presently being performed, or is performed so inefficiently that it is practically worthless. The advantage of direct conversion is the relatively low cost of implementation.

The primary disadvantage of direct conversion is that a working system is abandoned in favor of a still unproven system. Under these circumstances, direct conversion involves a high degree of risk, and is, therefore, not recommended.

Parallel conversion. Parallel conversion is a method of operating the old system with the new system simultaneously for some specified period of time. With parallel conversion, the resulting output of both systems can be reviewed and any discrepancies may be investigated and reconciled.

The major advantage of parallel conversion is the protection it affords against failure of the new system. Consequently, this approach offers a greater measure of security to the court. The disadvantages of parallel conversion include the increased costs that are necessary in dual systems, the need for recruiting and training of temporary personnel, and the possible duplication of facilities.

Modular conversion. Modular conversion refers to the implementation of self-contained applications or sub-units of applications which provide certain services on their own. For instance, the cross-index for cases, attorneys, judges, courtrooms, plaintiffs, and defendants can be a self-contained module that could be installed prior to other applications. When indexing has proven to be error free, additional modules of caseflow management may be interfaced. The implementation of modules may involve either direct or parallel conversion.

One advantage of the modular approach is that the module may be tested and proved before proceeding to the next module. A second advantage is that the implementation of the complete system may be accomplished in manageable pieces. The disadvantages of modular conversion are that the conversion period tends to lengthen, and cost may increase if the linking of modules requires backtracking.

Regardless of which files are converted and which conversion approach is employed, certain activities must take place:

- converting the files of the court to the selected computer media, e.g., card, tape, or disk,
- maintaining the files of both the old system and the new system during the file conversion phase,
- proving that the new system is providing the specified results as depicted by the system design.

The computer system becomes operational after the conversion, or at some planned milestone during the conversion. The project manager and his staff must gradually release control of the system to an operating group.

During this phase, the operations group will function in a normal production environment. However, the greatest number of problems may be expected during the system transition. Accordingly, the project team is expected to provide assistance during the initial start-up period to preclude minor problems from disrupting the operating cycle. When it has been determined that the system is running successfully, the responsibility for maintaining it is transferred to operating management.

An evaluation of the project and the system is made as soon as practical after the computer is turned over to operations, in order to determine

- the level of accuracy, timeliness, and usefulness of information to users,
- the actual developmental cost versus projected cost at each milestone in the project,
- the differences between the projected schedule and the schedules actually met at each milestone,
- adherence of personnel to established manual and computer procedures and controls,
- adequacy of documentation.

One of the most critical aspects of the evaluation is to determine whether adequate documentation exists to carry on the system efficiently in the future. Although the details of the system are still fresh in the minds of the implementors, with time these details will fade. Without the proper documentation, modifications become difficult. It is important that the evaluator recommend procedures for maintaining documentation in a current condition, if the project team has neglected to do so.

Training personnel

In most computer installations, various types of personnel will require training in order to implement and use the computer system. Technical training concerning hardware, software, operation, and maintenance of the computer system is generally provided by the vendor in the form of manuals and training seminars. Additional in-house training sessions are required to augment those provided by the vendor, especially for court management personnel who will benefit from the computer system but may not be required to use it.

It is management's responsibility to start the educational process immediately once the decision is made to automate. Educate the technical staff involved, but more important, educate the personnel who, in the end, will interface with the system on a day-to-day basis. Fear of automation breeds resistance, avoidance, and inefficiency, which defeat the purpose of having a computer in the first place.

Appendix B contains figures illustrating guidelines for development of computer training curricula for court personnel.

Ongoing monitoring and evaluation

The evaluation of the computer system should be continuous by all people involved in the data processing environment. In addition, periodic comprehensive evaluations and audits should be made by specialists to assure the integrity and operational efficiency of the system.

Daily monitoring

Routine operational audits are performed by the personnel who are involved in all phases of data processing as part of the daily routine. Users of the system should be involved inasmuch as they are most affected by the performance of the system. As likely areas of improvement are discovered, they should be reported in some formal manner to the director of data processing, the court manager, and the users committee.

Formal evaluations of operations

Periodically, formal operational audits should be conducted, preferably by knowledgeable auditors, evaluators, or consultants. Formal operational audits are directed primarily toward the following types.

Procedural audits. The purpose of the procedural audit is to determine whether the system controls are operating as designed. This type of audit involves such tasks as comparing output totals to input totals, reviewing console logs and error registers, and verifying that input, processing, and output procedures are being met. Actual operating procedures are compared against standard operating procedures. The procedural evaluation also ascertains that the separation of duties concept is followed (e.g., systems analysts and programmers are not involved with day-to-day computer operations; operators do not revise programs).

Financial audits. The financial audit is typical of audits conducted by accounting firms. A large court may have an internal auditor for this function. The purpose of the audit is to determine whether the organization is conforming to generally accepted accounting practices. Courts, for instance, require a financial audit in departments where large sums of money are involved, such as in jury management, traffic citations, and alimony and support cases.

System evaluation. A system evaluation involves review and evaluation of the more technical aspects of data processing. Normally, the evaluation is conducted by knowledgeable data processing specialists who have the expertise and tools, including specially developed software, to measure system performance. It is essential that performance be compared to a plan and that variances be noted, investigated, and explained. The following areas are generally evaluated:

- Overall system logic and design
- Programming logic, operating system performance, compiler efficiency
- Computer configuration design and equipment selection methods
- Computer operation performance measurement
- Backup and contingency plans
- Data and system security
- Adherence to privacy regulations
- Adequacy of documentation

Refining the system

Owing to the rapid advancements in data processing technology, chances are good that new equipment and software packages will be available on the market even before the current system is fully operational. A misdirected tendency at this point is to recognize the shortcomings of the present system and to plan for another conversion as soon as possible. Some computer systems have never achieved their primary goals because they have been in the process of conversion from the time they were installed. From a practical standpoint, the court manager should endeavor to improve the installed system rather than immediately look at new ones.

At some point, however, the court manager should consider the possibility of substituting equipment. Compatible devices such as main memory, disk and tape subsystems, printers, and CRTs may offer better or equivalent performance at substantially reduced prices.

Before a decision is reached, however, the same cost-benefit methodology as discussed under cost-benefit analysis in Part I should be used to determine whether the switch is cost-effective. Some considerations include the following:

- Is the device less expensive because it has less capacity?
- Is the device more powerful than required by the court?
- What is the cost and time for conversion?
- Will a longer-term lease or purchase reduce the cost of the present device?
- What is the useful life of the present device?
- What effect, good or bad, will the replacement device have on relations with the present vendor?
- Can the device be tested in the installation before acquisition?
- Will the vendor providing the new device guarantee in writing the complete functional compatibility of the device in the court system and assume full liability for any damage to other components of the existing system?

Old and new vendors offer new hardware and software in the data processing marketplace every week. Together with the data processing tools already in use today, these aids present a formidable array from which the court user must choose the equipment best suited to court needs. Current research and development by vendors is permitting an evolution in mini-computer hardware capabilities and streamlined software that promises steadily increasing computing power per dollar invested when compared with current system configurations.

This more sophisticated equipment will permit increasing applications not only for automated information system purposes but also for other court activities such as word processing, computer-aided transcription, accounting, and personnel management. The basic planning and implementation approach to all this technology should be the same. Carefully evaluated, chosen, and managed, these data processing tools should contribute substantially to improving the administration of the courts.

Appendix A:
Requirements for a request for proposal

Source: Court Equipment Analysis Project, *Data Processing and the Courts—Reference Manual,* Appendix B (Denver: National Center for State Courts, 1977)

General Requirements Section of a Request for Proposal

General requirements explain the purpose of the RFP, the procedures that must be followed, and the criteria by which proposals will be evaluated.

Item No.	RFP Element	Purpose or Sample
1	**RFP COVER LETTER**	The cover letter specifies the RFP's purpose and its administrative details. This permits vendors to quickly determine if they should prepare proposals.
1a	Issuing Office: Name and Address	Self-explanatory.
1b	Procurement Officer	For formal vendor contact.
1c	RFP Issue Date	Self-explanatory.
1d	RFP Purpose	Self-explanatory.
1e	List of RFP Contents	To ensure that the vendor has all necessary materials.
1f	Proposed Schedule	The schedule informs vendors of anticipated proposal deadlines—e.g., initial reponse date, pre-bid conference dates, proposal due date and location, contract award date, and system installation date.
2	**PROPOSAL CONDITIONS**	This section includes the RFP terms and conditions; in short, it lists the rules of the procurement.
2a	Right to Reject Proposals	"The Court reserves the right to reject any or all proposals received as a result of the RFP, and to negotiate separately with any source whatsoever in any manner necessary to serve the best interest of the Court. This RFP is made for information or planning purposes. The Court does not intend to award a contract solely on the basis of any response made to this RFP; such information may be utilized in determining the suitability of equipment and software. Subsequent procurement, if any, will be in accordance with appropriate court contractual action."
2b	Incurring Costs	"The Court is not liable for any cost incurred by vendors prior to the issuance of an agreement, contract, or purchase order. The Court does not intend to pay for the information obtained; such information may be utilized in determining the suitability of equipment and software."
2c	RFP Addenda and Updates	"In the event that it becomes necessary to revise any part of this RFP, an addendum to the RFP will be provided to each vendor."
2d	Proposal Submissions	"To facilitate the evaluation process, ____ copies of the proposal are requested. Proposals must be received on or before _____. Bidders mailing their proposals must allow sufficient mail delivery time to ensure receipt of their proposals by the time specified. Proposals should be prepared simply and economically, providing a straightforward and concise delineation of the vendor's capability to satisfy the requirements of the RFP, and be adequate for evaluation."
2e	Technical Information	To ensure that copies of technical literature about the equipment configuration, software, and maintenance options are forwarded with the proposal.
2f	Proprietary Information	"Any restrictions on the use of data contained within a proposal must be clearly stated in the proposal itself. Proprietary information submitted in response to this RFP will be handled in accordance with applicable Court procurement regulations."
2g	Multiple Proposals	"Vendors may submit more than one proposal involving various equipment configurations to meet the RFP requirements. The additional proposals or alternate configurations can be contained within the prime or principal proposal. The additional configurations must be clearly identified as Alternate I, Alternate II, etc. A complete and separate detailed configuration is required for each proposed alternate, showing quantity, type and mode, features, description, purchase price, monthly rental, etc., for each component. Additional proposals need not be accompanied by extra copies of technical literature, except when requested."

2h	Withdrawal of Proposals	"No proposal shall be withdrawn for a period of _____ days subsequent to the opening of proposals without the consent of the Court."
2i	Proposal Modifications (of Errors)	"The Court reserves the right to waive informalities and minor irregularities in the proposals received."
2j	Acceptance Time	"The Court intends to make selection of equipment and software within _____ calendar days after the closing date for receipt of proposals. Upon selection, the Court will issue a letter of intent and a subsequent contract. Within _____ days from the issuance of the letter of intent, a contract must be completed or the Court may elect to cancel the letter of intent and award the selection to the next most successful vendor."
2k	Oral Presentation	"The Court may wish to request further proposal information or clarification in selected areas. Individual vendor conferences are the primary means for doing so. Additional written material may, however, be requested by the Court."
2l	Acceptance of Proposal Content	"The contents of the proposal of the successful bidder will become contractual obligations if acquisition action ensues. Failure of the successful bidder to accept these obligations in a purchase agreement, delivery order, or similar acquisition instrument may result in cancellation of the award."
2m	Prime Contractor Responsibilities	"The selected vendor will be required to assume responsibility for delivery, installation and maintenance of all equipment, software and support services offered in his proposal whether or not he is the original supplier. The (Court) will consider the selected vendor to be the sole point of contact with regard to contractual matters including the performance of services and the payment of any and all charges resulting from the rental or purchase of the entire equipment configuration and services performed except communications lines and supporting hardware leased from the common carrier."
2n	Original Supplier	"A vendor bidding equipment in which he is not the original supplier must identify each item by vendor name, type, model, description, etc. The vendor responding to this RFP has the responsibility of furnishing all the necessary information required for this equipment."
2o	Type of Equipment	To state whether the Court will accept reconditioned equipment for purchase, and to request information regarding its age and original price.
2p	Standard Contract	To reserve the right to incorporate standard contract provisions into any contract negotiated as a result of proposals submitted in response to the RFP. A sample contract is normally included as an attachment. Particular contract provisions (standard or not) which should be emphasized include penalty provisions (without any, a contract is worthless), contract execution provisions (and failure to execute the contract provisions), surety bonds, and insurance.
2q	Standard of Performance	"The vendor shall certify in writing to the Court when the system is installed and therefore ready to use. The Court will require a performance test. The proposed equipment and software must satisfy all mandatory requirements of the RFP and perform as stated in the proposal. Failure of the equipment or software to perform in compliance with the RFP anytime within _____ days of court acceptance may be considered just cause for termination of the contract."
2r	Benchmark Testing	In a few instances, courts may desire to perform benchmark testing of equipment and software as an integral component of proposal evaluation and selection.
2s	Retention of Proposals	To present the terms of document return, if any.
3	**PROPOSAL FORMAT SPECIFICATIONS**	These specify the format in which vendors must present their proposals so that comparisons between proposals may be made. The following format is offered for consideration.
3a	Management Summary	Vendors should prepare a management summary to describe their corporate structure, experience, capabilities, and financial condition.
3b	Technical Data Section	This section is for detailing the proposed system and its needs. The following subsegments are offered for consideration: • *System Configuration:* A general system summary should be prepared in a manner readily understandable even to individuals unskilled in data processing terminology. A configuration schematic should also be included.

- *Equipment Description:* Configuration components must be listed and described. Vendors must at least list the quantity, make and model, features and condition (new or used) of equipment components along with a general description. Optional information which the RFP may require includes equipment weight and dimensions, power requirements, air conditioning requirements (in BTUs), operating ranges (temperature and relative humidity), and equipment power variations tolerance.
- *Software Description:* The vendor's software description must include (1) software identity (name or package number, brief description, positions of memory or other storage required, and the number of installations using the software), (2) a statement of the vendor's policy for support and maintenance of the proposed software, and (3) a statement of the vendor's policy regarding software modifications by the Court.
- *Maintenance Description:* The vendor's maintenance description should include (1) description of preventive maintenance (number of hours/day, shift differentials, etc.), (2) response time for on-call maintenance and mean-time-to-repair, and (3) available maintenance personnel.
- *Site Preparation Description:* This includes recommended floor layouts of working space and access aisles; special flooring, ducts and troughs, cable racks; and drilling, wall removal, etc.
- *Installation and Transportation Description:* This includes shipping costs, cables and testing, and installation.
- *Systems Support Description:* Vendors should describe the extent of systems support to be provided after installation and the number of available personnel.
- *Training Support Description:* Vendors should describe the training program and manuals they will provide.
- *Supplies Description:* Vendors should describe the types of supplies necessary.

3c	Cost Data Section	This section is for delineation of system costs for the various acquisition plans. A good design permits ready cost comparisons between vendors. The following subsegments are offered for consideration. • *Equipment Purchase:* Each piece of equipment offered for purchase should be identified and priced. Basic information includes quantity, make and model, features, unit purchase price, and age and original price of used equipment. • *Equipment Rental:* Equipment offered through rental/lease plans should be priced and identified. Basic information includes quantity, make and model, features, and monthly rental. • *Other Acquisition Plans:* When other acquisition plans are offered, such as lease with purchase option, suitable price information and equipment identification must be provided. • *Equipment Maintenance Costs:* This portion is for detailing the costs for the various maintenance plans, by piece of equipment if necessary. • *Software Costs:* This is for presenting the costs of the various software packages. • *Site Preparation Costs:* Vendors may be required to provide an estimate of the costs of site preparation. • *Installation and Transportation Costs:* Vendors should present the cost of equipment installation and transportation, by unit if necessary. • *Systems Support Costs:* The extent of systems support and its hourly rate scheduled should be outlined here. • *Training Support Costs:* The costs of training and manuals should be presented. • *Supply Costs:* Unit prices should be presented for the various required supplies, and the rate at which they are consumed.
4	**OTHER QUESTIONS**	Vendors often neglect to provide vital information, not out of carelessness but because direct questions are not asked. This problem can be remedied by directly posing these questions in a separate section. The following checklist is provided as an example: Can the company guarantee delivery and installation of the proposed equipment on or before _____? If not, what is the earliest date? What is the company's policy concerning an unidentified service problem in a multiple vendor shop where *all* vendors have checked out their equipment and are satisfied that the problem is not theirs; however, the problem still exists? What is the company's policy with regard to "trade-in" of purchased equipment on faster peripherals, larger capacity units, etc.?

How many maintenance people are available locally to service the proposed equipment and where is their assigned territory?

What percent of service parts are stocked locally for the proposed equipment?

Where are the additional parts located and how long does it normally take to receive them?

State the date that the proposed equipment was made available.

State the estimated installation time required to check out the equipment and make it operational.

How many installations of the proposed equipment are currently in service?

How many installations of the proposed equipment are currently owned or used by courts?

Identify three (3) users of the proposed equipment and software (if applicable) giving the names and telephone numbers of the people to contact.

What is the company's policy with reference to maintenance or replacement of equipment when a particular device is continually down or high maintenance is required?

Does your company manufacture all the major components proposed? If no, identify the original manufacturer and unit name.

What is the capability and time required for your company to replace the entire proposed equipment or any component in case of physical disaster?

During installation, are there any special personnel needed to unpack and place proposed equipment?

Is any special rigging, drayage, or device needed during delivery or installation of your proposed equipment?

Who is responsible or liable during delivery and installation of the proposed equipment for the risk of loss or damage to the equipment?

What back-up facilities are available to the (Court) for the proposed computer equipment? If available, identify by name and location.

If requested, where will you demonstrate the proposed equipment? Indicate by yes or no response your control over the proposed equipment:

Do you design_____, manufacture_____, inspect_____, test_____, recondition_____?

5	**EVALUATION AND SELECTION CRITERIA**	This section informs vendors of evaluation and selection methods and procedures. Part E of this *Reference Manual* is devoted to this topic.
6	**DEFINITION OF TERMS**	To communicate court needs via the RFP, many court terms and data processing terms (as understood by the court) should be defined. This section of any RFP spells out such definitions.

Specific requirements section of a request for proposal

Specific requirements explain the data processing needs of the court in terms of system concept, specific processing requirements, and system implementation.

Item No.	RFP Element	Purpose
1	**System Concept Summary**	The system concept summary should describe the basic needs and wants which the system should fulfill. It introduces the vendor to the envisioned work applications and synopsizes the Phase I system design. It should normally outline what functions each participant (vendor, court) will perform.
2	**System Requirements**	The system requirements section should detail the court's system needs and wants in a number of ways: 1. *Physical System Description:* A description of the system configuration envisioned. The description should be nominal, not over-specific. Over-specific descriptions will limit the initiative and creative suggestions of vendors. Total system performance is more important than the specifications of one component. 2. *Activity Description:* A description in flowchart form of what the system should do. However, the description should not be overly detailed, but should describe the nominal activities of the system. 3. *Performance Requirements:* This states important parameters of system performance—e.g., response time, volume throughput, accessibility, security expansion capabilities. 4. *Information Description:* A description of the volume, type, origin, and destination of information which is being handled. When possible, envisioned files and reports should be briefly described. Again, however, over-specific descriptions of files (e.g., file format) may be restrictive to vendor initiative.
3	**Implementation Requirements**	This section details the various stages of system implementation and project start-up. The implementation schedule (court timetable) is presented to notify vendors of the court's time requirements.

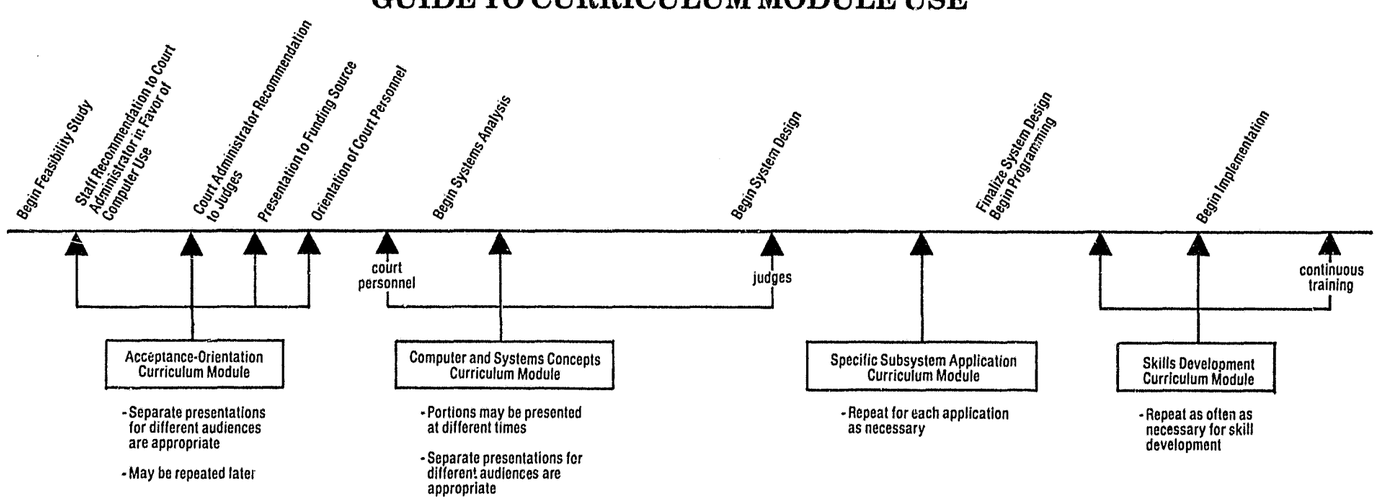
Appendix B:
Guidelines for development of computer training curricula for court personnel

Source: Maureen M. Solomon, *Guidelines for Development of Computer Training Curricula for Court Personnel* (Denver: National Center for State Courts, 1974), pp. 10, 13, 35, 55, 79, 99.

GUIDE TO SUGGESTED PERSONNEL CATEGORIES

Code	Characteristics of the Category	Typical Members of the Category
I-A	Determines or recommends overall court policy; maintains policy-level relationships with non-court agencies; is responsible for program justification to funding authority; initiates major programs within the court; is a recipient and user of management information and exception reports	Administrative Officers, Court Budget Officers, Court Legislative Liaison Personnel
I-B		Presiding Judges, Judicial Committees
I-C	Source of funding for court operations or projects	County Boards of Supervisors, City Councils, State Legislators and their Staffs, Judicial Councils, State Court Administrator's Staff, State Planning Agencies
II	Recommends policy to category I-A and B; supervises operational personnel; has mid-level decisional responsibility; uses daily computer output for management of his department; expects operational changes in his department as a result of computer use	Assignment and Scheduling Office Managers, Chief Deputy Administrators and Clerks, Departmental Supervisors from the Court and Other Related Agencies, and Data Quality Control Supervisors
III	Works with well-defined procedures on integral functions within the court system; uses daily operational data in performance of job; may recommend procedures for case progress control; supplies data for input to computerized information system on regular basis	Courtroom Clerks, Minute Clerks, Bailiffs, Docketing Clerks, and Other Clerical Personnel
IV	Operates terminals for input and output of data; performs systems analysis of programming for system	Computer Operators, Operations Supervisors, Terminal Operators, Systems Analysts, Computer Programmers
V	Potential use of computer system output, but not involved in input of data to system; and court personnel who will not be involved in the computer system	Attorneys, Members of the Public Defender's Office and Prosecutor's Office, Judge's Messengers or Bailiffs (who do not have any data preparation or input responsibilities), and Personnel from the Court and Related Justice Agencies Who Will Not Be Directly Involved in Computer Use, Judges As a Group, Members of the Public

GUIDE TO CURRICULUM MODULE USE



ACCEPTANCE-ORIENTATION MODULE

SUBJECT	AUDIENCE	PRIORITY FOR THIS AUDIENCE	ESTIMATED DURATION	INSTRUCTORS	PROJECT PHASE	EDUCATIONAL TECHNIQUES
NEED FOR THE PROPOSED SYSTEM	I-A	C	60 minutes	Director of Information Systems and Lead Analyst	Before project activities begin	Lecture, discussion, Q & A, films, slides, charts, handouts of comparative information
Problem Description	I-B & I-C	C	30 minutes	Court Administrator & Dir. of Information Systems		
Causes	II & III	C	30 minutes	Court Administrator & Dir. of Information Systems		
Alternative Solutions	IV	U	30 minutes	Court Administrator & Dir. of Information Systems		
Expected Benefits of Automation	V	D	memo & press release	Presiding Judge and Court Administrator		
Precedents Set in Other Courts						
PRACTICAL CONSIDERATIONS IN COMPUTER USE	I-A & I-B	C	1 hr. max. w/poss. add'l. discussion	Director of Information Systems and Lead Analyst	Before project activities begin (possibly slightly after above topic)	Same as above plus possible presentation by personnel from another court
Impact on Court as a Whole						
Cost vs. Benefits or Other Savings	I-C	I	same as above	Court Admin., Dir. of Info. System, possibly P. J.		
Areas of Possible Difficulty						
Realistic Timetable	II & III	I	30 minutes	Court Administrator and Dir. of Information Systems		
	IV & V	U	———	———		
PERSONNEL ASPECTS OF CONVERSION	I-A	I	60 minutes	Director of Information Systems	Before project activities begin (possibly repeat some portions later)	Lecture, Q & A, small group discussions
TO COMPUTER USE	I-B & I-C	U	———	———		
Common Employee Fears	II & III	C	2 hrs. possible follow-up discussion	Court Administrator and Dir. of Info. Systems		
Possible Reorganizations or Reordering of Tasks						
Potential New Career Paths						
Anticipated Training Programs	IV & V	U	———	———		
Employees' Involvement Throughout						
Court-ADP Liaison During Project						
ORGANIZATION OF ACTIVITIES FOR PROJECT	I-A	I	30 minutes	Director of Information Systems	Before project activities begin	Lecture and discussion
	I-B & I-C	U	———	———		
Project Organization and Management	II	C	60 minutes	Director of Information Systems and Lead Analyst		
Project Stages	III	C	30 minutes	Director of Information Systems and Lead Analyst		
User Committees for Planning	IV & V	U	———	———		
Jointly Establishing Priorities						
CONCLUSION						
Summary of Major Points	all categories receiving portions of module above		as much time as necessary	Whoever leads the session		
Further Questions and Plans for Possible Future Sessions						
Program Evaluation						

COMPUTER AND SYSTEM CONCEPTS MODULE

TOPIC	AUDIENCE	PRIORITY FOR THIS AUDIENCE	ESTIMATED DURATION	INSTRUCTORS	PROJECT PHASE	EDUCATIONAL TECHNIQUES
INTRODUCTION OF THE MODULE	I-A	I	20 minutes	Project Leader, Lead Analyst	Prior to beginning systems analysis and design	Lecture, illustrated with charts, as appropriate
Curriculum Purpose	I-B	I	20 minutes	See I-A		
Personnel Selection	I-C	U	———	———		
Program Philosophy	II & III	C	20 minutes	See I-A		
	IV & V	D	20 minutes	See I-A		
DESCRIPTION OF COMPUTER PROJECT	same as above		15 minutes	same as above	same as above	same as above
THE SYSTEMS APPROACH	I-A	I	120 minutes	Project Leader, Lead Analyst, Consultant	same as above (may be repeated later for some audiences)	Lecture and discussion; audio-visual material may be available
Systems Theory						
Systems Concepts	I-B	I	45 minutes	See I-A		
Analysis Methodology	I-C	U	———	———		
	II & III	C	120 minutes	See I-A		
	IV & V	D	90 minutes	See I-A		
COMPUTERS	I-A	D	2 hrs w/tour	Data Processing Manager, Project Leader, Programmer	see above (might be delayed or repeated later in conjunction with Applications module)	Lecture and discussions; tours of facilities; films
Historical						
Hardware Components	I-B	D	30 minutes*	Project Leader		
Software and Programming	I-C	U	———	———		
	II & III	C	2 hrs w/tour	See I-A		
	IV	U	———	———		
	V	D	2 hrs w/tour	See I-A		
CONCLUSION						
Summary of Major Points	Each audience at the conclusion of its module	C	30 minutes	Project Leader and Others as Needed		
Questions and Answers						
Program Evaluation						

*A special tour might be arranged for the judges, just before system implementation.

SPECIFIC AUTOMATED APPLICATION MODULE

TOPIC	AUDIENCE	PRIORITY FOR THIS AUDIENCE	ESTIMATED TIME ALLOCATION	INSTRUCTORS	PROJECT PHASE	EDUCATIONAL TECHNIQUES
ORIENTATION TO THE AUTOMATED SYSTEM Complete Computerized System Specific Application for This Audience	I-A I-B I-C II & III IV V	C D U C D D	45% of total time available	Technical Personnel See I-A, plus Court Administrator ——— Departmental Supervisors and Tech. Personnel Lead System Analyst Court Administrator	Just prior to and during finalization of application	Lecture, audio-visual aids, handouts of sample system output, demonstration
DESCRIPTION OF ORGANIZATION STRUCTURE UNDER THE NEW SYSTEM Lines of Authority Job Descriptions Inter-departmental Relations	I-A I-B I-C II & III IV V	C D U C U D	25% of total time available ———	Lead System Analyst and Info. System Manager Court Administrator Court Administrator and Departmental Supervisor ——— Court Administrator	Just prior to implementation of application	Lecture, charts, audio-visual aids, discussion
TECHNICAL ASPECTS OF THE APPLICATION Equipment Description Hardware and Software Limitations Back-up Procedures Data Quality	I-A I-B I-C II & III IV V	D U U C I U	15% of total time available	Data Processing Manager and Lead Analyst ——— See I-A See I-A ———	Same as above	Lecture, slide presentation, discussion
IMPLEMENTATION SCHEDULE AND PROCEDURES Activities Timetable	I-A I-B I-C II & III IV V	C I ——— C I U	10% of total time available	Departmental Supervisor and Lead Systems Analyst See I-A ——— See I-A See I-A ———	Same as above	Lecture and handouts
DATA SECURITY Policies Procedures	I-A I-B I-C II & III IV V	C C U C I U	5% of total time available	Data Processing Manager See I-A ——— See I-A See I-A ———	Same as above	Lecture, discussion, demonstration

SKILLS DEVELOPMENT MODULE

Audience	Project Phase	Estimated Time Required	Subject & Degree of Coverage	Educational Techniques	Instructor
Court and Related-Agency Administrative and Clerical Personnel	10 days prior to installation	2 hours and travel time	Basic Familiarization with Automated Systems, Hardware	Demonstration on local system NOT VENDOR, (Govt. Agency, Bank, Industry)	D. P. manager and lead systems analyst
	Installation week	2 hours/day 5 days	Introduction to on-site *hardware* with stress on input/output devices (Get Comfortable)	Lecture, Audiovisual-supported Demonstrations and Hands On! Equipment Manuals	Supervisors & vendor reps., technical personnel
Systems Analysts and other Technical Personnel	Prior to beginning systems analysis	Whatever time is required to develop necessary skills	Orientation to Courts Enhancement of Technical Skills Enhancement of Interpersonal Skills	Lecture and discussion; possible small-group problem-solving	Court personnel; technical schools; managing systems analyst; possibly outside tech. personnel
Equipment Operators	Week following installation	4 hours/day 5 days	Introduction to Operations/ Procedures & *Software* (Input & Retrieval) Following Sequence Recommended: A) Operations Overview-Role of individual in system & its impact B) Applications Orientation C) Consequence of Error-Importance of Input Accuracy D) Entry Procedures E) Inquiry Procedures F) Restrictions Imposed by Local Court Policy and Statute G) Cross Indexing of Codes H) Summary 1) General Comment 2) Updating Procedures	Hands On!	Supervisors & vendor reps. senior analyst & middle management supervisor

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