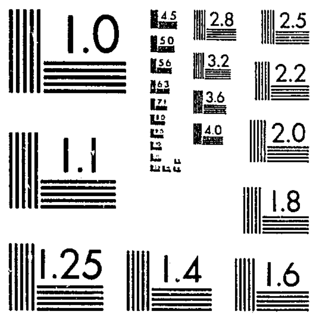

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

AUTOMATED CORRECTIONAL DATA SYSTEM

by

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NATIONAL EVALUATION PROGRAM

PHASE I ASSESSMENT

SUMMARY REPORT

AUTOMATED CORRECTIONAL DATA SYSTEMS

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June 1982

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PREFACE

On August 10, 1978, Rensselaer Polytechnic Institute was awarded a National Evaluation Program contract by the National Institute of Justice (formerly, the National Institute of Law Enforcement and Criminal Justice), U.S. Department of Justice, to conduct a study entitled "Phase I Assessment of Automated Correctional Data Systems."

The results of the study are, for the most part, contained in three formal reports: an Interim Report, a Final Report, and a Summary Report. The Interim Report was published in July 1979; it was based on work undertaken during the first nine months of the study. In terms of content, the results documented in the Interim Report have, of course, been updated, expanded, refined and included in the Final Report. Additionally, the Final Report contains a discussion of pertinent evaluation-related issues, as well as other supplemental information. The Summary Report can be regarded as an abridged version of the Final Report; it does not, for example, include the completed data collection instrument for the 49 state, county and federal level automated correctional data systems that were reviewed in the conduct of this study.

During the course of the study many individuals have been contacted either by telephone, in person or through written correspondence; they have collectively contributed to the state of knowledge that is reflected herein. Appendix B of the Final Report contains a list of those individuals contacted. Additionally, the authors would like to acknowledge the invaluable direction and support provided by Ms. Jan J. Hulla, the government monitor for this study; the guidance and help provided by Mr. Bernard Shipley, a member of the Bureau of Justice Statistics and the government monitor for the Offender-Based State Corrections Information System program; and the input and advice provided by Mr. Larry Greenfeld, a member of the National Institute of Justice, and Dr. Charles M. Friel, a Professor of Criminal Justice at Sam Houston State University. The study has likewise benefited from the input provided by Mr. Billy L. Wayson, Ms. Gail Funke and Mr. Thomas A. Henderson, all of whom are associated with the Correctional Economics Center of the Institute for Economic and Policy Studies, Inc., an organization which served as a subcontractor to this study. The study consultants --Dr. Roland J. Chilton, Dr. Harland L. Hill, Dr. Lawrence W. Sherman and Dr. Leslie T. Wilkins -- have also contributed to the contents herein; they provided both advice and critical reviews. Internally, the authors would like to acknowledge the related efforts of other faculty members (Dr. Herbert Freeman, Dr. Reginald L. Hendricks, Dr. Kang G. Shin, Dr. Yao-Chung Tsao, and Dr. William A. Wallace); the assistance of graduate students (Mr. Raymond C. Ellerman, Ms. Angelica Kamiyama, and Mr. Cyril M. Theccanat); and the editing and typing support provided by Ms. Rosanne M. Blackman and Ms. M. Madonna Taurinskas.

Finally, it should be noted that this study reflects an assessment of automated correctional data systems, as they existed during the two-year period of study. The growing pace of computer technology and the changing political and economic environment can, of course, affect the direction and progress of the assessed systems. However, although the systems described herein may have changed in character, the assessment results -- including issues raised and lessons learned -- remain valid; they should be heeded in any future development or redevelopment of automated correctional data systems.

> *...there is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things... Machiavelli, 1513*

EXECUTIVE SUMMARY

All but a handful of the 50 states in the U.S. have implemented or are in the process of implementing some version of an automated (ie., computer-based) correctional data system (ACDS); in fact, many systems have been upgraded or changed several times since their inception, which, in some cases, date back to a dozen years or more. The creation of the Law Enforcement Assistance Administration (LEAA) in the Omnibus Crime Control and Safe Street Act of 1968 has significantly accelerated the development and proliferation of ACDSs.

An obvious question is whether ACDSs are effective or, more precisely, cost-effective? It is, of course, the purpose of this National Evaluation Program (NEP) Phase I assessment to answer this question or, at least, to begin to answer the question. Unfortunately, the paucity of available information and knowledge about ACDs prevents us from providing an explicit answer at this time; indeed, there has, to date, been no impact evaluation or cost-effectiveness analysis of the ACDS. Moreover, although there are many potential effectiveness-related benefits of an implemented ACDS, they are typically very difficult to both quantify and measure. Additionally, cost-related data are also not readily available. Nevertheless and in the spirit of an NEP Phase I study, we have been able to i) define and detail pertinent ACDS issues, ii) identify gaps in the present state of knowledge, and iii) make recommendations concerning future development and evaluation activities (including an NEP Phase II study) which should be undertaken to fill those gaps. Thus, in addition to meeting the policy needs of the NEP, the contents of this report should also be helpful to those corrections agencies which are contemplating a development, upgrade or redevelopment of their ACDS.

In this executive summary, we highlight our study approach, identify the status of the various ACDSs, discuss several system issues (including our recommendations concerning their amelioration), consider some related issues, and then conclude with our suggestions for future ACDS-related activities and our responses to specific ACDS-related policy questions.

STUDY APPROACH

In an attempt to be responsive to the NEP Phase I requirements, our study reflects a review or general assessment of existing ACDSs, rather than an analysis or intensive assessment of ACDS evaluations, which, as stated earlier, are non-existent. The review has been sensitive to i) the need to identify the current status of ACDSs, ii) the need to review pertinent ACDS issues, and iii) the need to develop a viable ACDS evaluation design. Inasmuch as these three needs require different types and levels of data, we have addressed each need by considering a different sample of ACDSs. Thus, our study approach -- which is similar to that of two other NEP Phase I studies -- is based on three different study samples; specifically,

- Preliminary Sample. In applying Criteria Set A to the universe of potential ACDSs, 47 systems were selected; they contributed to our understanding of the current status of ACDSs.

- Analysis Sample. In applying Criteria Set B to the universe of potential ACDSs, 26 systems were selected; they contributed to our understanding of pertinent ACDS issues.

- o Assessment Sample. In applying Criteria Set C to the Analysis Sample of ACDSs, 5 systems were selected; they contributed to our development of a viable ACDS evaluation design (which is detailed in the body of the report and is not discussed in this executive summary).

Criteria Set A insured that the Preliminary Sample would contain correctional data systems that are at least partially automated (i.e., Criterion A.1), and would not contain local systems which deal primarily with detained offenders (i.e., Criterion A.2). Additionally, systems which do not contain offender-based data are excluded (i.e., Criterion A.3) since, although processing of non-offender related data (e.g., payroll data) provides a service to corrections, it alone would not constitute a correctional data system and could therefore be assessed outside of the correctional context. In obtaining the Analysis Sample, Criterion B.1 required that Criteria Set A be satisfied, while Criterion B.2 insured the inclusion of certain unique systems (e.g., Michigan's distributed ACDS) and also certain large regional systems (i.e., systems belonging to St. Louis County, San Diego County, the federal government and Washington, D.C.) which possess characteristics that are more in common with a majority of state ACDSs than some state systems which contain data on a very small population of offenders. In addition to requiring that the Analysis Sample be balanced and representative of the existing ACDSs (i.e., Criterion B.3), we had hoped that they would be well documented (i.e., Criterion B.4); unfortunately, this latter criterion could not be met -- instead, we had to site visit all 26 of the Analysis Sample of ACDSs in order to obtain pertinent information. Finally, in selecting the Assessment Sample, Criterion C.1 required that Criteria Set B be satisfied. Further, we wanted the sample to contain systems which had had some monitoring and/or evaluation experience (i.e., Criterion C.2); again, this criterion could not be met --instead, we selected five systems which expressed an interest in evaluation.

A key and very useful aspect of our study approach was the development of an extensive, 212-question Structured Data Collection Instrument (SDCI), which served as a **common** collection point for all three of our sources of data. That is, as we i) reviewed the pertinent literature (including project reports and memoranda), ii) undertook telephone interviews, and iii) conducted site visits, we first integrated the data from these three sources and then entered them in the appropriate SDCI. By integrating or combining data from several sources, we were actually employing a multi-measurement approach, which can be shown to minimize certain data bias threats to the study's validity. In total, 49 SDCIs were completed: they are contained in Appendix C of the Final Report, and they, of course, constitute the basis for our findings, conclusions and recommendations. A summary of the SDCI collected data is included in Appendix A of this report.

Three remarks should be made regarding the SDCI data. First, because of the limited number of ACDSs involved and the gaps in the data, no statistical analysis is made; however, we believe that the data are valid and that their implications are significant. Second, although the original NEP Phase I solicitation stated that this study "can be initiated without extensive data collection and analysis efforts through reviewing completed evaluation projects...and by conducting a limited number of site visits", extensive data collection effort has been necessary, as there are neither any ACDS evaluations nor any detailed ACDS documents. Indeed, most of the available documents are nothing more than progress reports mandated by the LEAA as part of the OBSCIS grant requirements. For this reason, we undertook a large number of site visits, about twice as many as would typically be required in NEP Phase I studies. Third, because the SDCIs were filled out by members of the study team, and not by the various ACDS staff, the SDCI data can be considered to be relatively consistent.

SYSTEM STATUS

This section provides a summary of the state of development of the various ACDSs; it also lays the groundwork for the later discussion of ACDS issues. The ACDS environment, characteristics and applications are considered in the following three subsections, respectively.

System Environment

All the corrections agencies examined in this study have one aspect in common: responsibility for incarcerated, sentenced offenders. Beyond this, they vary widely in areas of responsibility, activity levels, data processing experience and many other aspects. Several agency characteristics which may affect the development and operation of an ACDS are identified below.

- o State or Authority and Agency Name. In 31 states and the District of Columbia, the corrections agency is an independent department. In 16 states, the corrections agency is a part of a social services umbrella agency. In 5 states and the federal government, the corrections agency is a part of a criminal justice umbrella agency.

- o Agency Responsibility: Number of Offenders. While this study is directed at only those corrections agencies responsible for incarcerated, sentenced adults, many of these agencies have additional responsibilities. 25 agencies are also responsible for probation supervision; 38 (including the D.C. Department of Corrections) are responsible for parole supervision; and 6 (including the D.C. Department of Corrections) are responsible for detainees. The wide variation in the numbers of offenders for which the agencies are responsible, and the proportions of probationed, detained, incarcerated, and paroled provide some indication of the range of different needs and problems faced by the various agencies in their automation effort.

- o Agency Responsibility: Number of Facilities. Most of the agencies have from 3 to 10 facilities or institutions, with a median number of 9 and a maximum of 81. The sizes of the facilities vary from agency to agency and within agencies as well. Different sizes of facilities and different numbers of facilities present different management problems. As examples, more institutions provide more opportunities for inmate transfer (thus inmate tracking may be more of a problem), while facilities with smaller sizes have less need for a computer to keep track of empty beds.

- o Incarcerated Activity Levels. Growth in the incarcerated population of an agency can be gauged by the amount that admissions exceed releases, as they do in all cases except Alabama, Hawaii, Louisiana, Maine, Minnesota, Mississippi, and North Dakota; several of these states had a population decrease due to court orders to reduce overcrowding.

- o Years Since the First ACDS. State corrections agencies have a total of 311 years of ACDS experience, with an average of 6.2 years and a median of 5.0 years. If those 8 states which do not have ACDSs or have them in a test mode are not considered, the average becomes 7.4 years and the median 7.0 years. These figures are significant in that the field of automation is one in which experience counts. Frequently the first system installed by an agency is subject to special problems resulting from the fact that agency staff have not yet learned what the

computer can do for them. Subsequent systems are often more successful due to the added sophistication of both users and data processing staff. We have in general found this observation to be true, in that many agencies approached the development of their second system with much more realistic goals and much more concrete ideas of what they expected from the system.

- o Current ACDS Status. 40 states, Washington, D.C., the Federal Bureau of Prisons and numerous regions and localities (of which two, St. Louis County and San Diego County, are included in this study) have ACDSs which are operational. By operational, we mean that at least one offender-based application is operating and officially in use by the appropriate agency staff. It should be noted that most systems are constantly being modified and upgraded, if not slated for replacement; this fact does pose a problem for the conduct of an ACDS evaluation.

- o Development Funding Sources. In 22 states, the first ACDS development was initiated with LEAA funds, 14 of those received Offender-Based State Corrections Information Systems (OBSCIS) program grants and 8 received block grants or other LEAA funds. 28 of the currently operating systems were developed with LEAA funds, 21 of those under the OBSCIS program. Five additional states are in the process of developing ACDSs using OBSCIS funds. In our extensive review of the Analysis Sample of ACDSs, we found that ACDSs developed without LEAA funds are no different than those developed with LEAA funds, nor are those developed under the OBSCIS program any different than the non-OBSCIS funded ACDSs, although the variation within each of these groups is quite large. The reasons for the lack of impact of the funding source on the nature and type of system developed are i) the fact that all corrections agencies have a core of similar needs, ii) the fact that OBSCIS materials are available to all agencies, regardless of their funding source, and iii) the fact that strict adherence to the OBSCIS program requirements has not been enforced.

- o Date of First OBSCIS Funding. 35 states and Washington, D.C. have received $11.9 million in OBSCIS funding, with an average of about $331,000 per site. One of these, Arkansas, returned all but $20,000 of its OBSCIS grant, due to internal political reasons. Another state, Nevada, received an OBSCIS grant that was awarded to the Department of Parole and Probation rather than to the Department of Prisons; the award was used to upgrade the existing manual system rather than to develop an automated system.

System Characteristics

The ACDSs which have been developed in the environments described in the previous section are as diverse as those environments. Some of the more important characteristics of these systems are identified below.

- o Mainframe(s). Although ACDSs run on a wide variety of different central processing units or mainframes, the IBM 370 and its look-alikes (such as Amdahl or Itel equipment) dominate the field, with 28 installations. Six states have, in addition to their large mainframe, minicomputers located in their institutions: in most cases, these are used for peripheral applications such as inmate fund accounting or psychological test scoring.

- o Mainframe Location. 30 of the ACDSs are located at state data centers. Only six agencies have their own ACDS computers, and another six have minicomputers which are used for peripheral applications (e.g., inmate fund accounting and

psychological test scoring). The minicomputers are usually located at the records or business office of the institution.

- o Number of Interactive Terminals. Although most systems have fewer than 20 terminals, a few of the larger states (i.e., Illinois, Michigan, and New York) and the Bureau of Prisons have more than 50 terminals. The average number of interactive terminals per ACDS is 19.

- o Source of Programming Support. Programming support does not always come from within the corrections agency. In 16 cases, the programming staff is employed by the state data center, the state planning agency, or some other agency external to the department of corrections. This fact has important implications for the future of the ACDSs in those states, since the impetus for further development often seems to come from the programming staff. It also could result in a mangement control problem, since the corrections agencies have no direct control over how much staff or which individuals are assigned to their needs. For example, two states reported problems because data center staff assigned to the project were frequently reassigned to other projects.

- o Source of ACDS Software. The majority of the ACDS software programs were written in-house by programming staff within the corrections agency. Those ACDSs which were developed by contractors or the state data center or other agencies external to the corrections agency were typically subject to additional problems resulting from the need to coordinate and control staff outside the agency, and sometimes from the lack of knowledge about corrections on the part of the outside contractors. For example, one state data processing manager remarked that he would not hire a contractor because an outsider could never know the needs of the agency as well as insiders.

- o System Software Package(s). Commercially produced system software may be used in support of the ACDS software. As examples, the states of Connecticut and South Dakota use IBM's CICS telecommunication software along with the Basic OBSCIS Software Package, and the states of Oregon and Nebraska use the EASYTRIEVE package to extract data and write reports from their ACDS files. One type of system software package which is becoming more common is the data base management system (DBMS). A DBMS is a set of programs which organize and maintain the data base and provide the ACDS with access to it. IBM's IMS and Univac's DMS are two examples of DBMSs. 19 agencies are using DBMSs; in four of those, the system is not yet officially operational. Systems which make use of DBMSs may not be easily transferrable to installations which do not have the same packages available.

- o Software Language(s). The majority of the ACDSs are written in COBOL; some have parts written in assembler language as well. Four of the systems are written all or partly in FASTER. This has been a problem in that the FASTER language is no longer supported by the vendor (IBM) and very few programmers have knowledge of the language. Although it is currently a part of the LEAA regulations that grantees write all application programs in ANS COBOL or FORTRAN (with the exception that programs for mini- and microcomputers may be written in BASIC), it does not appear that these regulations have been strictly enforced. As examples, California's system is written in PL/1, Florida uses META for a part of its system, New Hampshire uses BASIC, and several systems use some assembler language, as well as the four written in FASTER.

- o Extent of On-Line Processing. On-line processing refers to the ability to interact with the computer system through a terminal device such as a teletype or a cathode ray tube (CRT). The functions of data entry, data editing, data retrieval, and data or file updating may be performed either on-line (i.e., via the terminal) or through batch processing. Most systems only provide the capability for one or the other, but in a few cases both are available. 35 of the currently operating systems in this study have some degree of on-line capability; that is, at least one of the above four stated functions can be performed via the terminal. 18 of the 29 systems now under development will have some degree of on-line capability. The function of data or file updating deserves further explanation. When a system has on-line file updating (i.e., the files are modified at the time that the data are entered), it is known as a **real-time** system. Real-time systems provide the advantage that data can be retrieved and used as soon as it is entered rather than being unavailable until the batch file update takes place. Thus, if data are entered in a timely fashion, real-time systems can provide up-to-the-minute information. Real-time systems are quite costly, however, in that they are much more complex to program and require higher levels of data security.

- o Interface With Other Criminal Justice Systems. An interface exists between two systems if data derived from one system are transmitted to the other. That interface is said to be automated if the data are transmitted in machine readable form; otherwise, the interface is manual. In terms of automated interfaces, the highest form of interface is, of course, by electronic signals: only one state (Alabama) -- where the corrections, pardons and parole systems share the same data base -- could claim such an interface. All other automated interfaces have been by magnetic tape or punched cards, which, of course, would still require a certain amount of human assistance.

System Applications

The potential value of an ACDS can be partially gauged by the number and types of applications it can perform. Based on our Structured Data Collection Instrument (SDCI) which considered 30 offender-based applications, some 20 of the more prominent applications are considered below; they include the set of OBSCIS supported, offender-based applications, although some of the OBSCIS definitions have been modified or expanded to reflect more accurately the actual applications which have been implemented.

- o Admission Reporting. This refers to the recording and reporting of admission activity by offender and corresponds to the OBSCIS application of the same name. Nearly all of the projects either have or are planning this application.

- o Offender Record Retrieving. This corresponds to the OBSCIS application known as cross index retrieval and refers to the ability to retrieve an offender's records using keys other than the agency's assigned identification number (e.g., name or FBI number). 30 systems have this ability and 12 more are planning it.

- o Classification/Program Assignment Reporting. This encompasses and extends the OBSCIS offender profile application. It consists of the maintenance of offender profile data in a form in which it can be promptly retrieved and used as a basis for assessment, classification, and/or program assignment. It also includes the production of other reports such as a listing of programs for which an individual is eligible or a listing of individuals due to be reclassified. For example, in one state (Texas) this application consists of a computerized inmate job matching system

which matches inmate's skills and training to jobs available throughout the prison system. This is one of the few applications which may directly benefit the offender, in the form of improved classifications and assignments; at least one (Missouri) of the twelve states having this application has reported such a result. 16 additional states are planning this application.

- o Problem/Special Needs Monitoring. This application is an expansion of the OBSCIS diagnostic problem reporting application. It involves the production of reports identifying medical or psychological problems or special situations (e.g., enemies, educational skills, and religious dietary requirements) which may affect the placement and/or assignment of offenders. Four systems have some form of this application (i.e., reporting on some subset of the possible problems or needs) and 13 are planning to add it.

- o Test Scoring. This corresponds to the OBSCIS application of the same name and refers to the automatic scoring of answer sheets for psychological, vocational, and intelligence tests. It is interesting to note that five of the 11 systems which have this application run it on a separate microcomputer system (using a proprietary software package), which is not linked to the main ACDS. Five systems are planning to add this application.

- o Reporting of Program Participation. This corresponds to the OBSCIS program reporting application and refers to the collection of information on program participation and the reporting of program participation by program and/or by offender. 22 states have this application and 14 more are planning it. It is an important application in that, in addition to meeting administrative needs, it provides potentially useful information for program evaluation.

- o Disciplinary Reporting. This corresponds to the OBSCIS application of the same name and involves the collection and reporting of data on disciplinary infractions. Although associated with the individual offender's records, the information collected for this applicatin has also been used to pinpoint trouble spots in the institution. 18 systems have this application and 13 are planning to add it.

- o Offender Tracking. This also corresponds to the OBSCIS application of the same name and covers data gathering and file updating for records reflecting changes in the status and location of offenders. This application is present in 35 systems and planned for 10 more; for many of them, it represents the core or primary function of their ACDS.

- o Movement Reporting. This corresponds to the OBSCIS application of the same name and includes the reporting of offender movement between institutions and between status categories. Nearly all the systems either have this application or are planning it.

- o Transportation Scheduling. This involves scheduling and/or reporting of transportation of inmates transferring both within the correctional systems and outside of it (e.g., to court, to a doctor's appointment, etc.) Only three states have even a limited form of this application and each of these only produces a transfer report; no explicit scheduling is done. Five states are planning to develop this application.

- o Parole/Discharge Eligibility Date Calculation. This corresponds to the OBSCIS application of the same name and involves the partial or complete computer

calculation of dates on which the individual offenders are eligible for parole or discharge. Although many agencies claim that this function is too complex to be computerized, 20 agencies have done so and 9 more are planning to do so. In most cases, not all calculations can be done by the system; the more complex and involved calculations must be done by hand. This application has reportedly been a major time saver for at least four agencies.

- o Legal Status Reporting. This corresponds to the OBSCIS application of the same name and includes the reporting of offenders eligible for parole hearings or other review processes and the provision of relevant status and history information for those hearings. 37 systems have this application and 8 more are planning to add it.

- o Parole Hearing Scheduling. This could involve scheduling of parole hearings and/or reporting of outcomes of those hearings. It extends and builds on the legal status reporting application. 19 systems have this application and 13 are planning to add it.

- o National Statistical Reporting. This corresponds to the OBSCIS application of the same name and involves the generation of data for the National Prisoner Statistics (NPS) and/or Uniform Parole Reports (UPR) programs; it is one of the special requiremetns of the OBSCIS program. The data may be generated either in the form of printed reports or in machine readable form. 28 systems have this application and 10 more are planning to add it.

- o Inmate Accounting. This involves the processing of inmate bank accounts and commissary purchases. 12 state agencies and San Diego County have this application; however, in six of these agencies it is a separate system rather than a part of the ACDS, a situation which is not unreasonable since an inmate's financial records are generally not relevant to most purposes for which the ACDS is used.

- o Health Services Tracking. This includes the recording of medical treatment received by individuals. Of late, there has been a growing interest in improving the quality of health care in corrections. Five systems have developed such a component (one of which has a separate health care system) and 13 are planning for this application.

- o Visitor Control Reporting. This includes the tracking of who is allowed to visit an offender and/or how many visits an offender has received. Three agencies now have this application and five are planning it.

- o Victim Restitution Reporting. This includes the recording and tracking of an offender's participation in a victim restitution program. In many states there are no victim restitution programs and where programs do exist they are frequently administered by agencies other than the corrections agency. Of the 12 state department of corrections or public safety administering victim restitution programs, six of these states have the victim restitution application on their ACDS while four more are planning to.

- o Probation Status Reporting. This involves the tracking and reporting of the status of individual probationers, including violations. 14 state agencies plus St. Louis County and San Diego County have this application; all of the 16 agencies have responsibility for probation supervision. Five more states are planning for this application.

- o Parole Status Reporting. This corresponds to the OBSCIS application of the same name and involves the tracking and reporting of the status of individual parolees, including violations. 22 of the 33 corrections agencies responsible for parole supervision and having an operational ACDS have this application.

SYSTEMS ISSUES

The issues contained in this section are based on our collation and analysis of the SDCI results (which are summarized in Appendix A); they represent a culling and systematizing of the more important issues that were initially identified in the Preliminary Sample of 47 ACDSs and subsequently detailed in terms of the 26 systems in the Analysis Sample. While we address some three dozen ACDS issues in this section, there are, of course, many more possible issues that can be considered; some of these are also alluded to in the SDCI summary in Appendix A.

We have found it convenient to group the ACDS issues into four categories -- input, process, outcome and systemic. The input issues focus on the system's background and development; the process issues focus on the system's operation or performance; the outcome issues focus on the system's immediate impacts, especially in relation to its users; and the systemic issues focus on the system's broader impacts, as gauged from a total systems viewpoint. This four-category framework is not only logical from an ACDS development perspective, but also from a program evaluation standpoint.

In discussing the four sets of issues in the next four subsections, respectively, it should be noted that while our observations are not based on extensive evaluations, we do feel that they are valid, at least valid enough to be considered as test hypotheses in any formal ACDS evaluation. It should also be noted that for each issue we first identify the issue and then state our recommendation regarding what could be done to mitigate its negative impact.

Input Issues

11 issues are considered in this subsection: they are grouped into ACDS planning, ACDS design and ACDS implementation issues.

ACDS Planning

- o Issue: The absence of a formal needs assessment (and related functional specification) effort has been a major reason for ACDSs -- especially their earlier versions -- to have failed or not to have lived up to expectation. Recommendation: Inasmuch as ACDSs, like other automated systems, are constantly being redeveloped or modified, a needs assessment/functional specification effort is never too late, and the resultant document should be constantly updated.

- o Issue: The lack of user involvement throughout the ACDS development process (i.e., planning, designing, testing, implementing, operating and maintaining) has resulted in a lack of user support of ACDS at both the data input and data utilization ends of the ACDS. Recommendation: User involvement should not only be encouraged but mandated at every stage of the ACDS development -- and redevelopment -- process.

- o Issue: While LEAA -- in particular OBSCIS -- funds have been critical in the development of ACDSs, they have not prevented the "reinventing of the wheel". Recommendation: Despite the demise of LEAA, the federal government should

continue to help states by funding i) basic ACDS research and development efforts, ii) ACDS-related technical assistance assignments to requesting states, iii) a national clearinghouse for ACDS-related information (including a yearly national meeting for ACDS administrators to meet each other and to be exposed to recent ACDS developments), and iv) an ACDS-related evaluation program.

o Issue: While SEARCH Group, Inc., has carried out its LEAA/BJS-funded activities (to support OBSCIS and related developments) with diligence, it has had this role since 1973. Recommendation: The federal government (i.e., the Bureau of Justice Statistics) should every five years award -- on a competitive basis -- two, five-year grants to carry out the above recommended activities: one grant to carry out the first three activities; the second grant to carry out the fourth evaluation activity.

ACDS Design

o Issue: Several problems can occur when the corrections agency does not have direct control over its ACDS mainframe. Recommendation: As some are currently planning, corrections agencies should consider the use of mini- and microcomputers (especially in a linked network of distributed processors) -- the impact and potential of these new technologies need to be evaluated.

o Issue: Several problems can occur when data elements and procedures are not first clarified, codified and/or standardized. Recommendation: Data elements and procedures should be continually clarified, codified, and/or standardized, and a manual should be produced and updated accordingly.

o Issue: In regard to data base design, problems can occur if data files are sequential; if the data base management system (DBMS) is not well understood; if the historical data file cannot be directly accessed by statistical analysis packages; and if no purging criteria exist for historical data. Recommendation: Data files should be structured for random access; DBMSs should be comparatively evaluated by using a "benchmark" testing procedure; historical data should be aggregated in a manner that allows direct access by statistical analysis packages; and suitable purging criteria should be developed.

o Issue: Creation of an initial data base for an ACDS is a major undertaking and one whose difficulty has frequently been underestimated. Recommendation: The manual records should be in good condition before attempting a conversion, which may require the hiring of some extra, temporary data processing help.

ACDS Implementation

o Issue: User involvement and elaborate approaches to ACDS system testing have been minimal. Recommendation: User involvement should be a requirement in system testing; and the above recommended benchmark (i.e., a test package with known results) for comparative DBMS assessment could also be used in system testing.

o Issue: System documentation has been poor to nonexistent, causing problems in system operation and maintenance. Recommendation: Documentation should be mandated, and documentation standards should be added to the requirements of any future funding in the ACDS area.

o Issue: Most agencies have not carried out intensive user training, which in turn has contributed to decreased user support. Recommendation: User training should be intense and should be given to all members of the agency.

Process Issues

9 issues are considered in this subsection: they are grouped into ACDS support and ACDS performance issues.

ACDS Support

o Issue: ACDS performance has been negatively affected by the relatively low rank of data processing administrators, the high turnover of data processing staff, and frequent reorganizations within the corrections agency. Recommendation: Records and data processing staff should report to the same administrator; data processing staff should receive industry-level pay; and ACDS developers should build a broad base of support within the corrections agency.

o Issue: ACDS operation has been negatively affected by impractical designs, programmers reassigned to other tasks, and contractors who are unfamiliar with corrections. Recommendation: Data processing staff should include individuals with corrections background; corrections should negotiate for administrative control over programmers assigned to do its work; and contractors should be closely supervised and required to produce good documentation.

o Issue: Lack of software maintenance has resulted in some severe problems. Recommendation: Techniques (e.g., modular programming and structured programming) which make the software easier to maintain should be employed, and good system documentation, as well as explicit administrative procedures for system maintenance, should be developed.

o Issue: System security has been quite lax and the potential for misuses and abuses of offender data exist. Recommendation: A minimum set of security requirements should be required of all ACDS.

o Issue: Reliable system cost data have been uniformly unavailable. Recommendation: Corrections agencies should separate out ACDS-related costs.

ACDS Performance

o Issue: Although for legal and practical reasons the manual files must duplicate at least a portion of the ACDS files, redundant manual files (which could be displaced by the ACDS) have been maintained. Recommendation: User training and better communication between users and data processing staff should be required.

o Issue: Real-time (versus delayed) file updating and local (versus central) data entry have been topics of controversy. Recommendation: Real-time file updating and local data entry should both be evaluated.

o Issue: Although improving, data quality -- in terms of factual accuracy, entry accuracy, completeness, and timeliness -- has been a problem. Recommendation: The ACDS should be designed to be useful to those who enter data into it; user training should be improved; thorough system testing should be undertaken; those

entering data into the ACDS should be held accountable; procedures should be established for reporting and correcting program errors; and periodic audits of the ACDS files should be conducted.

Outcome Issues

7 issues are considered in this subsection: they are grouped into ACDS output and ACDS impact issues.

ACDS Output

- o Issue: Most offender-based applications have been operating at the "data" level, producing listings or summaries of data. Recommendation: Offender-based applications (including inmate count taking and transportation scheduling) should operate at the "information" level where the power of the computer could be used to produce timely and relevant information.

- o Issue: While the operational or tactical needs of corrections are being met (at least partially), the more strategic needs of planning, research and management have, for the most part, not been met. Recommendation: ACDS development should continue to meet the tactical needs of corrections but should also concentrate on meeting their strategic needs.

- o Issue: While they have been reporting to the NPS and UPR reporting programs, corrections agencies have problems with the reporting formats and see no benefit in return for their efforts. Recommendation: The NPS and UPR should clarify and standardize the reporting formats and should produce timely and reliable summaries of the data provided them.

ACDS Impact

- o Issue: While the ACDS applications have resulted in significant time savings for corrections staff, they have barely begun to make use of the power of the computer. Recommendation: ACDS should continue to be developed in those areas which would potentially yield the most time savings as well as those which make the most use of the computer's power.

- o Issue: The attitudes of users toward ACDS have, for the most part, not been positive, primarily because of a lack of perceived benefits of the ACDS. Recommendation: More user involvement and user training should be initiated and carried out.

- o Issue: The attitudes of some administrators toward ACDS have been less than positive and have caused some severe problems. Recommendation: ACDS developers should, if possible, secure the support of most, if not all, corrections agency administrators.

- o Issue: ACDS goals have been surreal, ambiguous and not measurable; their attainment have been mixed. Recommendation: ACDS goals should be realistic, specific and measurable.

Systemic Issues

6 issues are considered in this subsection; they are grouped into ACDS environment, ACDS influence and ACDS evaluation issues.

ACDS Environment

- o Issue: Very few ACDSs have interfaced with other criminal justice information systems. Recommendation: An ACDS should be automatically interfaced with other criminal justice information systems, with special attention paid to security and privacy issues.

- o Issue: Transfers of ACDS technology have been few (i.e., mostly of the Basic OBSCIS Software Package) transfers with mixed results. Recommendation: Transfer of ACDS technology should be encouraged and the above recommended, federally-funded, technical assistance contractor should assist in such transfers.

- o Issue: There has been no technology transfer from other environments similar to that of corrections. Recommendation: ACDS developers should look into the possibility of accessing the data systems technology from other similar environments, especially hospitals.

ACDS Influence

- o Issue: Except in helping to prove fair treatment in a handful of litigation cases, ACDSs have not been used to protect an offender's right to have adequate and fair treatment. Recommendation: ACDSs should develop and implement applications which can protect an offender's right to have adequate and fair treatment.

- o Issue: Except in a few cases, ACDS data have not been used to shed light on corrections issues, and ACDSs have not assisted in the monitoring of an agency's compliance with correctional standards. Recommendation: ACDS data should be analysed to shed light on contemporary issues in corrections, and ACDSs should be used to monitor an agency's compliance with correctional standards.

ACDS Evaluation

- o Issue: It should be noted that i) ACDS evaluations are nonexistent; ii) ACDS staff are unfamiliar about program evaluation; iii) ACDS goals are ambiguous; iv) ACDS, as a program intervention, lacks integrity; v) ACDS environment is not well defined; and vi) ACDS benefits are hard to quantify. Recommendation: A purposeful, systemic evaluation design should be able to mitigate the various threats to the validity of an ACDS evaluation.

RELATED ISSUES

While the previous sections contain a discussion of issues specific to our Preliminary and Analysis Samples of ACDSs, this section addresses critical policy-oriented issues that draw upon not only our understanding of ACDSs but also our experience with developing user-supported information systems, our recognition of the general cut-back in federal funding of public programs, our knowledge of privacy and security issues, our awareness of the difference between data and information, and our vision of what an effective automated correctional information system could be. Thus,

in this section, we consider the ACDS-related issues of user support, federal support, privacy and security, data versus information, and an alternate system.

User Support

In this study, as well as in our previous experience with automated data systems, we have frequently seen implemented systems which are operating without the support of their users. This problem is so important that it has also received a great deal of attention in the literature. Organizations cannot derive the benefits planned from their automated systems if those systems do not have user support.

In fact, implementing an automated data system without user support can have far reaching detrimental effects. When employees have a negative attitude regarding the system, error rates increase and acts of sabotage may occur. Specifically, i) data are not supplied to the system (eventually the files become out-of-date or inaccurate); ii) the system is not used or is used improperly; and iii) staff continue to use the old methods while being expected to keep up the new system (thus they feel overworked and their resentment of the new system is increased). These conditions may cause morale to drop and staff turnover to rise, ultimately decreasing the productivity of the organization.

The problem of lack of user support stems from the way in which an automated system is implemented, the effects of an automated system on the organization, and the users' perceptions of the system and its effects. It has long been recognized that any change in the organization creates uncertainty which generates resistance. In the introduction of an automated system, there are other causes of resistance as well. Among them is the fact that automation or computerization always necessitates the transfer of some power from the user department to the data processing department. Also, managers resist because functional lines, which were formerly clear, become blurred by the introduction of the automated system. Further, the increase in volume of data brought about by computerization overloads managers with data and data processing-related tasks, causing a decrease in their job performance, at least by traditional standards. Users at all levels of the organization are afraid of the way in which the system may change their jobs, especially when their skills (which have been developed over the years) are no longer needed and new skills must be developed. In addition, the automated system may make the users' work harder: the users are frequently inadequately prepared for the changes beforehand; they do not understand how the system works; they feel the system is not compatible with their way of doing things; and they do not have confidence that the system works properly. Furthermore, the users frequently feel that the system has been imposed upon them from above and that it provides no benefits to them as individuals. The user may be justified in these complaints in that, particularly in government, automated systems may be introduced because of requirements by state or federal legislatures or other government agencies, without support from the installing agency's administration. Similarly, within the organization, impetus for the development of systems may come from the data processing department which has become a "skill bureaucracy", and thus powerful enough to introduce a system which may not be desired by the users. Finally, certain characteristics of the automated system itself may tend to irritate users and thus reduce their support; among them are rigidity of the system, obscure input and output codes, and errors in the system.

The many conditions just detailed which cause a lack of user support need not occur. Various steps can be taken to mitigate or eradicate these problems; they can be grouped into i) those that apply through all the phases of planning, developing and

implementing the automated system, ii) those that apply principally at the planning phase, iii) those that apply principally at the development phase, and iv) those that apply principally at the implementation phase. While those steps are detailed in the report, it should be noted that if they had been followed in the development of the existing ACDSs, many of the observed problems would not have occurred.

Federal Support

It is helpful to first summarize the impact that the federal -- mostly LEAA -- support has had on ACDS development to date. We can state without qualification that federal support for ACDS-related activities during the past decade has been very beneficial; the number of ACDSs would not be as many and the state of ACDS development would not be as advanced if it were not for federal support. Where would the number and state of ACDSs be if there had been no federal support? Our best estimates are that there would only be half as many ACDSs and only a third as much advancement of ACDS technology. Certainly, the limited support -- an estimated 20 million dollars of LEAA support (which includes 11.9 million dollars for the OBSCIS program) -- provided by the federal government could not have by itself resulted in such widespread impact: indeed not, what the federal support has been able to do has been to **leverage** state and local spending in this area. Thus, in this case, the federal role has been quite appropriate and effective; it has not only stimulated state and local interest in ACDSs, but also provided direction and support.

While the federal money has, for the most part, been effectively spent, two activity changes would have, in our opinion, enhanced this effectiveness. First, in terms of the OBSCIS program, the OBSCIS guidelines -- in particular, the implementation-related guidelines -- should have been better enforced; this would have prevented ACDS developers from falling into the same problem areas and subsequently "reinventing the wheel". Second, the technical assistance provided to the states should not only have included ACDS audits or reviews, but also more **basic** assistance (e.g., needs assessment, functional specifications, hardware specifications, proposal review, and software debugging). This type of assistance, although costly, would have been cost-effective in the long-run, since many ACDS developers have been "learning by doing"; basic technical assistance would have shortened this learning process and, again, prevented much "reinventing of the wheel".

Given the demise of the LEAA and the general cut-back in federal funding of public programs, what should the federal role be in supporting ACDS development? Our recommendation is that the federal government should support four types of ACDS-related activities. First, the federal government should continue to support basic ACDS research and development efforts, including the research of correctional data needs and the development of offender-based application modules (that is, basic application programs which must be modified to meet the specific needs of a particular agency). Second, the federal government should expand its support of technical assistance assignments to states which require them; the assignments could range from general ACDS audits or reviews to more basic assistance, as defined above. Third, the federal government should expand its support of a national clearinghouse for ACDS-related information; the clearinghouse should actively seek out information and should also sponsor a yearly national meeting for ACDS administrators to meet each other and to be exposed to recent ACDS developments. Fourth, the federal government should institute an ACDS-related evaluation program, which would provide the needed **feedback** with regard to what works, what doesn't work, and why.

In regard to a mechanism for carrying out the above four activities, we recommend that the federal government (i.e., the Bureau of Justice Statistics) award -- on a competitive basis -- two five-year grants: the first to an organization which would carry out the first three activities; and the other to an organization which would carry out the fourth evaluation activity.

Privacy and Security

For any modern society to function, even somewhat efficiently, vast amounts of information must be collected, analyzed, and the results utilized for the proper functioning of institutions within the society. The increased bureaucratization of modern society has resulted in larger data systems and with them have emerged potential problems concerning the misuse and abuse of such systems. And within a democracy, government must concern itself with the proper balancing of the individual's "right to privacy" and the government's (and society's) "right to know". Thus, any data system must be comprehensive and accurate; it must be secure from misuse and abuse; and it must protect the privacy of the individuals.

Ever since the establishment of statewide correctional institutions, correctional data systems have always existed, both to track inmates within the system as well as for administrative and other functions. With the computerization or automation of the correctional data system, access to inmate information is quicker, if not easier, thus compounding the privacy and security concerns. It should, however, be noted that security and privacy are concerns in any data system, manual or computerized, correctional or other.

In regard to ACDSs, we note that while no significant privacy and security problems have occurred to date, the potential is there, since system security is lax. Further, privacy and security problems could become even more exarcebated in situations where an ACDS is automatically or electronically interfaced with other automated data systems, including other criminal justice systems. Fortunately, as one systems designer at a correctional institution said, "there just does not seem to be much market value for stolen offender data". If adequate privacy and security measures are not implemented and this "market value" rises, then it is quite possible that the frequency of privacy and security abuses would go up.

Data Versus Information

Although it is proper english to use the words "data" and "information" interchangeably, it is instructuve to distinguish between the two words from a computerization or automation perspective. Data reflect the most basic knowledge while information reflects a higher level of knowledge: information is data put through some type of analysis or processing -- or, in our words, information is "analysed or processed data".

In terms of the operational and management (including planning and research) needs of corrections, it is obvious that both data and information are needed. The operations staff at the institutions must be able to access the raw offender-based data for a number of reasons; they may, for example, require a listing of the names of all the inmates -- a simple data utility program can perform this function. In another example, they may require the names of all the inmates in a specific prison program; although this is also a listing, it would require an application program to go through the offender-based data base to extract the names of those inmates whose records indicate that they are enrolled in the specified program. The particular application program is, in

essence, an analyser or processor of data; thus, its output is information. Consequently, the operational need to make tactical decisions require both data and information.

The management (including planning and research) need, on the other hand, is more strategic in nature: it requires, almost exclusively, information rather than data -- that is, management's strategic decisions would typically concern groups (or may be the entire population) of offenders rather than individual offenders. It should obviously be noted that when we say that only information is required, we do not mean that data would not play a role (indeed, it does, since information is analysed or processsed data), but we simply mean that a higher level of knowledge is required.

Given our definitions for data and information, what are possible analysers or processors of data? We have already indicated that application programs serve to process data into information; thus, the application programs which respectively support all the various offender-based applications are data processors. There is, however, a more powerful and more general data processor, called a data base management system (DBMS). Although there are several available DBMSs (e.g., IBM's Information Mangement System (IMS), MRI's System 2000, Cullinane Corporations's Integrated Database Management System (IDMS), Cincom System's TOTAL, Software AG's Adaptable Data Base System (ADABAS)), their objectives are the same: namely, to facilitate data organization and data access. A DBMS offers a number of advantages over a basic data utililty program, including i) a user's view of the data that is usually quite different from the way data are stored in the computer; ii) a data language which allows the user to retrieve, update, insert, and delete data from the data base; iii) data independence, whereby the application programs are protected from changes in the hardware, operating system, and data storage devices; iv) data sharing, whereby all the applications use one copy of the data base; v) security, whereby only authorized individuals, terminals, and programs can perform specific functions; and vi) data integrity, whereby hardware and software defects would not make the data base inconsistent.

In considering the historical development of ACDSs, we have, in general, noted a gradual, three-phase process. First, the corrections agency loads a selected set of offender-based data (usually, just an offender's name and a few other identifiers) on an available (usually belonging to the state data center) central processing unit (with operating system); the outputs are restricted to simple listings made available by a basic data utility program that is typically provided as a part of the operating system. Then, after some experience and the allocation of an explicit budget for data processing activities, the agency enters into a second phase in which the data base is expanded to include many more offender characteristics and programmers are hired (or loaned from the state data center) to develop special application programs for specific analyses or applications. Most agencies with ACDSs are obviously in this phase of their ACDS development. Some agencies, however, having had more experience and having allocated a larger budget for data processing activities, are entering into a third phase in which they acquire a DBMS so as to facilitate the organization of an ever-increasing data base, as well as to minimize the need to write application programs for an ever-increasing number of demands.

In overlaying our concepts of data and information on the three-phase ACDS development process, we can state that a phase one automated system is clearly a **data system**, a phase three system is clearly an **information system**, while a phase two system represents a hybrid version of the two indicated systems. We feel that an information system should have some sort of a DBMS which would allow for an easy access to and processing of the data; further, we feel that an information system should

have some capability of on-line, ad hoc queries (for which DBMSs are especially well suited). Given this more stringent definition for an information system, it is clear that most, if not all, ACDSs are indeed data systems; it should be noted that none of the 19 ACDSs which possess DBMSs have implemented a systems-wide capability for on-line, ad hoc queries (a few have this capability for central office staff only). However, it should just be a matter of time before one or more of the current ACDSs become a complete automated correctional **information** system (ACIS). As an ACIS, the system would serve both the operational and management needs of corrections, while, as an ACDS, the system would primarily serve the operational need (although not half as effectively as would an ACIS). Consequently, we recommend that, subject to budgetary constraints and individual needs, the current ACDSs (which are tactically -- or operationally --oriented) should grow into ACISs (which would be both tactically and strategically -- or management -- oriented) so as to be of maximum utility to corrections.

Actually, the above recommendation that ACDSs become ACISs is nothing more than recommending that the **power** of the computer be used. While ACDSs are, for the most part, automated analogs of previous manual procedures and processes, ACISs are more proactive and attempt to improve on those procedures and processes, by making available useful (i.e., timely and relevant) decision-oriented information.

Finally, it should be cautioned that our strong endorsement of a DBMS-based ACIS should be tempered by cost considerations. A DBMS is costly to implement, and its maintenance would require an almost full-time data base administrator. Further, it is unclear as to which type or which available DBMS is best suited for corrections. Consequently, we recommend that an evaluation be undertaken to assess the various DBMSs; this would first require the development of an appropriate and comprehensive correctional "benchmark" which could then be employed to comparatively evaluate the performance of the various DBMSs.

An Alternate System

In this subsection, we attempt to answer the question: Given our current knowledge of ACDSs, what could be an effective automated correctional information system? Since the effectiveness of current ACDSs seems mixed, at best,we have tried to identify an alternate approach to ACDS development. Our driving force has been the realization that current ACDSs lack user support. Aside from taking the various steps which would gain and maintain user support, we have noted that i) users have a need for decision-oriented information (not just listings or summaries of data elements), and ii) users have a need to "control" their data (and not to give it up to a distant data storage device that is under someone else's -- most likely data processing's -- jurisdiction). The latter need is based on the perception that data constitute power, a perception that is held in many organizations, both public and private organizations.

Fortunately, the state of computer technology is such that the above two needs can be very appropriately met. First, the DBMS can be a very effective analyser or processor of data into information. Second, a distributed network of computers (including mainframes, minicomputers and microcomputers) can allow for a data base in which data are geographically distributed, with each data set residing in a computer (or "node") at or near the location where it is entered; yet, all the data in such a network can still be viewed as one data base and are available from all nodes, subject to the access constraints of the network. Further, the processing of data can also be carried out locally, on a distributed basis. In sum, the system that we feel would be effective in the corrections environment, especially in a large environment, is a distributed

automated correctional information system (DACIS). Although we are confident that DACIS, if properly implemented, would enhance user support, we have obviously not been able to fully develop this alternative system; such a developmental study is recommended.

A key consideration is whether and how to interface DACIS with other criminal justice data systems. We feel that any automated correctional system should be electronically or automatically interfaced with other criminal justice data systems, especially if they require some of the same data elements. The problems of privacy and security, although real, can be overcome by limiting access and monitoring all interchanges between systems. In regard to a DACIS interface with another criminal justice data system, DACIS could treat the other system as just another node (if it contains just one computer) or another network (if it itself is a distributed system); thus, one day an automated criminal justice information system could be characterized as a multi-network system.

FUTURE ACTIVITIES

Two development and four evaluation activities are recommended. All six activities deserve immediate attention; they should be funded by the federal government and carried on in coordination with each other. It should be noted that either one or all four of the evaluation activities could be carried out as an NEP Phase II effort. Alternatively, the NEP Phase II study could be an intensive evaluation of any ACDS. In sum, we strongly recommend that an NEP Phase II effort be carried out: we must begin to evaluate ACDSs so that we can determine what works, what doesn't, and why.

Development Activities

We recommend the development of a benchmark for ACDS testing purposes and a detailed design for a distributed automated correctional information system (DACIS).

Benchmark

One of the most striking findings of our study is the absence, in almost every case, including the prototype OBSCIS system, of an element which could be an extremely valuable tool: a prototypical test package or benchmark. Testing, at the system level, serves a multitude of purposes. The one most commonly thought of is to verify that the programs are free of bugs; however, a well designed benchmark should also serve i) to assure that the system performs as the users expect it will; ii) as a vehicle for training users and generating their trust in the system; iii) as a test of associated manual procedures as well as the computer programs themselves; iv) to monitor system performance and accuracy as changes are made in the course of normal maintenance; v) as an aid to debugging when problems arise; and vi) as an aid to evaluating different systems (e.g., DBMSs).

The benchmark mark should have three components: input data, processing instructions, and expected results. The input data should be carefully constructed to include the most common examples of all types of offender-based transactions, all possible valid field values, and all types of errors, each in every possible combination. The processing instructions should be extremely complete and explicit; they should include all data cards and/or control cards to be changed, the names and locations of all files, and any other information which might be needed. The preparation of the expected results should be closely coupled with the preparation of the test input, and may constitute the major portion of the test development. In addition, the benchmark

should contain tests for batch, on-line, and, possibly, real-time applications. Further, the benchmark itself should be field tested as a part of this development effort.

DACIS

In order to provide a detailed DACIS design, it is obvious that a specific corrections environment must be identified; it should be an appropriate corrections agency which has a genuine interest in implementing such a design. The design developer should take into consideration such issues as types of network, type of computers, number of computers (not every institution need or should have a computer), system-wide procedures and protocols, maintenance, training, security, privacy, and cost.

Evaluation Activities

We recommend the evaluation of i) DBMSs, ii) DACIS, iii) real-time offender-based applications, and iv) data entry location.

DBMSs

Using the benchmark produced as a result of the above recommended development activity, various DBMSs should be evaluated in their respective ACDS environments. Since 19 states have DBMSs, it should not be difficult to select a representative sample of DBMSs (say, six) to carry out a comparative evaluation. It should be noted that what we are recommending here is a performance -- not systemic -- evaluation; our purpose is to compare the available DBMSs to see which one(s) is(are) best suited for the corrections environment.

DACIS

Three states (Michigan, Wisconsin and Minnesota) are planning to implement a distributed system. Although their systems may not be the same type of DACIS that is produced as a result of the above recommended development activity, it would still be worthwhile to evaluate one or more of these systems, so that an initial base of knowledge about distributed systems can be established.

Real-Time Offender-Based Applications

Real-time file updating could be beneficial in certain offender-based application areas (e.g., inmate count taking and transportation scheduling), but, on the other hand, it is costly to support. Consequently, we are recommending a cost-benefit or cost-utility type of evaluation in this case.

Data Entry Location

As stated earlier, there is controversy about where the data should be entered into the computer: locally or centrally. In order to help resolve this controversy, we recommend conducting an evaluation of a corrections agency which is planning a data entry location change (most likely, from central to local).

POLICY QUESTIONS

Finally, in this section, we answer some key policy questions, being as brief as possible and without attempting to address the underlying reasons, which can, of course be found in the body of the report.

What has been the size of federal support for automated correctional data systems (ACDSs)?

Our best estimate is that, during the past decade, the size of the federal -- almost exclusively, the Law Enforcement Assistance Administration (LEAA) -- support for ACDS development has been about 20 million dollars, which includes 11.9 million dollars for the Offender-Based State Corrections Information System (OBSCIS) program.

What has been the impact of this support?

We can state without qualification that federal support for ACDS-related activities has been very beneficial; the number of ACDSs would not be as many and the state of ACDS development would not be as advanced if it were not for federal support. Further, federal support has been able to leverage state and local spending in this area.

How many jurisdictions have ACDSs?

Depending on how far along in its development before a system can be called an ACDS, no more than 46 states have an ACDS; also, the Federal Bureau of Prisons, several counties and several municipalities have an ACDS. Our study, however, has concentrated on state level ACDSs.

What is the state of ACDS development?

Some ACDSs have as few as two offender-based applications (while others have 10 times that number); some have on-line capabilities (while the majority do not); some have data base management systems (while the majority do not); and some have minicomputers (while the majority do not). In general, we feel that most ACDS applications are no more than automated analogs of previous manual operations, and the power of the computer has not been used to improve on those operations. However, ACDS development is continuing, although it is being set back by the demise of the LEAA.

Given the demise of the LEAA and the general cut-back in federal funding of public programs, what should the federal role be in supporting ACDS development?

The federal government should support four types of ACDS-related activities. First, the federal government should continue to support basic ACDS research and development efforts, including the identification of correctional data needs and the development of offender-based application modules. Second, the federal government should expand its support of technical assistance assignments to states which require them; the assignments could range from general ACDS audits or reviews to more basic assistance (e.g., some types of software debugging). Third, the federal government should expand its support of a national clearinghouse for ACDS-related information; the clearinghouse should actively seek out information and should also sponsor a yearly national meeting for ACDS administrators to meet each other and to be exposed to recent ACDS developments. Fourth, the federal government should institute an ACDS-related evaluation program, which would provide the needed feedback with regard to what works, what doesn't, and why.

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LIST OF EXHIBITS

1 INTRODUCTION

All but a handful of the 50 states in the U.S. have implemented or are in the process of implementing some version of an automated (i.e., computer-based) correctional data system (ACDS)*; in fact, many systems have been upgraded or changed several times since their inception, which, in some cases, date back to a dozen years or more. The creation of the Law Enforcement Assistance Administration (LEAA) in the Omnibus Crime Control and Safe Street Act of 1968 has significantly accelerated the development and proliferation of ACDSs. It is estimated -- based on an extrapolation of data contained in the LEAA Grant Management Information System --that close to 20 million dollars of LEAA's total budget have been expended on ACDSs. Together with substantial state level funding, the total estimate of ACDS related spending could be well in excess of 200 million dollars. Further, the adoption of ACDSs by certain counties (e.g., St. Louis County and San Diego County) and local jails (e.g., Washington, D.C.) would also serve to bolster this conservative estimate.

An obvious question is whether ACDSs are effective or, more precisely, cost-effective? It is, of course, the purpose of this National Evaluation Program (NEP) Phase I assessment to answer this question or, at least, to begin to answer the question. Unfortunately, the paucity of available information and knowledge about ACDs prevents us from providing an explicit answer at this time; indeed, there has, to date, been **no** impact evaluation or cost-effectiveness analysis of the ACDS**. Moreover, as highlighted in Section 5.1, although there are many potential effectiveness-related benefits of an implemented ACDS, they are typically very difficult to both quantity and measure. Additionally, cost-related data are also not readily available. Nevertheless and in the spirit of an NEP Phase I study, we have been able to i) define and detail pertinent ACDS issues, ii) identify gaps in the present state of knowledge, and iii) make recommendations concerning future research and evaluation activities (including an expanded NEP Phase II study) which should be undertaken to fill those gaps. In addition to meeting the policy needs of NEP's sponsor, the National Institute of Justice (NIJ), the contents of this report should also be helpful to those correctional agencies which are contemplating a development or redevelopment of their ACDS.

In the remainder of this introductory section, some pertinent background issues are briefly considered in Section 1.1, while the study approach is detailed in Section 1.2 and the scope of the report is outlined in Section 1.3.

1.1 BACKGROUND ISSUES

As the name implies, an automated correctional data system focuses on the **intersection** between corrections and automated data systems. Consequently any ACDS study or assessment must first be sensitive to the critical issues in these two individual areas before considering the third intersecting or overlapping area of ACDS.

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*A glossary of abbreviations and acronyms follows Section 6 of this report.

**Actually, an NEP Phase I assessment of a topic area is typically based on a systematic analysis of previous evaluations in the area; in this ACDS area, however, we have been limited to information obtained from i) a review of the literature (including project reports and memoranda), ii) telephone interviews, and iii) site visits.

CORRECTIONS

As reflected in Exhibit 1, criminal justice is big business, and, in terms of total expenditures, corrections account for nearly a quarter of that business, which is being supported, for the most part, by state and local revenues. Corrections may be defined as the "community's official reactions to the convicted offender whether adult or juvenile" (National Advisory Commission on Criminal Justice Standards and Goals 1974, p. 2). This definition includes the probation and parole functions as part of corrections but excludes the responsibility for those detained and for those who pass through the juvenile court system (which is considered non-criminal in most states and from which no convictions can result). The precise definition of corrections varies from state to state, usually excluding probation and somewhat less often excluding parole as well. For the purpose of this study, corrections refer to those organizations responsible for the incarceration of sentenced offenders. However, certain automated data systems dealing with probationers, detainees, or parolees have been included in this study: these are systems which have been implemented as a part of or in conjunction with systems dealing with incarcerated, sentenced offenders.

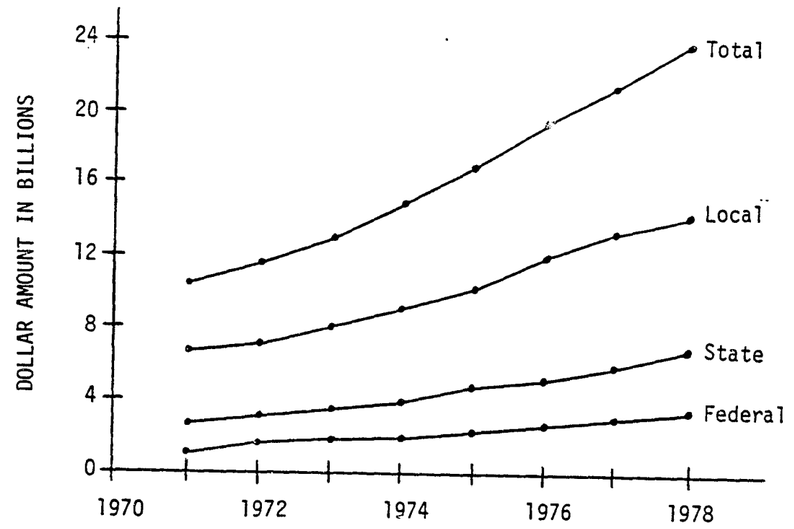
The field of corrections is "currently a battlefield of ideas and ideologies" (Schwartz et al., 1980, p. 1). On the one hand, correctional institutions are perceived as merely a means of housing society's rejects; this is reflective of the "hard line" approach to crime control, which includes drastic curtailment of the rights of criminal suspects (Radzinowitz and Wolfgang, 1971; Inban and Carrington, 1971). Such a narrow and severe viewpoint may also have a detrimental effect on the reintegration of offenders when they are released from these institutions. On the other hand, other criminal justice experts believe in the **capacity** of lawbreakers for lawful behavior (Skoler, 1971; Fox, 1972). That is, one of the purposes of actions taken against lawbreakers should be to "give society an opportunity to attempt to transform lawbreakers into law-abiding citizens" (President's Commission, 1967, p. 7). Although the conservative wind that is currently sweeping the nation seems to support the hard line, "just deserts" approach to crime control, there are three critical reasons why the field of corrections will continue to remain in a state of conflict and flux.

First, the underlying social forces (i.e., life-styles, demographics, economics, politics, and technologies) are in a constant state of change and uncertainty; thus, society's perception of such issues as crime control and corrections will reflect these uncertainties. Moreover, the emergence of "new crimes" (i.e., electronic crimes, personal privacy violations, tax evasions, white collar frauds, political influence bribes, and high technology thefts), coupled with the persistence of the "traditional" offenses, will pose additional problems for the field of corrections. Second, the fact that "corrections inherits any inefficiency, inequity and improper discrimination that may have occurred in any earlier step of the criminal justice process" (National Advisory Commission on Criminal Justice Standards and Goals, 1974, p.5) is another reason why the goals of corrections cannot be developed in a vacuum and remain unchanged. Third, because the deterrent and/or rehabilitative effects of corrections have not been empirically established, the corrective aspects of corrections remain in doubt and subject to criticism.

In order to better understand corrections and to help resolve the conflicting viewpoints, it is necessary to approach corrections from a consistent policy-oriented perspective. Exhibit 2 depicts such a policy-oriented model; it is seen that the goals and standards of corrections must be i) sensitive to prevailing social values, ii) cognizant of legal requirements, and iii) constrained by available public resources. Additionally, in budgeting, managing and operating correctional facilities, it is impor-

Exhibit 1

Direct Criminal Justice Expenditures by Level of Government and Activity



(a) Direct Expenditures Over Time and by Level of Government

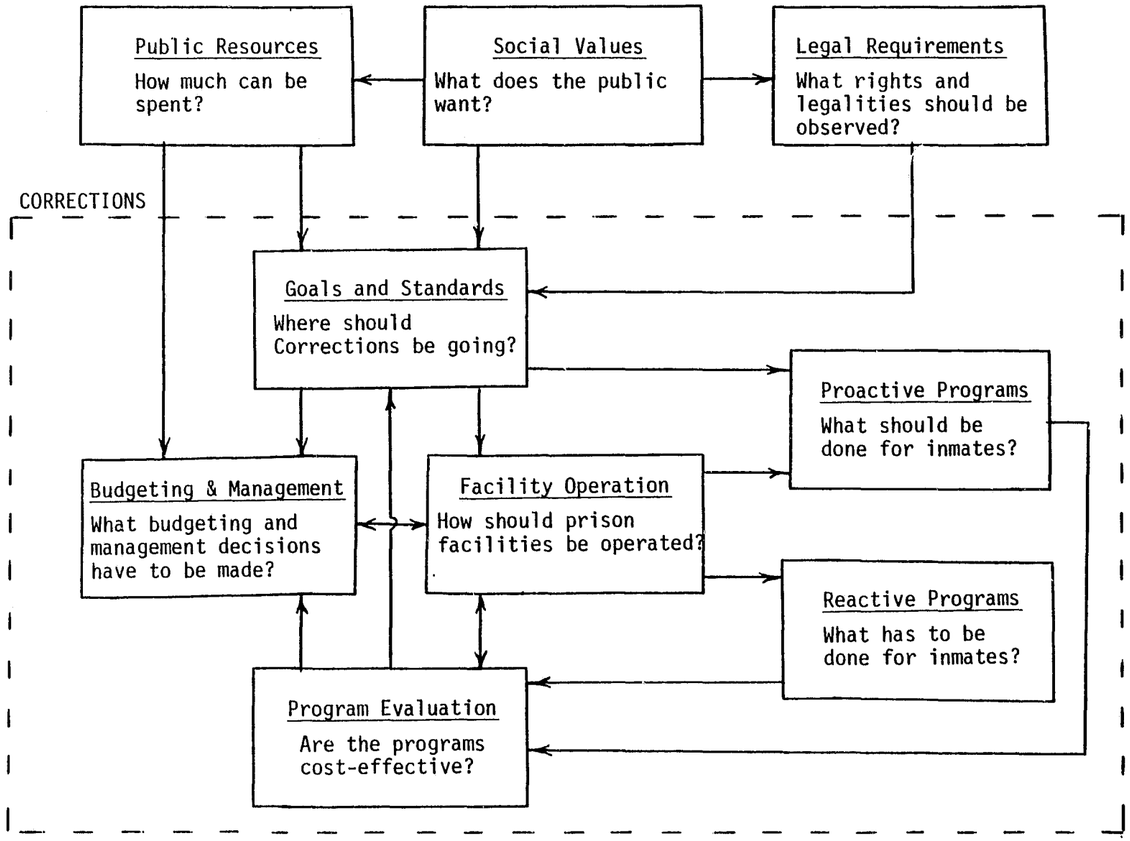
Activity	Dollar Amount in Billions (Row %/Column %) Federal	State	Local	Total
Police Protection	1.952 (14.9/63.2)	1.892 (14.4/28.3)	9.261 (70.7/64.7)	13.105 (100/54.4)
Judicial	0.295 (9.7/9.6)	1.013 (33.4/15.1)	1.727 (56.9/12.1)	3.035 (100/12.6)
Legal Services and Prosecution	0.216 (14.7/7.0)	0.386 (26.3/5.8)	0.867 (59.0/6.1)	1.469 (100/6.1)
Public Defense	0.209 (39.9/6.8)	0.098 (18.7/1.5)	0.217 (41.4/1.5)	0.524 (100/2.2)
Corrections	0.331 (6.0/10.7)	3.177 (57.6/47.5)	2.008 (36.4/14.0)	5.516 (100/22.9)
Other Criminal Justice	0.087 (19.9/2.8)	0.123 (28.1/1.8)	0.228 (52.0/1.6)	0.438 (100/1.8)
Total	3.090 (12.8/100)	6.689 (27.8/100)	14.308 (59.4/100)	24.087 (100/100)

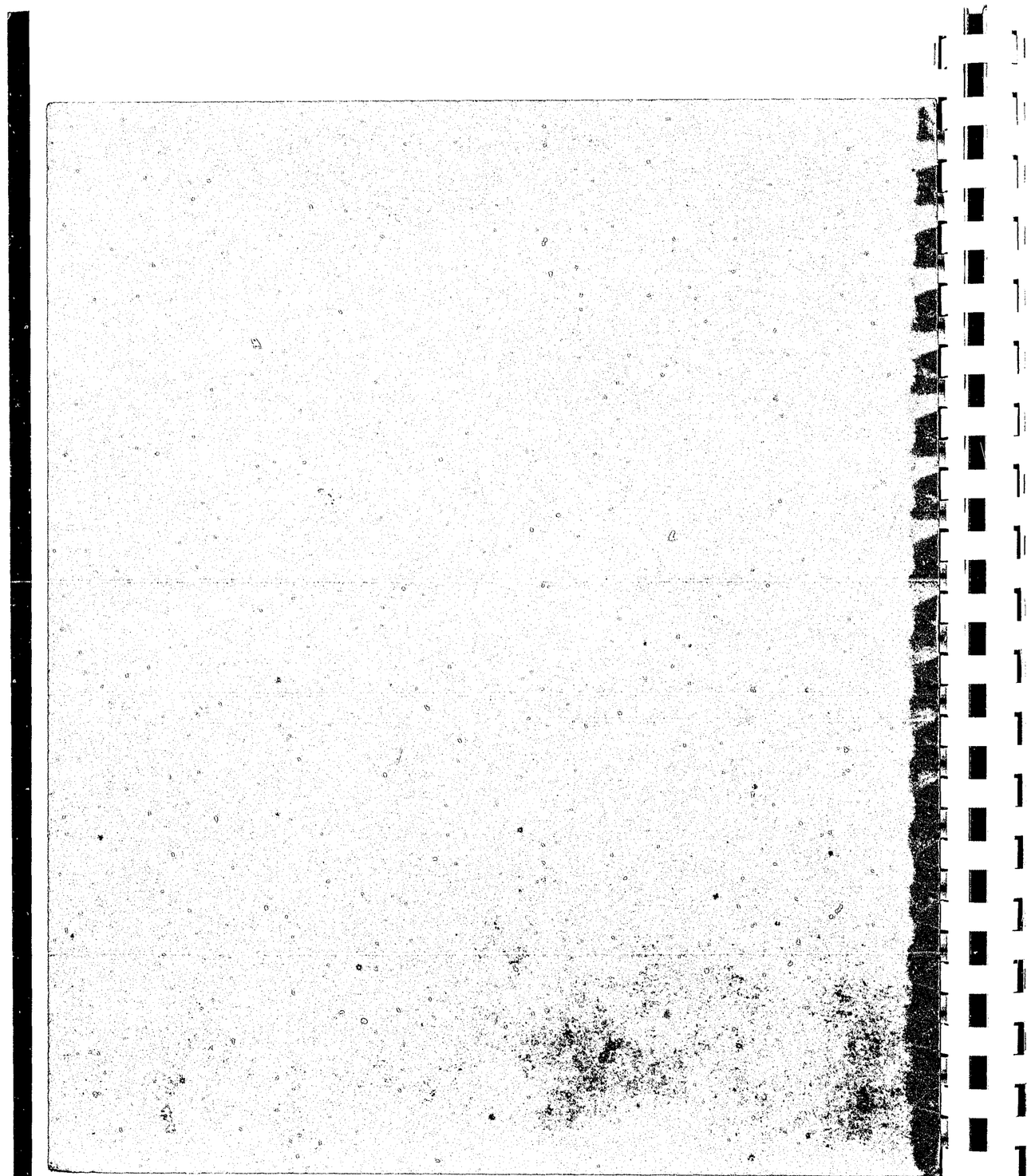
(b) Direct 1978 Expenditures By Activity

SOURCE: Bureau of the Census, 1980

Exhibit 2

A Policy-Oriented Model for Corrections





tant not only to provide the necessary services (i.e., reactive programs) but also to experiment with innovative and potentially effective programs (i.e., proactive programs). An essential aspect of our policy-oriented model for corrections is the feedback provided by the evaluation component; sound policy decisions should always take into consideration evaluative information. Some of the unanswered questions or issues in each of the model components are listed in Exhibit 3. Data -- or, more specifically **information** (which can be thought of as analysed data) -- must be employed to shed light on these issues. The degree to which automated data systems have helped to address these issues is, of course, an object of our study.

AUTOMATED DATA SYSTEMS

Data systems can range from a completely manual to a completely computer-based or automated system. In terms of storing, retrieving and analyzing data, an automated system is presumably superior to a manual one, especially when the amount of data is large. Despite these advantages, an automated system can develop problems in regard to the security, privacy and confidentialilty of data. In the case of manual systems, the safeguard measures could be relatively straightforward. However, it would appear that greater caution is needed for automated systems because large amounts of information may now be collected, processed and shared. Thus, automation seems to have accentuated the privacy issue. Many individuals have been apprehensive about the rapid developments in computer technology, especially because it could result in organizations collecting more extensive personal data on individuals. On the other hand, Westin and Baker (1972) have stated that there is a limit on the information that can be collected and shared.

Exhibit 4 contains a list of issues which should be considered in both the design and/or evaluation of an automated data system. Several issues deserve more discussion. One of these is the "learning capability" of an automated system; this is the ability of the system to identify operating deficiencies and to diagnose system malfunctions. The results could be accomplished by having the system monitor its own performance. Specific internal system checks could be provided in the basic system design to detect failures or errors (Tien, 1973). For example, system monitors could be warned when expected events do not occur or when the system finds itself in an unusual state. In addition, this could serve as a security measure, and knowledge of this monitoring activity could deter individuals from indulging in misuse or abuse of the system.

The adaptive capabililty is an important corollary to the learning capability. After identifying an operating deficiency, the system must be able to be adaptively modified to correct or compensate for the deficiency. In more general terms, adaptability implies a flexibility to provide smooth man-machine interactions, to meet peak load and other unexpected demands, and to cope with system growth and a changing environment (Tien, 1973). Any evaluation must assess the system's adaptive capability.

In the context of adaptability it is also important to determine whether provisions have been made for the system to grow and adapt to a changing environment. Whatever initial installation is made, changes required as the system matures should not produce chaos or necessitate huge reprogramming efforts. Major sections of hardware and software should be capable of being replaced or substantially modified with a minimum of perturbation on the rest of the system. In this respect, modularization should be the basic design concept. The operating software elements should be programmed as separable sub-routines. New hardware and software modules should be implemented and debugged without compromising the operating system. It is expected that

Exhibit 3

Issues in Corrections

Social Values

- Are society's views changing with respect to such issues as sentencing, imprisonment, community-based corrections, probation, parole, rehabilitation, treatment and restitution?
- Is incarceration more desirable than supervision (i.e., probation and parole) in achieving society's aims for the offender?
- To what extent is corrections merely reacting to the actions of other criminal justice system components (i.e., police, prosecution, judicial, probation, and parole)?
- Would corrections be more effective with greater community involvement?
- How is the future of correctional institutions affected by the conflicting viewpoints of most communities (which oppose establishment of institutions in their vicinity) and most criminologists (who favor the establishment of institutions near communities)?
- How does public opinion influence correctional operations and programs?

Legal Requirements

- Should sentences be determinate?
- Are offenders' records adequately protected from unauthorized access by other offenders or by people outside the corrections agency?
- What services are required to ensure offenders' rights regarding i) due process and the administration of discipline within the prison, ii) due process and the granting and revocation of parole; iii) censorship of incoming and outgoing mail, iv) adequate medical and dental care, v) visitation, vi) racial discrimination, vii) employment and payment for such employment, and viii) religious freedom?

Public Resources

- Should more money be allocated to corrections?
- What is the impact of budget limitations (e.g., California's Proposition 13 and Massachusetts Proposition 2-1/2) on corrections?
- Should prison industries be allowed to compete with private industry?
- Should prison industries pay wages comparable to private industry?

Goals and Standards

- What is the primary goal of corrections -- retribution, rehabilitation, incapacitation, or deterrence?
- Should corrections be an independent agency, part of an umbrella social services agency, or part of an umbrella criminal justice agency?
- Should probation and/or parole be implicitly integrated within corrections?
- What should the required interactions and links be between corrections and other criminal justice system components?
- Would integration of juvenile and adult correctional services -- not integration of the juvenile and adult populations -- result in improved management efficiency?
- Should local correctional agencies be organized so that the population can be redistributed to community-based, locally operated prisons?
- Should correctional officers' role be primarily custodial or rehabilitative?
- Should high level corrections administrators be political appointees?

Goals and Standards (Cont'd)

- What is an appropriate prison size?
- Are available offender classification methods valid?
- Should there be explicit standards (e.g., those promulgated by the American Correctional Association) for correctional institutions?
- How could compliance with available standards be encouraged or enforced?

Budgeting and Management

- How should the correctional budget be allocated between providing security and providing services to the offender?
- Should existing prison facilities be expanded and/or new facilities be built?
- Is the allocation and scheduling of capacity and services efficient and effective with respect to offender type and length of sentence?

Facility Operation

- In terms of the individual offender or inmate, what procedures are employed for carrying out an inmate's admission, examinations (both physical and mental), classifications, program assignments, intra-facility transfers, inter-facility transfers, fund accounting, special needs, visitations, and parole hearings?
- In terms of information requirements, what procedures are employed to meet the information needs of such diverse groups as inmates, managers, researchers, national reporting agencies, judges, prosecutors, and national policy makers?

Reactive Programs

- What services or programs are mandated by law and/or correctional standards?
- Which, if any, of the various available programs (e.g., educational, vocational training, work release, group or individual psychotherapy, victim restitution, etc.) have a beneficial effect on offenders and/or society?

Proactive Programs

- Should long-term inmates participate in programs different than those for short-term inmates?
- Are there other innovative and potentially effective programs?

Program Evaluation

- Is recidivism rate a valid measure of program effectiveness?
- Is there any relationship between recidivism and types of rehabilitative programs?
- What data requirements are necessary in order to obtain pertinent evaluative information?
- How could the goals and standards specification, budgetary, management and facility operation processes be upgraded?

Exhibit 4

Issues in Automated Data Systems

Systems Requirements

- Who are the users and what are their needs?
- What kinds of applications and analyses does the system need to perform?
- What kind of system is appropriate (i.e., degree of computerization, data base management programs, analyses capabilities, etc.)?
- What budgetary, organizational and political constraints must the system satisfy?
- How much personal information should be stored in the system?
- Should information be purged after fulfilling its initial objectives, and, if so, how?
- Who should have access to what information?

System Design

- Are appropriate data items included?
- How much coding is required per data element?
- What hardware, software, and communication items are needed?
- How should the system be configured?
- What are the file structure and their file items and do they meet the requirements for data collection?
- What are the security and validation procedures in connection with collection, conversion and use of data?
- What report generating capabi³ity does it have?
- What is the extent of the system's "learning capability" (i.e., the ability to identify operating deficiencies and to diagnose system malfunctions)?
- What is the extent of the system's "adaptive capability" (i.e., the ability to correct or compensate for an identified operating deficiency)?
- How does one safeguard against misuse and abuse of the data system?

System Development

- Was a functional analysis performed before system development?
- Are there any institutional or management constraints in the development and implementation of the system?
- What are the advantages/disadvantages of a tailor-made system as opposed to a generalized data base management system?
- How is the system's potential adaptability to both data growth and technological development (i.e., microcomputers and distributed processing)?

System Operation

- How is the system's security and privacy of data maintained?
- Are the reliability and maintainability of the hardware and software of the system adequate relative to system performance?
- How are data validated for accuracy?
- What kind of back-up system is available to ensure smooth and efficient system operation?
- How does file structure affect system operation?
- Are the operating procedures well documented?
- Are explicit transactions (i.e., transactions by the users) relatively straightforward?
- What is the level of implicit transactions (i.e., transactions by the computer)?
- Are inquiries and updates easy to perform?
- What are the operational (recurring and non-recurring) costs?
- What is the benefit and cost-effectiveness of the system?

System Interface

- How compatible is the system in terms of man-machine interaction?
- Can the system's data be interfaced with other data sets?
- Can the system's hardware and software be interfaced with those of other systems?
- How is the organizational structure (including the distribution of power) affected by the introduction of the automated data system?

modularization would increase system costs, but it may be well justified in the long-run, especially in the wake of microcomputers and distributed processing.

The effect of maintainability and reliability on the performance of the automated data system is another aspect which should be evaluated. The system must operate satisfactorily over a range of conditions with a high probability that it will perform its intended function whenever needed. Hardware and software must be easily maintainable. All maintenance requirements and costs must be clearly identified. Furthermore, preventive maintenance should be regularly scheduled and carried out during periods when low activity is anticipated.

A key element of reliability is that when a failure of a component occurs and the system performance degrades, it must remain intact and operational. Nicknamed graceful degradation, this reliability feature is a consequence of the modularity concept. In addition, sufficient redundancy and interchangeability could also ensure reliable operation when particular elements of the system fail.

A related area which should be considered is the back-up capability of the data system. No matter how much reliability is built into a computer system, there is a finite probability that a failure could cause the entire system to become inoperative for long periods of time. During these periods, users must revert to a manual back-up system. The switch-over from automatic to manual control and back again should be smooth.

AUTOMATED CORRECTIONAL DATA SYSTEM

The earliest automation efforts in corrections began in the 1950s; they consisted of card files which were processed by electronic card sorters and printers. The few systems which employed a computer were also card-oriented and very simple. Indeed, most of today's ACDSs remain quite basic and, in most cases, they are no more than an automated analog of a part of the existing manual data system. However, for the purpose of this study, we include all state level ACDSs, no matter how technically unsophisticated they may be; our study approach is further detailed in the next section.

In regard to some background information concerning our NEP Phase I topic area, Exhibit 5 summarizes the major ACDS-related activities which have occurred during the past decade; they include studies dealing with ACDS requirements, federal grants for ACDS development, studies which assess related criminal justice data systems, and national programs for the reporting of ACDS-related statistics. Inasmuch as these studies, grants and programs are referred to and discussed at appropriate points throughout this report, we refrain from further discussing them here, except to remark that the federal government -- in particular, the LEAA - has provided substantial funding for the development of ACDSs.

1.2 STUDY APPROACH

In an attempt to be responsive to the NEP Phase I requirements, our study reflects a review or general assessment of existing ACDSs, rather than an analysis or intensive assessment of ACDS evaluations, which, as stated earlier, are non-existent. The review has been sensitive to i) the need to identify the current status of ACDSs, ii) the need to review pertinent ACDS issues, and iii) the need to develop a viable ACDS evaluation design. Inasmuch as these three needs require different types and levels of data, we have addressed each need by considering a different sample of ACDSs. Thus, as indicated in Exhibit 6, our study approach -- which is similar to that of two other

Exhibit 5

Major ACDS-Related Activities

Requirements Studies

- Correctionetics: Modular Approach to An Advanced Correctional Information System [Hill and Woodall, 1972]
  Funded by the National Institute of Mental Health, this six-volume report provides a framework for ACDS development.
- Offender-Based State Corrections Information System (OBSCIS) [SEARCH Group, Inc., 1975]
  Funded by the LEAA and conducted by Project SEARCH (now, SEARCH Group, Inc.), this study resulted in a design for an 8-module (i.e., admissions, assessment, institutions, parole, movement status, legal status, management and research, national reporting) ACDS.
- State Corrections Resource Management Systems [SEARCH Group, Inc., 1980]
  Funded by the LEAA, this study provided the impetus for expanding the offender-based OBSCIS into a Corrections Management Information System (CMIS).
- Correctional Data Analysis Systems [Friel et al., 1980]
  Funded by the LEAA, this study describes the nature of the information needed to plan, manage, monitor, evaluate and analyse correctional activities and identifies transferable technologies which can assist in meeting this need.

Federal Development Grants

- Comprehensive Data Systems (CDS) Program (1976-1980)
  Funded by the LEAA, this program provided grants to states which wished to establish and/or upgrade (including automating) their Offender Based Transaction Statistics (OBTS), Computerized Criminal Histories (CCH), and Uniform Crime Reports (UCR) [LEAA, 1976]. (Statistical analysis centers were also funded by this CDS program.)
- Offender-Based State Corrections Information System (OBSCIS) Program (1974-1980)
  Funded by the LEAA, this program provided grants to states which intended to establish and/or upgrade their ACDSs in consonance with the SEARCH-developed, OBSCIS guidelines. 35 states and Washington, D.C. have received OBSCIS grants. (A Basic OBSCIS Software Package, developed jointly by Iowa and SEARCH Group, Inc., was later transferred to Connecticut, Utah, South Dakota and Alaska, while a minicomputer version of the package was implemented in Kansas and Idaho.)
- Corrections Management Information System (CMIS) Program (1979-Present)
  Funded by the LEAA, this program allows SEARCH Group, Inc., to provide limited ACDS-related technical assistance to states and to develop CMIS modules. The first two modules currently being developed are visitor control and inmate fund accounting; other modules being contemplated include prison industries, food management, transportation, and inventory control.

Assessment Studies

- Information Technology and Urban Management in the United States [Kraemer et al., 1976]
  Funded by the National Science Foundation, this study obtained findings regarding automated urban data systems that, for the most part, do not contradict our ACDS findings.
- Evaluation of the Accomplishments and Impacts of the Programs of LEAA in the Areas of Information Systems Development and Statistics Services [McMullan and Ries, 1976]
  Funded by the LEAA, this study obtained findings regarding automated criminal justice data systems that, for the most part, do not contradict our ACDS findings.
- Criminal Statistics: Federal Efforts to Produce Statistical Information about Crime and Criminals in the United States [Chilton, 1978]
  Funded by the LEAA, this study concluded that most automated criminal justice data systems -- including OBSCIS -- do not automatically contribute to the national statistical reporting programs.
- Two Related National Evaluation Program Phase I Studies [Kreindel et al., 1977; Brounstein et al., 1979]
  Funded by the LEAA, these studies obtained findings regarding automated courts [Kreindel et al., 1977] and prosecution management [Brounstein et al., 1979] information systems that, for the most part, do not contradict our ACDS findings, including the fact that there are no available evaluations of automated systems.
- Evaluation and Interface of Four Criminal Justice Information Systems [Calpin et al., 1979]
  Funded by the LEAA, this study found that the interface among four automated criminal justice data systems -- including CCH and OBSCIS -- is very limited.

National Statistical Reporting Programs

- National Prisoner Statistics (NPS)
- Uniform Parole Reports (UPR)

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National Statistical Reporting Programs

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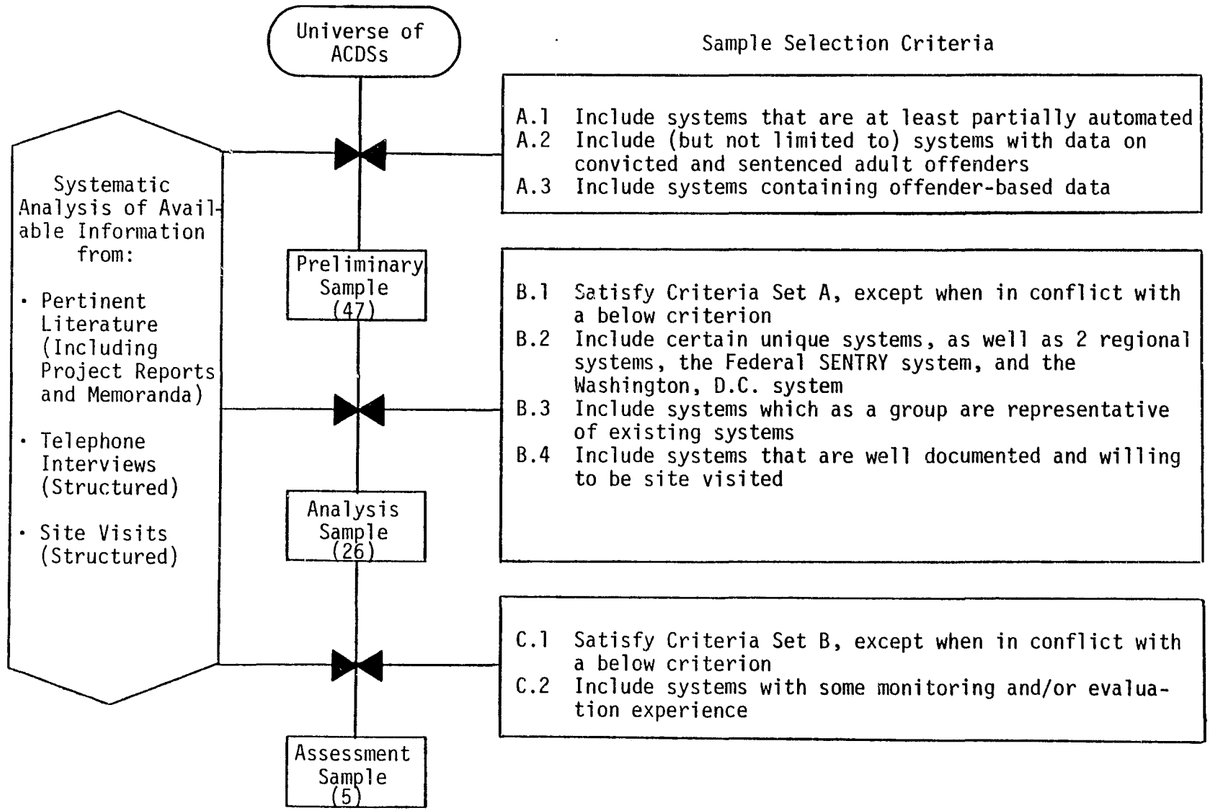
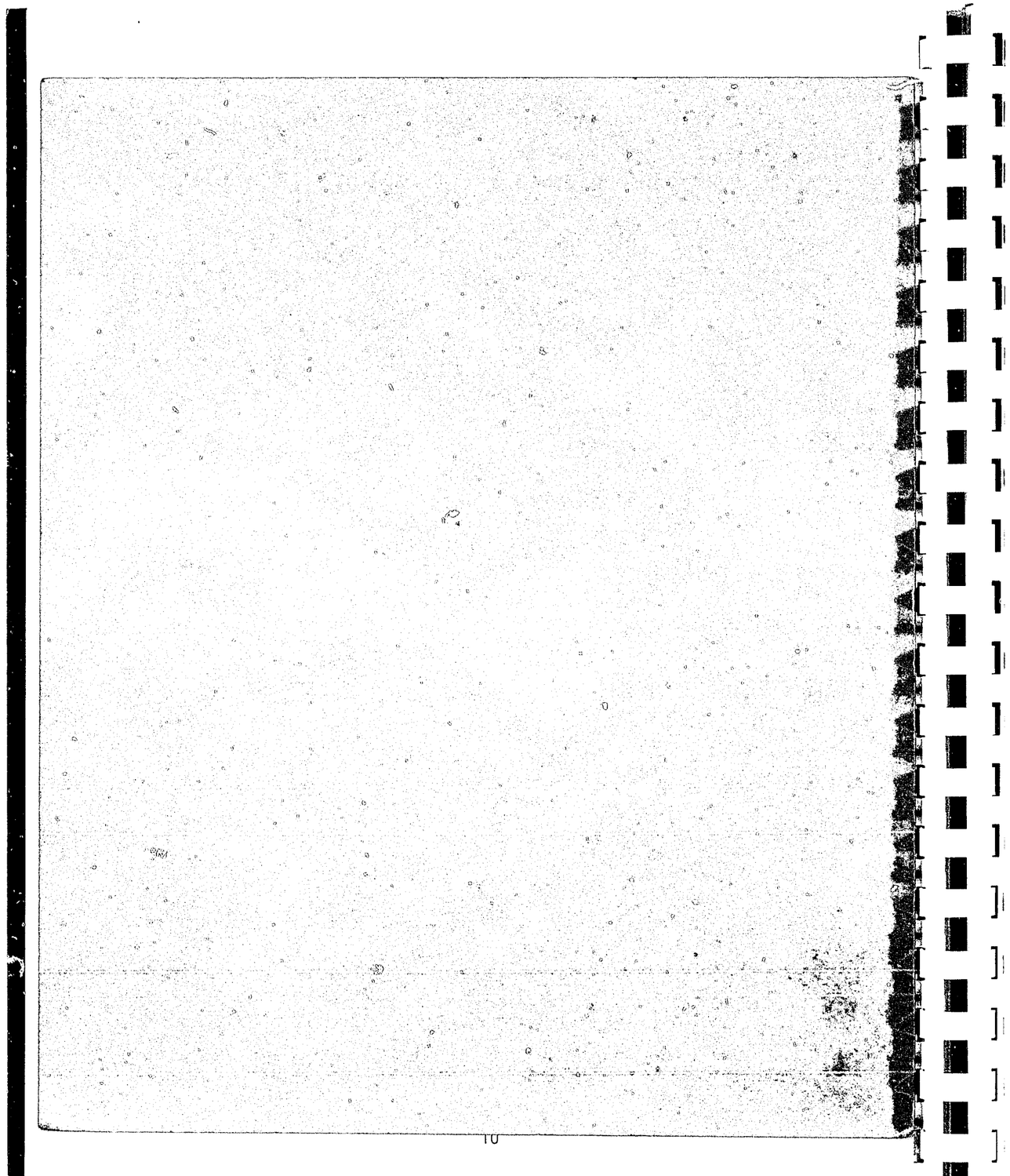
- Uniform Parole Reports (UPR)

Exhibit 6

Study Approach: Sample Selection Process





NEP Phase I studies (Tien, 1979; Colton et al., 1981) -- is based on three different study samples; specifically,

- o Preliminary Sample. In applying Criteria Set A to the universe of potential ACDSs, 47 systems were selected; they contributed to our understanding of the current status of ACDSs.

- o Analysis Sample. In applying Criteria Set B to the universe of potential ACDSs, 26 systems were selected; they contributed to our understanding of pertinent ACDS issues.

- o Assessment Sample. In applying Criteria Set C to the Analysis Sample of ACDSs, 5 systems were selected; they contributed to our development of a viable ACDS evaluation design.

Criteria Set A insured that the Preliminary Sample would contain correctional data systems that are at least partially automated (i.e., Criterion A.1), and would not contain local systems which deal primarily with detained offenders (i.e., Criterion A.2). Additionally, systems which do not contain offender-based data are excluded (i.e., Criterion A.3) since, although processing of non-offender related data (e.g., payroll data) provides a service to corrections, it alone would not constitute a correctional data system and could therefore be assessed outside of the correctional context. In obtaining the Analysis Sample, Criterion B.2 insured the inclusion of certain unique systems (e.g., Michigan's distributed ACDS) and also certain large regional systems (i.e., systems belonging to St. Louis County, San Diego County, the federal government and Washington, D.C.) which possess characteristics that are more in common with a majority of state ACDSs than some state systems which contain data on a very small population of offenders. In addition to requiring that the Analysis Sample be balanced and representative of the existing ACDSs (i.e., Criterion B.3), we had hoped that they would be well documented (i.e., Criterion B.4); unfortunately, this latter criterion could not be met -- instead, as indicated in Exhibit 7, we had to site visit all 26 of the Analysis Sample of ACDSs in order to obtain pertinent information. Finally, in selecting the Assessment Sample, we had hoped that it would contain systems which had had some monitoring and/or evaluation experience (i.e., Criterion C.2); again, this criterion could not be met -- instead, we selected five systems which expressed an interest in evaluation. The composition of each of the three study samples and their data sources are summarized in Exhibit 7.

A key and very useful aspect of our study approach was the development of an extensive, 212-question Structured Data Collection Instrument (SDCI), which served as a **common** collection point for all three of our sources of data. That is, as we i) reviewed the pertinent literature (including project reports and memoranda), ii) undertook telephone interviews, and iii) conducted site visits, we first integrated the data from these three sources and then entered them in the appropriate SDCI. By integrating or combining data from several sources, we were actually employing Tien's (1979) multi-measurement approach, which can be shown to minimize certain data bias threats to the study's validity. In total, 49 SDCIs were completed: they are contained in Appendix C of the Final Report, and they, of course, constitute the basis for our findings, conclusions and recommendations. A summary of the SDCI collected data is included in Appendix A.

Obviously, not all questions on the SDCI are answered for each ACDS, even if they were applicable. One reason is that the range of subjects dealt within the

Exhibit 7

ACDS Study Samples and Data Sources

	ACDS STUDY SAMPLES			DATA SOURCES		
	Preliminary Sample	Analysis Sample	Assessment Sample	Pertinent Literature	Telephone Interview	Site Visit
ALABAMA	X	X	X	X	X	X
ALASKA	X				X	
ARIZONA	X	X		X	X	X
ARKANSAS	X	X		X	X	X
CALIFORNIA	X	X		X	X	X
COLORADO	X	X	X	X	X	X
CONNECTICUT	X	X		X	X	X
DELAWARE	X	X			X	X
FLORIDA	X	X		X	X	X
GEORGIA	X	X	X	X	X	X
HAWAII	X	X		X	X	X
IDAHO	X				X	
ILLINOIS	X				X	
INDIANA	X				X	
IOWA	X	X		X		X
KANSAS	X	X		X	X	X
KENTUCKY	X	X		X	X	X
LOUISIANA	X				X	
MAINE	X				X	
MARYLAND	X				X	
MASSACHUSETTS	X	X	X		X	X
MICHIGAN	X	X		X	X	X
MINNESOTA	X				X	
MISSISSIPPI	X			X	X	
MISSOURI	X	X			X	X
MONTANA	X	X		X	X	X
NEBRASKA	X			X	X	
NEVADA					X	

Exhibit 7

(Page 2 of 2)

	ACDS STUDY SAMPLES			DATA SOURCES		
	Preliminary Sample	Analysis Sample	Assessment Sample	Pertinent Literature	Telephone Interview	Site Visit
NEW HAMPSHIRE	X				X	
NEW JERSEY	X				X	
NEW MEXICO	X			X	X	
NEW YORK	X	X		X	X	X
NORTH CAROLINA	X	X	X	X		X
NORTH DAKOTA					X	
OHIO	X				X	
OKLAHOMA	X				X	
OREGON	X				X	
PENNSYLVANIA	X			X	X	
RHODE ISLAND	X				X	
SOUTH CAROLINA	X			X	X	
SOUTH DAKOTA	X			X	X	
TENNESSEE	X				X	
TEXAS	X	X		X	X	X
UTAH	X				X	
VERMONT	X				X	
VIRGINIA	X	X		X	X	X
WASHINGTON	X	X		X	X	X
WEST VIRGINIA					X	
WISCONSIN	X			X	X	
WYOMING					X	
WASHINGTON, D.C.	X	X			X	X
FEDERAL BUREAU OF PRISONS		X		X	X	X
ST. LOUIS COUNTY		X		X	X	X
SAN DIEGO COUNTY		X		X	X	X
TOTAL	47	26	5	29	52	26

instrument is sufficiently broad that in many systems or agencies, no one individual could be familiar wtih all aspects of the system. Although we attempted in our site visits to interact with several individuals (including administrative, data processing, research, records office, and institutional staff and users), we were not able to do this in every case; nor did time permit us to conduct extensive telelphone interviews. Another reason is the lack of historical perspective caused by staff turnover. In many agencies, nearly all the staff associated with the initial ACDS development and implementation had left. A third reason is the fact that the collected data were by necessity that which were readily available within the agencies; that is, we took no measurements or surveys for the agencies. Consequently, there are many areas where data were simply not available. For example, many agencies have no idea what the error rate in their data files is. In order to determine the error rate, a sample of computer records would have to be compared with the corresponding manual records. Similarly, a valid assessment of user support would require a general survey of user attitudes. Although such a survey instrument is included in the SDCI, it was not practical to conduct and process such a survey as a part of this study; we were, however, able to assess its viability by reviewing its content with the Assessment Sample of ACDS agencies.

Three final remarks should be made regarding the SDCI data. First, because of the limited number of ACDSs involved and the gaps in the data, no statistical analysis is made; however, we believe that the data are valid and that their implications are significant. Second, although the original NEP Phase I solicitation stated that this study "can be initiated without extensive data collection and analysis efforts through reviewing completed evaluation projects...and by conducting a limited number of site visits", (NIJ, 1978, p. 2), extensive data collection effort has been necessary, as there are neither any ACDS evaluations nor any detailed ACDS documents. Indeed, most of the available documents are nothing more than progress reports mandated by the LEAA as part of the OBSCIS grant requirements. For this reason, we undertook a large number of site visits, about twice as many as would typically be required in NEP Phase I studies. Third, because the SDCIs were filled out by members of the study team, and not by the various ACDS staff, the SDCI data can be considered to be relatively consistent.

1.3 SCOPE OF REPORT

The scope of this report can best be viewed in terms of the sample selection process, as indicated in Exhibit 6. Following this introductory section, Section 2 identifies the status of ACDSs based on information obtained from the Preliminary Sample of systems, while the issues addressed in Sections 3 and 4 are based on information obtained from the Analysis Sample of systems. The evaluation design that is developed in Section 5 was guided by information obtained from the Assessment Sample of systems. Lastly, the conclusions section, Section 6, summarizes the present state of knowledge, identifies the gaps in the knowledge base, and outlines future research and evaluation activities which could be undertaken to fill those gaps.

As noted in the Preface, the Summary Report can be regarded as an abridged version of the Final Report. However, the Final Report also includes two additional appendices. The first, Appendix B, contains a list of individuals with whom we came in contact during the course of this study: their contributions are acknowledged. The second, Appendix C, as stated earlier, contains the completed SDCIs for 49 ACDSs.

As also noted in the Preface, this study reflects a general assessment of ACDSs, as they existed during the two-year period of study. If we had to pick a point in time at which the information contained in this report can be considered to be up-to-date, we would cautiously specify July 1980 as the most reasonable date. This date should also be considered to be the reference date for such statistics as "years since first ACDS" (see Exhibit 8 in Section 2.1).

Finally, the content of this report should be of interest to correctional administrators and planners, as well as to professionals engaged in the technical aspects of designing, installing or maintaining an automated correctional data system. The administrator or data processing manager who is concerned wtih establishing or upgrading an ACDS should read Section 6; the planner or computer specialist who is developing an ACDS should read Sections 2, 3 and 4; while the planner who is interested in evaluating an ACDS should, of course, peruse the entire report.

2 SYSTEM STATUS

The purpose of this section is to summarize the state of development of ACDSs and to lay the groundwork for the more detailed discussion of ACDS issues in Sections 3 and 4. The ACDS environment, characteristics and applications are considered in the following three subsections, respectively.

2.1 SYSTEM ENVIRONMENT

As stated in Section 1.2, all the corrections agencies examined in this study have one aspect in common: responsibility for incarcerated, sentenced offenders. Beyond this, they vary widely in areas of responsibility, activity levels, data processing experience and many other aspects. Exhibit 8 contains several agency characteristics which may affect the development and operation of an ACDS. An explanation of and comments on each column of the exhibit follow.

State or Authority and Agency Name

- In 31 states and the District of Columbia, the corrections agency is an independent department.
- In 16 states, the corrections agency is a part of a social services umbrella agency.
- In 5 states and the federal government, the corrections agency is a part of a criminal justice umbrella agency.

Agency Responsibility: Number of Offenders

- The figures shown are as reported for July 1, 1979 to the American Correctional Association (Travisono, 1980). In some cases, we have verified these figures with the agencies involved.
- While this study is directed at only those corrections agencies responsible for incarcerated, sentenced adults, many of these agencies have additional responsibilities. 25 agencies are also responsible for probation supervision; 38 (including the D.C. Department of Corrections) are responsible for parole supervision; and 6 (including the D.C. Department of Corrections) are responsible for detainees.
- The wide variation in the numbers of offenders for which the agencies are responsible, and the proportions of probationed, detained, incarcerated, and paroled provide some indication of the range of different needs and problems faced by the various agencies in their automation effort.

Agency Responsibility: Number of Facilities

- The facilities or institutions are broken down by size and the numbers include all security levels, women's institutions, community-based institutions, etc. Juvenile institutions are not included due to the fact that in almost every case they are under the jurisdiction of a different agency. Another way to view the facilities is by security level. This is less clear cut than by size, however, as many institutions include multiple security levels.

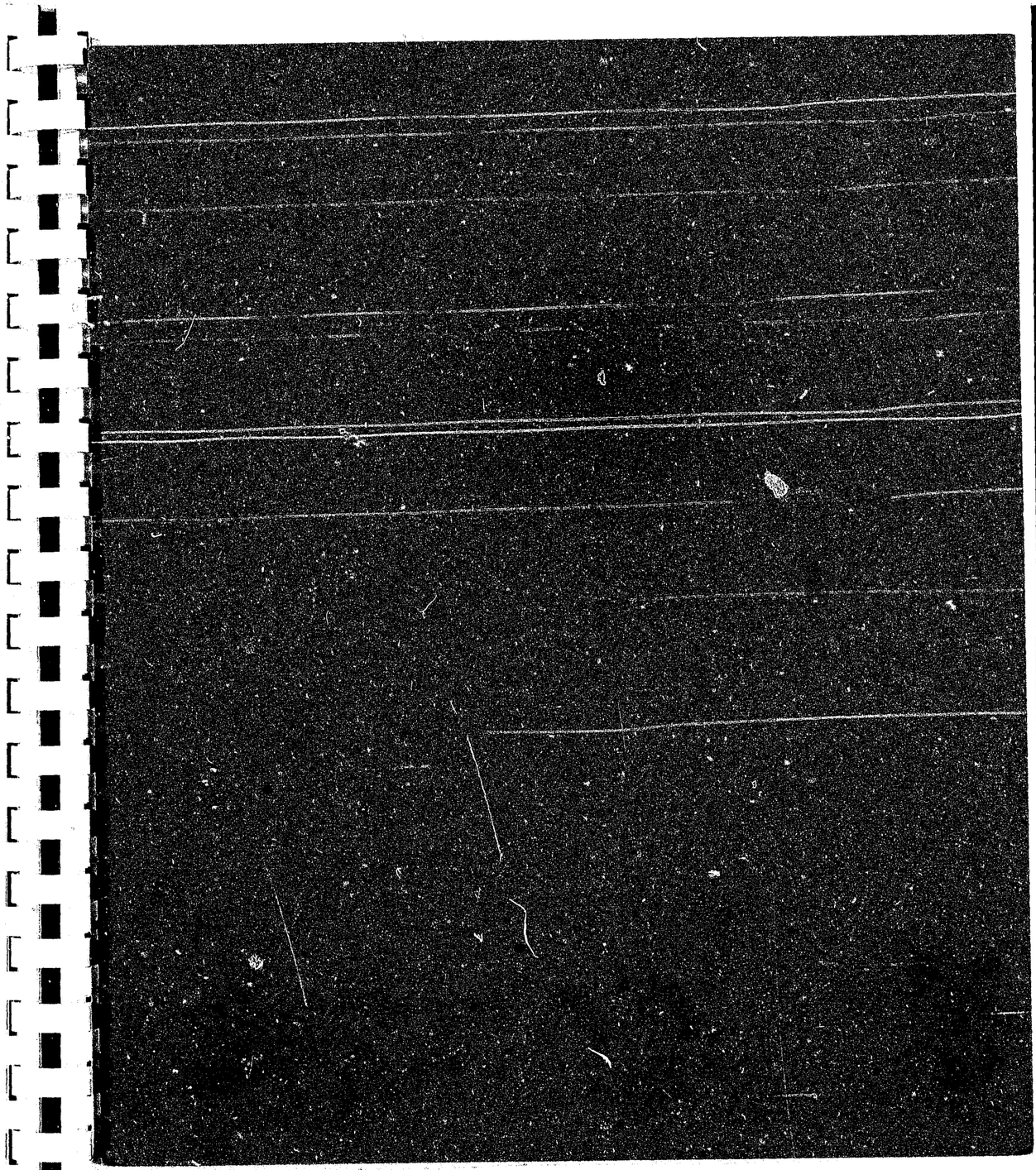


Exhibit 8

ACDS Environment

State or Authority	Agency Name	Agency Responsibility: No. of Offenders: 1979 (probationed; detained; incarcerated; paroled)	Agency Responsibility: No. of Facilities (less than 50 offenders; between 50 and 250; more than 250)	Incarcerated Activity Levels: 1976: Admissions	Incarcerated Activity Levels: 1976: Population Level	Incarcerated Activity Levels: 1976: Releases	Years Since First ACDS	Current ACDS Status	Development Funding Sources[1] (initial system/ current system)	First OBSCIS Funding
ALABAMA	State Board of Corrections	NA; NA; 3779; NA	2; 14; 5	1605	4430	2993	9	operational since 1978	O/O	11/77
ALASKA	Dept. of Health & Social Services Division of Corrections	1050; Unk; 577; [2]	2; 7; 0	205	207	182	0	under development	O/O	3/79
ARIZONA	Dept. of Corrections	NA; NA; 3378; 543	0; 6; 3	1622	2654	1419	7	operational since 1976	S/O	7/75
ARKANSAS	Dept. of Corrections	571; NA 2863; 2608	2; 2; 3	1825	2163	1556	8	operational since 1976	S/S	12/76[4]
CALIFORNIA	Health & Welfare Agency Dept. of Corrections	NA; NA; 22557; 15455	0; 0; 12	9658	17328	8841	24	OBSCIS operational since 1976	S/O	11/74
COLORADO	Dept. of Corrections	NA; NA; 2540; 1349	0; 1; 3	1582	2045	1382	4	operational since 1976, new system Aug. 1980	O/O	11/74
CONNECTICUT	Dept. of Corrections	NA; [3]; 4434; 1297	0; 4; 6	1634	1856	1560	10	operational since 1977, new system Aug. 1980	S/S	6/77
DELAWARE	Dept. of Corrections	448; Unk; 1254; 3176	0; 4; 2	447	583	345	0	operating in test mode	O/O	1/78
FLORIDA	Dept. of Corrections	35159; NA; 20279; 8008	0; 6; 21	9742	15327	7264	10	operational since 1978	S/O	7/75
GEORGIA	Dept. of Offender Rehabilitation	29248; NA; 12217; NA	0; 7; 10	5336	10402	4623	8	operational since 1976	S/O	7/74
HAWAII	Dept. of Social Services & Housing, Corrections Division	NA; Unk; 898; NA	6; 2; 1	124	336	133	5	operational since 1976, new system under dev.	O,L/O,L	12/74
IDAHO	Dept. of Corrections,	1762; NA; 890; 270	0; 2; 1	659	579	557	3	operational since 1978, OBSCIS under dev.	S/S	--
ILLINOIS	Dept. of Corrections	NA; NA; 11356; 3499	0; 0; 10	6530	7862	4652	5+	operational since 1975	S/L,O	7/75
INDIANA	Dept. of Corrections	NA; NA; 5167; 3229[5]	5; 3; 4	2444	3891	2138	9	suspended since 1975	L/--	--
IOWA	Dept. of Social Services Div. of Adult Corrections	NA; NA; 2578; 1196	0; 5; 2	956	1787	851	2	operational since 1978	O/O	1/78
KANSAS	Dept. of Corrections	NA; NA; 2346; 1345	2; 4; 2	1746	1691	1353	1	operational since 1979	O/O	5/78
KENTUCKY	Dept. of Justice Bureau of Corrections	3617; NA; 3555; 2405	2; 6; 2	2914	3254	2503	2	operating in test mode	S/S	--
LOUISIANA	Dept. of Corrections	13481; NA; 7472; 1830	2; 7; 7	1464	4763	1631	7	operational since 1973	L/L	--

[1] O=OBSCIS, L=Other LEAA, S=State, X=Local
[2] Included with the probationers
[3] Included with the incarcerated
[4] All but $20K was returned
[5] Includes juveniles

Exhibit 8

(Page 2 of 3)

State or Authority	Agency Name	Agency Responsibility: No. of Offenders: 1979 (probationed; detained; incarcerated; paroled)	Agency Responsibility: No. of Facilities (less than 50 offenders; between 50 and 250; more than 250)	Incarcerated Activity Levels: 1976: Admissions	Incarcerated Activity Levels: 1976: Population Level	Incarcerated Activity Levels: 1976: Releases	Years Since First ACDS	Current ACDS Status	Development Funding Sources[1] (initial system/ current system)	First OBSCIS Funding
MAINE	Dept. of Mental Health & Corrections, Bureau of Corrections	2222; NA; 873; 253	0; 1; 2	749	641	782	12	operational since 1979	O/O	9/76
MARYLAND	Dept. of Public Safety & Correctional Services, Div. of Correction	NA; NA; 8121; NA	0; 13; 6	5654	6966	4707	13	MILES since 1967, OBSCIS under dev.	S/S	10/75
MASSACHUSETTS	Executive Office of Human Services, Dept. of Correction	NA; NA; 3082; 3948	1; 2; 4	2094	2241	1685	8	operational since 1972, OBSCIS under dev.	S/S	1/77
MICHIGAN	Dept. of Corrections	25389; NA; 17015; 6103	0; 2; 13	6745	10835	5135	12	operational since 1967, OBSCIS in test mode	S/S	10/76
MINNESOTA	Dept. of Corrections	3778; NA; 2145; 7603	1; 5; 2	1176	1682	1237	15	operational since 1978	S/O	10/74
MISSISSIPPI	Dept. of Corrections	4447; NA; 3305; 1569	4; 0; 1	1378	2414	1665	2	operational since 1978	S/S	
MISSOURI	Dept. of Social Services, Division of Corrections	NA; NA; 5285; NA	0; 5; 4	2722	4381	2096	5	operational since 1975, OBSCIS under dev.	L/L	8/77
MONTANA	Dept. of Institutions, Corrections Division	1675; NA 741; 489	1; 2; 1	479	428	357	4	operational since 1978	O/O	11/75
NEBRASKA	Dept. of Correctional Services	NA; NA; 1423; 357	0; 2; 2	936	1251	749	2	operational since 1977	L/L	--
NEVADA	Dept. of Prisons	NA; NA; 1501; NA	1; 1; 2	552	849	447	0	No ACDS	--	--
NEW HAMPSHIRE	New Hampshire State Prison	NA; NA; 270; NA	2; 0; 1	260	249	262	1	operational since 1979	O/O	6/78
NEW JERSEY	Dept. of Corrections	NA: NA; 4158; 8819	1; 2; 6	3861	5671	3858	16	operational since 1976, OBSCIS under dev.	S/L	10/76
NEW MEXICO	Criminal Justice Dept., Corrections Division	2287; [3] ; 1718; 725	1; 3; 1	889	1002	668	3	operational since 1977	O,L/O,L	9/75
NEW YORK	Dept. of Correctional Services	NA; NA; 20843; NA	2; 12; 19	9737	16044	8103	5	operational since 1978	S/O	7/75
NORTH CAROLINA	Dept. of Corrections	36539; NA; 15824; 6855	3; 73; 5	8661	10994	8084	13	operational since 1967	S/S	--
NORTH DAKOTA	Director of Institutions	NA; NA; 276; NA	1; 1; 1	173	173	184	0	no ACDS	--	--
OHIO	Dept. of Rehabilitation and Corrections	NA; NA; 14246; 7413	0; 0; 8	7563	11432	6459	7	operational since 1978	S/O	1/76
OKLAHOMA	Dept. of Corrections	14138; NA; 3460; 1444	2; 8; 8	2339	3136	1823	5	operational since 1978	L/S	--

[1] O-OBSCIS, L=Other LEAA, S=State, X=Local
[2] Included with the probationers
[3] Included with the incarcerated
[4] All but $20K was returned
[5] Includes juveniles

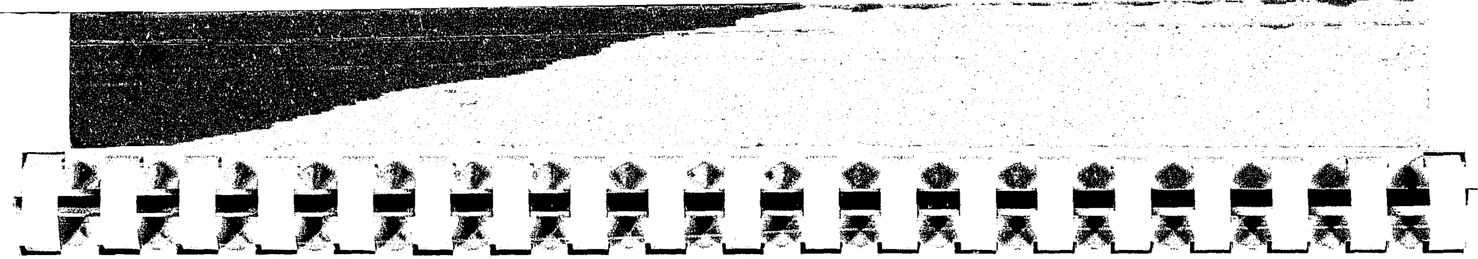


Exhibit 8

(Page 3 of 3)

State or Authority	Agency Name	Agency Responsibility: No. of Offenders: 1969 (probationed; detained; incarcerated; paroled)	Agency Responsibility: No. of Facilities (less than 50 offenders; between 50 and 250; more than 250)	Incarcerated Activity Levels: 1969: Admissions	Incarcerated Activity Levels: 1969: Population Level	Incarcerated Activity Levels: 1969: Releases	Years Since First ACDS	Current ACDS Status	Development Funding Sources[1] (initial system/ current system)	First OBSCIS Funding
OREGON	Dept. of Human Resources Corrections Division	9323; NA; 3120; 2055	0; 5; 2	1817	2473	1438	11	operational since 1976	S/S	--
PENNSYLVANIA	Dept. of Justice Bureau of Corrections	NA; NA; 8381; NA	0; 2; 7	4018	5986	3344	10	operational since 1970, OBSCIS under dev.	S/S	8/80
RHODE ISLAND	Dept. of Corrections	5217; [3]; 591; 263	2; 5; 0	309	409	227	0	scheduled for Aug.1980	S/S	--
SOUTH CAROLINA	Dept. of Corrections	NA; NA; 6400; NA	4; 23; 5	3967	5610	3134	4	operational since 1976	O/O	7/75
SOUTH DAKOTA	Board of Charities & Corrections	NA; NA; 639; 146	1; 2; 0	415	338	275	0	under development	O/O	7/79
TENNESSEE	Dept. of Corrections	6979; NA; 6568; 2500	0; 6; 7	2914	4555	2503	2	operational since 1978	O/O	11/76
TEXAS	Dept. of Corrections	NA; NA; 25076; NA	0; 0; 15	10854	18965	9074	10	operational since 1973, new under development	L/S	7/75
UTAH	Dept. of Social Services Division of Corrections	7100; NA; 1383; 652	5; 2; 1	383	657	292	4	operational since 1976, new under development	L/L	9/78
VERMONT	Agency of Human Services Dept. of Corrections	3683; NA; 424; 418	3; 3; 0	301	245	238	5	small separate systems oper., OBSCIS under dev.	L/L	8/79
VIRGINIA	Dept. of Corrections	11260; NA; 8679; 3124	3; 34; 12	3819	5488	3136	8	operational since 1978	S/O	11/75
WASHINGTON	Dept. of Social & Health Services Adult Corrections Division	11312; NA; 8866; 2748	1; 7; 2	2190	3373	1678	12	operational since 1978	S/S,L	--
WEST VIRGINIA	Dept. of Corrections	639[5]; NA; 1330; 610[5]	4; 5; 2	656	1266	633	0	no ACDS	--	--
WISCONSIN	Dept. of Health & Social Services Division of Corrections	14816; NA; 4705; 2806	7; 2; 8	1959	2990	1652	10	operational since 1970s, new system planned	S/S	3/79
WYOMING	Board of Charities & Reform	NA; NA; 467; NA	3; 2; 1	203	308	170	0	no ACDS	--	--
WASHINGTON, D.C.	Dept. of Corrections	NA; Unk; 4024; Unk	0; 1; 6	3984	2312	3987	12	operational since 1973	S/S	3/78
FEDERAL BUREAU OF PRISONS	U.S. Dept. of Justice Federal Bureau of Prisons	NA; NA; 26799[5]; NA	6; 7; 37	34416	24128	31748	10	operational since 1978	--	--
ST. LOUIS COUNTY	Regional Justice Information System (REJIS)	NA; [3]; 1600; NA	Total: 4	NA	NA	NA	5	NA	L/L	--
SAN DIEGO COUNTY	San Diego County	NA; [3]; 1500; NA	0; 2; 1	NA	NA	NA	13	NA	X/X	--

[1] O=OBSCIS, L=Other LEAA, S=State, X=Local

[2] Included with the probationers

[3] Included with the incarcerated

[4] All but $20K was returned

[5] Includes juveniles

- Most of the agencies have from 3 to 10 facilities or institutions, with a median number of 9 and a maximum of 81.

- The sizes of the facilities vary from agency to agency and within agencies as well. Different sizes of facilities and different numbers of facilities present different management problems. As examples, more institutions provide more opportunities for inmate transfer (thus inmate tracking may be more of a problem), while facilities with smaller sizes have less need for a computer to keep track of empty beds.

Incarcerated Activity Levels

- The figures shown are the admissions, population level and releases for the year 1976 (Parisi et al., 1979); they include only those inmates with sentences of more than one year and thus would be low for those states which have jurisdiction over detainees and/or offenders with shorter sentences -- this is not the case, however, for most states.

- Growth in the population can be gauged by the amount that admissions exceed releases, as they do in all cases except Alabama, Hawaii, Louisiana, Maine, Minnesota, Mississippi, and North Dakota; several of these states had a population decrease due to court orders to reduce overcrowding.

- The ratio of population to releases provides a relative estimate of average length of stay, assuming that i) sentencing and paroling practices remain constant and ii) all offenders are incarcerated for at least one year. Because the latter is not valid for many states, such an estimate would be high, especially for agencies with jurisdiction over detainees.

Years Since the First ACDS

- This figure indicates the number of years since the first automated system using computer programs (as opposed to unit record equipment) was installed. In some cases, we have been unable to determine precisely when the first computer programs were installed due to the fact that no one now working in the agency was present at the time; these are indicated by a number followed by a plus sign (+), implying at least that many years.

- State corrections agencies have a total of 311 years of ACDS experience, with an average of 6.2 years and a median of 5.0 years. If those 8 states which do not have ACDSs or have them in a test mode are not considered, the average becomes 7.4 years and the median 7.0 years.

- This figure is significant in that the field of automation is one in which experience counts. Frequently the first system installed by an agency is subject to special problems resulting from the fact that agency staff have not yet learned what the computer can do for them. Subsequent systems are often more successful due to the added sophistication of both users and data processing staff. According to Rosove (1967), the experience, knowledge, and software products gained during construction of one system are passed on to the development of subsequent systems. We have in general found this observation to be true, in that many agencies approached the development of their second system with much more realistic goals and much more concrete ideas of what they expected from the system. For example, in one state

(Missouri) the user committee involved in the development of the first system did not have enough data processing knowledge to make any useful suggestions. By the time of the development of the second system, the users had enough experience to know what they wanted from the system. This is not to suggest that every first automation effort is doomed to be a failure, only that an agency's prior experience with automation tends to be a positive influence on any subsequent ACDS development.

- Of the 40 state corrections agencies operating ACDSs as of July 1980, 25 are operating their first system, and 10 of these 25 are actively involved in developing new systems. One of the 25 is running both its first and second systems in parallel, and three others are running highly modified versions of their original system. At least two and possibly more of the remaining 15 agencies are on their third or subsequent system.

Current ACDS Status

- 40 states, Washington, D.C., the Federal Bureau of Prisons and numerous regions and localities (of which two, St. Louis County and San Diego County, are included in this study) have ACDSs which are operational. By operational we mean that at least one offender-based application is operating and officially in use by the appropriate agency staff.

- It should be noted that most systems are constantly being modified and upgraded, if not slated for replacement; as discussed in Section 5.1, this fact does pose a problem for the conduct of an ACDS evaluation.

- One state, Indiana, had an ACDS, the operation of which was suspended in 1975 for lack of funds; there are no plans to reinstate the system at present.

- 4 states are now in the process of developing their first ACDS and 4 states have no ACDS and no plans to develop an ACDS in the near future, although in the latter category we have included Nevada, which does have an inmate finance accounting system.

Development Funding Sources

- This column identifies the funding source(s) for the development of the initial ACDS and the current ACDS. In the cases where the current system is the initial system the funding source(s) is repeated.

- In 22 states, the first ACDS development was initiated with LEAA funds, 14 of those received OBSCIS grants and 8 received block grants or other LEAA funds. 28 of the currently operating systems were developed with LEAA funds, 21 of those under the OBSCIS program. Five additional states are in the process of developing ACDSs using OBSCIS funds.

- In our extensive review of the Analysis Sample of ACDSs, we found that ACDSs developed without LEAA funds are no different than those developed with LEAA funds, nor are those developed under the OBSCIS program any different than the non-OBSCIS funded ACDSs, although the variation within each of these groups is quite large. The reasons for the lack of impact of the funding source on the nature and type of system developed are i) the fact that

all corrections agencies have a core of similar needs, ii) the fact that OBSCIS materials are available to all agencies, regardless of their funding source, and iii) the fact that strict adherence to the OBSCIS program requirements has not been enforced.

Date of First OBSCIS Funding

- 35 states and Washington, D.C. have received $11.9 million in OBSCIS funding, with an average of about $331,000 per site. One of these, Arkansas, returned all but $20,000 of its OBSCIS grant, due to internal political reasons. Another state, Nevada, received an OBSCIS grant that was awarded to the Department of Parole and Probation rather than to the Department of Prisons; the award was used to upgrade the existing manual system rather than to develop an automated system.

- A discussion of the issues surrounding the OBSCIS funding program can be found in Section 3.1.

2.2 SYSTEM CHARACTERISTICS

The ACDSs which have been developed in the environments described in the previous section are as diverse as those environments. Exhibit 9 summarizes some of the more important characteristics of these systems. An explanation of and comments on each column of the exhibit follow.

Mainframe(s)

- Although ACDSs run on a wide variety of different central processing units or mainframes, the IBM 370 and its look-alikes (such as Amdahl or Itel equipment) dominate the field, with 28 installations. Six states have, in addition to their large mainframe, minicomputers located in their institutions; in most cases, these are used for peripheral applications such as inmate fund accounting or psychological test scoring.

- Idaho, Kansas, and Oklahoma each have their entire ACDS running on a single minicomputer.

- Michigan has 3 Burroughs 1860 minicomputes, and plans call for linking these machines in such a way that one serves as a central processor and the other two as front-end processors.

- Illinois has local inmate tracking systems on minicomputers at five institutions; although they are not linked to each other, they are able to receive inmate records from the statewide ACDS which is on the IBM 370 at the state data center.

- Wisconsin and Minnesota plan to introduce distributed processing through the use of minicomputers, which, in addition to running certain functions locally, would be linked to the central computer. These plans are further discussed in Section 3.1.

Mainframe Location

- 30 of the ACDSs are located at state data centers. Only six agencies have

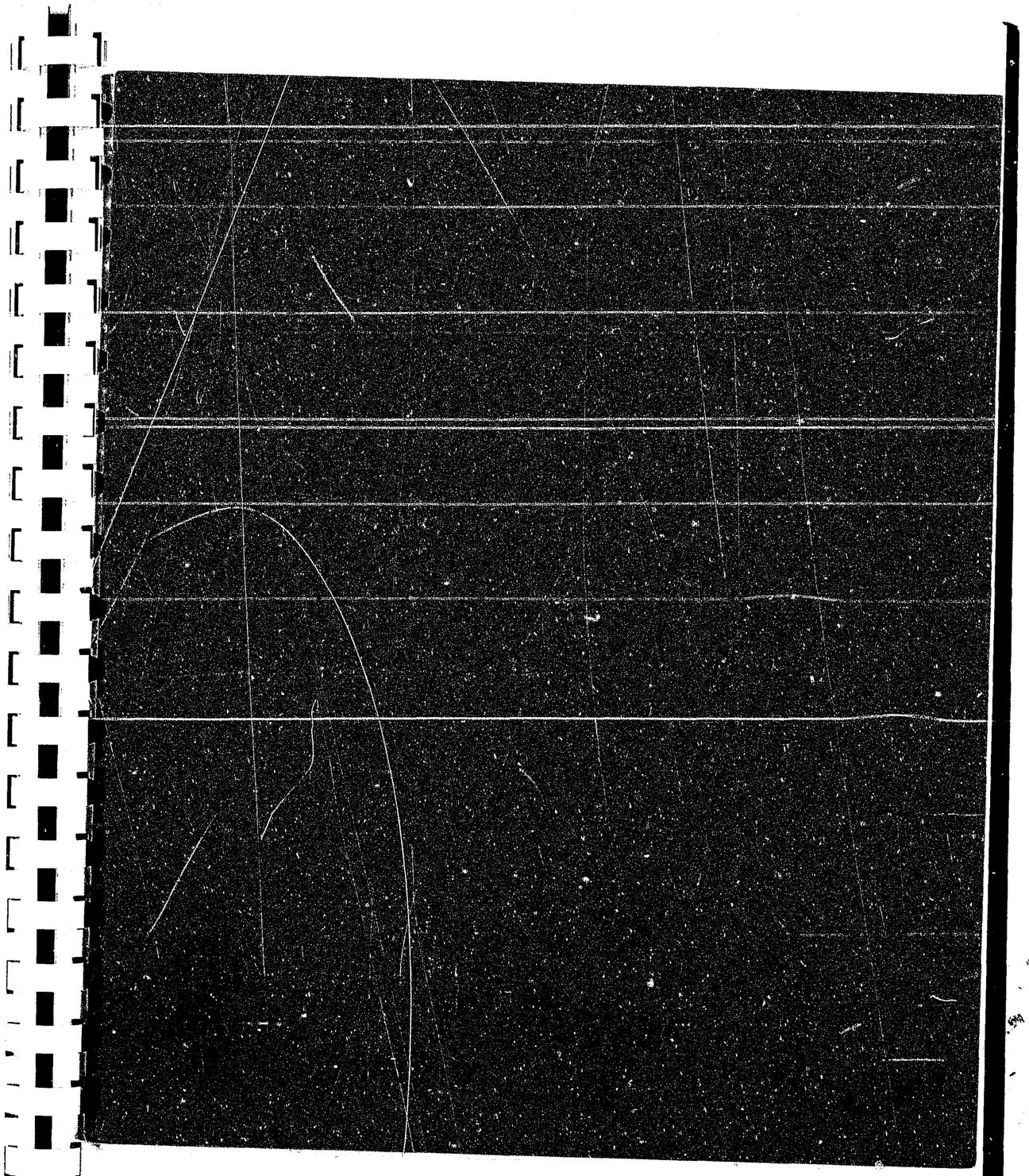


Exhibit 9

ACDS Characteristics

	HARDWARE			SOFTWARE							Interface With Other Criminal Justice Systems[2]
	Mainframe(s)	Mainframe Location	No. of Interactive Terminals	Source of Programming Support	Source of ACDS Software	System Software Package(s)	Software Language(s)	Extent of On-Line Processing[1] 1	2	3	4	
ALABAMA	UNIVAC 90/80	State Data Center	10	Corrections Agency	Crim. Just. Info. Ctr., Contractor	Univac/DMS	COBOL	0	0	0	0	OBSTS(A), CCH(M), Probation/Parole(A)
ALASKA	IBM 3031 (Not yet up)	State Data Center	0	Corrections Agency	Basic OBSCIS (from South Dakota)	CICS	COBOL	CP	OP	OP	BP	OBTS/CCH (A), Courts (A)
ARIZONA	2 ITEL AS/4, DG Nova	Dept. of Public Safety	9	Corrections Agency	Contractor	None	COBOL, ALGOL	0	0	0	B	None
ARKANSAS	IBM 370/155	State Data Center	105	State Data Center	Contractor, State Data Center	IBM/IMS, CICS	COBOL Assembler	0	0	0	0	CCH(A), Police (A), Probation (A)
CALIFORNIA	IBM 370/168	State Data Center	20	Corrections Agency	Corrections Agency	ADABAS	PLI, COBOL	0	0	0	0	None
COLORADO	Univac 1100/82, IBM 3033	Dept. of Corrections	9	Corrections Agency	Corrections Agency	DMS	COBOL, RPG II	0	0	0	0	None
CONNECTICUT	IBM 370/168, IBM 3032	State Data Center	18	Corrections Agency	Basic OBSCIS (from Iowa)	CICS	FASTER, COBOL	0	0	0	B	None
DELAWARE	IBM 370/158	State Data Center	0	State Data Center	Contractors	ADABAS	COBOL	OP	OP	OP	B	None
FLORIDA	IBM 370/145, IBM 4341	Justice Data Center	8	Corrections Agency	Contractors, Corrections Agency	IBM/IMS, MARK IV	FORTRAN	0	B	0	B	OBTS/CCH (A)
GEORGIA	Univac 1100/82	State Data Center	7	State Data Center	Contractors, State Data Center	Univac/DMC	COBOL	0	0	0	B	None
HAWAII	IBM 370/168	State Data Center	0	Corrections Agency	Corrections Agency	None	COBOL	B	B	B	B	None
IDAHO	IBM System/34	Dept. of Corrections	7	Corrections Agency	Corrections Agency	None	COBOL, RPG II	0	B	0	B	None
ILLINOIS	2 HP 3000	State Data Center	107	Corrections Agency	Contractors, Corrections Agency	CICS, HP/DBMS	COBOL	0	0	0	0	None
INDIANA	None	State Data Center	0	NA	Contractors	None	None	B	B	B	B	None
IOWA	IBM 370/158	State Data Center	0	Umbrella Agency	Corrections Agency	None	COBOL	B	B	B	B	OBTS/CCH (M), Police (M)
KANSAS	IBM System/34	Dept. of Corrections	Unk	Corrections Agency	Basic OBSCIS (from Iowa)	None	COBOL, RPG II	0	0	0	B	None
KENTUCKY	IBM 370/168	State Data Center	Unk	Corrections Agency	Corrections Agency	IBM/IMS, IBM Justice DB	COBOL, Assembler	OP	OP	OP	OP	None
LOUISIANA	Univac 1110	Dept. of Highways	25	Corrections Agency	From D.C.	Univac/DMS	COBOL	0	0	0	0	Disposition Reporting System (A)

[1] 1=Data Entry, 2=Data Editing, 3=Data Retrieval, 4=Data or File Updating; B=Batch, O=On-Line, P=Planned

[2] OBTS-Offender Based Tracking System, CCH=Computerized Criminal History; (A)=Automated Interface, (M)=Manual Interface

Exhibit 9

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	HARDWARE			SOFTWARE								Interface With Other Criminal Justice Systems[2]
	Mainframe(s)	Mainframe Location	No. of Interactive Terminals	Source of Programming Support	Source of ACDS Software	System Software Package(s)	Software Language(s)	Extent of On-Line Processing[1] 1	2	3	4	
MAINE	Honeywell 6000	State Data Center	10	Corrections Agency	Corrections Agency	None	COBOL	O	B	O	B	None
MARYLAND	IBM 370/145	State Data Center	30	Umbrella Agency	Umbrella Agency	CICS	COBOL	O	O	O	O	Police (A)
MASSACHUSETTS	Burroughs 6700	Criminal History Board	0	Corrections Agency	Corrections Agency	None	COBOL	B	B	B	B	None
MICHIGAN	3 Burroughs 1860	Dept. of Corrections	78	Corrections Agency	Corrections Agency	None	COBOL	OP	OP	OP	B	None
MINNESOTA	IBM 370/158, IBM 370/168	State Data Center	17	State Data Center	State Data Center	TOTAL	COBOL, Assembler	O	O	O	O	OBTS/CCH (M)
MISSISSIPPI	IBM 370/158, Amdahl V6-2	State Data Center	5	Corrections Agency	Corrections Agency	None	COBOL, Assembler	B	B	B	B	None
MISSOURI	IBM 370/158	Highway Dept.	15	Umbrella Agency	Corrections Agency	TOTAL	COBOL	O	O	O	O	None
MONTANA	2 IBM 370/158	State Data Center	21	Corrections Agency	State Data Center	CULPRIT (report writer)	COBOL	B	B	O	B	Police (A)
NEBRASKA	IBM 370/135	State Data Center	13	State Data Center	State Data Center	IBM/IMS, EASYTRIEVE	COBOL	O	O	O	O	None
NEVADA	Burroughs 8800, IBM System/34	Dept. of Prisons	Unk	Unk	Unk	None	COBOL, RPG II					
NEW HAMPSHIRE	Honeywell 6000	State Data Center	1	Statistical Analysis Center	Crime Commission	None	BASIC	O	O	O	O	None
NEW JERSEY	ITEL AS/5	Dept. of Public Safety	1	Dept. of Public Safety	Dept. of Public Safety	None	COBOL	O	B	B	B	None
NEW MEXICO	IBM 370/145, IBM 370/158	State Data Center	5	State Data Center	State Data Center	IBM/DMS II, CICS	COBOL	O	O	O	B	None
NEW YORK	Honeywell 6000	State Data Center	56	Corrections Agency	Corrections Agency	None	COBOL	O	O	O	O	OBTS (M)
NORTH CAROLINA	Univac 90/60	Dept. of Corrections	Unk	Corrections Agency	Corrections Agency	None	FORTRAN	B	B	O	B	Probation/Parole(A)
NORTH DAKOTA	None	NA	0	NA	NA	None	None					
OHIO	Univac 1100	State Data Center	3	State Data Center	State Data Center	Univac/DMS	BAL, COBOL	O	O	O	O	None
OKLAHOMA	DG 230, DG Nova	Dept. of Corrections	44	Corrections Agency	Corrections Agency	None	COBOL, FORTRAN	O	O	O	B	None

[1] 1=Data Entry, 2=Data Editing, 3=Data Retrieval, 4=Data or File Updating; B=Batch, O=On-Line, P=Planned

[2] OBTS=Offender Based Tracking System, CCH=Computerized Criminal History; (A)=Automated Interface, (M)=Manual Interface

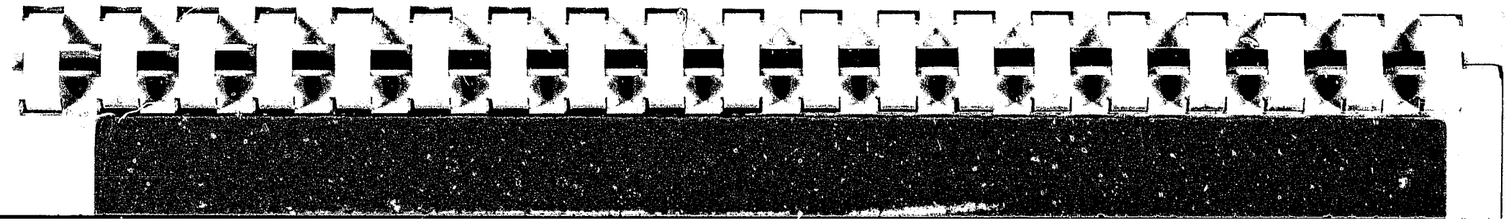


Exhibit 9

(Page 3 of 3)

	HARDWARE			SOFTWARE								Interface With Other Criminal Justice Systems[2]
	Mainframe(s)	Mainframe Location	No. of Interactive Terminals	Source of Programming Support	Source of ACDS Software	System Software Package(s)	Software Language(s)	Extent of On-Line Processing[1]				
								1	2	3	4	
OREGON	IBM 3032	Dept. of Human Services	0	Corrections Agency	Corrections Agency	EASTRIEVE	COBOL, BASIC	B	B	B	B	None
PENNSYLVANIA	Univac System 80	Prison Industries	0	Corrections Agency	Prison Industry (Inmates)	None	COBOL	B	B	B	B	None
RHODE ISLAND	IBM 3033	State Data Center	Unk	State Judicial Info. System	State Judicial Info. System	CICS	COBOL	O	O	O	O	None
SOUTH CAROLINA	IBM 360/65	State Data Center	24	Corrections Agency	From Illinois via Ohio	CICS	BAL, COBOL	O	O	O	B	None
SOUTH DAKOTA	IBM 370/158	State Data Center	3	State Data Center	Basic OBSCIS	CICS	COBOL	O	O	O	B	None
TENNESSEE	IBM 370/158, Amdahl 470	State Data Center	13	Corrections Agency	Corrections Agency	IBM/IMS	COBOL	O	B	O	B	None
TEXAS	IBM 4341	Dept. of Corrections	27	Corrections Agency	Corrections Agency	None	COBOL	B	B	O	B	CCH (M) Parole (A)
UTAH	ITEL AS15, Amdahl V6	State Data Center	0	Corrections Agency	Corrections Agency	CICS	COBOL	B	B	B	B	OBTS (A)
VERMONT	IBM 370/158	State Data Center	0	Corrections Agency	Corrections Agency	None	COBOL	B	B	B	B	None
VIRGINIA	IBM 370/158, IBM 3033	State Data Center	13	Corrections Agency	Corrections Agency	IBM/IMS	COBOL	O	B	O	B	Police (A)
WASHINGTON	Univac 1100/82	State Data Center	4	Corrections Agency	Corrections Agency (Inmates)	None	COBOL, FORTRAN	O	O	O	B	None
WEST VIRGINIA	IBM 3033	Unk	0	NA	NA	None	None					
WISCONSIN	IBM 3033	Dept.of Health & Soc. Serv.	0	Umbrella Agency	Umbrella Agency	None	COBOL, RPG II	B	B	B	B	None
WYOMING	IBM 370	Unk	Unk	Unk	Unk	None	COBOL					
WASHINGTON, D.C.	IBM 370/158	Police Dept.	34	Corrections Agency	Corrections Agency	CICS	COBOL, RPG II	O	O	O	O	None
FEDERAL BUREAU OF PRISONS	IBM 370/168 2 Amdahl V7	Dept. of Justice	63	Corrections Agency	Corrections Agency	IBM/IDMS	COBOL	O	O	O	O	None
ST. LOUIS COUNTY	IBM 370/158, IBM 370/155	REJIS	6	REJIS	REJIS	ALERT	FASTER	O	O	O	O	Police (A)
SAN DIEGO COUNTY	IBM 370/158	San Diego County	3	San Diego County	San Diego County	ALERT	COBOL, FASTER	O	O	O	O	Police (A) Prosecution (A)

[1] 1 Data Entry, 2=Data Editing, 3=Data Retrieval, 4=Data or File Updating; B-Batch, O-On-Line, P=Planned

OBTS Offender Based Tracking System, CCH=Computerized Criminal History; (A) Automated Interface, (M)=Manual Interface

their own ACDS computers, and another six have minicomputers which are used for peripheral applications (e.g., inmate fund accounting and psychological test scoring). The minicomputers are usually located at the records or business office of the institution.

- There is one case of a system being run on a computer not owned and operated by a government agency: the inmate information portion of the Florida system is run out of the computer center at the Florida State University. This system is now being converted to run at the Justice Data Center.

- There is one case (Pennsylvania) in which the ACDS computer is the responsibility of the prison industry, which serves as a service bureau to the department of corrections.

- The impact of the location of the mainframe on the development of ACDSs and on other related issues is discussed in Section 3.1.

Number of Interactive Terminals

- The number of interactive terminals (i.e., devices capable of both input and output functions) is provided to give an idea of the size of the network supported by individual ACDSs.

- Although most systems have fewer than 20 terminals, a few of the larger states (i.e., Illinois, Michigan, and New York) and the Bureau of Prisons have more than 50 terminals. The average number of interactive terminals per ACDS is 19.

Source of Programming Support

- Programming support does not always come from within the corrections agency. In 16 cases, the programming staff is employed by the state data center, the state planning agency, or some other agency external to the department of corrections. This fact has important implications for the future of the ACDSs in those states, since the impetus for further development often seems to come from the programming staff. It also could result in a mangement control problem, since the corrections agencies have no direct control over how much staff or which individuals are assigned to their needs. For example, two states reported problems because data center staff assigned to the project were frequently reassigned to other projects. This issue is further discussed in Section 3.2

Source of ACDS Software

- The majority of the ACDS software programs were written in-house by programming staff within the corrections agency. Those ACDSs which were developed by contractors or the state data center or other agencies external to the corrections agency were typically subject to additional problems resulting from the need to coordinate and control staff outside the agency, and sometimes from the lack of knowledge about corrections on the part of the outside contractors. For example, one state data processing manager remarked that he would not hire a contractor because an outsider could never know the needs of the agency as well as insiders. Issues dealing with the use of contractors are further discusssed in Section 3.2.

- One agency (Kentucky) made use of the corrections portion of an IBM product known as Justice Data Base. Although the data base design of this package was unaltered, many of the programs were replaced or extensively modified.

- Recently, six states (Alaska, Connecticut, Idaho, Kansas, South Dakota and Utah) have transferred in the Basic OBSCIS Software Package (BOSP), which, as mentioned in Exhibit 5, was jointly developed by Iowa and SEARCH Group, Inc. The package is operational in only one of these states (Kansas) at this time, but should shortly be in use in Connecticut.

- Aside from those receiving the BOSP, only two of the ACDSs now operating were transferred from other agencies. Louisiana transferred in the CRISYS system from the D.C. Department of Corrections, and South Carolina is running an Illinois-originated system that was transferred in from Ohio (where it was found to be prohibitively expensive to run and eventually dropped). Both of these systems had to be extensively modified so that the transferred version bear little resemblance to the original system.

System Software Package(s)

- Commercially produced system software may be used in support of the ACDS software. As examples, the states of Connecticut and South Dakota use IBM's CICS telecommunication software along with the Basic OBSCIS Software Package, and the states of Oregon and Nebraska use the EASYTRIEVE package to extract data and write reports from their ACDS files.

- One type of system software package which is becoming more common is the data base management system (DBMS). A DBMS is a set of programs which organize and maintain the data base and provide the ACDS with access to it. IBM's IMS and Univac's DMS are two examples of DBMSs. 19 agencies are using DBMSs; in four of those, the system is not yet officially operational. Systems which make use of DBMSs may not be easily transferrable to installations which do not have the same packages available. Issues involving DBMS use are discussed in Section 3.1.

Software Language(s)

- The majority of the ACDSs are written in COBOL; some have parts written in assembler language as well.

- Four of the systems are written all or partly in FASTER. This has been a problem in that the FASTER language is no longer supported by the vendor (IBM) and very few programmers have knowledge of the language.

- It is currently a part of the LEAA regulations (LEAA, 1979a) that grantees write all application programs in ANS COBOL or FORTRAN, with the exception that programs for mini- and microcomputers may be written in BASIC. It does not appear that these regulations have been strictly enforced (or perhaps because they are a recent addition), since California's system is written in PL/1, Florida uses META for a part of its system, New Hampshire uses BASIC, and several systems use some assembler language, as well as the four written in FASTER.

Extent of On-Line Processing

- On-line processing refers to the ability to interact with the computer system through a terminal device such as a teletype or a cathode ray tube (CRT). The functions of data entry, data editing, data retrieval, and data or file updating may be performed either on-line (i.e., via the terminal) or through batch processing. Most systems only provide the capability for one or the other, but in a few cases both are available.

- 35 of the currently operating systems in this study have some degree of on-line capability; that is, at least one of the above four stated functions can be performed via the terminal.

- 18 of the 29 systems now under development will have some degree of on-line capability. One of them (Vermont) is only in the earliest planning stage and the decision has not yet been made.

- It is interesting to note that a few of the systems having on-line data entry do not edit the data as they are entered, apparently because of the added expense involved (even though a substantial advantage of on-line processing, the ability to correct errors as data are entered, is not being utilized).

- The function of data or file updating deserves further explanation. When a system has on-line file updating (i.e., the files are modified at the time that the data are entered), it is known as a **real-time** system. Real-time systems provide the advantage that data can be retrieved and used as soon as it is entered rather than being unavailable until the batch file update takes place. Thus, if data are entered in a timely fashion, real-time systems can provide up-to-the-minute information. Real-time systems are quite costly, however, in that they are much more complex to program and require higher levels of data security. The issue of real-time systems is further discussed in Section 3.2.

Interface With Other Criminal Justice Systems

- An interface exists between two systems if data derived from one system are transmitted to the other. That interface is said to be automated if the data are transmitted in machine readable form; otherwise, the interface is manual. A terminal in a corrections office which can retrieve data from a law enforcement system, or vice versa, does not constitute an interface according to our definition, as data are not being directly transmitted from one system to another.

- Interfaces with parole or probation systems are not indicated when parole or probation applications are part of the ACDS.

- In terms of automated interfaces, the highest form of interface is, of course, by electronic signals: only one state (Alabama) -- where the corrections, pardons and parole systems share the same data base -- could claim such an interface. All other automated interfaces have been by magnetic tape or punched cards, which, of course, would still require a certain amount of human assistance.

- There are surprisingly few interfaces between OBSCIS and other automated systems -- surprising because one of the special requirements of the OBSCIS program is that "the State must assure that OBSCIS will interface with other State level criminal justice information systems, including OBTS/CCH, SJIS, and SAC (Statistical Analysis Centers), where such systems are being implemented or are operational" (LEAA, 1978a). The reasons for this are discussed in Section 3.4.

2.3 SYSTEM APPLICATIONS

The potential value of an ACDS can be partially gauged by the number and types of applications it can perform, as summarized in Exhibit 10. Based on our Structured Data Collection Instrument (SDCI) which considered some 30 offender-based applications (see SDCI, 4.3*), Exhibit 10 highlights 20 of the more prominent applications; they include the set of OBSCIS supported, offender-based applications (SEARCH Group, Inc., 1975), although some of the OBSCIS definitions have been modified or expanded to reflect more accurately the actual applications which have been implemented. Additionally, some of the applications in Exhibit 10 are also being considered for CMIS development (see Exhibit 5). Before providing a statistical summary of Exhibit 10, we define and briefly comment on the applications, which are numbered for convenience and discussed further in Section 3.3.

1. Admission Reporting. This refers to the recording and reporting of admission activity by offender and corresponds to the OBSCIS application of the same name. Nearly all of the projects either have or are planning this application.

2. Offender Record Retrieving. This corresponds to the OBSCIS application known as cross index retrieval and refers to the ability to retrieve an offender's records using keys other than the agency's assigned identification number (e.g., name or FBI number). 30 systems have this ability and 12 more are planning it.

3. Classification/Program Assignment Reporting. This encompasses and extends the OBSCIS offender profile application. It consists of the maintenance of offender profile data in a form in which it can be promptly retrieved and used as a basis for assessment, classification, and/or program assignment. It also includes the production of other reports such as a listing of programs for which an individual is eligible or a listing of individuals due to be reclassified. For example, in one state (Texas) this application consists of a computerized inmate job matching system which matches inmate's skills and training to jobs available throughout the prison system. This is one of the few applications which may directly benefit the offender, in the form of improved classifications and assignments; at least one (Missouri) of the twelve states having this application has reported such a result. 16 additional states are planning this application.

4. Problem/Special Needs Monitoring. This application is an expansion of the OBSCIS diagnostic problem reporting application. It involves the production of reports identifying medical or psychological problems or special situations (e.g., enemies, educational skills, and religious dietary requirements) which may affect the placement and/or assignment of offenders. Four systems have some form of this application (i.e., reporting on some subset of the possible problems or needs) and 13 are planning to add it.

*This refers to question 4.3 in the SDCI that is contained in Appendix A. Other SDCI references in this report are similarly noted.

Exhibit 10

Offender-Based ACDS Applications

Does The ACDS Include The Following Application Areas?
(Y=Yes, N=No, P=Planned, S=Separate System)

1=Admission Reporting, 2=Offender Record Retrieving, 3=Classification/Program Assignment Reporting, 4=Problem/Special Needs Monitoring, 5=Test Scoring, 6=Program Participation Reporting, 7=Disciplinary Reporting, 8=Offender Tracking, 9=Movement Reporting, 10=Transportation Scheduling, 11=Parole/Discharge Eligibility Date Calculation, 12=Legal Status Reporting, 13=Parole Hearing Scheduling, 14=National Statistical Reporting, 15=Inmate Accounting, 16=Health Services Tracking, 17=Visitor Control Reporting, 18=Victim Restitution Reporting, 19=Probation Status Reporting, 20=Parole Status Reporting, 21=Total "Yes" Replies

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
ALABAMA	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	N	N[1]	N[1]	12
ALASKA	P	P	N	P	N	N	N	P	P	N	N	P	P	P	N	N	N	N	P	P	0
ARIZONA	Y	Y	N	N	YS	N	Y	N	Y	N	P	Y	Y	Y	N	N	N	N	N	Y	9
ARKANSAS	P	Y	P	P	P	P	P	N	Y	N	Y	Y	P	Y	P	P	N	N	N	Y	6
CALIFORNIA	Y	Y	YS	N	N	P	N	Y	Y	N	N	N	N	Y	PS	N	N	N	N	Y	7
COLORADO	Y	Y	Y	P	Y	N	Y	Y	Y	N	P	Y	P	Y	YS	N[2]	N	Y	N	Y	12
CONNECTICUT	Y	Y	N	P	N	N	N	Y	Y	N	P	Y	P	P	N	N	N	N	P	P	5
DELAWARE	P	P	P	P	P	P	P	P	P	N	P	P	P	P	N	P	N	N	P	P	0
FLORIDA	Y	Y	P	N	N	Y	Y	Y	Y	N	Y	Y	N	Y	YS	P	N	Y	Y	Y	13
GEORGIA	Y	Y	P	N	YS	Y	Y	N	Y	N	Y	Y	Y	Y	P	P	N	N	Y	Y	12
HAWAII	Y	Y	N	N	N	P	P	Y	Y	P	Y	Y	Y	Y	N	N	N	N	N	Y	9
IDAHO	Y	P	N	N	N	P	N	P	Y	N	N	Y	P	N	N	N	N	N	N	P	3
ILLINOIS	Y	Y	P	Y	N	Y	Y	Y	Y	N	Y	Y	N	N	N	N	N	N	N	N	9
INDIANA																					
IOWA	Y	N	N	N	N	P	P	Y	Y	N	P	Y	N	Y	N	N	N	N	N	Y	6
KANSAS	Y	Y	N	N	N	Y	N	Y	Y	N	N	Y	Y	Y	P	N	P	N	N	Y	9
KENTUCKY	P	P	P	P	N	P	P	P	P	N	N	P	P	Y	N	N	N	N	N	N	1
LOUISIANA	Y	Y	P	P	N	Y	N	Y	Y	N	N	Y	YS	Y	YS	P	N	N	Y	Y	11
MAINE	Y	N	Y	N	N	Y	N	Y	Y	N	Y	N	N	Y	N	N	N	N	Y	Y	9
MARYLAND	Y	N	P	P	P	P	P	Y	Y	N	P	P	P	P	N	N	P	P	P	P	3
MASSACHUSETTS	Y	P	N	N	N	N	N	P	P	N	N	N	N	N	P	P	N	N	N	P	1
MICHIGAN	Y	P	N	P	Y	Y	P	P	P	N	P	Y	Y	Y	Y	YS	P	N	N	N	8
MINNESOTA	Y	Y	P	P	P	P	Y	Y	Y	N	P	Y	Y	Y	P	P	Y	N	Y	Y	11
MISSISSIPPI	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	P	P	N	Y	Y	Y	15
MISSOURI	Y	Y	Y	P	N	Y	Y	Y	Y	N	Y	Y	P	P	P	P	P	N	N	N	9
MONTANA	Y	Y	Y	N	N	Y	P	Y	Y	N	Y	Y	Y	N	Y	Y	N	N	Y	Y	13
NEBRASKA	Y	Y	N	P	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	YS	N	P	Y	N	Y	14
NEVADA	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	1

[1]Alabama Board of Pardons and Parole has a separate computer system which provides this application, using the same data base as the OBSCIS system.
[2]Application exists but is not being used.

Exhibit 10

(Page 2 of 2)

Does The ACDS Include The Following Application Areas?
(Y=Yes, N=No, P=Planned, S=Separate System)

1=Admission Reporting, 2=Offender Record Retrieving, 3=Classification/Program Assignment Reporting, 4=Problem/Special Needs Monitoring, 5=Test Scoring, 6=Program Participation Reporting, 7=Disciplinary Reporting, 8=Offender Tracking, 9=Movement Reporting, 10=Transportation Scheduling, 11=Parole/Discharge Eligibility Date Calculation, 12=Legal Status Reporting, 13=Parole Hearing Scheduling, 14=National Statistical Reporting, 15=Inmate Accounting, 16=Health Services Tracking, 17=Visitor Control Reporting, 18=Victim Restitution Reporting, 19=Probation Status Reporting, 20=Parole Status Reporting, 21=Total "Yes" Replies

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
NEW HAMPSHIRE	Y	Y	N	N	N	Y	Y	N[3]	N[3]	N	Y	Y	N	Y	N	N	N	N	N	P	7
NEW JERSEY	Y	P	N	N	N	N	P	Y	Y	N	P	P	N	Y	N	N	N	N	N	YS	5
NEW MEXICO	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	N	N	N	11
NEW YORK	Y	Y	N	N	N	P	N	Y	Y	N	N	Y	N	Y	YS	YS	N	N	N	N	8
NORTH CAROLINA	Y	P	P	N	N	Y	Y	Y	Y	P	Y	Y	Y	Y	N	Y	N	P	Y	Y	12
NORTH DAKOTA																					
OHIO	Y	Y	N	N	YS	N	N	Y	Y	N	N[2]	Y	N[2]	Y	N	N	N	N	N	N	7
OKLAHOMA	P	Y	P	N	YS	P	Y	Y	Y	P	N	Y	Y	N	P	P	N	P	P	P	7
OREGON	Y	N	Y	N	N	Y	N	Y	Y	Y	N	Y	Y	Y	YS	N	N	Y	Y	Y	13
PENNSYLVANIA	Y	N	N	N	N	N	N	Y	Y	N	N	Y	N	Y	N	N	N	N	N	N	5
RHODE ISLAND	P	P	P	N	P	P	P	P	P	N	N	P	P	N	N	N	N	N	N	N	0
SOUTH CAROLINA	Y	Y	P	N	N	Y	Y	Y	Y	P	Y	Y	Y	Y	Y	P	N	N	N	N	11
SOUTH DAKOTA	P	P	N	N	N	N	N	P	P	N	N	P	N	P	P	N	N	N	N	P	0
TENNESSEE	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	N	YS	YS	P	15
TEXAS	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	N	Y	Y	P	Y	N	N	N	11
UTAH	Y	P	P	P	N	P	P	P	Y	N	N	Y	P	P	N	N	N	N	Y	Y	5
VERMONT	Y	P	N	N	N	Y	P	P	Y	N	Y	P	P	Y	N	N	N	N	N	N	5
VIRGINIA	Y	Y	P	N	N	P	P	Y	Y	P	Y	Y	P	P	P	N	N	N	Y	Y	8
WASHINGTON[4]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	P	N	N	Y	Y	15
WEST VIRGINIA																					
WISCONSIN	Y	N	N	N	YS	Y	YS	N	Y	N	N	Y	N	Y	P	N	N	P	YS	YS	9
WYOMING																					
WASHINGTON, D.C.	Y	Y	N	N	N	YS	N	Y	Y	N	N	Y	Y	P	P	N	Y	N	N	Y	9
ST. LOUIS COUNTY	Y	Y	N	N	N	N	N	Y	Y	N	N	Y	N	N	N	N	N	Y	Y	Y	7
SAN DIEGO COUNTY	Y	Y	P	N	N	N	N	Y	Y	N	Y	Y	N	Y	N	N	N	Y	N	N	8
TOTAL "Yes"	41	30	12	4	11	22	18	33	40	3	20	37	19	28	14	5	3	6	16	24	386

[2]Application exists but is not being used.
[3]Only one institution or facility has this application.
[4]Washington has three separate computer systems which perform the various applications.

5. Test Scoring. This corresponds to the OBSCIS application of the same name and refers to the automatic scoring of answer sheets for psychological, vocational, and intelligence tests. It is interesting to note that five of the 11 systems which have this application run it on a separate microcomputer system (using a proprietary software package), which is not linked to the main ACDS. Further study should be undertaken to determine the advantages and disadvantages of such a separate system. Five systems are planning to add this application.

6. Reporting of Program Participation. This corresponds to the OBSCIS program reporting application and refers to the collection of information on program participation and the reporting of program participation by program and/or by offender. 22 states have this application and 14 more are planning it. It is an important application in that, in addition to meeting administrative needs, it provides potentially useful information for program evaluation.

7. Disciplinary Reporting. This corresponds to the OBSCIS application of the same name and involves the collection and reporting of data on disciplinary infractions. Although associated with the individual offender's records, the information collected for this applicatin has also been used to pinpoint trouble spots in the institution. (A similar, non-offender-based application which was reported by two states is an incident-based reporting system which reports all incidents, including fights, accidents, escapes, etc.) 18 systems have this application and 13 are planning to add it.

8. Offender Tracking. This also corresponds to the OBSCIS application of the same name and covers data gathering and file updating for records reflecting changes in the status and location of offenders. This application is present in 35 systems and planned for 10 more; for many of them, it represents the core or primary function of the ACDS.

9. Movement Reporting. This corresponds to the OBSCIS application of the same name and includes the reporting of offender movement between institutions and between status categories. Nearly all the systems either have this application or are planning it. Since New Hampshire has only one major institution, it feels that there is no need for this application.

10. Transportation Scheduling. This involves scheduling and/or reporting of transportation of inmates transferring both within the correctional systems and outside of it (e.g., to court, to a doctor's appointment, etc.) Although this is a designated CMIS application, we have included it here because it deals with service provided to the individual offender and thus is offender-based. Only three states have even a limited form of this application and each of these only produces a transfer report; no explicit scheduling is done. Five states are planning to develop this application.

11. Parole/Discharge Eligibility Date Calculation. This corresponds to the OBSCIS application of the same name and involves the partial or complete computer calculation of dates on which the individual offenders are eligible for parole or discharge. Although many agencies claim that this function is too complex to be computerized, 20 agencies have done so and 9 more are planning to do so. In most cases, not all calculations can be done by the system; the more

complex and involved calculations must be done by hand. In the case of the Federal Bureau of Prisons' SENTRY system, the computer is used as an aid and the resulting dates are not automatically entered into the offenders' records. It should be emphasized that in many of the states which have successfully computerized this application, the sentencing laws can be extremely complex. This application has reportedly been a major time saver for at least four agencies.

12. Legal Status Reporting. This corresponds to the OBSCIS application of the same name and includes the reporting of offenders eligible for parole hearings or other review processes and the provision of relevant status and history information for those hearings. 37 systems have this application and 8 more are planning to add it.

13. Parole Hearing Scheduling. This could involve scheduling of parole hearings and/or reporting of outcomes of those hearings. It extends and builds on the legal status reporting application. 19 systems have this application and 13 are planning to add it.

14. National Statistical Reporting. This corresponds to the OBSCIS application of the same name and involves the generation of data for the NPS and/or UPR programs; it is one of the special requiremetns of the OBSCIS program (LEAA, 1978a). The data may be generated either in the form of printed reports or in machine readable form. 28 systems have this application and 10 more are planning to add it.

15. Inmate Accounting. This involves the processing of inmate bank accounts and commissary purchases; it is a planned CMIS module. 12 state agencies and San Diego County have this application; however, in six of these agencies it is a separate system rather than a part of the ACDS, a situation which is not unreasonable since an inmate's financial records are generally not relevant to most purposes for which the ACDS is used.

16. Health Services Tracking. This includes the recording of medical treatment received by individuals. Of late, there has been a growing interest in improving the quality of health care in corrections; for example, the July-August 1979 issue of Corrections Today was devoted to correctional health care. In the same issue, Thomas (1979) argued that the development of an ACDS health care component should offer significant benefits. Five systems have developed such a component (one of which has a separate health care system) and 13 are planning for this application.

17. Visitor Control Reporting. Also a planned enhancement of OBSCIS under the CMIS program, this includes the tracking of who is allowed to visit an offender and/or how many visits an offender has received. Three agencies now have this application and five are planning it.

18. Victim Restitution Reporting. This includes the recording and tracking of an offender's participation in a victim restitution program. In many states there are no victim restitution programs and where programs do exist they are frequently administered by agencies other than the corrections agency. The 1978 Sourcebook of Criminal Justice Statistics (Parisi et al., 1979) lists 12 state department of corrections or public safety administering victim restitution programs; six of these states have the victim restitution application on their ACDS while four more are planning to.

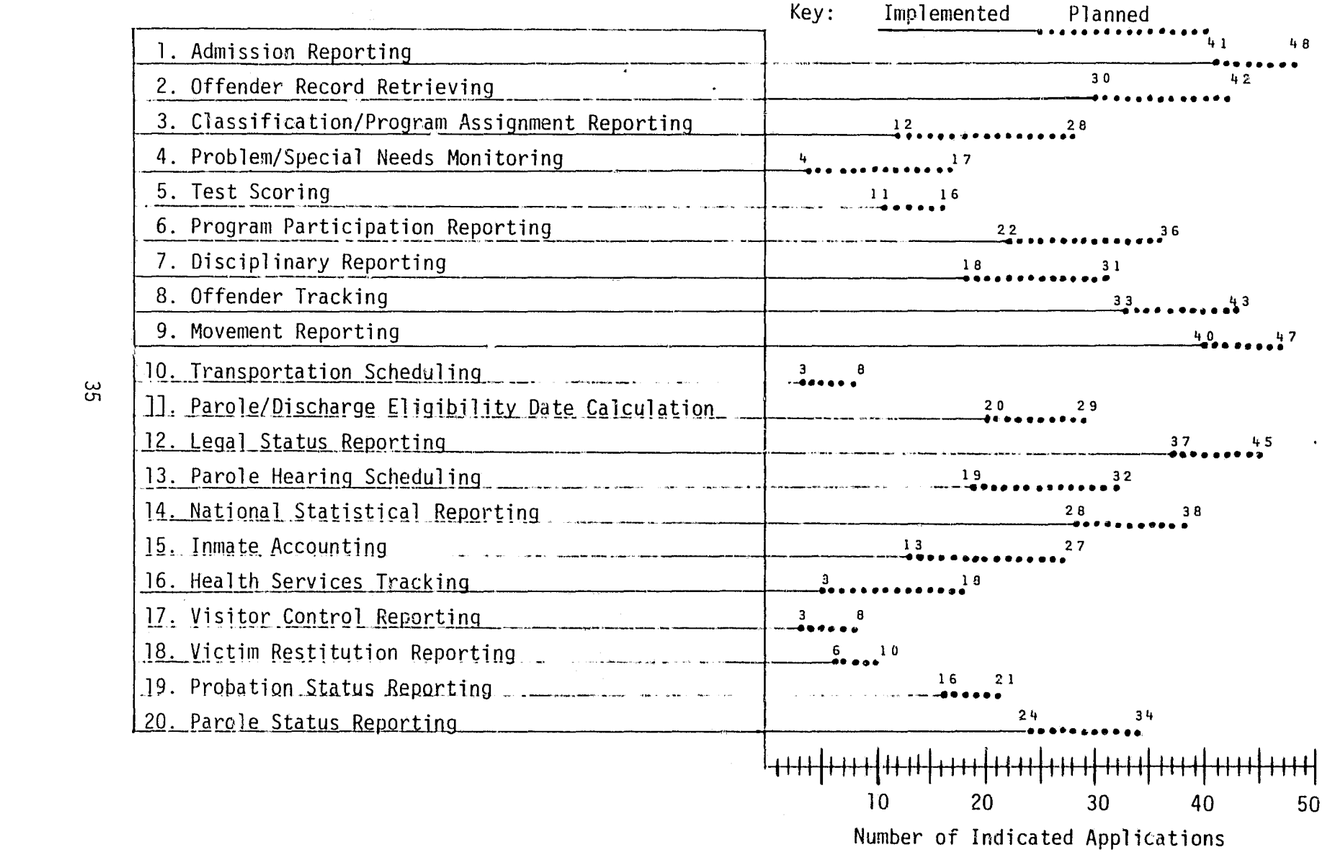
19. Probation Status Reporting. This involves the tracking and reporting of the status of individual probationers, including violations. 14 state agencies plus St. Louis County and San Diego County have this application; all of the 16 agencies have responsibility for probation supervision. Five more states are planning for this application.

20. Parole Status Reporting. This corresponds to the OBSCIS application of the same name and involves the tracking and reporting of the status of individual parolees, including violations. 22 of the 33 corrections agencies responsible for parole supervision and having an operational ACDS have this application. Additionally, two ACDSs in state agencies which are not responsible for parole also provide this application for the parole agencies and one (Alabama) provides the data base which is accessed by a separate set of programs in the parole agency. This type of cooperation is in fact one of the special requirements of the OBSCIS program (LEAA, 1978a). 10 more systems are planning to develop this application, two of which are in agencies not responsible for parole supervision.

Exhibit 11 provides a statistical summary of Exhibit 10. It is seen that, out of a maximum of 20, the average number of implemented applications per each of the 49 ACDSs identified in Exhibit 10 is 7.9; if the number of planned applications is included, then the average would increase to 11.8.

Exhibit 11

Distribution of Offender-Based ACDS Applications



3 SYSTEM ISSUES

The issues contained in this section are based on our collation and analysis of the Structured Data Collection Instrument (SDCI) results (which are summarized in Appendix A); they represent a culling and systematizing of the more important issues that were initially identified in the Preliminary Sample of 47 ACDSs and subsequently detailed in terms of the 26 systems in the Analysis Sample. While we address some three dozen ACDS issues in this section, there are, of course, many more possible issues that can be considered; some of these are also alluded to in the SDCI summary in Appendix A. In addition to the system issues highlighted in this section, we discuss some closely related issues in Section 4 from a more general, policy-oriented perspective, and then, in Section 5, consider a range of evaluation issues.

We have found it convenient to group the ACDS issues into four categories -- input, process, outcome and systemic. The input issues focus on the system's background and development; the process issues focus on the system's operation or performance; the outcome issues focus on the system's immediate impacts, especially in relation to its users; and the systemic issues focus on the system's broader impacts, as gauged from a total systems viewpoint. This four-category framework is not only logical from an ACDS development perspective*, but also from a program evaluation standpoint (Tien, 1979); Section 5.2 suggests that the same four categories can serve as the measures framework in an ACDS evaluation.

In discussing the four sets of issues in the next four sections, respectively, it should be noted that while our observations are not based on extensive evaluations, we do feel that they are valid, at least valid enough to be considered as test hypotheses in any formal ACDS evaluation. It should also be noted that in order to present an issue in more vivid terms, we provide accounts of explicit experiences; however, we have withheld the identities of those whose experiences were told to us in strict confidence.

3.1 INPUT ISSUES

11 issues are considered in this section: they are grouped into ACDS planning, ACDS design and ACDS implementation issues.

ACDS PLANNING

The four ACDS planning issues include needs assessment, user involvement, LEAA funding, and SEARCH Group, Inc., activities.

Needs Assessment

In the development of any automated data system, it is first necessary to undertake a needs assessment; that is, an assessment of the needs of the organization for automation, including what data should be automated; how up-to-date the data should be; what would be the demands on the data by potential users (i.e., planning, management, operations, research and statistics staff); and what applications programs

*In fact, the SDCI questions are, for the most part, also grouped in accordance with the four categories. Moreover, when we were on site, we were able to conduct our structured, SDCI-based interviews with relative ease; the four categories provided a convenient manner in which to structure the questions and to elicit the responses.

are required. The needs assessment effort is a necessary first step in the development of a technical "functional specification" document, which is in essence a blueprint by which hardware and software requirements can be identified. In our request for documentation from the ACDS agencies, we specifically requested material on needs assessment and/or functional specification but received no such formal documents (some informal, planning type reports were received). Our site visits were no more successful in this regard, but they did confirm our suspicion that this critical first step was, for the most part, ignored in the ACDS development process.

It is our considered opinion that the absence of a formal needs assessment or functional specification effort can be identified as one of the major reasons for ACDSs -- especially their earlier versions -- to have failed or not to have lived up to expectation. Moreover, we feel that it is never too late for such an effort since all automated systems are either being redeveloped or being modified (to take advantage of new technologies or to meet new demands from users who are becoming more sophisticated in both using the computer and understanding its potential). In fact, the needs assessment or functional specification document should remain alive and be constantly updated.

User Involvement

A very important aspect of the above identified needs assessment effort is the involvement of potential ACDS users in carrying out the effort. The importance of user involvement in the development of automated systems has long been recognized; Section 4.1 contains an expanded discussion of this subject, including a literature review. Our findings in this study also strongly indicate that user involvement is necessary if the system is to meet the users' needs and to receive their support. Lack of user involvement has been a primary cause of difficulties in ACDSs.

Less than half of the 29 systems for which we have information on this subject had users actively involved in the planning of the system (SDCI, 2.6(A)), and only 9 that we know of had users involved in any facet of the ACDS testing phase. Without this involvement, it is difficult for data processing staff to know the needs and desires of the users, especially since, in most cases, the data processing staff do not have corrections background (SDCI, 1.14), and in at least 16 cases, they are not even employed by the corrections agency (SDCI, 1.15).

The reasons users have not been involved are indicated in SDCI, 2.6(C); all but one are forms of communications failure within the agency, including a lack of awareness on the part of agency administrators that the data processing technicians and the users must work together to provide a viable and useful ACDS. The one exception was a similar situation in that the ACDS was a part of an overall criminal justice system and the developers made assumptions about corrections' needs rather than consulting with corrections staff.

The effects of insufficient user involvement are quite serious, as shown in SDCI, 2.6(D). In 9 cases where the users were not actively involved in the planning phase, the resulting system was not satisfactory and/or the users were unwilling to utilize it and to therefore support it (from both the data input and data utilization perspective).

Because of these findings and because of our prior experience in the field, we recommend that much greater emphasis be placed on user involvement at every stage of ACDS development from the initial planning stages through the continuing maintenance of the system after it is operational. User involvement is needed throughout the

ACDS effort because people tend to mistrust that which is new and unfamiliar. Involvement makes the system familiar and gives the user a sense of ownership. Furthermore, involving the users in the planning and execution of the system test gives the users the opportunity to prove to themselves that the system really does work. Finally, involving users in the post-implementation stages helps to insure that the system will continue to meet their needs and receive their support.

LEAA Funding

It appears that LEAA funding -- in particular, OBSCIS funding -- has acted as a **catalyst** in the development of ACDSs. Data processing managers from at least 13 states claim that ACDS development would not have taken place without LEAA funding (SDCI, 1.19(A)). From Exhibit 8, we see that 22 states secured LEAA funds for their first ACDS, 14 of which received OBSCIS funding, and, in total, all but five of the 50 states (i.e., Kentucky, Mississipi, Oregon, Texas, and Washington) have received LEAA funds during the course of their ACDS development and/or redevelopment. The other benefits and effects of LEAA funding are indicated in SDCI, 1.19(A); they include enabling the implementation of more ambitious systems, influencing the support of other funding sources (i.e., state legislatures), and enabling corrections, rather than the central data processing agency, to have control of the ACDS.

Given the imminent demise of the LEAA and the curtailment of large scale ACDS funding by the federal government, what would happen to the LEAA supported ACDSs? Only 8 states have indicated that termination of LEAA funding has caused or will cause termination of ACDS activities, for the reasons stated in SDCI, 1.19(C). In general, the continued funding of ACDS by the states is encouraging; it would appear to indicate a certain degree of approval for the ACDS, at least on the administrator's level. However, a few of the funding takeovers by the state have resulted in considerably reduced ACDSs. In Indiana, the system was virtually terminated in 1975, save for the maintenance of a skeleton master file, pending refinancing of the system through the State Planning Agency -- this refinancing has yet to occur. In Arizona, although the funding for operating the system was continued by the legislature, no funds for programming staff were allocated. Nevertheless, most states have sufficient funds to maintain their ACDSs without assistance from the LEAA (SDCI, 1.19(B)). Several, however, have indicated that without LEAA support, they would not have funds for system development or expansion. Our recommendations regarding future federal support of ACDSs are discussed in Section 4.2.

Finally, in regard to the 35 OBSCIS supported ACDSs (i.e., those of 34 states and Washington, D.C.), it should be stated that there are no significant differences in terms of either characteristics or performance between OBSCIS and non-OBSCIS supported systems. This finding is not surprising since i) many states had some form of an ACDS before even joining the OBSCIS program, and ii) the OBSCIS program requirements and guidelines were, for the most part, not enforced. Although one might draw the conclusion that OBSCIS and other LEAA funds merely saved the states money, it should be stated that, as noted earlier, some states would not have initiated an ACDS, and we feel that the general progress in ACDS development would not be as advanced as it is today without federal funding support. Moreover, because OBSCIS material are widely available, the possibility that the OBSCIS program has influenced the developments of the non-participating agencies almost as much as the participants, should not be overlooked. Additionally, as discussed next, the BJS/LEAA-funded activities of SEARCH Group, Inc. in support of the OBSCIS program have also contributed to ACDS development.

SEARCH Group, Inc. Activities

Another part of the federal or LEAA support of ACDS development has been the activities of SEARCH Group, Inc., which, as noted in Exhibit 5, has been funded since 1973 by the Bureau of Justice Statistics (BJS) to undertake ACDS-related efforts (i.e., OBSCIS, SCRMS and CMIS). SEARCH's ACDS-related activities have been directed in four areas: publications, meetings, the Basic OBSCIS Software Package (BOSP), and technical assistance. Each of these four areas are discussed next, followed by some general comments.

Publications

In 1975, SEARCH published its first report (i.e., Volume 1) on OBSCIS (SEARCH Group, Inc., 1975), followed by a series of supplemental reports (i.e., Volumes 2 through 8) dating through 1979. SDCI, 2.1 summarizes some of the agencies' use and opinions of these publications, while our comments follow.

Although the data element dictionary contained in Volume 3, with an updated version in Volume 7, was for the most part not used by some 15 agencies (SDCI, 2.1), an analysis of the data elements collected by those agencies would probably be very similar, as the SEARCH published dictionaries were developed after consultation with several of those same agencies.

The implemenation plan in Volume 4, with a theoretical example of its use in Volume 5, provides excellent guidelines for ACDS planning, development and implementation. Most of these guidelines would apply to any software development project. Unfortunately, very few of the ACDS projects made use of them (SDCI, 2.1); in fact, many of the problems discussed in this report could have been mitigated or avoided had these guidelines been followed. Thus, while OBSCIS has provided significant assistance to the states, it has not prevented them from falling into the same problem areas and subsequently "reinventing the wheel". Perhaps, SEARCH should have played a more active role by not only disseminating but also helping with the enforcement of the OBSCIS guidelines.

The application definitions in Volume 2 have been useful to a majority of the states (SDCI, 2.1). As discussed in Section 2.3, many of the offender-based application areas developed by the majority of the states correspond closely to those defined by OBSCIS.

The remaining volumes in the OBSCIS series are not directly useful in that they contain very general information. Volume 1 describes the OBSCIS approach, while Volumes 6 and 9 provide some summaries and case histories. The apparent intent of these volumes was to stimulate interest in and enthusiasm for the OBSCIS model and the Basic OBSCIS Software Package (BOSP). As such, however, they tend to portray the experiences of certain states (especially Iowa) as being much more successful than we have found them to be. It is important to distinguish between OBSCIS and BOSP: OBSCIS refers to any system funded by the LEAA OBSCIS program, while BOSP is a specific OBSCIS-based software package which has been used in only a small (but increasing) number of OBSCIS states. All the documents discussed above except for Volume 8 are pertinent to OBSCIS. Volume 8 and several small pamphlets (i.e., Basic OBSCIS Administrator's Guide, Basic OBSCIS Implementation Strategy, and Basic OBSCIS Small Computer Installations) refer to BOSP; although BOSP is considered in a later subsection, the BOSP pamphlets deserve further comment at this time. In

general, they are promotional literature, and, as such, convey some impressions which are not only inaccurate but, in our opinion, potentially detrimental to an agency planning an ACDS. The pamphlets suggest that BOSP can be successfully implemented in 90 days; it would, however, be very poor practice to implement such a major system in such a short time. The Iowa system, which was barely implemented in 90 days, has been far less successful than is claimed in these volumes, partly because the speedy implementation precluded user involvement in the process. The user support claimed for the Iowa project does not exist. In addition, the Administrator's Guide states that SEARCH can provide pre-installation planning, training, and software installation and validation. It would be to an agency's disadvantage to allow these tasks to be done for them, without close coordination and understanding. Moreover, it is questionable whether SEARCH would be able to provide software validation, as no standard test package exists. These misrepresentations are important because in order to adequately plan, agency administrators must have an accurate idea of what resources will be needed to build the system. For example, an agency intent on transferring in a BOSP system should be apprised of the fact that the documentation from the sending agency may not be up-to-date and that the programs may have problems which would have to be "debugged".

In sum, the value of the SEARCH publications depends on their use. If they are viewed as a starting point for discussion between data processing and user staff in determining the latter's needs, they can be very useful. In a few cases, however, they were used as a substitute for analysis and discussion of the state's own needs; to employ these publications in such a manner is extremely poor practice and should be more explicitly discouraged within the text of the publications.

Meetings

The OBSCIS User's Group meeting have been held once or twice yearly for a number of years. In addition, there was an OBSCIS project seminar held in September of 1977. Several states reported that these meetings are the most valuable of the SEARCH activities. These states found the opportunity to exchange ideas and discuss problems informally with other state staff extremely helpful. It seems that the formal sessions at these meetings have been less useful in that the presentations in many cases reflected, in the words of one attendee, "the ideal rather than the real systems". This is particularly evident in the OBSCIS Compendium, which is a published report of the proceedings of the OBSCIS seminar. The reports in this volume describe many of the systems as much more extensive and more successful than our findings have indicated. In spite of this fact, many states would like to see the meetings continue.

Basic OBSCIS Software Package (BOSP)

The Basic OBSCIS Software Package (BOSP) was developed for SEARCH by a subcontractor, Stochastic Systems Research (SSR) Corporation, using a Xerox computer. Before designing the system, SSR spent several days in each of 8 or 9 states to get an idea of what their needs were and how they varied from state to state. According to SSR, the system was designed with an awareness of the need for the system to be adapted for each individual state, and built to make those adaptation easy, thus resulting in a much more flexible system than would be possible were it written within a single state environment. This being the case, the package is bound to become less and less flexible as it is transferred from state to state, since each state must make changes to meet its own needs.

Iowa was the first state to install the original batch version of BOSP, putting it into operation in July 1978. Before it was completely debugged, Iowa's version was transferred to Connecticut where it was extensively modified and on-line data entry, editing, and retrieval was added. SSR was contracted by Connecticut to help make the needed changes. However, due to a number of problems, this is not yet operational. Iowa's version was also transferred to Kansas where it was also extensively modified and implemented on an IBM system 34 minicomputer. Kansas' version also has on-line data entry, editing and retrieval; it has been operational since December of 1979. Kansas' version has been transferred to Idaho; Connecticut's version has been transferred to South Dakota and Utah; and South Dakota's version has been transferred to Alaska. Copies of South Dakota's version have also been sent to Utah, Connecticut, Vermont, Montana, California and Australia for examination. One other version of the system exists on SEARCH's Data General Nova minicomputer.

A problem area with these transfers has been that every one of them has taken place before the system being transferred was put into operation. Because of this, there is much duplication of debugging effort going on. Furthermore, contrary to the impression given by SEARCH's promotional literature, there is no standard BOSP. Each existing BOSP installation has updated the system to meet its own needs without considering transfer isues and without updating the BOSP documentation. It has been suggested that SEARCH maintain a prototype version in a state; it is our impression, however, that the states' needs vary too much for this to be practical. Nevertheless, there should exist some means of communicating "bugs" found in one BOSP version which may exist in other versions; SEARCH should play a key coordination role in this area and should also provide technical assistance in debugging BOSP. Although there were many bugs when BOSP was first introduced, South Dakota claims most have been cleaned up. The reports of the degree of difficulty in modifying BOSP programs vary; Iowa and Kansas, however, do claim that the package was able to reduce the time needed for implementing a system. Two other BOSP deficiences require attention, perhaps SEARCH attention. One minor deficiency is the lack of a provision for purging files. The other, a major deficiency, is the poor BOSP documentation, especially the lack of detailed program documentation. Further, the installation guide should be much more specific, especially in the areas of installation-dependent program changes, file initialization, and conversion (which is not even mentioned); it would be of great benefit to future users to provide more information in these areas. If BOSP documentation is to be useful, however, it must reflect the current, up-to-date versions of the system. Again, SEARCH could play a key role in this regard.

Technical Assistance

SDCI, 2.2(A) indicates that 8 states have made use of SEARCH's technical assistance. Half of these found it very useful, while two found it not useful at all (SDCI, 2.2(C)).

The area in which the assistance was found to be most helpful was that of presenting staff and resource needs to the administration (SDCI, 2.2(B)). Frequently, it takes outside consultants to convince administrators of what their staff have been telling them all along. The area in which the technical assistance has been weakest is that of software debugging and modification (SDCI, 2.2(B)); this fact is especially unfortunate since, as noted in the above BOSP discussion, we feel that software is an area of critical technical assistance need.

General Comments

The activities of SEARCH Group, Inc., in corrections have proved valuable to many states; the OBSCIS model publications and the OBSCIS User's Group meetings have been especially helpful. SEARCH's role as a middleman in the development and dissemination of BOSP has been useful, while its technical assistance efforts have had limited success.

However, SEARCH has a tendency to oversell its own products and to claim success for projects which are either not yet completed or are having difficulties. This may unduly influence states toward adopting a system which may not be the best for them. Along with OBSCIS and BOSP information, SEARCH should also provide information about systems which were not developed under the OBSCIS model to states planning an ACDS development or redevelopment. Information such as is found in Section 2 of this report should be kept up-to-date and made available to anyone building or modifying an ACDS.

Additionally, as elaborated on in Section 4.2, we feel that the federal government should continue funding i) basic ACDS research and development efforts, ii) ACDS-related technical assistance assignments to states which require them, and iii) a national clearing house for ACDS-related information, including a yearly national meeting for ACDS administrators to meet each other and to be exposed to recent ACDS developments. The fact that SEARCH is carrying out some aspects of the above three activities in its current CMIS program may augur for it to continue in such a capacity. However, although we feel that SEARCH has in general carried out its responsibililties with diligence, we are of the opinion that the federal government (i.e., BJS) should competitively award such a grant every, say, five years.

ACDS DESIGN

The four ACDS design issues include computing facilities, data clarification, codification and standardization, data base design and data base creation.

Computing Facilities

In considering an ACDS's computing facilities, two related issues stand out: the location of the mainframe and the configuration of the hardware.

Mainframe Location

Exhibit 9 identifies the mainframe location of the various ACDSs; if we were to cross-tabulate this information with the problems reported as a result of this arrangement (SDCI, 2.5(B)), we would get Exhibit 12. The three "other agencies" referred to in the last column of the exhibit are a state university, a social services agency (which is not an umbrella agency to corrections), and a computer installation run by prison industry. From the exhibit it can be seen that only 6 agencies have their own computers; the majority (30) use the services of state data centers.

Because our SDCI data are incomplete, no firm conclusions can be drawn; however, some overall observations, based not only on the collated data but also on conversations with state agency staff, can be stated. More specifically, it is our impression that the most satisfactory arrangement is for the corrections agency to have its own computing facility. Most of the problems shown in Exhibit 12 would not occur or can be easily solved if corrections has control over the computer. There are several additional disadvantages to using computer services outside the agency. First, there is

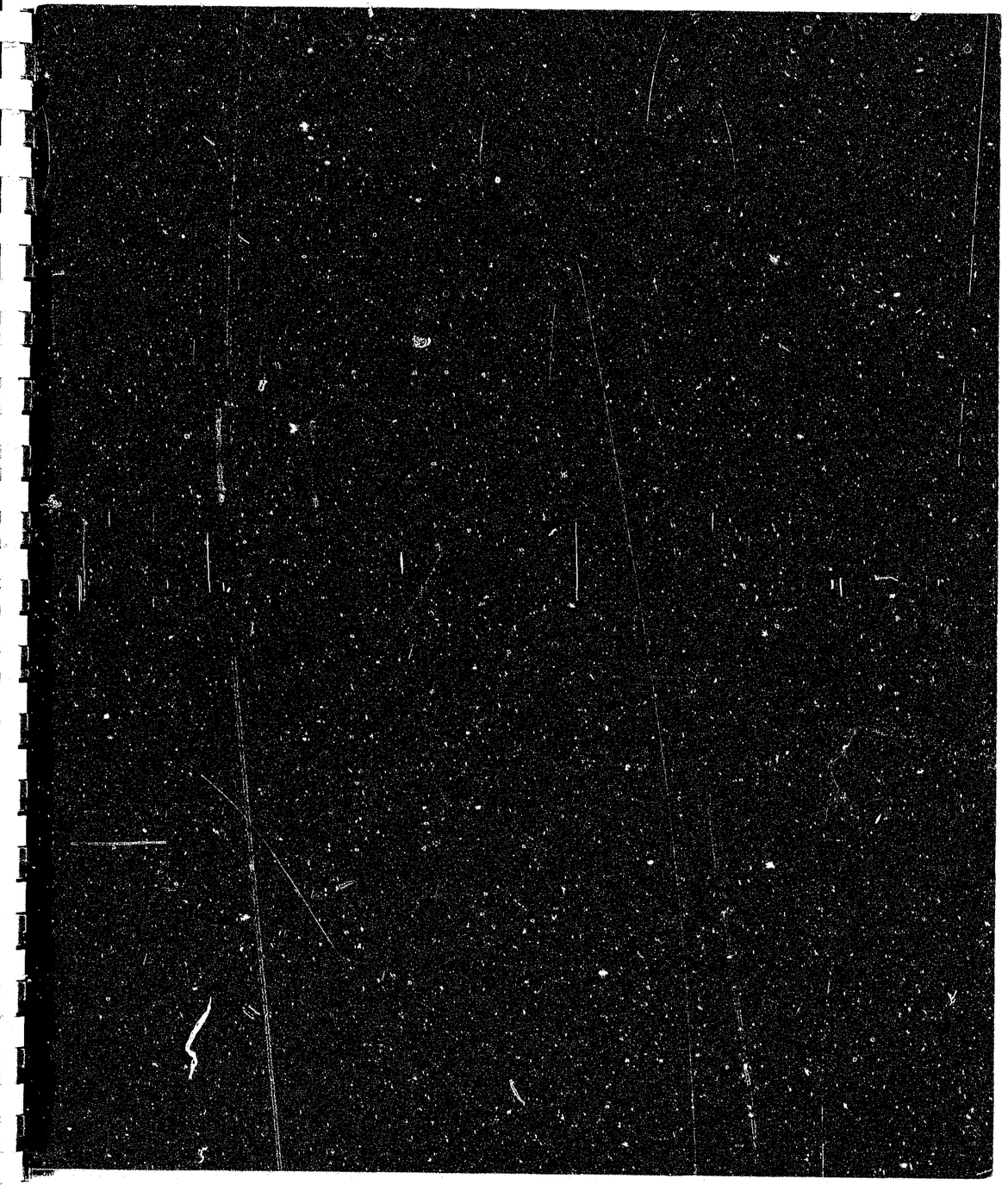


Exhibit 12

Mainframe Location and Associated Problems

	MAIN FRAME LOCATIONS					
	Corrections Agency	State Data Center	Criminal Justice or Police	Social Services Umbrella Agency	Other Agency	TOTAL
Number of ACDSs	6	30	7	2	3	50
Reported Problems:						
insufficient hours of scheduled machine availability			1		1	2
slow turnaround or response time due to low priority of corrections as a user		2	2		1	5
slow turnaround or response time due to saturation of the system			1			1
too much downtime	1	1	2		2	6
not enough hardware capacity to operate the system		2	1			3
not enough resources for parallel testing		1				1
insufficient access to systems personnel		1				1
system staff not familiar with needed software packages		1				1
not enough control over software packages used by agency			1			1
reassignment of programming staff		2				2
TOTAL PROBLEMS REPORTED	1	10	8	0	4	23

CONTINUED

1 OF 2

often a lack of freedom to choose the most appropriate teleprocessing package, data base management system, or any other software package. For example, one agency which uses a criminal justice data center is unable to run certain research applications because the computer center does not have a standard statistical analysis software package. A second problem is the fact that the corrections agency does not have the power to augment insufficient resources or to control data processing expenditures. Third, in some cases the computing facility staff must approve the corrections agency's plans; this review procedure substantially delayed ACDS development in at least one state. All of these problems may have an inhibiting effect on the development and operation of an ACDS.

There is one disadvantage to a corrections agency owning its own computing facility; that is, the corrections agency must bear the complete cost and responsibility for the purchase (or rental) and operation of the equipment. However, with the current availability of smaller, less expensive, but still powerful mini- and microcomputers, this is less of a burden than it was in the past. Section 4.5 addresses this issue further.

Hardware Configuration

Although there are various hardware configurations which are suitable for an ACDS, most agencies have no choice as to the type or configuration of computers they may use, since state policies generally dictate that they must use existing data centers, as highlighted in Exhibit 12. This may partially explain why none of the current ACDS hardware configurations is unusual. Aside from the five exceptions to be discussed, all the ACDSs run on large scale computers with either single or multiple-linked mainframes or central processing units. Six systems also have minicomputers to run peripheral systems such as inmate fund accounting and psychological test scoring; one has a minicomputer serving as a remote job entry terminal. Exhibit 9 lists the current ACDS hardwares.

Three (i.e., Idaho, Kansas and Oklahoma) of the five exceptions are systems which run on minicomputers. The Kansas and Oklahoma systems are on-line; the Oklahoma system supports 44 terminals. The current Idaho system is extremely rudimentary; the agency is now working on transferring Kansas' version of BOSP. Kansas and Oklahoma both report success with their systems.

The fourth exception is the Illinois ACDS. Illinois has one system running on the state central computer (providing release date calculation and various types of reporting for all institutions in the state) and another -- inmate tracking -- system running on Hewlett Packard 3000 minicomputers in five institutions. These minicomputers are not linked to each other but they are linked to the central computer and can receive data from it. While admission data are automatically transmitted to the minis, all other data must be entered into each system separately at the present time. The software for the minicomputers was written by contractors to the Illinois Law Enforcement Commission for use in the Cook County Jail, then transferrred to the state institutions.

The last exception is the Michigan system, which has three Burroughs 1860 minicomputers. Currently, a 13 year old Master Tape System (which actually no longer uses tape) is being run on one of the minis while the other two are being tested. The Michigan system was originally planned to have a distributed data base and to run on a network of five minicomputers in a star configuration; however, this plan proved to be too ambitious. The plan now is to have a central data base on one of the minis, and to use the other two for backup and as front-end processors. In the meantime, the system is running in a test mode in the central office.

Two other states have plans for distributed processing systems. Wisconsin is planning to implement some applications on IBM 8100s in the institutions. It is planned to link these to each other through the large central computer. Minnesota expects to put up a similar system within a year; plans call for having Texas Instrument 900 Model 10s in five institutions and the central office -- these will be linked to each other through an IBM mainframe. It is also planned that an inmate's record would be transferred automatically when the inmate transfers.

Although it is encouraging to see states adopting such new technologies as minicomputers and distributed processing (which together can potentially solve several of the problems confronting ACDSs today, as indicated in Section 4.5), we feel that evaluations are warranted to better understand the impact and potential of these new technologies. These evaluations should be funded by the federal government and should be initiated before the new systems are installed so that before-after comparisons can be made.

Data Clarification, Codification, and Standardization

Before a process or system can be automated it must be completely specified and all arbitrary elements must be removed. This often means clarifying and codifying existing definitions and procedures and, in the case of a system where diverse entities such as correctional institutions are involved, standardizing definitions and procedures among them. The process of clarifying, codifying, and standardizing is often, in itself, beneficial to the organization.

This has certainly been the case for corrections agencies; at least 20 agencies have had positive effects resulting from the codification, clarification, and/or standardization of their data elements and procedures (SDCI, 2.11), including 7 cases where the organization claims to have benefited from the added centralization achieved through new standards and procedures (SDCI, 6.2). These benefits have been derived even in states where the ACDS was considered to be unsuccessful or is no longer running. In one such state, part of the reason for the lack of success was the fact that standardization did not take place until the system was already running when difficulties maintaining the data base due to the lack of standardization became overwhelming. Judging from comments made by agency staff, the standardization resulting from ACDS development has been particularly valuable in the areas of date calculation (one state discovered that each institution's records office was computing the release date differently) and offender numbering systems (in at least three agencies, the separate offender numbering systems for each institution made following an offender's progress through the system extremely difficult).

Part of the planning of an ACDS should be the review and revision of data elements, forms and procedures. In order to avoid creating resistance among the users, this process should be a joint effort. The production of a manual should be a required product of such a process. The result of this process should be improved functioning of the agency even before the ACDS is implemented, as well as smoother functioning of the ACDS when it is implemented. Additionally, the process should be a continuing one, with the manual being continually updated.

Data Base Design

ACDS files generally contain a great variety of interrelated data. A typical ACDS may contain identification and demographic data which appear once for each offender, sentence data which may occur several times (once for each sentence

received), data about the programs in which the offender has participated, data regarding the offender's transfers between institutions, disciplinary incidents in which the offender has been involved, etc. Every offender who is currently in custody or recently released would have a record containing all or a portion of these data elements. The manner in which this diverse information is stored affects both the type of information which can be obtained from the system and the ease and efficiency with which it can be obtained. In the following paragraphs, file structures, access methods and the use of data base management systems (DBMS) are discussed, followed by some comments regarding historical data.

SDCI, 3.9 lists some of the potential characteristics of ACDS data bases. Although it is very inefficient to obtain information about individuals from sequential files, five ACDSs have sequential files. Fortunately, most of the ACDSs use more modern file structures which allow individual records to be accessed without having to read the entire file up to the point where the desired record resides, as is the case for sequential files. Some of these data bases have all the information about an offender in a single record with segments which recur as many times as needed for information such as sentence data or program participation data. Other data bases such as that for BOSP have the individual's information spread through several files. Exhibit 13 shows the data base structure for BOSP.

As is discussed briefly in Section 2.2, 19 ACDSs make use of available DBMSs, which allow more complex file structures and thus the ability to extract data in different configurations more easily and efficiently, all without increasing the complexity of the programming task. SDCI, 3.10 identifies the responses of 7 systems regarding the effects of using a DBMS; it should be noted that all the reported effects are positive. The experience of one agency, however, highlights some possible disadvantages to using a DBMS. In this agency, while the DBMS i) enables the storage of more repetitions of data such as transfer information, ii) reduces the amount of wasted disk space, and iii) provides the ability to add new data fields without having to modify the programs, certain costs have been incurred as a result of the DBMS, including i) overhead for functions which are not used, ii) overhead for maintaining certain types of summary information, and iii) programs which were at first prohibitively slow and expensive (many were rewritten once agency staff learned more about how to use the DBMS). On balance, the agency in question feels that the advantages outweigh the disadvantages. It appears to us, however, that the questions of whether to use a DBMS and, if so, which one to use are very complex, certainly deserving of a future "benchmark" testing study, as detailed Section 6.2.

With or without a DBMS there is one major disadvantage to the way the files are set up in many ACDSs. In at least 9 cases, statistical packages cannot be run directly against the ACDS files (SDCI, 3.12); this is unavoidable as, in most systems, statistical packages cannot be run against DBMS files or files with variable length records. Several systems get around this problem by creating an extract file at regular intervals for use with statistical packages. The same problem also exists for historical files in at least 8 cases (SDCI, 3.12); it is a significant problem because the primary use for historical data is in statistical analysis and reporting. For 10 out of 12 agencies responding, historical data are not structured so that statistics and trend data can be easily obtained (SDCI, 3.11(E)), and historical data are aggregated in only 3 of 17 systems (SDCI, 3.11(F)). It would be beneficial for agencies to give more attention to the design of their history file when planning their ACDS.

Exhibit 13

Basic OBSCIS Software Package: Data Files

Master File

- Key Segment: contains OBSCIS number
- Name Segment: contains name and alias indicator
- Identification & Description Segment: contains basic identification and demographic data
- Sentence Segment: contains most serious offense and aggregate release date
- Movement & Location Segment: contains current location and status, and most recent movement
- Parole Summary Segment: contains parole eligibility and conditions
- System Pointer Segment: contains
  - pointer to the individual's first record on the Sentence File;
  - pointer to the individual's most recent record on the Movement File;
  - space for pointers to other files which have not yet been developed (Name/Alias File, Institutional Program File, Program Experience File, Detainer/Warrant File, Infractions File, Parole Chronological Action File, Parole Information File, Medical/Diagnostic File)

Sentence File

Contains one record for each sentence for each individual

Movement/Location File

Contains one record for each movement for each individual

Translation Table File

Contains all codes used by the system and their decoded (English) values

It should be mentioned that at least 31 of the ACDSs contain historical data (SDCI, 3.11(A)); they are kept on the active file in 8 cases and on a separate file in 23. In most cases, the historical data are used when an offender is recommitted to form a part of the newly created record (SDCI, 3.11(B)).

As the years pass, it is obvious that the amount of historical data will grow until at some point the size of the files will become a problem. It is surprising that no agencies have developed purging criteria (SDCI, 3.11(C)), and only two have ever purged their files. Both of these purges were carried out under a court order which mandated the removal of those records of individuals who had been pardoned or whose conviction had been overturned. Although the size of most ACDS files has not yet caused problems, it is not too early for corrections agency staff to begin considering and implementing suitable purging criteria. In this regard, it would be useful for agencies to monitor the use of records from the history file to help determine which records could be appropriately purged. Typical criteria might be the age of the offender, or the amount of time since the offender was last released, or some combination of both.

Data Base Creation

The creation of the initial data base for an ACDS is a major undertaking and one whose difficulty is frequently underestimated by data processing staff. In building the data base, records are created for all inmates present as of a certain date. Some agencies have been able to do this in the course of a weekend; others have taken as long as a year. At least 8 agencies have encountered difficulties in building the data base (SDCI, 2.10), and in at least 2 cases these difficulties have caused delays in the completion of the ACDS project (SDCI, 1.12(B)).

The most common source of problems is the condition of the records to be converted. When planning the conversion, ACDS developers should take into account the fact that the manual records may be scattered, inaccurate, incomplete, or in nonstandard formats. It may be advisable for an agency to first improve its manual records before attempting conversion. (Even if an automated file is being converted, the same type of problems may be present, as was the case in at least one state.) Another problem has been insufficient data entry staff or facilities. Building the data base requires much more time than the ordinary day-to-day maintenance effort would require. Agencies planning to do a large amount of data entry in a short time (as is the case when building an ACDS data base) should consider hiring temporary data entry staff and equipment to avoid delays.

ACDS IMPLEMENTATION

The three ACDS implementation issues include system testing, system documentation, and user training.

System Testing

One of the foundations for success in any automated development effort is the conduct of a comprehensive system test: that is, a test in which all elements of the system are tested as interrelated components (Rosove, 1967), as opposed to a test of individual programs or system procedures. A well thought out and carefuliy executed test can prevent problems by detecting program errors so that they can be corrected before the system is put into operation, and by convincing users of the reliability of the system.

One very effective means of system testing is to run the new system in parallel with the old one for a period of time; that is, the same data is input to both the old and the new system and their respective outputs are compared. In addition to parallel testing, a test using prepared input with known results should be done; such a test is known as a benchmark test, which is detailed in Section 6.2.

Further, user involvement in testing is important for several reasons. First, the users' view of the system is very different from the programmers' view. Consequently, the users must participate in the test design to insure comprehensiveness. Second, users must participate in the execution and review of the tests as they, because of their knowledge of the operation of the agency, could discover discrepancies and problems which may go unnoticed by the data processing staff. Third, by participating in the test, users can satisfy themselves that the system works as it should. Finally, user involvement in testing can be an additional training device as it increases users' familiarity with the system.

Although at least 19 agencies performed some type of system testing, only about half undertook parallel testing (SDCI, 2.8(A)). While some agencies tested using live and/or artificial data, it does not appear that any prepared an elaborate test package with known results (i.e., benchmark). At least three agencies have had no system test whatever, preferring to install the system and see what happens. In one of these, it was claimed that the manual system was so inaccurate that it was useless for verification of the automated system. User involvement in testing, particularly in the planning and development of the test, has not been widespread, as can be seen from SDCI, 2.8(B).

In our opinion it would be extremely beneficial to ACDS projects to expand and improve system testing and user involvement in all phases of the preparation and execution of such tests. A very useful tool which could be developed to help bring this about would be a prototype test package or benchmark with known results, and a guide instructing agencies in how to modify the prototype for use in their system. As noted earlier, such a benchmark could also be employed to comparatively assess different DBMS packages.

System Documentation

The importance of good documentation cannot be underestimated. Good user documentation makes the user's job easier and affects his/her attitude toward the system. It also saves work for the programming staff as the users need their help less often. Good technical (system and program) documentation is invaluable in maintaining or transferring the system. In sum, good documentation of both kinds acts as a cushion against staff turnover and against some of the problems which may occur when the system is developed outside the user agency.

Good user documentation (i.e., user's guides, terminal operator's guides and/or coding manuals) should contain instructions which are written clearly and without jargon. They should also contain explanations of the error messages provided by the system and the procedures needed to correct the errors.

Good technical documentation should contain up-to-date flow charts of the overall system and of the individual programs. There should be a list of the files and their descriptions and, for each program, the input and output files should be indicated. Also for each program the important data areas should be noted and explained, and all the error conditions which can occur should be listed along with their causes and solutions. If there are computational algorithms used in a program, they should be

described in the documentation. There should be an operations manual which contains all the information needed by the computer operators to run the system (without consulting the programmers), and there should be an installation guide which clearly explains system start-up procedures. Finally, in order to be useful, documentation of all kinds must be accurate and up-to-date and must have an index or table of contents and numbered pages.

As can be seen in Exhibit 7, we received pertinent documentation from 29 agencies, including some that are not yet operational. Of the agencies that did not send us documentation, at least 6 had no documentation; some were in the process of developing documentation. Of those which did provide us with documentation, **none** met all of the criteria for good documentation listed above; in fact, none came close to meeting the criteria. Further, none of the agencies provided us with all the types of documents listed above (i.e., user's manual, system/program documentation, operations manual and installation guide) except for Iowa which provided us with the BOSP documentation. The BOSP documentation, however, does not reflect Iowa's system. For example, the operations manual shows the run control statements in the control language of the Xerox computer; this would obviously not be of any use to the operators of Iowa's IBM computer. Documentation from 9 of the agencies could be judged to be very poor, and none could be considered good. There may be at least one exception to these observations among the agencies which did not provide us with documentation. The Minnesota Department of corrections claims that its OBSCIS system documentation fills three file cabinets. Although the documentation added substantially to the time and cost of developing the system, Minnesota does admit that the programs have been very easy to maintain because of it. 9 agencies reported difficulty in maintaining the ACDS due to poor or nonexistent documentation (SDCI, 3.20(A)), and four reported that good documentation has eased system maintenance (SDCI, 3.20(B)).

In the data processing field in general, documentation is the most often neglected facet of system development and maintenance. Most programmers do not like to write and many managers view the time it takes to write documentation as unproductive, since it does not contribute to getting the system running in the first place. It is obvious that ACDS developers have been no better than the rest of the field in this respect. It would, however, be very helpful to the future of ACDSs if this attitude could be changed. One way to encourage this change would be to add documentation standards to program requirements for any future funding in the ACDS area. It might also be helpful if project managers budgeted time and money for documentation when planning the system and refused to let overruns on other parts of the project usurp that time and money. The OBSCIS Implementation Plan includes the preparation of documentation; as recommended earlier, closer adherence to this plan would have been beneficial and should still be encouraged.

User Training

Training may consist of anything from a brief overview of the system, to detailed instruction in its use, to intensive education in how it works. Training may be limited only to the staff who are directly using the system or to all levels of the organization. Properly executed training would not only teach people about the system, it would also gain support for and increase the utility of the system by making workers throughout the organization aware of what the system can do for them and how they can benefit from it.

It appears that ACDS agencies have not been making the maximum use of training. Of 22 agencies, only 10 offered intensive training to any of their users; 7 offered orientation sessions; and 5 gave no training at all (SDCI, 2.7). Lack of training has been pinpointed as a cause of lack of user support in at least three agencies (SDCI, 5.7). In one agency, where there was no training, the institutions refused to use the terminals provided for them. Those terminals were eventually removed and returned to the central office. In another agency, where there was no training initially, previously apathetic users have begun to support the system as a result of recently instituted training. In still another agency, where training was minimal, errors were introduced in the files when a "zero" was erroneously used instead of a blank to signify "unknown"; adequate training would have prevented this type of problem.

In sum, we believe that the amount of training for ACDS agencies should be increased. Further, training should not be restricted to those who directly use the system but should also be given throughout the organization so that staff at all levels can be aware of the potential benefits the system can provide to them and to the organization as a whole.

3.2 PROCESS ISSUES

9 issues are considered in this section: they are grouped into ACDS support and ACDS performance issues.

ACDS SUPPORT

The five ACDS support issues include organizational factors, data processing staff, software maintenance, system security, and system cost.

Organizational Factors

There are many organizationally-related factors which affect the performance and operation of an ACDS.

First, as noted in Section 3.1, the organizational location of the ACDS mainframe can affect its performance. Second, the position or rank of the ACDS administrator within the corrections organization is a critical factor; the higher he/she is, the more ability he/she has to resolve conflicts between users and data processing staff. Because of their common data interests, records and data processing staff should report to the same administrator. Indeed, three agencies which have combined their records and data processing administrator positions into one have found the change to have alleviated many problems. Third, the turnover in ACDS administrators presents a problem, particularly when an administrator who supports the ACDS is replaced by someone who is disinterested (as has been the case in at least three states), or is not replaced at all for a long period of time (as has been the case in several states), or is replaced by someone with a different philosophy regarding what purposes an ACDS should serve (as has been the case in at least three states). An interesting statistic is the fact that during the two-year period of this study, the heads of 16 ACDSs (i.e., nearly a third of the ACDSs in the study) that we know of, were replaced. Fourth, a much more severe turnover problem is that of the data processing staff, who, in the words of one ACDS administrator, "are trained by us and then lured away by private industry's much higher pay scales". Another reason for high turnover is the rigidity of some civil service systems which often make it impossible for staff to advance within their own organizational unit. The high level of staff turnover has contributed to ACDS delays in at least 7 states (SDCI, 1.12(B)) and to a staffing shortage in at least 8 states (SDCI, 1.16(B)).

Industry-level pay scales would obviously ease the turnover rate*; additionally, as indicated in Section 3.1, good system documentation can also ease the transition of responsibility from one staff member to another. Fifth, frequent reorganizations within the corrections agency have also affected ACDS operation (SDCI, 6.1(C)).

Finally, while ACDS developers have little control over the stability of their organizational environment, one step which can be taken to minimize the deleterious effects of instability is to build a broad base of support within the agency, so that if one administrator or manager leaves the agency, the ACDS project will be carried on by others.

Data Processing Staff

The background of the data processing staff is a factor affecting the kind of ACDS that is developed. If the system is designed and programmed by staff who are experienced in the working of the corrections agency, good results are more likely to occur. As reported by Tomlin (1970), we have also found that internal recruiting tends to achieve better cooperation from existing employees, who are also the users of the system. Administrators from the four agencies with data processing staffs who have corrections background (SDCI, 1.14) commented that their systems were more practical than they would have been had they only employed non-corrections-oriented programmers. There was one negataive comment about programmers with corrections background from a data processing manager (in a state where less than half of the ACDS staff were from corrections) who felt that the programmers with corrections background were far less competent than the others. This has apparently not been true in other states. A few states (Connecticut, Pennsylvania, and Washington) have in fact used inmates to program their systems. Only one problem was reported with this arrangement; high turnover due to transfer or parole.

The problem of programmers being reassigned by the state data center is one of several which can occur when the programming staff is provided by an agency external to the corrections agency, as was the case for 14 ACDSs (SDCI, 1.15). As with the ACDS mainframe location, all of these problems boil down to one: that of lack of control over the system which is being developed and the way in which it is developed. Consequently, corrections must negotiate to have at least some administrative control over those programmers assigned to its work. One state avoided this problem by close cooperation and by using the LEAA grant funds as leverage. Two others hired contractors to design the system as they felt they would have more control over contractors than over the state data center staff (SDCI, 1.14(C).

Contractors were hired for various reasons by at least 23 states (SDCI, 1.17(A)). The reasons are known for 9 of the 23, the most common ones being lack of or inability to fill data processing positions (SDCI, 1.17(B)). However, less than half of the reported effects of using contractors were positive (SDCI, 1.17(C)): the cited advantages included increased speed, lower cost, and better control over the system, while the disadvantages included unuseable or over ambitious designs, unfamiliarity with the system by agency staff, and lack of control over the system design. The fact that agency staif was unfamiliar with the system developed by outside contractors was

*One agency reported that the hiring of retired U.S. armed forces personnel with data processing background solved its staff turnover problem.

cited as a case of difficulty in program maintenance. Agency staff from three states pointed out that contractors cannot know the needs of the agency and thus must spend too much of their time learning about corrections. On the other hand, personnel from another state felt that contractors were useful because they have more freedom than state staff. Those that would hire a contractor in the future and those that would not were evenly divided (SDCI, 1.17(D)). Several of those that would gave the condition that close supervision of the contractor would be necessary. It is our feeling that such supervision would help to mitigate the problems associated with the use of contractors. Another helpful step would be stringent documentation requirements. In summary, better results can occur if the agency hiring the contractor is sensitive to the fact that ultimately it will be taking over full responsibility for the system.

Software Maintenance

The problem of software maintenance is one which is often overlooked; it is very important, however, because it has a direct bearing on such items as the quality and currency of the data in the system. As examples of the importance of the problem, consider the following: four states developed a new ACDS because the old one was too complex and hard to maintain (SDCI, 1.10(B)); delays in the completion of ACDSs were caused by difficulties in program maintenance in three cases (SDCI, 1.12(B)); errors in the data base were caused by program errors in four cases; and one state reported that delays in correcting program bugs caused user support to disintegrate. There are two important considerations in regard to maintenance: one is the characteristics which make a system easy or difficult to maintain; the other is the administrative procedures connected with system maintenance.

SDCI, 3.20(A) and 3.20(B) identify factors which have affected the ease or difficulty of maintaining ACDSs. The prominence of documentation in both questions is notable. Also notable is the fact that design and programming techniques such as top-down design, modular programming, and especially structured programming have helped to ease maintenance. On the other hand, administrative procedures for system maintenance are noticeably absent: we did not find any state where such procedures were evident. It is very important, once the system is up, to have established procedures by which the users can report system malfunctions and request system enhancements. Section 4.1 discusses this in more detail as it is an aspect of maintaining user involvement in and support of the system.

In sum, we recommend that agencies which are developing ACDSs make use of techniques such as structured programming which would make the software easier to maintain; that all ACDS projects develop good documentation, as discussed in Section 3.1; and that all ACDS projects develop explicit administrative procedures for system maintenance.

System Security

In order to safeguard an offender's right to privacy (which is further considered in Section 3.4) and to minimize misuses and abuses of ACDS data, the entire ACDS (i.e., hardware, software, data, and communications) must be secured or protected against accidental or intentional damage. Privacy and security are of concern for any automated system. They are of special concern for ACDSs because the individuals whose information is stored in the system have shown themselves to have a lesser regard for laws and regulations, and the information stored may affect their life and liberty.

The various types of measures which have been made available in ACDSs to provide security are shown in SDCI, 3.21. Measures dealing with the physical security of the central computer site are omitted as they are not peculiar to corrections and thus are beyond the scope of this discussion. No single measure listed is sufficient to thoroughly provide security. In fact, to be assured of absolute protection, all of the measures shown should be implemented. This has obviously not been the case. The most commonly implemented provisions (making the equipment inaccessible to offenders and limiting access by password and/or terminal identification) do, however, provide the greatest measure of protection. At least 9 agencies are aware of current LEAA regulations on privacy and security (LEAA, 1978b) and are attempting to comply with them (SDCI, 3.22(B)), but we have been unable to determine to what degree. Among the LEAA regulations is the stipulation that computer programs should be used to prevent, detect, and record unauthorized attempts to access the system, and that people working with or having physical access to the system be screened and informed of security regulations. In regard to this stipulation, 11 agencies keep a log of all attempted accesses, while 7 agencies inform users of security regulations (SDCI, 3.21).

In a few states, the security precautions are extremely inadequate. At least two states have on-line systems with no password protection; in one of these, terminals are located in the Department of Social Services offices where they are accessible to anyone. Although such lax security invites abuse, in practice, however, we are aware of only two security breaches. One of these was the destruction of computer terminals in the New Mexico prison riot; however, no data were lost because an alert computer operator in the state data center disconnected the terminals from the system when he realized there was trouble at the institution. The other problem occurred when a parolee, who had been inadvertantly employed by the central records office, changed his own records. This problem could certainly have been prevented had the records office staff been screened before hiring.

Although most agencies seem fairly complacent about the adequacy of their security precautions, we believe that there is a potential for serious problems in this area. We therefore strongly recommend that all projects implement at least the following minimum five precautions:

i) Terminals and keypunches or other data entry equipment should be inaccessible to offenders and should be key operated (with the key removed whenever the terminal is unattended);

ii) For on-line systems, access should be limited by password and terminal identification, and care should be taken to see that the passwords cannot be obtained by unauthorized persons;

iii) A log of all accessess and attempted accesses should be kept (this allows the agency to detect illegal accesses and to provide, if necessary, the offender with information as to who has received his/her records);

iv) All staff involved with or having access to either the automated system or the manual records should be screened and informed of the security and privacy regulations; and

v) Periodic security audits should be conducted to see that each terminal site is adhering to the security regulations and that unforseen problems are not developing.

One state data processing director indicated that he did not want to implement security and privacy precautions because they would make the system more complicated to use, which in turn would increase the users' resistance to the system. It is our opinion that the precautions listed above would not complicate the system greatly, and would not present a problem where other steps have been taken to assure user support. We believe the cost of these precautions is justified by the potential for abuse that exists were such steps not to be taken.

System Cost

Although some ACDSs have been in operation for a number of years, it is unfortunate that little seems to be known about what it costs to develop or operate them. Reliable cost data have been uniformly unavailable. The data are not being withheld by the states; rather, they simply do not have the costs of the ACDS separated from their other corrections-related costs.

In order to develop a useful cost model, it is necessary that the system costs be at least broken down into the categories specified in SDCI, 1.19(C) and 1.20. We also recommend that corrections agencies begin to separate ACDS-related costs from their other costs.

Finally, it should be stated that we are, of course, disappointed that no reliable cost data have been forthcoming since an important aspect of an NEP Phase I study is to discuss cost-related issues.

ACDS PERFORMANCE

The four ACDS performance issues include data redundancy, data quality, data currency, and data utilization.

Data Redundancy

One of the objectives of the OBSCIS program is the reduction of redundant data collection. The same data are collected, usually independently, by various agencies within the criminal justice system. For example, the data collected for the pre-sentence investigation (by probation in most states) are also collected by corrections when the offender is admitted to prison, and again by parole when the offender is paroled. Redundancy of this sort can only be eliminated if the systems can share the same data base through electronic interface, as discussed in Section 3.4.

Even within the corrections agency, the same data may be collected and maintained separately by various offices. For example, the institution's records office, the central records office and the caseworker may each maintain a file on the offender. An ACDS can eliminate the need for some of this redundancy by making the same files available to various parts of the agency. An additional form of redundancy occurs in agencies which have an ACDS that duplicates the information in the manual files. Redundancy in the latter case is not necessarily bad; rather the two parallel systems form a back up against the possibility that one or the other is destroyed, as was the case during the riots in New Mexico when a portion of the manual records was destroyed.

For the most part, ACDSs have not yet succeeded in reducing redundant data collection within the corrections agency. 20 of 25 manual systems completely duplicate the ACDS files (SDCI, 3.7(A)), and data collected for the ACDS are also

collected independently for other automated correctional applications (usually research) in at least five states and for non-automated applications in at least two (SDCI, 3.8). In a few cases, the ACDS has displaced or is expected to displace more than 10 percent of the paper-based system (SDCI, 3.7(B)); in these cases, what have been displaced are primarily index files and tickler files, all of which were time consuming to maintain. The reasons why duplicate files which could be displaced have not been are mostly ones that will be overcome with time as the ACDS becomes more available and reliable (SDCI, 3.7(C)). In four states, the manual system provides backup either when the computer is unavailable or where there are no terminals. In one state (North Carolina), the computer actually maintains the manual system; transactions are keypunched and entered into the ACDS which produces reports to be filed in the manual files. Having the computer do this has eliminated the need for many subsidiary files and saved a great deal of time for the records office staff.

It should be noted that to some degree manual files must duplicate the ACDS files; manual files need to be maintained for legal documents and items (e.g., psychological reports) which are not suitable for computerization. The expense involved is not substantially increased if the manual files also contain the information on the ACDS files, especially if the ACDS aids in the maintenance of the manual files and the extra protection of additional file backup is gained. The type of redundancy which is a problem is that which occurs when, instead of using ACDS files, staff within the organization collect and maintain their own redundant manual files. This can only be eliminated through training so that staff know what ACDS data are available and how to access the data, and by having clear paths of communication between the users and the data processing staff so that the users' needs can be met by the ACDS as they arise.

Data Currency

The requirement for timeliness of data in an ACDS varies according to the use to which the data are put. For research purposes or for reporting on the past functioning of the system, it is immaterial if the files are a month or even two behind. On the other hand, if the system is used for locating inmates or for establishing an inmate "count", nothing less than up-to-the-minute accuracy will be useful. The currency of the data is dependent on two related issues: the frequency with which the data files are updated and where the data are entered.

File Updating

An extremely controversial issue is that of the use of real-time file updating for ACDSs. In a system which has real-time file updating (known as a real-time system), the files are updated at the time of data entry through the terminal. In systems which are not real-time, data which are entered (either on-line or in batch mode) are stored until the next file update takes place. Exhibit 14(a) shows the predictable relationship between the frequency of update and currency of ACDS files. While real-time systems are more costly to program and to operate than other types, they do provide the advantage of having information available as soon as it is entered onto the system, which is very useful under certain circumstances. Although 19 of the ACDSs in this study are real-time systems, Exhibit 14(a) shows that at least four of those projects do not enter data in a timely enough fashion to derive any benefit from the real-time capability.

When we asked ACDS staff whether they felt that real-time file updating was necessary for certain functions, the results show that the majority felt it was not

Exhibit 14

Currency and Accuracy of ACDS Files

Frequency of Update	Currency of Files	No. of ACDSs
Real-time File Updating	No more than 24 hours out of date	8
	No more than 1 week out of date	4
	1-2 weeks out of date	0
	3-4 weeks out of date	0
	> 4 weeks out of date	0
Nightly or Daily File Updating	No more than 24 hours out of date	5
	No more than 1 week out of date	3
	1-2 weeks out of date	1
	3-4 weeks out of date	0
	> 4 weeks out of date	1
Less Frequent Updating	No more than 1 week out of date	0
	1-2 weeks out of date	3
	3-4 weeks out of date	3
	> 4 weeks out of date	5

(a) Currency of Files By Frequency of Update

Location of Data Entry	Currency of Files	No. of ACDSs
Central Office	No more than 24 hours out of date	2
	No more than a week out of date	5
	1-2 weeks out of date	2
	3-4 weeks out of date	2
	> 4 weeks out of date	6
Institutions	No more than 24 hours out of date	11
	No more than a week out of date	2
	1-2 weeks out of date	0
	3-4 weeks out of date	1
	> 4 weeks out of date	0

(b) Currency of Files By Location of Data Entry

Location of Data Entry	Data Error Rate	No. of ACDSs
Central Office	< 5%	5
	6-20%	3
	> 20%	2
Institutions	< 5%	6
	6-20%	3
	> 20%	3

(c) Accuracy of Files By Location of Data Entry

needed (SDCI, 3.17). Those that felt it was necessary were from agencies which also had jurisdiction over detainees, in jails where the turnover rate of the population is very high (e.g., an offender may enter, be transported to court, and then released within an hour's time). In such an environment, information which is even a few hours behind has very little utility for operational purposes. SDCI, 3.18 lists the reasons why some agencies have chosen not to go to real-time: cost-related reasons predominate.

In general, we feel that real-time file updating cannot be cost justified, except in situations where an ACDS is required to render real-time assistance -- as examples, tracking detainees, tracking inmates and taking the "count" (a procedure that must be carried out every few hours within an institution), and scheduling transportation runs. Actually, because the count and transportation processes represent real needs and because they are highly visible applications, we recommend in Section 4.4 that such real-time applications be given serious consideration. In all other situations, we see no reason why data which are updated within 24 hours (as can be provided by daily batch file updates) would not be adequate. However, we recommend that an evaluation be undertaken to determine the cost-effectiveness of real-time file updating.

Data Entry

Several of the causes of delay in getting data into the ACDS can be eliminated by having data entered locally at the institutions rather than centrally, as can be seen in Exhibit 14(b). One advantage to local data entry is that it eliminates the time delay needed for transportation of forms to the central office. It also shortens the time for error correction, as the person who submits the data may be the one entering it locally. Local data entry can also eliminate the time-consuming process of filling out forms by allowing data to be entered directly as it is collected; unfortunately, most corrections agencies do not do this, usually for the stated reasons of security and/or economy.

There are, however, costs associated with local data entry which must be considered. Local data entry requires standardization among the institutions; this may cause resistance to the system by institution staff. The terminals and telephone lines required for data transmission are costly; in many institutions, however, these are already present for data retrieval, thus no additional cost would be incurred in such cases. Where there are no terminals in the institutions, the added cost may be somewhat offset by the benefits to be gained by the accessibility of the data base through the terminal. Staff from some of the corrections agencies feel that data entry at the institutions presents problems in the areas of training and quality control because of the dispersion of the staff. If this were a serious problem, one would expect the error rates for systems where data are entered locally to be higher than those where data are entered centrally; Exhibit 14(c) shows this not to be the case.

In sum, we believe that local data entry is worth the cost not only because of the improvement in data currency, which it provides, but also because it helps to make those generating the data feel that they are involved, especially when the terminals in the institutions can also provide them with useful information. Nevertheless, because there are no formal evaluations to support our beliefs, we recommend that the local versus central data entry schemes be evaluated.

Data Quality

There are several factors which determine the quality of the data. The first is factual accuracy: is the information which is to be entered true? The second is entry

accuracy: has the data been entered into the file correctly? The third is completeness: how much of the data is present? A fourth factor, timeliness of the data, is discussed earlier in this section under data currency. Different methods are needed to assure the quality of the data in regard to each of these factors. The following paragraphs deal with the kind of quality control being exercised, the actual quality of the data in the ACDSs, the causes and effects of low quality data, and steps to be taken to improve the quality of the data.

In most cases, data about offenders are not verified for factual accuracy (SDCI, 3.6(B)). When an attempt at verification is made, it usually consists of comparison to records of other agencies (e.g., state police and pre-trial agency). The data for which validity is most important (i.e., crime and sentencing information) comes from the courts and are therefore not in question. Other information such as the offender's education level or job experience would be very expensive to verify.

There are many ways to check for errors in data entry. The method used by at least 20 agencies (SDCI 3.6(C)), the editing of fields for invalid or inconsistent content, catches an unknown proportion of the errors, but will tend to miss those cases where the data are seemingly sensible (but actually in error). For example, if the number of months a sentence is to run has been entered erroneously, but the number entered falls within the allowed values for that field, then the error would most likely not be caught. Key verification, which is done by at least four agencies, is more likely to catch such errors; it is generally not done, however, when the data are entered via terminal (in which case the operator can visually check his/her work while entering the data). The most reliable method of verification (also the most expensive and time consuming) is to check the automated files against the manual records after the automated files have been updated; this has the added advantage of detecting program errors as well as data entry errors. At least 9 agencies consider the accuracy of at least some types of data (generally sentence information) important enough to carry out verification of those fields against manual records. Finally, missing data can be detected by a program which examines each record for blank fields. At least 8 agencies edit the data for missing data items (SDCI, 3.5(C)) and 6 of those make an attempt to fill in the blanks (SDCI, 3.5(D)).

Estimates of the quality of the data in terms of erroneous data and missing data vary quite widely across agencies; except in those agencies where the records are checked against manual records, these estimates may be very poor approximations of the actual state of the files. SDCI, 3.6(A) shows that of 22 agencies, six had error rates of 6-20%. Four out of 9 had more than 5% missing data (SDCI, 3.5(B)). Several states reported that the quality of the data were poor initially due to inadequate quality control when the data base was being built, but that the quality has since improved considerably due to a major correction effort or due to improved attitudes toward the system. Several states also reported that the quality of the data has risen with the addition of applications (e.g., preparation of data for classification hearing, and calculation of release eligibililty dates) which provide incentive to those providing the data to see that it is accurate. It should be noted that in a few states the quality of the data in the corresponding manual system is not high either. In fact one state did not do parallel testing before implementing the system because they claimed the manual records were so inaccurate that they would not be usable for such a test. Another state which has a 20-40% error rate claims that the automated system is no less accurate than the manual; this state expects the accuracy of the automated files to increase since now errors are more easily detected and modified.

The causes of errors in the data base can be divided into two major groups: those caused by the users and those related to the system itself (SDCI, 3.6(D)). Those caused by the users (i.e., provision of inaccurate data and user carelessness in data entry) are by far the most commonly reported and are a sign of lack of support for the system by the users, or at least by the staff which are entering the data into the system. More than half the time, the latter are not the same people who use the data (SDCI, 5.2); this is a situation where those providing the data have little incentive to make it accurate. All the other causes of error shown in SDCI, 3.6(D) result from deficiencies in the design or execution of the system, with the exception of hardware and software malfunctions which are beyond the control of ACDS staff.

Low quality data seriously undermine the usefulness of the system. Out-of-date or erroneous data were reported as a cause of lack of user support in at least four agencies (SDCI, 5.7) and in five cases reports produced by the system were not used as a basis for long-term decisionmaking because of the decision-maker's distrust of the system (4.15(C)).

There are several steps which can and should be taken to improve the quality of the data and to insure its continued reliability. First, the system should be designed so that it offers some direct benefits to those who provide the data, thus giving them an incentive to provide the data promptly and accurately, as discussed in Section 3.1. Second, user training should be improved so that i) the users are aware of the benefits, direct or indirect, which they can get from the system, and ii) the users know and understand the right way to enter data into the system. Third, thorough testing of the system and the associated manual procedures and documentation should detect most of the inadequacies in the system, so that they can be corrected before the system is put into operation. Fourth, the individuals who provide data to the system should be held accountable for the quality of that data. The initials or code of the submittor should be carried on the transaction so that those who are the source of an inordinate number of errors can be identified and retrained, if necessary. Fifth, procedures should be established for reporting and correcting program errors. Without such procedures, program errors may go uncorrected for long periods of time, while the number of errors in the files continues to grow. Finally, periodic audits of the ACDS files should be conducted. Deroy (1976) describes an audit technique which she used to audit PROMIS files in the U.S. District Attorney's Office in the District of Columbia; this technique could be well suited to ACDS file audits.

Data Utilization

Although we have been able to obtain very little information on data utilization, it does support our belief that data collected by ACDS are being underutilized (SDCI, 3.15). On the other hand, a recent study by Friel et al. (1979) indicates that there is a considerable amount of demand for ACDS-related information that is not being fulfilled; coupled with our finding, this seems to suggest that although the basic data may be available in the ACDS, the needed information is not forthcoming. Section 4.4 considers the issue between data and information.

Because the largest portion of the expense of an ACDS is that for the collection, editing and storage of data, we recommend that each ACDS monitors the data usage to determine which data elements are not being used and whether i) the element is not needed, or ii) the element is not in a proper format, or iii) the values of the element are not accurate or complete enough, or iv) users do not know the existence of the element. Such a monitoring requirement is not burdensome, especially since some DBMSs are able to automatically record the references to each data element.

3.3 OUTCOME ISSUES

7 issues are considered in this section: they are grouped into ACDS output and ACDS impact issues.

ACDS OUTPUT

The three ACDS output issues include offender-based applications, management, planning and research applications, and national reporting.

Offender-Based Applications

The individual offender-based applications are identified and discussed in detail in Section 2.3. In this section, we consider their impact. Although only 11 agencies responded, all of them felt that the various offender-based applications are useful, even though they themselves had not implemented some of them (SDCI, 4.3). Because of no available evaluation-oriented information, we are unable to validly assess the impact of these offender-based applications at this time.

However, it is interesting to consider some of the offender-based applications which could be very useful and yet hardly implemented. First, although several systems create an offender's assessment profile, few report using the computer to aid in the assessment, classification, or program assignment decisions; thus the computer is used as a data repository rather than a tool. (One exception to this is the Texas Inmate Job Matching System which matches inmates' skills to available jobs in the prison system.) It has been speculated that the reason for this shortcoming is the difficulty agencies have in standardizing and removing the subjective elements from the processes now used for assessment, classification and program assignment, so that the processes can be programmed in the computer. Similarly, those states with the most severe problems with respect to release date calculations do not have the process computerized because they claim it is too complex to be computerized. Again, the suspicion is that, in addition to the complexity of the process, there are too many arbitrary elements which would have to be removed before computerization could take place.

Another application that is conspicuously absent is offender record monitoring (i.e., the flagging of "irregularities" or exceptions in the offender's record). An example of such an irregularity would be an offender staying too long in a program. One system reports on inmates overdue for parole hearings; however, no other similar uses have yet been discovered. Again, the power of the computer is not being employed.

There are several other applications (including inmate count taking and transportation scheduling) which could be significantly enhanced if the power of the computer were to be used appropriately. Although Section 4.4 addresses this issue in more detail, it should be stated here that, for the most part, we consider the current offender-based applications to be quite basic and operating at the "data" level (i.e., producing listings or summaries of data); the applications must be raised to the "information" level where the power of the computer could be used to produce timely and relevant information for either operational, management or research purposes.

Management, Planning, and Research Applications

The impact of ACDS on management, especially from an operational (i.e., tactical) perspective has in general been positive. In brief, the ACDS has helped to improve space utilization (SDCI, 4.11), the transfer process (SDCI, 4.12), the ability to

locate inmates (SDCI, 4.13), and several other processes and services (SDCI, 4.14). The accounting of a few experiences would help to understand this impact. In one state, the development of the ACDS has improved communications among the institutions and enabled them to deal more effectively with their common problems. In another state, where the institutions have the power to transfer individuals without obtaining the approval of the central office, the ACDS has enabled the central office to monitor the transfers. In still another state, the ACDS has provided the means for detecting fraudulent accounting procedures practiced by the institutions (for the purpose of increasing their financial apportionment); although this has been beneficial to the corrections agency as a whole, it has not made the ACDS popular with the institutions. In a fourth state, the ACDS provided an unexpected benefit; when census takers arrived at the prisons prepared to interview all of the inmates, the ACDS was able to provide all the needed information, thus averting the disruption that a large volume of interviews would have caused. In a fifth state, the ACDS has raised inmate morale by improving mail delivery through inmate location; previously, inmates who transferred between institutions would receive their mail several weeks late. In a sixth state, the inmate morale has also been affected by the automated sentence summaries which provide each inmate with information about his/her current status with regard to "good time" and parole eligibility.

In terms of the long-term (i.e., strategic) planning, research, and management needs of corrections, the ACDS has had much less of an impact, especially since most systems are primarily operationally-oriented. Nevertheless, the ACDS has helped to make long-term decisions (SDCI, 4.15(A)) and has substantially increased the number of planning and research questions which can be automatically answered (SDCI, 4.20). It is interesting to note, however, that most agencies intend for their ACDSs to remain operational or tactical and not grow to meet the more strategic needs of planning, research and management (SDCI, 4.22). This bias is quite real: when we were site visiting, we were constantly informed that the ACDS should be "institutionally" (i.e., operationally or tactically) oriented rather than "management" (i.e., strategically) oriented because "our real users are the institutions -- we need their support". While we concur with the notion that an ACDS should first be tactically oriented, we argue in Section 4.4 that it must then also grow to be strategically-oriented so that it can be of maximum utility to corrections.

National Reporting

The data requirements for the National Prisoner Statistics (NPS) program and the Uniform Parole Reporting (UPR) program are ideally suited for computer generation. ACDSs collect the data needed for NPS but, unless they have the parole status reporting application, they collect only a portion of the data needed for UPR. In general, corrections agencies feel that they receive no benefits from these programs.

NPS requirements are met using the ACDS in 30 agencies; of these, at least 17 produce machine readable data (SDCI, 6.5(A)). The ACDS produces data to meet the requirements for UPR in 17 agencies; of these, at least 4 produce machine readable data (SDCI, 6.5(A)) -- this low number is not surprising in that 1979 was the first year for which UPR accepted machine readable data. Production of the reports for NPS and UPR is a problem. The codes used by the reporting programs are generally not the same as those used by the states. Furthermore, we heard frequent complaints about changes in the reporting requirements and about the fact that the figures published did not correspond to those sent by the states. An official from one state stated that the way NPS collects data is not a true reflection of the way the correctional system functions. Part of the problem is the lack of standardized reporting formats and codes,

but there is no strong incentive for the states to develop the former and the latter are different because each state's criminal code is different from all the others. It should be noted that the problems discussed above are relevant whether the data for the reporting system are generated manually or by the ACDS. Nevertheless, increasing numbers of states are using the ACDS to perform this task.

While a review of the NPS and UPR reporting programs is outside the scope of this study, we do recommend, as does Chilton (1978), that they clarify and standardize their reporting formats and that they produce timely and reliable summaries of the data provided them; which would serve as an incentive for corrections agencies to continue to report to them.

ACDS IMPACT

The four ACDS impact issues include time savings, user attitudes, administrative attitudes, and system goals.

Time Savings

One of the benefits expected from any computerization effort is time savings. The computer can perform in fractions of a second processes which would take humans hours or days to do. The computer can retrieve or store hundreds of records in the time it takes a human to do one. Of course, time savings in itself is not of much value unless some good use can be made of the time saved.

ACDSs have provided a time savings to corrections agencies. They have, for the most part, decreased the amount of time spent collecting and maintaining offender records (SDCI, 4.23); the two agencies which indicated a substantial increase in this time are cases where data collection for the ACDS have been added onto other data collection functions, instead of being incorporated into them. For example, in one state, instead of revising the forms then in use so that they could provide the data for both the ACDS and the manual system, an additional form was devised for the ACDS, and now staff must fill out two forms instead of one. (Again, this duplication of effort would not have occurred had users been involved in planning the system.)

The preparation of reports, both routine and special requests, are two areas where time savings have been substantial (SDCI, 4.24 and 4.25). In one state, the time preparing routine reports was reduced from three clerical days per day to one clerical hour per day. While the time to answer a special request has been reduced, the number now being answered has increased substantially in at least 9 states (SDCI, 4.26). At least four states are answering special requests that were too time consuming to be attempted before the ACDS was implemented.

There have been time savings in other areas as well, as shown in SDCI, 4.27, the most common area being the retrieval of information about individuals. One state reported that this time savings has made things run much more smoothly in the institutions: instead of having to get an officer to cover his/her post while he/she went to the records office, a staff member can now retrieve the needed information immediately through the terminal. The area in which the ACDS seems to be saving the most time, aside from those already mentioned and in those states which have the application, is that of parole/discharge date calculation. Data calculation is not a process which is done once when an offender is first admitted and never redone. Date calculation must be done repeatedly for a multitude of reasons. Offenders gain or lose time frequently, according to their behavior in the institution, and each time a change

occurs, their projected release dates must be recalculated. Furthermore in one state, the dates were recalculated each time the offender transferred from one institution to another, prior to the ACDS. Because the statutes dealing with date calculation are very complex in every jurisdiction, calculating or recalculating them by hand is a very time consuming task. Using the computer for this task saves time even when the computer does only part of the calculation, as in the Bureau of Prison's SENTRY system.

The time savings accrued through the use of ACDSs has not been wasted. SDCI, 4.28 shows the uses to which it has been put in 14 states. Corrections agencies in recent years have been faced with continually increasing workloads and decreasing funds, thus the savings provided by the ACDS are particularly important. In the light of these findings and the fact that the power of the computer has barely been tapped by current ACDS applications, we must recommend the continuing expansion of the ACDS, concentrating in those application areas which would potentially yield the most time savings, as well as make the most use of the computer's power.

User Attitudes

In order for a system to be successful it must have the support of its users; even the best designed and executed system is worthless if it is not used. In order to obtain a true measure of user support, a survey such as the one included as a part of the SDCI must be distributed to all users (or a representative sample of all users) and the results collected and combined to given an indication of the users' attitudes about the system. Although such an effort was beyond the scope of this study, we have been able to obtain a general feel for their attitudes through conversations with some users and the answers to SDCI questions 5.1 through 5.7. Subjectively, we found about one third of the operating ACDSs were positively regarded by their users, one third to be negatively regarded, and for the remaining other one third we were unable to make a determination.

SDCI, 5.3 shows the time it takes for users to react if scheduled reports do not appear. Note that in two cases, users never react; in one of those, no reports were produced for three months and no one complained. More users seem to be interested in expanding the system capabilities than are in reading the reports currently produced; users in at least 16 states are asking for expansion (SDCI, 5.4). Similarly, in 12 states at least some of the users provide data to the system promptly and accurately, while in two states none do (SDCI, 5.5). SDCI, 5.6 shows that for 9 on-line systems, users react within 10 minutes when the system goes down, a good indication of the dependency that users have on the ACDS.

SDCI, 5.7 shows the reasons given by 17 states for lack of user support. Most of these reasons are discussed individually at appropriate places in this section; however, some additional comments are in order. The largest single cause of lack of support is the absence of perceived benefits of the ACDS; in fact, although, as mentioned earlier, most systems are operationally oriented, most users still perceive that the central office (i.e., central administration, planning, and research) staff derive the most benefits from the ACDS (SDCI, 5.1). Once again, we emphasize that more and better training is needed, so that individuals throughout the organization can become aware of the benefits the ACDS can provide. Also basic to this problem is the need to involve users in the planning and development of the system, so that the system which is developed does indeed provide them with benefits.

Ideally, an ACDS should have the support of its users even before it is implemented; in practice, however, many systems have gone up without support and gained support after months or years of operation. As elaborated on in Section 4.1, the best way to avoid such a situation is to view the development of an ACDS as a team effort with users and data processing staff working together to improve the functioning of the agency. One issue that stands in the way is the attitudes of the data processing staff toward the corrections staff and vice versa; we found these to be very negative in at least two states. One corrections administrator told us he used staff turnover to overcome this problem; we recommend the use of more active measures such as cooperation and training to acquaint users and data processing staff with each other's interests, needs and concerns.

Administrative Attitudes

No venture undertaken in an organization can expect unqualified success if it is undertaken without administrative support. This is particularly true of computerization projects which usually require large expenditures of time and money, and which potentially have far reaching effects. Top management should be genuinely interested in using the data system outputs and willing to face up to what the data may show (e.g., evidence of poor management). Administrative support means more than a statement of support -- it requires involvement by the administrator in the planning and development of the system.

10 out of 24 ACDSs have suffered from a lack of administrative support (SDCI, 4.10(A)); the effects of this have meant major problems for the systems in question (SDCI, 4.10(B)). In fact, several of the effects shown are also among the causes of the general lack of user support.

Unlike some of the problems discussed in this report, many of the causes of a lack of administrative support cannot be eradicated by the ACDS developers. The political situation within the agency which prevents support for the ACDS, for example, is usually beyond the control of ACDS developoers, as are unfavorable attitudes toward computing on the part of agency administrators. When these problems exist, agencies should seriously consider postponing the development of an ACDS until the climate is more favorable. A similar situation is when an agency such as a Governor's Commission or State Planning Agency wishes to develop a system for corrections; this should not take place without the full cooperation and support of the corrections administrator.

Turnover in administrative staff is also beyond the ACDS developers' control. When an administrator favorable to the system is replaced by one who is not favorable, this can be a real set back for the project. As is mentioned in Section 3.1, administrative turnover is a common occurrence in corrections agencies. Because of this, support for the development of an ACDS should be shared by several of the agency administrators, not concentrated in one person, thus assuring a cushion against any one individual's departure.

System Goals

One of the tasks of an NEP Phase I assessment is to determine the goals of the projects in the topic area and the extent to which these goals have been met. In most ACDS projects, however, the goals have never been explicitly stated, or, if they were, no one now in the agency knows what they were. In those projects where the goals are known, they are very ambiguous and not measurable. (Actually, the goals of the OBSCIS programs (LEAA, 1978a) are also not easy to measure.) Because of this, it is

impossible to give any empirical assessment of the degree to which ACDSs have achieved their goals. We can only go by the statements of agency staff in this regard.

16 agencies were able to state some or all of their goals (albeit in a very qualitative manner); their goal attainment have been mixed (SDCI, 4.9(A)). Some agencies indicated that they had attained or expect to attain ACDS functions which were not originally goals of the system; this explains why, in some rows of SDCI, 4.9(A), the number attaining and expecting to attain a goal is greater than the number for which it was originally a goal. The first eight goals shown in SDCI, 4.9(A) correspond to those sought by the OBSCIS program (LEAA, 1978a); the remaining are additional goals stated by the various ACDS projects.

Six agencies which have not achieved their goals gave the reasons shown in SDCI, 4.9(B). Several of the reasons shown are related to the planning process: careful planning should prevent the setting of unreasonably high goals. Consequently, we recommend that agencies developing or upgrading ACDSs devote more careful attention to the initial planning stages, especially to explicitly specifying attainable and measurable goals. For example, instead of having a goal of "providing population statistics and reports", a goal of "providing monthly reports describing the population by offense, ethnic origins, and education, with a 99% accuracy" would be much more desirable, as it can be determined without ambiguity when the latter has been achieved. Stating goals very specifically would also make it easier to determine if the agency actually has the resources to attain them and to modify them accordingly.

3.4 SYSTEMIC ISSUES

Five issues are considered in this section: they are grouped into ACDS environment and ACDS influence issues.

ACDS ENVIRONMENT

The three ACDS environment issues include system interfaces, system transferability, and system generalizability.

System Interfaces

As discussed in Section 3.2 under data redundancy, many criminal justice agencies collect the same offender data, independent of one another. This duplication of effort could be eliminated if the data systems of these agencies could be interfaced, either manually or automatically. However, as summarized in SDCI, 6.4(A), very few ACDSs interface with other criminal justice information systems, in spite of the fact that such interface is one of the special requirements of the OBSCIS program. Many states seem to experience a lack of interagency cooperation which obstructs the formation of such interfaces. Furthermore, there seems to be an unwillingness on the part of other agencies such as courts and probation to share information with corrections. In some cases, there are other obstructive factors such as equipment incompatibilities, or, in one case, a state law against computer systems "talking to each other". In the few cases where such interfaces do exist, there may be problems with the protection of the offender's privacy; this issue is further discussed in Section 4.3.

We know of only three states which have somewhat of an integrated criminal justice information system. In one of those states, however, and as mentioned earlier, the corrections portion of the system was developed without adequate corrections consultation so that, as an ACDS, it remains ineffective.

In Section 4.5, we recommend that the various criminal justice information systems of a state should be integrated together, in an automatic manner and with special attention paid to security and privacy issues.

System Transferability

System transfer is the process of implementing a system which exists at some other agency rather than developing a new system. This process may provide time and cost savings due to the fact that the receiving agency does not have to "reinvent the wheel". There are several levels of transfer ranging from the highest, transferring the system exactly as is (and, hopefully, making only the minimum changes to make the system work), to the lowest, transferring the design concept only. Obviously, the amount of work to be done by the receiving agency increases and the savings decrease as one goes from the highest to the lowest transfer level. The highest level of transfer, however, can only be accomplished under the condition that the needs and computer environments of the sending and receiving agency are nearly identical. Lower levels require less identity. The problems and factors inhibiting technology transfers are discussed by Kraemer (1977) and Colton and Tien (1979).

The ACDS which has been transferred the most (i.e., 6 times) has been the Basic OBSCIS Software Package (BOSP); as detailed in Section 3.1, the transfer experiences have been mixed. Except for the BOSP transfers, there have been very few other transfers (SDCI, 6(A)); we know of only five other ACDS transfers -- D.C.'s CRISYS to Louisiana, Illinois' ACDS to Ohio, Illinois' ACDS to South Carolina, IBM's JDB to Kentucky, and IBM's JDB to Virginia. Nearly all of the transfers required a moderate to extensive amount of rewriting of the software code (SDCI, 6.6(B)) and changes in some system components (SDCI, 6.6(F)), together with help from the vendor, the sending agency and/or SEARCH Group, Inc. (SDCI, 6.6(C)). As to the merits or time saved from transferring rather developing an ACDS, two out of 9 states indicated that the transfer saved them time; one said that it did not save any time; and six did not know (SDCI, 6.6(D)).

Overall, as we indicate in Section 4.5, we feel that ACDS-related transfers are cost-effective (and should therefore be encouraged), but that extreme care should be exercised both before and after transfer in order to increase the chances of a successful transfer. Further, we recommend that, as part of our earlier recommendation in Section 3.1, the federally-funded technical assistance contractor should assist in such transfers. With regard to the development of software programs or modules for the purpose of installation in any ACDS, it should be noted that such modules must be quite basic and must be modified for each installation so as to meet the specific needs of that particular ACDS.

System Generalizability

Due to the fact that certain other organizations bear much similarity in function to prisons, it is possible that ACDSs or parts thereof may be useful outside corrections. Conversely, it is possible that information systems developed for similar organizations may have applications within corrections. For example, hospitals are very similar to prisons in that they both have the responsibility for housing, feeding, tracking, and providing various services to the incarcerated populations, requiring around-the-clock supervision. In fact, our cursory review of one medical information, acronymed MUMPS (Massachusetts Utility Multi-Programming System), suggests that while it contains certain applications which are irrelevant to corrections (such as generation of laboratory test orders), some MUMPS application areas can indeed be generalized to the

corrections setting: similarly, portions of an ACDS could probably also find use in a hospital setting.

Unfortunately, the limited scope of this study precluded us from further exploring the above indicated possibilities; however, we recommend that ACDS developers should look into such possibilities.

ACDS INFLUENCE

The two ACDS influence issues include offender's rights and corrections issues.

Offender's Rights

The ACDS can impact an offender's rights in two key areas: the right to have his/her personal data kept private and the right to have adequate and fair treatment.

In the first area, Chilton (1978) identifies an offender's privacy rights to include i) the right to know what information about him/her is being kept, ii) the right to have such information removed or corrected if it either does not belong in the file or is incorrect, and iii) the right to know to whom the information has been furnished and for what purpose. In terms of ACDSs, SDCI, 3.23, shows that outside access to an offender's record is generally limited except for courts, law enforcement and state social services departments. Allowing unlimited access to these agencies may, however, be a source of problems, especially when other precautions such as password protection and logging of accesses to the system are absent. SDCI, 3.25 shows that only about half the agencies know who has accessed an offender's records. In only one state is the offender informed of who has accessed his/her records (SDCI, 3.26); in that state, the offender must sign a release before certain types of data are released. Finally, at least 22 agencies give offenders access to their own records on request. While we know of no violations of an offender's right to privacy as of this time, the fact that, as discussed in Section 3.2, ACDS security is, in general, quite lax is worrisome. As an ACDS grows and stores more personal data of the offenders, it is imperative that system security becomes a top priority for ACDS developers.

In the second area, it is obvious that the ACDS could help to protect an offender's right to have adequate and fair treatment. For example, the automatic scheduling of parole hearings may help to insure that due process is followed in granting of parole; and the recording of the outcome of parole hearings provides a data base which can be examined for breaches in procedure. Similarly, the recording of disciplinary incidents and their punishment could create a data base which would provide the means to detect arbitrary or capricious conduct or racial discrimination on the part of the authorities and thus aid in assuring due process. Further, the recording of medical and dental treatment could provide a means to audit the adequacy of care given to prisoners. Except in helping to prove fair treatment in a handful of litigation cases, the ACDS has, for the most part, not been used with an eye toward protecting an offender's rights, but it is an important potential development, and we recommend that such applications be a part of the ACDS in the near future.

Corrections Issues

As summarized in Exhibit 2 and discussed in Section 1.1, the field of corrections is currently a battlefield of different ideologies, including whether the goal of corrections should be rehabilitation, incapacitation, or deterrence. No one knows what is most beneficial to society. The ACDS data, however, could be analysed and used to evaluate

some of these ideologies. While our contacts with corrections research staff have indicated that they would like to carry out such policy-oriented studies, they have not had the time to do so. However, some universities and research companies have been able to access ACDS data for their research efforts; most corrections agencies have a formal procedure for handling such requests and for "sanitizing" (i.e., deleting all offender identifiers from) the requested data.

Another corrections issue which can be impacted or influenced by the ACDS is in the area of correctional standards. (There are currently two sets of correctional standards: the standards promulgated by the Commission on Accreditation for Corrections and the American Correctional Association (ACA), and those promulgated by the National Advisory Commission on Criminal Justice Standards and Goals.) The ACDS could assist the corrections agency to gain accreditation and/or to monitor the agency's compliance with the standards.

In sum, we recommend that the rich ACDS data base be analysed to shed light on contemporary issues in corrections, and that the ACDS be used to monitor an agency's compliance with correctional standards.

4 RELATED ISSUES

While Sections 2 and 3 contain a discussion of issues specific to our Preliminary and Analysis Samples of ACDSs, this section addresses critical policy-oriented issues that draw upon not only our understanding of ACDSs but also our experience with developing user-supported information systems, our recognition of the general cut-back in federal funding of public programs, our knowledge of privacy and security issues, our awareness of the difference between data and information, and our vision of what an effective automated correctional information system could be. Thus, in this section, we consider the ACDS-related issues of user support, federal support, privacy and security, data versus information, and an alternate system.

4.1 USER SUPPORT

In this study, as well as in our previous experience with automated data systems, we have frequently seen implemented systems which are operating without the support of their users*. This problem is so important that it has also received a great deal of attention in the literature. Organizations cannot derive the benefits planned from their automated systems if those systems do not have user support.

In fact, implementing an automated data system without user support can have far reaching detrimental effects. When employees have a negative attitude regarding the system, error rates increase and acts of sabotage may occur (Anderson et al., 1973). Specifically, i) data are not supplied to the system (eventually the files become out-of-date or inaccurate); ii) the system is not used or is used improperly; and iii) staff continue to use the old methods while being expected to keep up the new system (thus they feel overworked and their resentment of the new system is increased). These conditions may cause morale to drop and staff turnover to rise, ultimately decreasing the productivity of the organization.

The problem of lack of user support stems from the way in which an automated system is implemented, the effects of an automated system on the organization, and the users' perceptions of the system and its effects. It has long been recognized that any change in the organization creates uncertainty which generates resistance (Whisler, 1970a). In the introduction of an automated system, there are other causes of resistance as well. Among them is the fact that automation or computerization always necessitates the transfer of some power from the user department to the data processing department (Lucas, 1973b). Also managers resist because functional lines, which were formerly clear, become blurred by the introduction of the automated system (Huse, 1967). Further, the increase in volume of data brought about by computerization overloads managers with data and data processing-related tasks, causing a decrease in their job performance, at least by traditional standards (Guthrie, 1972). Users at all levels of the organization are afraid of the way in which the system may change their jobs, especially when their skills (which have been developed over the years) are no longer needed and new skills must be developed (Whisler, 1970a). In addition, the automated system may make the users' work harder: the users are

*For the purposes of this discussion, users refer to all staff who provide data to or use information generated by the system at every level of the organization. In terms of corrections, users would include institutional, central office, planning, research and administrative staff.

frequently inadequately prepared for the changes beforehand; they do not understand how the system works; they feel the system is not compatible with their way of doing things; and they do not have confidence that the system works properly. Furthermore, the users frequently feel that the system has been imposed upon them from above and that it provides no benefits to them as individuals. (The largest single cause of lack of user support found in this study has been the lack of perceived benefits (SDCI, 5.7).) The user may be justified in these complaints in that, particularly in government, automated systems may be introduced because of requirements by state or federal legislatures or other government agencies, without support from the installing agency's administration. Similarly, within the organization, impetus for the development of systems may come from the data processing department which has become a "skill bureaucracy" (Danziger, 1976), and thus powerful enough to introduce a system which may not be desired by the users. Finally, certain characteristics of the automated system itself may tend to irritate users and thus reduce their support; among them are rigidity of the system, obscure input and output codes, and errors in the system (Lucas, 1973b).

The many conditions just detailed which cause a lack of user support need not occur. Various steps can be taken to mitigate or eradicate these problems; they are discussed below in four groups (i.e., those that apply through all the phases of planning, developing and implementing the automated system, those that apply principally at the planning phase, those that apply principally at the development phase, and those that apply principally at the implementation phase).

ALL PHASES

One condition which is vital in generating and keeping user support is administrative support and involvement; what is needed is not just a superficial gesture (i.e., giving mild approval and attending a monthly meeting), but rather active participation. It has been noted that high levels of management support for and participation in the automated systems' activities result in favorable user attitudes (Lucas, 1975).

Another item of extreme importance is user participation. Users should participate throughout the entire project, from the initial planning to the final implementation. This will result in a better system, as well as make acceptance of the system easier by creating a sense of "ownership" of the system (Lucas, 1973a). One of the chief arguments against user involvement in the development of automated systems is the additional time required for such involvement; there is evidence to show, however, that user satisfaction has been highest in projects where the success in meeting project deadlines was also highest (Powers, 1971).

In parts of the project, user participation can be effectuated by representatives on committees. For best results, the user representatives should be line staff, not supervisors. Inclusion of more than one user representative will reduce role conflict and increase the representatives' ability to gather user support (Huse, 1967). It is important that the ideas of the user participants be fully considered. If suggestions are rejected, the reasons should be explained so that the rejections are understood and accepted. If people who are invited to participate are being ignored, their feelings of antagonism toward the system will be increased (Lucas, 1973b).

Another step which should be taken is that, throughout the development and implementation phases, the attitudes toward the project of staff at all levels should be carefully observed and steps should be taken to maintain positive motivation (Tomlin, 1970).

Lastly, users should be given a realistic idea of what the system will do, what it will mean to them personally, and when it will be ready. Changes in design and schedules should be communicated as they occur.

PLANNING PHASE

Involving user representatives in the planning of the system provides at least two advantages: a feeling by the users that they have a stake in the system, as mentioned above, and a resultant system which takes into account their current procedures. Current procedures should, however, be examined with great care and modified, if necessary. Overlooking portions of the manual system may result in the development of a system which does not account for all possible situations and at worst may not even be usable. One product of the planning phase should be documentation of the user oriented functional requirements, which should be reviewed and approved by the users. These specifications should be kept separate from the technical requirements so that the user understands how the system will perform (Blumenthal, 1969).

Still another helpful strategy is to recruit programmers and analysts from within the organization when possible. According to Tomlin (1970), internal recruiting tends to achieve better cooperation from existing employees. (In the case of ACDSs, first hand knowledge of corrections by the programmers and analysts has been claimed to be quite helpful in several projects.)

Finally, in planning the system, certain design features which could help to increase user support should be included. First, the computer system and its accompanying manual procedures should be designed so that those providing data to the system can also make use of the system. The users would then have a better incentive to provide data in a timely and accurate fashion, as well as a feeling of deriving some benefit from the system. Second, the system should be designed so that it appears responsive to users rather than forcing them to be responsive to the machine. For example, error messages should be understandable and polite, and names rather than codes should be displayed (Lucas, 1973a). Third, the system should be designed to allow for changes, as experience points to ways to improve it.

DEVELOPMENT PHASE

The development phase -- during which the primary activities are i) the creation of detailed specifications, and ii) the coding and testing of the individual programs -- is often quite lengthy. It is very important to maintain user interest during the period between initial design and implementation; otherwise, the sense of ownership developed through participation in the planning phase would dissipate.

During the development period, users can and should be involved in the design of forms and/or screens. In addition, if changes to the system design are found to be necessary as development progresses, users should be involved in those decisions. Another activity which should take place during this period is the development of the system test. Users should help develop test data and expected results for all situations they might encounter.

The development phase is an excellent time to train users in the basics of data processing, so that the new system will seem less alien to them. It is also a good time to develop the user training materials and user documentation, which are also activities in which some users should be involved. Actual training in the use of the system, however, should not take place until just before the system is scheduled to go up.

Otherwise, the training tends to lose its impact before it is put to use.

IMPLEMENTATION PHASE

The implementation phase includes the system testing, training, and data base conversion activities, as well as the initial months of system operation. How these activities are executed is very important to the maintenance of user support for the system.

Before the start of the implementation phase, the user documentation should be completed and distributed. The adequacy of the documentation can be tested during the course of the training and appropriate updates issued. Documentation is not adequate unless the system is described in such a way that it becomes independent of its designers and manageable for its users (Hartmann et al., 1968). In Section 3.1, some criteria for good documentation are discussed.

System testing provides an opportunity to increase user support and to prevent its future loss. Two types of system testing should take place. The first, an exercise of the system with a benchmark (i.e., prepared data and predicted results); the users should cooperate with data processing staff to review the test results, comparing them with the predicted results. When this testing is completed, the user should be satisfied that all discrepancies have either been fixed, or are scheduled to be fixed, or are actually the correct functioning of the system. The second type of testing is parallel testing. The new system and the old should be run in parallel for some period of time, and frequent comparisons of the files and outputs of the two systems should be made by the users. These review processes serve to build the users' confidence in and identification with the system, as well as to find errors which can then be eliminated before the system is officially in operation. It is very important that during the testing period (and afterward as well), the lines of communication between the users and the data processing staff are clearly delineated so that the reporting of errors does not become a source of friction.

Everyone should be aware that in a system test, it is not only the programs, but the operational procedures as well, that are being tested. It is also important to assure that the system is not put into operation without adequate back-up (i.e., manual) procedures; all concerned should be given a chance to review and comment, and if the procedures are not found acceptable, they should be revised.

Training is another, often overlooked, area where support for the system can be created. Users at every level should either be thoroughly trained or receive an orientation (which will make staff and managers aware of the system and its effects on the users and the organization). If the user group is large enough, training procedures should be pretested in a "preliminary" training session during which the trainees can evaluate the training material. It is also effective to have the first group of trainees be the trainers for the remainder of the users so that the training will be coming from within the user group rather than from outside the group.

Data base conversion and the first few months of system operation can be a very difficult time for most organizations. The conversion process always involves large amounts of extra work. In addition, staff productivity always drops in the initial months, while staff become familiar with the system, and the bugs (not caught during testing) are ironed out. If at all possible, the agency should consider hiring extra temporary help for the period of conversion and initial implementation. Management should also be made aware that a drop in productivity is normal during this period.

According to Lucas (1973a), the initial months of operation are very crucial in determining the success of the system. Users often lose their enthusiasm for the system as they discover errors and inconveniences in the system and find it difficult to get these conditions corrected. This problem can be alleviated by the use of clearly defined procedures for i) the verification of errors found in the system, ii) the prioritization of problems to be fixed, and iii) the verification of the code produced to fix those errors.

As noted throughout Section 3, many of the steps and procedures recommended in this section have not been followed in the development of ACDSs, with the result that many systems have not lived up to their potential. Careful attention to this section by staff in agencies developing or updating their ACDS is recommended.

4.2 FEDERAL SUPPORT

It is helpful to first summarize the impact that the federal -- mostly LEAA -- support has had on ACDS development to date. We can state without qualification that federal support for ACDS-related activities during the past decade has been very beneficial; the number of ACDSs would not be as many and the state of ACDS development would not be as advanced if it were not for federal support. Where would the number and state of ACDSs be if there had been no federal support? Our best estimates are that there would only be half as many ACDSs and only a third as much advancement of ACDS technology. Certainly, the limited support -- an estimated 20 million dollars of LEAA support (which includes 11.9 million dollars for the OBSCIS program) -- provided by the federal government could not have by itself resulted in such widespread impact: indeed not, what the federal support has been able to do has been to **leverage** state and local spending in this area. Thus, in this case, the federal role has been quite appropriate and effective; it has not only stimulated state and local interest in ACDSs, but also provided direction and support.

While the federal money has, for the most part, been effectively spent, two activity changes would have, in our opinion, enhanced this effectiveness. First, in terms of the OBSCIS program, the OBSCIS guidelines -- in particular, the implementation-related guidelines -- should have been better enforced; this would have prevented ACDS developers from falling into the same problem areas and subsequently "reinventing the wheel". Second, the technical assistance provided to the states should not only have included ACDS audits or reviews, but also more **basic** assistance (e.g., needs assessment, functional specifications, hardware specifications, proposal review, and software debugging). This type of assistance, although costly, would have been cost-effective in the long-run, since many ACDS developers have been "learning by doing"; basic technical assistance would have shortened this learning process and, again, prevented much "reinventing of the wheel".

Given the demise of the LEAA and the general cut-back in federal funding of public programs, what should the federal role be in supporting ACDS development? Our recommendation is that the federal government should support four types of ACDS-related activities. First, the federal government should continue to support basic ACDS research and development efforts, including the research of correctional data needs and the development of offender-based application modules (that is, basic application programs which must be modified to meet the specific needs of a particular agency). Second, the federal government should expand its support of technical assistance assignments to states which require them; the assignments could range from general ACDS audits or reviews to more basic assistance, as defined above. Third, the federal government should expand its support of a national clearinghouse for ACDS-related

information; the clearinghouse should actively seek out information and should also sponsor a yearly national meeting for ACDS administrators to meet each other and to be exposed to recent ACDS developments. Fourth, the federal government should institute an ACDS-related evaluation program, which would provide the needed **feedback** with regard to what works, what doesn't work, and why.

In regard to a mechanism for carrying out the above four activities, we recommend that the federal government (i.e., the Bureau of Justice Statistics) award -- on a competitive basis -- two five-year grants: the first to an organization which would carry out the first three activities; and the other to an organization which would carry out the fourth evaluation activity.

4.3 PRIVACY AND SECURITY

For any modern society to function, even somewhat efficiently, vast amounts of information must be collected, analyzed, and the results utilized for the proper functioning of institutions within the society. The increased bureaucratization of modern society has resulted in larger data systems and with them have emerged potential problems concerning the misuse and abuse of such systems. And within a democracy, government must concern itself with the proper balancing of the individual's "right to privacy" and the government's (and society's) "right to know". Thus, any data system must be comprehensive and accurate; it must be secure from misuse and abuse; and it must protect the privacy of the individuals.

Before we proceed further it is perhaps appropriate to define some common terms that pertain to this subject. The prevention of accidental errors is referred to as "protection" of the system; the term "security" denotes the measures taken to prevent deliberate attacks on the system; and "privacy" refers to the rights and interests of the individuals whose records are being maintained in the data system. There are two types of security measures: those that deal with the physical security of the record-keeping system and those that deal with the procedures for safeguarding the contents of an individual's files. We concentrate on the latter measures since they are very much related to the privacy rights of individuals.

Ever since the establishment of statewide correctional institutions, correctional data systems have always existed, both to track inmates within the system as well as for administrative and other functions. With the computerization or automation of the correctional data system, access to inmate information is quicker, if not easier, thus compounding the privacy and security concerns. This section does not focus on privacy and security concerns in correctional data systems per se, but on the impact of computerization of correctional data on privacy and security. It should be noted that security and privacy are concerns in any data system, manual or computerized, correctional or other.

AUTOMATED DATA SYSTEMS

Westin and Baker (1972) classify the privacy concerns in automated data systems within two major constitutional principles: the right to privacy and the right to receive due process of law. Basically, they point out that due process involves i) rules of conduct by authorities, ii) availability of fair hearings for every individual, and iii) the right to appeal. With regard to data systems, due process implies i) the authorities need to have rules regarding what information is collected, who has access to the information, how the information is managed for accuracy and completeness, and how it may be disseminated; ii) the individuals have the right to inspect data that pertain to them and they have the right to challenge inaccurate data; and iii) the individuals have a right to

appeal to "higher authorities" if the record-keeping agency refuses to correct a challenged item.

The right to privacy, on the other hand, is the "right to be left alone". In fact, some statutes provide that government and "public" organizations* cannot compel individuals to disclose certain private information (e.g., religion, political beliefs, etc.). Further, information that has been gathered must be held confidentially (unless it is, by statute, part of the "public record"); that is, access to the data is restricted by set rules and regulations.

In their assessment of the general impact of automated data systems, Westin and Baker (1972) investigated the hypothesis that computerization has increased the collection, integration and circulation of data. From their study of 55 organizations with advanced computerization, they concluded that the scope of the data elements had not increased, but only that management was now able to more quickly access the data. (Only for research and evaluative agencies or groups had the scope of the data elements increased significantly.) They noted that sensitive data, such as psychological and medical profiles, were still not automated and it was likely that they would always remain in manual files.

With regard to confidentiality of data, Westin and Baker (1972) investigated the hypothesis that computerization had increased the number of people or groups who were allowed access to a given file. Here again, they found that computerization had not increased access of confidential information to a broader class of users.

Westin and Baker (1972) also evaluated the impact of computerization on due process. In fact, in this case, they discovered that due process procedures were made more efficient, namely i) computerization had increased the public's awareness of the existence of data files; ii) computerization had not impeded the right of access and challenge, and, in fact, had increased the efficiency of access procedures; iii) subjective and personalized decisions were not made by computers or from computer "printouts", although the simple go/no-go decisions were greatly assisted by computers; and iv) computerization had, in general, not affected data accuracy but, in fact, had in many cases reduced the number of data omissions.

Finally, with regard to data security, Westin and Baker (1972, p. 314) noted, "We found no instances of complete-outsider intrusion...into computerized files to obtain information... We found far more examples of information breaches from manual files..."

Walker and Blake (1977) point out the various ways by which the security of automated data systems can be breached. Specifically, confidential information may be obtained from/by: i) waste material (used printouts, etc.), ii) residue of used tapes, iii) over-the-shoulder eavesdropping, iv) scanning someone else's output, v) theft, and vi) illegal access (e.g., electromagnetic pick-up, bribery of computer operators, and password theft). Walker and Blake (1977) also suggest several measures, both physical and procedural, for securing data systems. Additionally, Ruder and Maddin (1978) have

*"Public" organizations include those organizations that deal with a large segment of the public even though they may be within the private sector. Private educational institutions and credit bureaus are examples of public organizations.

analyzed several computer security safeguards and provided rankings, with respect to various measures, of these safeguards. The state-of-the-art in computer security, both physical and procedural, including cryptographic measures, is contained in a recent book by Hsiao et al. (1979).

A common impression is that the larger the data system, the greater its vulnerability to external threats, an impression based on the growth in the number of publicized computer abuses. However, some data systems experts feel that the increased size has with it increased safeguards, while others believe the opposite. In any case, the increase in the number of publicized computer abuses could be more attributed to the growth in the use of computers for record-keeping in the last decade than to the increase in the sizes of data systems.

Keeping in mind some of the observations that we have discussed above regarding privacy and security concerns for automated data systems, it is imperative that agencies have proper access control to their systems. Dial and Goldberg (1975) give guidelines for planning access control, and they contend that adequate safeguards are available that can be built into any data system for the protection of personal privacy and the confidentiality of the data contained in the system. They suggest that since the adequacy of the control depends on the nature of the data kept at a given organization, access control must be planned at the organization level. The guidelines suggested by Dial and Goldberg (1975) include guidelines on i) determination of who must prepare data access control, ii) monitoring and inspection of data access control, iii) determination of what data exist and who can add to it or alter it, iv) determination of what data are public and what are restricted, v) classification of data by levels of sensitivity, vi) development of physical security (to prevent unauthorized penetration and sabotage) and environmental security (against fire, flooding, air-conditioning failure, power failure, etc.), vii) maintenance of data (including purging of data that are not required), viii) access of data, ix) protection of files and software, and x) automated audit trail.

In particular, their guidelines on who should have access to what data (item viii) and automating an audit trail (item x) should be further elaborated. Dial and Goldberg (1975) suggest implementing user access by a "need to know" test; that is, information should be accessible only to users who can demonstrate a need to know that particular piece of information. With regard to an automated audit trail, they suggest that its requirements be such that i) one may be able to reconstruct the receipt and delivery of data files to and from the data system; ii) one may be able to reconstruct the files as they existed at some past point in time; iii) there exists a record of program modifications, and iv) there exists a record of all remote entries or attempted entries into the system and the programs and files accessed. Finally, in order to maintain information security, they further suggest establishment of penalties for noncompliance with access control regulations. In sum, the monitoring, inspection and auditing of data access (resulting in the threat of discovery of an illegal act) and the potential penalties for abuses and unauthorized access, together, provide the needed level of deterrence.

AUTOMATED CORRECTIONAL DATA SYSTEMS

A central issue here is whether the privacy and security concerns are any different for automated correctional data systems (ACDSs), as compared to other governmental or "public" data systems which Westin and Baker (1972), Dial and Goldberg (1975), Walker and Blake (1977), and others have studied. On the one hand, it may be argued that confidentiality, and hence due process, should be more strict within the criminal justice system where people's lives and liberties are at stake. On the other

hand, there appears to be less of a concern for the privacy of the individuals whose names are contained in these ACDSs (except for juveniles), perhaps on the assumption that much of the data in the files can be legally obtained and/or are in the "public record".

However, if safeguards for privacy and security are not provided in systems storing offender data, abuses of the system may be prevalent. Several such abuses have occurred, especially with regard to the criminal history data that were stored by the F.B.I. in the early sixties. In view of these abuses and the fact that the public is generally apprehensive about automated data systems, numerous laws have been passed, both at the federal level and at the state and local levels, which concern the privacy and security of criminal history records. A rather complete list of state legislations on privacy and security of data systems is available in a publication entitled Privacy and Security of Criminal History Information: Compendium of State Legislations (NCJISS, 1978c).

The former National Criminal Justice Information and Statistics Service (NCJISS) -- now, the Bureau of Justice Statistics (BJS) -- published a series of guidelines in the area of privacy and security (NCJISS, 1977, 1978a, 1978b, 1979a). These guides deal with, for example, i) procedures for individuals to review his/her criminal records, ii) procedures by which an individual can challenge data elements in his/her record, iii) procedures to review source documents of criminal justice agencies to determine the accuracy and completeness of the challenged information, iv) procedures to appeal to "higher authority" if a criminal justice agency refuses to correct a challenged record, v) procedures to correct information which has been disseminated but has been shown to be incorrect, vi) categories of information that are closed to the public, open to the public, or have restricted access, vii) procedures to purge unwanted data, viii) methods for physical and environmental security of record-keeping equipment, ix) training of staff on privacy and security safeguards, and x) monitoring of research and evaluation activities which use this data.

Perhaps the first to address the privacy and security problems posed by computerization of criminal history records was Project SEARCH (System for Electronic Analysis and Retrieval of Criminal Histories). It identified various privacy and security problem areas, and recommended measures and policies to reduce these problems (Project SEARCH, 1973), similar to those recommended by NCJISS. Based on recommendations of Project SEARCH, the U.S. Department of Justice (LEAA, 1975) issued regulations requiring that LEAA-funded criminal justice information systems have procedures to i) ensure the completeness and accuracy of data, ii) impose constraints on the dissemination of data, iii) audit the accuracy of data and access to it, iv) ensure individual's right to access, review and challenge data pertaining to him/her, and v) implement personnel and physical security measures.

The only specific privacy and security assessment of an automated correctional data system that has been published is the one conducted by SEARCH Group, Inc. (1979) for the South Carolina Department of Corrections. The study lists 61 privacy and security recommendations, 44 of which pertain to inmate data privacy and security and the others relate to security of financial data. Most of SEARCH's recommendations are, again, very similar to those listed above.

In regard to ACDSs, system security issues are addressed in Section 3.2, while offender's rights are considered in Section 3.4. We have noted in these sections that while no significant privacy and security problems have occurred to date, the potential is there, since system security is lax. Further, privacy and security problems could

become even more exarcebated in situations where an ACDS is automatically or electronically interfaced with other automated data systems, including other criminal justice systems. Fortunately, as one systems designer at a correctional institution said, "there just does not seem to be much market value for stolen offender data". If adequate privacy and security measures are not implemented and this "market value" rises, then it is quite possible that the frequency of privacy and security abuses would go up.

4.4 DATA VERSUS INFORMATION

Although it is proper english to use the words "data" and "information" interchangeably, it is instructuve to distinguish between the two words from a computerization or automation perspective. Data reflect the most basic knowledge; for example, data on the heights of five individuals could be 68", 69", 69", 72", and 75", respectively. Information reflects a higher level of knowledge: it is data put through some type of analysis or processing -- or, in our words, information is "analysed or processed data". Using the same example, the answer to the question "What is the height of the tallest person?" represents information; that is, it requires an analysis --albeit a very easy one -- of the five-point data set in order to yield the answer 75".

In terms of the operational and management (including planning and research) needs of corrections, it is obvious that both data and information are needed. The operations staff at the institutions must be able to access the raw offender-based data for a number of reasons; they may, for example, require a listing of the names of all the inmates -- a simple data utility program can perform this function. In another example, they may require the names of all the inmates in a specific prison program; although this is also a listing, it would require an application program to go through the offender-based data base to extract the names of those inmates whose records indicate that they are enrolled in the specified program. The particular application program is, in essence, an analyser or processor of data; thus, its output is information. Consequently, the operational need to make tactical decisions require both data and information.

The management (including planning and research) need, on the other hand, is more strategic in nature: it requires, almost exclusively, information rather than data -- that is, management's strategic decisions would typically concern groups (or may be the entire population) of offenders rather than individual offenders. It should obviously be noted that when we say that only information is required, we do not mean that data would not play a role (indeed, it does, since information is analysed or processsed data), but we simply mean that a higher level of knowledge is required.

Given our definitions for data and information, what are possible analysers or processors of data? We have already indicated that application programs serve to process data into information; thus, the application programs which respectively support all the various offender-based applications that are discussed in Sections 2.3 and 3.3, are data processors. There is, however, a more powerful and more general data processor, called a data base management system (DBMS). Although there are several available DBMSs (e.g., IBM's Information Mangement System (IMS), MRI's System 2000, Cullinane Corporations's Integrated Database Management System (IDMS), Cincom System's TOTAL, Software AG's Adaptable Data Base System (ADABAS)), their objectives are the same: namely, to facilitate data organization and data access (Tsichritzis and Lochovsky, 1977). A DBMS offers a number of advantages over a basic data utililty program, including i) a user's view of the data that is usually quite different from the way data are stored in the computer; ii) a data language which allows the user to retrieve, update, insert, and delete data from the data base; iii) data

independence, whereby the application programs are protected from changes in the hardware, operating system, and data storage devices; iv) data sharing, whereby all the applications use one copy of the data base; v) security, whereby only authorized individuals, terminals, and programs can perform specific functions; and vi) data integrity, whereby hardware and software defects would not make the data base inconsistent. DBMS technology has evolved to the point where there are two approaches to data representation and manipulation: a network (or hierarchical) model and a relational model. In general, network DBMSs would be employed in applications that are well structured and where efficiency is critical, while relational DBMSs would be used in evolving environments where adaptability and ease of change are of primary concern. It is interesting to note from Exhibit 9 that the majority of the 19 ACDSs which possess DBMSs has a network type of DBMS; one reason could be that network DBMSs have been available much longer than relational ones.

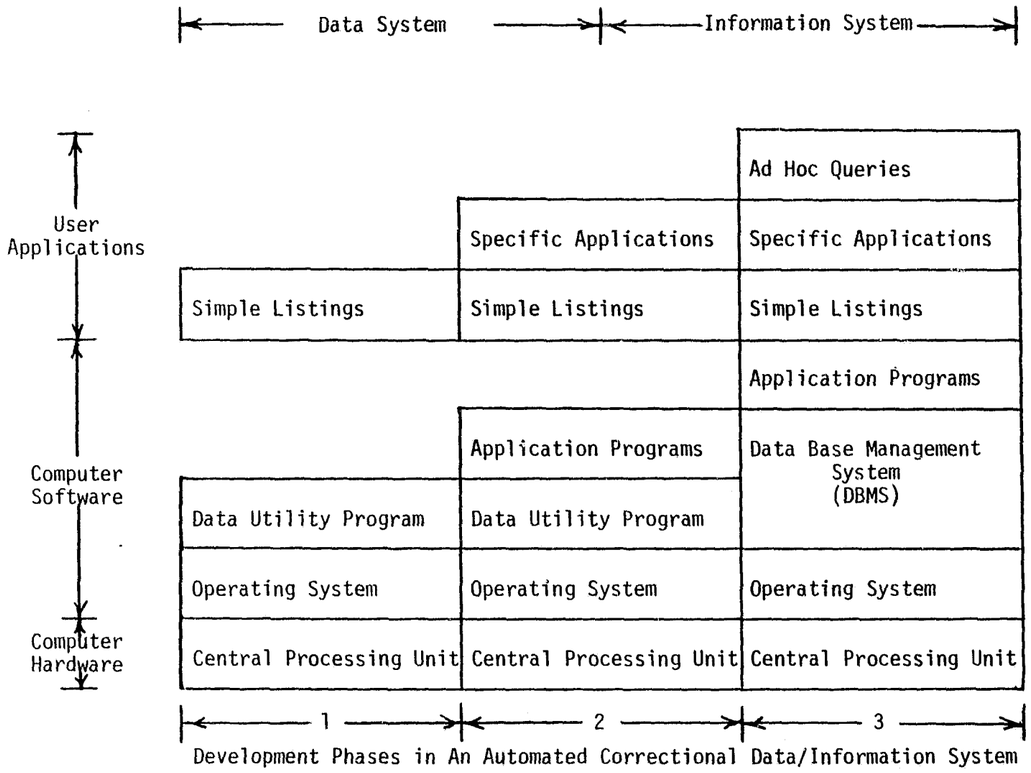
In considering the historical development of ACDSs, we have, in general, noted a gradual, three-phase process. As illustrated in Exhibit 15, first the corrections agency loads a selected set of offender-based data (usually, just an offender's name and a few other identifiers) on an available (usually belonging to the state data center) central processing unit (with operating system); the outputs are restricted to simple listings made available by a basic data utility program that is typically provided as a part of the operating system. Then, after some experience and the allocation of an explicit budget for data processing activities, the agency enters into a second phase in which the data base is expanded to include many more offender characteristics and programmers are hired (or loaned from the state data center) to develop special application programs for specific analyses or applications (e.g., the offender-based applications in Exhibit 10). Most agencies with ACDSs are obviously in this phase of their ACDS development. Some agencies, however, having had more experience and having allocated a larger budget for data processing activities, are entering into a third phase in which they acquire a DBMS* so as to facilitate the organization of an ever-increasing data base, as well as to minimize the need to write application programs for an ever-increasing number of demands, including those identified by Friel et al. (1979). It should be noted that in describing the three phases of ACDS development, we are not advocating that every corrections agency go through the three phases; in fact, except for the learning experience, time and money are wasted when an agency goes through the individual phases, especially if it was always intended that the ACDS should be of the type represented in the third phase. Instead, what we advocate is that an agency should undertake an intensive needs assessment effort to determine the type of ACDS that would meet its needs, and then to develop a multi-year plan -- subject to budgetary and technological constraints -- for achieving the desired ACDS.

In overlaying our concepts of data and information on the three-phase ACDS development process, we can state that a phase one automated system is clearly a **data system**, a phase three system is clearly an **information system**, while a phase two system represents a hybrid version of the two indicated systems. As illustrated in Exhibit 15, we feel that an information system should have some sort of a DBMS which would allow for an easy access to and processing of the data; further, we feel that an information system should have some capability of on-line, ad hoc queries (for which

*The DBMS box in Exhibit 15 is purposely shown to be larger than the "data utility program" box (which it replaces in the third phase) because, as noted earlier, it is much more powerful than the latter software program.

Exhibit 15

Development of An Automated Correctional Data/Information System



DBMSs are especially well suited). Given this more stringent definition for an information system, it is clear that most, if not all, ACDSs are indeed data systems; it should be noted that none of the 19 ACDSs which possess DBMSs have implemented a systems-wide capability for on-line, ad hoc queries (a few have this capability for central office staff only). However, it should just be a matter of time before one or more of the current ACDSs become a complete automated correctional **information** system (ACIS). As an ACIS, the system would serve both the operational and management needs of corrections, while, as an ACDS, the system would primarily serve the operational need (although not half as effectively as would an ACIS). Consequently, we recommend that, subject to budgetary constraints and individual needs, the current ACDSs (which are tactically -- or operationally --oriented) should grow into ACISs (which would be both tactically and strategically -- or management -- oriented) so as to be of maximum utility to corrections.

Actually, the above recommendation that ACDSs become ACISs is nothing more than recommending that the **power** of the computer be used. While ACDSs are, for the most part, automated analogs of previous manual procedures and processes, ACISs are more proactive and attempt to improve on those procedures and processes, by making available useful (i.e., timely and relevant) decision-oriented information. (In another NEP Phase I study, Colton et al. (1981) also found that the power of the computer is being underutilized; in that case, it was in the law enforcement area.) For example, with real-time file updating of an inmate's location, the ACIS's DBMS can be directly used to take an inmate count at any time of the day. Another real-time application using the ACIS could be transportation scheduling, which, because of the large daily volume of transfers (including transfers due to reclassification, medical need, disciplinary action, and court appearance), represents a real need in corrections*. In this case, however, an application program containing a scheduling algorithm -- see, for example, Bodin and Berman (1979) -- would have to interact with the ACIS's DBMS in order to produce an appropriate and up-to-the-minute schedule. Actually, because the inmate count and transportation processes represent real needs and because they are highly visible applications, we recommend that they be given serious consideration.

Finally, it should be cautioned that our strong endorsement of a DBMS-based ACIS should be tempered by cost considerations. A DBMS is costly to implement, and its maintenance would require an almost full-time data base administrator. Further, it is unclear as to which type (i.e, network or relational) or which available DBMS is best suited for corrections. Consequently, we recommend that an evaluation be undertaken to assess the various DBMSs; this would first require the development of an appropriate and comprehensive correctional "benchmark" which could then be employed to comparatively evaluate the performance of the various DBMSs. Section 6.2 recommends the development of such a benchmark, which, as indicated in Section 3.1, could also be used to test any ACDS.

4.5 AN ALTERNATE SYSTEM

In this section, we attempt to answer the question: Given our current knowledge of ACDSs, what could be an effective automated correctional information system? Since the effectiveness of current ACDSs seems mixed, at best,we have tried to identify an alternate approach to ACDS development. Our driving force has been the

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*One corrections agency, in fact, informed us that as many as 10 percent of all its inmates are sometimes "on the road in any one day". The two ACDSs which claim to do something in the transportation scheduling area (SDCI, 4.7(A)) merely issue lists of those requiring transport --no actual scheduling is done by the computer.

realization that current ACDSs lack user support. Aside from taking the various steps recommended in Section 4.1 to gain and maintain user support, we have noted that i) users have a need for decision-oriented information (not just listings or summaries of data elements), and ii) users have a need to "control" their data (and not to give it up to a distant data storage device that is under someone else's -- most likely data processing's -- jurisdiction). The latter need is based on the perception that data constitute power; Westin and Baker (1972) have found that this perception is held in many organizations, both public and private organizations.

Fortunately, the state of computer technology is such that the above two needs can be very appropriately met. First, as we have discussed in Section 4.4, the DBMS can be a very effective analyser or processor of data into information. Second, a distributed network of computers (including mainframes, minicomputers and microcomputers) can allow for a data base in which data are geographically distributed, with each data set residing in a computer (or "node") at or near the location where it is entered; yet, all the data in such a network can still be viewed as one data base and are available from all nodes, subject to the access constraints of the network. Further, the processing of data can also be carried out locally, on a distributed basis. There are three main approaches to organizing a distributed network (Breslin and Tashenberg, 1978). The **hierarchical** (or star) approach consists of a central node with various levels of minor nodes; the central node provides operational and developmental services on a shared basis, and each node can operate in a stand-alone fashion. The **ring** approach consists of a number of equal-capability nodes connected together like in a ring; since each node is capable of providing the same processing service as any other node, the computing or processing load can be distributed to nonbusy nodes when necessary. The **topological** approach consists of different-capability nodes; each node is usually able to provide a specific set of processing services. Whichever approach is used, the object is still the same -- that of storing and processing data on a distributed basis, under a system-wide management program (which controls data base definition, operating procedures, resource use, security, data access, and data and program transfers between nodes). It should be noted that the political realities of an agency's organization chart can, for example, be represented by an hierarchical network, such as the one proposed by Shin et al. (1981).

In sum and as identified in Exhibit 16, the system that we feel would be effective in the corrections environment, especially in a large environment, is a distributed automated correctional information system (DACIS). Although we are confident that DACIS, if properly implemented, would enhance user support, we have obviously not been able to fully develop this alternative system; such a developmental study is recommended in Section 6.2, which also recommends an evaluation of a possible implemented version of DACIS.

A key consideration is whether and how to interface DACIS with other criminal justice data systems. We feel that any automated correctional system should be electronically or automatically interfaced with other criminal justice data systems, especially if they require some of the same data elements. The problems of privacy and security, although real, can be overcome by limiting access and monitoring all interchanges between systems. In fact, as summarized in Exhibit 17, although some national automation efforts are directed at specific components of the criminal justice system, others are aimed at spanning over or interfacing the various components. In regard to a DACIS interface with another criminal justice data system, DACIS could treat the other system as just another node (if it contains just one computer) or another network (if it itself is a distributed system); thus, one day an automated criminal justice information system could be characterized as a multi-network system.

Exhibit 16

A Distributed Automated Correctional Information System

Hardware

- Distributed Set of Computers (Including Minicomputers and/or Microprocessors)
- Distributed Communication Network[1] (With Distributed Data Bases)
- Storage Devices, Printers, CRT's, and Other I/O Devices

Software

- Operating System
- Data Base Management System (DBMS)[2]
- Application Programs
- System-Wide Management Program

Applications

- Ad Hoc Queries
- Real-Time Offender-Based Applications[3]
- Other Offender-Based Applications (Which Cannot Be Handled by DBMS)
- Administrative Applications

Other Features

- Efficient and Accurate Data Entry[4]
- Interface With Other Criminal Justice Data Systems
- Good System and Program Documentation

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[1]Requires a developmental study and an evaluation: Should it be a hierarchical (or star), ring, or topological network? And what hardware configuration is most cost-effective?
[2]Requires an evaluation: Should it be a network or relational DBMS? And what features should it have (i.e., which available DBMS is best)?
[3]Requires an evaluation: Which applications (e.g., inmate count taking and transportation scheduling) would be cost-effective to require real-time file updating?
[4]Requires an evaluation: Should data be entered locally or centrally?

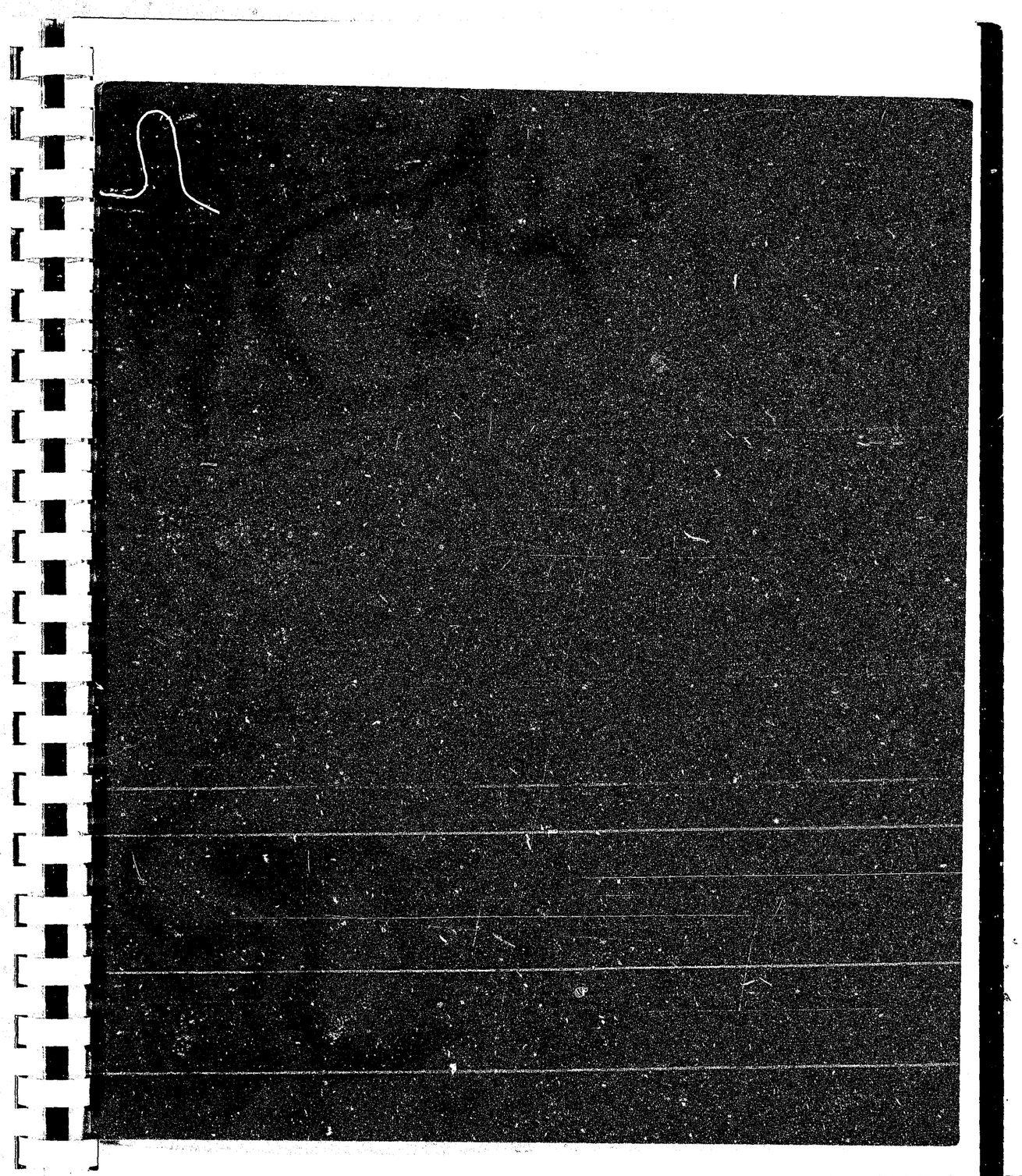


Exhibit 17

National Automated Criminal Justice Data Systems

ACRONYM (YEAR BEGAN)	NAME	ORIGINAL DEVELOPER	INITIAL FUNDING AGENCY[1]	CRIMINAL JUSTICE COMPONENTS							
				POLICE	JAIL	PROSECUTION	COURT	PROBATION	CORRECTIONS	PAROLE	OTHER
NCIC (1960s)	National Crime Information Center	FBI	FBI	↔			↔				
PROMIS (1971)	Prosecutors Management Information System	INSLAN, Inc.	LEAA	←	—	—	→				
CCH (1973)	Computerized Criminal History	SEARCH Group, Inc.	BJS	←	—	—	—	—	—	→	
SJIS (1973)	State Judicial Information System	SEARCH Group, Inc.	BJS				↔				
OBSCIS (1974)	Offender Based State Corrections Information System	SEARCH Group, Inc.	BJS						↔		
OBTS (1975)	Offender Based Transaction Statistics	BJS	BJS	←	—	—	—	—	—	→	
POSSE (1979)	Police Operations Support System -- Elementary	SEARCH Group, Inc.	BJS	↔							
CMIS (1979)	Corrections Management Information System	SEARCH Group, Inc.	BJS						↔		
JAMS (1979)	Jail Accounting Microcomputer System	SEARCH Group, Inc.	BJS		↔						
SCRS (1980)	Standardized Crime Reporting System	SEARCH Group, Inc.	BJS	↔							
MICRONYM (1980)	System for Identification Processing	SEARCH Group, Inc.	BJS								↔[2]

[1]LEAA=Law Enforcement Assistance Administration, BJS=Bureau of Justice Statistics (Formerly, National Criminal Justice Information and Statistics Service, LEAA), FBI=Federal Bureau of Investigation

[2]State identification bureaus.

5 EVALUATION CONSIDERATIONS

A requirement of the NEP Phase I program is the development of a single project evaluation design: in this case, a design for evaluating an ACDS project. Before developing such an evaluation design in Section 5.2, we consider some evaluation issues in Section 5.1. Section 5.3 remarks on our limited assessment of the developed design.

5.1 EVALUATION ISSUES

In developing the ACDS evaluation design, we became aware of five critical differences between the ACDS environment and the **typical** social program environment; these differences make it more difficult to develop and conduct an evaluation in the former environment than in the latter. There are, of course, certain aspects of an ACDS environment which would make it easier to develop and conduct an evaluation in it than it would be in the typical social program environment; for example, the fact that an ACDS can easily monitor itself is invaluable, as very few other social program interventions can monitor themselves, especially in an objective, automated manner.

The six issues which make an ACDS evaluation quite difficult include i) ACDS evaluations are nonexistent; ii) ACDS staff are unfamiliar about program evaluation; iii) ACDS goals are ambiguous; iv) ACDS, as a program intervention, lacks integrity; v) ACDS environment is not well defined; and vi) ACDS benefits are hard to quantify. The six issues are briefly discussed in the next six subsections, respectively; they are further considered in Section 5.2.

ACDS EVALUATIONS ARE NONEXISTENT

We have already stated several times that there have been no previous evaluations of ACDSs. However, have there been any related evaluations of information systems? In our limited review of the pertinent literature, we have found two distinct groups of evaluations. The first group contains strictly technical evaluations of computer performance (Ferrari, 1978), while the second group contains more broad-based evaluations of information systems (Hemmens, 1973; Carlson, 1974; Keen, 1975; King and Rodriguez, 1978). While both groups of material are helpful, especially from an evaluation measures perspective, perhaps the evaluation which is most related to the ACDS area, was one undertaken by Lyman (1977), who evaluated a criminal justice information system that was implemented in Santa Clara County, California. He evaluated the system along four performance dimensions (i.e., intergovernmental, organizational, and administrative; operational; technical; and security and privacy); most of his evaluation findings were based on "ratings" provided by 70 "stakeholders" who were interviewed on some 60 criteria.

ACDS STAFF ARE UNFAMILIAR ABOUT PROGRAM EVALUATION

Perhaps because of the fact that there have been no ACDS evaluations, the ACDS staff are uniformily unfamiliar about program evaluation. When the word "evaluation" is mentioned, they instinctively think about the narrow area of computer performance evaluation. Would this unfamiliarity result in a negative reaction if an ACDS evaluation were to be conducted in their respective organization? We think not, at least none of the individuals we came in contact with during this study were negative about the possibility of being evaluated. In fact, one data processing administrator stated, "I would welcome an evaluation; it would show my bosses what a good job we're doing, despite our recent cut-back in funding".

ACDS GOALS ARE AMBIGUOUS

As discussed in Section 3.3, the ACDS goals are ambiguous, and, for the most part, not measurable. A related problem has also been when a corrections agency's informal goals are in conflict with those of the ACDS funding source (i.e., LEAA). In such a case, the data processing administrator would usually try to "walk a middle ground". In terms of an evaluation effort, however, it would be very difficult, if not impossible, to get the administrator to explicitly state his/her set of goals.

ACDS, AS A PROGRAM INTERVENTION, LACKS INTEGRITY

In a social program environment, the intervention (or treatment) is usually stable, distinct and applied at a point in time; that is, it has integrity. In an ACDS environment, the intervention (which is the ACDS itself or a part of it) lacks integrity. As observed throughout the report, the ACDS is in a constant state of change (undergoing either a development, or an upgrading, or a modification, or a redevelopment); the ACDS then, as an intervention, is unstable, amorphous and not bounded within a period of time. Further, the fact that most ACDS mainframes are located in state data centers makes it very difficult to identify the ACDS intervention from the overall operation of the state data center.

ACDS ENVIRONMENT IS NOT WELL DEFINED

While the social program environment is relatively well defined (from a program intervention perspective), the ACDS environment is typically hard to define. Because the principal output of an ACDS is information (including data), it is very difficult to define an environment of potential ACDS impact, since information is so pervasive. Additionally, it should be pointed out that no two ACDS environments are alike: they differ in terms of simple operational procedures to more complex legal statutes.

ACDS BENEFITS ARE HARD TO QUANTIFY

Since most ACDS benefits are derived from the outputted information, the question arises: What is the value of information? This age old question has defied quantification. Although most researchers have assessed the value of information from an econometric approach (Gould, 1974), we propose in the next section to use a multiattribute utility approach.

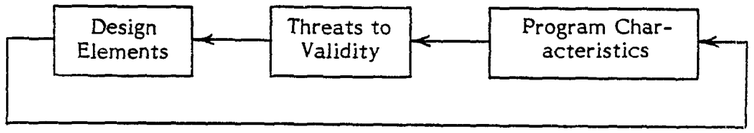
5.2 EVALUATION DESIGN

The evaluation design developed in this section has been shaped by four key considerations. First, the design is sensitive to the issues or problems addressed in Section 5.1; in fact, the design attempts to overcome or minimize these problems. Second, the design assumes that the intervention being evaluated is either the entire ACDS or a part of it (e.g., distributed processing, DBMSs, real-time offender-based applications, and data entry locations). Third, the design attempts to be comprehensive or **systemic** in its outlook; Tien (1979) defines a systemic evaluation to be at once an audit, formative and summative evaluation. Fourth, the design is based on a purposeful evaluation design process advanced by Tien (1979).

The process is illustrated in Exhibit 18; it is based on a dynamic roll-back approach. The "roll-back" refers to a three-step sequence: the sequence rolls back in

Exhibit 18

Evaluation Design Process: A Dynamic Roll-Back Approach



tion of the threats (i.e., problems and pitfalls) to the validity of the final evaluation; and to iii) a more immediate identification of evaluation design elements. The logic of this sequence of steps should be noted; that is, the anticipated program characteristics identify the possible threats to validity, which in turn point to the design elements that are necessary to mitigate, if not to eliminate, these threats. The "dynamic" aspect of the approach refers to its nonstationary character; that is, the components of the framework must constantly be updated, throughout the entire development and implementation phases of the evaluation design. In this manner, the design elements can be refined, if necessary, to account for any new threats to validity which may be caused by either previously unidentified program characteristics or changing characteristics (as is the case in ACDS). In sum, the dynamic roll-back approach is a systematic method of developing more purposeful and valid evaluation designs.

Before discussing the program characteristics, threats to validity and design elements, it should be noted that the evaluation design provided in this section must necessarily be at a general level: a specific design can be easily derived by applying the contents herein to a specific ACDS project.

PROGRAM CHARACTERISTICS

The ACDS characteristics are contained in Sections 2 and 3, and they include the six problematic characteristics identified in Section 5.1.

THREATS TO VALIDITY

As indicated in Exhibit 18, a careful consideration of the program or ACDS characteristics results in the identification of potential problems or threats to validity. Tien (1979) has identified 20 explicit threats which can be grouped into the following five categories:

- **Internal validity** refers to the extent that the statistical association of an intervention and measured impact can reasonably be considered a causal relationship.
- **External validity** refers to the extent that the causal relationship can be generalized to different populations, settings, and times.
- **Construct validity** refers to the extent that the causal relationship can be generalized to different interventions, impact measures, and measurements.

- **Statistical conclusion validity** refers to the extent that an intervention and a measured impact can be statistically associated -- error could either be a false association (ie., Type I error) or a false nonassociation (i.e., Type II error).
- **Conduct conclusion validity** refers to the extent that an intervention and its associated evaluation can be completely and successfully conducted.

The six issues or problems identified in Section 5.1 can be considered to be threats to validity; they pose a threat to the validity of any resultant ACDS evaluation study. More specifically, both the first issue (ACDS evaluations are nonexistent) and the second issue (ACDS staff are unfamiliar about program evaluation) represent a political infeasibility threat to conduct conclusion validity; the third issue (ACDS goals are ambiguous) represents a design instability threat to internal validity; the fourth issue (ACDS, as a program intervention, lacks integrity) represents an intervention integrity threat to statistical conclusion validity; the fifth issue (ACDS environment is not well defined) represents a test-setting sensitivity threat to external validity; and the sixth issue (ACDS benefits are hard to quantify) represents a measures sensitivity threat to construct validity. As illustrated in Exhibit 18, the design elements that are developed in the next subsection attempt to mitigate these threats.

DESIGN ELEMENTS

The various evaluation design elements can be grouped into five components, including test hypotheses, selection scheme, measures framework, measurement methods, and analytic techniques. Although the design components are obviously interrelated, they are mutually exclusive in scope. Each component is discussed next in terms of its essential elements (i.e., items which must be addressed in the development of an evaluation design) and, if applicable, its potential for mitigating the various threats to validity.

Test Hypotheses

The test hypotheses component is meant to include the range of issues leading up to the establishment of pertinent test hypotheses. The test hypotheses are related to the rationale or goals of the project and are defined by statements that hypothesize the causal relationships between dependent and independent measures; and it is a purpose of evaluation to assess or test the validity of these statements.

In terms of an ACDS project, we have identified in SDCI, 4.9(A) several possible ACDS goals which could be used to develop appropriate test hypotheses. The problem that ACDS goals are generally ambiguous (and may, in fact, be different than those stated), requires patience and care in soliciting and establishing the actual goals and related test hypotheses. Nevertheless, it is likely that the overall goals of an ACDS can be defined and agreed upon.

Selection Scheme

The purpose of this component of the evaluation design is to develop a scheme for the selection and identification of experimental and control groups. Because no two ACDS environments are alike, it is, of course, impossible to develop an experimental design in which one ACDS environment acts as a control for another. Instead, we recommend a quasi-experimental, **pretest-posttest** design in which an ACDS environment acts as its own control over time.

It should be noted that the pretest-posttest design or scheme is suitable for either the case where the intervention is the entire ACDS or the case where it is a part of the ACDS. In the former case, the pretest-posttest comparison could be a comparison either between a manual system and an ACDS or between two entirely different versions of an ACDS. In the latter case, the comparison would be between two time periods, which are linked by a sufficiently long transition period during which the ACDS improvement or change takes place. In either case, the pretest-posttest scheme should allow for a valid evaluation.

Measures Framework

The purpose of this component of the evaluation design is to identify the various measures that would be used to define the test hypotheses. Four sets of evaluation measures are identified in Exhibit 19. Although the first three sets -- input, process, and outcome -- have been proposed and discussed at length in the evaluation literature, the literature is not consistent regarding their respective definitions. For this reason, Exhibit 19 explicitly lists the possible measures in terms of an ACDS project; in fact, the alert reader would recognize these as the topic areas covered in Section 3. It should be noted, for example, that performance measures are a part of the process -- not outcome -- measures. Thus, data utilization is a process measure, which may impact an ACDS user's attitude which is an outcome measure. In general, the input and process measures serve to "explain" the resultant outcome measures. The outcome measures reflect the ultimate results or impacts of the ACDS. The fourth set of evaluation measures -- the systemic measures -- can also be regarded as impact measures but have been overlooked to a large extent in the evaluation literature. The systemic measures allow an ACDS's impact to be viewed from a total systems perspective, and include such issues as its transferability, its generalizability, and its impact on an offender's rights.

Actually, the items contained in Exhibit 19 represent gross measures: their detailed counterparts can be found in the SDCI, which contains over 200 questions seeking information on the detailed measures. A group of process measures that is missing from both Exhibit 19 and the SDCI is that pertaining to computer performance (e.g., response time, turn-around time, central processing unit time per transaction, memory storage utilization factor, etc.). Another missing group of process measures is that pertaining to cost (e.g., mainframe cost, software cost, installation cost, etc.). (Both groups of measures are missing from the SDCI because, although they were originally a part of the SDCI, we decided, for reasons of space, not to include them in the final version of the SDCI since we received no responses for them.) These two groups of process measures are, of course, very important and should be included in any ACDS evaluation effort.

Finally, an outcome measure which is indirectly addressed in the SDCI, but which requires more attention is that of the value of the information derived from the ACDS. As indicated in Section 5.1, much has been written about how to derive this measure or quantity. The traditional approach of using an economic or regression type model is, we feel, too aggregate an approach; the subtleties and relationships among the independent variables (which serve to explain the dependent variable of value) are lost or "assumed away" in such an approach. We recommend employing a multiattribute utility approach in which the administrator who makes use of the ACDS information is asked (through a series of lottery type questions) to provide his/her utility function of the various attributes or variables which constitute value. In this manner, the administrator could more explicitly provide his/her subjective feelings regarding the trade-off between, for example, the time until his/her request for information is fulfilled and the accuracy of the information.

Exhibit 19

ACDS Measures Framework

INPUT

- Needs Assessment
- User Involvement
- LEAA Funding
- SEARCH Group, Inc. Activities
- Computing Facilities
- Data Clarification, Codification and Standardization
- Data Base Design and Creation
- Management Support
- System Testing
- System Documentation
- User Training

PROCESS

- Organizational Factors
- Data Processing Staff
- Software Maintenance
- System Security
- System Cost
- Data Redundancy
- Data Currency
- Data Quality
- Data Utilization

OUTCOME

- Offender-Based Applications
- Management (Decision Support), Planning and Research Applications
- National Reporting
- Time Savings
- User Attitudes
- Administrative Attitudes
- System Goals

SYSTEMIC

- System Interfaces
- System Transferability
- System Generalizability
- Offender's Rights
- Corrections Issues

MEASUREMENT METHODS

An ACDS evaluation effort should be guided by four criteria in its selection of measurement methods: i) a commitment to a multi-measurement approach whereby each test hypothesis is assessed using at least two different methods or sets of measures; ii) a commitment to quantitative evidence wherever possible, realizing that the evaluation must also include qualitative measures (e.g., user attitude); iii) a commitment to undertake only needed measurements; and iv) a recognition that the purpose of any measurement method is to mitigate the various threats to the evaluation's validity. For example, we recommend a multi-measurement approach to mitigate the problem posed by the ACDS being in a constant state of change. That is, the ACDS administrator must, of course, first make a commitment to postpone any ACDS changes until after the formal evaluation period, and then a multi-measurement approach could be employed to monitor this commitment.

Five primary types of measurement methods should be employed in an ACDS evalution: software programs (for self-monitoring of computer performance), special data collection instruments, observations, structured interviews, and questionnaire surveys. In regard to the length of the evaluation period, we recommend at least an 18-month period (i.e., a six-month pretest period, a six-month transition period, and a six-month posttest period). A much longer time period would not necessarily increase the validity of the evaluation, since extraneous threats to validity may occur. It should be noted that, unlike a typical social program where a one-year posttest observation is required at a minimum (in order to account for any seasonal effects), an ACDS's impact should not have any seasonal variation. What is important, however, is that an adequate transition period be allowed for an ACDS intervention to take hold (i.e., after all the bugs have been worked out).

Analytic Techniques

Tests of significance should, of course, be applied to the test hypotheses, subject to an appropriate level of significance. In terms of an ACDS evaluation, a very important technique is cost-benefit analysis. Although there are numerous references which list potential costs and benefits associated with computing (see, for example, Exhibit 20), there are very few actual cost-benefit analyses of computing. One problem is, as noted in Section 3.2, the difficulty in acquiring cost data. The other problem concerns representation of the various benefits by a single outcome measure of benefit (or value of information); as suggested earlier in this section, we recommend a multiattribute utility approach to this problem. Thus, a cost-utility analysis should be undertaken in an ACDS evaluation.

5.3 DESIGN ASSESSMENT

As indicated in Section 1.2, the data processing personnel from the Assessment Sample of five ACDSs helped to develop and refine the evaluation design presented in Section 5.2, as well as the extensive structured data collection instrument (SDCI). Although initially they were unfamiliar with program evaluation, they indicated an interest and willingness to participate -- mostly by phone and mail -- in our evaluation design effort. They reviewed our design efforts and assessed our products, including the user attitude questionnaire contained in the SDCI. In fact, one data processing administrator indicated that he was going to distribute the questionnaire at the next users' meeting. In the end, they felt quite comfortable with our proposed design. When asked if they would allow an evaluation of their ACDS using such a design, they replied in the affirmative but felt that the evaluation should not start until they had completed

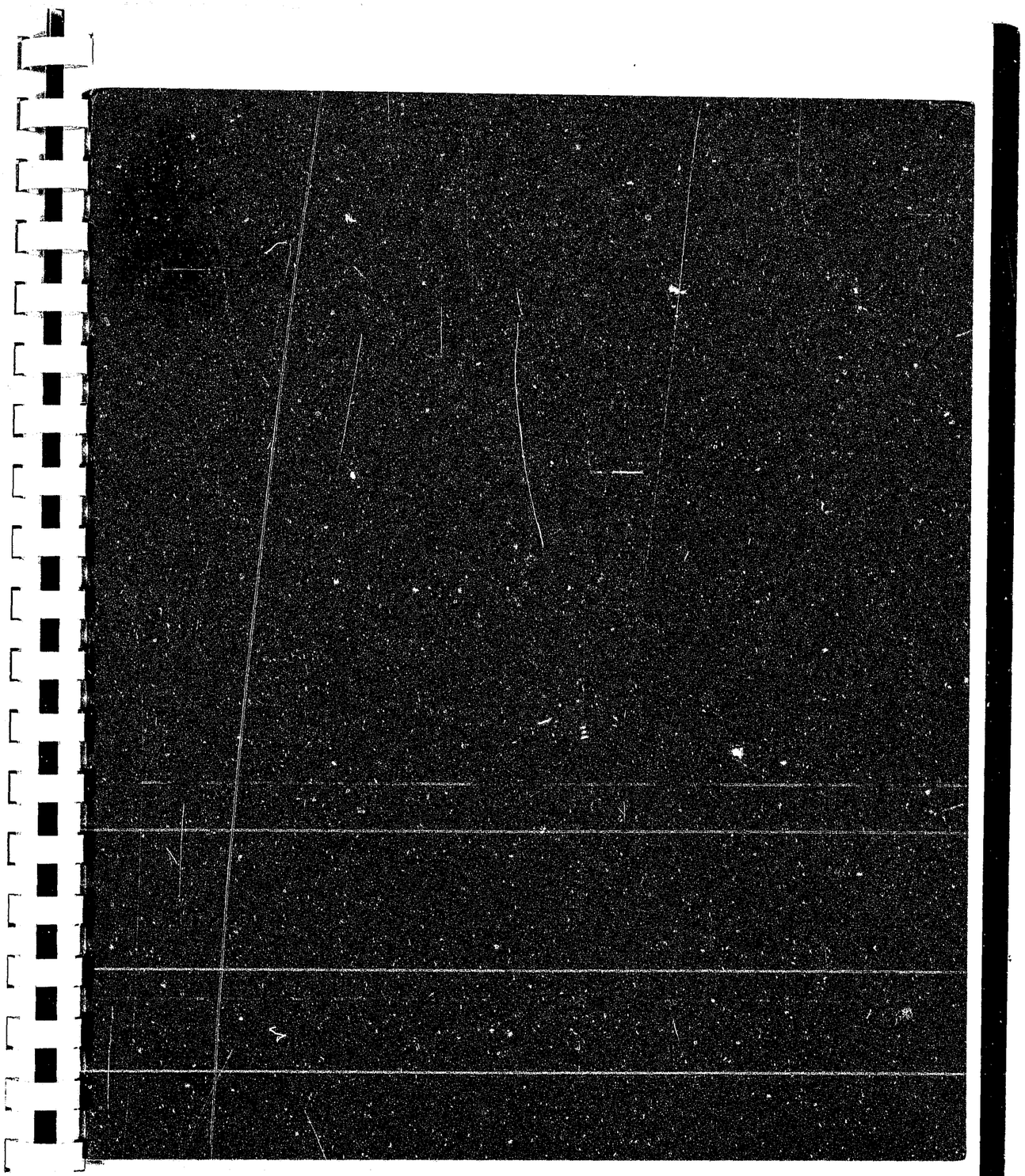


Exhibit 20

Potential Benefits and Costs Associated With Computing

List of Potential Benefits from Computing	List of Potential Costs Associated with Computing
Reduction in per-unit processing costs	Cost for consultants to assist in decision and design
Improved accuracy in calculations	Equipment purchase and lease costs
Improved ability to change variables and values in programs	Equipment installation cost
Increased speed in calculating and printing	Cost to modify equipment site and other facilities
Ability to automatically collect and store records	Cost of capital to undertake the operation
More systematic recordkeeping	Cost of management and staff time for decisions and initiation of computing
Reduction of space and cost for storing of records	Cost of operating system software
Standardization of records and recordkeeping	Communications systems installation cost
Improved records security	Start-up personnel and consultant costs
Improved record portability	Costs of hiring and training
Faster record retrieval	Costs associated with the disruption of normal activities
Better access to records in large data bases	Management costs for start-up
Greater flexibility in moving records around in data bases	Applications software costs
Ability to capitalize on telecommunications linkages among data bases	Modification costs for existing applications
Ability to keep ongoing records of data base use	In-house application development costs
Improved ability to audit recordkeeping and use activity	Costs of interaction between users and computer professionals
Ability to quickly make global changes in records	User training costs
Ability to manage large data files	Data collection and preparation costs
Ability to create new files through merge and sort of other files	Documentation preparation costs
Improved ability to perform complex calculations quickly	Management costs for applications development
Capacity for solving simultaneous equations	System maintenance costs
Ability to simulate complex phenomena	Utilities costs
Ability to aggregate large amounts of data for planning	Depreciation on hardware and facilities
Ability to automatically control physical processes	Operations staff costs
Improved capacity to collect data on system performance	

SOURCE: King and Kraemer, 1980, pp. 3-4

their respective upgrades. In sum, it can be stated that an ACDS evaluation can be carried out and that the evaluation design presented herein is viable. Perhaps, the most obvious indication of the design's viability is its partial application in this study; both the SDCI and our view of ACDS issues are based on a part of the design detailed herein.

6 CONCLUSIONS

The purpose of this section is to draw conclusions from the material presented in Sections 1 through 5. The present state of knowledge is presented in Section 6.1; future development and evaluation activities are recommended in Section 6.2; and specific policy questions are answered in Section 6.3.

6.1 STATE OF KNOWLEDGE

Exhibit 21 summarizes our state of knowledge regarding automated correctional data systems (ACDSs) in terms of the issues, gaps, and recommendations that are contained in Sections 2, 3 and 4. A quick review of Exhibit 21 reveals that most recommendations can and should be implemented by corrections agencies and/or ACDS developers. A second set of recommendations concern the conduct of future development and evaluation activities, which are further addressed in Section 6.2. A third set of recommendations is directed at the federal government; these recommendations are developed in Section 4.2 and briefly summarized in Section 6.3.

6.2 FUTURE ACTIVITIES

Two development and four evaluation activities are recommended in this section. All six activities deserve immediate attention; they should be funded by the federal government and carried on in coordination with each other. It should be noted that either one or all four of the evaluation activities could be carried out as an NEP Phase II effort. Alternatively, the NEP Phase II study could be an intensive evaluation of any ACDS, especially one that will be implemented at some future date so that the pretest-posttest scheme proposed in Section 5.2 can be employed). In sum, we strongly recommend that an NEP Phase II effort be carried out: we must begin to evaluate ACDSs so that we can determine what works, what doesn't, and why.

DEVELOPMENT ACTIVITIES

We recommend the development of a benchmark for ACDS testing purposes and a detailed design for a distributed automated correctional information system (DACIS).

Benchmark

One of the most striking findings of our study is the absence, in almost every case, including the prototype OBSCIS system, of an element which could be an extremely valuable tool: a prototypical test package or benchmark. Testing, at the system level, serves a multitude of purposes. The one most commonly thought of is to verify that the programs are free of bugs; however, a well designed benchmark should also serve i) to assure that the system performs as the users expect it will; ii) as a vehicle for training users and generating their trust in the system; iii) as a test of associated manual procedures as well as the computer programs themselves; iv) to monitor system performance and accuracy as changes are made in the course of normal maintenance; v) as an aid to debugging when problems arise; and vi) as an aid to evaluating different systems (e.g., DBMSs).

The benchmark mark should have three components: input data, processing instructions, and expected results. The input data should be carefully constructed to include the most common examples of all types of offender-based transactions, all possible valid field values, and all types of errors, each in every possible combination. The processing instructions should be extremely complete and explicit; they should

Exhibit 21

State of Knowledge: Issues, Gaps and Recommendations

ISSUES	GAPS	RECOMMENDATIONS
INPUT		
• ACDS Planning	• The absence of a formal needs assessment (and related functional specification) effort has been a major reason for ACDSs--especially their earlier versions--to have failed or not to have lived up to expectation.	• Inasmuch as ACDSs, like other automated systems, are constantly being redeveloped or modified, a needs assessment/functional specification effort is never to late, and the resultant document should be contantly updated.
	• The lack of user involvement throughout the ACDS development process (i.e., planning, designing, testing, implementing, operating and maintaining) has resulted in a lack of user support of ACDS at both the data input and data utilization ends of the ACDS.	• User involvement should not only be encouraged but mandated at every stage of the ACDS development--and redevelopment--process.
	• While LEAA--in particular OBSCIS--funds have been critical in the development of ACDSs, they have not prevented the "reinventing of the wheel".	• Despite the demise of LEAA, the federal government should continue to help states by funding i) basic ACDS research and development efforts, ii) ACDS-related technical assistance assignments to requesting states, iii) a national clearinghouse for ACDS-related information (including a yearly national meeting for ACDS administrators to meet each other and to be exposed to recent ACDS developments), and iv) an ACDS-related evaluation program.
	• While SEARCH Group, Inc., has carried out its LEAA/BJS-funded activities (to support OBSCIS and related developments) with diligence, it has had this role since 1973.	• The federal government (i.e., the BJS) should award--on a competitive basis--two, five-year grants to carry out the above recommended activities: one grant to carry out the first three activities; the second grant to carry out the fourth evaluation activity.
• ACDS Design	• Several problems can occur when the corrections agency does not have direct control over its ACDS mainframe.	• As some are currently planning, corrections agencies should consider the use of mini- and microcomputers (especially in a linked network of distributed processors)--the impact and potential of these new technologies need to be evaluated.
	• Several problems can occur when data elements and procedures are not first clarified, codified and/or standardized.	• Data elements and procedures should be continually clarified, codified, and/or standardized, and a manual should be produced and updated accordingly.
	• In regard to data base design, problems can occur if data files are sequential; if the data base management system (DBMS) is not well understood; if the historical data file cannot be directly accessed by statistical analysis packages; and if no purge criteria exist for historical data.	• Data files should be structured for random access; DBMSs should be comparatively evaluated by using a "benchmark" testing procedure; historical data should be aggregated in a manner that allows direct access by statistical analysis packages; and suitable purge criteria should be developed.

Exhibit 21

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ISSUES	GAPS	RECOMMENDATIONS
	• Creation of an initial data base for an ACDS is a major undertaking and one whose difficulty has frequently been underestimated.	• The manual records should be in good condition before attempting a conversion, which may require the hiring of some extra, temporary data processing help.
• ACDS Implementation	• User involvement and elaborate approaches to ACDS system testing have been minimal.	• User involvement should be a requirement in system testing; and the above recommended benchmark (i.e., a test package with known results) for comparative DBMS assessment could also be used in system testing.
	• System documentation has been poor to nonexistent, causing problems in system operation and maintenance.	• Documentation should be mandated, and documentation standards should be added to the requirements of any future funding in the ACDS area.
	• Most agencies have not carried out intensive user training, which in turn has contributed to decreased user support.	• User training should be intense and should be given to all members of the agency.
PROCESS		
• ACDS Support	• ACDS performance has been negatively affected by the relatively low rank of data processing administrators, the high turnover of data processing staff, and frequent reorganizations within the corrections agency.	• Records and data processing staff should report to the same administrator; data processing staff should receive industry-level pay; and ACDS developers should build a broad base of support within the corrections agency.
	• ACDS operation has been negatively affected by impractical designs, programmers reassigned to other tasks, and contractors who are unfamiliar with corrections.	• Data processing staff should include individuals with corrections background; corrections should negotiate for administrative control over programmers assigned to do its work; and contractors should be closely supervised and required to produce good documentation.
	• Lack of software maintenance has resulted in some severe problems.	• Techniques (e.g., modular programming and structured programming) which make the software easier to maintain should be employed, and good system documentation, as well as explicit administrative procedures for system maintenance, should be developed.
	• System security has been quite lax and the potential for misuses and abuses of offender data exist.	• A minimum set of security requirements should be required of all ACDSs --such a set is contained in Section 3.2.
	• Reliable system cost data have been uniformly unavailable.	• Corrections agencies should separate out ACDS-related costs.
• ACDS Performance	• Although for legal and practical reasons the manual files must duplicate at least a portion of the ACDS files, redundant manual files (which could be displaced by the ACDS) have been maintained.	• User training and better communication between users and data processing staff should be required.

Exhibit 21

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ISSUES	GAPS	RECOMMENDATIONS
	• Real-time (versus delayed) file updating and local (versus central) data entry have been topics of conroversy.	• Real-time file updating and local data entry should both be evaluated.
	• Although improving, data quality--in terms of factual accuracy, entry accuracy, completeness, and timeliness--has been a problem.	• The ACDS should be designed to be useful to those who enter data into it; user training should be improved; thorough system testing should be undertaken; those entering data into the ACDS should be held accountable; procedures should be established for reporting and correcting program errors; and periodic audits of the ACDS' files should be conducted.
OUTCOME		
• ACDS Output	• Most offender-based applications have been operating at the "data" level, producing listings or summaries of data.	• Offender-based applications (including inmate count taking and transportation scheduling) should operate at the "information" level where the power of the computer could be used to produce timely and relevant information.
	• While the operational or tactical needs of corrections are being met (at least partially), the more strategic needs of planning, research and management have, for the most part, not been met.	• ACDS development should continue to meet the tactical needs of corrections but should also concentrate on meeting their strategic needs.
	• While they have been reporting to the NPS and UPR reporting programs, corrections agencies have problems with the reporting formats and see no benefit in return for their efforts.	• The NPS and UPR should clarify and standardize the reporting formats and should produce timely and reliable summaries of the data provided them.
• ACDS Impact	• While the ACDS applications have resulted in significant time savings for corrections staff, they have barely begun to make use of the power of the computer.	• ACDS should continue to be developed in those areas which would potentially yield the most time savings as well as those which make the most use of the computer's power.
	• The attitudes of users toward ACDS have, for the most part, not been positive, primarily because of a lack of perceived benefits of the ACDS.	• More user involvement and user training should be initiated and carried out.
	• The attitudes of some administrators toward ACDS have been less than positive and have caused some severe problems.	• ACDS developers should, if possible, secure the support of most, if not all, corrections agency administrators.
	• ACDS goals have been surreal, ambiguous and not measurable; their attainment have been mixed.	• ACDS goals should be realistic, specific, and measurable.
SYSTEMIC		
• ACDS Environment	• Very few ACDSs have interfaced with other criminal justice information systems.	• An ACDS should be automatically interfaced with other criminal justice information systems, with special attention paid to security and privacy issues.

Exhibit 21

(Page 4 of 4)

ISSUES	GAPS	RECOMMENDATIONS
	• Transfers of ACDS technology have been few (i.e., mostly BOSP transfers) with mixed results.	• Transfer of ACDS technology should be encouraged and the above recommended, federally-funded, technical assistance contractor should assist in such transfers.
	• There has been no technology transfer from other environments similar to that of corrections.	• ACDS developers should look into the possibility of accessing the data systems technology from other similar environments, especially hospitals.
• ACDS Influence	• Except in helping to prove fair treatment in a handful of litigation cases, ACDSs have not been used to protect an offender's right to have adequate and fair treatment.	• ACDSs should develop and implement applications which can protect an offender's right to have adequate and fair treatment.
	• Except in a few cases, ACDS data have not been used to shed light on corrections issues, and ACDSs have not assisted in the monitoring of an agency's compliance with correctional standards.	• ACDS data should be analysed to shed light on contemporary issues in corrections, and ACDSs should be used to monitor an agency's compliance with correctional standards.
EVALUATION		
• ACDS Evaluation	• It should be noted that i) ACDS evaluations are nonexistent; ii) ACDS staff are unfamiliar about program evaluation; iii) ACDS goals are ambiguous; iv) ACDS, as a program intervention, lacks integrity; v) ACDS environment is not well defined; and vi) ACDS benefits are hard to quantify.	• A purposeful, systemic evaluation design should be able to mitigate the various threats to the validity of an ACDS evaluation.

include all data cards and/or control cards to be changed, the names and locations of all files, and any other information which might be needed. The preparation of the expected results should be closely coupled with the preparation of the test input, and may constitute the major portion of the test development; in effect, the developer must take the input and must (almost manually) carry out the processes which the computer will perform (i.e., build on paper the files which the computer will build on storage devices, keep tallies and counts, and produce the reports which the computer will produce). In addition, the benchmark should contain tests for batch, on-line, and, possibly, real-time applications. Further, the benchmark itself should be field tested as a part of this development effort.

DACIS

The DACIS concept is outlined in Section 4.5. In order to provide a detailed DACIS design, it is obvious that a specific corrections environment must be identified; it should be an appropriate corrections agency which has a genuine interest in implementing such a design. The design developer should take into consideration such issues as types of network, type of computers, number of computers (not every institution need or should have a computer), system-wide procedures and protocols, maintenance, training, security, privacy, and cost.

EVALUATION ACTIVITIES

We recommend the evaluation of i) DBMSs, ii) DACIS, iii) real-time offender-based applications, and iv) data entry location. The last three evaluation efforts can and should employ the evaluation design developed in Section 5.2. Since a pretest-posttest scheme is recommended, it is, of course, necessary that the item or intervention being evaluated must take place at some future date.

DBMSs

Using the benchmark produced as a result of the above recommended development activity, various DBMSs should be evaluated in their respective ACDS environments. Since 19 states have DBMSs, it should not be difficult to select a representative sample of DBMSs (say, six) to carry out a comparative evaluation. It should be noted that what we are recommending here is a performance -- not systemic -- evaluation; our purpose is to compare the available DBMSs to see which one(s) is(are) best suited for the corrections environment.

DACIS

As indicated in Section 3.1, three states (Michigan, Wisconsin and Minnesota) are planning to implement a distributed system. Although their systems may not be the same type of DACIS that is produced as a result of the above recommended development activity, it would still be worthwhile to evaluate one or more of these systems, so that a initial base of knowledge about distributed systems can be established.

Real-Time Offender-Based Applications

As discussed in Sections 3.2 and 4.4, real-time file updating could be beneficial in certain offender-based application areas (e.g., inmate count taking and transportation scheduling), but, on the other hand, it is costly to support. Consequently, we are recommending a cost-benefit or cost-utility type of evaluation in this case.

Data Entry Location

As stated in Section 3.2, there is controversy about where the data should be entered into the computer: locally or centrally. In order to help resolve this controversy, we recommend conducting an evaluation of a corrections agency which is planning a data entry location change (most likely, from central to local).

6.3 POLICY QUESTIONS

In this section, we answer some key policy questions, being as brief as possible and without attempting to address the underlying reasons, which can, of course be found in the body of the report.

What has been the size of federal support for automated correctional data systems (ACDSs)?

Our best estimate is that, during the past decade, the size of the federal -- almost exclusively, the Law Enforcement Assistance Administration (LEAA) -- support for ACDS development has been about 20 million dollars, which includes 11.9 million dollars for the Offender Based State Corrections Information System (OBSCIS) program.

What has been the impact of this support?

We can state without qualification that federal support for ACDS-related activities has been very beneficial; the number of ACDSs would not be as many and the state of ACDS development would not be as advanced if it were not for federal support. Further, federal support has been able to leverage state and local spending in this area.

How many jurisdictions have ACDSs?

Depending on how far along in its development before a system can be called an ACDS, no more than 46 states have an ACDS; also, the Federal Bureau of Prisons, several counties and several municipalities have an ACDS. Our study, however, has concentrated on state level ACDSs.

What is the state of ACDS development?

Some ACDSs have as few as two offender-based applications (while others have 10 times that number); some have on-line capabilities (while the majority do not); some have data base management systems (while the majority do not); and some have minicomputers (while the majority do not). In general, we feel that most ACDS applications are no more than automated analogs of previous manual operations, and the power of the computer has not been used to improve on those operations. However, ACDS development is continuing, although it is being set back by the demise of the LEAA.

Given the demise of the LEAA and the general cut-back in federal funding of public programs, what should the federal role be in supporting ACDS development?

The federal government should support four types of ACDS-related activities. First, the federal government should continue to support basic ACDS

research and development efforts, including the identification of correctional data needs and the development of offender-based application modules. Second, the federal government should expand its support of technical assistance assignments to states which require them; the assignments could range from general ACDS audits or reviews to more basic assistance (e.g., some types of software debugging). Third, the federal government should expand its support of a national clearinghouse for ACDS-related information; the clearinghouse should actively seek out information and should also sponsor a yearly national meeting for ACDS administrators to meet each other and to be exposed to recent ACDS developments. Fourth, the federal government should institute an ACDS-related evaluation program, which would provide the needed feedback with regard to what works, what doesn't, and why.

GLOSSARY

ACA	American Correctional Association
ACDS	Automated Correctional Data System
ACIS	Automated Correctional Information System
BJS	Bureau of Justice Statistics (Formerly, National Criminal Justice Information and Statistics Service, LEAA)
BOSP	Basic OBSCIS Software Package
CCH	Computerized Criminal History
CDAS	Correctional Data Analysis Systems
CDS	Comprehensive Data Systems
CMIS	Corrections Management Information System
CPU	Central Processing Unit
CRT	Cathode Ray Tube
DACIS	Distributed Automated Correctional Information System
DBMS	Data Base Management System
FBI	Federal Bureau of Investigation
IBM	International Business Machines Corporation
JAMS	Jail Accounting Microcomputer System
JDB	Justice Data Base
LEAA	Law Enforcement Assistance Administration
MICRONYM	A System for Identification Processing
NA	Not Applicable
NCJISS	National Criminal Justice Information and Statistics Service
NEP	National Evaluation Program
NCIC	National Crime Information Center
NIJ	National Institute of Justice (Formerly, National Institute of Law Enforcement and Criminal Justice, LEAA)
NPS	National Prisoner Statistics
OBSCIS	Offender Based State Corrections Information System
OBTS	Offender Based Transaction Statistics
POSSE	Police Operations Support System -- Elementary
PROMIS	Prosecutors Management Information System
REGIS	Regional Justice Information System
SAC	Statistical Analysis Center
SCRMS	State Corrections Resource Management Systems

SCRS	Standardized Crime Reporting System
SDCI	Structured Data Collection Instrument
SJIS	State Judicial Information System
SPSS	Statistical Package for the Social Sciences
SSR	Stochastic Systems Research Corporation
UCR	Uniform Crime Reports
Unk	Unknown (or Not Available)
UPR	Uniform Parole Reports

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APPENDIX A

STRUCTURED DATA COLLECTION INSTRUMENT: DATA SUMMARY

Rensselaer Polytechnic Institute Troy, New York 12181

Structured Data Collection Instrument
(Revised 6/80)

State/Project Name: _____

Status: The system described in this document is

____currently under development
____in operation less than six months
____in operation six months or more

Please indicate the date the system was or is expected to be put into operation _____.

Please Note: This document is for internal use only.

The following pages contain the data collection instrument to be used by the research staff to summarize data obtained from documentation, telephone interviews, and site visits. This document is strictly for internal use. Except for one section which is designed to be a user survey, it is not to be filled out by state project staff.

Information is broken down into the following major categories which also correspond, as shown, to the issues and measures taxonomy:

1. System Background: Input issues and measures
2. System Development: Input issues and measures
3. System Operation: Process issues and measures
4. System Impacts: Outcome issues and measures
5. System Users: Outcome issues and measures
6. Broader Issues: Systemic issues and measures

All questions should be answered or have Unk for unknown or NA for not applicable recorded immediately below the question number. If there are additional comments on any question, circle the question number on the form and append the comments, labelled with the question number, in the margins or on a blank sheet at the end of the form.

In cases where the system is not yet operational, answers should reflect what is planned. For example, if a question asks what kind of systems test has been performed, if testing has not yet taken place, then the answer should reflect the type of test which is planned.

Instrument History:

Filled in by	Date	Comments

Contact History:

Person Contacted	Position	Date	Method	Comments

Documents on Hand:

Title	Date	Date Received

Notes: 1) *49 Structured Data Collection Instruments were completed; these are contained in Appendix C of the Final Report.*

2) *Where possible and applicable, responses to the questions are summarized (in italics).*

3) *The "N" value for a question indicates the total number of respondents (which is not necessarily equal to the total number of responses).*

1. SYSTEM BACKGROUND

Agency Description

1.1 What are the names of all pertinent agencies and how do they relate to each other and the state government? (Pertinent agencies are those that provide adult and juvenile correctional services and include probation, parole, and agencies which provide data processing services to any of the above. Also include state agencies, if any, responsible for local jails. Please indicate which functions are performed by which agencies if it is not obvious by their titles -- an organization chart would be helpful).

_____

_____

1.2 What is the size of the agency providing adult correctional services (i.e., how many institutions are involved, how much staff and what size budget)?

Institutions:

maximum security____
medium security____
minimum security____
juvenile____
community based____
total

officers____
civilians____
total____

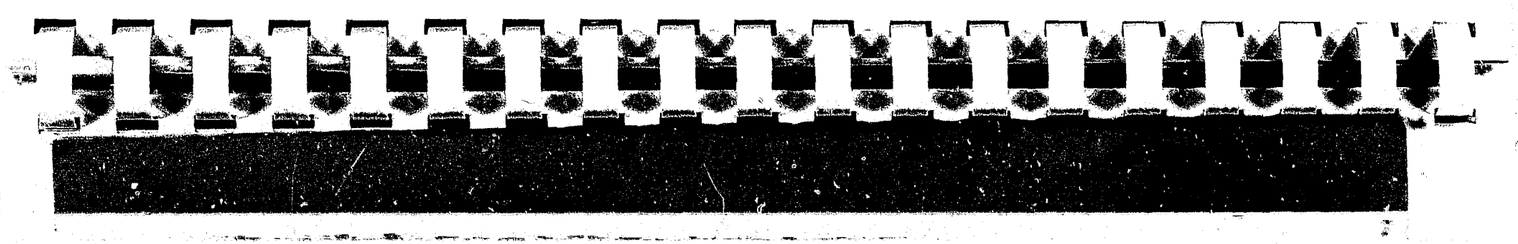
annual budget____

1.3 What types of and how many offenders are in the state's custody and how many are included in the ACDS?

	number in state custody	number on active file	number on history file
detainees			
sentenced offenders			
parolees			
probationers			
youthful offenders			
other (specify _____)			

1.4(A) To what degree are the correctional facilities decentralized or autonomous as regards the following functions: *N=19*

	autonomous	centralized	unknown	not applicable
transfer authority	*5*	*12*		
budget	*8*	*7*		
purchasing	*8*	*8*		
personal hiring & promotion	*8*	*8*		
records collection	*9*	*8*		
accounting	*10*	*5*		



1.4(B) If the facilities are autonomous as regards any of the above mentioned functions, what effect has this had on ACDS development? *N=26*

- 2 no effect
- 4 standards and procedures had to be imposed on the facilities
- 1 centralized data collection had to be imposed
- 3 central data entry unit must compensate for lack of standardization (e.g., recoding forms)
- 1 certain functional areas have not been developed because of lack of agreement among the institutions
- 1 it has been difficult to get cooperation among the institutions
- ___ other (specify *4 Unk*)

History of Computerization

1.5 When was computerization first introduced into corrections? ____

1.6 When was planning begun on the current system?_____

1.7 When was programming begun on the current system?_____

1.8 When was the current system first officially put into operation?_____

1.9(A) If the current system is to be replaced, when was work begun on its replacement?_____

1.9(B) And when is the new system scheduled to begin operations?_____

1.10(A) If this is not the first ACDS, how many earlier versions were there?_____

1.10(B) And why were earlier versions replaced? (Or, if this version is to be replaced, why?) *N=28*

- 9 to take advantage of more up-to-date hardware and software now available
- 4 earlier version's software was too complex and/or hard to maintain
- 3 earlier version was too expensive to operate
- 19 earlier version did not provide enough up-to-date information
- 8 earlier version did not have user or administrative support
- 2 computer center changed hardware model or vendor, forcing extensive rewriting for conversion
- 1 to obtain improved service, agency changed to a different computer center with a different hardware
- 1 earlier version was written in a language which became obsolete
- 2 to consolidate into an integrated system
- 2 other (specify _____)

1.11(A) Is there a long term plan for the use of computers in corrections? ___ yes ___ no

1.11(B) If yes, how many years does the plan cover? ___ (Get a copy of the plan)

1.12(A) If the current system development was delayed, how long was it delayed? *N=49*

- 0 < 1 month — *4 NA*
- 1 1-3 months — *27 Unk if delayed*
- 0 4-6 months — *7 Unk length of delay*
- 2 7-12 months
- 8 > 1 year

1.12(B) And what were the causes of the delay? *N=18*

- 7 high turnover of data processing staff
- 2 high turnover of all project staff
- 6 insufficient numbers of data processing staff
- 2 organizational changes
- 3 delays in delivery of equipment or software
- 3 poor project management
- 1 insufficient access to the computer
- 2 difficulties in creating the data base
- 1 change in hardware model or vendor
- 3 difficulties in program maintenance
- 2 hardware or software incompatibility problems due to ___ equipment from multiple vendors ___ other (specify _____)
- 1 difficulties in isolating responsibility for errors in the system (i.e., which piece of equipment or subsystem is in error)
- 1 errors in vendor software
- 2 insufficient hardware capacity
- 1 lack of knowledge of needed software packages by dp staff
- 1 design too ambitious to be doable
- 1 lack of interagency cooperation
- 3 delays caused by required review proceedings
- ___ other (specify *1 Unk*)

Date Processing Staff

1.13 What is the size of the staff providing data processing services for the inmate-oriented ACDS?

	allocated	currently filled	filled on average	annual budget
programmers & analysts				
data entry staff				
operations staff				
total				

1.14 What are the backgrounds of the professional data processing staff? *N=39*

	all	half or more	less than half
computer systems analysis and/or programming	21	6	3
sociology	___	___	1
corrections	___	4	3
other (specify *inmates*)	___	1	___

1.15 What agency outside corrections or what part of the corrections agency provides the data processing staff for the ACDS?

28 corrections
- *24* data processing
- *4* research and planning
- ___ records
- ___ other (specify _____)

8 state central data processing agency
4 SPA or Criminal Justice central agency
4 umbrella agency
___ other (specify _____)

1.16(A) Has insufficient numbers of data processing staff been a problem? *17* yes *3* no *N=20*

1.16(B) If yes, what are the causes? *N=15*

9 not enough positions funded
7 difficulty in filling positions due to
- *2* civil service regulations
- *5* a lack of qualified applicants
- *4* inadequate salary levels
- ___ other (specify _____)

8 high turnover of staff due to
- *6* great demand for data processing personnel
- *4* opportunity for advancement outside corrections
- ___ few opportunities for advancement within the organizational unit
- *2* other (specify *reassignment*)

weak ACDS project management
___ other (specify _____)

Use of Contractors

1.17(A) Was any part of the ACDS development undertaken by a contractor? *13* yes *21* no *N=34*

1.17(B) If yes, why was a contractor hired? *N=9*

5 lack of permanent data processing positions
2 lack of know-how in the corrections agency
3 inability to fill data processing positions
___ lack of available computer equipment
2 need for speedy development of a system
2 other (specify *reduced cost*)

1.17(C) If yes, what were the effects of using a contractor? *N=16*

5 corrections agency did not have adequate control over system development
3 agency staff are unfamiliar with the system
5 system was developed faster than would otherwise have been possible
1 design developed was beyond the agency's resources to implement
1 lower cost
4 other (specify _____)

1.17(D) Would the state recommend the hiring of a data processing contractor in the future for similar assignments? *8* yes *8* no
Please explain _____ *N=16*

LEAA Funding

1.18(A) What is the total cost for the development of the ACDS? _____

1.18(B) What are the funding sources? *N=49*

		amount	period
LEAA/OBSCIS	*32*	_____	_____
other LEAA	*19*	_____	_____
state funds	*13*	_____	_____
other (specify _____)	*2*	_____	_____

1.19(A) What has been the effect of the LEAA related funding? *N=14*

1 no effect
13 ACDS development would not have happened without LEAA funding
3 LEAA support enabled the implementation of a more ambitious system than would otherwise have been possible
1 LEAA support influenced other sources (such as the state legislature) to provide funds (specify _____)
3 LEAA funds enabled the purchase of equipment which would otherwise have been impossible
1 LEAA funds enable corrections, rather than the central data processing agency, to have control of the ACDS (e.g., by providing funds to hire programmers or contractors)
1 LEAA funds enabled excellent relationship between corrections and state central dp shop

1.9(A) Cont'd
__2__ LEAA funds enabled a larger staff than would otherwise have been possible
__1__ LEAA funds caused interagency cooperation which would otherwise not have occurred
__1__ LEAA funds caused the loss of positions previously funded out of general funds
__1__ other (specify _____)

1.19(B) What have been (will be) the effects of a termination in LEAA related funding on the following system elements? *N=44*

	terminated	curtailed	maintained	unknown
equipment	1		34	9
data processing staff	1	5	24	9
additional development file	2	5	22	10
maintenance		1	29	9
other system operation (specify_____)				
other (specify_____)				

1.19(C) If on termination of LEAA related funding the state did not (will not) assume complete funding for the ACDS, why not? *N=8*

__2__ state fiscal crisis
__3__ dissatisfaction with the benefits derived from the ACDS
__1__ state expected funding from other sources (specify _____)
__2__ lack of support for computerization in general
___ other (specify _____)

2. System Development

Search Group Activities

2.1 Please indicate the use made of each of the following Search Group products and the usefulness thereof. *N=49*

Product	not used: no opinion	not used: not useable	not used: would be useful as a starting point only	not used: would be useful	used: not satisfied	used: starting point only	used: moderately useful	used: major factor in development	unknown
data element dictionary	10		5			2	6	8	
OBSCIS implementation plan	20		5			3	1	6	
application definitions	13		5			3	2	7	
Basic OBSCIS software package	15		1					6	

2.2(A) Has the agency made use of Search Group technical assistance?
__8__ yes ___ no *N=8*

2.2(B) If yes, for what purpose? _____

2.2(C) If yes, how useful was it? *N=8*
__2__ not useful *1 Unk*
__1__ moderately useful
__4__ very useful

Computing Facilities

2.3 For each hardware element, indicate the quantity; the type of element; whether it was bought or leased; the pertinent cost; whether it was obtained specifically for the ACDS; and what the level of satisfaction is (i.e., not satisfied, satisfied, very satisfied?

	quantity	type	bought/leased	cost	ACDS specific	satisfaction	comments
cpu's							
terminals							
printers							
minicomputers							
tape drives							
disk drives							
leased lines							
dial-up lines							
other (specify____)							

2.4(A) How is the hardware configured? (If available, attach diagram.)

_____

_____

2.4(B) What problems or advantages result from this particular configuration? _____

_____

2.5(A) Which agency is responsible for the central processing unit?
_____

2.5(B) What problems have been experienced with this arrangement?

___none
___insufficient hours of scheduled machine availability
___slow turnaround or response time due to:
___low priority of corrections as a user
___saturation of the system
___other (specify _____)
___too much downtime (how much? _____)
___not enough machine capability to support parallel testing
___insufficient access to systems personnel
___insufficient disk storage space
___other (specify _____)

User Involvement

2.6(A) To what degree was each type of user involved in making decisions as to what functions/data elements would be included in the current version of the ACDS? *N=29*

user type	uninvolved	somewhat involved	actively involved	primary decisionmaker	unknown
any user	2	10	11	1	
central administration		4	7		
institutional administration	1	6	9		
records office	2	1	9	1	
institutional staff (officers)	6		3		
institutional staff (case workers)	6		4		
research and planning staff		3	6		
probation and/or parole staff					
other (specify *budget*)			2		

2.6(B) Were users uninvolved in the development of the first version of the ACDS, but involved in a subsequent version? 7 yes ___ no *N=7*

2.6(C) If the users have been less than actively involved in the planning or data element selection of the current version, why was this the case? *N=12*

5 project was managed by data processing staff who made no effort to involve the users
3 users made no attempt to become involved due to
___lack of experience with automated systems
3 lack of interest
___other reasons (specify _____)
___organizational structure made interaction between users and data processing staff difficult
2 communication problems due to
2 lack of corrections background of data processing staff
1 lack of data processing knowledge of corrections staff
___other reasons (specify _____)
2 time pressure did not allow user involvement
1 system was developed by contractors who did not involve agency staff
1 other (specify _____)

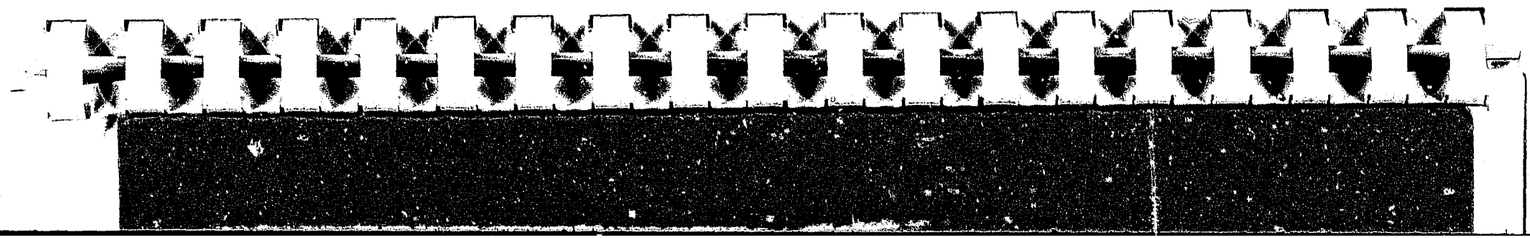
2.6(D) If the users have been less than actively involved in the planning or data element selection, what has been the effect? *N=9*

___no effect
2 needed data elements are not collected or not collected in the proper form
1 the system is inconvenient to use (specify _____)
6 users are unwilling to utilize the system
4 users are careless about entering data into the system
3 the system does not meet the users needs for
2 information about individual inmates
2 information about the population as a whole
___other (specify _____)

User Training

2.7 What was the content of the training received by each of the following type of user? *N=22*

user type	no training	orientation session	intensive training	unknown
any user	5	7	10	
central administration	2	5	3	
institutional administration	3	6	5	
records office	1	6	8	
institutional staff (officers)	5	3	4	
institutional staff (case workers)	5	2	4	



2.7 Cont'd

user type	no training	orientation session	intensive training	unknown
research and planning staff	____	5	1	____
parole and/or probation staff	____	2	____	____
other (specify ____)	____	____	____	____

System Testing

2.8(A) What kind of system testing was performed? *N=22*

- 3 none
- 10 parallel testing
- 7 testing using artificial data
- 9 testing using live data
- ____ other (specify ____)

2.8(B) If system testing did occur, to what degree was each type of user involved in the planning (including predicting test results), development, and execution of the test procedure, and the subsequent review of the test results? *N=16*

user type	not involved	planning	development	execution	review	unknown
any user	7	2	2	8	9	____
central administration	____	1	1	2	3	____
institutional administration	____	____	____	3	4	1
records office	____	____	____	4	5	1
institutional staff (officers)	____	____	____	1	2	1
institutional staff (case workers)	____	____	____	____	____	____
research and planning staff	____	____	____	____	____	____
probation and/or parole staff	____	____	____	____	____	____
other (specify ____)	____	____	____	____	____	____

Data Base Creation

2.9(A) What time span was planned for the data base creation? ____

2.9(B) And over what time span did the data base creation actually take place? ____

2.10 What problems were encountered in creating the base? *N=13*

- 5 none
- 4 manual records were not in standard formats
- 2 manual records were scattered, inaccurate and/or incomplete
- 2 not enough data entry staff and/or facilities
- 2 carelessness of staff collecting transactions
- 2 other (specify *program problems*)

2.11 What has been the impact of the development of the ACDS on the following definitional (i.e., codification, clarification, or standardization) issues? *N=19*

definition of:	negative impact	no impact	positive impact	unknown
data elements	____	3	12	____
data collection procedures	____	3	13	____
forms	____	4	10	____
security classifications	____	9	2	____
accounting procedures	____	9	2	____
specific events (e.g., head count, intake)	____	8	8	____
data calculation (i.e., release, parole)	____	5	4	____
other (specify ____)	____	____	4	____

System Documentation

2.12 For each of the following types of documentation, indicate whether it exists (i.e., yes or no), whether it is up-to-date (i.e., yes, slightly out-of-date, extremely out-of-date), and how it seems to be in quality (i.e., poor, fair, good). *N=26*

	existence Yes/No	currency	quality
user's guide	12/8	____	____
terminal operator's guide	13/8	____	____
system documentation	13/10	____	____
program documentation	15/6	____	____
other (specify ____)	____	____	____

3. SYSTEM OPERATION

Data Currency

3.1 How often are the files updated? *N=46*

- 18 on a real-time basis
- 15 nightly or daily
- 2 twice a week
- 2 weekly
- 2 bi-weekly
- 4 monthly
- 3 other (specify *on demand*)

3.2 How current is each of the following types of data on the ACDS files? *N=31*

	no more than 24 hours out-of-date	no more than 1 week out-of-date	1-2 weeks out-of-date	3-4 weeks out-of-date	more than 4 weeks out-of-date	not collected
basic identification data	2	1				
demographic data						
sentence data	1		1			
status and location changes						
program data						
discipline incident reports		1				
parole actions and scheduling						
all other data	11	4	2	3	5	

3.3 Where does data entry take place? *N=44*

12 institutions
21 central office
__ parole offices
__ probation offices
9 institutions and central office
2 institutions, central office and parole offices
__ other (specify_____)

3.4 What are the causes of delay in getting the data from the source onto the ACDS files? *N=30*

13 no extreme delays
10 forms must be transported from place of origin to data entry station
3 not enough data entry staff or equipment to handle the load
6 user indifference
4 delays due to the need for extensive error correction
3 delays due to inefficient error correction procedures
1 other (specify *coding not done at the source*)

Data Quality

3.5(A) How many data items per inmate are required? _____.

3.5(B) On the average, what percentage of the data items is entered? *N=9*

1 less than 50%
2 50-79%
1 80-95%
5 more than 95%

3.5(C) Is the data edited for missing data items after the initial record is entered? 8 yes 5 no *N=13*

3.5(D) And is an attempt made to fill in the blanks? 6 yes 2 no *N=8*

3.6(A) On the average, what percentage of the data is in error? *N=22*

11 very low (5% or less)
6 medium (6-20%)
5 high (>20%)

3.6(B) How is the data verified for factual accuracy? *N=19*

13 not verified
__ verified by the inmate
4 compared with other (e.g., parole) records (specify_____)
1 checked for reasonability
__ other (specify_____)

3.6(C) How is the data verified for accuracy in data entry? *N=25*

1 not verified
20 fields edited for invalid or inconsistent contents
4 key verified
__ verified by the inmate
9 verified against manual records
__ sight verified by entry operator
1 certain fields spot checked
1 other (specify *totals audited*)

3.6(D) What has been the cause of errors in the data base? *N=18*

8 inaccurate data provided
9 user carelessness in data entry
1 inadequate computer editing
4 program errors
2 inadequate data entry instructions
2 hardware or software malfunctions
1 inadequate verification of data for factual accuracy
__ inadequate verification for accuracy in data entry
__ extensive delays in entering data
1 other (specify *complicated data entry requirements*)

Date Redundancy

3.7(A) To what extent do the manual files duplicate the ACDS files? N=25

20 completely
___ no overlap
___ only documents required by law are kept in manual files
4 most information duplicated, but ACDS file contains some information not on the manual files (specify_____)
1 other (specify only institutions keep manual files)

3.7(B) When the ACDS is fully implemented, what percentage of the current parallel paper-based system could it displace? N=14

4 none
3 less than 10%
___ 10-25%
3 26-50%
2 51-75%
2 more than 75%
___ no parallel paper-based system exists

3.7(C) If there is more duplication than is legally necessary, what is the reason? N=13

5 mistrust of the computer system
2 to give access to records during times when the computer is unavailable
6 unwillingness to give up manual records before the computer system has been stabilized.
2 to give access where terminals are not available
1 computer system is used to maintain manual files
1 unwillingness to give up old ways
___ other (specify_____)

3.8 Is data collected for the ACDS also collected independently for other agencies or other use by corrections? N=15

1 no data is collected independently for other reasons
6 data is collected by probation for pre-sentence investigation
6 data is collected by parole officers
2 data is collected for non-automated correctional applications
5 data is collected independently for other automated correctional applications
1 data is collected independently for OBTS
1 data is collected independently by a bail agency
1 other (specify_____)

Date Base Design

3.9 Which of the following are characteristics of the ACDS files? N=33

2 files are mostly sequential
22 files are mostly direct, random access, ISAM or VSAM
12 files contain pointers to each other

3.9 Cont'd
4 index files exist
19 a commercial DBMS (which? _____) is used to access and maintain the files
___ different types of information may be easily retrieved from the files
___ changes to the file descriptions may be made with minimal effort
___ other (specify_____)

3.10 If a commercial DBMS is used, what effects has it had? N=7

___ no effect
___ slower development of the ACDS
4 faster development of the ACDS
3 easier program maintenance
___ more difficult program maintenance
4 easier system expansion
___ more difficult system expansion
___ easier access to the data for statistical purposes
___ more difficult access to the data for statistical purposes
___ increased disk storage requirements
1 decreased disk storage requirements
1 increased flexibility for storing repeating fields
1 other (specify better recovery after computer goes down)

3.11(A) Does the system contain historical data? N=32

23 a separate history file is maintained
8 historical data is kept on the active file
1 no historical data is kept

3.11(B) Is historical data used when an offender is recommitted? N=24
20 yes 4 no

3.11(C) When is historical data purged? N=25

12 no purging criteria are developed as yet
11 never
___ after 1 year
___ after 5 years
___ when offender reaches age 70
2 on court order
___ other (specify_____)

3.11(D) Has historical data every been purged? N=4 2 yes 2 no

3.11(E) If historical data is maintained, are the files structured so that statistics and trend data can be easily obtained? N=12
2 yes 10 no

3.11(F) Is historical data aggregated? N=17 3 yes 14 no

3.12 Can statistical packages be run against the files directly? N=21

	yes	no	not applicable	unknown
active files	12	9	___	___
history files	5	8	___	___

Data Utilization

3.13 What information -- which was previously unavailable or not easily obtained -- has been made easily available by the ACDS? *N=18*

__2__ none
__11__ current location of offender
__6__ current legal status of offender
__6__ empty bed information
__4__ inmate transfer information
__9__ up-to-date information about the characteristics of the inmate population
__2__ program participation information
__5__ parole eligibility information
__1__ inmate financial information for commissary
____ inmate visitor information
____ other (specify_____)

3.14(A) Is data collected which was not collected before the ACDS?
__7__ yes __4__ no ____ unknown *N=11*

3.14(B) If yes, what type? _____

3.15 How much of the data collected by the ACDS is actually used? *N=13*

____ none
____ less than 25%
__1__ 25-50%
__4__ 51-75%
__8__ more than 75%
____ all

3.16 How many times a year are there requests for reports which cannot be produced by the ACDS because needed data elements are not collected? _____

Real-Time File Updating

3.17 Is real-time file updating necessary for any of the following functions? Please explain. *N=43*

	yes	no	unknown	why?
offender tracking	6	24		
visitor control	2	8		
inmate census	1	10		
inmate financial accounting	2	13		
detainer/warrant reporting	1	18		
other (specify_____)				

3.18 If the system does not have real-time file updating, why was this decision made? *N=10*

__3__ real-time file updating is too costly
__5__ present equipment cannot support real-time file updating
__5__ real-time file updating not needed
____ real-time file updating would be too complex to program
__1__ data processing staff has insufficient experience in developing real-time system
____ other (specify_____)

Software Maintenance

3.19 How often are changes to the software required?

____ more than once a day
____ more than once a week
____ more than once a month
____ once a month or less

3.20(A) What difficulties have been encountered in maintaining the ACDS software? *N=16*

__3__ none
__4__ software is complex
__9__ documentation is poor or nonexistent
__6__ staff turnover is high
__1__ not enough staff
__2__ system was developed by contractors so agency staff not familiar with it
__1__ staff doesn't know the language the system is written in
____ other (specify_____)

3.20(B) What factors have caused the ACDS software to be easily maintained? *N=9*

__2__ software is simple
__2__ top-down design used
__4__ documentation is good
__5__ programs are "structured"
__3__ programs are "modular"
__2__ data processing staff very familiar with system
__4__ DBMS makes changes easier
__1__ other (specify *rigid programming standards*)

Security and Privacy

3.21 What types of security provisions have been made? *N=29*

__20__ equipment inaccessible to offenders
__1__ equipment guarded
__8__ equipment key operated
__17__ access limited by password
__18__ access limited by terminal identification
__11__ log of all attempted accesses kept
__2__ personnel with access to data or equipment screened
__1__ none (all ACDS information is public)

3.21 Cont'd

__7__ personnel with access to data or equipment informed of security and privacy regulations
__2__ on-line system inactivated at night
__2__ certain transactions must be verified by supervisory staff
__1__ security audit of terminal sites takes place periodically
__1__ data is well backed up
__1__ other (specify *shredding of obsolete printouts*)

3.22(A) Is the agency aware of the LEAA regulations regarding privacy and security of criminal history information? __9__ yes ____ no *N=9*

3.22(B) If yes, is an attempt being made to comply with these regulations?
__9__ yes ____ no *N=9*

3.22(C) If no, why not?

____ regulations don't apply to this agency
____ too expensive
____ regulations are more stringent than needed
____ cannot enlist needed cooperation of other agencies
____ other (specify_____)

3.23 What access do those outside corrections have to an offender's records? *N=22*

__6__ no access
__8__ all requests must be screened
__5__ law enforcement personnel have unlimited access, all others must be screened
__2__ courts and law enforcement have unlimited access, all others must be screened
__1__ social services and law enforcement have unlimited access, all others must be screened
____ other (specify_____)

3.24 What access do inmates have to their own automated records? *N=25*

__3__ no access
__20__ on request
__2__ automatically given copies of part or all at certain times or events (specify_____)
____ other (specify_____)

3.25 Does the corrections agency know who has accessed an inmate's records through the ACDS? __8__ yes __8__ no *N=16*

3.26 Is the inmate informed of who has accessed his/her records?
__1__ yes __16__ no *N=17*

3.27(A) Have there been any unauthorized access or lawsuits, inquiries, complaints, or investigations regarding privacy or security?
__2__ yes __22__ no *N=24*

3.27(B) If yes, please detail _____

_____

Costs

3.28 How does the development cost -- and the funding source(s) -- breakdown in terms of the following items?

	amount	source(s)
equipment maintenance		
equipment purchase or rental)		
costs (include one time costs such as purchases of equipment even though they may have occurred after the "development" period)		
equipment operation (i.e., charges for cpu time, etc.)		
software purchase (if any)		
programming and analysis staff		
other staff		
data conversion (i.e., building the data base)		
other (specify_____)		
total		

3.29 How does the annual operating cost -- and the funding source(s) -- breakdown in terms of the following items?

	amount	source(s)
equipment maintenance		
equipment rental		
equipment operation		
data storage		
communication lines		
data entry		
software maintenance (i.e., data processing staff and cost for program compiles and tests)		
other (specify_____)		
total		

4. System Impacts

Applications

4.1 What is the primary orientation of the ACDS? *N=30*

__2__ research
__4__ management
__11__ operational
__2__ research and management
__4__ management and operational
__2__ research and operational
____ other (specify_____)

4.2 List the reports produced by the ACDS; how often they are printed (i.e., frequency); who receives them (i.e., distribution list); their usefulness (i.e., not useful, somewhat useful, or very useful); and whether they were produced under the previous manual system (i.e., yes or no).

report name	frequency	distribution list	usefulness	previously produced

4.3 For each of the following potential applications, indicate whether it is in the system; planned for future addition to the system; not planned but would be useful; or considered to be unimplementable. *N=11*

	in system	planned	would be useful	unimplementable	comments
admission reporting					
cross index retrieval					
computer aided assessment, classification or program assignment			1		
diagnostic problem reporting and/or monitoring inmates' special needs			4		
test scoring and/or test scheduling			2		
monitoring of irregularities			5	1	
program reporting			2		
disciplinary incident reporting			2		
offender tracking					
population movement reporting			1		
transportation scheduling and/or reporting			1		
parole/discharge date calculation			2	5	
legal status reporting			1		
parole hearing scheduling and/or reporting			2		
detainer/warrant reporting			1		
population prediction			3		
program evaluation			2		
use for special requests and/or inquiries					
national reporting					
inmate financial accounting			2		
health services tracking and reporting					
visitor control			3		
victim restitution					
billing of other jurisdictions for inmate care			1		
interstate compact reporting					
presentence investigation					
probation status reporting					
probation case-load analysis			1		
parole status reporting					
parole case-load analysis			1		

4.4 What inhibits the introduction of applications which would be useful and implementable, yet are not in the system or planned for development? *N=11*

- 2 not considered cost effective
- 3 funds are not available for further development
- 2 equipment could not handle additional load
- 7 not enough staff available to write the programs
- 4 lack of administrative support for additional development
- ___ other (specify_____)

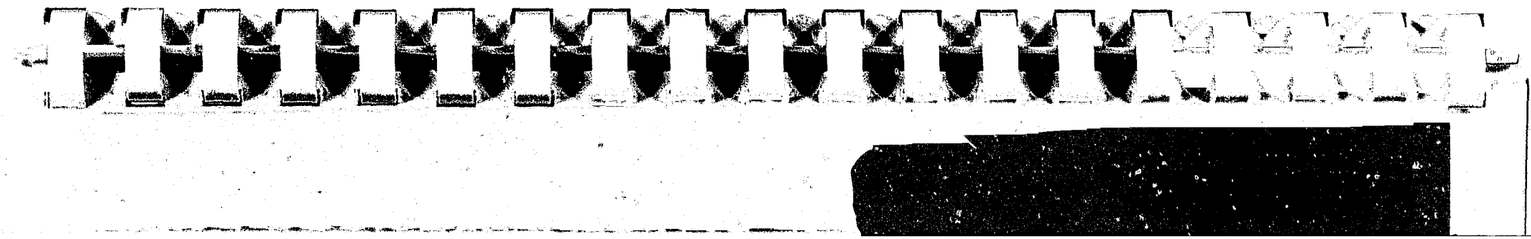
Transportation Scheduling

4.5 How many transfers take place each year in the state? _____

4.6 Must inmates start in maximum security institutions and work their way down to minimum? 2 yes 10 no *N=12*

4.7(A) Does the ACDS provide transportation scheduling or related analysis? 2 yes ___ no *N=2*

4.7(B) If yes, describe the scheduling algorithm or analysis. _____



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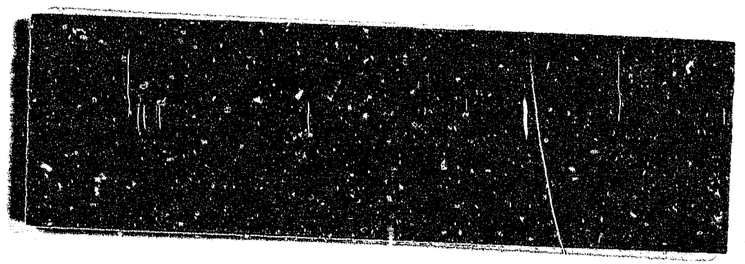


4.7(C) If not, could the data base as it now stands easily provide the data needed for transportation scheduling or related analysis (i.e., is origin-destination information available? ___yes ___no

Systems Goals

4.8(A) Were the goals for the ACDS explicitly stated at the time planning and development of the ACDS were initiated? ___yes ___no

4.8(B) Did the actual goals for the project differ from those which were formally stated? ___yes ___no

4.9(A) For each of the following possible ACDS goals, indicate 1. whether it was initially a goal; 2. whether it has been attained; 3. if not, whether it is expected to be attained with further development of the system (do not include development of a new system in this category); or 4. whether it has been abandoned as a goal for the present system: *N=16*

	indication	comments
provide general, up-to-date information about individual inmates	1/2/3/4 8/8/0/0	
provide population statistics and reports	7/5/1/0	
provide information to be used to make decisions about how individual inmates should be classified and routed through the system	6/1/4/0	
provide information to monitor the progress of inmates in terms of health, education, attitude adjustment, and other factors	2/0/3/0	
provide information on program activities that allows evaluation of their success	3/1/3/0	
provide the capability for retrieving historical data, giving feedback and projections for planning of facilities, programs, personnel, and funding	5/2/2/0	
provide correctional information to other state level criminal justice information systems such as OBTS/CCH, SJIS, parole systems, etc.	6/3/2/0	
provide information for NPS and UPR	2/2/1/0	
reduce or eliminate redundant data collection and/or storage and maintenance	2/3/0/0	
provide automatic scheduling of parole hearings to protect due process in granting of parole	3/1/2/0	
provide recording of parole hearing outcome to identify breaches in procedure	2/0/2/0	
provide recording of disciplinary incidents and their outcomes to identify discrimination or capricious conduct by authorities	1/1/1/0	
provide health services data to determine adequacy of inmate medical care	0/1/1/0	
standardize operational information and the attendant data recording and storing process	1/0/1/0	
other (specify_____)		

4.9(B) If initial goals have not been attained, why not? *N=6*

3 goals were unreasonably high
2 insufficient funds were available
4 lack of administrative support
2 lack of user support
___ delays
2 disappointment with initial results caused curtailment of continuing effort
1 other (specify *lack of legislative support* _____)

Administrative Support

4.10(A) Has the system suffered from a lack of administrative support? *10* yes *14* no *N=24*

4.10(B) If yes, what effect has this had? *N=10*

___ no effect
2 delay in reaching project deadlines
3 failure to acquire adequate funds or equipment
4 inadequate project management
6 inadequate numbers of project staff
3 lack of cooperation between data processing staff and users
1 inadequate system design
___ other (specify_____)

4.10(C) If yes, what was the cause? *N=10*

5 political reasons
4 unfavorable attitudes towards computing in general
1 disappointment in the initial results of the project
1 delays in implementing the project
3 system was initiated by another agency such as SPA (specify_____) and imposed on corrections
2 turnover in administrative staff
___ other (specify_____)

Operational Impacts

4.11 What effect has a daily "empty beds" report had? *N=29*

23 no such report
1 no effect
4 better space usage
2 fewer instances of overcrowding
___ other (specify_____)

4.12 What effect has the availability of records immediately after transfer had? *N=25*

18 no such availability
2 no effect

4.12 Cont'd

__2__ increased inmate productivity by allowing immediate assignment to programs and jobs
__1__ decreased likelihood of loss of records in transfer process
__2__ increased inmate safety by virtue of the fact than an inmate's special needs are known immediately
__1__ other (specify *ability to prepare for inmate's arrival*)

4.13 What effect has the ability to retrieve an inmate's current location through the terminal had? *N=19*

__14__ no such capability
____ no effect
__2__ speeded up mail delivery
__2__ allowed location of "enemies" prior to transfer
__1__ aided in visitor processing
__1__ decreased time spent on inmate counts
____ other (specify_____)

4.14 Aside from those previously mentioned, what aspects of the ACDS have had operational impacts beyond direct time or cost savings and what are these impacts? *N=18*

__2__ none
__1__ planning process has improved communications among institutions
__1__ improved service to inmates in the form of classification reviews
__2__ report of projected movements has helped agency clear needed space in time
__1__ better classifications
__1__ better pretrial recommendations
__1__ fewer transfers due to closer central supervision enabled by the sytem
__2__ more accurate date calculations
__1__ program assignments more consistent with time structure of the offender's sentence
__1__ staff are using other automated systems more
__1__ improved accuracy of inmate records
__4__ other (specify_____)

4.15(A) Are reports produced by the ACDS used as a basis for critical long-term decisions? __12__ yes __14__ no *N=26*

4.15(B) If yes, which reports are used and how are they used? _____

_____

4.15(C) If not, why not? *N=14*

__9__ ACDS does not provide appropriate information
____ decision makers are unaware of information availability
____ decision makers are unwilling to change established patterns

4.15(C) Cont'd

__5__ decision makers mistrust system outputs
____ other (specify _____)

4.16(A) Does the system have a query or ad hoc report generation capability? __15__ yes __18__ no *N=33*

4.16(B) If not, is it the intention to have such a capacity? *N=9*
__5__ yes (when? _____)
__4__ no

4.16(C) If the system does have a query capability, which staff other than data processing staff uses it directly? *N=13*

__4__ none
__1__ central administration
__1__ institutional administration
__4__ records office
____ institutional staff (officers)
____ institutional staff (case workers)
__6__ research and planning staff
__1__ data entry staff
____ other agency (specify _____)
____ other (specify _____)

4.17(A) Have any parts of the ACDS affected inmate morale? __3__ yes ____ no

4.17(B) If yes, what parts, and what were the effects? *N=3* _____

_____

4.18 Describe the organizational relationship between research and planning, and the data processing unit. _____

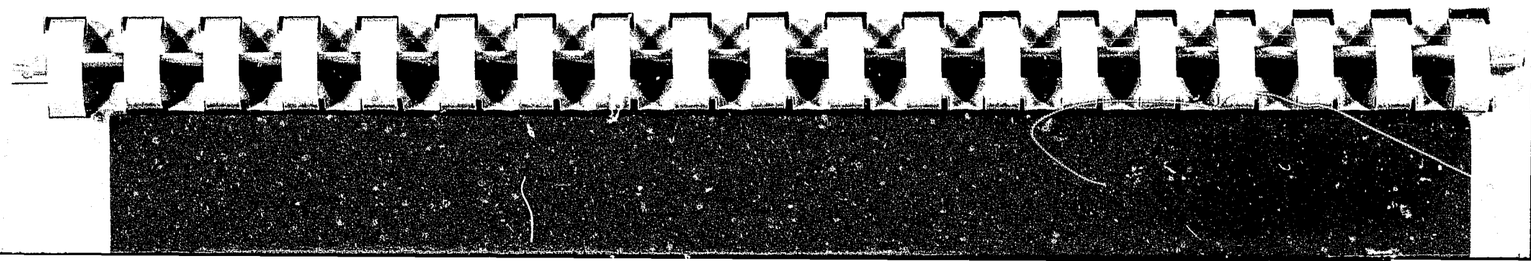
_____

4.19 How many research and planning staff are there? *N=13*

____ none
__4__ 1-2
__2__ 3-5
__7__ more than 5

4.20 How has the number of research and planning applications changed since the ACDS has been in operation? *N=21*

____ substantially reduced
__1__ slightly reduced
__8__ no change
__1__ slightly increased
__11__ substantially increased



4.21 What percentage of the research and planning applications use the ACDS files, or information extracted from those files? *N=20*

3 none
5 half or less
1 more than half
11 most

4.22 Will the future needs of research and planning be met by the ACDS? *N=12*

5 yes
3 no
4 some changes to the ACDS will be needed (specify _____)

_____

Time Savings

4.23 How has the amount of time spent collecting and maintaining offender records changed since the ACDS has been implemented? *N=19*

9 substantially reduced
2 slightly reduced
1 no change
5 slightly increased
2 substantially increased

4.24 How has the amount of time preparing routine reports been affected by the ACDS? *N=20*

15 substantially reduced
2 slightly reduced
2 no change
slightly increased
1 substantially increased

4.25 What was the average time needed to answer a special request before and after the implementation of the ACDS? *N=10*

	before	after
could not be done	4	
1 day or less	0	6
1 week or less	2	1
2 weeks or less	1	2
1 month or less	2	1
more than 1 month	1	0

4.26 How has the number of special requests answered per month changed since the ACDS has been in operation? *N=11*

substantially reduced
slightly reduced
2 no change
slightly increased
9 substantially increased

4.27 In what other areas has there been time savings as a result of the ACDS? *N=11*

2 none
inmate census
1 visitor control
2 preparation of reports for NPS and UPR
6 retrieving information about individuals
2 preparation of parole hearing calendars
1 preparation for classification review hearing
4 other (specify *parole date calculation*)

4.28 What use has been made of the time saved, if any, as a result of the ACDS? *N=17*

3 no time has been saved
10 workload has increased without adding staff
2 departing staff has not been replaced
9 work which was not done previously is now being done (specify _____)
3 the quality of other work has improved
1 backlog of work has been reduced or eliminated
1 reduction of overtime worked
other (specify _____)

5. SYSTEM USERS

User Support

5.1 Who are the principal entities to derive benefits from the system? *N=25*

5 none
14 central administration
8 institutional administration
14 records office
4 institutional staff (officers)
4 institutional staff (case workers)
13 research and planning staff
data entry staff
data processing staff
1 parole and probation staff
2 legislators
1 governors
inmates
other (specify _____)

5.2 Are those who provide the data also those that use it? *N=26*

10 yes 16 no

5.3 How soon do users react if scheduled reports do not appear? N=12

user type	the same day	the next day	within a week	after a week	never	comments
any user	3	3	2		2	
central administration	1	3	1		1	
institutional administration	2	1			1	
records office	3	1	1			
institutional staff (officers)						
institutional staff (case workers)						
research and planning staff			1	1		
probation and/or parole staff						
other (specify police)			1			

5.4 Are users interested in expanding the system capabilities or reports produced? N=23

user type	yes	no	comments
any user	16	1	
central administration	11		
institutional administration	6	2	
records office	7	2	
institutional staff (officers)	1	1	
institutional staff (case workers)	1	1	
research and planning staff	10	1	
parole and/or probation staff	2	1	
other (specify _____)			

5.5 Do staff provide data to the system promptly and accurately? N=23

	yes	no	not applicable
any staff	12	2	
central administration			
institutional administration	1	2	
records office	8	3	
institutional staff (officers)	3	3	
institutional staff (case workers)	4	2	
research and planning staff			
probation and/or parole staff			
other (specify _____)			

5.6 For on-line systems: How soon do users react when the system goes down? N=11

user type	immediately	within ten minutes	within an hour	the same day	never	unknown
any user	7	2				
central administration						
institutional administration	2				1	
records office	3	2				
institutional staff (officers)		1				
institutional staff (case workers)		1				
research and planning staff	1					
probation and/or parole staff						
other (specify _____)						

5.7 If there has been a lack of user support, what are the causes? N=17

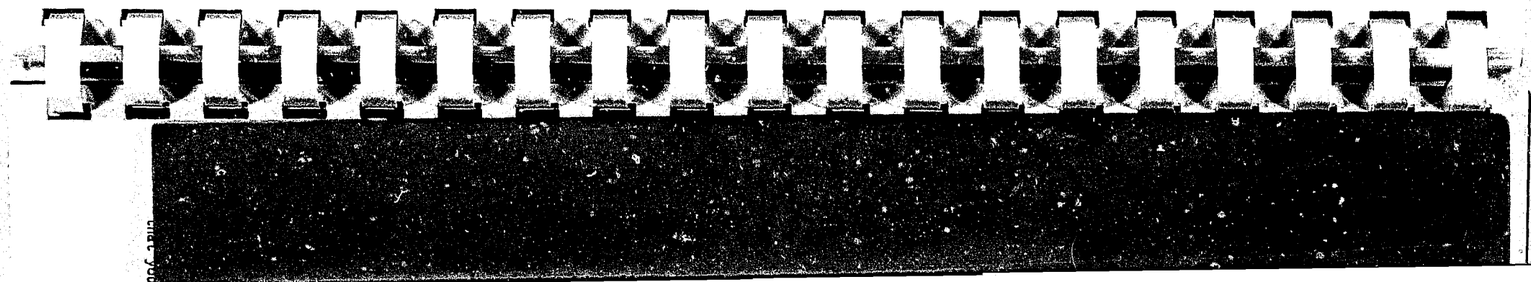
- 5 users were not involved in planning and development
- 1 users were not involved in testing
- 3 inadequate user training
- 4 out-of-date or erroneous data
- errors in the programs once system was put into operation
- 3 poor service (i.e., late reports and/or, for on-line systems, frequent system unavailability)
- 11 lack of perceived benefits of the ACDS
- 3 delays in system completion
- 1 delays in correction of program bugs
- users feel that the system is difficult to use
- 1 users are unwilling to change
- 1 other (specify *systems detects overcounting of inmates*)

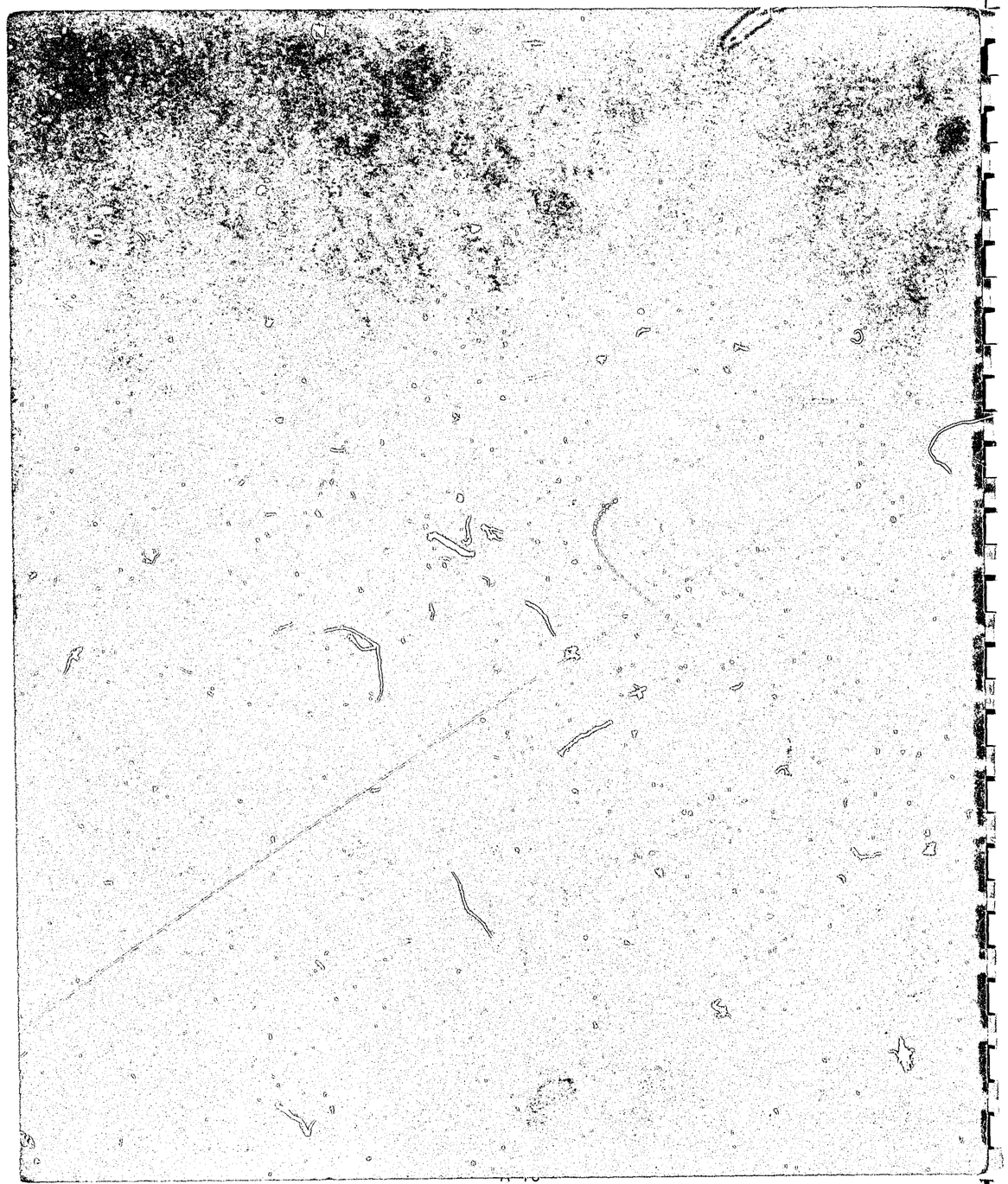
User Attitudes

5.8 The User Attitudes Section consists of two parts. Part 1 should be reproduced and distributed to all users. Part 2 should be reproduced and several copies distributed to each user.

Part 1

This questionnaire is a part of an effort to assess the impact of your automated correctional data system (ACDS). Do not sign your name as your identity is unimportant for this purpose. Complete anonymity and confidentiality will be maintained.





Part 1 Cont'd

1. Date _____ 2. Job title _____

3. Do you use the ACDS or reports produced by it as a part of your day to day work? ___yes ___no

Why? _____

Please indicate the degree to which you agree or disagree with each of the following statements by checking the proper column. If the statement does not apply to you, check the column labeled Not Applicable.

statements*	not applicable	strongly disagree	disagree	neutral	agree	strongly agree
History						
4. I was not involved in the planning of the system.	___	___	___	___	___	___
5. I was not involved in the testing of the system.	___	___	___	___	___	___
6. I did not wish to be involved in the planning or testing of the system.	___	___	___	___	___	___
7. I did not receive adequate training in the use of the system.	___	___	___	___	___	___
Design of the Systems						
8. The system does not collect some needed data.	___	___	___	___	___	___
9. Needed data is not collected in the right form.	___	___	___	___	___	___
10. The system collects more data than is needed.	___	___	___	___	___	___
11. Needed reports are not produced.	___	___	___	___	___	___
12. The reports which are produced are not useful.	___	___	___	___	___	___
Ease of Use						
13. The system is not easy to use.	___	___	___	___	___	___
14. Documentation of the system is inadequate.	___	___	___	___	___	___
Performance						
15. Response time (if applicable) is too slow.	___	___	___	___	___	___
16. Information provided by the system is not up-to-date.	___	___	___	___	___	___
17. I am disappointed in the performance of the system.	___	___	___	___	___	___
Reliability						
18. The system does not always work properly.	___	___	___	___	___	___
19. The system is often unavailable.	___	___	___	___	___	___
20. When errors in the system are detected they are not quickly corrected.	___	___	___	___	___	___
Impacts						
21. The implementation of the computer system has not caused improvements in manual standards and procedures.	___	___	___	___	___	___
22. Information which I get from the system was previously available or easy to access manually.	___	___	___	___	___	___
23. Information which I get from the system is more complete and/or accurate than what was previously available.	___	___	___	___	___	___
24. In spite of the system, I complete no more work in a given period of time than before.	___	___	___	___	___	___
25. Certain parts of my job take more time to perform because of the system.	___	___	___	___	___	___
26. The computer system is of little benefit to me.	___	___	___	___	___	___
27. My work unit runs no more smoothly as a result of the system.	___	___	___	___	___	___
28. I do not use the computer system as an aid for planning and/or long-term decision making.	___	___	___	___	___	___
Attitudes						
29. I do not make a point of providing data to the system as quickly and accurately as possible.	___	___	___	___	___	___
30. I do not notice immediately when reports produced by the system are late.	___	___	___	___	___	___

*For convenience, the statements listed are all uniformly "negative" in content. If you, for examole, strongly disagree with the statement "I was not involved in the planning of the system", then we will assume that you were very involved in the planning of the system.

Part 1 Cont'd

statements	not applicable	strongly disagree	disagree	neutral	agree	strongly agree
31. I do not feel a personal sense of involvement in the system.	___	___	___	___	___	___
32. My job is harder to do because of the system.	___	___	___	___	___	___
33. My job is less interesting because of the system.	___	___	___	___	___	___
34. If I have a choice between using the automated or the manual system, I would choose the manual.	___	___	___	___	___	___
35. I would like to see the computer system eliminated.	___	___	___	___	___	___

Part 2

This questionnaire deals with the utility of reports provided by your automated correctional data system and is part of an effort to assess the system's impact. Do not sign your name as your identity is unimportant for this purpose. Complete anonymity and confidentiality will be maintained. Please fill out one copy of this questionnaire for each report you use in your work.

1. Report name _____ 2. How often produced? _____

3. Would you like this report to be produced on a different schedule? _____
   If so, what schedule would you prefer? _____

4. For each of the following purposes, please indicate how useful this report is to you by checking the appropriate column.

	Not Used	Minimally Useful	Fairly Useful	Quite Useful	Extremely Useful
General Information	___	___	___	___	___
Organizational Planning	___	___	___	___	___
Research	___	___	___	___	___
Locating Inmates	___	___	___	___	___
Aid in Decisions about Inmates' Activities	___	___	___	___	___
Answering Special Requests for Information	___	___	___	___	___
Scheduling Activities or Resources	___	___	___	___	___
Other (specify _____)	___	___	___	___	___

5. Do you feel additional data should be added to this report? _____
   If yes, please identify data and reason for inclusion _____

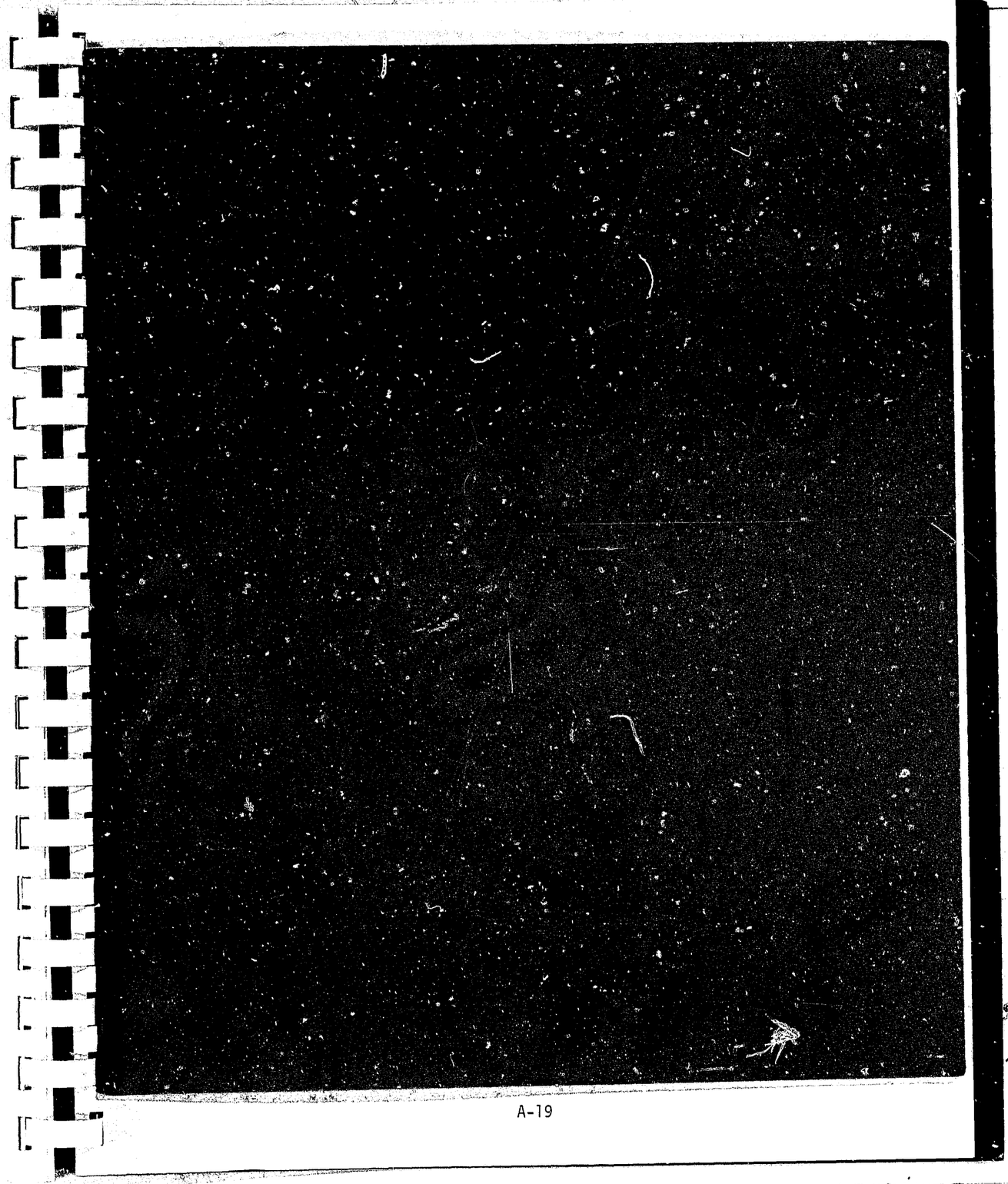
   _____

6. Do you feel any data should be eliminated? _____ If yes, please identify data and reason for exclusion _____

   _____

7. Date _____

8. Job title _____



6. Broader Issues

Organizational Impacts

6.1(A) Have organizational changes taken place during the development of the ACDS? 9 yes 14 no N=23

6.1(B) If yes, were they caused by the ACDS? N=9

1 caused by ACDS
8 independent of ACDS

6.1(C) If yes, what was the effect? N=6

1 no effect
___ sped up project development
4 delayed project development
1 caused a change in personnel working on the project
1 necessitated system changes because of
  1 changed user groups
  ___ changed functions of user groups
  ___ other reasons (specify _____)
___ other (specify _____)

6.2 Have any organizational changes been brought about as a result of the implementation of the ACDS, and what has been the effect of these changes (i.e., beneficial, no effect, harmful)? N=16

	no	bene-ficial	no effect	harmful
central records office has been established	15	1	___	___
more centralization has been achieved through new standards and procedures	9	7	___	___
other (specify _____)	___	___	___	___

6.3(A) Have any organizational changes been brought about as a result of information derived from the ACDS (e.g., program changes, revised staffing patterns, etc.)? 2 yes 14 no N=16

6.3(B) If yes, please give details _____

Systems Interfaces

6.4(A) Indicate whether any of the following automated systems exist, and if there is an automated or manual interface between them and the ACDS. N=34

6.4(A) Cont'd

automated system	unknown	doesn't exist	exists without interface	part of the ACDS	manual interface	automated interface
OBTS/CCH	___	11	9	___	6	4
prosecutor's information system (e.g., PROMIS)	___	17	5	___	___	___
court information system	___	14	9	___	___	1
police information system	___	5	15	___	2	4
probation information system	___	8	7	13	___	3
parole information system	___	7	4	23	___	2
other (specify patrol)	___	___	1	___	___	___

6.4(B) If interfaces do not exist between the ACDS and other automated criminal justice systems, why not? N=10

3 lack of interagency cooperation
3 unwillingness to share data on the part of the agencies involved
1 equipment incompatibilities
1 laws prohibit such interface
2 concern about privacy or security of the data
___ other agencies were not involved in the planning and design of the ACDS
1 lack of interest on the part of the corrections agency
___ case rather than individual orientation of some other agencies such as courts (specify _____)
1 other (specify lack of uniform numbering system)

6.5(A) Are NPS and UPR reporting requirements met, and through what means? N=36

	NPS	UPR
not applicable	___	___
unknown	___	___
reporting requirements are not met	1	3
reporting requirements met through other sources than the ACDS	5	3
the ACDS produces printed reports to meet requirements	2	7
the ACDS produces machine readable reports to meet requirements	17	4
the ACDS produces data to meet the requirements - format unknown	11	6

6.5(B) What is the quality of the data sent to NPS/UPR? *N=8*

	NPS	UPR
no data sent	___	___
unknown	___	___
poor	*4*	*4*
fair	*1*	*1*
good	*3*	*1*

6.5(C) Are the codes used for NPS/UPR the same as or easily convertible from those used by the agency? *N=8*

	NPS	UPR
not applicable	___	___
unknown	___	___
yes	*3*	*1*
no	*5*	*6*

System Transferability

6.6(A) What is the source of the ACDS software? *N=49*

33 designed and programmed in-house
3 designed and programmed by a contractor
3 joint design effort in-house and contractor, programmed in-house
1 designed by a contractor, joint programming effort in-house and contractor
3 designed by contractor, programmed in-house
2 joint design and programming effort in-house and contractor
6 Basic OBSCIS Software Package
1 commercially produced corrections software package (specify _____)
3 software transferred from another project (specify _____)
___ other (specify _____)

6.6(B) If the ACDS was transferred from an already existing system (i.e., this includes Basic OBSCIS Software and commercially available packages as well as those transferred from other ACDS projects), what was needed in addition to the original software itself, to effect the transfer? *N=9*

___ nothing
2 aid from organization providing the software
4 extensive rewriting
4 a moderate amount of rewriting
___ changes in external procedures to conform to the system
1 aid from vendor in debugging compilers and/or operating system software
___ other (specify _____)

6.6(C) If the ACDS was transferred from an already existing system, what was the transfer mechanism? *N=9*

1 computer vendor
1 software vendor
4 Search Group and its sub-contractor
3 the receiving agency
___ the sending agency
___ other (specify _____)

6.6(D) If the ACDS was transferred from an already existing system, was there any time savings in the estimated development effort? *N=9*

1 no *6 Unk*
___ less than a month
___ 1-6 months
1 7-12 months
___ 13-24 months
1 over 2 years

6.6(E) If the ACDS was transferred from an already existing system, does the completed ACDS meet the needs of the agency as well as one written from scratch would have? *2* yes ___ no *7 Unk* *N=9*

6.6(F) If the ACDS was transferred from an already existing system, what areas were problematical? *N=4*

1 none
1 file handling
___ table handling
___ job control language
1 telecommunications interface
2 program logic
2 adaptations due to differences in external procedures (i.e., laws, department rules, etc.)
1 compilers, assemblers and/or operating system software
___ other (specify _____)

6.7(A) Could this ACDS or parts of the system be easily transferred to another agency? *13* yes *1* no

6.7(B) If yes, why and which parts can be transferred? _____

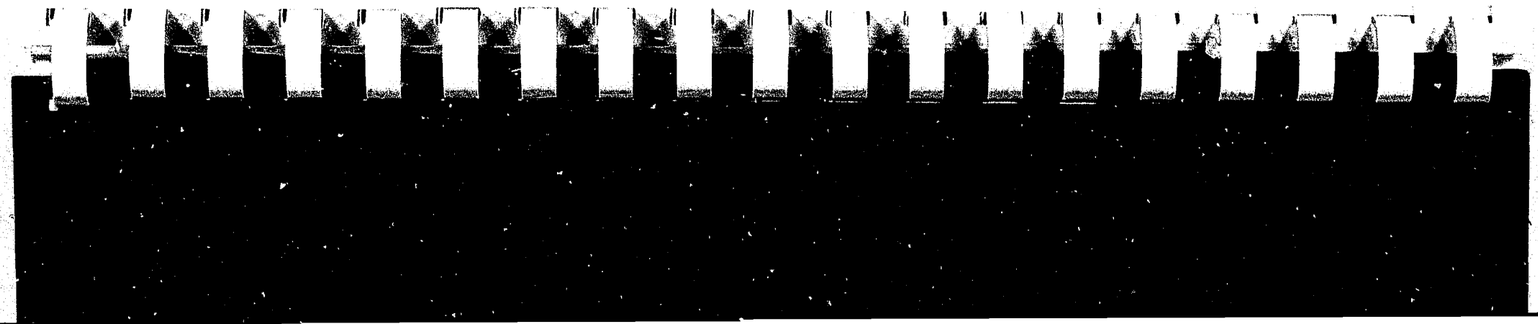
_____

6.7(A) Has this ACDS been transferred to any other agencies? *N=7*

7 yes (specify _____)
___ no

6.7(B) If yes, what has been the outcome? _____

_____



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