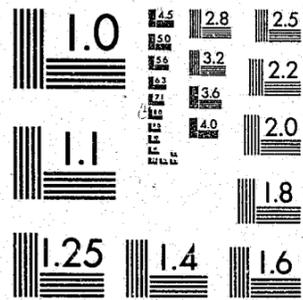


National Criminal Justice Reference Service



This microfiche was produced from documents received for inclusion in the NCJRS data base. Since NCJRS cannot exercise control over the physical condition of the documents submitted, the individual frame quality will vary. The resolution chart on this frame may be used to evaluate the document quality.



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

Microfilming procedures used to create this fiche comply with the standards set forth in 41CFR 101-11.504.

Points of view or opinions stated in this document are those of the author(s) and do not represent the official position or policies of the U. S. Department of Justice.

National Institute of Justice  
United States Department of Justice  
Washington, D. C. 20531

3/25/86

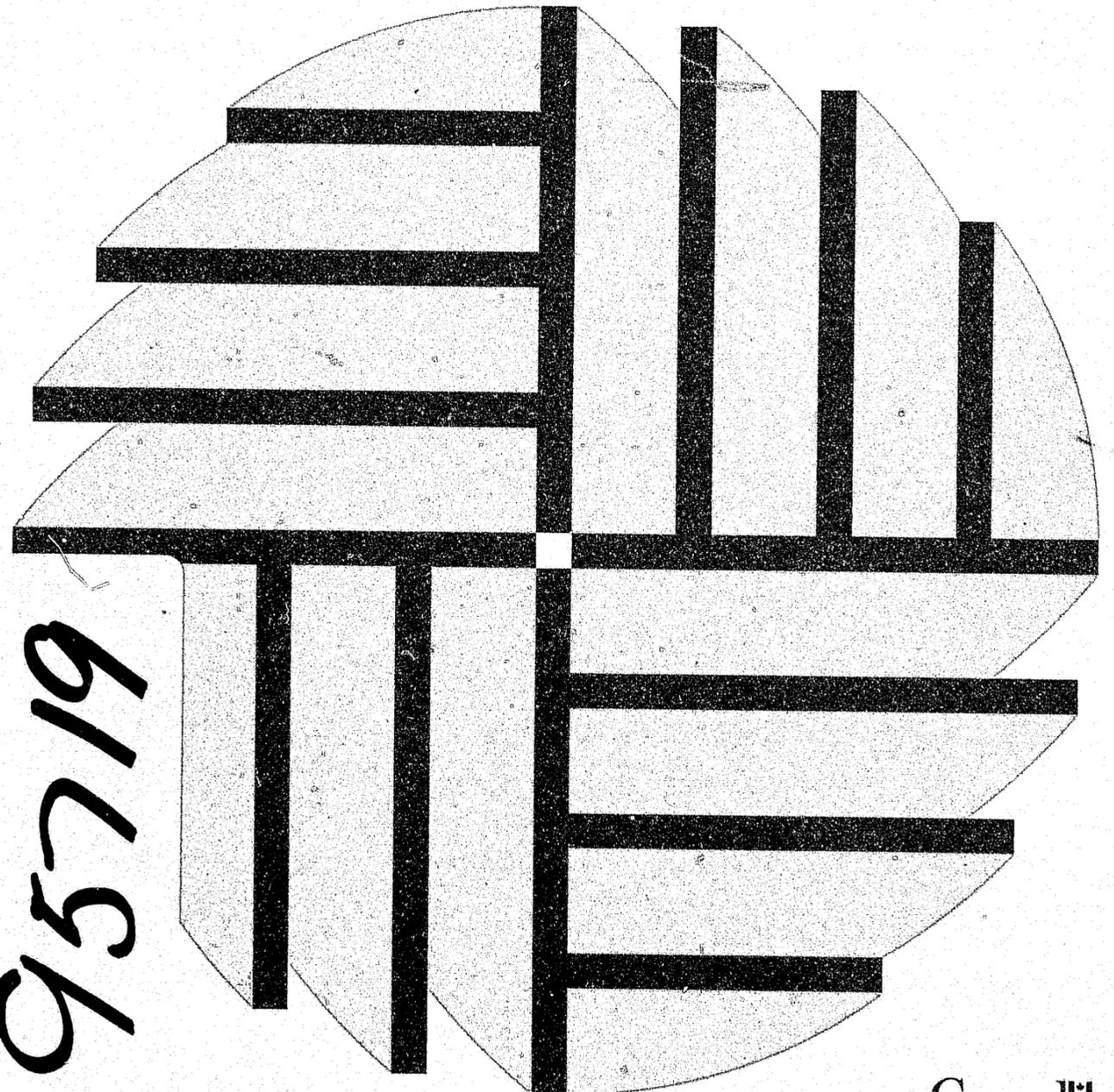


Statistics Canada  
Canadian Centre  
for Justice Statistics

Statistique Canada  
Centre canadien  
de la statistique juridique

CR-Sent  
2-5-85

# A Review of PROMIS



95719

95719

A REVIEW OF PROMIS®

EXECUTIVE SUMMARY

Canadian Centre for Justice Statistics

95719

U.S. Department of Justice  
National Institute of Justice

This document has been reproduced exactly as received from the person or organization originating it. Points of view or opinions stated in this document are those of the authors and do not necessarily represent the official position or policies of the National Institute of Justice.

Permission to reproduce this copyrighted material has been granted by

A. Wytenburg/Canadian Centre for  
Justice Statistics

to the National Criminal Justice Reference Service (NCJRS).

Further reproduction outside of the NCJRS system requires permission of the copyright owner.

The Canadian Centre for Justice Statistics was created as a result of the 1979 National Project on Resource Coordination. The concept of the Centre was one of four options developed by the Project in seeking improved co-ordination of resources for justice information and statistics. It is the purpose of the Centre not only to oversee the collection of justice information and statistics, but also to assist various jurisdictions in finding the most efficient means of collection. This review addresses the issues involved in establishing a useful, cost-effective information system. It introduces the Prosecutor's Management Information System (PROMIS) marketed by INSLAW, Inc. and relates the PROMIS system to the issues raised. Finally, it draws conclusions about the implementation of software systems in general and of PROMIS in particular.

July 2, 1984

## TABLE OF CONTENTS

Section	Page
<b>1. INTRODUCTION</b>	<b>1</b>
1.1 A Review of PROMIS -- Background	1
1.2 Resources Consulted	1
1.3 Purpose and Uses of this Review	3
<b>2. INFORMATION SYSTEMS IN COURT ADMINISTRATION</b>	<b>4</b>
2.1 Types of Information	4
2.2 The Problem of Diversity	6
2.3 Dedicated and Integrated Systems	4
2.4 Requirements Analysis	5
2.5 The Choices Available	6
- Buy an Existing System	6
- Build a Customized System	6
2.6 Making a Choice	6

...continued

TABLE OF CONTENTS (cont'd)

Section	Page
3. PROSECUTOR'S MANAGEMENT INFORMATION SYSTEM (PROMIS)	9
3.1 The Product and the Vendor	9
- Capabilities	9
- Applications	10
- Hardware Releases	10
- Software Availability and Cost	11
- Vendor Support	11
- Software Transferability	12
3.2 PROMIS in the United States	12
3.3 PROMIS in Canada	13
- National Work Group on Justice Information and Statistics	13
- New Brunswick	14
- Manitoba	14
- Alberta	15
- British Columbia	16
- Summary	16

...continued

TABLE OF CONTENTS (cont'd)

Section	Page
4. BUY OR BUILD?	18
4.1 Conclusions	23
5. CONCLUSIONS	24
5.1 Benefits of PROMIS	24
5.2 Drawbacks of PROMIS	25
5.3 Summary	25

## 1. INTRODUCTION

### 1.1 A REVIEW OF PROMIS -- BACKGROUND

The Technical Assistance Directorate of the Canadian Centre for Justice Statistics (CCJS) assists Canadian jurisdictions in implementing effective information systems to support the administration of justice and to potentially contribute to the collection of National Justice Statistics. One particular system for case-tracking, called the Prosecutor's Management Information System (PROMIS), has attracted wide interest in Canada. In response to an expressed interest on the part of Canadian jurisdictions in acquiring useful information systems, particularly PROMIS, the Centre has produced this Review of PROMIS. The review is a plain-language report which attempts to cover the issues involved in selecting information system software for a particular jurisdiction, with a special focus on PROMIS.

### 1.2 RESOURCES CONSULTED

The resources consulted during the production of the Review of PROMIS included the following persons:

- o Denis Sauvé, Technical Assistance Directorate, CCJS
- o Arnold Wytenburg, Technical Assistance Directorate, CCJS
- o Stephen Chase, Research and Planning Branch, New Brunswick  
Department of Justice
- o Allan Goodz, Manitoba Department of the Attorney General
- o Jim Roberts, Planning, Research and Development, Alberta Attorney  
General
- o Gene Spencer, Court Services, British Columbia Ministry of the Attorney  
General
- o INSLAW Inc., author and publisher of the PROMIS technology,  
Washington, D.C. 20005

The principal publications used in preparing the review were:

- o An Overview of On-Line PROMIS, INSLAW, Inc., Washington, D.C., 1978.
- o National Evaluation Program Phase I Summary Report: Prosecution Management Information Systems, Sidney H. Brounstein et al., October 1980.
- o Court Case Management Information Systems Manual, National Center for State Courts.
- o NWG Document No.7: An Overview of PROMIS, T. Hutton, National Work Group on Justice Information and Statistics, March 1981.
- o PROMIS for the Courts: A New Computerized Information System for Management of the Court, INSLAW, Inc., Washington, D.C., 1979
- o PROMIS 82<sup>TM</sup>: Information Management and Decision Support for Public Prosecutors, INSLAW, Inc., Washington, D.C., 1982.

### 1.3 PURPOSE AND USES OF THIS REVIEW

It is the purpose of this review to assist Canadian jurisdictions in selecting an automated justice information system. This review does not advocate one system over another, but rather attempts to identify and describe the role and impact of information systems in court administration, the issues involved in choosing a justice-related information system, and some of the choices available.

Section 2 describes in detail the role of automated justice information systems, the issues involved in automating the court functions, and the necessary steps in choosing a system.

Section 3 gives an overview of the Prosecutor's Management Information System (PROMIS), which has attracted wide interest in Canada. The section describes PROMIS in detail, and summarizes the experiences of the Canadian jurisdictions which have studied and/or installed PROMIS.

Section 4 outlines the points to consider when making the decision to buy or to build a justice-related information system. The advantages and disadvantages of buying and building are identified, described, and compared.

Section 5 compares the benefits and drawbacks of PROMIS, and summarizes the general experiences of the Canadian jurisdictions which have installed PROMIS.

If further information is desired, please contact:

Technical Assistance Directorate  
Canadian Centre for Justice Statistics  
19th Floor  
R.H. Coats Building  
Statistics Canada  
Ottawa, Ontario  
K1A 0T6  
(613) 993-7137

## 2. INFORMATION SYSTEMS IN COURT ADMINISTRATION

### 2.1 TYPES OF INFORMATION

As in any organization today, court administrators are under pressure to collect, process, and report increasing volumes of information.<sup>1</sup> Two main categories of information are involved:<sup>2</sup>

- administrative, and
- case-related.

"Administrative" is meant to include all information pertinent to the operation of the court as a business. The administrative system comprises logistics and facilities management, personnel management, and budgeting and accounting.

"Case-related" covers information pertaining to the issues and individuals who come before the court. This report is principally concerned with "case-related" information. The case-related system consists of four components: case management and clerical information; case-related information; integrated application processing procedures; and an interrelated data base. The case-related system can be used for four general activities: transactions; operational control; management control; and strategic planning.

### 2.2 THE PROBLEM OF DIVERSITY

Individual jurisdictions frequently differ in their approach to gathering and processing case-related information. There are differences in legal procedures, court organization, staff capacity, and management style. Specific dissimilarities exist in such areas as caseloads, statistics, arrest data, disposition data, operational costs, application of the system by district offices, resources, and local statutory constraints.

The diversity in case management procedures makes it difficult to buy a quickly-installed, automated, "generic" information management system. While automated systems exist which have the potential for satisfying each court's needs, no currently-existing system can be installed without at least some modifications. These modifications may significantly increase the actual cost of transferring to far above the expected cost.

### 2.3 DEDICATED AND INTEGRATED SYSTEMS

A major factor to consider when evaluating an automated justice information system is the extent to which the system automates the flow of information between the various court components. A dedicated system allows only one component of the court direct access to the data base, while an integrated system allows multiple components of the court to share the same data base.

### 2.4 REQUIREMENTS ANALYSIS

A requirements analysis should always be undertaken as part of any system development effort. The analysis should document the host environment as it truly exists, rather than the perceived ideal pattern. Studies of systems of all types have repeatedly indicated that satisfaction with a system's usefulness has less to do with the particular system selected than with how well the system matches the documented needs of the user. Even custom-built systems can fall short of an ideal if the system designer does not carefully study the working environment which the system is meant to serve.

### 2.5 THE CHOICES AVAILABLE

#### Buy an Existing System

In 1979 and 1980, in separate surveys, the since-dissolved National Work Group on Justice Information and Statistics (Canada) and the National Evaluation Program (U.S.) examined a number of existing automated justice information systems available in Canada and the United States.<sup>3,4</sup> Of these systems, only PROMIS from INSLAW, Inc. was directly applicable to the top-priority operational and statistical needs expressed by the majority of jurisdictions. At present, only the most superficial information is available about specific existing systems other than PROMIS which may be transferable to other jurisdictions.

#### Build a Customized System

Building a customized system holds many advantages for the end user. The information being captured, stored and retrieved, the flow of work through the system, the format of reports and forms can all be developed to fit the user's requirements exactly. The end product can conform precisely to the specified requirements, and the potential for high user satisfaction is excellent.

### 2.6 MAKING A CHOICE

Transferring an existing system is attractive because of the perceived potential for savings in time and cost. However, research has shown that the transfer of an existing justice information system may not result in lower costs.<sup>5</sup> While the cost of a system is an important factor, the decision between buying and building a software system cannot be based on financial criteria alone. Obtaining value for the money spent is harder to quantify, but vastly more important. An inexpensive system that is difficult to use can actually cost far more than a system whose larger price tag can be justified by its ability to provide high user satisfaction. Then again, high cost is not necessarily indicative of high quality.

An integrated system, with a shared data base, is potentially the most effective type of system. In a shared data base, data is captured and stored only once whenever possible, thereby avoiding duplication of effort, redundancy of data, and the potential for errors of inconsistency. Security and access constraints can be installed so that each agency can access only the information to which it is entitled. These agencies are therefore assured of data privacy and integrity.

The only truly useful measure of a system's potential performance is how well it accommodates the specific needs of its day-to-day users. User satisfaction generally has less to do with the choice between buying or building than with the matching of the actual needs of the user community to the final product. The most important tool used to make the decision is the detailed requirements analysis.

## 2. Information Systems in Court Administration

### Notes

1. National Center for State Courts, Court Case Management Information Systems Manual, p. 15.
2. Ibid., pp. 24, 25.
3. T. Hutton, NWG Document No. 7: An Overview of PROMIS (National Work Group on Justice Information and Statistics, March 1981).
4. Sidney H. Brounstein et al, National Evaluation Program Phase I Summary Report: Prosecution Management Information Systems (October 1980), p. 39.
5. Ibid., pp. 60, 104.

### 3. PROSECUTOR'S MANAGEMENT INFORMATION SYSTEM (PROMIS)

#### 3.1 THE PRODUCT AND THE VENDOR

The Prosecutor's Management Information System (PROMIS) was originally developed in 1971 by the Institute for Law and Social Research (INSLAW) as a tool for prosecutors in the United States. The work was undertaken for the U.S. Attorney for the District of Columbia and was funded with grants from the U.S. Law Enforcement Administration Agency (LEAA).

The first commercially available version of PROMIS was a batch processing PDP-11 minicomputer-based system known as "Mini-PROMIS." Subsequently, PROMIS was redesigned and implemented on other equipment. Over the following decade, development and enhancement of the software resulted in the availability of several improved versions of the system.

This report deals primarily with PROMIS 82<sup>TM</sup> (hereafter referred to as PROMIS), an on-line version of PROMIS developed to operate on various popular mainframe and mini-computers. PROMIS is also marketed in several forms for a range of criminal justice agencies. Variations of PROMIS include DOCKETRAC, JAILTRAC, YOUTHTRAC, REGULAW, CASETRAC, CIVILTRAC and MODULAW.

#### Capabilities

PROMIS is designed to assist the prosecutor's office in tracking arrests, cases, defendants, and witnesses through the events in the criminal justice process. PROMIS consists of a data management system and a tailoring package which allows the system to be adapted, up to a point, to meet the specific needs of users in individual jurisdictions. Transactions are entered on-line from a video display workstation. Reports can be printed from stored data through either on-line or batch requests. Statistical reports can also be generated in a variety of arrangements.

The PROMIS software is designed to be flexible and readily adaptable to the user's needs and operational procedures. The software consists of a number of components (such as the Tailoring component, the Data Entry and Retrieval component, and the Historical Purge component), which may be implemented selectively by the user.

#### Applications

The principal services which PROMIS can provide to a court administrator are:

- o retrieval services -- quickly locating information concerning one or more special cases, offenses, charges, witnesses, defendants, and/or attorneys;
- o scheduling services -- either recording or retrieving scheduling information;
- o clerical services -- producing printed notices, subpoenas and case jacket labels;
- o management services -- printing reports about individuals or cases as background to court management decisions;
- o record keeping services -- maintaining records in such a way that statistics can be easily extracted.

#### Hardware Releases

As of July 2, 1984, hardware brands for which separate PROMIS versions exist include Burroughs, DEC, IBM, PRIME, and Wang. This gives potential PROMIS users who have not yet acquired hardware a degree of choice among hardware suppliers. However, the experience of users who already own/share hardware not on this list has indicated that converting an existing version for different equipment is time-consuming and costly.

#### Software Availability and Cost

INSLAW provides PROMIS software programs under licence initially for a 5-year term at a price of \$65,000 (U.S.), as at July 2, 1984.

The licence agreement includes the right to use one copy of the licenced software and delivery of the software documentation. At the expiry of the initial licence period, the client may renew the licence for another 5-year period (obtaining the most current software version for the new term) at 80% of the then-current 5-year fee; or, the user can choose to renew the licence on his existing software for 30 years at a price of \$30,000 (U.S.).

The agreement also includes a total of 10 days of training for one system manager, one system operator, the data entry operators, and the end users, and maintenance for the first year of the term of the licence agreement. Maintenance for subsequent years can be purchased separately at the per annum rate in effect at each annual renewal (\$12,500 (U.S.) as at July 2, 1984).

#### Vendor Support

INSLAW does not directly implement the PROMIS system, but the company will assist in any way possible to ensure successful implementation and operation of the system. These services are not part of the licence agreement and must be negotiated separately. Services which INSLAW has provided in the past include analysis of the costs and benefits of implementing PROMIS, requirements analyses, customization of packages to user specifications, installation of the package on the client's hardware, operational support, and preparation of the user manual. INSLAW can provide technical assistance to prepare project descriptions, briefings, requests for consultant services or computer hardware procurement, software knowledge, and so on.

INSLAW organizes and administers a PROMIS User Group in the United States that meets periodically in cities where a PROMIS system is installed. The users in the group trade knowledge and experience related to PROMIS in various environments.

Most of INSLAW's current clients have indicated that the on-going advice and support they have received was most helpful. These support services may be billable or non-billable, depending on the particular licence agreement or maintenance agreement in force, as well as on the nature of the problem. Both telephone consultation and on-site assistance may be obtained.

#### Software Transferability

The licence agreement contains a standard clause prohibiting distribution or use of licenced software (including the tailored end product) to/by third parties. The agreement also prohibits unauthorized transfer of the system to a second installation within the particular jurisdiction. Permission to install PROMIS on multiple installations involves negotiation of separate licence agreements.

### 3.2 PROMIS IN THE UNITED STATES

A study<sup>1</sup> conducted in 1980 in the United States found that among a sample of criminal justice offices with 25 or more employees who were currently using a computerized information system, 37 per cent were using some version of PROMIS. Of those offices planning such a system, 70 per cent were planning to use some version of PROMIS.

The study did not find that PROMIS systems cost less than custom-built systems; in fact, on average, PROMIS-based systems cost about \$25,000 (U.S.) or 16.7% more to develop. However, in operation, PROMIS systems tended to cost a few cents less per case, on average. These statistics are based on the technology of the day (1980).

The study indicated that user satisfaction with an individual system had less relationship to the type of system implemented than to how thoroughly the user's requirements had been defined before the decision to buy or to build had been made. Even then, PROMIS systems tended to score slightly higher in user satisfaction, a fact that could be attributed to PROMIS User Group meetings. Groups who built their own customized systems had no one with whom to share problems and/or achievements.

### 3.3 PROMIS IN CANADA

In Canada, the National Work Group on Justice Information and Statistics (NWG) and four provincial jurisdictions have evaluated PROMIS. The NWG installed PROMIS to study the possibilities of adapting the system to Canadian jurisdictions. Independently from the NWG study, three provinces (New Brunswick, Manitoba, and Alberta) evaluated and selected PROMIS; the fourth province (British Columbia) decided against selecting the system.

The NWG study, and the provincial evaluations (which were requested by CCJS for this report), indicate the extent to which PROMIS meets the vendor's claims and the users' expectations when installed in Canadian jurisdictions.

#### National Work Group on Justice Information and Statistics

The National Work Group on Justice Information and Statistics (NWG) chose PROMIS as a test system because it was designed for installation in any jurisdiction, and because PROMIS met the major stated priority (development of more effective operational and statistical programs in the adult court areas) of the majority of the provincial and territorial jurisdictions.

The evaluation of the system was complicated by the fact that the hardware which supported PROMIS was not readily available. Following resolution of the difficulties caused by software/hardware incompatibility, the NWG found that the most difficult implementation task was tailoring for the particular jurisdiction. The tailoring package was not user-friendly, and required expert knowledge both of PROMIS and the jurisdictions's requirements. Even when expert knowledge was available, the task was lengthy and took several trials to complete.

The NWG found that PROMIS could be adapted for Canadian jurisdictions. If an INSLAW-supported hardware/software configuration was not used, the installation and tailoring were both more difficult and time-consuming. The NWG recommended that, from the outset of the project, the jurisdiction have a manager who both understood PROMIS' concepts, and was reasonably familiar with the methods of the jurisdiction and with data-processing concepts in general.

The NWG found that the on-line data entry and retrieval facilities were powerful and relatively easy to use. The security features, such as terminal identifiers, passwords, and user identifiers, were adequate and were considered practical in the on-line environment.

#### **New Brunswick**

In New Brunswick, PROMIS plays a part in an overall Justice Information System (JIS). The aim of the JIS is to improve court management, while reducing expenditure on day-to-day operations. Custom-building was rejected as unfeasible; and, of pre-packaged software, only PROMIS met the technical requirements of the project. However, adapting PROMIS for the UNIVAC 1100/83 hardware available in New Brunswick (a system not supported by INSLAW) proved to be more complex, time-consuming and costly than anticipated.

Operationally, the PROMIS software has performed as expected. There are on-going problems with response time and turnaround time for ad hoc reports, but these seem to be linked with problems specific to the implementation, which are still being resolved.

#### **Manitoba**

Manitoba chose PROMIS to fill its need for a Manitoba Justice Information System (MJIS) in Winnipeg. The aim of MJIS is to improve court management activities and to reduce expenditure on operational effort. It is hoped that MJIS will integrate the functions performed by the Winnipeg City Police, the Winnipeg Remand Centre, the Court Services and Criminal Prosecutions Divisions of the Department of the Attorney General, Probations Services, and the Department of Corrections.

As in New Brunswick, development of a custom system was rejected for various reasons. PROMIS was selected as the only pre-packaged solution which met the project requirements. Although implementation is not yet complete, there seem to be few problems establishing the software in the IBM hardware environment (INSLAW supported). Tailoring of the software for the court system in Manitoba has not been smooth, but the problems have not been impossible to overcome, simply more costly and time-consuming than originally anticipated.

#### **Alberta**

PROMIS was installed in Alberta as an interim measure to assist the Office of the Crown Prosecutor in Edmonton and Calgary. Eventually, the functions performed in these offices were meant to be incorporated into a Courts Automation Project (CAP). Due to the interim nature of the project, PROMIS was chosen as a relatively low-cost, pre-packaged, adaptable solution which was perceived to have been installed successfully in other (non-Canadian) jurisdictions.

At the time the system was acquired, no IBM hardware release existed, so the then-current PDP-11/70 release was converted. This approach was both costly and time consuming; however, tailoring the software for use in the Canadian justice system was not very difficult. More important was the fact that manual procedures became more complex to accommodate PROMIS, and consequently users find the system to be cumbersome, "unfriendly", and ineffective.

It appears that many of Alberta's problems with PROMIS can be attributed to the lack of a formal study of user needs prior to implementation. A review of the volumes of data captured has indicated that the system is required to operate beyond the limits for which it was intended.

### British Columbia

Unlike the three previously-discussed jurisdictions, British Columbia had previously developed a series of automated systems to assist various functional components of the judicial process. Both PROMIS and a custom-built system would be capable of satisfying the technical requirements of an integrated system. However, upon examining PROMIS implementations and custom-built systems in other jurisdictions, British Columbia concluded that the expenditure required for implementation could be better used to upgrade existing systems and develop new custom-built systems.

### Summary

The research by CCJS indicates that several general conclusions may be drawn from the PROMIS installations in Canada.

Jurisdictions which have implemented PROMIS generally found that technical expertise far in excess of what had been originally anticipated was necessary for successful implementation of their projects. Implementation was faster and smoother on systems with a hardware environment that was already supported by INSLAW. All jurisdictions felt that communication with other Canadian users to share expertise and experience would have been valuable.

All jurisdictions felt that system operating costs and the turnaround time in ad hoc reporting were higher than they should be. However, no adequate solution to either of these problems has yet been found.

Some jurisdictions have expressed concern that PROMIS is not user-friendly, and PROMIS does not easily handle the volume of data encountered in the host Canadian jurisdictions.

All jurisdictions felt that PROMIS performs as advertised by INSLAW, and that PROMIS met the overall user and technical requirements.

### 3. Prosecutor's Management Information System (PROMIS)

#### Notes

1. Sidney H. Brounstein et al., National Evaluation Program Phase I Summary Report: Prosecution Management Information Systems (October 1980), p. 23.

#### 4. BUY OR BUILD?

There are generally two methods of acquiring applications software: buy a pre-packaged commercial system, or build a custom system.

Pre-packaged application systems are one of the major growth areas in commercial computing today. For standard applications such as payroll and accounting, a variety of generic packages can be purchased off-the-shelf and installed with little or no modification. Because the same package is used by many organizations, each purchaser pays for only a small proportion of the total development cost. For standard applications, it is frequently cheaper and faster to buy a package than to develop a custom-built system with the same capabilities.

On the other hand, if the application is unique, or in low demand, there may not be a pre-packaged system available commercially. If the organization owns hardware that is non-standard in configuration, an existing software package may not fit that specific configuration. If the organization uses a procedure or method which is not reproduced in the software package, the procedure must be changed to conform to the pre-packaged software; the software must be modified; or a custom package must be developed to handle that procedure.

A major factor in software evaluation is the determination whether a pre-packaged system (if available) is suitable for the application, or if a custom-designed system will provide a greater return for each dollar spent. This section discusses the issues involved in choosing to buy or build a software system, and compares the alternatives. This section does not attempt to advocate buying over building or vice versa, but rather to indicate the factors which must be weighed in reaching a decision.

A tabular comparison of the factors to be considered is presented in Table 4-A: Comparison of Factors in Buying and Building a Software System.

**Table 4-A: Comparison of Factors in Buying and Building a Software System**

FACTOR	BUYING A SYSTEM	BUILDING A SYSTEM
<b>Conformity to User's Needs</b>	Software will usually require some modifications to adapt it to the hardware environment or to the organization's policies and procedures.  Alternatively, departmental policies and procedures may require extensive modifications to adapt to the software.	Specifications can be designed to meet the user's needs perfectly.
<b>Implementation Period</b>	Generally (but not always) short. Benefits of using the system can accrue quickly.	Generally (but not always) longer than the implementation period for buying. Initial benefits may not accrue quickly.  However, the custom-built software should be more efficient than a purchased system in terms of operating speed; when the system becomes operational, the benefits of increased speed (lower operating costs and faster turn-around time) can accrue quickly.
<b>Implementation Schedule</b>	If extensive modifications are required, the implementation schedule may take more time than anticipated.	The system can be built in stages to meet pressing needs first, then expand to encompass the lower-priority needs.

...continued

FACTOR	BUYING A SYSTEM	BUILDING A SYSTEM
<b>Contract Obligations</b>	The contract must specify the ownership and licensing of the package, any provisions for back-up copies, modifications, installation on multiple systems, and external support after acceptance of the product.	If the work is performed by an independent software development company, the contract must specify the ownership and licensing of the package, any provisions for back-up copies, modifications, installation on multiple systems, and external support after acceptance of the product.
<b>Modifications</b>	The contract may restrict or prohibit modifications to the software.  If the vendor subsequently updates the software, the modifications to the original version may be lost.	There are no restrictions on the modifications to the software.
<b>Expansion</b>	The package may not be expandable enough to fit the future needs of the users.	With forethought and planning, the system can be continually updated and modified.
<b>Transferability</b>	The contract may restrict or prohibit installation of the software on other computer environments belonging to the purchaser.	On a well-planned system, there are no legal constraints on the transferability of the software.
<b>Uniformity</b>	If several agencies obtain the same package, a potential will exist for uniform information and statistics exchange among those agencies.	Generally, each branch of the organization will receive the same system, thereby ensuring uniform information and statistics exchange.

...continued

FACTOR	BUYING A SYSTEM	BUILDING A SYSTEM
<b>Age of System</b>	Older system has proven itself; newer system may not be sufficiently debugged.  Older system frequently do not take advantage of the state-of-the-art technology.	New custom-built system may not be completely tested and debugged.  New custom-built system can take advantage of the state-of-the-art technology.
<b>Design and Compatibility</b>	Because the vendor has internal expertise and experience with other users, the pre-packaged system may be more sophisticated than an internally-developed system.  The system may not integrate with existing manual and automated procedures.	The system can be designed to follow the organization's exact method of operation, and therefore integrates well with the existing manual and automated procedures. The system is likely to be more efficient operationally than a pre-packaged system.
<b>User's Group</b>	A number of users of the package may have organized a user's group.	No user's group exists.
<b>Training</b>	Training provided by an experienced vendor may reduce the anxiety of staff members. However, training provided under contract may not be sufficient for the staff to make the most efficient use of the system.	The training period may be shorter, because the program is designed to emulate the manual procedures used previously. However, the training provided may not be as extensive and professional as that provided by an experienced vendor.

...continued

FACTOR	BUYING A SYSTEM	BUILDING A SYSTEM
<b>Staff Acceptance</b>	Those who operate and maintain the system may resent having to install, maintain, and use a system which was not developed internally.	Staff members often develop pride of ownership in a custom-built system.
<b>Documentation</b>	Written documentation is more likely to be complete than on custom-built systems.  If documentation is inadequate, the purchaser may have to buy or write additional documentation.	The documentation frequently will be incomplete and/or out-of-date.  The documentation must be written, maintained, and updated by the developers.
<b>Development Cost</b>	The cost of the basic package is fixed and known. Usually, a pre-packaged system costs less than a custom-built system, because sales to several purchasers reduces the per capita development cost and subsequently the price per purchaser.  If extensive modifications are required, the cost may be much higher than anticipated. The time and cost required to modify and install the system are frequently underestimated.	The final cost of the project must be estimated. The time and resources required to develop the system are frequently underestimated.
<b>Operational Cost</b>	The operating costs may be estimated from the experience of other purchasers.	The operating costs may be lower than those of a pre-packaged system, because the custom-built system can be developed for maximum efficiency within the user's environment. Over a period of time, this lower operating cost may offset the higher development cost.

#### 4.1 CONCLUSIONS

The question of whether to buy or to build an automated system may be answered only by considering many factors. The relative weight of each factor varies according to the specific needs of a particular organization at a given point in time. In a few cases, a commercial package will fit the user requirements exactly; in others, there will be no commercial packages available; in most cases, commercial software will fit some user requirements but not all of them. Given the latter case, the decision must be made to accept the limitations, to attempt to tailor the package, or to build from scratch.

A requirements analysis should take into account each factor discussed in this section. This analysis must define the specifications of the system, determine if a pre-packaged system exists, estimate the costs (of development, installation, and operation), and consider management factors such as the potential of the system for future growth and modification, and its impact on the user community. Only when the weight of all these factors in each particular situation is considered can the buy/build question be resolved.

#### 5. CONCLUSIONS

Generally, the PROMIS software product can be adapted to suit the needs of the Canadian justice community. However, PROMIS' ability to satisfy the needs of a particular jurisdiction can only be determined by a careful evaluation of that jurisdiction's specific needs through a detailed requirements analysis.

Only when all of the relevant factors have been defined and included in the overall cost/benefit equation can a clear distinction be made regarding the suitability of the PROMIS software to a specific jurisdiction.

##### 5.1 BENEFITS OF PROMIS

PROMIS has a proven track record. The system has been installed in a number of American and Canadian jurisdictions with relative success. The vendor, INSLAW, provides comprehensive technical assistance (at varying cost) both before and after installation. The majority of the purchasers of the PROMIS software have been favourably impressed with the on-going support and advice received.

The ability to tailor the product allows the user jurisdiction to modify the basic system to suit its particular needs. The data base, data entry screens and editing criteria, inquiry displays, indices, and output formats can all be modified or adapted to a greater or lesser extent.

INSLAW organizes and administers a PROMIS User Group that meets periodically in American cities. Users of the PROMIS system can trade experiences and knowledge related to PROMIS in various environments.

In American justice-related automation studies, the PROMIS system tends to score slightly higher in user satisfaction than other systems.

## 5.2 DRAWBACKS OF PROMIS

The user must convert, install, and tailor the software system. The conversion of PROMIS to a particular hardware environment (whether supported by INSLAW or not) requires skilled personnel who are knowledgeable in PROMIS and subject-matter concepts, as well as in the policies and procedures of the jurisdiction. Without this expertise, conversion can take much longer than generally expected.

PROMIS is not considered to be user-friendly. Existing policies and procedures may have to be modified to accommodate PROMIS. Data capture can be a complex and cumbersome procedure. In certain installations, terminal response time is slow. Although the system is thoroughly documented through the automatic generation of listings, end-user documentation must be written by the user.

PROMIS is not capable of handling large volumes of data entry on a routine basis.

Compared to custom-built systems, PROMIS systems do not necessarily cost less. An American study in 1980 (by Sidney H. Brounstein et al., for the National Evaluation Program) found that PROMIS systems cost, on average, about 16.7% more to buy, install, convert, and tailor. However, in the same study, PROMIS systems tended to cost slightly less to operate.

## 5.3 SUMMARY

The users who were most satisfied with the automated justice information system (whether PROMIS-based or not) were those who matched the needs documented in a thorough requirements study to the system they eventually bought/developed. In any marketplace, the onus is on the buyer to shop wisely and select goods which fulfill a real need. Shopping for software is no exception to this rule.

A REVIEW OF PROMIS®

Canadian Centre for Justice Statistics

The Canadian Centre for Justice Statistics was created as a result of the 1979 National Project on Resource Coordination. The concept of the Centre was one of four options developed by the Project in seeking improved co-ordination of resources for justice information and statistics. It is the purpose of the Centre not only to oversee the collection of justice information and statistics, but also to assist various jurisdictions in finding the most efficient means of collection. This review addresses the issues involved in establishing a useful, cost-effective information system. It introduces the Prosecutor's Management Information System (PROMIS) marketed by INSLAW, Inc. and relates the PROMIS system to the issues raised. Finally, it draws conclusions about the implementation of software systems in general and of PROMIS in particular.

July 2, 1984

## TABLE OF CONTENTS

Section	Page
<b>1. INTRODUCTION</b>	<b>1</b>
1.1 A Review of PROMIS -- Background	1
1.2 Resources Consulted	1
1.3 Purpose and Uses of this Review	3
<b>2. INFORMATION SYSTEMS IN COURT ADMINISTRATION</b>	<b>4</b>
2.1 Types of Information	4
2.2 The Problem of Diversity	4
2.3 Dedicated and Integrated Systems	6
2.4 Requirements Analysis	7
2.5 The Choices Available	8
- Buy an Existing System	8
- Build a Customized System	8
2.6 Making a Choice	9
- Cost	9
- Data Sharing in the Information System	10
- User Satisfaction	10

...continued

TABLE OF CONTENTS (cont'd)

Section	Page
3. PROSECUTOR'S MANAGEMENT INFORMATION SYSTEM (PROMIS)	12
3.1 The Product and the Vendor	12
- Variations	12
- Capabilities	13
- Components	14
- Applications	15
- Hardware Releases	17
- Software Availability and Cost	18
- Vendor Support	18
- Software Transferability	19
3.2 PROMIS in the United States	19
3.3 PROMIS in Canada	20
- National Work Group on Justice Information and Statistics	20
- New Brunswick	22
- Manitoba	24
- Alberta	27
- British Columbia	29
- Summary	30

...continued

TABLE OF CONTENTS (cont'd)

Section	Page
4. BUY OR BUILD?	32
4.1 Making the Decision to Buy	33
- Age of the Package	33
- Speed of Implementation	34
- Portability and Expansion	34
- Design and Compatibility	35
- Training and Staff Acceptance	36
4.2 Making the Decision to Build	37
- Development Risks and Rewards	37
- Contracting for a System	40
4.3 Comparing the Buy/Build Options	40
- Physical Considerations	41
- Tabular Comparison	41
4.4 Conclusions	46
5. CONCLUSIONS	48
5.1 Benefits of PROMIS	48
5.2 Drawbacks of PROMIS	49
5.3 Summary	49

APPENDIX A: Justice Information Systems

A-1

## 1. INTRODUCTION

### 1.1 A REVIEW OF PROMIS -- BACKGROUND

The Technical Assistance Directorate of the Canadian Centre for Justice Statistics (CCJS) assists Canadian jurisdictions in implementing effective information systems to support the administration of justice and to potentially contribute to the collection of National Justice Statistics. One particular system for case-tracking, called the Prosecutor's Management Information System (PROMIS), has attracted wide interest in Canada. In response to an expressed interest on the part of Canadian jurisdictions in acquiring useful information systems, particularly PROMIS, the Centre has produced this Review of PROMIS. The review is a plain-language report which attempts to cover the issues involved in selecting information system software for a particular jurisdiction, with a special focus on PROMIS.

### 1.2 RESOURCES CONSULTED

The resources consulted during the production of the Review of PROMIS included the following persons:

- o Denis Sauvé, Technical Assistance Directorate, CCJS
- o Arnold Wytenburg, Technical Assistance Directorate, CCJS
- o Stephen Chase, Research and Planning Branch, New Brunswick Department of Justice
- o Allan Goodz, Manitoba Department of the Attorney General
- o Jim Roberts, Planning, Research and Development, Alberta Attorney General
- o Gene Spencer, Court Services, British Columbia Ministry of the Attorney General
- o INSLAW Inc., author and publisher of the PROMIS technology, Washington, D.C. 20005

The principal publications used in preparing the review were:

- An Overview of On-Line PROMIS, INSLAW, Inc., Washington, D.C., 1978.
- National Evaluation Program Phase I Summary Report: Prosecution Management Information Systems, Sidney H. Brounstein et al., October 1980.
- Court Case Management Information Systems Manual, National Center for State Courts.
- NWG Document No.7: An Overview of PROMIS, T. Hutton, National Work Group on Justice Information and Statistics, March 1981.
- PROMIS for the Courts: A New Computerized Information System for Management of the Court, INSLAW, Inc., Washington, D.C., 1979
- PROMIS 82™: Information Management and Decision Support for Public Prosecutors, INSLAW, Inc., Washington, D.C., 1982.

### 1.3 PURPOSE AND USES OF THIS REVIEW

It is the purpose of this review to assist Canadian jurisdictions in selecting an automated justice information system. This review does not advocate one system over another, but rather attempts to identify and describe the role and impact of information systems in court administration, the issues involved in choosing a justice-related information system, and some of the choices available.

Section 2 describes in detail the role of automated justice information systems, the issues involved in automating the court functions, and the necessary steps in choosing a system.

Section 3 gives an overview of the Prosecutor's Management Information System (PROMIS), which has attracted wide interest in Canada. The section describes PROMIS in detail, and summarizes the experiences of the Canadian jurisdictions which have studied and/or installed PROMIS.

Section 4 outlines the points to consider when making the decision to buy or to build a justice-related information system. The advantages and disadvantages of buying and building are identified, described, and compared.

Section 5 compares the benefits and drawbacks of PROMIS, and summarizes the general experiences of the Canadian jurisdictions which have installed PROMIS.

If further information is desired, please contact:

Technical Assistance Directorate  
Canadian Centre for Justice Statistics  
19th Floor  
R.H. Coats Building  
Statistics Canada  
Ottawa, Ontario  
K1A 0T6  
(613) 993-7137

## 2. INFORMATION SYSTEMS IN COURT ADMINISTRATION

### 2.1 TYPES OF INFORMATION

As in any organization today, court administrators are under pressure to collect, process, and report increasing volumes of information.<sup>1</sup> Two main categories of information are involved:<sup>2</sup>

- administrative, and
- case-related.

"Administrative" is meant to include all information pertinent to the operation of the court as a business. The administrative system comprises logistics and facilities management, personnel management, and budgeting and accounting.

"Case-related" covers information pertaining to the issues and individuals who come before the court. This report is principally concerned with "case-related" information. The case-related system consists of four components: case management and clerical information; case-related information; integrated application processing procedures; and an interrelated data base. The case-related system can be used for four general activities: transactions; operational control; management control; and strategic planning.

### 2.2 THE PROBLEM OF DIVERSITY

Individual jurisdictions frequently differ in their approach to gathering and processing case-related information. There are differences in legal procedures, court organization, staff capacity, and management style. Specific dissimilarities exist in such areas as caseloads, statistics, arrest data, disposition data, operational costs, application of the system by district offices, resources, and local statutory constraints.

The diversity in case management procedures makes it difficult to buy a quickly-installed, automated, "generic" information management system. If case management was similar among Canadian jurisdictions, the courts could choose a common automated information management system and make modifications in the system to suit the specific needs of each province or territory. One advantage of similar systems would be the potentially lower cost of installing a common system in each jurisdiction, compared to the cost of installing and modifying a different system in each jurisdiction. Also, as user experience with the common system expanded, the possibilities for sharing technical expertise would increase.

However, while automated systems exist which have the potential for satisfying each court's needs, no currently-existing system can be installed without at least some modifications. Where computer hardware environments are not identical, the software system must be modified extensively during the transfer process. These modifications may significantly increase the actual cost of transferring to far above the expected cost. For example, at least one study has found that, if an INSLAW-supported hardware/software configuration is not in place, the process of modifying PROMIS is much more time-consuming, costly, and cumbersome than expected.<sup>3</sup>

When software has been installed and converted to run in a different hardware environment, the transfer process is not yet complete. The jurisdiction must either adapt to the system's formats, procedures, and structures (therefore changing its own), or modify the system to fit the jurisdiction. Generally, changing the jurisdiction's procedures is an expensive process; however, modifying the software to fit the jurisdiction can also be as or more expensive if the software does not readily accommodate such efforts.

For similar reasons, software systems custom-built for one jurisdiction are seldom transferable to another without major modifications. If transfer is to be considered feasible at all, the system must be thoroughly documented. One of the largest obstacles to such transfers is inadequate documentation. A survey in 1980 in the United States concluded that apart from PROMIS installations, only five information systems surveyed had documentation that was considered adequate to support technology transfer.<sup>4</sup>

## 2.3 DEDICATED AND INTEGRATED SYSTEMS

A major factor to consider when evaluating an automated justice information system is the extent to which the system automates the flow of information between the various court components.

In a dedicated system, only one component of the court has direct access to the data base. Some users believe they are best served by a system under their complete control. They believe that their data collection procedures are more reliable, and that maintenance and improvements can be carried out as needed.

Integrated systems, which serve multiple components of the court who share the same data base, are potentially the most effective type of system. In a shared data base, data is captured and stored only once whenever possible; all reports of court-related activity and all inquiries against court-related data originate from the same data source.

The chief differences between dedicated and integrated systems usually include:

- Information exchange -- Dedicated systems perform functions for a single functional user only. Integrated systems allow centralized records to be updated as events occur throughout the system. New or changed information is available immediately to all system users.
- Data recording -- In a dedicated system, information is selected and entered according to the needs and desires of a single user. In an integrated system, each user within the court enters a selected portion of a complete set of information being collected.
- Management information processing -- A dedicated system can provide support which is limited to output which benefits the operation and management of a single user. An integrated system can provide support to the daily operation and management of all users within the court.

## 2.4 REQUIREMENTS ANALYSIS

A requirements analysis should always be undertaken as part of any system development effort. The organizations which have been the most successful in developing and implementing a useful justice information system started with a thorough analysis of their requirements before making any decision about buying or building.<sup>5</sup> Organizations that decided to buy a particular system before defining requirements and resource constraints generally encountered avoidable problems in implementing the software.

The analysis should document the host environment as it truly exists, rather than the perceived ideal pattern. This can only be done through careful study and with the co-operation and commitment of those who currently do the work. Studies of systems of all types have repeatedly indicated that satisfaction with a system's usefulness has less to do with the particular system selected than with how well the system matches the documented needs of the user. Even custom-built systems can fall short of an ideal if the system designer does not carefully study the working environment which the system is meant to serve.

In 1979, a survey was made of 17 justice information system sites throughout the United States. The performance of a thorough requirements analysis was noted in only five sites (four non-PROMIS sites and one PROMIS site).<sup>6</sup> The majority of the remaining projects failed to meet the users' expectations.

Justice information systems (pre-packaged or custom-built) that were based on a systematic requirements analysis have tended to evolve in phases, with new applications being added to the system according to the conceptual design and a master plan. In these cases, realistic user expectations, based on clearly defined requirements, have been met.<sup>7</sup>

## 2.5 THE CHOICES AVAILABLE

### Buy an Existing System

At present, only the most superficial information is available about existing systems (other than PROMIS) which may be transferable to other jurisdictions. The utility of such systems, and the amount of modification required to accommodate different operational environments and user requirements, can differ widely. Each system would have to be investigated independently.

In 1979 and 1980, in separate surveys, the since-dissolved National Work Group on Justice Information and Statistics (Canada) and the National Evaluation Program (U.S.) examined a number of existing automated justice information systems available in Canada and the United States.<sup>8,9</sup> The systems which were examined in the two surveys include PROMIS-based systems, non-PROMIS integrated systems on large-scale computers, and non-PROMIS dedicated systems on minicomputers. See Appendix A for a list and short description of the systems which were examined.

Of the existing systems examined by the studies referenced in this report, only PROMIS from INSLAW, Inc. was directly applicable to the top-priority operational and statistical needs expressed by the majority of jurisdictions. In 1980, PROMIS was the only commercial system known to be used in more than two jurisdictions. The only known non-PROMIS transferred system was CORPUS in Alameda County, California.<sup>10</sup>

### Build a Customized System

Building a customized system holds many advantages for the end user. The information being captured, stored and retrieved, the flow of work through the system, the format of reports and forms can all be developed to fit the user's requirements exactly. The end product can conform precisely to the specified requirements, and the potential for high user satisfaction is excellent.

Many jurisdictions, in both the United States and Canada, have built customized systems for court management. Except for PROMIS and CORPUS, all of the existing systems listed in Appendix A were originally custom-built for a particular jurisdiction.

## 2.6 MAKING A CHOICE

### Cost

Transferring an existing system is attractive because of the perceived potential for savings in time and cost. However, research has shown that the transfer of an existing justice information system may not result in lower costs.<sup>11</sup>

With many transferred systems, substantial investments in time and human resources have been required to modify the software so that it runs in various operational environments and adheres to the policies and procedures of the new organization. Frequently, the time and effort required to study, test, evaluate, modify, and debug an existing package have proven more costly than that required to develop a custom-built package.<sup>12</sup>

While the cost of a system is an important factor, the decision between buying and building a software system cannot be based on financial criteria alone. Obtaining value for the money spent is harder to quantify, but vastly more important. An inexpensive system that is difficult to use can actually cost far more than a system whose larger price tag can be justified by its ability to provide high user satisfaction. Then again, high cost is not necessarily indicative of high quality.

### Data Sharing in the Information System

The most popular use for information systems is the production of case status reports and workload reports, followed by calendaring and scheduling.<sup>13</sup> For these functions to work effectively, information must flow quickly and directly within and between the court components. To facilitate this flow of information, a shared data base within an integrated system is required.

Because data is captured and stored only once whenever possible, a shared data base avoids duplication of effort, redundancy of data, and the potential for errors of inconsistency. Security and access constraints can be installed so that each agency can access only the information to which it is entitled. These agencies are therefore assured of data privacy and integrity.

### User Satisfaction

The only truly useful measure of a system's potential performance is how well it accommodates the specific needs of its day-to-day users. User satisfaction generally has less to do with the choice between buying or building than with the matching of the actual needs of the user community to the final product. The most important tool used to make the decision is the detailed requirements analysis.

## 2. Information Systems in Court Administration

### Notes

1. National Center for State Courts, Court Case Management Information Systems Manual, p. 15.
2. Ibid., pp. 24, 25.
3. Sidney H. Brounstein et al., National Evaluation Program Phase I Summary Report: Prosecution Management Information Systems (October 1980), p. 39.
4. Ibid., p. 104.
4. Ibid., p. 39.
6. Ibid.
7. Ibid., p. 40.
8. T. Hutton, NWG Document No. 7: An Overview of PROMIS (National Work Group on Justice Information and Statistics, March 1981).
9. Brounstein et al.
10. Ibid., p. 9.
11. Ibid., pp. 60, 104.
12. Ibid., pp. 40, 60.
13. Ibid., p. iii.

## 3. PROSECUTOR'S MANAGEMENT INFORMATION SYSTEM (PROMIS)

### 3.1 THE PRODUCT AND THE VENDOR

The Prosecutor's Management Information System (PROMIS) was originally developed in 1971 by the Institute for Law and Social Research (INSLAW) as a tool for prosecutors in the United States. The work was undertaken for the U.S. Attorney for the District of Columbia and was funded with grants from the U.S. Law Enforcement Administration Agency (LEAA).

The first commercially available version of PROMIS was a batch processing PDP-11 minicomputer-based system known as "Mini-PROMIS." Subsequently, PROMIS was redesigned and implemented on other equipment. Over the following decade, development and enhancement of the software resulted in the availability of several improved versions of the system.

This report deals primarily with PROMIS 82<sup>TM</sup> (hereafter referred to as PROMIS), an on-line version of PROMIS developed to operate on various popular mainframe and mini-computers. PROMIS is a criminal case-tracking information management system that is used to automate the tracking of cases, defendants, and charges in the criminal justice process (local, state or provincial, and federal) within the prosecutor's office.

### Variations

In addition to PROMIS 82, several variations of the software package are marketed for a range of criminal justice agencies.

DOCKETRACT<sup>TM</sup> is a trial court information system for civil and criminal environments. DOCKETRAC is used to automate scheduling and docketing functions, and to track cases, litigants, case parties, causes of action, and charges from filing to disposition. An optional Debt Collection module aids in the collection of fines and other debts.

JAILTRACTM is an on-line booking and jail management system that is used to automate the tracking of arrestees, inmates, and cases for law enforcement agencies, pretrial release agencies, and detention centers.

YOUTHTRACTM is a justice information system which tracks the progress of each juvenile referral through final disposition. YOUTHTRAC reflects the terminology, processing procedures, and security and confidentiality requirements that are specific to juvenile justice and child care agencies.

REGULAWTM is a justice information system which assists regulatory and administrative law agencies in controlling and reporting on their workloads.

CASETRACTM is a civil and criminal justice information system used in the complex litigation environment in state or provincial offices. CASETRACTM monitors the progress of cases through the preparation and litigation stages. An optional Debt Collection module aids in the collection of fines and other data.

CIVILTRACTM is a civil justice information system which records case documentation in test actions against state, provincial, or local jurisdictions.

MODULAWTM is a justice information system designed for private law firms and corporate legal departments. MODULAW is used to support most areas of client and file management, including docket control and calendaring, conflict-of-interest monitoring, and cross-referenced indexing of issues.

#### Capabilities

PROMIS is designed to assist the prosecutor's office in tracking arrests, cases, defendants, and witnesses through the events in the criminal justice process. PROMIS consists of a data management system and a tailoring package which allows the system to be adapted, up to a point, to meet the specific needs of users in individual jurisdictions. Using the tailoring capability, users may customize the data base, data entry screens, data editing criteria, inquiry displays, indexes, and output formats.

Transactions (data entry, updating, and retrieval) are entered on-line from a video display workstation. Reports can be printed from stored data through either on-line or batch requests. Statistical reports can also be generated in a variety of arrangements. Terminal displays and printed reports can be tailored to fit the user's requirements.

#### Components

The PROMIS software is designed to be flexible and readily adaptable to the user's needs and operational procedures. The software features described below are provided as components of PROMIS. These components are standard features of the PROMIS package; however, the user may decide to implement them selectively.

The Tailoring package permits the user to customize the software to suit the particular vocabulary, data structures, and data capture, update and retrieval functions of the host environment.

The On-Line Data Entry and Retrieval feature is a data management system which allows information to be added to, modified, or deleted from the data base via on-line video display terminals.

The Internal Data Base Manager controls access to and manages the internal functions of the data base.

The Formatted Output Package enables the user to design and produce forms, special on-line inquiry screens, and reports.

The Reports Package produces several types of standardized reports, either on demand or at regularly scheduled times. The flexibility of the Reports Package enables the user to define a variety of descriptive and statistical reports to suit the specific needs of the user.

The Generalized Inquiry Package enables the user to produce descriptive data on any group of related cases or matters, in both the on-line and historical files. This package is designed as an aid to managerial decision-making or policy development.

The Management Report Package enables the user to define and modify statistical reports. This package provides aggregate numerical information on any group of related cases or matters, in both the on-line and historical files. This package is designed as an aid to management decision-making or policy development.

The Historical Purge feature removes certain records (on the basis of user-defined criteria) from the on-line master file to off-line (magnetic tape) historical files. Summary records may be retained in the on-line files.

The Security functions ensure privacy and security for all files, by allowing the system manager to limit access to information in the data base. Access to the system can be limited by terminal location or by the operator, using defined passwords. The password and security systems may be periodically changed to maintain confidentiality.

The system's back-up features, the Logging and Recovery features and the Recovery and Analyzer feature, ensure that back-up copies of the information in the data base are kept. Recovery features allow information to be recovered in the event of system failure.

#### **Applications**

PROMIS can provide the court administrator with services and benefits which can improve case management and office productivity.

The system's retrieval features can locate information concerning one or more specific cases. PROMIS can provide access by multiple indexes, including case number, defendant number, name, calendar date, and type of offense. The system can conduct phonetic, as well as literal, name searches.

The system's scheduling feature can automatically produce a case calendar which can also be used for recording case actions. The calendar provides summary case and defendant information, a list of completed events, and the next scheduled event, together with space to record the outcome of the case for subsequent data entry.

The system's office administration features can produce printed notices, subpoenas and case jacket labels. The administrative documents can be produced on-line or in batch mode (which allows long documents or a large number of standard documents to be printed at night or at other non-peak hours).

The system's management reporting features, the Management Report Package and the Centralized Inquiry Package, provide information about individuals or cases as background to long-term court planning decisions. The Management Report Package can provide aggregate information on each stage of the judicial process; for example, the number of, and reasons for, rejections at screening or court dismissals; the number of guilty pleas to the top charge and to the reduced charge; bail statistics; and cases pending. The Generalized Inquiry Package can provide descriptive data on a group of cases with one or more features in common, such as type of crime, assigned prosecutor, assigned judge, and reason for dismissal.

The system's record-keeping features maintain records in such a way that statistics can be extracted on request. The system can also assist the user in monitoring and recording the information being added to the data base.

The system's statistical reporting features track the details regarding both defendants and cases through each step of the criminal justice process from arrest to final disposition. Statistics are available in numerous arrangements, for example, breakdowns by individual charges (e.g., robbery), or groups of charges (e.g., all offences or all violent crimes). The reports can display frequency counts and percentages, attrition rates, dispositions, and time delays, together with the recorded reasons for all actions taken.

The system's Historical Purge feature retires closed cases from on-line status (direct access through terminals) to an historical file (off-line storage medium). Through the tailoring package, the user can specify the criteria for retiring a case. If desired, a skeleton record of each closed case may remain in the on-line data base. The generalized reporting feature can access both the current and historical files.

#### Hardware Releases

The on-line version of PROMIS is designed to operate on various mainframe computers or minicomputers. In fact, PROMIS was developed with the intention that it be capable of installation on several of the more popular brands of computer hardware.

The process of making PROMIS software operational on the user's hardware is referred to as conversion. The conversion process may be fairly simple, or quite long and arduous. The latter is likely to be the case if the user's brand of hardware is not one for which INSLAW has an existing software version.

As of July 2, 1984, hardware brands for which separate PROMIS versions exist include Burroughs, DEC, IBM, PRIME, and Wang. This gives potential PROMIS users who have not yet acquired hardware a degree of choice among hardware suppliers. However, the experience of users who already own/share hardware not on this list has indicated that converting an existing version for different equipment is time-consuming and costly.

Although a wide variety of terminals can be considered in the evaluation process, only one type may be selected for each PROMIS installation. The system does not tolerate a mixture of terminal types within a given installation.

#### Software Availability and Cost

INSLAW provides PROMIS software programs under licence initially for a 5-year term at a price of \$65,000 (U.S.), as at July 2, 1984.

The licence agreement includes the right to use one copy of the licenced software and delivery of the software documentation. At the expiry of the initial licence period, the client may renew the licence for another 5-year period (obtaining the most current software version for the new term) at 80% of the then-current 5-year fee; or, the user can choose to renew the licence on his existing software for 30 years at a price of \$30,000 (U.S.).

The agreement also includes a total of 10 days of training for one system manager, one system operator, the data entry operators, and the end users, and maintenance for the first year of the term of the licence agreement. Maintenance for subsequent years can be purchased separately at the per annum rate in effect at each annual renewal (\$12,500 (U.S.) as at July 2, 1984).

#### Vendor Support

INSLAW does not directly implement the PROMIS system, but the company will assist in any way possible to ensure successful implementation and operation of the system. These services are not part of the licence agreement and must be negotiated separately. Services which INSLAW has provided in the past include analysis of the costs and benefits of implementing PROMIS, requirements analyses, customization of packages to user specifications, installation of the package on the client's hardware, operational support, and preparation of the user manual. INSLAW can provide technical assistance to prepare project descriptions, briefings, requests for consultant services or computer hardware procurement, software knowledge, and so on.

INSLAW organizes and administers a PROMIS User Group in the United States that meets periodically in cities where a PROMIS system is installed. The users in the group trade knowledge and experience related to PROMIS in various environments.

Most of INSLAW's current clients have indicated that the on-going advice and support they have received was most helpful. These support services may be billable or non-billable, depending on the particular licence agreement or maintenance agreement in force, as well as on the nature of the problem. Both telephone consultation and on-site assistance may be obtained.

#### Software Transferability

The licence agreement contains a standard clause prohibiting distribution or use of licenced software (including the tailored end product) to/by third parties. The agreement also prohibits unauthorized transfer of the system to a second installation within the particular jurisdiction. Permission to install PROMIS on multiple installations involves negotiation of separate licence agreements.

### 3.2 PROMIS IN THE UNITED STATES

A study<sup>1</sup> conducted in 1980 in the United States found that among a sample of criminal justice offices with 25 or more employees who were currently using a computerized information system, 37 per cent were using some version of PROMIS. Of those offices planning such a system, 70 per cent were planning to use some version of PROMIS.

The study did not find that PROMIS systems cost less than custom-built systems; in fact, on average, PROMIS-based systems cost about \$25,000 (U.S.) or 16.7% more to develop. However, in operation, PROMIS systems tended to cost a few cents less per case, on average. These statistics are based on the technology of the day (1980).

The study indicated that user satisfaction with an individual system had less relationship to the type of system implemented than to how thoroughly the user's requirements had been defined before the decision to buy or to build had been made. Even then, PROMIS systems tended to score slightly higher in user satisfaction, a fact that could be attributed to PROMIS User Group meetings. Groups who built their own customized systems had no one with whom to share problems and/or achievements.

### 3.3 PROMIS IN CANADA

In Canada, the National Work Group on Justice Information and Statistics (NWG) and four provincial jurisdictions have evaluated PROMIS. The NWG installed PROMIS to study the possibilities of adapting the system to Canadian jurisdictions. Independently from the NWG study, three provinces (New Brunswick, Manitoba, and Alberta) evaluated and selected PROMIS; the fourth province (British Columbia) decided against selecting the system.

The NWG study, and the provincial evaluations (which were requested by CCJS for this report), indicate the extent to which PROMIS meets the vendor's claims and the users' expectations when installed in Canadian jurisdictions.

#### National Work Group on Justice Information and Statistics

The National Work Group on Justice Information and Statistics (NWG) began testing PROMIS as part of its mandate to help Canadian jurisdictions become aware of developed or planned automated justice information systems, and to provide technical assistance in adapting existing operational systems for Canadian jurisdictions. PROMIS was chosen as a test system, because it was designed for installation in any jurisdiction, and because PROMIS met the major stated priority (development of more effective operational and statistical programs in the adult court areas) of the majority of the provincial and territorial jurisdictions.

When the NWG tested PROMIS, its evaluation of the system was complicated by the fact that the hardware which supported PROMIS was not readily available. Following resolution of the difficulties caused by software/hardware incompatibility, the NWG found that the most difficult implementation task was tailoring for the particular jurisdiction. The tailoring package was not user-friendly, and required expert knowledge both of PROMIS and the jurisdictions' requirements. Even when expert knowledge was available, the task was lengthy and took several trials to complete.

The NWG found that PROMIS could be adapted for Canadian jurisdictions. If an INSLAW-supported hardware/software configuration was not used, the installation and tailoring were both more difficult and time-consuming. The NWG recommended that, from the outset of the project, the jurisdiction have a manager who both understood PROMIS' concepts, and was reasonably familiar with the methods of the jurisdiction and with data-processing concepts in general.

INSLAW provided two types of documentation for PROMIS. A set of manuals described the PROMIS system. In addition, each program had documentation embedded within it, and a utility program was provided to extract this documentation. The embedded documentation must be referenced frequently while the system is being tailored.

The NWG found that some of the PROMIS features do not become clear until test cases are added to the data base and access is attempted in the on-line environment.

The software delivered by INSLAW assumed that a particular type of terminal would be used with the system. The NWG recommended that the default terminal be used if it was economically feasible. If another type of terminal was to be used, the services of a telecommunications analyst would be required.

The NWG found that the on-line data entry and retrieval facilities were powerful and relatively easy to use. The security features, such as terminal identifiers, passwords, and user identifiers, were adequate and were considered practical in the on-line environment.

## New Brunswick

In New Brunswick, PROMIS plays a part in an overall Justice Information System (JIS). The aim of the JIS is to improve court management, while reducing expenditure on day-to-day operations. The on-line system is installed in the fourteen court offices, with each office having at least one video display workstation and one hard-copy printer. Data entry is handled by the regional court staff within each office. Operational reports, forms, and documents are produced locally while the majority of the statistical and management reports are produced at the central office and are distributed accordingly.

Custom-building was rejected as unfeasible; and, of pre-packaged software, only PROMIS met the technical requirements of the project. Major factors in the decision to select PROMIS were that the tailoring package provided for future growth and change; INSLAW could support the product with technical information, documentation, training, and system enhancements; the package was available at no charge (note: this is no longer the case); and financial support for the implementation of PROMIS was available from the NWG. In addition, PROMIS was perceived to have been successfully implemented in Alberta and received a favourable review in a Manitoba feasibility study.

Although the PROMIS package met or exceeded the technical requirements originally identified for the JIS project, adapting PROMIS for the UNIVAC 1100/83 hardware available in New Brunswick (a system not supported by INSLAW) proved to be more complex, time-consuming and costly than anticipated. The single largest problem was the conversion of the software to the unsupported computer environment.

The adaptation of PROMIS, an American package, to the Canadian environment was much simpler than anticipated due to the effective use of the tailoring subsystem. However, the level of in-house expertise necessary to install the software proved to be much higher than anticipated. This problem can be largely attributed to the environment not being supported by INSLAW. While extensive technical knowledge of both PROMIS and the New Brunswick environment was required during implementation, a simple working knowledge of the system proved to be sufficient for daily operation.

The possibilities for sharing of technical expertise were non-existent, because no other PROMIS systems had been installed on a UNIVAC system. The possibilities for sharing subject-matter expertise was restricted to other Canadian installations. In fact, even this possibility was almost non-existent because only one such installation existed at the time (in Alberta), and the package had been installed at that location in a completely different context.

PROMIS took approximately fifteen calendar months to install in New Brunswick, much longer than the expected three to six months. The conversion to the UNIVAC environment and the lack of available human resources were the major factors in the overrun.

Support from INSLAW was often requested during the early stages of the project. On most occasions, the responses were both timely and effective. Throughout the project, INSLAW provided quality documentation (both system and training), and has continually upgraded and enhanced the PROMIS software.

During the implementation and tailoring phases of the project, very little impact was felt by the users. To ease the transition of each local office from its unique operational procedures to the new, uniform procedures, the installation procedure was phased to bring one office on-line at a time.

Operationally, the PROMIS software has performed as expected. There are on-going problems with response time and turnaround time for ad hoc reports, but these seem to be linked with problems specific to the implementation, which are still being resolved. Although the operational costs were originally high, a modified rate structure has improved this problem. Presently, the cost is not a major concern, but may be somewhat excessive when compared to other systems currently in use. The regularly scheduled reports produced by the system are generally correct and on schedule. These reports require an overnight production run. The procedures for these reports were implemented by the Data Processing Division, not by the users.

The system and data security have proven satisfactory to date.

The Management Reporting Package, a standard component of PROMIS, has not yet been fully implemented. It is anticipated that the package will be implemented following the completion of testing, and will be used to improve the long-term planning of the courts. However, this is not as high in priority as the on-going problems with terminal response time and ad hoc report turnaround time.

Maintenance on the system has been less difficult than originally anticipated, although the non-standard hardware environment requires regular attention. The cost of on-going maintenance has been estimated at approximately one person-year per annum.

In the management operations, the system meets the regular report schedule, but is slow in satisfying ad hoc report requests. In the future, user control over the report production may be implemented.

Overall, implementation of the system is considered to be successful. As indicated, there are several on-going areas of concern and a detailed study has been initiated to identify causes and potential solutions.

#### Manitoba

Manitoba chose PROMIS to fill its need for a Manitoba Justice Information System (MJIS) in Winnipeg. The aim of MJIS is to improve court management activities and to reduce expenditure on operational effort. It is hoped that MJIS will integrate the functions performed by the Winnipeg City Police, the Winnipeg Remand Centre, the Court Services and Criminal Prosecutions Divisions of the Department of the Attorney General, Probations Services, and the Department of Corrections. It is intended that all locations will have video display workstations and, with the exception of the courtrooms, hard-copy printers for the production of forms, documents, and reports.

As in New Brunswick, development of a custom system was rejected for various reasons. PROMIS was selected as the only pre-packaged solution which met the project requirements. Major factors in the decision to select PROMIS were that INSLAW was prepared to provide adequate support throughout the implementation, the tailoring package provided for future growth and modification, the price was relatively low compared to custom development, and PROMIS was perceived to have undergone reasonably successful implementation in other jurisdictions.

Although implementation is not yet complete, there seem to be few problems establishing the software in the IBM hardware environment (INSLAW supported). Tailoring of the software for the court system in Manitoba has not been smooth, but the problems have not been impossible to overcome, simply more costly and time-consuming than originally anticipated.

A solid technical background in PROMIS and the justice environment are considered to be essential requirements to successfully install the software. Although no definite conclusions can be reached yet, it is felt that a solid technical background in PROMIS will continue to be required to maintain effective performance levels in both operations and maintenance endeavours.

As in New Brunswick, outside assistance and expertise relating specifically to Canada were not available. The American installations that had been reviewed did not provide pertinent insights into implementation or technical aspects of the system. Some Canadian experience had been gained in Alberta, but its software was an earlier version and had been implemented to serve a much different purpose.

Throughout the project, INSLAW has provided accurate, timely and effective support for the package and has continually upgraded and enhanced the product. The decision to consult INSLAW on technical points has saved time and money. Manitoba recommends that any jurisdiction anticipating the purchase of PROMIS should involve the vendor as much as possible throughout the project's life cycle, to gain the maximum benefit from the vendor's experience and expertise.

Because the MJIS is not an operational system, specific technical problems have not been identified. However, some areas of possible concern have been marked for future scrutiny. The terminal response time will be a critical concern when the system becomes operational, because terminals will be installed within the courtrooms. Problems with lack of "user-friendliness" are not anticipated; however, these areas of concern will be monitored and addressed if necessary.

The method of handling text has been identified as a general deficiency of the current version of PROMIS. Although PROMIS can handle textual data, the occasional need to maintain exact wording has led to the development of an auxiliary system which uses a word processor.

The project is estimated to require fifteen calendar months from the start of the project to the final implementation. At the time of this report, the project was performing beyond the original estimates for human and dollar resource consumption and was extending beyond the original calendar schedule.

Because the MJIS is not yet operational, the day-to-day and managerial operations have not been automated. The operational costs have not yet been determined, but the system is expected to provide service at relatively low cost.

Although PROMIS is not yet operational in Manitoba, the product has performed as expected, and has fulfilled all its advertised specifications and most of the project's requirements. In the future, Manitoba hopes to integrate the MJIS with an automated accounting system and to expand the MJIS to include additional courts and cities.

## Alberta

PROMIS was installed in Alberta as an interim measure to assist the Office of the Crown Prosecutor in Edmonton and Calgary. Eventually, the functions performed in these offices were meant to be incorporated into a Courts Automation Project (CAP). Due to the interim nature of the project, PROMIS was chosen as a relatively low-cost, pre-packaged, adaptable solution which was perceived to have been installed successfully in other (non-Canadian) jurisdictions. The mainframe computer on which PROMIS runs serves two locations (Calgary and Edmonton) via nineteen video display workstations and fourteen printers.

At the time the system was acquired, no IBM hardware release existed, so the then-current PDP-11/70 release was converted. This approach was both costly and time consuming. Although the conversion was originally perceived as a relatively straightforward and problem-free task, many difficulties were encountered. The conversion indicated that a high level of expertise related to PROMIS was necessary for successful conversion, installation, operation, and maintenance of the system.

Tailoring the software for use in the Canadian justice system was not very difficult. INSLAW had partially adapted PROMIS to accommodate Canadian terminology before the software was delivered. Alterations not handled by INSLAW were resolved in the conversion and installation process.

At that time, little or no expertise with PROMIS existed in Canada and INSLAW did not support PROMIS in an IBM environment. In retrospect, Alberta feels that the ability to share PROMIS-related experiences with other users would have been beneficial.

INSLAW provided timely, accurate and helpful support during the conversion process, despite the disadvantages inherent with installing PROMIS on unsupported hardware.

The installation, conversion and tailoring of the system was accomplished within the allotted six-month time frame. This was achieved only at the expense of human and dollar resources significantly in excess of original estimates. The extensive resource overruns have been largely attributed to the complexity of installing the system on an unsupported hardware environment.

At the time, several seemingly insignificant modifications to the existing systems and procedures were required during the installation and tailoring procedures. Manual procedures became more complex in order to accommodate PROMIS, and consequently users find the system to be cumbersome, "unfriendly", and ineffective. A modification which has had significant impact on the users was the change in responsibility for the production of subpoenas. This task was originally performed by the Law Enforcement community, but is now performed by the Office of the Crown Prosecutor.

Due to the short-term nature of the original project, Alberta decided not to implement several of the PROMIS options. Because Alberta's implementation of the system lacked the Historical Purge function, the unchecked growth of the data files caused disk storage requirements, data retrieval cost, and performance to be adversely affected. As the lifetime of this system has been extended, an archiving function has been developed, and the resulting performance gains should result in reduced operating costs and some increase in user satisfaction.

The Management Reporting Package was not implemented due to the temporary nature of the original project. If this package is implemented in the future, it is expected that the cost and difficulty of converting, interfacing and re-tailoring will be high.

Very little system maintenance has been required. Generally, system "bugs" have been extremely scarce and routine maintenance has been simple, rarely required, and easily accomplished.

Operationally, the system is slow and difficult to work with. The system does not easily handle large volumes of data entry on a routine basis. A large number of data entry screens must be used to capture a limited amount of data. The system lacks proper data-processing controls and contains only limited edit features. Users have complained that accessing and retrieving data requires excessive and time-consuming effort.

It appears that many of Alberta's problems with PROMIS can be attributed to the lack of a formal study of user needs prior to implementation. A review of the volumes of data captured has indicated that the system is required to operate beyond the limits for which it was intended.

Due to the interim nature of the project and provincial fiscal restraint, no attempts have been made to resolve the outstanding problems through system retailoring or adjustment. Despite the uncertainty regarding further developments in this area, it has been agreed that PROMIS does not meet and is not capable of meeting the needs of the users in its present form. A system retailoring may resolve a number of immediate problems; however, it is felt that there is little probability that PROMIS would be capable of handling the volume of data. Currently, an effort is underway to initiate a detailed requirements analysis of the Office of the Crown Prosecutor in anticipation of future development. Also, the initial proposal of integrating PROMIS with the CAP system is being reviewed.

#### **British Columbia**

Unlike the three previously-discussed jurisdictions, British Columbia had previously developed a series of automated systems to assist various functional components of the judicial process. Both PROMIS and a custom-built system would be capable of satisfying the technical requirements of an integrated system. PROMIS offered significantly faster implementation, a proven track record both in conversion to a variety of hardware environments and as an operational system, and qualified assistance from INSLAW. The lack of an adequate accounting function was the only significant disadvantage of PROMIS which was recognizable at the time.

However, upon examining PROMIS implementations and custom-built systems in other jurisdictions, British Columbia concluded that the expenditure required for implementation could be better used to upgrade existing systems and develop new custom-built systems. Two major factors contributed to the decision: PROMIS would duplicate functions already performed by several of the existing systems; and projected operating costs seemed much higher than they should be. In addition, system response time was generally perceived as poor, and the ability of PROMIS to handle large volumes of data was questionable.

#### **Summary**

The research by CCJS indicates that several general conclusions may be drawn from the PROMIS installations in Canada.

Jurisdictions which have implemented PROMIS generally found that technical expertise far in excess of what had been originally anticipated was necessary for successful implementation of their projects. Implementation was faster and smoother on systems with a hardware environment that was already supported by INSLAW. All jurisdictions felt that communication with other Canadian users to share expertise and experience would have been valuable.

All jurisdictions felt that system operating costs and the turnaround time in ad hoc reporting were higher than they should be. However, no adequate solution to either of these problems has yet been found.

Some jurisdictions have expressed concern that PROMIS is not user-friendly, and PROMIS does not easily handle the volume of data encountered in the host Canadian jurisdictions.

All jurisdictions felt that PROMIS performs as advertised by INSLAW, and that PROMIS met the overall user and technical requirements.

### 3. Prosecutor's Management Information System (PROMIS)

#### Notes

1. Sidney H. Brounstein et al., National Evaluation Program Phase I Summary Report: Prosecution Management Information Systems (October 1980), p. 23.

### 4. BUY OR BUILD?

There are generally two methods of acquiring applications software: buy a pre-packaged commercial system, or build a custom system.

Pre-packaged application systems are one of the major growth areas in commercial computing today. For standard applications such as payroll and accounting, a variety of generic packages can be purchased off-the-shelf and installed with little or no modification. Because the same package is used by many organizations, each purchaser pays for only a small proportion of the total development cost. For standard applications, it is frequently cheaper and faster to buy a package than to develop a custom-built system with the same capabilities.

On the other hand, if the application is unique, or in low demand, there may not be a pre-packaged system available commercially. If the organization owns hardware that is non-standard in configuration, an existing software package may not fit that specific configuration. If the organization uses a procedure or method which is not reproduced in the software package, the procedure must be changed to conform to the pre-packaged software; the software must be modified; or a custom package must be developed to handle that procedure.

A major factor in software evaluation is the determination whether a pre-packaged system (if available) is suitable for the application, or if a custom-designed system will provide a greater return for each dollar spent. This section discusses the issues involved in choosing to buy or build a software system, and compares the alternatives. This section does not attempt to advocate buying over building or vice versa, but rather to indicate the factors which must be weighed in reaching a decision.

#### 4.1 MAKING THE DECISION TO BUY

Commercial software packages can have many advantages and disadvantages. Often, whether a feature of the package is an advantage or disadvantage depends on the purchaser and the use to which the package is put.

##### Age of the Package

Software packages which have been in existence for some time may be a better investment than a newly-released product. The newer software may or may not have been adequately tested in the type of environment for which it was designed. If the vendor has not done sufficient de-bugging, undetected errors in the software can cause the data and information being handled by the system to become inaccurate. Occasionally, software packages are released before adequate documentation exists, and even before the vendor's staff is prepared to support the new product.

Vendors of established software packages have had the opportunity to benefit from previous customer reaction to their product. As a result, the package may have been enhanced to meet user demands in such areas as ease-of-use ("user friendliness"), performance, reliability, security, and applicability to a specific environment. The vendor will also have acquired experience in the typical problems faced by current customers. This experience is reflected in the kind of support new customers can expect from the vendor. In addition, customers may have organized formal or informal user groups to trade experiences. Written documentation is also more likely to be complete, accurate, and reflective of the user's needs.

On the other hand, older software products may not take advantage of the latest developments in systems and software technology. The fields of hardware and software technology are volatile, and development is continually increasing the speed and efficiency of state-of-the-art automated systems. A new system may be more powerful and faster than an older product. The decrease in computer time required to run an application package may result in both lower operating costs and the increased availability of the computer to run additional application packages.

##### Speed of Implementation

The implementation period for software packages is generally short, allowing the benefits of using the system to accrue quickly. However, few pre-packaged systems can be installed, turned on, and used without some modification to suit the specific environment. Occasionally, the product is designed in such a way as to make this "tailoring" process as simple as possible, but more often no provision is made by the vendor in this area.

The modifications may be major or minor, depending on a number of factors. These include whether the original package was a "good fit" (considered to occur when the unmodified software does 70 to 80 per cent of what the user requires <sup>1</sup>); and whether the package was developed on hardware identical to that used by the customer.

In most cases, the time and effort required to perform the necessary modifications are grossly underestimated. Implementation involves more than just installing the software. A vendor may advertise that a package can be installed and running in two days, but this is just one facet of implementation. It may take much longer to integrate the new package with the customer's operating environment.

##### Portability and Expansion

It is important to carefully investigate the terms of the vendor's standard software purchase or lease contract. The contract should always specify whether the user may copy the software (in order to have a backup copy, or to use the same program at a second location), or whether the user must buy additional copies at full or reduced cost. The same provisions may also apply to system documentation. It should be clearly stated whether the user may make copies of documentation, or whether copies must be purchased from the vendor.

Other licensing or security provisions should also be carefully evaluated. The vendor may impose constraints on the use of program code so that the package can only be modified on his terms. For example, altering code may be grounds for invalidating a maintenance agreement.

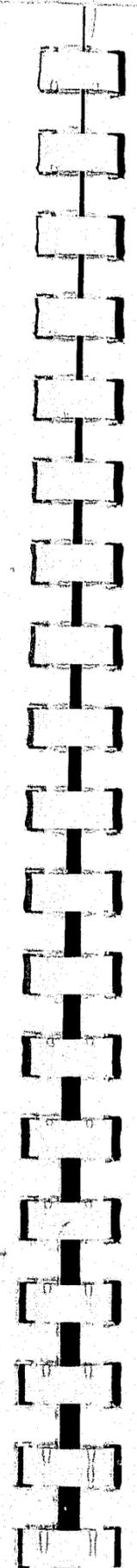
An organization which purchases pre-packaged software should also carefully evaluate its own future plans. Does the organization own, or plan to buy, another computer? Even if the second machine is the same brand-name as the first, the machines may be so different that the software designed for one will not automatically run on the other. If the brand-names are different, conversion may prove to be difficult and costly, if not impossible.

It is also important to evaluate the future uses of the software package to be purchased. If the initial implementation is successful, it is not unusual for the user to demand more and more from the package as time goes by. If a pre-packaged system only just fits the current needs of the purchaser, then, in a short while, further demands will exceed the product's capabilities. If a package has features and capacity beyond the current need, the user will be able to "grow into" the package. If a package that just fits the current need is selected, planning should begin immediately for development or purchase of more advanced features or of a new system.

Another factor to consider is the flexibility of the system. Many vendors design systems that allow for "customization" (tailoring) by each user. However, the extent to which customization is permitted can vary widely from system to system.

#### **Design and Compatibility**

A pre-packaged system may attain a greater level of sophistication than a similar, internally-developed system. Because the vendor recoups the development costs from a group of licensed users, it is usually possible for the vendor to devote more resources to refining the system than could any single user. A pre-packaged system may be designed to satisfy a wide range of users, however, it may also be slower and less efficient than a custom-built system.



An organization may have branch offices which regularly exchange information, or it may be required to report to outside agencies on a periodic basis. By selecting pre-packaged software, the organization can ensure that the information exchanged is uniform, and that reports are always produced using the same format. If each branch or agency uses a different system, it is frequently necessary for each to develop expensive "front-end" programs to manipulate the format of the information coming from the other members of the group.

Similarly, if an organization has already automated to some extent, the new package may not integrate with the existing system(s). If information must be transferred, translation programs may be required to make the existing format compatible with the new system. Costs for developing such programs must be anticipated.

#### **Training and Staff Acceptance**

If the new system requires a massive change in work patterns, staff members may exhibit resistance to the system for months, or even years. To overcome this, it is important to have staff members involved in the evaluation and selection of the system from the earliest possible date. Early staff involvement can help to reduce post-installation resistance. Training provided by an experienced vendor may also reduce the anxiety of staff members who are wary of machines and reluctant to give up an overloaded manual system.

On the other hand, the training provided under contract by the vendor may not be sufficient for the staff to make the most effective use of the system. Written documentation may be inadequate to fill in the gaps. The vendor may supply further training and documentation at a specified cost. If not, the organization may find it necessary to write manuals to supplement the documentation provided by the vendor, or even to hire an in-house support person to provide extra training and ad hoc support to other staff members on a continuing basis. The costs involved in training and documentation, whether provided by the vendor or by an in-house employee, are factors seldom considered when estimating system cost.

When a system is purchased without sufficient involvement of the staff in the decision, the "NIH" (Not Invented Here) syndrome<sup>2</sup> may appear. Staff may resent having to install, maintain and use a system that was not developed internally. This feeling can be exacerbated if the package is poorly designed and/or difficult to implement.

#### 4.2 MAKING THE DECISION TO BUILD

Custom software is written expressly to fit the application requirements of a particular organization. The program may be developed using either in-house staff or a firm under contract to the organization.

As with commercial software, there are both advantages and disadvantages to building custom software.

##### Development Risks and Rewards

###### Scheduling

Through frequent monitoring of the project's progress, the organization can keep development time and costs in line by re-arranging priorities, redefining the scope of the project, or re-allocating resources, as necessary. Development can also be scheduled with a view to hardware availability -- either taking advantage of slack periods, or freeing the computer during periods of heavy demand by other applications.

If desired, the new system can be built in stages. Pressing needs can be met first; and if the system is carefully designed, expansion can easily encompass the "frills." In fact, with enough forethought, the package can be continually updated and tailored to fit the expanding and changing needs of the organization, at minimum cost.

On the other hand, development projects frequently entail a large risk of unexpected problems that can cause delays in the schedule. Often, the time required for the work is underestimated at the start. Once the project is underway, maintaining the schedule depends on many factors.

If schedule delays become extreme, there is a risk that the final cost of the project will be more than the resulting system is worth. In fact, projects are often cut short for budget reasons, and may never reach a state where they perform all of the originally-intended functions. In some cases, time and effort may be better spent on tailoring and maintaining a pre-packaged system.

###### Cost

Usually (though not always), a custom system costs more than a pre-packaged system. Aside from the costs of schedule delays, already discussed, there are other costs to be considered.

To ensure a reasonable level of sophistication in the completed system, there must be a blending of programming expertise with in-depth knowledge of the organization for whom the system is being developed. Most developers are not experts in subject-matter areas. It may even prove impossible to find the necessary mixture of expertise. Without this sort of collaboration, the system may not be sufficiently flexible to accommodate developments and changes that occur in the given subject-matter area. Major changes may require redevelopment of the package, with all developmental costs being incurred once again.

It is important to ensure that development is documented as it proceeds. If an employee should leave the project before completion and no documentation of his/her special knowledge of the system exists, costs are incurred while waiting for a replacement to acquire that special knowledge.

The operating cost of the system is another factor. A pre-packaged system is designed to fit the requirements of as many potential customers as possible. This aspect of the system is frequently reflected in slower operating speed and higher operating cost. A custom-built system can be streamlined and fine-tuned to fit the user's needs perfectly, which usually results in an increase in the operational performance and a reduction in the operating cost.

#### End Result

The system which results from custom development is likely to be more efficient than a pre-packaged system. The organization can specify the computer, the operating system, and the programming language to be used. By designing the system around the existing hardware environment, the organization is unlikely to underuse existing equipment or be forced to buy equipment which it did not previously require. The organization can also specify the design, development, documentation and operating standards it desires.

The custom-built system can be designed to fit precisely into the organization's operational environment. The likelihood of developing a more effective system (from the user's viewpoint) increases. The new system can also be designed to integrate with and take advantage of existing systems and data bases.

Staff members often develop pride of ownership in a custom system, particularly if they have been thoroughly consulted during development. This proprietary feeling enhances their ability to learn and to use the system profitably. The feeling develops not only because the system was developed within the company, but also because the system more accurately conforms to the organization's methods. The system can be designed to fit the specific needs of the end-users.

#### **Contracting for Development of a System**

If, instead of using the in-house staff, a software development company is hired, there are several important points to consider. The first is the volatile nature of the industry. Many small development firms remain in existence for only a few years. If the firm goes out of business shortly after the system is completed, no external support for the package will exist. Support from that point will depend on the amount and quality of written documentation available.

Another consideration is the ownership of the software. The contract must specify who owns, who may sell or license, and who may modify the software. The contract should also set out the terms of the acceptance test for the system, as well as the type and amount of support to be provided by the developer after acceptance.

#### **4.3 COMPARING THE BUY/BUILD OPTIONS**

When deciding whether to buy or build, the user must consider each factor discussed previously, along with the relative weight of each factor. The advantages of custom systems may seem few in number, but the relative weight of each advantage is high. The advantages of pre-packaged systems are high in number, but may be overwhelmed by the relative advantages of the custom system. For example, depending on the complexity of the software and how well the package fits the required application, the tailoring necessary to implement the pre-packaged software may be so intense that the time and effort could be better spent developing a custom system. Reduced operating costs (resulting from the increase in operating speed and efficiency) may cancel the higher initial development costs.

**Physical Considerations**

Whether the system is bought or built, it is important to assess the new system's impact on existing computing capacity within the host organization. A large, detailed system may unacceptably slow other processing on the same computer, or may even exceed the computer's processing capacity. It may be necessary to redesign the system; to redefine priorities for computer access; or to acquire more processing capacity.

If the solution is to acquire more processing capacity, a choice has to be made between adding another computer of the same type, or obtaining a more powerful model. There are usually critical differences among computer models, even when they are built by the same firm. If a new computer is acquired in the middle of a development project, it may be necessary to reschedule or delay the project while the system is being adapted to the new machine. Where possible, hardware additions or changes should be anticipated and scheduled into the project.

**Tabular Comparison**

A tabular comparison of the factors to be considered is presented in Table 4-A: Comparison of Factors in Buying and Building a Software System.

**Table 4-A: Comparison of Factors in Buying and Building a Software System**

FACTOR	BUYING A SYSTEM	BUILDING A SYSTEM
<b>Conformity to User's Needs</b>	Software will usually require some modifications to adapt it to the hardware environment or to the organization's policies and procedures.  Alternatively, departmental policies and procedures may require extensive modifications to adapt to the software.	Specifications can be designed to meet the user's needs perfectly.
<b>Implementation Period</b>	Generally (but not always) short. Benefits of using the system can accrue quickly.	Generally (but not always) longer than the implementation period for buying. Initial benefits may not accrue quickly.  However, the custom-built software should be more efficient than a purchased system in terms of operating speed; when the system becomes operational, the benefits of increased speed (lower operating costs and faster turn-around time) can accrue quickly.
<b>Implementation Schedule</b>	If extensive modifications are required, the implementation schedule may take more time than anticipated.	The system can be built in stages to meet pressing needs first, then expand to encompass the lower-priority needs.

...continued

FACTOR	BUYING A SYSTEM	BUILDING A SYSTEM
<b>Contract Obligations</b>	The contract must specify the ownership and licensing of the package, any provisions for back-up copies, modifications, installation on multiple systems, and external support after acceptance of the product.	If the work is performed by an independent software development company, the contract must specify the ownership and licensing of the package, any provisions for back-up copies, modifications, installation on multiple systems, and external support after acceptance of the product.
<b>Modifications</b>	<p>The contract may restrict or prohibit modifications to the software.</p> <p>If the vendor subsequently updates the software, the modifications to the original version may be lost.</p>	There are no restrictions on the modifications to the software.
<b>Expansion</b>	The package may not be expandable enough to fit the future needs of the users.	With forethought and planning, the system can be continually updated and modified.
<b>Transferability</b>	The contract may restrict or prohibit installation of the software on other computer environments belonging to the purchaser.	On a well-planned system, there are no legal constraints on the transferability of the software.
<b>Uniformity</b>	If several agencies obtain the same package, a potential will exist for uniform information and statistics exchange among those agencies.	Generally, each branch of the organization will receive the same system, thereby ensuring uniform information and statistics exchange.

...continued

FACTOR	BUYING A SYSTEM	BUILDING A SYSTEM
<b>Age of System</b>	<p>Older system has proven itself; newer system may not be sufficiently debugged.</p> <p>Older system frequently do not take advantage of the state-of-the-art technology.</p>	<p>New custom-built system may not be completely tested and debugged.</p> <p>New custom-built system can take advantage of the state-of-the-art technology.</p>
<b>Design and Compatibility</b>	<p>Because the vendor has internal expertise and experience with other users, the pre-packaged system may be more sophisticated than an internally-developed system.</p> <p>The system may not integrate with existing manual and automated procedures.</p>	The system can be designed to follow the organization's exact method of operation, and therefore integrates well with the existing manual and automated procedures. The system is likely to be more efficient operationally than a pre-packaged system.
<b>User's Group</b>	A number of users of the package may have organized a user's group.	No user's group exists.
<b>Training</b>	Training provided by an experienced vendor may reduce the anxiety of staff members. However, training provided under contract may not be sufficient for the staff to make the most efficient use of the system.	The training period may be shorter, because the program is designed to emulate the manual procedures used previously. However, the training provided may not be as extensive and professional as that provided by an experienced vendor.

...continued

FACTOR	BUYING A SYSTEM	BUILDING A SYSTEM
<b>Staff Acceptance</b>	Those who operate and maintain the system may resent having to install, maintain, and use a system which was not developed internally.	Staff members often develop pride of ownership in a custom-built system.
<b>Documentation</b>	Written documentation is more likely to be complete than on custom-built systems.  If documentation is inadequate, the purchaser may have to buy or write additional documentation.	The documentation frequently will be incomplete and/or out-of-date.  The documentation must be written, maintained, and updated by the developers.
<b>Development Cost</b>	The cost of the basic package is fixed and known. Usually, a pre-packaged system costs less than a custom-built system, because sales to several purchasers reduces the per capita development cost and subsequently the price per purchaser.  If extensive modifications are required, the cost may be much higher than anticipated. The time and cost required to modify and install the system are frequently underestimated.	The final cost of the project must be estimated. The time and resources required to develop the system are frequently underestimated.
<b>Operational Cost</b>	The operating costs may be estimated from the experience of other purchasers.	The operating costs may be lower than those of a pre-packaged system, because the custom-built system can be developed for maximum efficiency within the user's environment. Over a period of time, this lower operating cost may offset the higher development cost.

#### 4.4 CONCLUSIONS

The question of whether to buy or to build an automated system may be answered only by considering many factors. The relative weight of each factor varies according to the specific needs of a particular organization at a given point in time. In a few cases, a commercial package will fit the user requirements exactly; in others, there will be no commercial packages available; in most cases, commercial software will fit some user requirements but not all of them. Given the latter case, the decision must be made to accept the limitations, to attempt to tailor the package, or to build from scratch.

A requirements analysis should take into account each factor discussed in this section. This analysis must define the specifications of the system, determine if a pre-packaged system exists, estimate the costs (of development, installation, and operation), and consider management factors such as the potential of the system for future growth and modification, and its impact on the user community. Only when the weight of all these factors in each particular situation is considered can the buy/build question be resolved.

#### 4. Buy or Build?

##### Notes

1. Steven Weinberg, quoted by Carol Tomme Thiel, in "A Shopper's Bonanza", Infosystems, Vol. 28, No. 9, p. 54.
2. Martin and McClure, "Buying Software off-the-rack", Harvard Business Review, Vol. 61, No. 6, page 32.

#### 5. CONCLUSIONS

Generally, the PROMIS software product can be adapted to suit the needs of the Canadian justice community. However, PROMIS' ability to satisfy the needs of a particular jurisdiction can only be determined by a careful evaluation of that jurisdiction's specific needs through a detailed requirements analysis.

Only when all of the relevant factors have been defined and included in the overall cost/benefit equation can a clear distinction be made regarding the suitability of the PROMIS software to a specific jurisdiction.

##### 5.1 BENEFITS OF PROMIS

PROMIS has a proven track record. The system has been installed in a number of American and Canadian jurisdictions with relative success. The vendor, INSLAW, provides comprehensive technical assistance (at varying cost) both before and after installation. The majority of the purchasers of the PROMIS software have been favourably impressed with the on-going support and advice received.

The ability to tailor the product allows the user jurisdiction to modify the basic system to suit its particular needs. The data base, data entry screens and editing criteria, inquiry displays, indices, and output formats can all be modified or adapted to a greater or lesser extent.

INSLAW organizes and administers a PROMIS User Group that meets periodically in American cities. Users of the PROMIS system can trade experiences and knowledge related to PROMIS in various environments.

In American justice-related automation studies, the PROMIS system tends to score slightly higher in user satisfaction than other systems.

## 5.2 DRAWBACKS OF PROMIS

The user must convert, install, and tailor the software system. The conversion of PROMIS to a particular hardware environment (whether supported by INSLAW or not) requires skilled personnel who are knowledgeable in PROMIS and subject-matter concepts, as well as in the policies and procedures of the jurisdiction. Without this expertise, conversion can take much longer than generally expected.

PROMIS is not considered to be user-friendly. Existing policies and procedures may have to be modified to accommodate PROMIS. Data capture can be a complex and cumbersome procedure. In certain installations, terminal response time is slow. Although the system is thoroughly documented through the automatic generation of listings, end-user documentation must be written by the user.

PROMIS is not capable of handling large volumes of data entry on a routine basis.

Compared to custom-built systems, PROMIS systems do not necessarily cost less. An American study in 1980 (by Sidney H. Brounstein et al., for the National Evaluation Program) found that PROMIS systems cost, on average, about 16.7% more to buy, install, convert, and tailor. However, in the same study, PROMIS systems tended to cost slightly less to operate.

## 5.3 SUMMARY

The users who were most satisfied with the automated justice information system (whether PROMIS-based or not) were those who matched the needs documented in a thorough requirements study to the system they eventually bought/developed. In any marketplace, the onus is on the buyer to shop wisely and select goods which fulfill a real need. Shopping for software is no exception to this rule.

APPENDIX A

**CONTINUED**

**1 OF 2**

## Appendix A - Justice Information Systems

The following justice information systems were studied in 1979 and 1980 by the National Evaluation Program in the United States and by the National Work Group on Justice Information and Statistics (NWG) in Canada.

### PROMIS - Prosecutor's Management Information System

PROMIS is designed to track arrests, defendants, charges, cases, court events, and witnesses through the judicial process. A special tailoring package allows the system to be adapted, within limits, to the needs of each jurisdiction. PROMIS has been adapted to a number of jurisdictions. PROMIS may run on several large-scale computers and mini computers. See section 3 of this report for more details on PROMIS.

### CORPUS - Criminal Oriented Records Production Unified System (Alameda County, California)

CORPUS is an integrated system on a large scale computer with extensive data sharing. CORPUS was originally transferred from Santa Clara County, California, to Alameda County, but extensive modifications were made to the transferred system. CORPUS is the only non-PROMIS transferred system that was examined in the two studies.

### DALITE - District Attorney Automated Legal Information System (Alameda County, California)

DALITE is a prosecutor-dedicated system run on a minicomputer. The information can be entered and accessed only by representatives of the prosecutor's office.

### CJIC - Criminal Justice Information Center (San Jose, California)

CJIC is an integrated system on a large scale computer with extensive data sharing.

### SUPER/CC - Superior Court/County Clerk Information System (Santa Ana, California)

See the general description for CJIC.

### ACIS - Automated Court Information System (San Bernardino, California)

See the general description for CJIC.

### CJIS - Dade County Criminal Justice Information System (Miami, Florida)

See the general description for CJIC.

### JARS - Judicial Automated Records System (Waukegan, Illinois)

See the general description for CJIC.

### CMS - Case Management System (Boston, Massachusetts)

See the general description for DALITE.

### ADRS - Arrest Disposition Reporting System (Oklahoma City, Oklahoma)

See the general description for CJIC.

### TCCJIS - Tarrant County Criminal Justice Information System (Fort Worth, Texas)

See the general description for CJIC.

TRACER - Total Recall Adult Criminal Element Record (Norfolk, Virginia)

See the general description for CJIC.

MCS - Maryland Court System (Baltimore, Maryland)

See the general description for CJIC.

OBSCIS - Offender Based State Corrections Information Systems.

JAMS - Jail Accounting Microcomputer System.

TRACER - Total Recall Adult Criminal Element Record (Norfolk, Virginia)

Voir la description générale du CJIC.

MCS - Maryland Court System (Baltimore, Maryland)

Voir la description générale du CJIC.

OBSCIS - Offender Based State Corrections Information Systems

JAMS - Jail Accounting Microcomputer System