



Helsinki Institute for
Crime Prevention and Control,
affiliated with the United Nations

Ministry of Justice
The Netherlands



MPI

140557
L55041

COMPUTERIZATION OF CRIMINAL JUSTICE
INFORMATION SYSTEMS
Volume II

Edited by

Richard Scherpenzeel



ands

HEUNI Publication Series
No. 20

140557

**FIRST
UNITED NATIONS WORKSHOP
ON COMPUTERIZATION OF
CRIMINAL JUSTICE INFORMATION**

**Havana, Cuba, 27 August - 7 September 1990
Palacio de las Convenciones**

**COMPUTERIZATION
OF
CRIMINAL JUSTICE INFORMATION SYSTEMS**

Proceedings of the Workshop

Second Volume

**Edited
by
Richard Scherpenzeel**

JAN 26 1993

A 12 15 1992

140557

**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

HEUNI

to the National Criminal Justice Reference Service (NCJRS).

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

**FIRST
UNITED NATIONS WORKSHOP
ON COMPUTERIZATION OF
CRIMINAL JUSTICE INFORMATION**

**Havana, Cuba, 27 August - 7 September 1990
Palacio de las Convenciones**

**COMPUTERIZATION
OF
CRIMINAL JUSTICE INFORMATION SYSTEMS**

Podium Presentations

by

National Delegations and Invited Experts

DELEGATION
OF
AUSTRALIA

Reports

by

Trevor W. Haines

Ivan Potas

John C. Johnson

David A. Hunt

Trevor W. Haines
Secretary Attorney General's Department
New South Wales
Australia

MODELLING CRIMINAL JUSTICE SYSTEM PROCESSES

1. Introduction

In most countries at most times, a predictable flow of people pass through the process from arrest to court hearing and on to prison. It is on this basis that all attempts at modelling criminal justice system processes proceed. It is at this point, however, that approaches to the problem of modelling criminal justice system processes also begin to diverge.

There have essentially been three main points of divergence. These concern the type of model developed, the scope of the model developed and the means by which the simulation was effected.

2. Variations in Model Type

There have been two main strategies adopted in the actual building of the models. One line of attack is to build a mathematical representation of the system being modelled. These are what Bohigian¹ refers to as formula models.

Mathematical or formula models seek to prescribe equations relating the operation of one facet of a system to another. For example, from a mathematical model of the court system, we might obtain a formula expressing court delay as a function of the number of cases arriving for disposal, the size of the existing case backlog, the rate at which the courts are able to dispose of cases and the number of courts.

The strength of this approach is that in some circumstances it can be used to determine, for example, the optimum number of judges and/or court rooms required

¹See H. Bohigian in Nagel op. cit.

to keep court delay down to some specified minimum level. The weakness of the approach is that predictions can usually be obtained only by making special, and often implausible, simplifying assumptions.

A typical example of this sort of simplifying assumption is the common presumption in mathematical models of court systems that the rate at which judges dispose of cases is not affected by the size of the backlog of cases waiting for a hearing. This is an implausible assumption, in New South Wales, at least, because of a tendency on the part of some magistrates to try and clear the list, in other words, to dispose of all the cases which have been assigned regardless of variations in their number. This will inevitably result in cases being disposed of more quickly when the list is what we call full than when there are fewer cases to deal with.

An alternative approach to mathematical modelling is build a computer simulation model of the process or processes of interest. Instead of obtaining predictions by solving equations, simulation models use computers to mimic the process under examination. Finding out how a court or prison system behaves then becomes a matter of experiment on computer. To find out what happens to the backlog of cases when additional judges are appointed, for example, involves entering the relevant number of judges into the computer and then observing what effect this has on the backlog of cases as the computer shuffles through them.

The virtue of this model building strategy is that it allows one to examine processes at practically any level of complexity. One of its drawbacks, though, is that it is no longer easy to resolve question such as what number of judges is necessary to maintain a court's case backlog down below a certain minimum level. Optimisation questions like these can only be resolved using simulation models by trial and error.

However they also present another difficulty. As the complexity of the model increases so too does its demand for information. A simulation model which depicts the flow of cases from registration to listing, to hearing and yet which also allows for the possibility along the way of adjournments, plea changes, absconding by a defendant or changes to the indictment by the prosecution requires detailed information on all of these things. As noted earlier, most jurisdictions simply do not have reliable data on the output of a court or prison system let alone access to data which would enable them reliably to determine such things as the probability of an

adjournment or a plea change.

This brings us to a second important point of divergence between models of criminal justice system processes, namely the scope of the models which have been developed.

3. Scope of the Model

Actually the scope of a model can be considered from two different vantage points:

- One concerns whether the model seeks to describe the operation of the whole of the criminal justice system or only some part of it such as a court or prison system;
- The other concerns the level of detail at which the model seeks to describe a system.

Models which attempt to describe the operation of the whole criminal justice system typically begin with assumptions about the crime rate and then proceed to describe the process from crime to crime report, crime report to arrest, arrest to court appearance and court appearance to prison. Perhaps the best known example of this approach is the model Jussim developed in the United States in response to the President's Commission on Law Enforcement and Administration of Justice in the mid 1960's. Other examples include the Dutch Ministry of Justice Alpha model and the criminal justice system model being developed by the Home Office in England.

In contrast to the macro approach there have been relatively few efforts to model the operation of component parts of the justice system. One example of this micro approach, though, is the patrol car allocation model developed in the United States by Chaiken and Dormont. With micro models the object is usually to deal with those aspects of a particular stage of criminal justice processing which would not normally figure in a more criminal model.

The level of detail at which a model attempts to reproduce a system or process is, in fact, the other dimension of scope which must be considered. The original Dutch Alpha model, for example, sought to describe, among other things, the relationship

between court resources and the court's disposal rate of cases. It approached this problem by dividing court resources up into component parts; such as the number of courts and the number of prosecutors required to run them. The Home Office approach to the same problem was to establish a general relationship between court resources and case disposal rate without attempting to articulate within the model how these resources were allocated. Of the two dimensions of scope, the level of detail issue is undoubtedly the more important.

The choice of whether to model the whole or only a part of the criminal justice system is or should be determined solely by the questions one wants answered. Models of the entire criminal justice system are of obvious relevance to policy issues which affect the entire system. The number of police, the number of courts and the number of prisons which a jurisdiction ought to maintain are issues which need to be addressed in terms of their system-wide interactions. Where, however, the focus of concern is on the administrative or organisational arrangements which affect the flow of cases or people through a criminal justice process it may be preferable to resort to a micro model which captures the operation of that process in considerable detail. A court simulation model, for example, might tie together information on variations in sitting times or listing rules associated with different courts.

The inclusion of these in a larger model which serves a different set of interests may be unnecessary, especially when regard is had to the method of processing employed by a model, the next point to be raised.

4. Case-by-Case versus Aggregated Processing

One way to simulate the operation of a court system is to describe the various routes cases can take to get through the system and then to make assumptions about the proportion of cases which typically pass each of these routes. In such an arrangement it is impossible to say of cases exiting the system, which stages they passed through and how long they spent there. This means we cannot say, for example, how long it typically takes cases to get to a hearing where the defendant changes plea from not guilty to guilty after being listed for hearing. Nor can we make predictions about the average age of cases still pending in the system.

These are important limitations because the interest of administrators is often as

much upon the characteristics of cases still in a system as it is upon the average age of cases which get through it. Now one way out of this difficulty is to model the flow of groups of cases through a system recording the path taken by each individual case.

The first approach could be described as aggregated processing, the second as processing on a case-by-case basis. Models such as Jussim, the Dutch Alpha model and the British Home Office model describe the flow only on an aggregated basis. Models based on case by case processing are less common but one example is the model Dotsim developed in the United States by Jago and Ozenne².

The advantage of case-by-case processing is that it allows us to say much more about what is happening to cases as they pass through various stages of the criminal justice system. If the model is a good one, case-by-case processing allows us to identify the places in the system where cases tend to bank up. The trouble with case-by-case processing is that it calls for a great deal more information and computing power than models based on aggregated processing. This demand on information and computing power will expand with the scope of the model being developed.

These are the main issues which the Bureau of Crime Statistics has been grappling with in its own approach to model development.

5. Developments in New South Wales

The interest in criminal justice system models in New South Wales arose directly out of the state's experience of congestion in the system. There was a recognised need for two kinds of management decision support tool:

- One dealing with problems associated with the general flow of cases through the criminal justice system as a whole;

²W. Jago and T. Ozenne (1973) Mathematical Modelling of Criminal Justice System Processing. Report 012-00, prepared for Ventura County model CL System Project, Santa Barbara, California: Public Safety Systems.

- The other dealing with particular aspects of the flow of cases through the court system.

One way of tackling these two problems would have been to develop an integrated model of the criminal justice system capable of fulfilling the need for both kinds of information system. This would have led however, to a model which was both unwieldy and unnecessarily complex.

Effective management of the courts is aided by a close understanding of the way in which factors such as listing practices, adjournment policies and plea changes affect cases as they move from registration to disposal. Models of the court system directed to this end ought ideally to adopt a case-by-case processing approach. The added demand for information presented by this approach can be set off against the fact that the focus of attention is fairly restricted.

In managing the criminal justice system as a whole, there is less need for detail on the movement of particular cases than there is a need for accurate data on the rate at which different cases arrive at and are disposed of by court and prison systems. For this reason criminal justice system models lend themselves to processing on an aggregated basis.

The Bureau of Crime Statistics has therefore tackled the modelling problem by beginning development on two quite different development models:

- One capable of dealing with general questions of criminal justice system policy;
- The other adapted to deal with policy issues arising out of court management.

The criminal justice system model has been designed on the basis of aggregated processing. The District Court model has been designed on the basis of case-by-case processing.

6. The District Court Model

The district court model is written in SAS as a simple menu driven system designed to run on a P.C. This was done with several considerations in mind.

The bureau took the view that, to be useful to court administrators, a court simulation model ought ideally to be easy for non-technical people to use, portable if possible and written in a language which was easy for in-house technical staff to modify. The menu options also needed to reflect, as closely as possible, the actual decisions confronting court administrators.

Since the New South Wales District Court system consists of a number of courts, groups of which are attached to a particular registry, the model separately simulates the operation of each cluster of courts attached to each registry.

In a typical simulation the user proceeds by first selecting a registry. The next step is to enter parameter values governing the operation of that registry. Users may alter the number of new cases being registered in each of the four categories of criminal case dealt with by the District Court. These are, respectively, trials, cases where the accused has pleaded guilty and must be sentenced and cases involving appeals against sentence and/or conviction decisions in a lower court. Having set the input to the court system, the user must prescribe a probability distribution of hearing lengths for each category of case. Three other probability parameters must then be set:

- The first governs the rate at which cases fall out of the legal system, either because the charges are no-billed or the accused absconds or dies;
- The second sets the probability of a change of plea or a change to the grounds of appeal;
- The third sets the probability, at a particular point in time, that the prosecution will be ready to proceed.

Various other parameters are then fed into the system, such as the available court sitting time and the number of matters listed for hearing each month, before the

user of the model is able to start the simulation. The simulation itself is carried out by creating a series of computer records representing the case input, for a given category of case, for that month. The categories of case distinguished within the model are: trials, sentence matters, and appeals against conviction and/or sentence in lower courts.

Each case is separately considered by the model according to whether or not the accused is being held in custody. This is necessary because the case listing rules differ according to whether the accused is on bail or not.

The records for each category or case are added to the existing backlog of case records still waiting to be processed from earlier months. Then, for each case in the system, including backlog and new cases, a series of steps is carried out to determine whether it is adjourned, whether there has been a change in plea, whether it is listed, whether it is reached and whether it is finalised.

Not all cases go through all of these stages, some stages also take longer for some cases than others. The time required for a hearing, for example, is assumed to vary with every case. The nature of that variation depends on whether the case is a trial or a sentence matter or an appeal against a decision in a lower court.

The model uses information provided to it by the user to determine both the likelihood of a given case going through a particular stage, the duration of hearings and the amount of available court time. By keeping track of the date of entry of each case record into the system, the amount of time consumed at each stage and the amount of available court time, the program can determine three crucial statistics at the end of each month. These are:

- The number of cases at each of the processing stages;
- The age distribution of cases at each stage;
- The amount of court time consumed.

By running the model through a succession of such monthly cycles it is then able to generate predictions about these issues.

The consequences of different policy options can be explored in the model either by changing the likelihood of cases going through particular stages or changing the amount of court time they require or the amount of court time available.

7. The Criminal Justice System Model

The development of a design for a criminal justice system model, no less than that of the district court model, was driven by the potential needs of its users. The Bureau of Crime Statistics conducted a study to determine the feasibility of developing a model capable of meeting those needs within a specified time period and given the data available. The result of that study was a revised set of requirements able to be met by a model built around existing data sources and subject to an 18 month development time-table.

The core requirements of the criminal justice model so far as the police are concerned is that it prescribe the effect on police time of the number of court cases.

For courts the requirements are that it prescribe the effect on the number of cases awaiting hearing of the number of persons arrested, the available court time, the number of judges and magistrates, the average trial time and the plea rates of different defendants. For the courts the model is also expected to provide a capacity to analyse the effect on court costs of the number of persons arrested and the offence profile of those arrested.

For prisons we are looking to the model firstly to provide a capacity to analyse the effect on the sentenced prisoner population of the number of people sentenced to prison and the length of sentence of those sent to prison. We would also like it to perform the same function for the community corrections population, as well as provide cost impact predictions for changes in the size and composition of the prison and community corrections populations.

Given these requirements it will come as no surprise to discover that the criminal justice system model, unlike the District Court model, is designed on the basis of aggregated rather than case by case processing.

The basic difference of approach between it and its counterparts in other countries, lies in a more parsimonious approach to the problem of scope discussed earlier.

As it is presently designed, the model is not intended to provide information about the effect of increased spending on law enforcement by police on the number of persons arrested. Though there is no doubt that increased funding for police may affect the number of arrests, the effect depends on how the money is spent. The present design for the criminal justice system model therefore requires decisions about the effect of increased expenditure on arrest rates to make outside the model.

This difference aside, the present design of the criminal justice system model being developed by the Bureau of Crime Statistics, follows that of its predecessors in the United States, Great Britain and The Netherlands. It consists of a number of processing steps, each carried out in sequence for each cycle of the model. A single cycle through the model would represent a one year time period. To use the model to predict what would happen in ten year's time, for example, would require 10 cycles.

Analytically, the criminal justice system model is obviously much less complicated than that of the District Court model. Its simplicity, however, should not be taken as a measure of its power or utility.

As pointed out at the beginning of this paper, the major information deficits surround the flow of cases and people between criminal justice agencies rather than within them.

Whether the criminal justice system model, as designed, becomes a useful management tool is something which remains to be seen. After all, we have yet to build it. No doubt, the small investment in research which it calls for, is easily justified by the potential return on that investment. The New South Wales Government presently spends well over a billion dollars per annum on police, courts and prisons. The development cost of the model is estimated at a little over \$100,000.

If nothing else came of it the development work undertaken so far has proven extremely useful in highlighting gaps in the information required for effective criminal justice system management. If the model, once developed, also turns out

useful in aiding major capital works decisions it will have proved its value many times over.

Ivan Potas
Director Judicial Commission of New South Wales
New South Wales
Australia

**THE SENTENCING INFORMATION SYSTEM OF NEW SOUTH WALES:
PROMOTING CONSISTENCY IN SENTENCING THROUGH COMPUTERIZATION**

1. Introduction

It is only of relevantly recent date that sentencing has been taken seriously. As long ago as 1863, the great 19th Century jurist, Sir James Fitzjames Stephen, pointed to the considerable care and attention given to the trial process and contrasted this to the sentencing stage, where judges made their momentous decisions on penalty without consultation, advice or guidance. This was despite the fact that, as Stephen explained, "The sentence is the gist of the proceedings. It is to the trial what the bullet is to the powder."¹

Perhaps a century ago, capriciousness was less of a problem at the sentencing stage because:

- Judges had fewer sentencing alternatives to contend with;
- The notion of individualised sentencing, that is, of fitting the punishment to the offender rather than to the offence, had not been developed;
- Penological theories, particularly those of armchair philosophers such as Beccaria and Bentham, were applied without questioning their efficacy.

As modern psychology began to impinge upon the so-called "classical school" of criminology and challenge the concept of free will, greater attention was to focus on the individual offender. Notions of criminal responsibility and liability to punishment began to shift from an almost exclusive concern for the offender's deeds, to at least

¹The Punishment of Convicts (1963) 7 Cornhill Magazine 189.

a partial consideration of the offender's needs. This meant that offenders who committed similar crimes, could, justifiably, be given dissimilar sentences.

Furthermore, the adverse effects, the costs and the humanitarian considerations of incarcerating offenders gradually lead to the search for more cost-effective forms of sentencing.

Increasingly, and particularly in the last two decades, Australian judges were offered alternative sentencing measures such as periodic detention, community service orders and fine options. These measures were added to the sentencing armoury of the courts in an attempt not only to do justice in the individual case but also to quell the rising tide of imprisonment and prison overcrowding. Sentencers were also given the benefit of pre-sentence reports prepared by probation officers to assist them in their increasingly difficult task of determining the appropriate type, as well as the appropriate quantum, of penalty. Laws relating to probation, parole and the new sentencing alternatives, while adding much needed flexibility to the sentencing discretion, also increased the level of complexity of the sentencing process.

2. The Common Law System of Sentencing

Australian sentencing systems, steeped as they are in the English Common Law tradition of justice, confer upon the sentencing judge or magistrate the power to impose sentences authorised by law. Subject to a small number of exceptions, the sentencer may impose any sentence up to the maximum penalty which is prescribed for the particular offence and no more. Furthermore, in many cases, the sentencer may impose a different kind of sentence altogether. Thus, for example, the legislation may prescribe a penalty of 25 years penal servitude for armed robbery, but the sentencing judge may, and usually will, impose a lesser term of imprisonment. In some exceptional cases the sentencer may even decide to impose one of a number of non-custodial sanctions. The point of this exposition is to stress that under Australian law it is the judge or magistrate alone who has the power and the duty to determine, within the parameters permitted by law, the appropriate sentence to be imposed in an individual case².

²Veen (No. 1) (1979) 143 CLR 458.

The ambit of judicial discretion is not quite as broad as the preceding summary may suggest. As the former New South Wales Chief Justice, Sir Laurence Street, once explained, the determination of a particular sentence is not "an uncharted sea" but involves "an adjudicative balancing of a number of differing and not entirely consistent elements".³ Thus the sentencing discretion of judges "must be exercised with due regard to principles of law deducible from authoritative decisions", and although the discretion left to the judge is wide the doctrines and principles of the Common Law "provide the chart that both relieves the judge from too close a personal involvement with the case in hand, and promotes consistency of approach on the part of individual judges".⁴

The development of the Common Law system of sentencing was given impetus when in 1912 the New South Wales Court of Criminal Appeal was established⁵. Henceforth persons who had been convicted on indictment could apply for leave to appeal against the severity of their sentences, and the Court could quash or vary the sentences imposed by the sentencing judge⁶. The legislation followed the English model⁷, in that the appeal was by way of review, and the Court of Criminal Appeal was not limited to acting as a court of cassation⁸. The original sentence would not be upset unless the Court was satisfied that the sentencing judge had erred in the exercise of the sentencing discretion.

It was soon established that the incorrectness of the sentence had to be manifest before an appeal court would interfere with it⁹. When in more recent times the Crown was given the right to appeal against the leniency of sentences¹⁰,

³Rushby (1977) 1 NSWLR 594 at 597.

⁴Ibid.

⁵Criminal Appeal Act (1912) NSW s. 5(1)(c).

⁶Ibid. s. 6 (3).

⁷Criminal Appeal Act (1907) (UK).

⁸See Griffiths (1977) 137 CLR 293, per Barwick CJ at 309.

⁹House (1936) 55 CLR 499 at 505.

¹⁰Criminal Appeal Act 1912 (NSW). s. 5D; see also Griffiths (1977) 137 CLR 293.

sentencing judges had to exercise even more care to ensure that their sentences were within acceptable ranges. Otherwise their decisions would be over-turned, or the matter would be remitted for their re-consideration.

In determining sentences, the New South Wales magistracy and judiciary have reference to the penalties prescribed by statute, the doctrines and principles of sentencing enunciated by the Court of Criminal Appeal and the High Court of Australia, and other persuasive decisions on sentencing, even though some of these may emanate from other Australian States or Territories or from overseas countries. In addition, they may have reference to text books or learned articles on the subject of sentencing, and to any relevant statistics which may be available. They will, of course, apply this information to the circumstances of the particular offence having regard also to the idiosyncratic features of the offender. In this regard the prior criminal history of the offender has always been a relevant consideration in sentencing and in many cases the sentencer will be assisted by the provision of pre-sentence, medical or other, reports.

The weight of evidence presented during the course of the trial and during the sentencing hearing will constitute the primary data upon which the judge must deliberate when considering the penalty to impose in a particular case.

Ultimately, the sentencing judge must pursue the ideal of even-handedness by giving full weight to the collective wisdom of other sentencing judges. The collective wisdom of the judges is revealed in the general pattern of sentences which are relevant to the case at hand¹¹.

3. The Need for Better Information

The need for better information on sentencing practice in Australia has been recognised for some time. In New South Wales a significant step was made in 1969 when the Bureau of Crime Statistics was established. This was the first governmental criminal justice agency in Australia to collect and disseminate information on crime statistics.

¹¹Visconti (1982) 2 NSWLR 594 at 107.

While the Bureau of Crime Statistics produced, and continues to produce policy relevant reports of a general nature, the need to provide judicial officers with more directly relevant and timely information still exists. Certainly disparity in sentencing is an issue which continues to be of concern. In 1984, in the High Court of Australia, Mason J (as he then was) commented that unfairness and unequal treatment under the law leads to an erosion of public confidence in the integrity of the administration of justice. It was for this reason that: "the elimination of unjustifiable discrepancy in sentencing is a matter of abiding importance to the administration of justice and to the community."¹²

While the Common Law system of sentencing coupled with appellate review, provided the courts with some guidance and incentive towards achieving consistency of approach in sentencing, it was apparent that more could be done to assist them in this difficult task. Indeed, spurred on by a report of a group of academics claiming that there were glaring inconsistencies in the sentencing of drug offenders¹³, the New South Wales Government of the day decided to establish the Judicial Commission.

4. The Judicial Commission of New South Wales

The Judicial Commission was established as an independent statutory authority by the Judicial Officers Act 1986 (NSW). Its principal functions relate to sentencing, judicial education and complaints against judicial officers. The terms of the Commission's sentencing function are set out in section 8 (1) of the Act. It states as follows: "The Commission may, for the purposes of assisting courts to achieve consistency in imposing sentences a) monitor or assist in monitoring sentences imposed by courts; and b) disseminate information and reports on sentences imposed by courts."

Here, then, was a government agency dedicated to assisting courts achieve consistency in sentencing. Of significance also was subsection (2) of section 8,

¹²(1984) 154 CLR 606 at 610-611.

¹³Vinson et al (1986) Accountability and the Legal System: Drug Cases Terminating in the District Court 1980-1982. Report to the Criminology Research Council.

because it was there provided that the courts' sentencing discretion would not be restricted by the Commission's statutory mandate. In short, the Commission would assist courts by providing information, and not restrict or otherwise interfere with courts by imposing guidelines which they were bound to follow. In this way the independence of the judiciary, and the integrity of the common law system of justice, were preserved.

Thus, instead of curtailing the ambit of judicial discretion, the Government of New South Wales has opted for a more informed judiciary, and sentencing consistency is promoted through the process of disseminating reliable and timely information via the Commission's Sentencing Information System (S.I.S.).

5. The Sentencing Information System (S.I.S.)

The Sentencing Information System, a computerised database, has been designed to provide the judiciary of New South Wales with both legally and statistically relevant information on sentencing. Gradually all judges and magistrates will have access to the system through computer terminals installed in court chambers. These terminals will be linked to the Commission's central computer database.

At present, the central computer contains two databases. The first is the Penalty Statistics database, which provides up-to-date information upon the range and frequency distribution of penalties imposed in past cases. The second is the Sentencing Law database, which provides the sentencer with information upon relevant sentencing options as well as any statutory constraints involved in the use of such options. In addition, this database contains examples of the forms of order which may be appropriate for selected dispositions.

Work on a third database, containing both reported and unreported judgments of the Court of Criminal Appeal, has commenced. This database will bring to light many cases and principles which, although relevant, are often overlooked because of the difficulty of locating unreported sentencing decisions. This database is designed in a way which will allow sentencers and members of the legal profession to obtain information on similar cases.

A fourth database, providing details of relevant sentencing programmes or

facilities, is also planned. Courts then will be in a better position to determine not only what sentencing or social welfare resources may be available in a particular case, but also determine whether there are any practical restrictions in the use of those resources. For example, the sentencing judge may wish to know whether the offender before the court could be placed into a drug or alcohol rehabilitation programme. He or she may wish to know, for example, whether there is a particular type of programme in the area, the criteria for entry into that programme, and finally whether there is a vacant position available within that programme. Work on this component of the Sentencing Information System has yet to be commenced.

6. Penalty Statistics

As it is not possible, within the scope of this report, to elaborate in sufficient detail upon each of the four components of the Sentencing Information System, I will describe more fully only the Penalty Statistics component. This database contains statistical data on sentences imposed in the courts of summary jurisdiction (the Local Court) and the higher courts (the District and Supreme Courts) covering the preceding period of two years.

As new data are added to the system, data which are more than two years old are removed, so that sentencers have available to them the most recent statistics. However, where there are five or fewer cases for a particular offence in the database, old decisions will be retained. This ensures that statistics on unusual cases are not discarded.

It is anticipated that the sentencing judge or magistrate will consult the system when desiring to discover what range or statistical distribution of penalties were imposed by fellow judges or magistrates in past cases of a particular kind.

The advantage of the system over traditional statistics goes beyond the convenience of being able to retrieve the most recent information at a push of a button, for it also allows users of the system to tailor or tune their statistical inquiries to the circumstances of their particular case.

This is how it works. After choosing the Penalty Statistics component of the Sentencing Information System, the user specifies the relevant jurisdiction (Higher

or Local Court) and enters the act and section number of the legislation relating to the principal offence in respect of which information is sought.

The user must then indicate whether the person being sentenced for a particular offence is to have other admitted offences taken into account¹⁴, whether the offender is an individual or a corporation, and whether there is only one or a number of principal offences to be considered.

No particular skills are demanded, as each entry is made by a single keystroke, and a novice user is guided through each step by prompt and help messages situated at the foot of each screen.

The user may now wish to enter certain further information in order to cut down on those superfluous variables which would otherwise hinder rather than help the inquiry. For example there is provision for specifying the plea, age, prior criminal record and bail or bond status of the offender (see figure 1). These factors are ones which the judiciary itself selected as being the most important for the purpose of determining sentence¹⁵.

Ultimately the statistics generated reflect only those cases which contain the particular features that are selected.

If relevant to the inquiry, for example in a burglary case, property values may be specified, and in drug cases there are provisions for entering both the type of drug and the value of the drug. Again, statistics will be presented for only those cases which contain the variables selected.

¹⁴When sentencing the offender for an offence, the sentencer, with the consent of the offender, may take into account other admitted outstanding charges: Criminal Procedure Act 1986 (N.S.W.) s. 21. In these circumstances, no convictions for the outstanding charges are recorded, and there is a bar to subsequent proceedings in respect of them unless the decision of the court is quashed or set aside: s. 23 of the Act.

¹⁵Following a survey conducted by the Judicial Commission.

Figure 1

Higher Jurisdiction	(PS24)	
ACT : Crimes Act 1900	SECTION : 52A(1)(f)	
OFFENCE : Culpable driving causing grievous bodily harm		
STATUTORY MAXIMUM PENALTY :-		
36 months imprisonment		
Individual Offender	No Other Offences	One Count

Prior Convictions	: [A/B/C/D]	Plea	: [G/N]
Bail/Bond At Offence	: [Y/N]	Age	: [A/B/C/D]

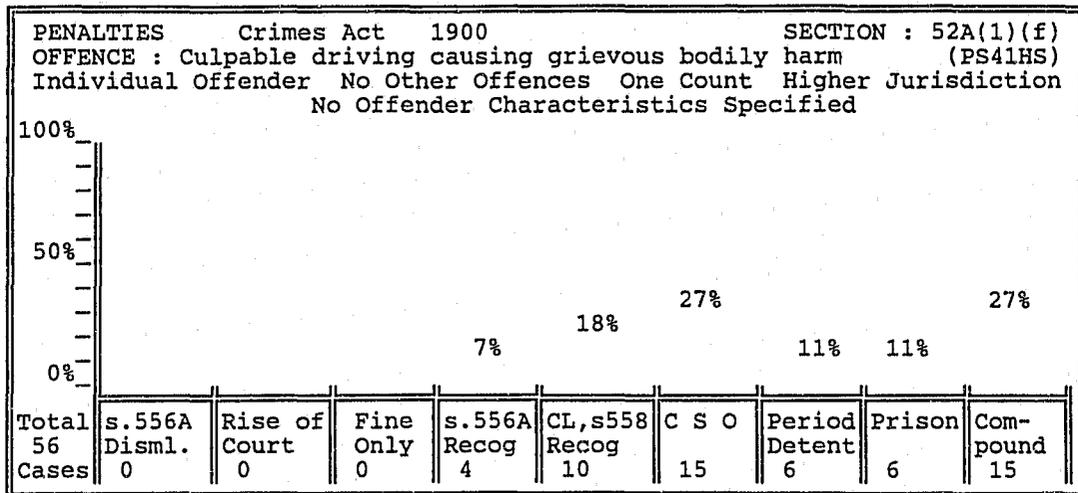
F2 for graphs OR enter offender characteristics
F5 for prior record options
F1 -Prv Form F2 -Nxt Form F3 -Page Up
F4 -Page Dwn F5 -Help F10-More Key
Alt-D DOS

ACCELL/CP

The statistical distribution of the total number of selected cases is illustrated in a bar chart which indicates the number and percentage use of the various dispositions. That is, for any given offence and for the chosen variables, the chart will display the percentage use of various custodial and non-custodial dispositions. Figure 2 illustrates the chart for the offence of culpable driving occasioning grievous bodily harm.

It is possible to analyse the statistics in even greater detail, by focusing upon particular sentencing options (e.g. minimum terms, fines, licence disqualifications). For example, a judge having already made up his mind, may not so much be interested in deciding whether to impose a term of imprisonment but rather with determining the length of the term of imprisonment he wishes to impose.

Figure 2

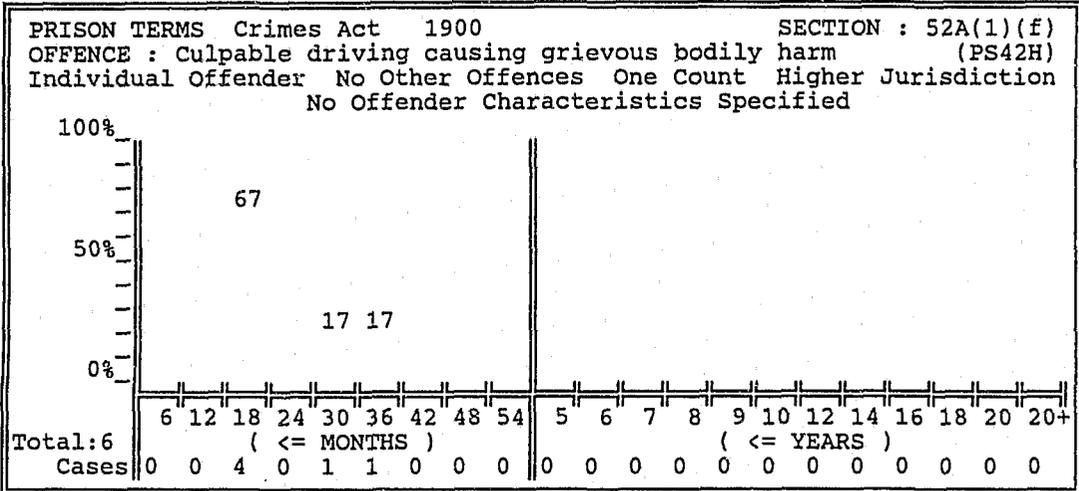


F1-Menu of Graphs F2-Table of Penalty Details
 ENTER-Licence Disqual. Graph
 F1 -Prv Form F2 -Nxt Form F3 -Page Up F4 -Page Dwn
 F5 -Help F10-More Key
 Alt-D DOS

ACCELL/CP

The Sentencing Information System enables the judge to analyse the distribution of past prison sentences for any given offence, and use this information as an aid in deciding what sentence to impose for the case at hand. Figure 3 illustrates the more detailed analysis of the prison sentences contained in the prison bar of Figure 2.

Figure 3



F1 -Return to Menu of Graphs F2 -View Table of Non-Parole Periods
 F1 -Prv Form F2 -Nxt Form F3 -Page Up F4 -Page Dwn F5 -Help F10 -More Key
 Alt-D DOS ACCELL/CP

7. Conclusion

The Sentencing Information System is the first of its kind in Australia and is still being developed. By 1993, it is anticipated that it will reach into every courtroom that exercises criminal jurisdiction in New South Wales. The development is proceeding on the basis that unjustified disparity in sentencing may be reduced by providing courts with relevant and timely information - information which reflects the collective wisdom of the judiciary of New South Wales. It represents a belief that the Common Law system and appellate review of sentencing which have had a long and successful history in Australia, are essentially sound systems that are best calculated to achieve justice both generally and in relation to individual cases.

The Sentencing Information System will aid rather than fetter the exercise of sentencing discretion by providing information of a kind which hitherto has been unavailable to the sentencing judge. At the same time the human face of sentencing will remain intact, ensuring that the opportunity to do justice in all cases is not only preserved but enhanced.

John C. Johnson
Deputy Commissioner
Australian Federal Police
Australia

**INTERNATIONAL CO-OPERATION AND MUTUAL ASSISTANCE:
THE USE OF COMPUTER TECHNOLOGY**

1. Introduction

In recent times the rapid development and deployment of information technology, including the use of computers, telecommunications and office automation, has demanded new management techniques. Maximum practical benefit from the adoption of complex technical systems must be balanced against fiscal responsibility. Improvements in efficiency and productivity must be equivalent to the investment. Development of personnel training to adapt to the introduction of this technology is essential.

A major responsibility for police executives will be to develop policies for guiding the use of this technology to reflect individual organisation strategies and to facilitate and encourage interjurisdictional co-operation.

Law enforcement agencies can achieve substantial benefits from involvement in the joint conduct of research and development projects with other jurisdictions. The combined information available on systems currently in use, those being developed and those considered redundant could be assessed with the view to providing significant cost and resource savings for those agencies seeking to explore these facilities. In these times of fiscal austerity it is vital that maximum return is achieved from any program embarked upon.

The use of compatible computer systems by countries co-operating in criminal justice and criminal investigation programs is essential for efficiency and effective use of resources in the field of law enforcement.

The Australian federal government has in place a number of computerised systems developed to ensure the effective management of its major criminal investigations and intelligence networks. Some of the technology involved in these systems may well be of assistance to other countries investigating the introduction of similar technology to support their fields of criminal investigations.

The Australian Federal Police is the Australian federal government's principal criminal investigation agency. The Australian Federal Police has in place the largest computerised criminal intelligence storage systems in Australia and one of the most powerful computerised collation systems available to assist in the investigation of major crime.

2. Australian Federal Police Intelligence Systems

The systems currently used by the Australian Federal Police provide for the recording of persons, establishments and organisations, addresses, vehicles, numbers (e.g. passports and telephones), aircraft and vessel movements and documents with associated text. It also provides for the linking of any of these entities to reflect the associations outlined in the source documents.

The system currently provides retrieval facilities for individual entities, retrieval by text key words and the facility to retrieve information using partial information. Further developments are envisaged covering the areas of analyst support facilities, purging of time-expired data and the expansion of database management facilities.

3. Australian Federal Police Xerox Intelligence System (AXIS)

The primary system is supported by a computerised aid to criminal intelligence analysis. It provides for an advanced collation function. The main feature is its provision for a use to store and manipulate data on electronic cards in the same manner as manual cards, files and cabinets are used in a conventional office environment.

It is used primarily as an information structuring facility and can be used for complex information management and collation. This system can also interface with the primary intelligence network.

4. Home Office Large Major Inquiry System (HOLMES)

This software package was developed in the United Kingdom. The Australian modified version of HOLMES is a cosmetically modified version of the system specifically designed by McDonnell-Douglas and the Australian Federal Police to meet the requirements of the Australian environment.

The Australian modified version of HOLMES provides facilities for case and operation management in controlling, processing, collating and disseminating the large volume of data generated during a particular major operation.

5. Telecommunication Interception

In 1987 the Australian government expanded existing legislation for the lawful interception of telecommunications in respect to offences involving drug trafficking to include criminal offences of murder, kidnapping, and other serious offences punishable by life imprisonment or for a period of seven years or longer.

In order to implement strict controls on the use of these interception powers, the amended act requires comprehensive reporting provisions and limits the use of interception material. Inspections by the Commonwealth Ombudsman are also required under the legislation.

This amended act provides for the establishment of a Telecommunications Interception Division within the Australian Federal Police. This division conducts interceptions on behalf of law enforcement authorities including, the National Crime Authority, State Police forces, the New South Wales Drug Crime Commission, the Independent Commission Against Corruption, Northern Territory Police as well as for the Australian Federal Police.

The administrative requirements of complying with the provisions of authorising legislation would place high manpower demands and administrative costs on the Australian Federal Police. The Australian Federal Police has opted for a computer system to control and maintain many thousands of intercepted conversations.

An automated system was selected for this task. The system records and stores all data required to be collected and retained under the act. Two Computer Consoles Inc. 6/32 mini computers operating in tandem provide the necessary processing power for the automated systems. They work with custom written application programs providing an interface with each police operator.

Staff supporting these operation comprise: police (working on a 24 hour per day basis), technical, computer and administrative personnel.

The automated system is designed to capture all signals on individual intercepted telecommunications lines and to identify the particular warrants in relation to which each interception is conducted. For each interception the system records the date, time and duration of the call together with the name of the officer responsible for the interception. Full details of the judicial warrants authorising the interception are also recorded at the same time as is a variety of statistical data required both for management and legislative accountability purposes.

While national priorities in relation to telephone interception may vary from country to country, the system in use in Australia is a tested and relatively inexpensive model which would be worthy of consideration by other agencies investigating the development of similar models.

This system provides practical cost control, legal accountability and demonstrates an effective application of modern computer technology in the area of criminal investigation.

6. National Automated Finger-Print Identification System (NAFIS)

The National Automated Finger-Print Identification System is an automated fingerprint system that has the finger-print collection of all Australian police forces in a single data base. It has the ability to enquire (search) and update the system records with new offenders details directly from any state or territory within Australia coupled with the capability to transmit stored finger-print images to remote locations in Australia.

It is based on a central data base currently housed in the National Central

Finger-Print Bureau and is serviced by a network of smaller computers, one based in each jurisdiction. All Australian police forces are connected to and benefit from the network.

The system comprises three stage of operation:

- Finger-print Input: providing large scale memory and storage facilities;
- Finger-print Matching: providing enquiry facility of stored material, i.e. matches against previously stored prints;
- Digital image retrieval: providing a search and retrieval system.

This system has drastically reduced the time involved in manual and visual checks with the inherent high costs and eliminated the logistical difficulties of transporting physical print records around the country from state to state.

7. National Exchange of Police Information (NEPI)

This system managed by a committee formed of representatives from all Australian police forces. A process is being formulated to develop a common approach to the exchange of information on compatible systems throughout the state and territories with the view to further enhancing criminal investigation on a national scale.

This committee will also be tasked to develop strategies for encouraging international co-operation in the use of computer technology in the global cause of law enforcement.

8. Conclusion

The application of computer technology in the development and manipulation of a comprehensive intelligence data base makes available to the Australian Federal Police Intelligence and Investigation Units a versatile and efficient tool for the detection and curtailment of criminal activity. This is further complimented by other smaller systems to assist information management and office efficiency.

David A. Hunt
Commissioner of Police
South Australia
Australia

THE SOUTH AUSTRALIAN EXPERIENCE IN THE IMPLEMENTATION OF AN INTEGRATED JUSTICE INFORMATION SYSTEM

1. An Australian Perspective

Australia is a federation of states and territories, each with its own parliament an administration, and so, any notion of an integrated system for the whole of Australia would be too ambitious. In his report on International Co-operation and Mutual Assistance in the Use of Computer Technology, submitted to the First United Nations Workshop¹, Deputy Commissioner John Johnson of the Australian Federal Police describes the systems in place which serve the eight police forces in Australia: the National Automated Finger-Print Identification System, the Intelligence Systems, the National Exchange of Police Information System, and links to Interpol, etc. These are police system which are interlocked but are separate to the Justice Information System in South Australia.

2. Dimension of Presentations in the Workshop

Reports have been submitted to the First United Nations Workshop on Computerization of Criminal Justice Information on the subject of various systems and the nature of the files within those systems. I am not a technocrat and therefore avoid any notion of technical matters on software and hardware.

This report concentrates on the management issues associated with building a system because the combination of a group of related organisations brings with it some special problems.

¹Proceedings of the Workshop page 197 et seq.

Reference is made to the report of the secretariat on "Computerization of the Administration of Criminal Justice" to the First United Nations Workshop on Computerization of Criminal Justice Information A/CONF. 144/14², and in particular to paragraph 40-45 dealing with management issues. For the benefit of developing nations, and for those contemplating introduction of such a facility, the experience gained in the implementation of the South Australian system reported here might be useful.

3. Historical Comments

Some 10 years ago, each of the Justice related departments was working towards its own separate developments in computerisation. In a state of some 1.3 million people, most of whom are concentrated in the capital city, it seemed reasonable to consider a centralised facility to serve the group. Naturally, each department wanted everything it saw as a need included in the system. That was our first mistake, for there was so much enthusiasm that the proportions of the system were very large indeed.

The decision was broadly taken then that we would approach it on the basis of the common needs of the participating agencies, Police, Corrections, Prosecution, Welfare and Courts. A representative committee was formed and work began to determine the scope and content of the system.

Mention has been made at the Workshop on Computerization of Criminal Justice Information of two major factors:

1. The decision to opt for
 - 1.1 a purchase system off the shelf
 - 1.2 a turn key system
 - 1.3 development of a new system.

1.1. and 1.2. were discounted as nothing was available and even though 1.3. was the more costly and had the higher risk factor, we chose it as there was no other alternative.

²Proceedings of the Workshop page 11 et seq.

2. The methodology of managing such an enterprise.

In this we joined together the management and user group levels of the agencies, which are coordinated by a central unit under the control of the Board of Management.

Discussions from commercial computer companies and from government representatives have reinforced each other that there are major problems in meeting common ground between the agencies and agreeing on a planned approach even though some of the systems might not be implemented in a fashion which suits a particular agency.

The secret is that at ministerial level there must be a commitment so as to convince government that the system is for the delivery of service to the community and not merely to make life easier for the operatives. Also, this commitment must exist so that the funding for the specially created central agency employed to develop the system can operate effectively. The Board of Management consists of the chiefs of each agency and rigorous control and direction must be exercised, both financially and in the direction and implementation.

In the learning process and in the uncertain world of developing a system from ground up, we have made mistakes, but at least we share the responsibility for these and there is a joint effort to recover lost ground. I point this out because the views at the Workshop on Computerization of Criminal Justice Information might lead people to believe that such a system of management is impossible because of the diversity of interests in each agency.

One controlling factor is that the system is not all embracing and does not cater for personnel or inventory systems: it is an offender based tracking system and especially, it is integrated.

It has been truly integrated, a feature not identified in many of the systems referred to at the Workshop and has been achieved through attention to need, security, area codes, law codes, integration standards, name matching standards, identification and the laws relating to freedom on information, and privacy.

In such an enterprise there have been speculations in the media and government enquiry as to the propriety of the system and in controlling costs we have had to modify some of our earlier ambitions. The speculation and enquiry however, have had the effect of keeping us all on track and confidence in the system is high.

The success so far can be gauged in the utilisation and benefit returns achieved and we are confident of implementation of the whole range of current systems on time.

Another aspect which has been mentioned at the Workshop is the reluctance of the courts to be involved. We too had to give special consideration to this question and finally achieved a suitable approach by a separate computer for the courts but appropriate electronic exchange of information to meet the mutual needs of all agencies, thus preserving the independence of the courts.

The report of the secretariat on Computerization of the Administration of Criminal Justice to the Workshop A/CONF. 144/14 refers to some possible problems and pitfalls. We have encountered and overcome these and indeed we recognise the advice given in paragraph 37-39. It is sound advice and further, we agree with the notion that these systems are too important to over-delegate to consultants and/or others. The management effort is tremendous but to achieve a satisfactory result, the challenge must be met.

The methodology adopted in South Australia is commended.

DELEGATION

OF

CANADA

Reports

by

**Denis Sauvé
Raymond Benoit
John Hogarth**

Denis Sauvé
Canadian Centre for Justice Statistics
Ottawa
Canada

CANADIAN PUBLIC SECTOR ROLE IN THE COMPUTERIZATION OF THE ADMINISTRATION OF JUSTICE

1. Organizations and Responsibilities

The Constitution of Canada defines a federal system of government which means that authority to make laws is divided between the Parliament of Canada and the provincial legislatures. The federal government deals with issues concerning Canada as a whole, such as the regulation of trade and commerce, national defence, immigration, criminal law and the postal service. As well the federal government has responsibilities over the Yukon and the Northwest Territories. Provinces make laws within their own jurisdiction which are effective within their own boundaries. This authority to make laws covers such matters as education, property and civil rights, the administration of justice, hospitals, and municipalities.

In the Canadian system of justice the Parliament of Canada has exclusive authority over criminal law and procedure and has the power to set up national courts such as the Supreme Court of Canada, the Federal Court and the Tax Court of Canada.

Thus the laws in Canada are made on two levels: provincial and federal. For example the Criminal Code, a federal statute, applies to everyone in Canada. Highway traffic laws on the other hand, are made by provincial governments and can vary from province to province.

It is important to remember that although the federal government is responsible for the Criminal Law, the provinces are responsible for the administration of justice and law enforcement. Thus each province sets up its own infrastructure to administer justice and to interpret and apply federal and provincial laws. In 1981, the Chief Statistician and the Federal and Provincial Ministers with justice responsibility in Canada began a unique enterprise which has come to be known as the National

Justice Statistics Initiative. Its purpose is to develop Canada's system of justice statistics and information in order to support the administration of justice in Canada. The operational arm of the Initiative is the Canadian Centre for Justice Statistics (CCJS). Over the years the Canadian Centre for Justice Statistics has played a key role in the development of automated systems within the justice community. Technical and financial assistance for the development of operational systems is available from the Centre through the Technical Assistance Directorate. The provision of assistance was conceived as a strategy to achieve the national statistics objectives by promoting the development of information systems that would meet the jurisdictional operational needs as well produce agreed-upon data for statistical purposes.

2. Sectors

There may be some disagreement among purists as to what are the sectors or the components of the justice system or as to what is indeed the justice system; however, for the purpose of this discussion some of the major sectors have been identified. It is the specific needs of these sectors which have served as the catalyst for the development of computerized systems in the justice community. The sectors that we will be exploring are:

- Law Enforcement
- Courts
- Corrections.

Law Enforcement

Canada provides for the sharing of policing responsibilities between three levels of government: federal, provincial, and municipal. The Royal Canadian Mounted Police (RCMP) is the primary federal law enforcement agency responsible for the enforcement of most federal laws. All provinces and territories except Quebec and Ontario have entered into contracts with the Royal Canadian Mounted Police to enforce criminal and provincial laws under the direction of the respective ministers of justice, attorneys general or solicitors general. Most provinces make it mandatory for cities and towns to maintain their own police force once they reach a certain

population. Municipalities usually are given the option of creating their own municipal police department, contracting for the services of the Royal Canadian Mounted Police, the provincial police force or entering into an agreement with neighbouring municipalities for the operation of a regional police force.

Courts

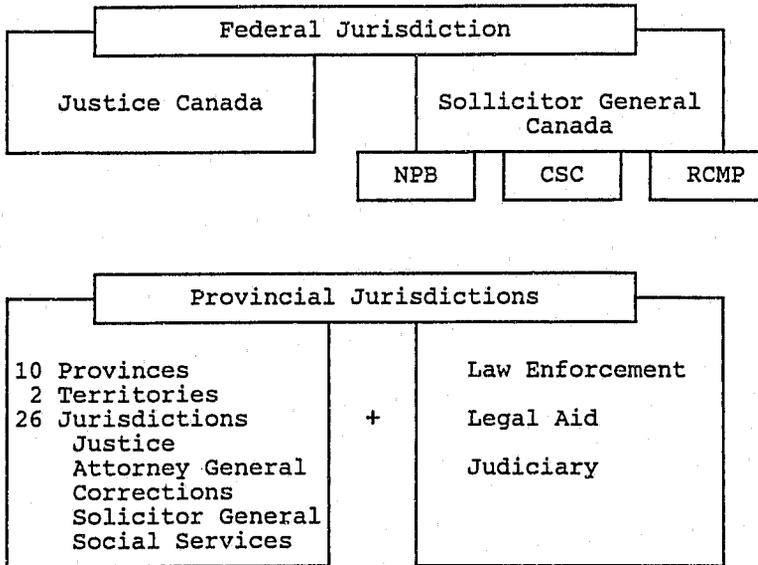
In responding to their responsibilities, each province sets up courts to administer justice and to interpret and apply federal and provincial laws. In addition, there are courts that are administered solely by the federal government. Even if the court system is roughly the same across Canada the names of the courts vary from province to province. There are various levels of courts within a province depending on the structure in place in that particular province. Judges at the lower levels are appointed by the provincial governments and at the higher level by the federal government. Generally the courts deal with both civil and criminal matters. The level of court that hears a case is usually determined by how serious the case is.

Corrections

The provision of correctional services in Canada is a responsibility shared among all federal and provincial governments. The Criminal Code of Canada prescribes that all offenders sentenced to incarceration of less than two years shall be a provincial responsibility and offenders sentenced to prison terms of two years or more are a federal responsibility. Each province or territory, although bound by general guidelines, has instituted its own set of legislative and regulatory guidelines for the delivery of correctional services.

Keeping in mind the shared responsibilities for administering criminal justice in Canada and considering the variants that may be introduced in the system as a result of the number of participants, it is easy to understand the complexity of undertaking major automation projects in this environment. Figure 1 gives an idea of the need for automation as well the degree of overlap and commonality within this system. Remember that while many organizations exhibit many similarities with other groups, each is sufficiently different to justify uniqueness in its development of automated systems. Also do not underestimate the ego of the systems developers who usually suffer from the NIH syndrome.

Figure 1



3. Computerization

During the 1960's and the 1970's, the need to use computers in the day-to-day operation of the office was very much in question. There were several reasons for this situation, the main one being that information technology was new for most users and its introduction led to understandable uneasiness on their part. The solutions that information technology offered at that time required severe changes in the natural way of arranging the production process. Batch processing was imposed on an operation which was by its nature interactive, as most office work is. The result in several organizations has been the development of tensions between the management of the user organization and that of the data processing organization. Within the justice community this lack of appropriate technology has been viewed as the basic reason for the limited amount of automation and the slow evolution of systems.

Fortunately this period has now ended. The 1980's information technology has

become interactive and "user friendly", making it possible to automate in a manner which follows the natural organization in an interactive mode. This new era was made possible by significant improvements in hardware, software and development methodologies. The so-called microcomputer revolution has introduced several new factors. The shift in cost ratio between EDP functions and the advent of new development tools (CASE, I-CASE, O-O) is leading into the next revolution: the decentralization of EDP functions.

4. Priorities

Given the demand and need for automation within the justice community and the mad rush by the responsible managers to get on the computerization bandwagon, competition for system resources quickly developed. By the early 1980's the prevailing loose fiscal policies of the two previous decades had been replaced with a need to utilize automation to actually reduce costs rather than simply provide an increase in benefits. Given this excess on demand relative to the capacity to produce, some form of priority assignment had to take place.

Types of Systems

Systems which directly support the operations of an organization are always given priority. The need to process offenders through the system is and will always remain the primary objective. These functions were performed before the days of automation and will continue to be performed regardless of the state of computerization. The role of automation is to support the performance of these functions and in so doing make the administration of criminal justice more efficient and effective. Whether the sector is law enforcement, courts or corrections most of the administrative functions are data intensive and therefore well suited for automation. Automation has reduced operating costs and increased both productivity and the service to the public. By concentrating on the development of systems supporting operations, the initial benefits have accrued to the people involved in the administration of justice. This has contributed to the acceptance of automation and the growing demand to expand the scope of computerization.

From sound operations systems can be produced valuable management information. The ability to use well designed and structured databases for research and to analyze the available data can be extremely important in enabling responsible

authorities to develop appropriate policies and to deal effectively with emerging issues or unforeseen crises. The ability to produce good management information is never simply a matter of producing reports from existing systems. Unless serious thought was given to management information requirements during systems development, the possibility of extracting meaningful data to produce information may simply not exist. In most major systems you will find that the management information component is developed after the initial development of the operations system, often in response to a crisis situation where senior managers had little or no hard facts upon which to base their decisions. Management information thus becomes a module added to the system or more likely a system of its own. Management information systems can be grouped in a category which is assigned a lower priority than operations oriented systems.

Beyond good management information which supports the decision making process, one could hope to produce meaningful statistics which are comparable with those of similar jurisdictions or organizations. In Canada through the National Justice Statistics Initiative we strive to meet this challenge. National statistics must be meaningful, of high quality and comparable among jurisdictions. They are the by-product of operations and/or management information systems and provide information on caseloads, case characteristics, costs of programs or qualitative descriptions of a given program. The data must exist in current systems. Therefore to develop national statistics, the only requirement is to extract these data from their current databases and process them in a statistical system.

Determining Factors

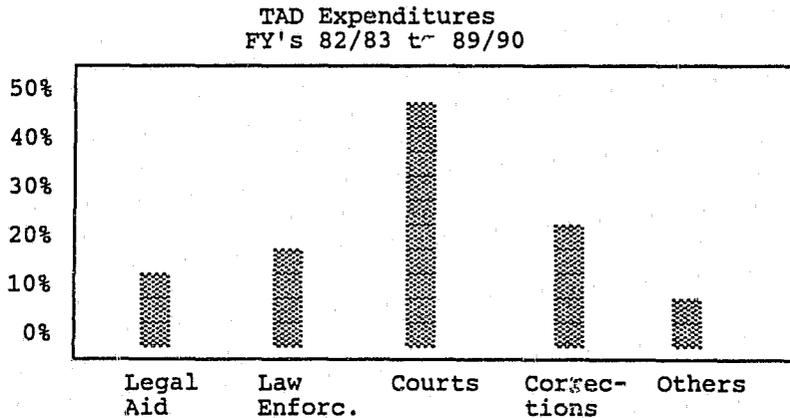
Determining that the order of priorities for systems development is: operational systems, followed by management information systems and finally systems to produce national statistics is a fairly simple task. However, before proceeding with the actual development and implementation of such systems a whole new set of criteria must be satisfied. The most common factor which makes automation necessary is sheer workload often dictated by the population of a jurisdiction. That is why you find that some form of computerization has existed for a long period of time in the larger jurisdictions. Systems dating back to batch mainframe environments provided some relief to the workload. Most of these systems have already been replaced or are in the process of being replaced.

The availability of funds to purchase hardware, software and to develop and operate the system is another major criteria. Budgets are constantly being squeezed and competition for the available funds is fierce within departments and throughout entire governments.

Even beyond budgets, one must have access to technical resources before engaging in major system development efforts. Good technical resources are both expensive and scarce. With new developmental tools and techniques the requirements for this type of resources may be reduced, but justice community managers quickly realize that the profile of support staff has changed and that computer literacy is now a must in the operational environment. Finally support staff need to be flexible and capable of resolving routine problems or have immediate access to technical resources.

Figure 2 illustrates TAD expenditures for systems development since 1982. It is obvious that emphasis has been on the courts sector where almost 50% of available funds have been directed. Even if the priority for CCJS was the collection of national statistics, this chart reflects the desperate need for automation which existed in the courts and the priority it was given by the various governments.

Figure 2



5. Systems

The complexity of modern-day informatics dictates that systems development is not a trivial exercise. This is especially true since the accelerated acceptance of micro-based technologies. Throughout the process, the developer faces a vast range of choices and will need to demonstrate a high degree of technical awareness. The ultimate goal of any development project is to produce an effective and efficient system. In Canada the Public Sector has taken the lead role in the development of its systems. Responsibility for management of these projects is always retained within the user jurisdiction. The Technical Assistance Directorate has assisted jurisdictions with this activity and over the years a strong pool of project management expertise has been developed in each jurisdiction and across the country. The effectiveness of a system is ensured by the involvement of key operations staff and management personnel in the initial phase of the project. The use of appropriate methodologies and walk-through techniques coupled with the participation of all concerned provide a cooperative atmosphere and reduce the inherent risk associated with system development projects. Emphasis is placed on maintaining a data view of the organization through the development of data models and their review and acceptance by senior managers and operations staff.

The efficiency of a system is largely left to the designers. They must ensure that a system meets technical performance requirements. Because of the extensive amount of development that has taken place in the justice community over the past decade, considerable expertise now exists in both the public and the private sectors. Throughout the development effort serious consideration is given to relational technology, system portability, robustness and flexibility and the adherence to international standards.

In each sector there is shared responsibility for the administration of justice and these operational realities must be respected when developing systems. The scope of the system is determined in the early phases of the development cycle and encompasses as much functionality as is practically feasible. Ideally a system would contain all the functions performed within the system but this approach is rarely practical. The growth of computerization is a result of small achievements coupled with larger successful projects. An entire sector may be automated by one system or one project or alternatively individual functions (which represent a priority area)

may be selected for automation. Most systems developed in Canada are multi-functional and serve more than one set of statutes. For example a court tracking system will track all activities in a court whether for criminal, provincial or municipal infractions. Because the processes are so similar they can share the same system even if the legislation is different. The same applies for administration of adult and young offenders. In so doing the developer must ensure that the requirements of the various legislation are respected in regards to security, confidentiality and other aspects.

6. Funding

Regardless of the sector, criminal justice is a shared responsibility. The federal government legislates, the provincial government administers and the National Justice Statistics Initiative collects information. Systems must be developed to satisfy all these needs, so who is responsible for the cost of development and operation of these systems? The simple response is that the user jurisdiction has the responsibility for the costs relative to computerization within its boundaries. To relieve some of this burden several federal assistance programs exist to cost-share both development and operations.

The Young Offenders Act Systems Development Contribution Program is an example of such a program. When the Young Offenders Act was proclaimed by the government of Canada, it changed significantly the way the justice system dealt with young offenders. The provincial jurisdictions had to adapt their administrative procedures to cope with the legislation. Some of these changes were significant and required major modifications to existing systems, the re-development of complete systems and in cases where no system existed it forced the introduction of automation. The federal government thus established the Young Offenders Act Fund to assist with these activities. This fund provided upwards of \$ 10 million for the development of automated systems. While there have been some problems with the administration of this program, overall it has been judged a success as it provided funds for over 25 projects spanning every province and territory. This program has contributed significantly to improvements in the state of automation within the Canadian justice community.

As stated earlier the Canadian Centre for Justice Statistics through its Technical

Assistance Directorate also provides assistance to jurisdictions in the development of automated systems. This assistance is often linked to the ability of the systems to produce national statistics and is much more modest than funds provided under the Young Offenders Act. The Canadian Centre for Justice Statistics usually defrays the cost of interfaces between jurisdictional systems and statistical processing systems as well as provides seed money to initiate projects, conduct feasibility studies, and share in development costs.

Re-inventing the wheel is always the most costly approach, and in the Canadian justice community there is a lot of similarity among the systems development activities. For this reason the concept of technology transfer is promoted and is often effective in reducing costs.

7. Canadian Success Story

What is really unique about the Canadian situation is the National Justice Statistics Initiative which brings together all the participants in the justice community. Based on the common objective of producing useful national statistics the National Justice Statistics Initiative in a few short years has grown from a hierarchical model to a network model. Under the historical hierarchical model Canadian Centre for Justice Statistics was responsible for collecting approved national data and creating a large central database from which could be extracted national information to be used by analysts or researchers. This approach, although valid, is very limiting. It creates a huge infrastructure yet the only available national information is a select core of data elements which reside at the Canadian Centre for Justice Statistics. This model has quickly evolved into the network model where the Canadian Centre for Justice Statistics continues its role but is no longer the hub or the sole focal point of the initiative. The source of justice information is now the sum of all jurisdictional and special databases, not just one central database formed by extracting data from jurisdictional systems. As a result information users have many points of access to this total database of Canadian criminal justice data.

This partnership concept goes beyond the sharing of data elements. The on-going participation in the National Initiative and constant exchange of information facilitates technology transfer. As we have seen before there is considerable duplication of systems activity within the Canadian justice community and through

the Initiative and the network model partners are constantly aware of on-going developments in other jurisdictions and can easily benefit from them. To be effective technology transfer must be viewed in the larger scope and not simply restricted to the transfer of software from Point "A" to Point "B". Technology transfer can be accomplished at various levels where conceptually an idea or approach may be very useful to a partner who is considering a similar activity. In the automation of complex functions, even if the actual code cannot be used or is incompatible with the new environment, it may be possible to transfer and use functional specifications. Canada has been quite successful in this area.

As a result of the significant efforts in the development of systems in the last decade most sectors and important functional areas are automated in every jurisdiction. The next logical step is to move towards the integration of all this automation. The ability to effectively share and exchange information among existing systems has mostly been ignored but is now being recognized as forming an essential part of the system. Because of the level and degree of existing automation there is an opportunity for growth and the on-going development efforts are rapidly moving towards full integration.

8. Public/Private Sectors

Even if you have the impression from this report that there are a large number of systems which are in operation or under development and that opportunities seem to be unlimited, remember that the population of Canada is approximately 25 million so all these jurisdictions serve a limited market. The jurisdictions have taken the lead role and assume responsibility for their own systems development. This has left little room for the private sector to take the initiative and to play a major role in the development of turnkey systems. The demand for such systems has been limited and the potential for private developers to participate has not often been worth the risk. The exception is the law enforcement community where several firms have built and marketed their systems to various police forces. The emphasis has been for customized development and tailor-made interfaces which reflect the individual requirements and procedures of each jurisdiction.

Jurisdictions are most eager to assume responsibility for project management and oversee the development of systems. In most cases the jurisdictions and the

provinces do not have sufficient resources to proceed with major projects. Some of these projects cost in excess of one million dollars and require several person years' commitment. This is where the private sector is most useful and plays a major role. Because of the lack of specialized resources, the jurisdictions must contract the majority of the developmental work. Private consultants have done an excellent job in this area over the years and a considerable amount of expertise now exists in every province. The private sector has complemented the jurisdictional resources quite effectively and can now provide leadership in the enhancements and maintenance of existing system.

9. Future

This is basically where we now stand in Canada with respect to computerization in the justice community. A lot of development has taken place and thankfully most experiences have been very positive. Where do we go from here? Where will technology take us? With the rapid technological changes we are experiencing no one can predict for sure. From the development perspective we note that tangible results have been obtained using newer approaches and technologies which seemed innovative and risky just a few years ago. Summarized in a few words, in Canada the incremental approach to systems development will continue with the likely emphasis on integration.

Raymond Benoit
Sous-Ministre
Ministère de la Justice
Québec
Canada

BILAN ET OPPORTUNITÉS D'AVENIR DES SYSTÈMES D'INFORMATION AU MINISTÈRE DE LA JUSTICE DU QUÉBEC

1. Préambule

Au Québec comme ailleurs dans le monde, la promotion et le respect des droits des citoyens et citoyennes et l'accessibilité à la justice sont largement tributaires de l'efficacité de l'administration de la justice. Or, depuis quelques années les nouvelles technologies de l'information offrent à l'administration de la justice des possibilités d'améliorer son efficacité de façon très significatrice.

Ainsi, le Ministère de la Justice du Québec a une expertise certaine dans ce domaine. Doté depuis déjà quelque temps d'une architecture générale des systèmes, le ministère bénéficie aujourd'hui d'un instrument de conception qui nous assure de la cohérence d'ensemble de chacun des systèmes d'information à développer ou à implanter.

Notons par ailleurs, que l'infrastructure technologique du Ministère de la Justice est comparable en envergure à celle de plusieurs grandes organisations au Québec alors que son environnement d'exploitation au niveau central est techniquement à l'avant-garde dans ce domaine.

Ainsi le Ministère de la Justice du Québec depuis plus de quinze ans s'est efforcé de profiter au maximum de ces nouvelles technologies et à développer dans ce domaine une solide expertise.

Cette expertise porte autant sur le plan technologique que sur le plan de l'identification des opportunités de mécanisation et de développement de systèmes. Sur le plan technologique, le ministère jouit maintenant d'une infrastructure technologique

de grande envergure.

Sur le plan du développement des systèmes le ministère a mis au point une méthodologie qui nous assure cohérence et efficacité dans le développement de chacun des systèmes à développer et à implanter.

2. L'informatique: un outil essentiel

Au rythme du développement et de l'implantation de chacun de nos systèmes d'information, le ministère a introduit l'utilisation des technologies dans l'ensemble des volets de l'administration de la justice.

Pour les juristes et les fonctionnaires qui oeuvrent dans les domaines judiciaire, législatif et des affaires juridiques, l'informatique est un outil essentiel utilisé quotidiennement. L'informatique a permis des améliorations importantes dans les modes d'opération et les méthodes de travail. L'informatique est devenu pour eux un moyen indispensable qui permet:

- D'obtenir les informations requises en vue d'appliquer les lois et en assurer le respect et ce très rapidement;
- D'exploiter plus à fond l'information juridique documentaire, c'est-à-dire de bénéficier rapidement des renseignements contenus dans les diverses banques de données juridiques interprétatives ainsi que de stocker et traiter la documentation juridique législative;
- De produire l'information de gestion nécessaire à l'administration des palais de justice et des bureaux d'enregistrement. En effet, dans les palais de justice et dans les bureaux d'enregistrement, l'informatisation des pluriactifs et des registres améliore la gestion des causes de même que l'enregistrement des droits relatifs à la propriété tout en rendant la consultation plus rapide et plus facile;
- De disposer d'informations de gestion pertinentes à l'administration des ressources humaines, financières et matérielles.

Pour le régistrateur, le légiste, le juriste-conseil, le substitut du Procureur général, le juge ou pour toute autre personne du milieu judiciaire, l'informatique offre aussi d'autres avantages. En effet, l'accès accru à des données stratégiques permet d'évaluer les situations avec rapidité et précision et de mieux choisir les mesures à adopter.

De plus, l'informatique contribue à l'augmentation de l'efficacité opérationnelle des différents intervenants de l'appareil judiciaire en plus d'offrir de nouvelles possibilités en raison de la grande vitesse et capacité de traitement qu'elle soutend.

De façon générale, l'informatique engendre des bénéfices importants d'ordre financier car elle permet de rationaliser l'utilisation des ressources humaines et le nombre de points de services habituellement requis, dégageant de ce fait des ressources qui peuvent ainsi être affectées à l'amélioration de l'accès à la justice, voire à la création de nouveaux services aux citoyens.

3. L'informatique: un défi de gestion

L'utilisation des technologies a forcé le ministère à se doter d'un cadre complet de gestion de l'informatique, à concevoir un plan stratégique en ce domaine et à mettre au point un plan directeur de ses activités informatiques.

Ce fut un défi difficile à relever mais combien salutaire. J'aimerais vous signaler quelques éléments de ces plans et de ce cadre de gestion qui illustreront le travail à effectuer quand on s'engage dans la voie de l'informatisation.

La mise en place d'un cadre de gestion a nécessité une collaboration de l'ensemble de l'organisation pour revoir le partage des responsabilités en fonction d'une collaboration étroite entre utilisateurs et informaticiens. De nouveaux rôles et responsabilités ont été identifiés et mis en place tels:

- La fonction de responsable de système dans chacune des principales unités administratives;
- La fonction de planification des technologies de l'information;

- La fonction de gestionnaire à la clientèle assurant le lien entre les utilisateurs et les informaticiens;
- Un comité tactique pour la concertation entre utilisateurs et informaticiens afin de proposer des orientations, des priorités pour équilibrer l'offre et la demande en matière de technologie de l'information;
- Un comité stratégique regroupant les décideurs de l'organisation pour fixer et approuver les recommandations proposées en cette matière.

La mise en place d'un cadre de gestion commande également la planification de toutes les activités reliées au domaine des technologies de l'information. Ces différentes planifications mettent en lumière les besoins de l'organisation par rapport aux ressources disponibles, tout en identifiant les priorités retenues.

Voici quelques exemples de défis de gestion que le ministère a relevé ou aura à relever dans ce domaine:

- Le besoin en développement de nouveaux systèmes dépasse près de dix fois la capacité de réalisation annuelle du ministère;
- La gestion d'un centre de traitement de grande envergure à la fois pour les besoins du ministère et comme centre serveur pour d'autres organismes;
- L'implantation à la grandeur du ministère de la micro informatique par l'ajout de ressources spécialisées pour supporter les utilisateurs d'un parc de plus de 700 équipements, en croissance continue, à l'échelle du territoire du Québec;
- L'entretien et l'évolution des technologies en place pour répondre aux besoins de l'organisation. Par exemple, la capacité de traitement aura passé d'environ 2 MIPS (millions d'instructions par seconde) à 60 MIPS entre 1982 et 1994, la capacité d'emmagasinage pendant la même période aura passé de 20 à 125 giga-octets;
- En plus des activités courantes, le ministère aura des investissements de

l'ordre de 60.000.000 de dollars à consacrer dans les prochaines années pour être en mesure de supporter l'organisation dans l'atteinte de ses objectifs;

- Finalement, comme un peu partout dans nos organisations, relever ces défis avec un budget stable depuis 5 ans.

4. Les Informations: notre matière première

Par ailleurs, lorsqu'on traite de l'information relative à l'administration de la justice, notre expérience nous a démontré l'importance capitale de cerner avec précision les informations qui seront colligées et informatisées.

Pour ce faire le processus de développement et de gestion de systèmes a été élaboré à l'aide d'une méthodologie appelée MEDSI.

La méthodologie MEDSI identifie tous les éléments nécessaires pour effectuer un travail de développement complet, efficace et dans une séquence bien définie. La démarche méthodologique MEDSI s'articule autour de deux axes: les activités de développement et la documentation de système. Elle établit clairement les activités de chacune des phases de développement, les résultats attendus, les documents à produire et les techniques requises.

Un ministère, comme celui, de la justice traite des informations qui concernent l'information juridique documentaire et l'information de gestion. Pour notre part, nous avons procédé au développement de plusieurs systèmes dans chacun de ces deux secteurs.

L'Information Juridique Documentaire

Dans ce secteur, nous possédons un système informatisé de traitement de la documentation juridique du ministère qui permet l'enregistrement, la mise à jour et le repérage de la documentation législative de même qu'il facilite la publication des lois refondues. La documentation juridique législative comprend toutes les lois et les règlements en vigueur au Québec, en version française et anglaise. Quant à la documentation juridique interprétative qui est également supportée par le même système, elle contient principalement des résumés de jugements, des mémoires et des avis juridiques.

Les Systèmes d'Information de Gestion

En cette matière, le personnel du Ministère de la Justice et les intervenants judiciaires ont à leur disposition des systèmes d'information de gestion pour offrir un service adéquat aux justiciables, ainsi ils peuvent consulter des banques de données centralisées qui regroupent toutes les données relatives aux causes pénales, criminelles et civiles inscrites dans les plunitifs des palais de justice.

D'ailleurs ces systèmes ont constitué les deux premières applications à être développées au ministère. Aujourd'hui, la plupart des palais de justice sont informatisés (représentant 90% des dossiers ouverts au Québec).

Dans les bureaux d'enregistrement, l'enregistrement et la consultation de l'information relative aux droits réels sont aussi informatisés et le public peut consulter à l'écran divers registres dont l'index des immeubles. Par ailleurs, les données concernant la Loi sur la cession des biens en stock conservées dans les bureaux d'enregistrement sont informatisées, ce qui permet à des tiers d'obtenir tous les renseignements nécessaires aux nantissements commerciaux.

Les juristes ont également accès aux données ayant trait aux dépôts volontaires, aux saisies-arrêts, à l'exécution des jugements et à la perception des pensions alimentaires. Ils peuvent aussi utiliser le système de contrôle des revenus pour obtenir de l'information sur les créances des contrevenants, sur les entrées inscrites aux comptes des accusés (amendes et frais), et sur les procédures concernant un dossier précis.

5. Un Serveur Québécois: pour l'accès aux banques de données

Le ministère a confié à un organisme externe la responsabilité de mettre en place les dispositifs nécessaires pour rendre ces informations accessibles au public et à la communauté juridique.

La Société Québécoise d'information juridique (SOQUIJ) donne accès à certaines banques créées par le Ministère de la Justice telles la banque des lois refondues et la banque des règlements. Elle traite également les données relatives aux décisions rendues par les divers tribunaux. Elle crée aussi des banques qu'elle alimente et diffuse, notamment une banque des décisions de la Cour d'Appel, une banque qui

comprend des résumés de jugements des tribunaux du Québec et une banque d'exercice pour les fins de formation des utilisateurs au repérage. De plus, elle participe activement au développement du plan de documentation juridique en étudiant les principales tendances du marché et les besoins de la clientèle juridique.

Il est à noter que non seulement les juristes mais également d'autres professionnels ainsi que des citoyens peuvent avoir accès aux diverses banques de données du ministère en s'adressant à la Société Québécoise d'information juridique.

6. Une Infrastructure Technologique d'Envergure

Le centre de traitement informatique du ministère est un centre sophistiqué qui possède un parc d'équipements de quelque 20 millions de dollars.

En effet, les opérations du Ministère de la Justice au Québec sont basées sur un ordinateur de grande puissance de la famille IBM (IBM 3090-300E) qui exécute jusqu'à 45,000,000 millions d'instructions par seconde pour traiter environ 550,000 transactions par jour et imprimer quelque 2,000,000 de lignes par jour.

Le centre de traitement du ministère est aussi doté de 8 mini ordinateurs supportant la fonction saisie à travers l'ensemble de réseau qui desservent plus de 200 points de services répartis dans l'ensemble du territoire Québécois. On prévoit d'ailleurs une extension prochaine de 100 nouveaux points de services en prévision de l'informatisation des bureaux d'enregistrement et palais de justice non encore informatisés.

Cette infrastructure technologique est complétée par l'exploitation de 2 systèmes de gestion de base de données, l'une de type réseau et l'autre de type relationnelle. Ainsi, le ministère voit à l'exécution d'environ 12.000 programmes par jour en provenance de son portefeuille d'applications.

Toutes cette infrastructure technologique permet au ministère d'agir comme centre serveur au ministère de la sécurité publique et à la Société Québécoise d'information juridique qui désert l'ensemble de la communauté juridique du Québec.

7. Les Systèmes d'Information au Ministère: opportunités d'avenir

Dans l'avenir, de nouvelles applications sont envisagées. Substitution du médium papier par un support électronique de données (technologie du traitement d'image), saisie en direct des procès-verbaux dans une salle d'audience, transfert électronique des données (les actes de vente, les hypothèques ...) et consultation des plunitifs ou des registres à partir de leur bureau par les notaires et les avocats.

Par ailleurs, en matière de documentation juridique, d'ici la fin de 1992, le ministère mettra à la disposition des juges et de leurs collaborateurs, les équipements informatiques requis pour les activités de rédaction et de diffusion des jugements rendus par la Cour d'Appel, la Cour Supérieure, la Cour du Québec et le Tribunal du Travail. En outre, toute l'information consignée dans les arrêts et la jurisprudence sera progressivement transférée dans des banques de données conçues pour répondre aux besoins des utilisateurs. En matière de droit criminel et pénal, l'information juridique fera aussi l'objet d'une restructuration majeure en vue de faciliter l'accès. Tous ces changements devraient être apportés à court terme.

A moyen et à long terme, une croissance importante de la demande d'accès aux banques informatisées comme source première de référence étant prévue, ces dernières de même que les systèmes qui les soutiennent seront améliorés de façon à en simplifier encore plus l'accès et à les rendre encore plus rapidement disponibles.

De plus, sur la base des besoins exprimés par les membres du Barreau et de la Chambre des Notaires, un groupe de travail effectue la concertation requise des principaux intervenants pour le développement d'un logiciel répondant à leurs besoins en matière de documentation juridique.

Nous procédons également à la refonte de nos systèmes d'information. Outre l'amélioration des fonctions actuelles, nous prévoyons l'ajout de plusieurs nouvelles fonctions.

Ainsi tous les bureaux d'enregistrement seront informatisés dans les prochaines années. Cette opération permettra un décloisonnement qui facilitera les consultations des registres de tous les bureaux d'enregistrement ce, à distance et sans

intermédiaire. Par ailleurs, la refonte du système de gestion des pensions alimentaires sera réalisée grâce à l'implantation d'un système de perception automatique qui permettra de recouvrer les sommes dues par les débiteurs fautifs.

Des systèmes seront également mis au point pour assurer ou faciliter la mise en application de la réforme du Code Civil. Par exemple un nouveau système supportera la création d'une banque centrale contenant toutes les données relatives aux actes de naissance, de mariage et de décès ainsi qu'au changement de nom au Québec.

Pour gérer les causes civiles, un nouveau système informatique traitera tous les renseignements contenus dans les dossiers afférents, depuis l'émission des brefs jusqu'aux jugements. Ceci facilitera l'accès aux rôles et à la gestion de ces derniers. Il en sera de même pour la gestion des causes pénales; l'information contenue dans les dossiers avant judiciarisation sera saisie, depuis la plainte jusqu'à l'exécution du jugement.

Par ailleurs, en améliorant et en ajoutant diverses fonctions, l'accès aux plumitifs deviendra encore plus facile.

Quant à la refonte des systèmes de contrôle des revenus, on définira les bases et le concept d'un système comptable qui permettra de mieux gérer les comptes à recevoir, de recouvrer les créances et de contrôler les cautionnements prévus dans notre nouveau Code de Procédure Pénale.

Ces améliorations technologiques auront un impact dans la vie de tous les jours des juristes, des fonctionnaires et des citoyens. Voici quelques exemples de l'impact pratique de ces améliorations:

- Implantation de réseaux locaux au sein de plusieurs unités administratives en vue d'une plus grande efficacité des opérations du ministère. A titre d'exemple, l'utilisation des outils bureautique par les juristes (traitement de texte, chiffrier électronique, logiciel de base de données, outil graphique ...);
- Possibilité d'entendre certains témoins sans que ces derniers aient à se rendre

au palais de justice¹;

- Conception de systèmes experts en vue de faciliter l'élaboration des lois, leur modification, leur refonte et leur application d'une part et la détermination des sentences d'autre part;
- Possibilité aux juristes, depuis leur poste de travail, d'avoir accès rapidement aux diverses banques de lois et de règlements de même qu'aux banques de jurisprudence;
- Possibilité de consulter des jugements rendus dès qu'ils seront prononcés;
- Possibilité de mesurer l'impact de certaines décisions à partir des informations contenues dans les banques de données opérationnelles du ministère et ce, par le biais de simulations des scénarios potentiels.

8. Les Gages de Réussite

Il ne fait pas de doute que les technologies de l'information peuvent être un outil important dans l'amélioration l'administration de la Justice. Cependant, l'utilisation intensive et adéquate des technologies ne peut se faire dans l'improvisation. Elle exige une intervention rigoureuse et planifiée et constitue un défi managériel autant que technique.

En référant à notre expérience des dernières années, à nos succès comme à nos insuccès, j'aimerais signaler quelques facteurs qui, dans le cadre de cette action rigoureuse et planifiée, peuvent assurer le succès de notre intervention, et peuvent s'avérer des gages de réussite.

Le premier élément est certe la définition claire et précise de chacun des projets à réaliser, car l'acceptation d'un projet par l'organisation est un engagement qui détermine toute la dynamique entre les informaticiens et les utilisateurs. Pour ce faire, il importe de cerner les enjeux dans toutes leurs dimensions et de mettre en

¹A la Cour Suprême, les procureurs peuvent déjà plaider à distance grâce aux technologies audio-visuelles présentement disponibles.

place les conditions requises pour y faire face avec succès.

Le second élément concerne les mécanismes de gestion des projets proprement dit. Dans le contexte de déconcentration des responsabilités de gestion dans une organisation de la taille du ministère, il faut établir une structure et des mécanismes qui soutiennent l'imputabilité de la haute direction tout en favorisant la cohérence et l'unité d'action. Ainsi, l'organisation peut mieux gérer chacun des projets grâce à une bonne circulation de l'information et à l'identification rapide des problèmes rencontrés dans le respect des compétences de chacun. Le soutien enthousiaste de la haute direction est, vous le conviendrez, essentiel dans la gestion de tels projets.

Un élément qui m'apparaît tout aussi important est la gestion du changement. L'utilisation des technologies dans une organisation passe inévitablement par des changements de toute sorte. Ces changements peuvent être reliés directement à l'introduction de la technologie, ou à une organisation nouvelle du travail devenue nécessaire pour tirer profit de la technologie, ou même à des réorganisations administratives. Dans chacun de ces cas, il importe de cerner le mieux possible les impacts qui sont susceptible de toucher les différentes ressources de l'organisation et de prévoir les actions nécessaires. La gestion du changement est un élément essentiel à l'utilisation réussie des technologies.

Il faut également noter que le rôle des professionnels de l'administration de la justice et du droit en est un de premier plan, et loin de demeurer de simples utilisateurs, ils doivent s'imposer comme de véritables agents de changements.

En résumé, nous tenons à souligner que l'un des facteurs critiques de succès de la gestion dans les années 90, sera la volonté de reconnaître les défis organisationnels des nouvelles technologies de l'information et d'y donner suite.

9. Le Défi Ultime: l'efficience de l'administration de la justice

Comme toutes les autres sphères d'activités sociales, la justice et le droit québécois pourraient davantage s'appuyer sur les technologies de l'information au cours des prochaines années. Le défi qui nous attend est celui de l'efficacité et même de l'efficience de la justice.

Il appartient donc à ceux et celles qui utilisent ou veulent utiliser les technologies modernes de l'information de prendre les mesures qui s'imposent pour créer les conditions adéquates d'utilisation de ces technologies.

Je souhaite que ces commentaires constituent une contribution positive pour relever ce défi.

L'organisation du Ministère de la Justice du Québec

Le Ministère de la Justice agit en soutien au ministre dans ses rôles du Procureur Général, juriconsulte, registraire et administrateur de la justice. Six directions générales se partagent ces tâches:

- **La Direction des Affaires Criminelles et Pénales:**
Assume la poursuite dans les cas d'infractions au Code Criminel, à d'autres lois fédérales et aux lois du Québec;
Traite les plaintes en droit pénal provenant des ministères et organismes;
Conseille le ministre en matière de législation pénale et criminelle.

- **La Direction Générale de l'Enregistrement:**
Veille à l'enregistrement des documents prescrits par diverses lois;
Assume le contrôle des activités de courtage immobilier;
Voit à l'application de la Loi sur les Huissiers.

- **La Direction Générale des Services Judiciaires:**
Assume l'administration de l'appareil judiciaire (notamment en faisant le lien entre celui-ci et le citoyen et en exerçant une surveillance des officiers de justice et de certains services publics).

- **La Direction des Affaires Législatives:**
Rédige les projets de loi et règlement ministériels et assiste les autres ministères et organismes à cet égard;
Assure la réforme du Code Civil, la refonte des lois et règlements, le lien avec la Société Québécoise d'information juridique (SOQUIJ).

- **La Direction Générale du Contentieux des Affaires Juridiques:**
Dispense des avis juridiques ;
Intervient dans les litiges ;
Établit et ratifie les actes juridiques et administratifs pour l'ensemble des ministères et organismes gouvernementaux.

- La Direction Générale du Personnel et de l'Administration:
Assure la liaison entre le sous-ministre et les directions générales, ainsi qu'avec les organismes centraux et autres, en matière de gestion des ressources informatiques, humaines, matérielles et financières;
Assure les fonctions de planification, coordination et évaluation à l'échelle du ministre.

- La Direction de la Vérification Interne, la Direction des Communications et les différents tribunaux et organismes relevant du Ministère de la Justice viennent compléter l'organisation du ministère, que chapeaute le Bureau du Sous-Ministre.

John Hogarth
President LIST Foundation
Vancouver, B.C.
Canada

PLANNING FOR TECHNOLOGY TRANSFER IN THE COURTS

1. Introduction

The world is experiencing a technological revolution that is as great in scope and profound in its implications as the first industrial revolution. Personal computers and other technologies have become integrated in professional life to a degree that would have been unthinkable just a few short years ago. Modern communication technologies permit individuals to communicate with each other to such an extent that our planet is rapidly becoming a global, technological village. In that village, computer literacy will be as essential as traditional skills in reading, writing, and mathematics.

Courts, and the people who work in them, are among the last to embrace modern information-based technologies. Many courts in Canada and elsewhere continue to rely on manual systems that have not changed in decades. Increasingly, an awareness is growing that this situation must change. Increased workloads, inordinate delays in processing cases, rising public expectations, increased cost consciousness on the part of government and a growing eagerness to embrace technology on the part of some incumbents, particularly younger professionals, are among the stimuli that are forcing managers to look to technology. At the same time, the price/performance of computers and other hardware has improved dramatically in recent years, software needed to support various functions in the court system has become widely available and there are many living examples of successful applications of technology in the court system.

In Canada, the computer revolution is just beginning. There are numerous examples from all Canadian provinces and in the federal system of new applications that are reaping immediate productivity gains.

This paper will not attempt a comprehensive survey of all those initiatives. Rather, it will focus on the process of change itself. Our view is that the choice of appropriate hardware and software to support specific applications is no longer the most difficult question. Those technologies exist and are being developed further. The more difficult question is how to introduce technology into a system that is not known to embrace change readily. Our thesis is that technology transfer must be part of a planning process directed at improving the quality and efficiency of services delivered to the public. We wish to emphasize that technology is not an end in itself. It is only a tool in aid of other objectives. From a management perspective, those objectives include: improving the quality of decisions and services, increased accessibility to justice, the elimination of unnecessary delays, the efficient use of personnel and maintaining control over costs. Seen in this light, the introduction of technology is part of a larger planning process designed to rationalize and improve the delivery of court services.

The technological revolution has created the opportunity to rethink how courts are managed and services delivered. The planning process which starts with describing the existing system, its structure, its personnel and job assignments, its paper flow, and the services and products delivered will identify inefficiencies, duplication of effort and redundancies which create the occasion to undertake fundamental rationalization.

There is a second reason to place technology transfer within the context of a wider planning process. If this is not done the process of change will tend to be driven by technology rather than by user needs. The temptation that should be resisted is to respond to ad hoc requests to purchase the latest piece of hardware or software. Unplanned introduction of new technology on an inconsistent and occasional basis is likely prove more costly in the long run and will militate against system-wide development.

While our thesis is that planning should precede development, it is also true that technology creates an opportunity to manage courts in new and better ways. The mere one-for-one replacement of manual activities with computer based technologies does not do justice to the great opportunity that those technologies provide.

If change management is the greatest challenge posed by technology transfer, how

does one respond to it? This paper will address that question in three parts. Part one will briefly identify some of the unique features of the criminal justice system in Canada which make technological change more difficult to introduce than in other sectors of professional and business life. The second part will describe, by way of example, several successful Canadian applications in our courts. The third part will return to the main question by attempting to draw together some of the lessons learned. We recognize that each country has unique social, political, cultural and economic situations. Only you can decide if there are aspects of the Canadian experience that can be of benefit to you.

2. Institutional Factors Impacting on Technology Transfer in Criminal Justice

All mature organizations resist change, particularly technological innovation. At the institutional level, the introduction of technology may be seen as a challenge to existing power relationships. Individuals in positions of power have a vested interest in the status quo. Anything that may be perceived as having the potential to alter those relationships may be viewed as a threat. At the personal level, fear of redundancy, particular at lower levels in the hierarchy, is a powerful disincentive to incorporate new technologies. That fear is often disguised by expressions of concern about the dehumanizing consequences of technology transfer and other covert defence mechanisms. If line staff are sceptical about upper management, it becomes all the more difficult to convince them that technology will liberate them to do a better and more personal rewarding job. These dynamics exist in all professional fields. Experience in medicine, business, and in other governmental agencies all confirm that the human dimensions of technology transfer pose challenges which are among the most complex and difficult to manage.

There are a number of features of the criminal justice system, at least in our country which create unique problems:

- In a federal system, such as Canada, criminal law jurisdiction is split between federal and provincial governments. The Government of Canada creates the criminal law and appoints judges to superior trial and appellate courts, including the Supreme Court of Canada. Provinces are responsible for appointing judges to lower trial courts, and, most importantly, for the administration of justice. We have federal, provincial and municipal police

forces. Criminal Code prosecutions are the responsibility of provincial governments, while the federal government prosecutes other federal statutes such as those dealing with illicit drugs.

- In Canada, it is misleading to characterize criminal justice as a single system. Rather, it is a series of sub-systems, each with its own hierarchy, legislative base and area of responsibility. A comprehensive plan of technology transfer, therefore, requires a high level of formal and informal cooperation among and between the bureaucracies involved. If the potential for jurisdictional conflict is not addressed in the planning process, technological innovation is in danger of becoming neutralized.
- Like many nations in the world, Canada has an independent judiciary and an independent bar. Judges and lawyers fiercely guard their autonomy and no government initiative can make a significant and lasting change without their active cooperation.
- Technology transfer requires a multi-year planning cycle. Departmental budgets at both federal and provincial levels are normally based on one fiscal year. Government ministers cannot commit beyond a single year. Responsible cabinet ministers, entire governments and priorities may and do change. This creates the need to position technology transfer as a non-partisan issue and to obtain a broad spectrum of public and professional support for those changes. It also means that despite the need for a multi-year plan, short term results with demonstratable payoffs should feature prominently in the plan and its implementation.
- There are certain traditional attitudes and behaviours within the criminal justice system that have to be overcome. Prominent among them is the myth "justice has no price." There is increasing recognition in Canada that we can no longer afford that rationalization. In any event, politicians and the public are demanding not only that justice be done, but that it be done in a timely and cost-effective way. Modern public administration concepts are slowly finding their way into the attitudes and behaviours of court administrators. Progressive administrators are beginning to look upon their area of operational responsibility, as a business. This involves identifying the cost and

benefits of each sub-activity, reallocating resources to achieve high priority objectives, measuring and rewarding staff in terms of productivity gain and removing redundancy. This change is not easy to accomplish within a system which up to recently has been justified only on historical grounds. It requires a new management philosophy, new types of training at all levels and new tools (a topic to which we will return).

3. Examples of Recent Canadian Initiatives

Despite the difficulties listed above there has been an explosion of activity in Canada that from an historical perspective is nothing short of revolutionary. Listed below are brief descriptions of some of those initiatives, by way of example. So much is happening that it is impossible to create an up-to-date inventory. Our Canadian colleagues will forgive us if projects important to them are left of this list.

3.1. Drafting Judgements

There has been a rapid increase in the number of judges that are using personal computers to draft judgements. In several Canadian provinces, personal computers, including laptops, are being made available to judges who request them. In one, a recent survey indicated that 20 percent of the judges have purchased or have being given personal computers within the last two years. In at least two Canadian provinces those personal computers are linked to local area networks permitting drafts prepared by the judge in his or her chambers to be downloaded to the judge's secretary for formatting and proofreading. Some judges have been given modems so that they can prepare a draft at home or while on circuit, having them available in hard copy or on disk when they return to their principal place of work. By adding two way telecommunication components, judges are able to access information contained in centrally located databases.

Judges using this technology are reporting that they are writing shorter, more carefully considered, and more internally consistent judgements.

3.2. Trial Scheduling, Witness Management and the ROTA

It is universally recognized that trial management is an exceedingly complicated

matter. Schedules of judges, lawyers, witnesses, court clerks, court reporters and others must be coordinated. The efficient use of physical and human resources lends itself to computer applications. Last minute settlements, changes in plea, or method of trial occupy labour intensive, time consuming and costly manual effort. The availability of a judge or a courtroom may change from day to day. Estimates of the length of trials may be erroneous. Any illness or other incapacitation of any one of the key players may bring the whole process to a temporary halt. All these and other factors create inefficiencies. The traditional approach has been to overbook judges and courtrooms, in anticipation of last minute cancellations. The result is the sad spectacle of witnesses and lawyers prepared to proceed with no judge or courtroom available. Alternatively courtrooms, judges, and support staff stand idle, due to greater than expected attrition at the pre-trial stage.

All Canadian provinces have some form of witness management, trial scheduling and rota (assignment of judges) procedures in place. Several have begun to use computers to allocate and manage resources. Early results look promising but it is too early to come to a final determination of the success of all these initiatives. The following generalizations can be made:

- The software engineering involved in applying computer based systems to these functions is not trivial.
- The most difficult problem is not a technical one. Rather, it is one to drawing from incumbents using manual systems, all the articulated and unarticulated assumptions which underline their decisions. Computers can only model human decision-making. If humans do not reveal how they choose among alternatives, there is little that a knowledge engineer can do.
- Small scale initiatives seem to be achieving better results than more ambitious projects. Computers can be deployed to handle simple yet time consuming tasks at an early stage of implementation and slowly take over some of the more complex work at a later stage.
- There is enough early success in this area to want further development.

3.3. Pre-Trial and Experiments

For the past four years the Supreme Court of Canada has initiated a program which permits counsel to appear for leave to appeal by interactive video. This eliminates the travel and other costs associated with personal appearances at the court in Ottawa. It facilitates an early determination of applications. Some provincial Courts of Appeal have case management systems which permit electronic filing of pre-trial documents, applications and motions. Plans are underway in at least two provinces to permit counsel to file electronically from remote locations, such as their own offices. Early results are very positive and one can expect further development along these lines.

3.4. Registry Functions

It is generally recognized that the registry is the engine room of the court system. It is also the place where the greatest productivity gains can be made with the use of modern technology. Not surprisingly, it is in this area that some of the most sophisticated systems have been built. The Supreme Court of Canada has an elaborate case management and case tracking system which is now central to its functions. A maturely developed system exists at the Court of Appeal registry in British Columbia. Similar systems are being built in other provinces. Those systems provide the following functions:

- A permanent record of the history of the case;
- An account of its current status;
- A time calendar which identifies dates at which all future events are scheduled to occur;
- Names, addresses and telephone numbers of all the players;
- A record of all interim and final judgements;
- Hard copy made available to counsel and other interested parties, of all orders and decisions made in the course of the trial or appeal;

- Distribution of judgements.

Quite apart from facilitating the expeditious handling of litigation, the data generated from such systems form the basis of management information systems which permit administrative judges and senior court administration staff to evaluate the cost-efficiency of each stage of the process, to identify problems requiring attention, and to surface opportunities that would not otherwise be visible.

3.5. Litigation Support

There are a number of outstanding examples of judges using commercially available software to expedite trials.

The Alberta Court of Appeal is receiving trial transcripts, appeal books and written arguments on diskette. Using key word search software they are able to quickly move through volumes of text and quickly identify where a particular subject, name or event was mentioned. Terminals are placed on the bench and at counsel table. This expedites bench rulings and reduces time taken by lawyers to find a particular record, testimony or document. It also expedites rulings on evidence, preliminary motions or objections raised.

In the province of British Columbia, the Chief Justice of the Supreme Court (as he then was), in a long and complex trial received daily transcripts in both hard copy and in ASCII of all oral and written evidence presented. Counsel received the same information. The electronic form of that evidence was loaded into a personal computer and litigation support software was used by the Chief Justice in analyzing the material. What this has done is eliminate the laborious, time-consuming and error-prone process of manually searching through over 200 volumes of transcript.

Plans are in place to build a paperless courthouse in British Columbia. Newly developed software used by court reporters instantly display a visual record of the transcript of the trial as it proceeds. Terminals will be placed in front of each judge on the bench and at counsel table. A large screen will display the same information so that the public, the press and other spectators will not be excluded. Daily transcripts will be available in both hard copy and machine readable form.

In the province of Nova Scotia, one judge has successfully demonstrated the value of pre-trial conferences by video, the key players interacting with each other from remote locations.

In Manitoba, the Department of Justice has successfully demonstrated the value of videotaping investigative interviews with child sexual abuse complainants. This avoids the trauma of examining that child in court. If that case proceeds to court, copies are given to counsel on both sides.

These and other novel means of introducing evidence electronically raise legal issues that have not yet been fully settled in Canadian law. In this area, as in others, technology has outstripped the law. A key question yet to be determined is the legal status of electronic records. The substantive and evidential issues posed are under review by the Department of Justice and legislation may be forthcoming.

3.6. Legal Databases

Judges in Canada at all levels have free access to on-line judgement databases. Query language systems has an on-line service which provides access to all appellate reported and unreported judgements. Judgements of the Supreme Court of Canada are made available within four hours of decision. In Quebec, a crown corporation (Soquij) distributes full text and summaries of judgements of the Superior Courts in that province. In-house electronic distribution systems are being implemented for Superior Courts in a number of provinces through local area networks. The search methodologies for all the above mentioned on-line services are of a key word variety using boolean key word search terms. This is an old but stable technology similar to that employed by Westlaw and Lexis.

Small personalized databases have been developed by a number of judges. They include Standard Jury Charges and Rules of Court which reside on personal computers. These small portable databases are particularly useful for judges who travel on circuit and do not have access to a law library.

3.7. Expert Systems

The newest development in Canada has been the creation of specialized expert

systems in particular fields of law. Pioneering work in this regard is being carried out at the University of British Columbia where a large Computer and the Law Project is creating a number of working prototypes. Faculties of Law at the University of Alberta, Queen's University, Osgoode Hall, the University of Montreal and Dalhousie have begun work in this area. These applications range from the development of hypertext software to navigate through text material, through intelligently structured databases in particular fields of law, to advanced expert systems using state-of-the-art techniques in artificial intelligence. Perhaps the best known system that has come into full production is the LIST Foundation's Sentencing Database System. This system permits lawyers and judges to do high quality legal research in a fraction of the time that would be absorbed manually. It is designed to improve the quality of legal research and decision making while reducing unwarranted disparity in sentencing.

4. The Planning Process

For the most part, the initiatives listed above resulted from the vision, energy and commitment of a few individuals who some how were able to marshal the resources and support required to embark upon an experimental programme. Only recently, has it become clear to a critical mass of decision-makers that a more comprehensive planning process is required. The challenge is how to develop a systematic plan without neutralizing the energy and enthusiasm of innovators in the field.

The provinces of British Columbia and Alberta have put into place a comprehensive plan within which individual initiatives take place. The Province of Ontario is about to embark upon a similar process. Other provinces are attempting to pull together decision-makers so that planning within each sub-system can take place within the framework of an overall strategy.

What follows is an attempt to identify critical success factors in planning and implementation of technology transfer in the courts. It is based solely on the Canadian experience and is obviously shaped by our culture and institutional arrangements.

5. Critical Success Factors in Planning Technology Transfer

5.1. The Need For Commitment At The Top

Commitment starts at the political level. Responsible cabinet ministers must not only tolerate technological innovation but also champion and give support to it at treasury board when budgets are determined and at meetings with staff where the authority of his or her office is made demonstrably visible. In addition, senior management and other key players who have legal and/or moral authority to influence others should be appointed to a high level planning committee that ensures that individual initiatives maybe integrated within the overall plan. The support of senior members of the judiciary and highly respected members of the organized bar will be crucial.

The role of the senior planning committee should be to develop high level guidelines for development including minimum technical standards to ensure compatibility of hardware. It is also the logical place to establish priorities for implementation, balancing user needs against budget limits. Such a committee can play a powerful role in ensuring that initiatives are not dropped when governments and/or responsible cabinet ministers change.

5.2. The Need for Bottom-up Planning

Technology poses the greatest threat and the greatest potential benefit to line staff. They also are the individuals who were likely to use the technology most in their day-to-day work. Most importantly, these persons have a fund of knowledge about how the present system works, its weaknesses and the potential for improvement. This fact is often overlooked or minimized. Without active participation of line staff in planning and implementation, the danger of passive resistance, if not subtle sabotage, can arise.

Provinces that have taken the time to involve line staff and middle management in planning are reaping benefits, not only in overcoming resistance but also in receiving creative suggestions as to how practical problems, which senior management may not be aware of, can be overcome. One of the first of deliverables of the planning process should be a set of user requirement documents, each directed at a component of activity in the court system. Those documents can then

be fed into the planning process which takes place at a higher level.

5.3. The Need for Minimum Technical Standards

Modern system design concepts stress object-oriented programming using standardized tools which are compatible. The theory behind an object oriented approach to system design is that it permits systems to develop initially as autonomous stand alone entities which can later be integrated into a larger design without having to re-engineer software or replace hardware. Fortunately, most hardware manufacturers and software developers are attempting to create products that are compatible across hardware platforms. Planners should insist that all suppliers conform to minimum standards. It is absolutely essential that these standards be established before any hardware or software company is approached.

A robust planning process will take standardization beyond the selection of hardware and software. There are long-term efficiencies to be achieved by determining minimum standards for such matters as: the layout of technical and user manuals, protocols for access to databases, menu structures, the user interface and the format in which hard and electronic copy will be provided.

5.4. The Role of Outside Consultants

Most Canadian provinces embarking upon large scale technology transfer have used one or more outside consultants to assist in the process. Our experience is that they provide very useful staff support to the planning process, but ultimate control should rest with the individuals and agencies which will ultimately use the product.

The use of technical consultants is very common. Management consultants are less often used but recent experience shows that they can bring expertise to the management of change that may not exist within government. In British Columbia, for example, a large international management consulting firm is playing a major role not only in marshalling technical expertise, but also and more importantly, in assisting senior managers to develop a process to implement fundamental change with a minimum of stress. A change management manual was developed in British Columbia which attempts to anticipate the human and institutional problems that may be expected and it sets out a number of strategies to cope with them.

5.5. Recognize Formal and Informal Power Relations

Early in the process of planning for change it become important to identify all the stake holders that may be impacted. They include those who can be expected to champion change and those who may see it as a threat. Opinion leaders should be identified and brought into the process. It is wrong to assume that the only opinion leaders that matter are at the top of their respective hierarchies.

Unless planners are prepared to cope with a major counter reaction, they should avoid challenging the existing power structure. This means that the plan should provide something for everyone.

It is also important to give continued support to those individuals who take personal and professional risks in participating in a process that may be sceptically viewed by their colleagues. This need not take the form of immediate financial reward. It is usually sufficient for those individuals to be recognized by their immediate superiors and to know that, regardless of outcome, of their participation is valued.

5.6. The Need for Multi-year Planning with Single Year Implementation

Experience in the Canadian context shows that long range plans are viewed with a great scepticism. It therefore becomes important to develop strategies of implementation which permit early demonstrable pay-offs. As stated above, application planning works best if it takes place at the micro level. Provided those plans fit within the overall macro plan there is every reason to bring forward one or more applications which can be built and implemented within one fiscal year. There is a tendency among some system designers to build complex systems requiring the massive infusion of resources over a considerable period of time. The danger is that those systems will never get out of development. This underlines the need for senior managers to be acutely sensitive about delivering something useful within a reasonable period of time.

5.7. The Need to Use Proven Technology

Court services is not the place to experiment with unproven technology. Fortunately, the hardware and software needed to support most functions taking

place within modern court complexes have been successfully tested in other contexts. While applications may be unique, the hardware and software selected and the design concepts used should be drawn from the best of proven technology. In today's world that technology is universal and global, knowing no national or regional boundaries. Specific applications, on the other hand, are local and must be sensitive to the particular context in which they are applied.

5.8. The Need for Initial and On-going Training

Training is an essential component of any plan to transfer technology. Unfortunately, it is not always given the emphasis it deserves. Training should be seen not only as a medium to transfer technical skills. It can play an important role in changing attitudes and behaviours.

Computer applications are becoming simpler for novice users. The Sentencing Database System, for example, is one that is being used by judges and lawyers with no previous experience with computers, without training or reference to a user manual. It is entirely intuitive. Our experience is that, regardless of how user friendly the system is, some individual's will experience anxiety about using computers for the first time. With notable exceptions, not wanting to feel incompetent is more likely to be found among older, males in senior positions. Individuals in this group may prefer one to one instruction followed by a self-administered program which can be conducted within the privacy of their own office. The good news is that initial nervousness usually gives way to a growing fascination with the potential of the technology, and for many, unbounded enthusiasm that is hard to control. We wish those problems on you all.

6. Conclusion

In Canada, the introduction of technology in the courts is rapidly moving beyond the experimental phase. It is now beyond dispute that significant productivity gains can be made and at the same time improve the quality of justice services offered to the public. The main lesson learned is that those twin objectives can best be achieved if control over the process remains with those willing to use it in their daily lives.

**DELEGATION
OF
COLOMBIA**

Report

submitted by

Alfonso Reyes Alvarado

Alfonso Reyes Alvarado
Instituto SER de Investigación
Fundación para la Educación Superior
Colombia

UN SISTEMA DE INFORMACIÓN PARA EL APOYO DE UN TRIBUNAL DE SEGUNDA INSTANCIA EN EL PROCESO PENAL

1. Introducción

La justicia, pilar de todo estado de derecho, en Colombia se encuentra en un franco proceso de descomposición.

Son múltiples los problemas que la aquejan y pocas las soluciones planteadas llevadas a feliz término. Se le reprocha en particular:

- Su Lentitud;
- Su Caracter Abstracto;
- Su Elevado Costo Social (disminución de las posibilidades de una adaptación social positiva del condenado);
- Su Desigualdad (sobre todo respecto a los sectores mas desfavorecidos de la sociedad);
- Su Inconsecuencia (excesiva severidad o demasiada indulgencia);
- Su Falta de Independencia respecto al Poder Ejecutivo.

Como consecuencia grave de este proceso, se ha venido generalizando en forma peligrosa un sentimiento de indiferencia social hacia la administración de justicia y hacia las personas encargadas de cumplir con esta difícil labor (los jueces), y se ha incrementado el número de organizaciones paramilitares regidas por el equívoco convencimiento de ser las señaladas para administrar su propia justicia.

Un país que con indiferencia lee en la prensa o escucha por diversos medios de comunicación la cada vez más común noticia del asesinato de ciudadanos, jueces, magistrados, políticos, y representantes de los cuerpos de seguridad del Estado, paradójicamente clama en silencio un vuelco completo, un renacer de un orden social estable cada vez más lejano. El reciente pronunciamiento de los Colombianos en favor de una asamblea constitucional, independientemente de si es o no el mecanismo correcto a utilizar, es una demostración de este sentimiento.

Nuestra administración de justicia ha perdido credibilidad. En un estudio realizado por Rodrigo Losada Lora y Napoleón Franco¹ patrocinado por la Fundación Unidad para el Progreso, en el cual se investigó la opinión de más de dos mil colombianos sobre sus principales instituciones, se encontraron los siguientes resultados con relación a la justicia:

- A la primera pregunta: "Cree usted que algunos jueces en Colombia se dejan comprar?", el 88% contestó SI, el 6% NO, y el 6% no supo que responder;
- A la segunda pregunta, formulada a quienes habían contestado afirmativamente a la primera: "Y de cada 10 jueces, cuántos cree usted que se dejan comprar?", la respuesta promedio fue de 5.5, es decir, más de la mitad;
- A la tercera pregunta: "Qué cree usted: en Colombia los jueces generalmente aplican la ley por igual a todos los ciudadanos, Si o No?", la respuesta fue: NO, el 85.4%, SI el 11.5%, y no supieron que responder, el 3.1%;
- A la cuarta pregunta: "De 1 a 10, donde 10 es lo mejor y 1 lo peor, qué tanto confía usted en los jueces y la justicia en Colombia?", la respuesta fue de 4.7, es decir, por debajo de la mitad.

Esta pérdida de fe en la justicia es sumamente grave, y puede ser en gran medida la razón de la seria convulsión social que padece el país. Buena parte de la violencia guerrillera puede encontrar su estímulo para el reclutamiento de adeptos en la impotencia de las personas pobres para defender sus derechos a través de caminos

¹Rodrigo Losada y Napoleón Franco "Democracia y Libre Empresa en Colombia: Un Estudio de Actitudes". Fundación para el Progreso.

institucionalizados; al mismo tiempo, la pérdida de fe en la justicia puede ser la causa, como y a mencionamos, del surgimiento de grupos paramilitares.

2. Un Breve Diagnóstico

Al hacer un diagnóstico de la Justicia Penal Colombiana², se encuentra que uno de los principales problemas que padece nuestros despachos judiciales es el de la congestión. Veamos algunas cifras al respecto.

El Instituto SER de Investigación llevó a cabo dos inventarios, uno en 1976 y otro en Junio de 1982, para determinar el número de procesos que se tramitaban en los juzgados penales.

Las cifras reflejaron un problema dramático: a mediados de 1982 había un total de 1,397.800 casos penales pendientes. Esta cifra, comparada con la obtenida de 1976, representa un incremento del 85% en 11 años, es decir, aproximadamente un aumento anual del 7.7%.

Del total de procesos que había acumulados en 1982, el 96.5% se encontraba en la etapa de investigación, mientras que tan solo 48.500 - el 3.5% -, se hallaba en la etapa del juicio. En 1987 ingresaron a la etapa de investigación 334.000 nuevos procesos penales, y al final de ese año pasaron a la etapa del juicio tan solo 20.000.

Esto pone de relieve el nivel de ineficacia que ha alcanzado la investigación criminal en nuestro país a pesar de los muchos intentos que se han hecho para resolverlo, por lo menos a nivel normativo. Esta proporción de procesos en la etapa de investigación se refleja en la condición de las personas detenidas, pues según un estudio de la Dirección General de Prisiones, en 1986 el 62% de las personas privadas de libertad eran sindicados, mientras que tan solo el 38% eran condenados. Lo mas alarmante es que el censo penitenciario realizado en 1977 daba una distribución igual, es decir, en nueve años la situación no había variado. Si además se tiene en cuenta que en promedio el 64% de los sindicados permanece privado de la libertad entre uno y seis meses, el 21% entre siete meses y un año, el 11% entre uno y dos años, y el 5% por

²Jaime Giraldo, Alfonso Reyes y Jorge Acevedo "Reforma de la Justicia en Colombia". Instituto SER de Investigación. Bogotá, Enero de 1987.

mas de dos años, estamos ante un inobjetable reflejo de una clara contradicción con el principio universal de presunción de inocencia.

Al indagar sobre el número de procesos que están a cargo de cada juzgado encontramos que en promedio este supera fácilmente los mil y en algunos casos, como en la ciudad de Barranquilla, puede llegar a los cinco mil.

Esta congestión es una de las causas principales de la impunidad, y quizá de algunas prácticas inmorales debido a que, como los jueces apenas alcanzan a tramitar los negocios en que se encuentra detenida una persona (existen sanciones disciplinarias para los jueces que incumplan los términos judiciales cuando hay un detenido), los sindicatos tratan por todos los medios lícitos y aún ilícitos, de obtener su libertad, y a través de ella, la parálisis y eventual prescripción de su negocio.

Otra de las consecuencias de esta congestión es la duración exagerada de los procesos. En un estudio realizado en 1980 por el Instituto de Ciencias Penales y Criminológicas de la Universidad Externado de Colombia sobre el tiempo que demoraba el trámite de los distintos procesos penales con relación a los términos establecidos por la ley³, se encontró que aquél era siempre superior a éstos. En algunos casos la diferencia entre la duración real del proceso penal y la duración legal máxima alcanzaba el 203%. Algo similar ocurre en las jurisdicciones civil, laboral, de menores y aún en la justicia penal militar.

Estas demoras niegan el precepto constitucional de una pronta y cumplida justicia y generan en el ciudadano común una sensación de impotencia y frustración al tener que verse sometido al lento y desgastador mecanismo judicial para tener que resolver sus conflictos.

Los gobiernos de turno han tratado de encarar el problema de la congestión en varias oportunidades pero lamentablemente en forma inefectiva. La solución común ha sido el incremento en el número de despachos judiciales. En 1980, mediante la ley 22 se decretó una emergencia judicial por medio de la cual se crearon 767 nuevos cargos entre jueces adjuntos y jueces auxiliares distribuidos en todo el territorio nacional.

³Jesús Antonio Muñoz "La Duración Real del Proceso Penal". En Derecho Penal y Criminología, Vol. VII. No. 24. Universidad Externado de Colombia, Bogotá 1980.

Su trabajo consistía en elaborar, bajo la responsabilidad del titular del respectivo despacho judicial, proyectos de sentencias y autos en los expedientes que el juez le repartía.

Sin embargo, y luego de los quince meses que duró la emergencia judicial, podemos concluir que el alivio alcanzado fue mínimo si observamos que luego de este proceso - cuyo costo directo fue de mas de \$ 600 millones de pesos de entonces - quedaron en el sistema penal alrededor de 1,390.000 procesos pendientes.

Lamentablemente a finales de 1989, a través de las facultades extraordinarias que el Congreso le otorgó al ejecutivo por medio de la ley 30 de 1987, se crearon 9600 nuevos cargos en la rama judicial cuyo costo total sobrepasa los doscientos mil millones de pesos.

El Instituto SER de Investigación desarrolló en 1983 un modelo matemático en donde se analizaba los procesos de entrada, salida y rendimiento del sistema penal colombiano, y llegó a la conclusión de que ni duplicando el número de juzgados sería posible, durante un período de diez años, eliminar la congestión dado el elevado número de sumarios que se inician por año y la lentitud del sistema judicial penal para concluirlos. Es decir, la solución no consiste ciertamente, en un incremento del número de juzgados.

Por otra parte, y contribuyendo a aumentar aun mas el volumen de procesos que ingresan anualmente, debe señalarse que nuestra legislación penal, en cada reforma (y éstas se suceden muy a menudo) van apareciendo tipificadas como delitos nuevas conductas. Esto ha ido produciendo la aparición de nuevos capítulos en el Código Penal, en los que se asigna a los jueces la defensa de estos nuevos valores, de tal manera que el número de delitos va aumentando día a día, haciendo mas grande la congestión y, por consiguiente, mas inoperante la justicia.

En el Código Penal de 1980 se introducen, por ejemplo, como capítulos nuevos:

- El Tráfico de Influencias;
- El Enriquecimiento Ilícito;

- El Fraude Procesal;
- El Acaparamiento;
- La Especulación;
- Los Atentados contra los Recursos Naturales;
- La Celebración Indebida de Contratos, etc.

Algo análogo sucedió con la reciente expedición del Código del Menor.

De lo expuesto hasta aquí, es claro que nos encontramos ante un panorama desolador y ciertamente muy preocupante. Las soluciones deben encontrarse mediante un estudio integral del problema y deben ser aplicadas en forma inmediata.

Los mecanismos tendientes a descongestionar los juzgados pueden ser agrupados en seis categorías:

- Reformas Procedimentales;
- Descriminalización;
- Despenalización;
- Desjudicialización;
- Desprisonalización;
- Agilización de los Trámites Judiciales.

En este documento solamente nos referiremos al último de ellos. El lector interesado puede hallar información sobre los cinco primeros en "Comentarios sobre la Adminis-

tración de Justicia en Colombia"⁴.

Una forma de agilizar inmensamente los trámites judiciales es mediante el empleo adecuado de la informática. A comienzos de 1985 el Instituto SER de Investigación desarrolló un sistema de información en la Sala Penal del Tribunal Superior de Bogotá. La experiencia resultó exitosa y ha sido tomada como modelo para replicarla a nivel nacional. En este documento se describe esta experiencia haciendo énfasis en los logros alcanzados así como en los mecanismos utilizados para su replicación.

Sin embargo, y para comprender con mayor claridad el alcance del sistema de información, es pertinente describir la estructura organizacional del poder judicial en Colombia.

3. Estructura del Poder Judicial en Colombia

La rama judicial del poder público en Colombia está integrada por el Tribunal Disciplinario, la jurisdicción de lo contencioso administrativo, la jurisdicción penal aduanera, la jurisdicción ordinaria, y las jurisdicciones de familia y agraria de muy reciente creación.

La jurisdicción ordinaria está conformada por la Corte Suprema de Justicia, los Tribunales Superiores y los Juzgados.

3.1. La Corte Suprema de Justicia

Es la cabeza de la rama jurisdiccional. La conforman 24 magistrados vitalicios, que se nombran mediante el mecanismo de cooptación (es decir, que cuando uno de ellos se retira o fallece, los restantes nombran a su sucesor). Se divide en cinco Salas:

- Sala Plena, integrada por todos los magistrados;
- Sala de Casación Penal, conformada por ocho magistrados;

⁴Alfonso Reyes "Comentarios sobre la Administración de Justicia en Colombia". Instituto SER de Investigación, DCD-040, Bogotá, Agosto de 1990.

- Sala de Casación Civil, compuesta por seis magistrados;
- Sala de Casación Laboral, integrada por seis magistrados;
- Sala Constitucional, que la componen cuatro magistrados.

Entre las funciones de la Corte se destacan las siguientes:

- Juzgar a los altos funcionarios nacionales;
- Servir como Corte de Apelación en los asuntos que conocen los Tribunales en primera instancia, y mediante el recurso extraordinario de casación regular la jurisprudencia a nivel nacional;
- Decidir sobre la exequibilidad de los proyectos de ley que hayan sido objetados tanto por su contenido material como por vicios de procedimiento en su formación.

3.2. Los Tribunales Superiores

El Territorio Nacional se encuentra dividido en 27 Distritos Judiciales. A la cabeza de cada uno de ellos se encuentra un Tribunal Superior. Cada Tribunal Superior tiene un número distinto de Magistrados, que conforman cuatro Salas:

- La Sala Penal;
- La Sala Civil;
- La Sala Laboral;
- La Sala Disciplinaria.

Los Magistrados de los Tribunales son nombrados por los Magistrados de la Corte Suprema de Justicia para un período de cuatro años.

Entre sus funciones se pueden destacar las siguientes:

- Conocer en segunda instancia de los procesos que han sido decididos en primera instancia por los jueces superiores y de circuito;
- Conocer en primera instancia de los procesos que se adelanten contra miembros de la iglesia (con excepción de los Obispos) y contra jueces de la república.

3.3. Los Juzgados Penales

Existen en número distinto en cada Distrito Judicial. Son nombrados por los Magistrados de los Tribunales Superiores de cada Distrito para un período de dos años. Se clasifican, según la clase de delitos asignados para su conocimiento, en:

- Jueces Superiores;
- Jueces Penales del Circuito;
- Jueces de Instrucción Criminal;
- Jueces Penales Municipales.

4. Descripción del Sistema de Información

4.1. Objetivo

El sistema de información en cuestión se desarrolló inicialmente en la Sala Penal del Tribunal Superior del Distrito Judicial de Bogotá. Su objetivo básico es agilizar el trámite de los procesos que allí cursan.

4.2. Componentes del Sistema

El sistema está compuesto de seis módulos:

- Radicación de negocios;
- Adjudicación de negocios ya repartidos;

- Reparto de nuevos negocios;
- Registro de las actuaciones de los magistrados;
- Producción de listados para consulta del público;
- Generación de informes estadísticos.

4.2.1. Radicación de Negocios

Mediante este módulo se registra en el computador la información relevante de cada proceso penal que llega al Tribunal. Entre otros datos se consignan los siguientes:

- Datos del (los) sindicado(s);
- Clase de delito(s);
- Establecimiento(s) carcelario(s) en donde se encuentra(n) el (los) sindicado(s);
- Juzgado que remite el proceso, si es una apelación;
- Magistrado que lo estudió anteriormente, si es una apelación;
- Grupo al que pertenece según su complejidad.

4.2.2. Adjudicación de Negocios ya Repartidos

Si el proceso llega por una apelación, el sistema busca si ya había sido registrado anteriormente. En caso afirmativo, el proceso se le asigna al mismo Magistrado que lo conoció en aquel momento.

4.2.3. Reparto de Nuevos Negocios

Si el proceso llega por vez primera al Tribunal, éste es repartido aleatoriamente entre los 25 magistrados competentes para estudiarlo. Este procedimiento de reparto

se hace automáticamente y debe ser aleatorio y equitativo teniendo en cuenta la complejidad del proceso. Para ello, el sistema pregunta una palabra clave al presidente de la Sala Penal del Tribunal (únicamente él está autorizado para realizar este tipo de labor) y a continuación le solicita un número entero de no más de tres dígitos. Con estos datos y con la información básica del proceso (que fue suministrada en el módulo de radicación), el sistema escoge al azar un proceso, luego selecciona al azar un magistrado y hace la asignación correspondiente. Para asegurar un equilibrio en las cargas de trabajo, los procesos se clasifican en grupos según su nivel de complejidad.

4.2.4. Registro de las Actuaciones de los Magistrados

A medida que el trámite de cada proceso se surte, el Magistrado correspondiente va tomando una serie de decisiones que se concretan en actuaciones judiciales. Cada vez que una de estas actuaciones se lleva a cabo, se registra en el sistema de información. De esta manera se conforma una historia de cada proceso.

4.2.5. Producción de Listados para Consulta del Público

Diariamente el sistema produce una serie de listados con información útil para los abogados que tienen procesos en el Tribunal. Mediante estos listados los abogados pueden conocer, entre otros aspectos, los siguientes: a qué magistrado se le asignó el estudio de un proceso; cuales han sido las decisiones adoptadas durante el transcurso de un proceso; cual es la última actuación judicial tomada con relación a un proceso.

4.2.6. Generación de Informes Estadísticos

Periodicamente el sistema produce reportes estadísticos en donde se puede apreciar la siguiente información:

- Número de procesos ingresados al Tribunal por cada magistrado y discriminado por tipo de delito;
- Número de actuaciones proferidas por cada magistrado, discriminadas por tipo de actuación;

- Número de sentencias discriminadas por magistrado y por tipo; etc.

5. Soporte Físico (Hardware) y Soporte Lógico (Software)

El sistema de información se desarrolló en microcomputadores compatibles con equipos IBM-AT. Los programas de computador fueron hechos utilizando el lenguaje de programación Pascal y el manejador de archivos B-Trieve. El sistema operacional es DOS.

Actualmente se está probando una versión del sistema para equipos multiusuario desarrollada en el lenguaje de programación C y utilizando las librerías B-TREE, R-TREE y D-TREE. Esta versión funciona con el sistema operacional UNIX.

6. Logros del Sistema

Para determinar el impacto del sistema de información, se realizaron algunas mediciones en los trámites judiciales que se adelantan en la Sala Penal del Tribunal Superior de Bogotá antes y después de su instalación.

En la secretaría de esta Sala trabajan siete empleados, encargados de realizar las labores de radicación, reparto y adjudicación de negocios, registro de las decisiones de los 25 magistrados respectivos, y atención de las consultas del público. Actualmente llegan a la Sala Penal cerca de mil procesos cada mes.

Veamos en algún detalle el beneficio obtenido en cada uno de los trámites adelantados por la secretaría de la Sala Penal.

6.1. Proceso de Radicación

Tardaba una semana con el procedimiento manual. Durante este tiempo los empleados de la secretaría clasificaban los negocios, recuperaban o producían (según el caso) la tarjeta de kárdex con la información del negocio, transcribían las carátulas para cada uno, y finalmente separaban los grupos de reparto. Es decir, el procedimiento manual represaba durante una semana los negocios.

El sistema automático permite realizar este proceso en forma diaria, lo que representa

un ahorro de cuatro días hábiles por proceso.

6.2. Reparto y Adjudicación de Negocios

El procedimiento manual permitía un reparto semanal y utilizaba en promedio 18 horas-hombre (el presidente de la Sala y cinco empleados de la secretaría, ocupados durante tres horas).

El reparto automático ocupa al presidente de la Sala durante diez minutos y a dos empleados por treinta minutos mientras añaden las carátulas (generadas por el computador) al proceso correspondiente. Actualmente se hace un reparto diario, es decir, que en la semana, con la dedicación de una hora del presidente de la Sala y seis horas de dos empleados, se realizan seis veces más repartos que con el proceso antiguo.

6.3. Entrega a los Magistrados de los Negocios Repartidos o Adjudicados en los Despachos

En el sistema manual, el procedimiento tardaba en promedio tres días hábiles. En el sistema actual, el traslado se realiza el mismo día del reparto.

6.4. Registro de las Decisiones y Cumplimiento de las Normas Procedimentales Consecuencia de las Mismas

Para cumplir con este proceso, el personal de la secretaría debe informar de las decisiones a las partes, fijar en lista aquellos negocios en los que puedan presentarse alegatos, informar los términos de que disponen las partes para interponer dichos alegatos y vigilar su cumplimiento, efectuar los traslados a las diferentes fiscalías, y algunas otras funciones de menor importancia. Debido al volumen de trabajo que este proceso representaba, cada actuación importante significaba para el proceso una demora promedio de cuatro días hábiles; con el actual sistema el proceso se realiza diariamente con un ahorro efectivo de tres días hábiles en el trámite de cada negocio.

Esta representa una de las mayores economías del sistema actual, máxime si se tiene en cuenta que esta etapa puede repetirse entre diez y doce veces por cada negocio

durante su estadía en el Tribunal.

6.5. Devolución de Negocios

Consiste en registrar la salida de los negocios hacia los juzgados de origen en un libro de la secretaría; producir recibos que deben ser firmados por los jueces como constancia de la recepción del expediente, y trasladar efectivamente los negocios a los juzgados. El sistema manual requería en promedio cinco días hábiles; el sistema automático solamente requiere un día hábil, con un ahorro efectivo de cuatro días hábiles por proceso.

Aglutinando estas cifras, y suponiendo solamente dos providencias emitidas durante el proceso de segunda instancia (cifra mínima para cumplir con los requisitos procedimentales), concluimos que el sistema automático representa un ahorro efectivo mínimo de 19 días hábiles por negocio y por cada decisión de segunda instancia que se produzca. Si se tiene en cuenta que un negocio puede tener en promedio tres ascensos al Tribunal desde un juzgado, se obtendrían ahorros de 57 días hábiles por negocio, es decir, el equivalente a 2,4 meses calendario. Para los negocios de cierta complejidad en donde pueden presentarse entre ocho y diez recursos de apelación con seis o siete providencias por recurso, el ahorro es mucho mas significativo: de 16 a 24 meses calendario.

Además del ahorro en tiempo mencionado, el sistema automático ocupa, para su funcionamiento normal, a dos empleados de la secretaría, liberando a los demás para la realización de labores igualmente importantes, tales como el control de los términos, el registro de los memoriales, etc.

Hoy, la Sala Penal del Tribunal Superior de Bogotá se encuentra al día; ya no se observan en su secretaría decenas de expedientes en espera de tardías decisiones y la consulta del público (antes realizada a gritos en medio de una muchedumbre) se hace ordenada y eficientemente con ayuda de los listados producidos por el computador con la información requerida.

7. Replicación del Sistema

Existen 27 Tribunales Superiores en el país y casi la totalidad de ellos cuenta con

tres Salas. Esto hacía la labor de replicación bastante difícil máxime si se tiene en cuenta que en ninguno de estos Tribunales se tenía experiencia en el uso de sistemas de computación.

Para asegurar un respaldo del Tribunal durante la etapa de implantación del sistema automático, únicamente se incluyó durante la fase de replicación a aquellos Tribunales que hicieron una solicitud formal del sistema en donde expresaban su compromiso para facilitar los cambios administrativos que se requerían.

Como el gobierno no contaba con suficientes recursos para apoyar este proceso fue necesario idear estrategias alternas. Es así como cada uno de los Tribunales que deseaba tener el sistema debía conseguir, dentro de su región, el respaldo de alguna entidad privada que asegurase el mantenimiento de los suministros requeridos durante al menos un año (papel de computador, cintas para impresora, etc.). Igualmente, debían conseguir el respaldo de alguna entidad de educación que se comprometiese a dar capacitación básica sobre computación a los empleados del Tribunal.

Una vez seleccionados estos Tribunales, la Fundación para la Educación Superior, FES financió al Instituto SER la replicación del sistema en ellos. La estrategia de replicación se basó en las siguientes etapas:

- Selección de ingenieros responsables de la instalación del sistema: En cada región en donde se encuentra localizado el Tribunal, se seleccionó un ingeniero con suficiente formación para instalar el sistema;
- Capacitación de estos ingenieros: Se realizó un taller de una semana en donde se capacitó a todos los ingenieros responsables de la instalación del sistema;
- Adaptación del sistema a cada región: Como existían pequeñas diferencias procedimentales entre los Tribunales, se hicieron las adaptaciones necesarias para cada caso;
- Instalación del sistema: Una vez adaptados los sistemas se realizó la implantación, en cada Tribunal seleccionado, bajo la coordinación del Instituto.

De esta forma el sistema se replicó en cuatro Tribunales adaptándose igualmente a las restantes Salas.

Para replicar el sistema al resto de los Tribunales del país se conformó un grupo de ingenieros que diseñó y programó una nueva versión para equipos multi-usuario. El proceso de implantación al resto de Tribunales se inició a mediados de 1990 con el apoyo del gobierno, el respaldo operativo y económico de la FES, y gracias a una ayuda financiera de la AID.

8. Comentario Final

Como ya hemos mencionado, en el caso colombiano la congestión judicial es una de las principales causas de la impunidad y atenta, además, contra la credibilidad de la ciudadanía frente a la eficacia del poder judicial. Es por esto que debe ser atacada en una forma integral e inmediata.

Pero aun cuando el empleo de sistemas de información tiene repercusiones muy favorables en el quehacer jurisdiccional, debemos ser enfáticos en que los problemas que aquejan a la administración de justicia no serán resueltos con la simple modernización de sus procedimientos. Un examen global del sector debe contemplar necesariamente el factor humano, el presupuestal y el administrativo. Pero estos son temas que, por sí mismos, deben ser objeto de un estudio mas detallado.

DELEGATION

OF

CUBA

Report

by

Marié Fernandez de Alaiza

Carlos Matias Xigues

**Marié Fernandez de Alaiza
Carlos Matias Xigues
Ministerio de Interior
Cuba**

EL SISTEMA AUTOMATIZADO JURÍDICO OPERATIVO

1. Objetivos del Sistema

El Sistema Automatizado Jurídico Operativo surge a partir de la necesidad de tener un control de los hechos denunciados, sus características, autores, víctimas, objetos vinculados así como el seguimiento de los mismos, de manera tal que se pudiera contar con la información requerida para:

- El conocimiento de la actividad delictiva y su enfrentamiento;
- El trabajo investigativo de los hechos sin autores conocidos.

Con anterioridad a la implantación de éste, se contaba con varios sistemas no relacionados entre sí y que trataban información común, generándose trabajo doble en el tratamiento de los datos e incluso cierta incompatibilidad. Asimismo, desde el punto de vista técnico resultaban ser obsoletos y no permitían obtener resultados oportunamente en el nivel de base, por lo que se "llevaban" estadísticas manualmente produciendo un trabajo altamente engorroso y con baja confiabilidad.

A partir de estas insuficiencias los Organos de Justicia (Fiscalía y Tribunales) y el Ministerio del Interior, se propusieron hacer el sistema que se describe a continuación, el cual contempla en la actualidad todo el tratamiento automatizado desde que se produce la denuncia del hecho hasta que el mismo se cierra y es elevado a la Fiscalía y/o Tribunales.

Se encuentra en explotación en Ciudad de la Habana desde 1988 y en todo el territorio nacional desde enero de 1989.

2. Concepción del Sistema

El sistema se encuentra soportado en dos tipos de técnica:

- Microcomputadoras compatibles IBM (en sentido general XT);
- Minicomputadoras soviéticas 1420.

Conceptualmente, desde el punto de vista técnico, se basa en:

- Realizar la entrada de la información a partir de los propios documentos legales, minimizando los modelos específicos con fines de automatización y logrando la utilización de los datos a los efectos estadísticos y de apoyo a la investigación;
- Llevar a cabo el proceso de introducción, validación y creación de los ficheros en la técnica de microcomputadora, garantizando la calidad de la información que se tramita hacia los niveles superiores;
- Transmitir diariamente la información procesada desde las microcomputadoras hacia el nivel superior para su tratamiento en las 1420;
- Garantizar la adecuada compatibilidad informativa entre los 2 tipos de técnicas existentes;
- Obtención de resultados estadísticos, de dirección, y de apoyo al trabajo de investigación en ambos tipos de técnica;
- Garantizar que las Unidades de Base que no contasen con microcomputadoras, tuvieran acceso rápido y eficaz a través de las terminales de las 1420 instaladas para este y otros fines, para lo cual se elaboró el aseguramiento de programas que permitiera la obtención de un grupo de estadísticas con cierto grado de flexibilidad en cuanto al período de las mismas, los delitos a contemplar, y que se pudieran pedir interactivamente, mostrándose los resultados en las propias terminales;

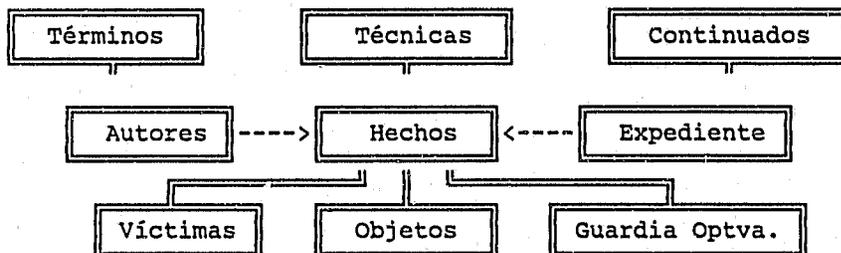
- Esta misma posibilidad se desarrollo para las microcomputadoras;
- Desarrollar medios de aseguramiento de programas que posibilitaran el uso de la información en las microcomputadoras y en particular la obtención de estadísticas y gráficos no previstos. En este sentido se logró diseñar y elaborar el MARGINAL y el GENTABLA.

3. Breve Descripción del Sistema

El sistema parte del control de las denuncias levantadas en cada territorio así como las víctimas, los autores, los objetos, las guardias operativas y los EFP asociados a las mismas.

La información se encuentra organizada de manera semejante tanto en micro como en mini a partir de la existencia de una llave única común a todos los ficheros.

De manera gráfica, la relación entre los ficheros maestros puede representarse de la siguiente forma:



La introducción y validación de los datos se realiza siempre en la microcomputadora, lo que garantiza la existencia de la llave única en el fichero de hechos; en los ficheros donde puede existir más de un artículo por cada llave, se asocia a cada artículo un No. de Orden, de manera que se pueda realizar la identificación de los mismos con seguridad.

La base en la mini se mantiene actualizada a partir de la transmisión diaria de ficheros de movimiento, que tienen una estructura semejante a los ficheros maestros pero que además contiene el tipo de tarea a realizar con cada artículo (alta, baja o

actualización) y una marca que indica si debe pasar o no a nutrir los ficheros de registros operativos.

En la minicomputadora se realiza la actualización por sustitución del artículo completo y se logra un proceso eficiente a partir de la existencia de un fichero índice que relaciona los maestros y contiene la llave, el tipo de fichero, el No. de Orden del artículo y la posición lógica del artículo en el fichero en cuestión.

Tanto en la micro como en la mini, se implementó una opción de administración y mantenimiento de la base y los ficheros, lo que garantiza:

- La detección de errores;
- La consistencia de la información en cada fichero;
- La correcta interrelación de ellos.

Esta opción, en el caso de la micro, es "corrida" por el propio usuario y/o el administrador del sistema; en el caso de la mini sólo puede ser corrida en el Centro de Cálculo, es decir no existe como parte del menú al que tiene acceso el resto de los usuarios del sistema.

Con esta opción se satisfacen los siguientes objetivos dentro de cada nivel:

- Verificar la integridad del fichero índice con respecto a los ficheros maestros;
- Verificar la integridad de la radicación de los hechos, personas, víctimas, objetos, guardias operativas, expedientes, técnicas y términos asociados a la misma llave;
- Depurar físicamente los ficheros maestros;
- Detectar los artículos de personas, objetos, víctimas, guardia operativa, expediente, técnica y términos sueltos; es decir, sin ningún hecho asociado.

Para garantizar la adecuada compatibilidad entre los dos niveles se realizan las

siguientes tareas:

- En micro: se obtienen ficheros reducidos con las llaves de los diferentes ficheros de datos y otros campos de interés, para que sean enviados a la mini;
- En mini: se ejecuta una tarea de rastreo de la base provincial mediante comparación con las llaves que envían las micros de las Unidades para determinar incongruencias que pueden darse por ausencia de artículos, duplicidades o alteración de los campos principales.
Este proceso brinda la información necesaria para que el administrador del sistema tome las medidas pertinentes y solucione las diferencias, si existen.

También en ambas técnicas, como una opción del menú, se pueden obtener 7 tipos distintos de estadísticas con formato fijo, pero con un grado de flexibilidad que permite seleccionar el periodo y los delitos deseados cada vez, dándose la posibilidad de obtenerlos por display o impresora.

4. Principales Aspectos del Software

La base técnica utilizada para el desarrollo del sistema fueron microcomputadoras compatibles IBM y minicomputadoras del tipo SM-1420.

El software de la aplicación en sentido general fue elaborado en un porcentaje alto para fines específicos, aprovechándose además las facilidades y posibilidades de los sistemas operacionales utilizados; en el caso de las micros se utilizó como medio fundamental el MFOXPLUS.

A continuación se hace una descripción mas detallada del aseguramiento de programas en micro y minicomputadora:

Software de Minicomputadora

Medio Técnico : Minicomputadora SM 1420
Sistema Operativo : RSX-11M, Versión 4.1 (1988)
RSX-11M-Plus (a partir de 1989)

Software	Tareas a Resolver
Lenguaje Macro-11 (ensamblador)	<ul style="list-style-type: none">- Actualización de los ficheros maestros- Administración de la base informativa- Cálculo de matrices para tablas estadísticas- Obtención de estadísticas complejas- Módulos de enlace entre diferentes software- Utilitario para manipulación de E/S en disquettes de 5¼ desde la mini
Lenguaje Cobol	<ul style="list-style-type: none">- Edición de salidas estadísticas- Decodificación de salidas en forma de listados
FMS	<ul style="list-style-type: none">- Edición de salidas por display con formato de fichas
Ficheros Indirectos del Sistema Operativo	<ul style="list-style-type: none">- Presentación de pantallas de menú- Enlace de los procesos computacionales- Validación de la conclusión de cada proceso (mediante variables globales)
Base-4 (Tratamiento de Ficheros)	<ul style="list-style-type: none">- Elaboración de procesos computacionales sobre los ficheros de datos
Utilitarios del Sistema Operativo (RMS y FCS)	<ul style="list-style-type: none">- Elaboración de procesos computacionales en general- Salva de la información- Edición de todos los resultados del sistema
Pogramma Server 11	<ul style="list-style-type: none">- Recepción de la información transmitida desde micro

Características de los Ficheros de Datos

	Ficheros Maestros	Ficheros Indices
Organización	Secuencial (FCS)	Indexada (RMS)
Formato y Longitud	Fijo	Fijo
Forma de Manipulación	Tratamiento de Ficheros	Tratamiento de Ficheros
Acceso para Lectura/Escritura	Directo o Secuencial	Directo

El aseguramiento matemático elaborado para mini realiza el tratamiento sobre 9 ficheros secuenciales relacionados entre sí.

A fin de evitar las clasificaciones sistemáticas, tanto por el tiempo como por los volúmenes, se creó una tabla índice (fichero indexado) que facilita las actualizaciones y garantiza la relación entre estos ficheros maestros.

Los programas se enlazan a través de ficheros indirectos que controlan los códigos de retorno de cada proceso y revisan sistemáticamente la integridad de los ficheros de datos con que se trabaja.

En general, la explotación del sistema se separó en dos módulos:

- uno para los procesos que debe ejecutar el Centro de Cálculo;
- otro para las posibilidades de recuperación de los usuarios finales (analistas de información delictiva y otros funcionarios de las unidades de base).

En el módulo de trabajo del Centro de Cálculo se satisfacen, mediante formato de menú, las tareas siguientes:

- Actualización de los ficheros maestros, los ficheros temporales necesarios y los ficheros índices que garantizan las respuestas inmediatas cuando el usuario las solicita;
- Separación de la información de interés para los registros operativos;
- Salva diaria de la información;
- Administración de los ficheros maestros.

Durante la ejecución de este módulo se tiene en cuenta cuáles procesos terminan satisfactoriamente de manera que si ocurre algún evento que interrumpe la ejecución se pueda continuar el trabajo de actualización desde un punto razonable sin necesidad de comenzar desde el inicio del proceso.

En el módulo de trabajo dirigido al usuario (y que también puede emplear el operador para satisfacer solicitudes directamente desde el Centro de Cálculo) se ofrecen los tres tipos de resultados siguientes:

Comprobaciones

Esta opción da la posibilidad de:

- Buscar los datos de un hecho conociendo el No. Denuncia de interés;
- Conocer los datos de las personas, víctimas, objetos y guardia operativa asociados a un hecho concreto a partir de un No. Denuncia de interés;
- Buscar personas por nombres y apellidos;
- Buscar personas por número de identidad o fecha de nacimiento;
- Conocer la situación de un EFP de interés.

Las comprobaciones "Buscar personas por nombres" y "Buscar personas por número" dan como resultado un listado de los casos que cumplen la condición solicitada y se puede acceder directamente a cada caso ampliando la información del suceso ocurrido mediante la presentación de la información que otorgan las comprobaciones descritas an "Buscar los datos" y "Conocer los datos" con breves manipulaciones por parte del usuario.

Recuperaciones Estadísticas/Descriptivas con Formatos Establecidos

En esta opción se obtienen varias tablas estadísticas por pantalla, del período y del territorio que se desee, permitiendo ampliar la información estadística (cada escaque de la tabla) con un listado descriptivo y decodificado de los principales datos de interés de la tabla en cuestión. A su vez cada línea del listado se puede ampliar con la información que se otorga por los incisos "Buscar los datos" y "Conocer los datos" de las comprobaciones para el caso que se esté analizando.

En este tipo de salida se implementó además una tabla que da la posibilidad de cambiar dinámicamente las filas según las necesidades del usuario.

Tablas Estadísticas para Períodos Mensuales

Esta opción permite obtener tablas estadísticas con formatos establecidos, generalmente para períodos mensuales, con la característica de que se pueden solicitar diferentes rompimientos según las tipicidades delictivas de interés para el análisis, permitiendo agrupar varios delitos en una misma tabla, darlos separados y obtener tablas de restos y totales de manera directa en una misma corrida, también se pueden obtener de manera separada las estadísticas de las tipicidades definidas como graves.

Los tipos de resultados "Recuperaciones Estadísticas" y "Tablas Estadísticas" están separados de manera que cada usuario desde su terminal pueda definir sus propias estadísticas o recuperaciones sin interferir al resto de las terminales.

En caso de error durante la ejecución de un proceso, se muestra por pantalla el código del error ocurrido y el nombre de los ficheros implicados, lo que facilita su ubicación y posterior arreglo.

Software de Microcomputadora

Medio Técnico : Microcomputadora compatible IBM

Sistema Operativo : MS-DOS, Versión 3.1

Software	Tareas a Resolver
MFOXPLUS (FoxBase multi-usario)	<ul style="list-style-type: none">- Captación y validación de la información- Almacenamiento de la información- Salidas estadísticas- Salidas decodificadas en formato de fichas o en listados- Tareas de administración con múltiples ficheros
Lenguaje Pascal	<ul style="list-style-type: none">- Salidas estadísticas
Lenguaje C	<ul style="list-style-type: none">- Salidas estadísticas complejas- Editor de filas/columnas para salidas estadísticas de formato flexible- Tareas de administración con tratamiento de ficheros voluminosos
Procomm	<ul style="list-style-type: none">- Transmisión de información hacia la mini
Ficheros en Lote del Sistema Operativo	<ul style="list-style-type: none">- Enlace de módulos de diferentes software
Utilitarios del Sistema Operativo	<ul style="list-style-type: none">- Salva de la información

El software de microcomputadora se caracteriza por:

- Ser el encargado de garantizar la captación de los datos y asegurar un nivel de calidad máximo de la información que se tendrá en todos los niveles. Esto se asegura con fuertes mecanismos de validación y de administración de la base de datos;
- Estar orientado a personal que no tiene conocimientos de computación

(funcionarios de base) los cuales satisfacen las tareas planteadas mediante la selección de opciones que se van presentando en pantalla a través de sucesivos menues anidados.

En el proceso de captación se garantiza la validación de términos legales ajustados al Código Penal vigente en el país; ésto significa que se captan y validan determinados datos si la tipicidad es grave y otros si es leve, así pasa también con los datos relativos al nivel de competencia que procesará la denuncia formulada y otros.

Para el almacenamiento de la información y el mantenimiento de los ficheros índices se aprovechan las posibilidades que ofrece el MFOXPLUS.

El módulo de administración en microcomputadora satisface los objetivos generales que se plantean de manera funcional para ambos niveles y además, por ser este el nivel donde se capta la información se requieren tareas tales como:

- Chequeo del completamiento de los campos más importantes;
- Chequeo de la presencia de artículos en ficheros maestros asociados al fichero de hechos en los casos que lo requiera para alertar ante casos de asesinatos sin víctimas, hurtos sin objetos sustraídos, etc. que pueden estar dados por falta de información a la máquina.

Las salidas del módulo de administración son resúmenes estadísticos de los problemas que se analizan y además listados detallados con las llaves de los casos problemáticos lo que permite al funcionario y/o al administrador resolver estas situaciones.

La información procesada en la micro se envía a la mini utilizando el Procomm, con protocolo Kermit; a partir de 1989 se cuenta con la posibilidad de leer y escribir en la mini floppys de 5¼" con formato IBM.

El otro aspecto voluminoso del software de micro es lo relativo a las salidas que se brindan. Se pueden agrupar en:

Comprobaciones

Estas salidas dan todos los resultados en forma de fichas y se pueden resolver las siguientes tareas:

- Conocer los datos de un hecho de interés;
- Conocer las personas, víctimas, objetos y guardia operativa asociadas a una denuncia de interés;
- Buscar personas por nombre y apellido;
- Buscar personas por número de identidad;
- Búsquedas temáticas.

Salidas con Formato Fijo

En estas salidas se encuentran tablas estadísticas que sirven para apoyar el trabajo de dirección de las fuerzas policiales, conocer las características fundamentales de la población que delinque, conocer la situación del trabajo de la guardia operativa. Además, se obtienen una serie de listados descriptivos acerca del cumplimiento de los términos legales con el objetivo de alertar cuales son los casos próximos al cumplimiento del término legal correspondiente y evitar así violaciones en este sentido, tanto para hechos graves como para hechos leves.

Tablas Estadísticas para Períodos Mensuales

Los objetivos que se alcanzan con este grupo de tablas son los mismos planteados en el software de mini para este tipo de resultados y se tienen en cuenta las mismas facilidades procesándose en este caso la información del territorio en cuestión.

Teniendo en cuenta las necesidades estadísticas en cuanto a la diversidad de formato de las tablas y la obtención de la respuesta y su programación en el menor tiempo posible se desarrollaron dos medios aplicables a cualquier fichero con estructura DBF (dBASE III). Sus características son:

- Marginal: Permite marginar un fichero, DBF por campos o segmentos de éstos, incluir una condición como filtro para el conteo de las frecuencias, dar los

resultados decodificados, extraer los 15 valores más frecuentes de lo que se esta marginando y con ellos obtener 5 tipos de gráficos para apoyar esta información estadística;

- Gentabla: Generador de tablas estadísticas con posibilidades de obtener resultados estadísticos, recuperación por escaques, gráficos y otras facilidades.

**DELEGATION
OF
FINLAND**

Report

by

Helena Saari

Helena Saari
Bureau of Data Management
Ministry of Justice
Finland

COMPUTERIZATION OF CRIMINAL JUSTICE INFORMATION IN FINLAND

1. Background Information

The highest state organs in Finland are:

- The Parliament;
- The President of the Republic;
- The Council of State and the Ministries;
- The Judiciary.

1.1. Ministry of Justice

The Ministry of Justice is one of the 12 ministries. The departments are:

- General Management Department (budgeting, housing, personnel, central services for the ministry, elections, criminal records, register on foundations, register on associations, register on parties etc.);
- Legislative Department (drafting of constitutional legislation, criminal law, law of procedure, basic rights etc.);
- Department of Judicial Administration (budgeting, housing and administrative services for the courts and other bodies in the legal system, collection of fines, distraint, electronic data processing services for the judicial administration etc.);

- Prison Department (budgeting, housing and training personnel for prison management, execution of prison sentences);
- Accounting Division (salaries, accounting services, etc.).

1.2. Courts

There are two kinds of court procedures in Finland:

- Court procedure for civil and criminal cases;
- Court procedure for administrative matters.

The courts are independent. The Ministry of Justice can give regulations and orders in administrative matters.

General courts:

- Courts of first instance:
 - Circuit Courts and City Courts;
 - Housing Courts.
- Courts of Appeal;
- The Supreme Court.

1.3. Execution of Sentences

- Execution of fines;
- Execution of prison sentences.

The Ministry of Justice and The Ministry of Internal Affairs are responsible for the execution of fines. The Ministry of Justice, the Prison Department, is responsible

for the execution of prison sentences, i.e.:

- Stage before entering the prison;
- Stage while staying in prison;
- Stage after release.

Institutions in the prison system:

- Closed Prisons:
 - Prisons;
 - Special Security Section;
 - Prison for Juveniles;
 - Prison Mental Hospital.
- Open Institutions:
 - Open Prisons;
 - Labor Colonies.
- Prison Personnel Training Center;
- Probation and After-Care Association.

2. Policy and Strategy in the Computerization of Criminal Justice

2.1. Principles

- Electronic data processing systems, which support the primary functions of the bodies in criminal justice, have the highest priority;

- Electronic data processing systems shall improve the service to clients, make the functions more efficient and be economic;
- Data processing shall be reliable and improve the legal safeguards of the clients;
- Computerization shall be developed in close co-operation with constituent groups;
- The Ministry of Justice must be independent and seek open and decentralized applications.

These principles have not been expressed as a strategy, but are commonly accepted within the Ministry of Justice.

2.2. Tendencies

- The costs of administration are high in Finland and more efficiency is needed. To reach this goal, a new approach has been adopted by the government: the management-by-result policy. Instead of detailed budgets and strict monitoring by the Ministry of Finance each ministry will have free hands to reach its objectives within their budgets.
- This new approach covers electronic data processing, too. The ministries and other state bodies can organize their own functions within given guidelines and confirmed standards.
- The management-by-result policy is a difficult task for the management on all levels. They have to settle objectives, define strategies and to share the resources in a fair and reasonable way. They have to be able to measure the results and draw the right conclusions.
- Electronic data processing systems support the basic functions of judicial administration in Finland. They produce information on activities. The aim in designing has been functionality. Less emphasis has been laid on the needs of management. It is a great challenge to modify the systems so that they

produce information for the management, too.

- Co-operation between research, decisions making, users and electronic data processing services must be improved in order to carry out the changes.

3. Objectives

The objectives mentioned below are in general common to all the systems.

Objectives:

- To give better service to the clients;
- To promote the uniformity of the application of the law and enforcement;
- To reduce bureaucracy and unnecessary handling, search and reproduction of documents within and between authorities;
- To improve accessibility of information for decision making both on central and local level;
- To give the authorities a tool for monitoring the execution process as well as single cases;
- To simplify the organizational structure and to improve the manageability and efficiency of court procedures and enforcement.

4. Description of Systems

4.1. The scope of Computerization in Criminal Justice in Finland

Electronic data processing systems in judicial administration in Finland have been operational since 1972. At present the main centralized systems are operational nearly in full scope. By the end of 1992 courts, prisons and other offices (prosecutors excluded) in judicial administration will have computer equipment.

The present total number of systems in judicial administration is about 25, 10 of these can be considered large. The number of mainframes and office computers is about 20, the number of microcomputers 1,200 and the number of terminals about 750.

The systems implemented up to-day serve mainly the primary functions, judicial decision making, enforcement of judgments. In the near future more emphasis will be laid on administrative applications (office services, network services, systems for staff management, accounting etc.).

The role of computerization is vitally important in administration. In addition to training of personnel it is the main tool for developing and rationalizing the administration.

4.2. Systems

Existing main systems in criminal justice are:

- Court Decisions System;
- Collection of Fines System;
- Execution of Fines System;
- Execution of Prison Sentences System;
- FINLEX Data Bank;
- Criminal Records System;
- Court Case Management System;
- Register on Sentencing Policy.

Court Decisions System

The Court Decisions System handles sentences of courts of first instance and courts of appeal in criminal cases. The system comprises:

- Storage of end result data on sentences in criminal cases as well as output of court decisions and notifications of decisions;
- Machine language and hard copy distribution of stored decision notification data to a great number of authorities and data systems.

The Court Decisions System produces the conclusion of the decision. The system transmits the data to the prison authorities, to the Fine Collecting System, the Criminal Records System, the Central Motor-Vehicles Register and some other departments or agencies. The same data in the conclusion of the court decision will be available to the litigant and all the parties needing the information of the decision. The same data are forwarded to the higher courts, too. The system is also used to obtain information on the accused during trial.

The system is a centralized one. The court personnel, judges as well as office personnel, have access to the register. Though the office workers enter the data in the register, the judge or the assistant to the judge is responsible for the case being entered correctly.

The system improves the quality on data, reduces the amount of work and the number of errors, makes the enforcement process more efficient and shortens the handling time.

Summary Penal Order System

By means of the Summary Penal Order System, data on the decisions of judges who pass summary penal orders are transmitted to the authorities who require this information. In Finland a judge deals with summary penal matters, of which there are some 250,000 each year.

Data on the decisions of judges in charge of summary penal matters are transferred in machine language to the enforcement authorities, the Central Motor-Vehicle Register and the Central Statistical Office. Data on the decisions in summary penal

matters are stored in the court decision register from the duplicate copy of the penal order in the Bureau of Data Management of the Ministry of Justice. Payment data are obtained from the postal savings bank (Postipankki) in machine language form. This enables to compare the summary penal order information and the related payment data in the Collection of Fines System.

The function of the Summary Penal Order System is parallel to the Court Decisions System. The system runs on the State Computer Center mainframe.

The introduction of the Summary Penal Order System has rendered enforcement more effective because the flow of information has been streamlined and speeded up. Piling up of enforcement matters has been eliminated. The simplification and speeding up of the flow of information has been accompanied by improving the freedom from error of enforcement matters.

Collection of Fines System

The Collection of Fines System is part of a large data system, which is comprising the Court Decisions System, the Summary Penal Order System and the Collection of Fines System.

Data on fines to be executed come in machine language from the Court Decisions System and the Summary Penal Order System. If the fine has not been paid after issuance of a payment reminder, the system produces a writ of execution, which is sent to the bailiff's office for collection. This initiates the enforced collection phase.

The system speeds up the collection of fines by handling routine cases without human measures. Thus, the authorities can concentrate their effort on complicated cases and fines that have been unpaid for a long time.

The system is a centralized one and runs on the State Computer Center mainframe.

Distrain

Distrain is traditionally a means of executing court decisions in civil cases. Nowadays unpaid taxes are also collected by means of distrain measures, as well as certain fees for public services, and fines.

Distraint is carried out by the distraint organization under the Ministry of Justice and the Ministry of the Interior. The executive officers for the execution of distraint are in the first instance district officials (nimismies) in the countryside and in the new cities and the city bailiffs in the old cities. Certain distraint cases are in first instance executed by a higher execution authorities, the country administration and the city administration in the old cities.

The system is a centralized one and runs, like the other centralized systems, on the State Computer Center mainframe.

Criminal Records System

The Criminal Records System is not yet computerized. The current manual card-index Criminal Records System comprises information on persons who have been sentenced to unconditional imprisonment, decisions of dismissal from office and some rare cases with other sanctions. The register contains personal data, data of the crimes committed and the punishment. These data are provided by the Court Decisions System. The prisons transmit data on the execution of the sentences. The Central Population Register sends notices of changes in personal data.

The length of the period a person will be registered in the Criminal Records System varies from 10 years to lifetime, depending on the severity of the crime.

Information from the Criminal Records System can be given only to authorities or persons for purposes stated by the law, such as:

- Sentencing;
- Prosecution;
- Coercive means;
- Execution of prison sentences;
- Some administrative cases.

A person can verify his data in the register. He is entitled to have an extract of his

data in the system, too, for defined reasons.

Computerization of the Criminal Records System is in the process of development. An electronic data processing system will be operational in the near future. The system will exploit the data of the Court Decisions System and the Prison Sentences System (see below). It is a centralized system and will contain data of about 150,000 persons.

The objective of the system is shortening the handling time in the courts by reducing the number of postponements of the trials caused by incomplete extracts of criminal records.

Decision Support Expert Systems

The Ministry of Justice has carried out preliminary studies in expert systems. In general, it seems advisable to build an expert system for decision support if the organization meets the following qualifications:

- The application area can be defined clearly;
- There are persons who can give rules to solve the problem or to make a decision;
- Problem solving or decision making effort is time consuming and error-prone;
- Problem solving or decision making is routine work;
- The number of qualified persons to solve the problems or to make the decisions is too restricted;
- Training is time consuming and too expensive;
- The expert system will be profitable;
- Save of costs, time, personnel;
- Improved competition ability;

- Existing data systems can be exploited;
- The organization is mature for new techniques;
- Member(s) of the organization promote new ideas;
- End-users insist on using electronic tools;
- The project is in capable hands;
- The management of the organization supports the project and is willing to invest in it.

Possible application areas for expert systems in judicial administration would be:

- Intelligent search of precedents in the Finlex Data Bank;
- Sentencing policy of the courts (fines, prison sentences, conditional sentences, parole);
- Calculating of time of release in case of prison sentences;
- Planning of legislation.

There are only few operational expert systems or pilot projects in this area. Legislation on state loans for the purchase of agricultural land proved so complicated that an expert system has been developed and implemented for this purpose. The Ministry of Justice considers exploiting the experiences of this project.

Electronic Data Processing Systems in Prison Administration

The Prison Sentences System covers the entire execution procedure of prison sentences:

- Stage preceding imprisonment (register of sentences to be executed);
- Postponements (register of postponements);

- Placement in open institutions;
- Arrest warrants;
- Imprisonment (register of inmates);
- Cumulative files;
- Search files;
- Probation (register of young offenders under supervision);
- Statistics.

Inmates are registered in the same way in all types of penal institutions and for all kinds of sentences. Some establishments have sections far way from the main institution but their enforcement duties with regard to decision making, registering and transfer of documents is taken care of at the main institution.

The date of release is calculated manually at the penal institution because regulations regarding this matter have been considered too complicated for converting to electronic data processing. This enforcement duty is incumbent upon the governor of the institution. There have been plans to build an expert system to calculate the date of release.

Basic data on the person held in custody are obtained from the court or from the prisoner's pass issued by the police and are recorded in the provincial prison to which the offender has been remanded.

Data on unconditional prison sentences to be served are registered centrally at the Prison Department of the Ministry of Justice. The enforcement warrant issued on the strength of the decision of the court, is sent to the distraint officer or to the prison, if the sentenced person is already in prison. The distraint officer orders the sentenced person to report himself at the prison. In case the officer can not locate him the documents are transmitted to the Prison Department for further inquiries. The police issues an arrest warrant on request when necessary in the Register of

Persons Wanted by the Police.

The Prison Department and the prisons can not directly access this register for inquiring from their own terminals.

The Prison Department supervises the enforcement process and registers all the steps taken. Cases remain in the register until the prison reports the receipt of the sentenced person or until they are removed on legal grounds. A case can be closed because of pardon, because the sentence is barred by lapse of time or because of the decease of the offender. Fine defaulters are included in the local registers but not in the central register of sentences to be executed.

The centralized search register at the Prison Department enables swift locating of inmates and answering inquiries. Some data will be transferred after release to cumulative files of the Prison Department and will be available in machine language at the beginning of a subsequent term of imprisonment.

In the institution to which the sentenced person has been committed by the distraint officer his data are recorded on the Prisoners' Computerized Personal File which is drawn up on the day imprisonment has begun. Each prison keeps its own local files. The data on the sentences to be enforced are taken from the Court Decisions System in machine language through the centralized registers of the Prison Department. Some data on new sentences has to be keyed into the local registers from the enforcement warrant, until the Court Decisions System covers all courts. Inmates in the local registers are either remand prisoners, serving an unconditional sentence, fine defaulters, or a combination of these.

Postponement is granted by the Prison Department. The Department keeps a computerized register on postponements for filing, registering, dealing with and supervising cases of postponed enforcement. Approximately 3,000 cases are recorded annually. Every step taken in the case is recorded on the register. This register will be merged with the register on sentences to be executed in the near future.

An inmate is committed to a particular institution according to sex, age, residence, number of previous sentences, length of sentence and ability to work. Closed

prisons do not have any kind of a booking system but must always have capacity to accommodate new inmates. This is possible by allowing overcrowding and by placing more inmates in a cell than it is supposed to accommodate. Overcrowding is common during winter and is not evened-out between prisons.

The Prison Administration would prefer a balanced use of accommodation facilities. Even though the new system does not include a booking system, it permits the use of legislative measures to postpone less urgent cases in order to balance the use of accommodation facilities.

Placement in an open institution is decided on by the Prison Department. There are more applications for commitment to open institutions than there are places. The optimum use of open institutions is hindered by the fact that the placement decisions are sometimes cancelled just before commitment because of a postponement or a new sentence imposed on the inmate. The new system keeps record on these and, thus, makes it easier to use the whole open institution capacity.

The court can determine that a young offender, who has a conditional prison sentence, be placed under supervision for a certain period. Data on these sentences come in computer language from the Court Decisions System. The register runs on the Prison Department's central computer. The Prison Department works in close cooperation with the Probation and After-Care Association.

Finlex Data Bank

Finlex is a legal data bank applicable to Finland. The Ministry of Justice's Bureau of Data Management, which collaborates closely with several data producers, develops and maintains the Finlex database.

The current contents include the following public data registers:

- Statutes:
- Suomen Laki ("Finnish Law") registers;
- International treaties and agreements (Finntreat);

- Parliamentary debates on legislation.
- Registers of case law:
 - General Courts:
 - Two registers of Supreme Court sentences (one each in Finnish and Swedish);
 - Registers of sentences of the Courts of Appeal;
 - Administrative Courts:
 - Supreme Administrative Court precedents register;
 - Provincial Courts case register;
 - Special Courts:
 - Land Courts case register;
 - Two Marketing Court case registers (one each in Finnish and Swedish);
 - Labour Court case register;
 - Insurance Court case register;
 - Administrative Authorities:
 - Central Tax Board precedents register;
 - Consumer protection authorities case reports register;
 - Other Registers:
 - Register of case law in literature;
 - Bibliographia Iuridica Fennica;
 - Nordiske Domme i Sjøfartsanliggender (Nordic Decisions in Shipping Matters);
 - Register on Sentencing Policy.

Work is constantly being done to develop the contents of Finlex both quantitatively and qualitatively. One particular aim is to increase the volume of statute material which it contains.

Finlex data bases can be accessed directly by means of different types of terminals and modem links. The most flexible way of accessing the system is to use a terminal

with a video display unit and keyboard, and by attaching a printer one can obtain the data on paper. A printer terminal, word processor, microcomputer or videotext terminal can also be used.

Information on cases and other data in Finlex are accessed by common language keywords. Any word contained in the register files can be used to access the register. Thus, words comparable with keywords are file codes and references to law appearing in texts.

The Finlex database is at the service of administrative authorities, lawyers, courts, industrial companies, banks, insurance companies and other bodies and private citizens who need up-to-date and accurate information on valid law and the administration on justice.

Register on Sentencing Policy

The Register on Sentencing Policy has been implemented recently. This register has been developed by the Statistical Central Office in co-operation with the Ministry of Justice and the State Computer Center. It is a sub-system of Finlex.

The data base contains statistical tables on sentences in criminal cases (summary penal orders are excluded). The information covers the years from 1986 on. Each document (sentence) contains: description of the crime, type of the punishment, case information as to the penal scale and the average penalty.

The system is meant for judges and researchers.

Court Case Management System

A Court Case Management System is in the process of developemt. It is planned to keep track of cases and is, thus, an administrative tool for the management of the court.

Recent legislation on criminal court procedures is ordering, that all the pending cases of one defendant should be handled by the same court in the same trial. If not, a new trial is needed to combine the decisions to a single one. The new case management system will provide this possibility. The registers are local, but a network plus a central index will facilitate this function.

5. Technical Information

5.1. Centralized Systems in the State Computer Center

The Ministry of Justice, the courts, the fine collection and distraint authorities make use of the mainframe services of the State Computer Center.

- Hardware : IBM-mainframe
- Software : Database management:
IDMS, VM
Information retrieval:
MINTTU
Telecommunication:
VTAM

5.2. Courts

- Hardware : Workstations:
IBM PC XT, AT, PS2
Nokia Mikro-Mikko
IBM Wheelprinters/Proprinters
Canon LBP laser-printers
- Software : Text processing:
TEKO, WordPerfect or
DisplayWriter
- Operating system : PC/MS-DOS
Emulation: SNA 3270
- Network : Token Ring (IBM)

The local micro networks and terminals are connected to the mainframe using a sophisticated network with fast lines, district nodes and monitoring services. This network, called "the Data Highway" is furnished by the State Computer Center.

Supported protocols are IBM SNA and NAX-DECNET. There is a strong pressure from the state to adopt ISO/OSI standards in telecommunication, too.

5.3. Prison Department: Central Prison Management Computer Services

- Hardware : Wang VS/7010 office computer
- Software : Wang PACE application generator
Output (documents) in text processing mode
Some special features programmed in Cobol
- Telecommunication : Wang WSN-protocol Prison Department <--> Prisons
IBM SNA 3278 emulation Prison Department <-->
State Computer Center
Lease lines; partly X.25 protocol

5.4. Prisons

The local module of the system is operational in the largest prisons only.

- Hardware : Wang VS/5 or VS/5000-series office computers
- Software : The local module of the system has been developed using text processing as application program. Text processing was the only method flexible enough to allow the variety of the data needed at a reasonable price
- Telecommunication : See above.

6. Development and Management of Projects

All main systems in judicial administration have been developed in projects with representatives from the Ministry of Justice, end-users and a software house (either State Computer Center or other software house). The Ministry of Justice does not have its own software specialists. In most projects the project management was at

judges from courts, being specialists in the application area. The Ministry of Justice supplies other resources and finances for recruiting outside consultants. In addition to permanent project members there have been temporary assistants (end-users) in the project groups, too.

Standard software and application generators are used when possible. Final procurement of the software is done by the Ministry of Justice in co-operation with the software house involved.

User-friendliness of the centralized systems is not the best possible. The centralized systems have been operational for years and they have been planned for fixed function terminals. Microcomputers have replaced them nowadays and text processing is a major function. The users criticize the old systems for lack of text processing features in updating the data bases. It has proved too expensive and complicated to change the systems so that updating could be done by text processing. At designing the new systems special attention has been paid to integration of text processing and data bases.

The Ministry of Justice uses the services of the State Computer Center and, thus, has restricted possibilities to influence the choice and methods of standard multi-user services.

The Bureau of Data Management of the Ministry of Justice is responsible for system maintenance. For each application one or more persons are assigned at both the ministry and the contracted software house. If maintenance requires changes in the software, this will be done by the software house.

7. Impact of Legislation

In Finland the main statutes regulating data systems in judicial administration are:

- The Act on Publicity of Public Documents;
- The Data Protection Act;
- The Statutes on Court Procedures and Execution of Sentences.

The principles of publicity of administration are expressed in the Act on Publicity of Public Documents. All public documents are open to any citizen. Exceptions of publicity principle are mentioned in the act. For instance the publicity of criminal records and prisoners records is restricted. The same rules regulate both data bases and storing confidential data.

The Data Protection Act is of recent date. This act had, however, no impact on the then operational systems in judicial administration because the principles of data protection have been adopted in data processing from the early days of system development.

Legislation on court procedures and execution of sentences set, in some cases, demands on the structure of data bases. For instance, when storing court decisions, the status of the publicity and the ability of changing decisions differ according to the phase of the procedure. The structure of the data base and the data system handling court decisions are complicated. Adoption of data processing in courts has focused a problem on signatures. All court decisions must be signed when sent to the execution or other authorities. Now data systems prepare the documents and exchange data on court decisions. Signatures can not be exchanged in traditional meaning through data systems. In Finland, there is in several cases a special paragraph in the act stating that a computerized signature is as valid as a hand written one.

8. Evaluation of the Effects of the Introduction of Computers in Criminal Justice

Experiences in EDP-systems in Criminal justice :

- Personnel:
 - Number of office workers has reduced;
 - The structure of personnel has changed, more training and new skills are needed;
 - Difficulties in finding substitutes for persons in key positions;

- The state cannot compete with the private sector on trained personnel with knowledge in electronic data processing;
- Costs/benefits:
 - Costs have not been reduced as expected, on the other hand the service level has been improved;
 - It is difficult to make reliable calculations and to control the costs;
 - Centralized systems have become more popular than expected and their running costs have increased;
 - Some parts of the network software have proved immature and defective and it has been time and effort consuming to make the software function sufficiently.

The most laborious detail has been print-outs from central registers to the local network printers.

No measurable benefits are expected in the near future. In the long term the increase of costs will be cut. Main benefits will be improved service of the public, motivated workers and more efficient and economic functioning of the administration.

Training the users is one of the main problems and a restricting factor in implementing electronic data processing systems. The Ministry of Justice organizes and finances all the training in courts and other offices in the judicial field. There are two training paths: training of end-users and training of system managers (end-users with an in-depth training). The training is given in several phases and starts with text processing. There are specialized instructors for each system. The training resources are insufficient. Lack of training personnel restricts the speed of training new units and exploiting existing systems.

The Courts of Appeal have made a new approach to training. A group of judges and other end-users in courts are given comprehensive training. The trainees are also trained in didactics so that they in turn can take over the training responsibility in

their courts. The training program will also help the persons to understand the functions and the possibilities of the electronic data processing systems better and thus improve the results of the METO-study.

With regard to the impact on decision making has to be mentioned:

- The quality of substantive decision making has improved;
- Administrative decision making on projects is often based on insufficient information and presumptions and gives inadequate results.

With regard to the impact on the organization:

- The traditional sector-based organization model is not workable in building and implementing large systems comprising many authorities or functions; a support organization is needed;
- One of the great problems is to modify the existing organization to embed the electronic data processing functions.

Most electronic data processing systems in the judicial administration are nationally unique and bound by the national law. Technical know-how is available, but experience on similar systems is available only from other countries. The problem is how to eliminate the impact of national law on the systems.

The present systems have been designed 5 to 10 years ago, they are partly tailor-made and based on techniques and ideas from the 1970s. The systems should be and are re-built. Maintenance of the existing systems requires the main part of the available resources, both money and staff. Very small resources are available for developing new systems or making major changes in existing ones. Thus, there is a tendency that computerization becomes a stagnant factor and an obstacle for development. The new management-by-result policy should give more flexibility to decision makers to organize the needed resources.

On the other hand the rate of change in information technology is fast. Electronic data processing specialists struggle with an increasing number of problems in

pursuance of compatibility of the old existing and new advanced technology.

**DELEGATION
OF
FRANCE**

Report

by

François Franchi

François Franchi
Parquet du Tribunal de Grande Instance Paris
France

L'INFORMATISATION DE LA JUSTICE PÉNALE EN FRANCE

1. Avant-Propos

L'introduction de l'informatique dans le domaine judiciaire remonte à une quinzaine d'années. Celle-ci s'est effectuée sous la direction et le contrôle de la Chancellerie, dans le cadre de schémas directeurs permettant de définir les priorités et de planifier les réalisations.

La justice pénale a bénéficié d'une place prépondérante dans ces projets en raison de l'augmentation de la charge de travail des juridictions pénales et du caractère répétitif des informations traitées (réutilisation des données au cours des diverses étapes de la procédure; édition de documents répétitifs).

Deux schémas directeurs se sont déjà succédés:

- 1979-1983
- 1984-1988,

et le troisième est en phase de mise en oeuvre pour la période:

- 1990-1994.

2. Les Schémas Directeurs

En comparant les trois projets, on constate que le premier a favorisé le développement de gros systèmes informatiques dans les plus grandes juridictions; le second s'est orienté vers l'équipement de juridictions de taille inférieure à l'aide de mini-ordinateur; le troisième vise à prendre en compte les évolutions techniques en

remplaçant les systèmes actuels devenus obsolètes et favorise la communication entre différentes applications par une normalisation.

3. Premier Schema Directeur

Le premier schema directeur (1979-1983) a eu pour objet la mise au point d'applications sur de gros systèmes informatiques destinés à permettre de résoudre le problème de la gestion de la masse des procédures et des données pour les juridictions les plus grandes:

- Bureau d'ordre de la région parisienne, dit BOP, gérant les tribunaux de Paris, Creteil, Nanterre, Evry, Bobigny et Versailles à partir d'un site central;
- Casier judiciaire national de Nantes.

Ces applications tournent sur des matériels Iris 80 biprocesseur et DPS 7 de la Société Bull, avec un système d'exploitation Siris 8, et un moniteur transactionnel Stratège.

4. Deuxième Schema Directeur

Le deuxième schema directeur (1984-1988) s'est orienté vers l'équipement de juridictions de taille moindre, à l'aide de mini-ordinateurs, en ajoutant aux fonctionnalités initiales (fichiers-éditions) des outils de gestion des procédures (fabrication des actes de poursuites ou des jugements par exemple).

Mais parallèlement, des juridictions se sont lancées dans des expériences informatiques en constatant l'impossibilité pour la Chancellerie de satisfaire leurs demandes dans l'immédiat ou de couvrir leurs besoins spécifiques. Elles ont su profiter de l'explosion du marché de l'informatique (hard- et software) dont les progrès ont incontestablement facilité l'entrée et l'utilisation de cette technique dans les palais de justice. De ces expériences, il est possible de présenter plusieurs aspects:

- La Chaîne Pénale Informatisée;
- Le Contentieux des Requêtes;
- La Gestion du Dépôt Légal;
- La Gestion des Affaires Financières.

La Chaîne Pénale Informatisée

Réalisation: Ministère de la Justice, Direction des Services Judiciaires.
Implantation: 67 Tribunaux de grande instance (de moyenne importance).
Matériel: Forum multipostes (5 à 10 postes).
Système
d'Exploitation: Prologue II.
Logiciel: Edifich II (Société CIEE).
Objet: L'Application permet la gestion automatisée de la chaîne pénale depuis l'enregistrement initial de la procédure jusqu'à l'édition des pièces d'exécution des peines.
Fonctionnalités: Enregistrement initial des plaintes et procès-verbaux,
Suivi des affaires,
Alertes et relances automatiques,
Recherche de précédents,
Statistiques locales et nationales,
Éditions automatisées.
Spécificités: Fichier commun mis à jour en temps réel par tous les postes de travail.

Le Contentieux des Requêtes

Réalisation: Ministère de la Justice, Direction des Services Judiciaires;
Tribunal de Grande Instance de Paris.
Implantation: Tribunal de Grande Instance de Paris.
Matériel: Forum V.V Biprocesseur: 12 postes de travail.
Système
d'Exploitation: PROLOGUE II.
Logiciels: EDIFICH II (Société CIEE).

- Objet:** L'Application permet une gestion complète et automatisée des requêtes intervenant postérieurement au jugement pour aménager la peine.
- Fonctionnalités:** Recherche des précédents,
Alertes et relances automatiques,
Mise en état de la procédure,
Éditions automatisées,
Statistiques.
- Spécificités:** Croisements des données: aide à la décision par le chaînage des écrans.

La Gestion du Dépôt Légal

- Réalisation:** Cellule Informatique du Parquet du Tribunal de Grande Instance de Paris.
- Implantation:** Tribunal de Grande Instance de Paris.
- Matériel:** Micro-ordinateur GOUPIL monoposte.
- Système d'Exploitation:** MS DOS
- Logiciel:** FOXBASE
- Objet:** L'Application a pour objet de gérer le dépôt légal du Parquet, s'agissant tant de la presse écrite que de l'audiovisuel et des services télématiques.
- Fonctionnalités:** Gestion des fichiers,
Instruction des demandes,
Éditions associées,
Statistiques.
- Spécificités:** Aide à la décision conservation de l'historique.

La Gestion des Affaires Financières

- Réalisation:** Cellule Informatique du Parquet du Tribunal de Grande Instance de Paris.
- Implantation:** Tribunaux de Grande Instance de Paris et Evry.
- Matériel:** Micro-ordinateur GOUPIL monoposte.
- Système d'Exploitation:** MS DOS.
- Logiciel:** FOXBASE.

- Objet:** L'Application a été conçue pour gérer la masse des affaires relevant de la délinquance financière et attribuée en général à un service autonome.
- Fonctionnalités:** Recherche des précédents concernant tant les entreprises que leurs dirigeants,
Alertes et relances automatiques,
Suivi des procédures,
Éditions associées,
Statistiques.
- Spécificités:** Outil de traitement de texte associé.

5. Troisième Schema Directeur

Le troisième schema directeur (1990-1994) est plus ambitieux. Il repose sur:

- Une modélisation des activités du Ministère de la Justice;
- Une évaluation de l'existant informatique;
- L'Adoption d'une même méthode unique de conduite de projet.

Modélisation des Activités de Ministère de la Justice

Quinze domaines de gestion regroupés en trois familles ont été identifiés:

- Famille "Pénal et Mineurs";
- Famille "Civil, Commercial et Social";
- Famille "Administration".

La famille "Pénal et Mineurs" couvre:

- cinq domaines:
 - décider et contrôler les mesures d'assistance éducative pour les mineurs;

- mettre en oeuvre ces mesures;
 - sanctionner;
 - exécuter les décisions pénales;
 - tenir le casier judiciaire.
- trois applications:
- la Nouvelle Chaîne Pénale;
 - le Casier Judiciaire National;
 - le Greffe Pénitentiaire.

Évaluation de l'Existant Informatique

Le Ministère de la Justice dispose de 42 applications de gestion dont un tiers couvre le domaine de la justice pénale. Ce dernier juxtapose des systèmes se caractérisant par des conceptions différentes, des matériels différents et des logiciels différents, ce qui a notamment pour conséquence d'accroître les coûts de formation des personnels et de maintenance des matériels ainsi que de compliquer les transmissions de données par liaisons télématiques. Ces applications sont en outre souvent inadaptées et incomplètes, ce qui a conduit à l'idée de concevoir de nouvelles applications avec une seule et même méthode de conduite de projet.

Adoption d'une Méthode de Conduite de Projet

Le Ministère de la Justice a opté pour la méthode de conduite de projet Mérise (Société Gamma International), laquelle présente les caractéristiques suivantes:

- Méthode systémique: l'analyse se fait par les échanges (la description d'un système par ses fonctions et son environnement);
- Méthode séparant les données (qui mémorisent l'information), les traitements (qui transforment l'information), et les communications (qui transmettent l'information), la description se faisant toujours sous ces trois aspects;

- Méthode allant du général au particulier:
 - en passant du niveau conceptuel (choix de gestion), au niveau organisationnel (choix d'organisation) et au niveau physique (choix technique)
 - en suivant trois étapes:
 - les études préalables reposant sur une analyse par domaine et la recherche de solutions d'organisation,
 - les études détaillées passant par une réflexion socio-technique des postes de travail, la conception des outils logiciels, la description des traitements et des fichiers,
 - la réalisation informatique revenant à traduire en langage informatique le résultat des études détaillées.

6. La Nouvelle Chaîne Pénale

Le module central de ces nouvelles applications informatiques est constituée par la Nouvelle Chaîne Pénale. Il s'agit de l'outil qui enregistre, en premier lieu, les données relatives à une affaire, à une procédure et aux personnes en cause.

Le module concernant le Casier Judiciaire National a pour objet de gérer le fichier des condamnations et de permettre un certain nombre de traitement (contrôle de légalité des décisions: prise en compte de l'amnistie...). Il sera alimenté par les juridictions grâce à une liaison télématique et pourra être consulté, de la même façon, par celles-ci, et ce en permanence.

Le module Greffe Pénitentiaire a pour objet la gestion des peines d'emprisonnement en liaison avec la Nouvelle Chaîne Pénale et le Casier Judiciaire National.

Par ailleurs, un schéma de communications sera mis en place entre ces trois applications ainsi qu'avec les partenaires de l'institution judiciaire grâce à un système d'information unifié qui permettra l'échange rapide et contrôlé des données.

Les objectifs de la Nouvelle Chaîne Pénale sont:

- De mettre en place un système informatique unique pour l'ensemble des juridictions permettant de rationaliser les traitements et de privilégier la communication d'informations;
- D'automatiser les opérations, dans un souci d'amélioration de la qualité et des conditions de travail (éditions automatiques, intégration de banques de données: tables des infractions, dictionnaire des communes, cartographie des services d'enquête...);
- De gérer les dossiers du début à la fin de la chaîne pénale, en prenant en compte la spécificité de chaque type de procédure;
- D'avoir une meilleure connaissance de la délinquance et de maîtriser les flux et les délais;
- De doter les magistrats d'outils de pilotage.

La Nouvelle Chaîne Pénale, comme le Casier Judiciaire National ou le Greffe Pénitentiaire, est un produit dont la mise au point est piloté par la Chancellerie. Toutefois, la méthode de conduite de projet choisie associe des utilisateurs (magistrats et greffiers) pour la conception (études préalables; spécifications détaillées externes) au sein de groupes de travail et d'un groupe de validation des choix opérés.

La stratégie technique s'appuie sur trois systèmes d'exploitation dont deux sont des standards internationaux:

- Système d'exploitation GCOS 7 développé par la Société Bull essentiellement pour les grosses juridictions de la région parisienne (jusqu'à 300 postes de travail);
- Système d'exploitation sous UNIX pour les juridictions de moyenne importance (jusqu'à 60 postes de travail);

- Système d'exploitation sous MS DOS pour les petites juridictions.

Le système de gestion de bases de données qui est associé aux systèmes d'exploitation choisis, est de type relationnel et de marque Oracle.

La réalisation technique est également assurée par la Chancellerie (division de l'informatique) mais en partenariat avec des entreprises du marché, notamment les Sociétés Bull et Steria. La réalisation d'applications de qualité "industrielle" dans des délais et des coûts maîtrisés nécessite un cadre de travail rigoureux. La méthode de conduite de projet associe donc à la méthode Mérisse:

- Un ensemble de normes, standards et d'outils communs;
- Deux outils de conception assistée par ordinateur: Espace-Micro et Espace-Central;
- Un outil de réalisation assisté par ordinateur: Pallas (Société Steria).

L'ensemble constitue l'atelier de génie logiciel.

Plutôt que d'équiper chaque juridiction de façon autonome avec la même application, la Chancellerie a fait le choix de créer des Centres de Production Régionaux favorisant le développement des échanges de données. L'organisation de la production informatique repose ainsi sur 10 Centre de Production Régionaux où seront installés les unités centrales supportant les applications nationales, ce qui facilitera les communications avec le Casier Judiciaire et les Greffes Pénitentiaires.

Les questions liées à la sécurité de l'application Nouvelle Chaîne Pénale tiennent compte des choix faits et précédemment décrits:

- La sécurité du système et son intégrité seront pris en charge par les Centre de Production Régionaux, de même que la sécurité physique des installations centrales;
- Le contrôle de l'accès à l'application sera assuré au niveau de chaque juridiction, notamment par un programme de gestion de codes d'habilitation.

Il a été souhaité que cette habilitation soit gérée de façon différente:

- pour les magistrats et greffiers qui s'intéressent essentiellement aux informations,
- pour les fonctionnaires qui ont une tâche liée à des opérations déterminées en fonction de leur service;
- Le respect de la confidentialité dans le cadre des principes généraux de la procédure pénale a été pris en compte au niveau de la conception de l'application et influe sur le choix du type de matériel (par exemple, les cabinets de juges d'instruction seront équipés non de consoles systèmes mais de micro-ordinateurs connectés au système central).

7. Champs de la Nouvelle Chaîne Pénale

Dans le déroulement du processus du procès pénal, trois grands champs ont été identifiés:

- Sanctionner: L'objet du procès pénal est d'aboutir à la sanction d'un comportement qui est une infraction à la loi pénale. Ce champ recouvre donc la phase procédurale qui va de la mise en garde à vue par les services d'enquête à l'édition des pièces d'exécution après jugement et éventuellement signification aux parties concernées par celui-ci et passe plus précisément par:
 - la prise en compte des plaintes et procès-verbaux,
 - l'instruction de la procédure (enquête, instruction stricto sensu, expertise ...),
 - la décision sur la suite à donner à la procédure,
 - l'audiencement de l'affaire,
 - le jugement,

- la prise en compte de l'exercice des voies de recours;
- Exécuter: Cette phase recouvre la mise en oeuvre de la sanction prononcée et son champs s'étend donc à la fois:
 - à l'exécution de la sanction quelle que soit sa nature: peine, avec ou sans emprisonnement ou mesure de substitution à la peine (rôle du Ministère public),
 - à l'application des peines c'est-à-dire à l'aménagement éventuelle des peines d'emprisonnement et la mise en oeuvre des peines de substitution (rôle du juge de l'application des peines);
- Mettre en oeuvre des mesures d'assistance éducatives: Dans le cadre de la législation concernant les mineurs délinquants, il s'agit de pouvoir gérer non seulement des peines mais surtout les mesures d'assistance éducative qui lui sont substituées, celles-ci supposant un suivi pour être efficace.

8. Conclusion

L'informatisation de la justice pénale en France s'inscrit dans un souci d'efficacité sociale ce qui suppose également l'utilisation d'outils, tel l'informatique, qui soit adapté aux standards d'une société ouverte et en pleine évolution.

Les réalisations s'inscrivent également dans le souci de fournir une aide matérielle aux magistrats et fonctionnaires de justice, complémentaire de l'aide intellectuelle qui leur est fournie grâce à la mise à leur disposition de banques de données juridiques sur réseau Videotex et support Minitel, gérées par le Centre National d'Informatique Juridique (CNIJ).

Ces banques de données rassemble:

- 334 000 documents de législation;
- 156 000 décisions de jurisprudence;

- 3 300 décisions de la Cour de Justice des Communautés Européennes;
- 19 000 documents du Médiateur, de la Commission Nationale Informatique et Liberté et du Conseil Supérieur de l'Audiovisuel;
- 19 300 documents de conventions collectives.

DELEGATION
OF
THE FEDERAL REPUBLIC OF GERMANY¹

Report

by

Karl-Heinz Groß

¹The First United Nations Workshop on Computerization of Criminal Justice Information was held before the reunification of Germany.

Karl-Heinz Groß
Ministry of Justice of Hesse
Hesse
Germany

COMPUTERIZATION OF CRIMINAL JUSTICE ADMINISTRATION IN HESSE

1. Introduction

Before reviewing the use of modern information technology in the German State of Hesse, a brief description is given of the structure of the administration of justice in Germany, because the foci of our efforts to date to utilize electronic data processing are derived from this structure.

Germany is a Federal State. The constitution determines the functions of the Länder (States) and the functions of the Federal Government. In the field of criminal law, the Federal Parliament is responsible for legislation. In other words, Germany has a uniform Penal Code and a uniform Code of Criminal Procedure. The execution of these laws is, however and with few exceptions, the responsibility of the States. The States establish a court system for their jurisdictions, they appoint the necessary personnel and provide the requisite funding.

This report refers to the developments in the State of Hesse. Nevertheless, this report may also serve as an illustration, more or less, of the developments in other States of Germany, as well.

2. The Criminal Justice System in Hesse

Hesse, a State with approximately 5.5 million inhabitants, has 58 Local Courts, which are comprised in nine Regional Court Districts, and to each Regional Court is attached an Office of the Public Prosecutor. These Courts and Offices of the Public Prosecutor form essentially the first instance. In the second instance, there is only one Higher Regional Court in Frankfurt am Main, and that is where the Chief Public Prosecutor for the whole district of the Higher Regional Court, and thus for all of Hesse, has his seat.

Annually, there are approximately 260,000 investigations pending against known suspects for the nine Hessian Offices of the Public Prosecutor, as well as another ca. 300,000 investigations against unknown perpetrators. Furthermore, there are about 34,000 cases for breaches of regulations, primarily traffic violations.

The Hessian Offices of the Public Prosecutor have about 450 Public Prosecutors at the Regional and Local Courts to process these cases, as well as about 80 senior court officers (registrars) and 620 employees in the various registries and typing pools. The criminal justice administration has about 410 judges, senior court officers (registrars) and 580 office workers. On the whole, there are about 2,170 employees in the Courts and Offices of the Public Prosecutor, of which 1,200 clerks who work for the public prosecutors, judges and registrars in the registries and typing pools.

These figures show how labor-intensive the administration of criminal justice is in Hesse. About 70% of the budget expenditures for the Ministry of Justice in the State of Hesse is spent on personnel.

3. Computerization in the Judicial Field

In view of the constantly rising number of court cases of all kinds and of the related increasing need for personnel, staffing costs in public budgets are a top-priority political issue. This is why the Ministry of Justice began to utilize electronic data processing at a very early date, whereby rationalization was of primary importance, due to the indicated personnel costs.

As early as 1970, the Conference of the Ministers of Justice of the then Federal Republic of Germany discussed the use of data processing and established a standing commission composed of all State Justice Administrations and of the then Federal Ministry of Justice, for the purpose of examining the possibilities for using data processing and introducing the requisite changes in the law.

As in contrast with many other administrative fields, German jurisprudence is characterized by the formality of court proceedings by reason of the rule of law. The flow of work and jurisdictions are set forth in the regulations, for the most part. Until 1970, these regulations were tailored to the then prevalent methods of work without exception, especially with regard to the written documentation of all

procedural steps and results. It dawned very rapidly that these traditional procedures could not merely be copied into electronic data processing systems. Instead, the work processes first had to be analyzed and reformed, before a more efficient procedure could be introduced with the aid of electronic data processing systems.

A clear limit to the use of computers is drawn in the judicial system. According to the Constitution of Germany, the power of adjudication has been entrusted to an independent judiciary. This means that all evaluating decisions must - without exception - remain in the hands of the judges themselves; they may not be left to computers.

Therefore, the emphasis with regard to the use of electronic data processing in the justice administration was on the improvement of the supply of information to judges and public prosecutors and a more effective design of office services.

The heavy codification of the flow of work and the organization of the justice administration was and is a very great problem for the use of electronic data processing. Organizational changes are, as a rule, very time-consuming - and due to the independence of the judiciary, among other factors - they are often only feasible to a limited degree. Furthermore, there are the particular requirements of the Data Privacy Act, which is anchored in the Constitution in Germany. All of this serves to explain the lengthy period of preparation for the use of data processing in the administration of justice.

The development in the use of data processing in the administration of justice can be seen in three phases.

4. Initial Phase in the Use of Data Processing in the Administration of Justice

In the initial phase, in the years from 1970 to 1980, we looked at the so-called mass proceedings. At that time only mainframe computers were available in computer centers, in particular at the Hessian Central Office for Data Processing at Wiesbaden in Hesse.

In terms of criminal justice administration during this period, the Federal Central

Criminal Register was established. Until then, every Office of the Public Prosecutor kept a criminal register for its own jurisdiction. Since 1980, there is only the completely automated Federal Central Registry Office in Berlin, in which all of the convictions of residents in the then Federal Republic of Germany are stored for a period of time established by law. The Courts and the Offices of Public Prosecution are entitled to information to a certain degree. All Hessian Offices of the Public Prosecutor report those convictions, which by law must be reported to this Registry. Almost 11 million court decisions are on record in the Federal Central Criminal Register; almost 100,000 notifications are sent from Hesse to the Federal Central Criminal Register, most of which are still being submitted in written form. These data are transmitted electronically to Berlin from only one Hessian Office of the Public Prosecutor, namely the one in Darmstadt.

A second area of early usage of data processing is the buildup of the legal information retrieval system JURIS by the Federal Ministry of Justice with the support of all State Ministries of Justice. After a test phase of more than five years, the decision to go ahead with this information system was finally made in 1983. JURIS contains primarily all decisions which the courts consider to be worthy of documentation and which are published in collections or journals, as well as a complete collection of federal laws, together with all of the references, and a collection of literature on jurisprudence. The Chief Public Prosecutor in Frankfurt has direct access to JURIS, as do the courts in Frankfurt. In the not-too-far future, the Hessian judicial administration will make JURIS links available to every city with a Regional Court.

Communication with JURIS is at the moment still too difficult for many potential users. The JURIS GmbH is working in concert with the State Judicial Administrations to improve the user-friendliness. The costs of using JURIS are still too high, as well. One hour of on-line connect and search time costs about DM 120. Recently, JURIS and publishers specializing in law have started offering selected collections from JURIS on CD-ROM disks, for example, of the headings of all major legal publications or all the decisions of the Federal Constitutional Court.

These collections are very user-friendly and can be accessed in court via a PC, without having to use the JURIS hookup. In this year about eight courts will be equipped with such automated headings card files or selected collections of

decisions. The disks will be constantly updated. We hope to achieve a better acceptance of automated documentations by these means.

A third area of work in this first phase of the use of data processing is the automated assessment and collection of fines and costs of criminal proceedings, the JUKOS-system. This application is running on the mainframe computer of the Hessian Central Office in Wiesbaden for all Hessian Offices of the Public Prosecutor. Every Office of the Public Prosecutor has a data collection system, which is linked to the Central Office in Wiesbaden.

Annually, there are about 60,000 new enforcement cases in Hesse, and the central computer has an account for every debtor of fines and costs. The receipt of payment is automatically controlled, reminders (about 100,000 a year) are sent out by the computer, and the documents needed for execution are printed out, if required. This process, which was developed in North-Rhine Westphalia, cuts down on typing especially. The work of programming this function lasted several years however, not least because of the previously mentioned codification of all judicial proceedings.

5. Second Phase in the Use of Data Processing in the Administration of Justice

The second phase of development in the use of data processing in the justice administration began about ten years ago. The computer generation of the so-called medium data technology enabled every government agency to be equipped with a comprehensive and efficient computer system. This meant that a computer system has been installed in the Office of the Public Prosecutor at Frankfurt am Main for the purpose of keeping a central case register, which in Frankfurt consists of about 400,000 data records. Every report of an offense is entered into the system. With every new report, the computer checks to see whether an investigation is already being or has been conducted against the suspect in the last four years. This facilitates and accelerates the investigative work of the Public Prosecutor.

In 1982 at the Office of the Public Prosecutor in Darmstadt, this application has been expanded to include support with all of the work processes of the Office of the Public Prosecutor, in particular in the registries and typing pools. Almost all of the notations of data concerning an investigator's proceeding, which used to be kept in writing at the registries, are now stored and printed out, if necessary, for example,

daily printouts of the dates of all habeas corpus proceedings, other deadlines, transmission of all notifications in criminal proceedings to the Federal Central Criminal Register and to the Central Index of Traffic Offenses, as well as the preparation of very differentiated justice statistics. Up to 60 different pieces of information can be included in the data record of an investigation.

At approximately the same time, the Society for Mathematics and Data Processing in Birlinghoven, a major research institute in Germany, developed a program nucleus to support the case procedures in all kinds of judicial proceedings. This research of the Society for Mathematics and Data Processing, which was underwritten by a major computer company, lasted for a period of more than five years. From this one can see how complex and differentiated automated support must be in the field of justice, in order to meet the demands of practice.

At present is under examination whether the process being utilized in the Office of the Public Prosecutor at Darmstadt should be expanded to other Hessian Offices of the Public Prosecutor, or whether the UNIX-solution suggested and supported by the Society for Mathematics and Data Processing, which is being tested in two German states, should be introduced across the state in Hesse. In this connection, it should be pointed out, however, that the State Judicial Administrations and the Federal Ministry of Justice are discussing whether or not to establish a centrally automated register of all investigations conducted by Offices of the Public Prosecutor in Germany for use by the Courts and the Offices of the Public Prosecutor.

The concerns of the Data Protection Act compete with the interest in quicker and better information for judges and public prosecutors. At any rate, a decision by law-makers is required. We hope that a suitable compromise can be found, which will satisfy all of the requirements.

In addition, for more than ten years now we have been using word processing systems in the Courts and the Offices of the Public Prosecutor. They are used to correct texts, in particular long bills of indictment and judgments on the one hand, and on the other, we have developed and stored so-called text modules for similar cases, in particular traffic cases, which can be retrieved immediately by the word processor. In order to rationalize the time-consuming work of developing and

updating these text modules, all nine Hessian Offices of the Public Prosecutor use a uniform text manual (programmed word processing). We are also striving to achieve the use of the same word processing systems in all the Courts and Offices of the Public Prosecutor. Currently there is an invitation to tender designed to lead to a uniform decision on which system to use for the coming years. At the moment, stand-alone PC's with MS-DOS are utilized in the Courts for word processing. In the medium and in the long run, we are increasingly turning to the use of UNIX computers (X-Open Standard), with which integrated word processing and data processing, such as the keeping of all registers, can be done. The UNIX operating system is prescribed for all state administrative agencies in Hessen for multi-station systems.

6. Third Phase in the Use of Data Processing in the Administration of Justice

The third phase of data processing in the judicial system, which is perhaps the most interesting, is determined by the use of the personal computer, which began about six years ago. This technological development enabled a computer to be used with all of its components and complete performance at one workstation. Individual public prosecutors, and later judges too, began using these standalone PC's, together with standard software available on the market (such as Framework), to process extensive proceedings. They achieved a considerable increase in efficiency, especially in major white-collar crime cases with numerous suspects, victims, a large number of crimes, financial transactions, etc. In addition to keeping automated file content surveys, the trial material was kept in the computer in a certain order and updated constantly, as the results of the investigation came in. At the end, the bill of indictment was able to be drawn up with the aid of these stored elements with a considerable savings of time.

At present personal computers are tested with different software packages among 25 public prosecutors and clerks responsible for white-collar crime cases with regard to their suitability for the work of a public prosecutor. Currently, an invitation to tender has been announced. A decision will then be made regarding the system to be used for all Hessian Offices of the Public Prosecutor. According to current ideas, up to 75 administrative units could be equipped with PC's for public prosecutors and clerks responsible for white-collar crimes in the next three years.

In the judiciary a model experiment is conducted this year with about 30 judges, utilizing different software packages in order to gather experience. To date, only private PC's have been used by judges, primarily for the tasks of word processing. Judges, too, would like to store documentation for their fields of work.

7. User Support and Training

Prerequisite for the successful introduction of data processing in the administration of justice is support and training of users. The consequences of this have been completely perceived only gradually in the last few years.

The use of modern information technology, in particular, of personal computers, requires that the user be given support, and this is a problem in logistics, about which the judiciary has only just started to ponder in Germany. To date for example, the use of personal computers on the desks of clerks in justice administration (individual data processing) was primarily an activity of individuals who acquired their mastery of electronic data processing during their free time, for the most part. This meant that different software packages were in use, depending on the respective knowledge, experience and tendencies of the respective judicial employees. The work at the Offices of the Public Prosecutor and the Courts, can not, however, be individualized in this manner. The means, especially the software, with which the Offices of the Public Prosecutor and the judges work, must be portable. The tendencies and capabilities of computer-freaks can not be generalized. Judicial employees who have only an average interest in new methods of working must be won over to this new technology; they must be thoroughly trained and familiarized with this technology, and they must receive constant support and advice, as well. Especially this individual data processing, together with the constantly changing designs of the cases to be processed, means that both the expertise of a public prosecutor and/or judge and the knowledge of data processing must be brought together in one person. This combined knowledge for the further development of the software being utilized and for the advice and care of the users can not be provided for a variety of software and/or hardware products; the human resources are much too limited to be able to do this.

In many bodies that are concerned with data processing, there has recently been much discussion concerning how inadequate the standard software available on the

market is for the specialized tasks to be done, the difficulties the user has with this software and how time-consuming the updating of this software and the support of the user is. The overall opinion is that a much higher level of training, introduction and support is required than previously assumed. It is estimated that - depending on the degree of complexity of the application - for current support only, i.e. without additional programming tasks, one trainer is constantly needed to look after 20 to 40 users of stand-alone PC's or video workstations. We do not have a complete picture of the logistic requirements of data processing in justice yet. In the coming months and in close consultation with staff representatives, a program will be developed for this task. The staff representatives are very open-minded regarding data processing, but they emphatically demand a major increase in training and support given to the users. Only under this prerequisite further investments in data processing in the justice administration are meaningful and justifiable.

Associated with the above are considerations concerning the reform of the internal work processes at the Offices of the Public Prosecutor and the Courts. The new information technology leads to new ways of communication between the public prosecutor and the judge on the one hand, and other organizational units in the Courts and the Offices of the Public Prosecutor on the other hand. The office employees of the Courts and the Offices of the Public Prosecutor must be linked more closely with the work of the public prosecutors and the judges, and they will then be able to do more qualified work for the public prosecutors and judges. And many of them want this, but this presupposes a much improved program of training and further education for these persons. Only the knowledge and skills transmitted will enable workers to cooperate in the further development of programs. The use of computers in justice is only meaningful, however, if this further development is possible to a relevant degree within the administration's own capabilities. Constantly changing case features require a high degree of flexibility in the utilization of data processing. This can only be ensured by employees if they have mastered these instruments.

The use of computers also make new demands upon the senior staff. Computer programs are less easy to check than other methods of work. Therefore, it is very important that senior employees be familiarized with the use of computers in both the Courts and the Offices of the Public Prosecutor.

8. Summary

Even if we in the Hessian Judicial System already have established more than 600 video workstations, primarily for word processing, nevertheless we are just at the beginning of this development. Data processing goes beyond the purely technological questions in the judicial system to new challenges concerning the organization of our work and our management qualities. We have only just begun to draw the necessary conclusions. We can not force this new technology on our staff. Instead, we must try to achieve the acceptance of information technology among our employees with a sense of proportion and empathy. If we are successful, the use of data processing in justice will not only lead to rationalization, but also to a considerable increase in the quality of our work for the rule of law.

**DELEGATION
OF
GREECE**

Report

submitted by

Irini Vassilaki

Irini Vassilaki
Pantios University
Athens
Greece

THE COMPUTER AS A NEW ASSISTANT OF THEMIS¹

1. Introduction

The increasing material of law science provides for the servants of Themis the substance for thinking over, criticizing and further evolution of justice. The need of continuous and complete information indicates the problem of the modern lawyer: How is it possible to collect the sufficient material for a case fast and inexpensively, with guarantee and responsibility? The classical information carriers (e.g. books, law-journals) offer guarantee and responsibility but cost money and time. On the other hand, if someone tries to reduce these costs, one takes the risk of overlooking valuable data for a concrete case.

It is information technology that gives a satisfactory compromise to this problem. The computer with all its components and derivatives penetrates into the law area and fulfills the role of the adviser and the assistant. Judges, lawyers, law students, everyone who works on law can take advantage of the applications that computer technology offers in the field of justice².

This fact is illustrated in a lot of countries that use informatics in law mainly in three ways:

¹Themis was the Goddess of Justice in ancient Greece.

²For the co-operation of computer technology and justice see e.g. G. Czerny: Perspektiven der Zusammenarbeit zwischen Justiz und Hersteller bei der Einführung neuer Technologien, in: iur 1988, pp. 97, et seq.; G. Ernest: Der Einzug der elektronischen Datenverarbeitung in dem Bereich der Justiz, in DRiZ 1987, pp. 129 et seq.; E. Giannantonio: Introduzione all'Informatica Giuridica, Milan, Giuffrè 1984, pp. 218 et seq.; G.B.Gran: Workshop Report, in: Ch. Walter (Ed.) Computing Power and Legal Reasoning, St. Paul 1985, pp. 621 et seq.; S. Nora/A. Minc: L'informatisation de la Société Paris 1978.

- By creating law data banks;
- By developing programmes especially for the courts;
- By offering software to lawyers and notaries³.

2. Law Data Banks

A law data bank is a collection of specific legal data (especially statutory law, case law and law literature) which can be searched by a retrieval software.

On-line data banks are composed by data stored in a central computer which can be reached by national or international networks, which can transport data to the PC of the system user. The central computer with which the user communicates, is provisioned continually with new data so that the data bank is always updated and complete. Based on a specific licence agreement, the user has the limited right to use the database and take information from it, for a standard period of time.

On the other hand, off-line data banks contain data, stored on auxiliary memories (esp. discs and CD-ROM) which are then delivered to user of a computer system. Once the user has paid for the carriers, he has the right to access the data base so often he wants with no limits on time and frequency⁴.

³For the various ways with which the computer assists the function of justice see e.g. ACM (Ed.): *The First International Conference on Artificial Intelligence and Law-Proceedings*, 27 - 29 May 1987, Boston, Mass.; A. Borruso: *Computer e Diritto, Analisi Giuridica del Computer*, in: *Informatica e Ordinamento Giuridico*, Milan, Giuffrè, 1988; Burson: *Report from the Electronic Trenches: An Update on Computer-Assisted Legal Research*, *Legal Refer. Serv. Q.* Sommer 1984; Herr: *Chancen und Gefahren der EDV in der Justiz*, in: *DRiZ* 1986, p. 374; Naumann: *Möglichkeiten und Grenzen der EDV in der Rechtspflege*, in: *Pfleger* 1986, pp. 259 et seq.

⁴Concerning data distribution contracts see e.g. Alpa: *I Contratti di Utilizzazione del Computer* 1984; J. Bremyer/P. Miller: *Guide to Database Distribution: Legal Aspects and Model Contracts*, Philadelphia 1987; C. Laroche-Vidal: *Le Contrat entre Producteur de Bases de Données Documentaires et Serveur, Documentaliste, Science de l'Information* 1985, vol. 22, no. 2, pp. 72 et seq.; S. Schaff: *Banques de Données Juridiques: Analyse des Contrats Proposés aux Utilisateurs*, in: *Droit de l'Informatique* 1985-7, pp. 2 et seq.; Ch. Zahrnt: *DV-Verträge* 1988.

Independent of their technical form, data banks have as a content three different sorts of information:

- Legislation (statutory law);
- Jurisprudence (case law);
- Law literature (either as references or as full text).

Using the law data banks, the lawyers succeed in winning the battle against the torrent of law material. Till now the attempt of keeping an overview of legal activities was difficult especially, because of the great number of bills, acts, amendments and the whole theoretical discussion, which comes before and follows after them. This quantity of material which is divided into a lot of books, law journals and law collections has two consequences: The investigation about concrete law questions needs time (and often healthy nerves) and costs a lot of money for buying the necessary law material.

With the application of databanks in the law environment, the information that is stored in them, can be distributed quickly to everyone and everywhere. The search for special law problems and questions takes place at the office-desk. The lawyer in a small city with no law library has the same chances to find the material he needs as the lawyer of a big city; the law student can reach, with a small amount of money, sources which normally he could not financially afford. Having in a short time the overview of the material he needs, the judge and the lawyer can use their time, for the more theoretical aspect of law, which results in a better quality of their work.

In addition law data banks have made their information available to a broad public. Because of this, new law theories and opinions soon become known and are accepted or criticized by everyone who works on law.

As a result: data banks offer

- Acceleration and improvement of the legal decision proceeding;

- Fast expansion of new theories and doctrines in the law science⁵.

3. The Computer on the Judge's Desk

The court's load or better overload of work is known to everyone. This overload of work presses everyone who works on tribunal, namely employees, judges and state prosecutors. While the court personnel remains the same, the work increases every day. Besides the studying of legal papers and making decisions, the judge has to organise, synchronize and attend to a lot of proceedings. On the other hand, the participants in a legal proceeding request constantly information, in order to protect their legal interests.

In recent years, practice has proved that computer systems can help to confrontate these needs. Using software developed especially for the tribunal, the judges take advantage of the following functions:

- Registration of cases with the ability of adding new information according to the progress of a case and printing a part or whole of the documents;
- Administration and control of time limits and adjournments of all legal acts of cases and of the processing of summonces;
- Editing of decisions and declarations by use of standard documents for every type of legal dispute and by support of word-processing programmes especially made for legal applications;
- Storage of all cases in a court data bank, so that information can be given fast and uncomplicated to everyone who has a legal interest in a proceeding;

⁵For the use and the meaning of the data banks see e.g. J. Bink: Handbook of Legal Information Retrieval, Amsterdam 1984; M. Herberger: Unterstützung der juristischen Entscheidungsfindung durch elektronische Medien, in: Messe Frankfurt GmbH (Hrsg), Berichtsband zum Juristensymposium 12-5-87 im Rahmen der Infobase '87, Frankfurt 1987, pp. 10 et seq.; R. Kimbreel: Searching for Text? Send an N-Grou, in BYTE 1988, pp. 297. et seq.; G. Krohn (Hrsg): Computer-Datenbank der Rechtsprechung des Bundesgerichtshofes in Zivilsachen, Köln 1987; H. Manzanares: Vers une Réorganisation des Banques de Données Juridiques Françaises, in: Droit et Economie no. 85, 1984.

- Exchange of information and data concerning problems which appear during the prejudication or trial of a case, by use of a telecommunication system between different courts.

Summing up, the use of computer systems in tribunals leads to the following consequences:

- The acceleration of giving a solution to a legal dispute;
- The improvement of working conditions and service quality of the courts;
- A better service for the participants of a trial^a.

4. Computer Technology in the Lawyer's Profession

In recent years there has been an increasing number of lawyers who are interested in the use of the informatic media. This is not remarkable, because the new technology can assist the lawyer's profession in various forms.

Software for lawyers offers a standard word-processing program, that includes models for all kinds of legal documents. The lawyer only needs to add a few data (e.g. names of the participants, the awarded object etc.) in order to get project documents. Using this software documents can print fastly. In the same time documents can be stored in the data bank. A special part of the software can be used as a reminder of the daily meetings, days of trials of the office and time limits for all cases. Another function is the administration of the clients with respect to the name, object of a case, honorarium etc. The software for lawyers often contains a bookkeeping part that it suited to the needs of a lawyer's office. This part gives the

^aFor the use of computer systems in court see e.g. *Automation de Fichiers des Courts Administratives d'Appel et du Conseil d'Etat*, in: *Expertises 1989*, pp. 130 et seq.; J. Eidemann: *How to Apply Outline/Thought Processors (Automating the Law Practice*, Dallas 1986, WS-38); V. Frosini: *L'informatica e la Publica Amministrazione*, in: *Rivista Trimestrale di Diritto Pubblico 1983*, pp. 483 et seq.; Park/Burris: *Computer-Aided Instruction in Law: Theories, Techniques and Trepidations*, in: *American Bank Foundation Research Journal No. 1 (1978)*, pp. 1 et seq.; L. v. Raden/M. Weihermüller: *Datenverarbeitung zur Unterstützung Richterliche Tätigkeit*, in *iur 1988*, pp. 65 et seq.; G. Ziel: *Richter und Computer*, in *CR.*: 1986 pp. 244 et seq.

possibility for the lawyer to calculate the cost for every case and to make statistics, accounts, balances and generally to administrate every kind of income and expenses for his office.

Using law data banks a lawyer can quickly obtain all the information which he needs for the legal questions in a case (decisions, comments, books) avoiding the searching in libraries. In this way the lawyer uses his time for a better studying of a case without the fear of having forgotten something new and/or important.

The expansion of a communication's network which allows for a connection between lawyers, but also between lawyers and courts is the third main offer of the computer technology to lawyers. Using this network they can give and take information through computers avoiding telephone-calls, letters and meetings that cost time.

As a result, information systems offer:

- Better conditions to a lawyer's work;
- Improvement of the lawyer's law service;
- Enforcement of the law science by the lawyers⁷.

5. Foreign and International Experiences

The development of legal informatics in Greece is and will be influenced to a great deal by the experiences in foreign countries, in which the projects have already started at an earlier stage. This is especially the case with respect to legal data banks, which can be reached from Greece via telecommunication networks.

Since 1981 the European Communities developed the system CELEX (Communitatis

⁷For the application of computer technology see e.g. The Studies of Attorneys Computer Report, in: The Lawyer's PC vol. 3 (no. 11), 1 February 86; A. Flory/H. Croze: Informatique Juridique, in: Economica 1984; M. Herberger: Anwalt und EDV, in: iur. 1987, pp. 176 et seq.; H. Manzanares/Ph. Nectoux: l'Informatique au Service du Juriste, Litec 1987; C. Monville: Vers une Nouvelle Réglementation des Télécommunications, in: CRID, Namur 1987.

Europae Lex) which contains the legislation of the European Communities, jurisprudence of the EC-Court as well as the European Communities directives. An other important EC-law data bank is the SCAD-system (Service Central Automatisé de Documentation) which contains mainly literature. The ABEL-system presents the directives that are put in force every day. Similarly, the Council of Europe offers to national and international organisations a data bank with all its' Recommendations.

On a national level, very-well known data banks are:

- Belgium: CREDOC and JUSTEL, created by the Belgian Ministry of Justice and contain legislation and jurisprudence;
- France: C.M.I.J., JURIS-DATA, SYDONI and LEX covering the whole area of law science;
- Germany: JURIS, an on-line system covering legislation, jurisprudence, literature and connected with CELEX; LEXINFORM, covering mainly commercial and tax law, and ALEXIS a mail-box system;
- Italy: ITALGIURE, in which are stored over 2.000.000 documents distributed in 42 different smaller data banks;
- Switzerland: SWISSLEX, available since the beginning of 1988 and covering the Swiss legislation and the decisions of the Supreme Federal Court;
- United Kingdom: the data banks EUROLEX and LEXIS as well as the LAWTEL and INFOLEX;
- USA: among others LEXIS, available since the middle of the '70s and which was created with the assistance of the American Lawyers' Associations and covering all the decisions on federal level since the beginning of the 20th century, and Westlaw that also covers the law literature.

These examples of law data banks, indicate the tendency of all countries for the expansion of information technology in law science and the need of an international co-operation that support the realisation of this development.

6. The Greek Policy for Computer Technology and Law

Greece belongs to the countries that have started to use the new technology in law, but which still need a lot of work till a satisfactory application is possible.

In the late '80s the creation of a law data bank was started under the supervision of the government. This data bank contains legislation and jurisprudence, but has not yet reached a level to offer considerable help for the daily activity of a judge and a lawyer. Lately, the collection of all the decisions of the Greek Supreme Court (Arios Pagos) has begun for another data bank and it seems that this attempt will soon bring results. This project is administrated and attended by a judge of the Greek Supreme Court in cooperation with the Greek government. The Institute of Procedural Studies, under the supervision of professors from the University of Athens, prepares the collection of the procedural law (civil, penal, administrative procedural law) that is expected, because of the high value of these data in practice. Another data bank that deserves to be mentioned, is the collection of the mortgage records which contains all the property papers on record. After its' completion the lawyers and employees who work in this area, will have a great assistance.

The need for international co-operation for the development and use of informatics in law is obvious. Lately, the government started a new attempt to forward the progress of informatic's application in Greece generally and in justice especially. There are projects for the collection of all the case decisions as well as the laws that are in force and in cooperation with law institutes, universities and courts, this still on papers project can soon give results. There are also preparatory steps for the creation of software for the administration of cases in court, for the accommodation of the work of lawyers, judges and tribunal's employees.

It is clear that the way to a satisfactory application of informatics in law science in Greece will be long. But is also clear, that with international co-operation and the exchange of aspects and experiences on an international level, that way will be at least easier to cross.

**DELEGATION
OF
GUATEMALA**

Report

submitted by

Josefina Coutiño

Josefina Coutiño, Directora
Centro Nacional de Informática Jurídica CENALEX
Organismo Judicial de Guatemala
Guatemala

LA INFORMATIZACIÓN DE LA JUSTICIA PENAL EN GUATEMALA: EL PROBLEMA DE LA INFORMÁTICA DE GESTIÓN JUDICIAL EN EL MARCO DE LA TRANSICIÓN HACIA NUEVOS SISTEMAS DE JUSTICIA

1. Introducción

Una presentación exhaustiva del estado, los resultados y las perspectivas de la informatización de la justicia penal de la República de Guatemala sería necesariamente superficial si sólo se atuviera a describir sus características, dificultades y éxitos. La difusión que actualmente tienen los sistemas automatizados de gestión judicial, la uniformidad de muchos de los problemas específicos que ellos deben enfrentar y la experiencia que ya se ha acumulado en este campo, nos obligan a realizar una profundización de la función y el modo de inserción de la informática de gestión judicial, en el contexto de la situación institucional, política y cultural de la administración de justicia en los países latinoamericanos.

Es necesario, pues, que este informe comience por analizar el entorno en el que se inserta el proyecto de informatización de los tribunales penales, porque es allí, precisamente, donde se instalan los problemas y los dilemas que hacen que la utilización de computadoras en la justicia penal de Latinoamérica planteé ciertos problemas particulares respecto de otros países que recorren o han recorrido ese mismo camino.

Nuestro país, y en general los países latinoamericanos, conservan las estructuras de la administración de justicia colonial. Como esas instituciones, ya en el tiempo de la colonia eran atrasadas, podemos decir que nuestros países conservan, en gran medida, una administración de justicia que tiene trescientos o cuatrocientos años de atraso. En América Latina el proceso inquisitivo, que en otros países sólo forma parte de los libros de historia del derecho, es una realidad cotidiana, hiriente y difícil de modificar.

No pretendemos en este sucinto reporte realizar una caracterización global del sistema de justicia penal inquisitivo, sino sólo destacar aquéllas características que, a nuestro juicio, influyen enormemente en cualquier diseño de política de informatización.

La realidad del sistema inquisitivo de nuestro país puede ser caracterizada del modo siguiente: él es totalmente escrito, tanto en su faz sumarial o preparatoria como en la fase del juicio. Por medio de escritos se comunican las partes en sí y el juez con ellas, se realiza la prueba y todas las diligencias judiciales. Este carácter totalmente escrito de la actividad judicial (independientemente de que ciertas normas establezcan algunos actos que se realizan en forma oral, la escritura totaliza la vida del expediente judicial) ha generado estos efectos:

- Una sobrecarga de trabajo, que ha obligado a la delegación de hecho de funciones judiciales en empleados o funcionarios de los tribunales, depreciando la actividad jurisdiccional;
- Una absoluta falta de inmediación del juez, tanto respecto de las partes como de las pruebas;
- El predominio del registro de todas las pruebas de modo que sólo se leen actas, no se escuchan testigos ni peritos, por ejemplo;
- Un progresivo abandono del Juicio, como etapa principal del procedimiento, y la instauración del "sumario" (con su consiguiente carga de arbitrariedad) como etapa principal y privilegiada del proceso penal;
- La secretividad casi absoluta de la actividad de la justicia.

En síntesis, el estado actual de nuestra justicia nos muestra que ella es burocrática en extremos, oscura para el conjunto de la sociedad, lenta, formalista, que ha depreciado la actividad de los jueces, ha generado prácticas corruptas en el ejercicio de la abogacía y que no es percibida por el conjunto de la sociedad como un servicio valioso y esencial.

Pero no alcanza con describir este fenómeno para apuntar a la particularidad del

problema de la informatización de la justicia penal. Mal o bien, con mayor o menor profundidad, nuestras sociedades han tomado conciencia de que esa situación de la justicia penal es insostenible.

Y lo es, porque se halla en franca contradicción con los esfuerzos por construir una remozada democracia y por profundizar el contenido de la convivencia política pacífica.

Consciente de ello, nuestro país, como otros países del área, ha asumido y encarado una transformación global de su administración de justicia penal, que corta de raíces los vínculos con el sistema inquisitivo y adopta las modalidades y estructuras de una justicia moderna.

La adopción del juicio oral, la modificación de los sistemas de investigación, la racionalización de los recursos y trámites judiciales, la publicidad del juicio, el rescate de la inmediación, la selección de casos, la judicialización de la ejecución de la pena, la organización de un verdadero sistema de defensa pública, la mayor participación que se le otorga a las víctimas de los delitos, la participación ciudadana en la justicia, son sólo algunos de los cambios estructurales que se pretende introducir.

La magnitud del cambio, apenas reseñado, nos demuestra que es imposible esperar que ese cambio se produzca de un modo inmediato o automático. Antes bien, es esperable que se desencadene un proceso de cambio, que es tanto un proceso institucional como un proceso cultural.

Y es aquí cuando llegamos al punto central, que le otorga especificidad a un conjunto de problemas informáticos que debe encarar nuestro país y otros países de Latinoamérica. Guatemala se halla en un período de transición y es difícil determinar con precisión, ¿Cual será la función de la informatización de los tribunales penales en ese período de transición?

2. Informatizar ¿Que? ¿Para Que?

En realidad el dilema ya está planteado en el informe sobre datos informatizados de justicia penal, presentado por el Ministerio de Justicia de Polonia y el Instituto de

Helsinki de Prevención del Delito y Lucha contra la Delincuencia, afiliado a las Naciones Unidas, al Primer Seminario Europeo sobre la computarización de información en materia penal (Polonia, 1987). Allí se expresa con total claridad: "Hay una estrecha correlación entre el empleo de tecnologías modernas de información y el funcionamiento racional, eficaz y económico del sistema de justicia penal". Pero, por otra parte, "Si se introduce el proceso electrónico de datos en un sistema tradicional de información sin alterar las estructuras o los cauces de información de ese sistema, o sin modificar las formas y tipos de información, el sistema se automatiza, pero no varía cualitativamente la información, solo varía cuantitativamente. Por el escaso nivel de proceso, existe el peligro de que al presentar información antigua como procesada matemática y científicamente recaiga sobre esta una aureola de prestigio electrónico.

Sin embargo, el dilema planteado en ese seminario no toma en su total magnitud el problema latinoamericano y, por ende, guatemalteco. No se trata de someter los antiguos procedimientos a un análisis cualitativo, que permita mejorar sus procedimientos administrativos, paralelamente a su automatización. De lo que se trata en nuestros países es de reformar de cuajo esos sistemas, transformarlos desde sus más íntimas estructuras. No es que estén en juego algunos malos procedimientos, que un buen análisis estructural detecta y modifica, sino que se hallan en juego principios político-institucionales de gran magnitud, que hacen que sea imposible seguir administrando justicia a las puertas del siglo XXI, como se hacía hace cuatrocientos años!.

Frente a esta situación de transición creemos que en el contexto latinoamericano y guatemalteco preguntarse ¿qué informatizar? y ¿para qué informatizar? tiene una especificidad propia que debemos resolver.

Una primera postura plantea que la informatización acrítica de los sistemas de justicia penal es un modo de resolver sus problemas más urgentes y que no le corresponde al técnico hacer planteos que vayan más allá de este primer intento de solución. Es a los órganos políticos de la sociedad a quienes les corresponde decidir que justicia se quiere para cada sociedad.

Esta postura, no sólo es una visión tecnocrática, descomprometida con la realidad, sino que esconde el hecho de que el efecto del prestigio electrónico no es inocente.

Solucionando o intentando solucionar los problemas urgentes de la justicia penal se trabaja, en realidad, para consolidar un sistema francamente atentatorio de los derechos humanos. Otra postura, enfrentada diametralmente, considera que carece de sentido invertir recursos humanos y económicos en informatizar sistemas que hace doscientos años que debería estar enterrados. Si existen problemas urgentes, ellos no deben esconder los problemas estructurales, que son los que, en definitiva, generan los problemas urgentes.

¿Es este un dilema irresoluble?

No podemos decir que sea un dilema fácil de resolver. Sólo intentaremos esbozar algunas líneas de trabajo y decisiones previas, que, si bien no solucionan el conflicto, permiten superar el inmovilismo, sin caer en el descompromiso tecnocrático.

En primer lugar, debe quedar claro que la reforma de los sistemas de justicia penal es el objetivo principal y hacia allí deben dirigirse los mayores esfuerzos. La informatización de los sistemas actuales no se puede realizar sin un planteo general y previo del problema de la reforma estructural de la justicia.

A partir de allí, la informatización de los sistemas escritos pueden ayudar al proceso de reforma sí:

- Se convierten en etapas de sensibilización sobre la necesidad de una reforma estructural;
- Resuelven los problemas urgentes, sin ocultar que ellos son manifestación de problemas estructurales;
- Buscan rescatar el papel de los jueces, quitándoles todo trabajo que no tenga contenido jurisdiccional;
- Brindan información sobre el sistema, útil para planear las políticas de cambios;
- Analizan los sistemas de información teniendo en cuenta aquellas estructuras

de datos que permanecerán aún cuando se cambien radicalmente los modos de administrar justicia;

- Le otorgan mayor transparencia a los sistemas escritos.

En definitiva, la informatización de la justicia penal en un período de transición, es una informatización necesariamente subordinada a los objetivos y necesidades de la reforma de la justicia. Como tal es provisional, pero no inútil: ella puede cumplir el importante papel de abrir el camino, romper la trama cerrada de los formalismos, capacitar a los operadores del sistema en nuevas formas de administrar justicia, sensibilizar sobre la necesidad del cambio, abrir nuevas mentalidades, en fin, ella cumple su función, si es la avanzada de un nuevo sistema y no la consolidación tecnológica de los formalismos medievales.

3. Planteo del Proyecto

Dentro del marco teórico e institucional planteado en los dos puntos anteriores, debíamos diseñar proyectos que se ubicaran en el punto justo de equilibrio. Este proyecto, en su conjunto, debía atacar a dos problemas básicos de la administración de la justicia y el uso del derecho:

- El creciente desorden legislativo, con la consiguiente dificultad en la interpretación y aplicación de las leyes;
- El estado de sobrecarga administrativa de los tribunales, provocada por la dificultad en la realización material de trámites y procedimientos sencillos.

La necesidad de romper con un círculo vicioso.

El primer problema se intenta solucionar con el Sistema de Recopilación Integral de Información Jurídica. Sus objetivos básicos son los siguientes:

- Recopilación y tratamiento de toda la legislación nacional;
- Recopilación y tratamiento de la jurisprudencia.

Este sistema busca brindar información a los jueces y magistrados en general, a otros organismos del estado y al público en general. Su estado actual es el siguiente: se ha cargado todo el índice de la legislación nacional, estableciendo, dentro de lo posible, su vigencia. A finales de este año se habrá cargado el texto completo de la legislación vigente.

Hasta aquí hemos hecho una pequeñísima reseña de los objetivos y del estado de este proyecto. Como es notorio sus objetivos y desarrollo no varían sustancialmente de cualquier proyecto de esta clase. Sin embargo, no debemos olvidar que en Guatemala particularmente, pero también en muchos países de Latinoamérica, existe un grave problema que afecta a la vigencia misma del derecho y su carácter de instrumento básico de la política social: existe un fenómeno de inflación legislativa con una gran carga de contradicción, lagunas y redundancias. Es cierto que no existe orden jurídico sin lagunas, redundancias y contradicciones. Incluso, se ha sostenido que ellas cumplen una función necesaria dentro de la complejidad del orden jurídico. Pero, si esas contradicciones, lagunas o redundancias no responden a un deliberado propósito de técnica legislativa, sino que, por el contrario, son el resultado, de la elaboración improvisada de las leyes, de la falta de atención sobre lo que ya ha sido normado, o el resultado de las malas prácticas de derogación, y si ha eso le sumamos la inexistencia de sistemas de información completos y ágiles, encontramos que el derecho se convierte en un instrumento prácticamente inutilizable, o por lo menos, de difícil manejo.

Aquí también podríamos que repetir que este fenómeno no es un fenómeno muy novedoso, ya que todos los países sufren, en mayor o menor medida, situaciones como esta. Pero si una sociedad esta recreando su democracia, tratando que el Estado de Derecho no sea una ficción, que sus ciudadanos comprendan que sólo a través del derecho es posible solucionar los conflictos pacíficamente y que las políticas ganan en racionalidad y justicia cuando utilizan correctamente las normas jurídicas, la imposibilidad de usar efectivamente el derecho deja de ser un problema técnico para convertirse en un problema de gran importancia institucional.

Por tal razón, no alcanza con elaborar sistemas de información. Ellos son, por supuesto, la primera condición positiva para el orden legislativo. Pero si ellos no ayudan a resolver los problemas planteados y, en particular, no sirven para acercar el orden jurídico a la vida concreta de la sociedad, estaremos creando nuevas formas

de oscuridad "luminosa", pero tan o más "oscuras" que las anteriores, nuevamente nos enfrentemos al problema del "prestigio electrónico".

Esto lleva a uno de los principales problemas que debe enfrentar un sistema de estas características: su uso.

Muchas veces se invierten enormes recursos en elaborar sistemas de información complejos y completos, pero luego esos sistemas no tienen o no logran la cantidad de usuarios que justifiquen los esfuerzos realizados. La elaboración de una correcta política de difusión y uso de estos sistemas de informática documental no es un problema posterior, que se debe encarar cuando el sistema ya está completo, sino que se debe tratar de una política inicial, que ponga al alcance del público y los usuarios específicos, aún los resultados parciales.

Por supuesto, esta política genera una buena cuota de escepticismo o desilusión: todavía el usuario no suficientemente permeabilizado a la informática fluctúa entre el miedo y la magia. O cree que la computadora le complicará la vida enormemente o cree que le solucionará todos los problemas. Empero es preferible asumir este riesgo a fabricar elefantes blancos, que nadie use o cuyo uso no justifique sus gastos.

Vemos pues que un proyecto de informática documental en el contexto del desorden legislativo, sólo tiene razón de ser si se propone acabar con ese desorden (lo que no es fácil, porque los sistemas de información no son parlamentos) y se propone acercar el derecho a la vida real, para rescatar un uso racional de ese derecho. Un orden jurídico con una alta cuota de irracionalidad genera prácticas irracionales en el uso del derecho. Las prácticas irracionales en el uso del derecho, aumentan la irracionalidad del orden jurídico, en su totalidad, a través de la mala interpretación que se consolida a través de la jurisprudencia. El sistema de recopilación y tratamiento de información jurídica tiene que romper este círculo vicioso para cumplir con su misión.

Una justicia de formularios.

Ya hemos planteado la situación de transición en la que se hallan nuestros sistemas judiciales. También hemos planteado el dilema que debe resolver quien quiera encarar un proyecto de informatización de nuestra justicia de formularios, alejada

de la vida y los conflictos reales.

Por tal razón, se planteó como objetivo del Proyecto de Gestión Integral de los Tribunales el brindar a los jueces las necesarias herramientas tecnológicas para que alivien la sobrecarga de trabajo, sobre todo en todo aquello que signifique una actividad puramente administrativa o trámites con escaso valor jurisdiccional.

Debemos tener claro que no todo lo que hacen los jueces es actividad jurisdiccional por el simple hecho de que sean ellos quienes lo hagan. Al contrario, nuestros sistemas de justicia demuestran que a los jueces se los obliga a realizar un sinnúmero de tareas de contenido puramente administrativo, que los alejan de su verdadera misión de juzgar el caso. Esta situación, como ya lo hemos señalado, no se puede revertir sin un cambio cualitativo de la administración de justicia, lo que sí puede realizar un sistema de información en la transición es descargar las espaldas del juez de todos aquellos trámites que pueden ser automatizados. Una computadora no debe servir para que el juez se aleje del conflicto que debe resolver y pierda inmediatez. Ella debe estar al servicio de la inmediatez y para eso debe alejar al juez de la rutina. La rutina es la vida propia de la computadora, pero es la muerte del juez.

Dentro de este marco, el Proyecto de Gestión Integral de los Tribunales cubre dos áreas:

- El soporte a la oficina judicial;
- El sistema de información para la gestión judicial.

El primero comprende todas las actividades repetitivas que pueden ser tratadas como resoluciones-tipo. Se ha tomado especial cuidado en no convertir en resoluciones-tipo, a actos de gran contenido jurisdiccional tales como sentencias, autos de prisión o de apertura a juicio, etc. Asimismo se han desarrollado sistemas de archivo de expedientes, vinculados al sistema general de soporte de oficinas.

El sistema de información para la gestión judicial comprende todas las actividades de registro sobre la actividad judicial, de modo que el juez pueda tener información rápida y actualizada sobre el estado de sus trámites.

Aquí también la política de acercamiento a los usuarios ha sido tomada como un elemento esencial del proyecto. En este sentido, se han llevado a cabo innumerables seminarios de capacitación, cursos, conferencias, talleres, laboratorios y, en todo momento, se ha contado con la colaboración de los usuarios para el diseño y desarrollo de los programas.

Por supuesto los beneficios de un sistema de estas características son limitados. Y por suerte son limitado. Nada quedaría más afuera de la filosofía de estos proyectos que el pretender solucionar los problemas de la justicia penal de Guatemala con la instalación de una computadora en cada juzgado.

Al contrario, el proyecto piloto ha servido hasta el momento para sensibilizar a los jueces y demás operadores sobre la importancia y la necesidad de un cambio radical en su modo de administrar justicia.

Será en ese nuevo sistema, esperamos, donde la informática de gestión de los tribunales adquiera se punto máximo de eficiencia.

Bien, a través de la cooperación que nos ha brindado el ILANUD hemos podido encarar proyectos que con sólo nuestros propios esfuerzos hubieran sido difíciles de llevar adelante. También hemos podido realizar lo que a nuestro juicio es el planteamiento correcto, que no nos cansaremos de repetir: el problema de la justicia, en especial de la justicia penal, no es un problema informático; al contrario, se trata de un problema de alta política institucional, que se vincula con el tipo de sociedad que queremos diseñar, con el respeto a los derechos de las personas y con la aspiración irrenunciable de vivir en paz.

4. Descripción Técnica del Sistema

El sistema de informática del organismo judicial abarca dos grandes áreas, con objetivos diferentes; no obstante, ambos sistemas han sido desarrollados en una computadora IBM, de la serie AS 400 y en ambos, también, se han desarrollado las aplicaciones bajo el concepto de bases de datos relacionales.

Los sistemas comienzan a diferenciarse en su estructura tal y como se expresa a continuación:

- Proyecto Documental, Recopilación y Tratamiento de la Legis-lación Nacional;
- Sistema de Gestión Integral de Tribunales.

El Proyecto Documental, Recopilación y Tratamiento de la Legislación Nacional se cuenta con archivos de datos ingresados al computador por analistas jurídicos, que describen la legislación del país, así como, sus derogatorias, reformas y otros datos de importancia para su consulta mediante un método objetivo de análisis y la utilización de instrumentos específicos tales como los tesauros jurídicos elaborados por el Instituto Latinoamericano de Naciones Unidas para la Prevención del Delito y Tratamiento del Delincuente ILANUD.

Estos archivos se consulta por datos estructurados (llaves de acceso), y por palabras contenidas dentro del texto.

El sistema documental responde a un concepto eminentemente centralizado, que permite el acceso vía teleproceso; este es un sistema abierto al público, y en especial, a los funcionarios judiciales, universidades y entidades del estado.

La programación fue desarrollada con un criterio modular, que le da flexibilidad en cuanto a su mantenimiento y posibles cambios.

El Sistema de Gestión Integral de Tribunales centra su atención en el seguimiento de expedientes de los tribunales del ramo penal.

Su estructura responde a una concepción mixta, es decir, la combinación de una base de datos centralizada y, a su vez, el manejo individual de esos datos en cada tribunal, en lo relativo al seguimiento del expediente. Asimismo, en cada tribunal se cuenta con computadores personales fuera de línea, en los que se procesan textos de resoluciones tipo, que en un momento dado pueden ser conectados al sistema central, para relacionar en forma automática los datos de éstas con el seguimiento de los expedientes.

Los conceptos básicos sobre los que se realizó el diseño, fueron los siguientes:

- Facilidad de manejo: el diseño del sistema permite que el usuario no encuentre

obstáculos en su uso por complejidad;

- Flexibilidad: el sistema permite cambios en archivos sin modificar la programación central, debido a cambios en reglamentos y leyes que modifiquen el sistema de justicia penal actual.

5. Concepto General del Sistema

Existen tres grupos de datos que dan sentido lógico y funcional a la gestión:

- Datos de personas (sujetos procesales) y objetos;
- Datos de actuaciones y seguimientos;
- Datos de control.

La interrelación de estos grupos de datos brindan al funcionario judicial un solo sistema de información.

La diferencia más notoria entre un sistema y otro radica en el perfil de los usuarios. Mientras que en el primero el usuario es el público en general, ya que se trata de un servicio público, en el segundo sistema se limita al uso de los jueces y personal del tribunal, para la gestión, y al uso de las autoridades judiciales, para la planificación institucional.

6. Características del Desarrollo de los Proyectos

Ambos proyectos han sido desarrollados con una alta cuota de participación de los usuarios. Esta participación puede ser dividida en varias etapas. En un primer momento se realizaron actividades de sensibilización, tales como talleres de motivación al cambio, talleres de explicación de los objetivos de los proyectos y reuniones aclaratorias sobre la función de la informática en la gestión de los tribunales y en el tratamiento legislativo. En una segunda etapa se requirió el auxilio de los usuarios para todas las tareas de diagnóstico. Este auxilio se canalizó a través de un comité técnico asesor, formado por magistrados, jueces y funcionarios judiciales, que, en todo momento, tuvieron la posibilidad de canalizar sus inquietudes respecto a los

requerimientos del sistema y respecto de todos y cada uno de los instrumentos que se utilizarían en el futuro.

En la tercer etapa los usuarios, en el proyecto de gestión, participaron directamente en la prueba del sistema y, en el proyecto documental, participaron en la revisión de los índices de legislación penal que se hallan en la base de datos, así como en la realización del vocabulario controlado que permite analizar la legislación.

Finalmente, los usuarios son llamados continuamente a brindar su opinión sobre el funcionamiento del sistema, evaluando continuamente sus resultados. En este sentido, se realizan reuniones periódicas de evaluación, mediante la distribución previa de cuestionarios que permiten orientar la crítica al sistema.

7. Seguridad del Sistema

Está contenida en cuatro áreas principales:

- Seguridad física, involucra la protección de dispositivos, así como el uso de los mismos por personal no autorizado a través de controles sobre la localización del equipo, acceso físico al mismo y medidas contra incendios e inundaciones;
- Seguridad de la información, que se establece al momento del ingreso del usuario al sistema, utilizando la identificación del mismo y su contraseña, proceso nativo del AS 400;
- Seguridad institucional, a través de las copias de respaldo y recuperación para garantizar la continuidad del servicio;
- Seguridad propia de las aplicaciones.

En el Proyecto de Gestión de los Tribunales se han tomado diferentes medidas para garantizar la seguridad. Por ejemplo, en cuanto a la actualización de los datos el sistema reconoce la función del usuario y el tribunal específico al que pertenece, el usuario puede modificar únicamente los expedientes a su cargo, generando un movimiento histórico de esa modificación, en cuanto a la consulta, esta se relaciona

con la función del usuario: el juez y el secretario pueden consultar toda la información del tribunal, y el resto de funcionarios solo los expedientes que tienen a su cargo.

Estas son las características generales del proyecto que desarrolla Guatemala. Como hemos visto, este desarrollo se enmarca en un periodo de transición en el que es muy difícil determinar cuando el sistema cumple eficazmente sus objetivos o sirve a la conservación de lo que no debe ser conservado. Por eso, repetimos, tal situación nos obliga a una continua tarea de crítica, diríamos meta-informática, para saber si todos nuestros esfuerzos conducen, en realidad, a lo que nuestro país en verdad necesita.

DELEGATION

OF

INDIA

Reports

by

S.K. Sharma

P.P. Varma

**Shri S.K. Sharma, Director General
National Crime Records Bureau
Government of India
India**

COMPUTERS IN LAW ENFORCEMENT: INDIAN EXPERIENCE

1. Introduction

In India, the major components of the Criminal Justice System are the Police or other Law Enforcement Agencies, the Courts, Government Prosecution Agencies and the Defence Lawyers, Jails and other Institutions for Detention of Offenders and various Correctional and Rehabilitation Institutions.

Policing and criminal law enforcement is, by and large, a state subject under the constitution of India, but the central government has been playing a major role in guiding and assisting the states in the modernisation and improved functioning of various components of the criminal justice system in the states.

2. History and Growth of Computerisation in Law Enforcement

The government of India formulated a scheme for providing financial aid for modernisation of state police forces for a period of 10 years beginning 1970-1971, which has been extended from time to time. Modernisation of crime and criminal information through the use of computers was included in this scheme in the year 1974-1975. This heralded the beginning of computerisation in the Indian police in 1975-1976. Other components of the criminal justice administration have not gone in for computerisation under any planned scheme of the central government as yet, though a few isolated computer applications have been attempted in different fields.

The Indian police, over the years, have sought to improve the efficacy of the crime records systems to attain greater efficiency and improve their ability to prevent and detect crime. Towards this end, the central government has set up various organisations to facilitate exchange of information on crime and criminals within and among the states through centralised data banks. The Central Finger-Print Bureau

set up in 1956, the Inter-State Crime Records Section of the Central Bureau of Investigation in 1964, the Directorate of Co-ordination Police Computers in 1976, and finally the National Crime Records Bureau in 1986 are some of the important milestones in this direction. The main objective of the Directorate of Co-ordination Police Computers was to promote and encourage computerisation of crime records in the states to facilitate collection and fast dissemination of information on crime and criminals within and among the states. The activities of the directorate led to the development of a computer based crime and criminal information system and installation of computers for this purpose in 12 states, besides the one at the directorate itself. The storage and retrieval of data on crime and criminals has started and the states have been engaged in building up data bases of crime and criminal information on computers since 1974-1975.

Modernisation of crime records entered a new phase with the acceptance of the recommendations of the National Police Commission by the government of India in 1986. The National Police Commission recommended that crime records bureaux be established at the central, and also at the state and district levels for more efficient collection and dissemination of crime criminal information among the states/union territories and central law enforcement agencies. The commission envisaged that an effective spread of the computer network through the crime record bureaux at various levels will form the bedrock of a new information system for the entire country. The commission further envisaged that, when they started functioning, the crime record bureaux would be able to receive, store and furnish different types of data and information relevant to various requirements such as investigation, study of the present scheme of court trials and procedures and sentencing policies, as also on the conduct of the criminal, assessment of the effect of probation and correctional services and also to facilitate scrutiny of the various environmental factors promoting deviant behaviour and criminality in society, thus serving effectively the overall purposes of the crime and criminal justice system as a whole.

In pursuance of the recommendation of the National Police Commission, the Ministry of Home Affairs constituted a task force in June 1985 to work out the modalities for the setting up of a national crime records bureau. The task force submitted its report in September 1985 and upon its acceptance by the Ministry of Home Affairs, the National Crime Records Bureau was set up in January 1986. The following units which were already in existence as part of certain other central police organisations

were merged with it:

- The Directorate of Co-ordination Police Computers of the Ministry of Home Affairs;
- The Inter-State Crime Records Wing of the Central Bureau of Investigation;
- The Statistical Wing of the Bureau of Police Research and Development;
- The Central Finger-Print Bureau of the Central Bureau of Investigation.

As per the resolution of the government of India, the objectives of setting up the National Crime Records Bureau are:

- To function as a storehouse of information on crime and criminals including those operating at national and international levels so as to assist the investigators, and others, in linking crimes to their perpetrators;
- To store, co-ordinate and disseminate information on inter-state and international criminals from and to respective states, national investigating agencies, courts and prosecutors in India without having to refer to the police station records;
- To collect and process crime statistics at the national level;
- To supply data to penal and correctional agencies for their tasks of rehabilitation of criminals, their remand, parole, premature release etc.;
- To co-ordinate, guide and assist the functioning of the state crime records bureaux;
- To provide training facilities to personnel of the crime records bureaux;
- To evaluate, develop and modernise crime records bureaux.

The National Crime Records Bureau is also responsible to provide training facilities

to the personnel of states and central police organisations in respect of computerisation and crime records. It also collects and processes crime related statistics at the national level.

3. Impact of Computerisation on Crime Control

While the National Crime Records Bureau was taking shape with the merger of various crime records establishments between February 1986 and April 1988, a comprehensive plan for acquiring manpower and data processing equipment evolved by the National Bureau was finally approved by the government of India in August 1987. The National Crime Records Bureau, from the very beginning, has been well aware of the areas of weaknesses in the computerisation programme in the area of criminal justice administration. In order to take stock of the situation more scientifically, a study was undertaken by the Institute of Criminology and Forensic Science in the year 1986 on the impact of computerisation on crime control in India. The study of the institute has pointed out that while substantial data has been stored on computers, the extent of usage by the investigating agencies has not been commensurate with the data collection effort. Also the computer outputs did not really help investigators solve their cases. This study has, therefore, concluded that computerisation has had only a marginal impact on crime control.

In addition to the detailed study report by the Institute of Criminology and Forensic Science, the National Crime Records Bureau initiated discussions on the use of computer facilities in crime investigation with the fractional level police officers actually engaged in crime investigation and supervision with a view to assess their views and work out a plan of action to rectify the shortcomings so that police computerisation could proceed along fruitful lines. Accordingly, a plan of action was prepared taking into consideration the views that emerged during discussions with a cross section of investigators and supervisors across the country.

The National Crime Records Bureau's plan includes:

- Establishment of crime records bureaux at each state and district headquarters under the control of the states;
- Evolution of a concept of standard procedures and formats for use by the

police, courts, prosecutors, jails and correctional and rehabilitation agencies etc.;

- Introduction of new police forms integrating the police investigation and computerisation requirements;
- Setting up district computers units in addition to the existing state computer centres to improve data quality and faster information retrieval;
- Introduction of an improved and more user-friendly crime and criminal information system on police computers;
- Short- and long-term telecommunication plans for data transmission;
- Enhancement of the training capabilities and capacity of the National Crime Records Bureau to augment the number of trained staff for manning police computer centres at the state and district levels;
- Inclusion of a short module of computer appreciation training in all the ongoing training programmes in police training institutions at central and state level for generating greater awareness among police ranks about the utility of computers in law enforcement.

4. Expansion of Computerisation Plans

The computer systems now in use with the Indian police were installed from 1976 onwards. Most of these systems have completed their normal life and maintenance has become uneconomical and difficult due to non-availability of spares. The system software and application software development tools available for the crime and criminal information system on these computers are second generation tools. The application software is consequently quite rigid and not user-friendly and has, therefore, not proved popular with the police officers in the field.

For the above reasons, as also several others, the general view has emerged that the existing computer systems along with their software packages need to be replaced with the state-of-the-art technology urgently. There is a crying need to replace the

old software with more user-friendly and need-based packages and provide improved data communication facilities in order to foster extensive use at the cutting edge of the police. Consequently, a detailed revised police computerisation plan based on maintaining thresholded data at district, state and national (National Crime Records Bureau) level on a need-to-know basis, has been formulated by the National Crime Records Bureau in close consultation with the states. An extensive feasibility study has been carried out in collaboration with a professional software group to suggest computer configurations for all the 452 districts and 25 states all over India as also for the National Crime Records Bureau. The study also included concrete suggestions regarding data thresholding, volumes of data and broad patterns of enquiries for all the three levels. Based on the recommendations of the study, a comprehensive proposal for procurement of hardware and software of various categories was formulated involving financial implications of a non-recurring expenditure of approximately Rupees 300 millions apart from recurring and non-recurring expenditure on infrastructural facilities, staff etc.

It is felt that the use of computers should be extended to all facets of the criminal justice system, over and above its use as an aid to the prevention and detection of crime. It is also felt that far reaching possibilities will open out if the other agencies of the criminal justice system, viz. law enforcement agencies other than police (including immigration organisations), courts, jails, probation officers, penal and correctional institutions also join in by contributing their related data to building up a comprehensive computer-based integrated information system. Each of these agencies would then draw from the system, a far wider range of information than is available to them at present. It would help them to make a more effective contribution to the overall common objectives of a sound criminal justice administration system.

The courts will be able to receive information from the computer system on their case pendency, data relevant to sentences in individual cases and case statistics, while the probation officers will be able to ascertain and determine social, economic and personal factors influencing criminal behaviour and use the same for effective supervision and rehabilitation in each case. Similarly, the system will enable the penal and correctional institutions to identify the factors which may help them in effecting classification and treatment of juvenile offenders. But, as earlier stated, the other constituents of the criminal justice system have not as yet taken to

automation in their day-to-day working. The police organisations have, however, made a beginning and are on the threshold of entering the second phase of computerisation as outlined above. Some of the important computer applications in the Indian police are briefly described below.

Crime and Criminal Information System.

Data in respect of 19 offences which have inter-state ramifications are being collected from all the states and union territories at the national level. The computerised crime data bank has about 75,000 records out of the estimated 150,000 convicted inter-state criminals. The state computer centres holds massive data on crime and criminals varying from 100,000 records in smaller states to about 1 million records in larger states in the present scheme of computerisation. Large data in respect of stolen and recovered property (numbered or identifiable) are stored on computers at the states and the national levels. Separate files are maintained for economic offenders and highly desperate criminals. The information can be retrieved on various parameters of crime and criminals. These parameters include modus operandi (major, minor, method), place of occurrence, property involved, day and time of the crime, special features of the crime and name, age, height, sex, physical features, identification marks and deformity of the criminals. The system has been recently modified to make the outputs code-free and more user-friendly leading to nearly 150% increase in its usage.

Identification through Computerisation of Finger-Prints.

A semi-automated finger-print system evolved in 1973-1974 has been operational in some of the computer using states since early 1980s. The finger-print patterns and ridge counts are converted manually into a 40-digit specially designed code and stored on computers. In the retrieval process, enquiry slip is similarly converted into 40-digit code and matched on computers with the stored codes of finger-prints. Since the semi-automated system suffers from certain disabilities, the National Crime Records Bureau is engaged in promoting research and developmental activities in indigenous design of an automated finger-print identification system. This system is being developed in close collaboration with the Department of Electronics which has also funded the research and development effort. A prototype of the newly developed system has been put to different levels of tests by the National Crime Records Bureau and the results have been found to be encouraging. The system is likely to be installed at the National Crime Records Bureau shortly. Performance of

this system will be assessed in a live environment. Eventually, the system is proposed to be included in the central government's modernisation scheme for installation at the state level with input work stations at the district level. With a view to make use of this system on the most effective records, it is proposed to computerise the records of inter-state type of criminals at the national level and inter-district type of criminals at the state level in the first phase. The remaining records will be computerised in the subsequent phases. The total volume of records of finger-prints held at the National Crime Records Bureau is around 15,00,000 and the record size in the states vary from 50,000 to 700,000 ten-digit slips. Single-digit records and scene of crime prints are also maintained at the National Crime Records Bureau and in the states.

Automated identification of finger-prints can help the reformative and correctional institutions in focusing their attention to the recidivists who can be identified most conclusively on the basis of finger-print records. Statistics of recidivism, socio-economic milieu and the age groups of the recidivists are more easily available through this record which can not but enhance the capability of correctional institutions to assess the effectiveness of the reformation strategies and methodologies.

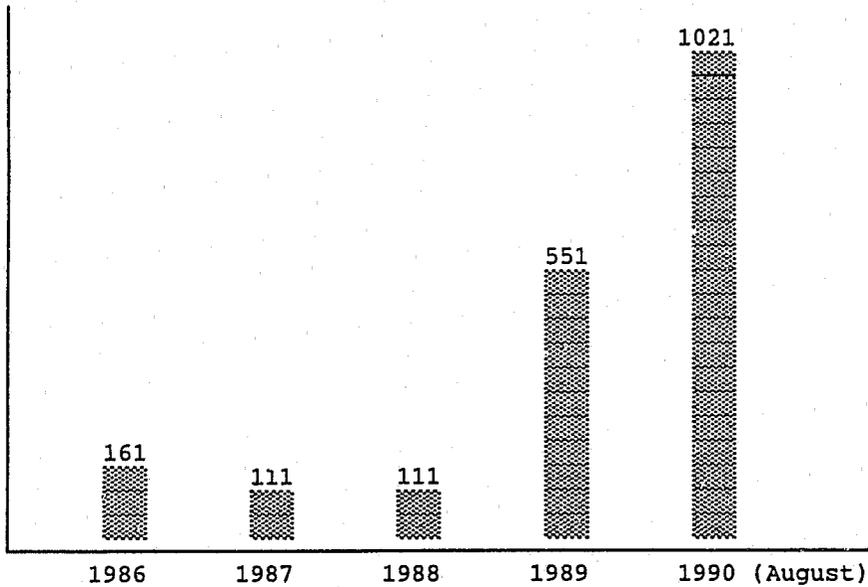
Property Co-ordination System.

Property co-ordination applications are operational at state level and at the National Crime Records Bureau for matching lost and recovered but unclaimed vehicles, fire-arms and cultural properties (idols, antiques). The data volume of the lost and recovered (and unclaimed) property at the National Crime Records Bureau is: vehicles 52,892, fire-arms 29,489, cultural property 7,375, counterfeit currency 32,814. On an average 70 properties are being co-ordinated every month at the National Crime Records Bureau alone at this stage though the data files are not yet complete and up-to-date. A yearwise increase in the number of successful matches of motor vehicles and fire-arms is shown below in figure 1.

A very innovative approach has been evolved to capture good quality data in respect of stolen motor vehicles from the General Insurance Corporation under an arrangement that will work to the mutual advantage of the National Crime Records Bureau as well as the General Insurance Corporation.

Figure 1

Year-Wise Tracings of Recovered Vehicles and Fire-Arms



Crime Statistical System.

This software provides for generation of a variety operational crime statistics from the Crime and Criminal Information System. The National Crime Records Bureau is already engaged in publishing national crime statistics in an annual publication titled "Crime in India" which gives a wide range of statistics on crime and criminals of various categories including juvenile and female offenders for police organisations, academic and research institutions and for individual researchers and scholars in criminology. Another annual statistical publication from the the National Crime Records Bureau is "Accidental Deaths and Suicides in India". Presently the compilation of statistics has been computerised only with manual inputs from all the states periodically. However, with the introduction of integrated police forms, all statistics will be produced as by-product of the main crime and criminal data bank.

Economic Offenders Information System.

Economic offenders' data has been computerised. The computer master file keeps about 7,500 records of economic offences. The Economic Intelligence Bureau of the Ministry of Finance is one of the users of the system. The information in respect of registered economic offenders can be retrieved on name, modus operandi, alias, sex, age, height, physical features, identification mark, passport number, telephone number, commodity involved, type of offences, area of operation etc. A complete criminal profile giving past arrests, convictions and acquittals etc. can be obtained once the enquiry parameter hit the corresponding records on the file.

Terrorist Information System.

With a view to help the law enforcement agencies to fix the identity of criminals suspected to be terrorists, a computer based data bank has been created at the National Crime Records Bureau. The volume of data is about 5,000 criminal records. Data received from various states and union territories was found to be deficient in several respects like physical features, finger-prints, photographs etc. Necessary correction and updating of data are underway in the states. The states and union territories have been advised to make use of the system. The information can be retrieved on various crime and criminal parameters.

Apart from information on terrorists, which aims at linking and tracing established terrorists, this system gives statistical information of terrorists crimes perpetrated at various places. Data are collected on a daily basis from each police station of the affected areas and are aggregated per district, range and state and also per period on daily, weekly, monthly and yearly basis. Information of statistics of previous corresponding periods for the last five years is also available for comparative analysis. The application is very useful as a decision support system as well as for identifying and monitoring the centres of terrorist activities, movement of gangs from one area to another and for the critical decisions of force deployment strategies.

Utilizing the facility for collecting the above information, the system has been enhanced to incorporate additional monitoring of status of general crime at each police-station and reporting of important narcotics and drug seizures on a daily basis, pendency of cases with the police and the law courts and also the internal monitoring of the police administrative activities like complaints, inspections, etc.

on a weekly/monthly basis.

National Information System for Drugs and Narcotics.

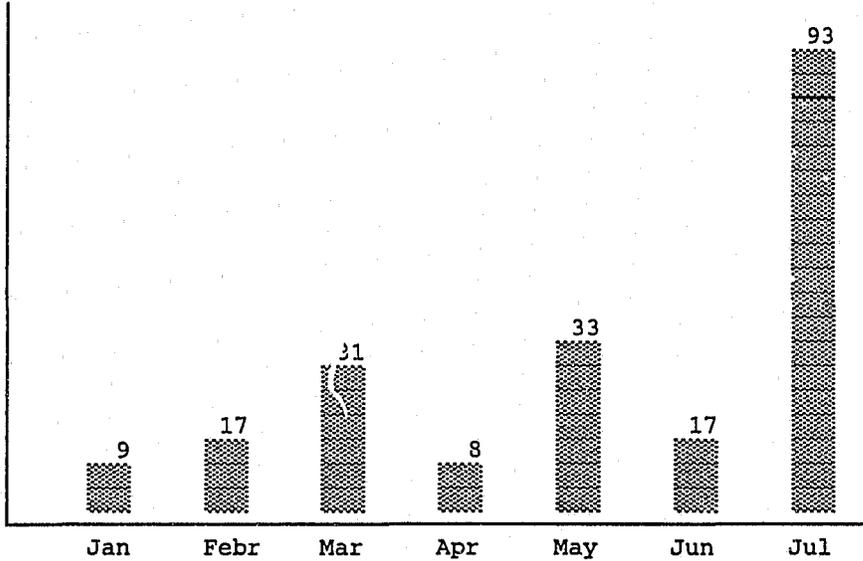
There is need to establish a national information system to study the patterns of modus operandi, geographic dispersion and the commodities involved in the incidence of drug trafficking and for quick dissemination of information on criminals indulging in smuggling of narcotic drugs and psychotropic substances. Since these offences have national and international ramifications, hence, the need to modernise the information system to effectively help in combating this fast spreading crime which is responsible, inter-alia, for promoting many other forms of crime. Basic data collection formats have been finalised in consultation with the Narcotics Control Bureau of the Ministry of Finance. Information requirements have been worked out and system design is under way.

Wanted Criminals Tracing System.

This system has been developed to check data of arrested persons against the data of wanted persons to ascertain the complicity of the arrested persons in other crimes. This application has been implemented both at the state level for inter-district criminals and at the National Crime Records Bureau for the inter-state criminals. So far about 35,000 records of wanted persons have been collected at the National Crime Records Bureau on the basis of which enquiries received from the states are being processed. This system has yielded very encouraging results in tracing wanted criminals of a state from amongst the persons arrested in other states as can be seen from the graphs at figure 2.

Figure 2

Matching - Arrested Persons with Wanted Persons (1990)



Portrait Building System.

In most of the crime cases, there are witnesses available who have seen the criminal(s) perpetrating the crime. However, the description given by such witnesses is usually vague and deficient. To help them identify the facial features and facial likeness of the person seen, conventionally, police artists have been drawing pencil sketches/portraits from the verbal description of the witnesses.

A scientific study, based on anthropological characteristics of the people of various regions in the country, was carried out by the Bureau of Police Research and Development and about 2,000 typical photographs were taken. These photographs were cut into six distinct facial features i.e. the hairline, the forehead, the eye, the nose, the lips and chin. About 250 of these photostrips were finally selected to enable 150 million combinations of synthesised faces. An ingenious mechanical template was designed to assemble the photographs selected by witnesses. The artist then gives the final touching on a transparency and a photograph is taken for

circulation with the look-out messages.

The manual system obviously had its own limitations of being slow and tedious besides the heavy wear and tear of the photographs resulting in a high recurring expenditure of replacing them. On a request of the Bureau of Police Research and Development, the National Crime Records Bureau undertook computerisation of this system by digitising, compressing and storing the photostrips on the computer memory and calling them onto the screen to synthesise faces. The synthesised faces can further be edited to align the features, expand and shrink individual features, zoom the whole face, rationalise complexion among all features or to change complexion as per the suggestion of the witness. The system is user-friendly, very simple to operate and works on any personal computer XT and up with monochrome screen or colour screen with EGA-card.

We are presently trying to incorporate some more powerful editing features to make the system more versatile. These additional features will include cut and past facilities from a library of headwear, spectacles, moustaches, beards, side-burns, etc. in addition to editing of features within a photostrip e.g. of the eyebrows within the eye strip. We are also aware of some very sophisticated packages available on the international market for a similar purpose. We have evaluated some of them and find that they are all based on sketches using paint-brush like technology. Our system is distinct from them in approach as it is based on stored photographs of facial features and hence more realistic.

Computerisation of Interpol Data.

It would be relevant to mention the efforts for computerising Interpol data in regard to crime and criminals. The Central Bureau of Investigation of the government of India has been functioning since 1967 as the national central bureau for India for co-ordination with ICPO-Interpol. This Bureau is responsible for extending international co-operation in all criminal matters connected with foreigners who come to adverse notice of the law enforcement agencies of this country. The Central Finger-Print Bureau, which functions as a part of the National Crime Records Bureau, receives ICPO finger-print slips and look-out notices in respect of wanted, under surveillance, missing, arrested and convicted persons etc. from all over the world sent by Interpol, Paris through the National Central Bureau for India. All these notices, with or without finger-prints, are classified, tested and searched, for

previous records before they are recorded. When an arrest or conviction of a foreign national takes place in India, the information is received through the concerned law enforcement agency and the arrest and conviction details along with finger-prints of the subject is sent to the Interpol wing of the Central Bureau of Investigation for onward transmission. Similarly, finger-print slips of persons arrested in foreign countries are also received in the Central Finger-Print Bureau for search to establish the identity and antecedents of the concerned person and the results of the search are conveyed back to the source.

The Interpol notices with finger-prints are codified and computerised according to the 40-digit formula. These 40-digit codes along with other details of the subject as also the Henry classification formula are stored on a computer for future reference. A separate data base of Interpol criminals wanted by police or courts is also created by storing all available data other than the finger prints. Finger-prints search references received through Interpol, India are similarly processed and the matching is done by the computer. Any match can immediately be verified and the result communicated. The data are also used for generating statistics as to the type of criminals, according to nationality, crime, sex etc.

5. Training in Computers

Over the last decade, the Directorate of Co-ordination Police Computers (now merged with the National Crime Records Bureau) has undertaken extensive training programmes to generate computer awareness in general, and of special areas of computer applications in the police in particular. To date more than 7,000 police officers of various ranks from the states and the central police organisations have been trained at the National Bureau or in situ courses organised in the states. The latter are organised to impart basic computer training to the personnel of the selected central and state police organisations as a computer literacy campaign before introducing computers in these organisations. It is one of the main objectives of the National Crime Records Bureau to continue to generate more computer literacy and to remove keyboard fear amongst the police officers.

The National Crime Records Bureau's training wing is the only police agency imparting training to police officers all over the country on crime information management and computers. The training modules have been designed to re-orient

officers to harnessing the modern methodologies and capabilities of computer based information management in crime prevention and detection. The modules also include software development approaches and systems analysis and design, management aspects of data bases and basic features of computerised systems managements.

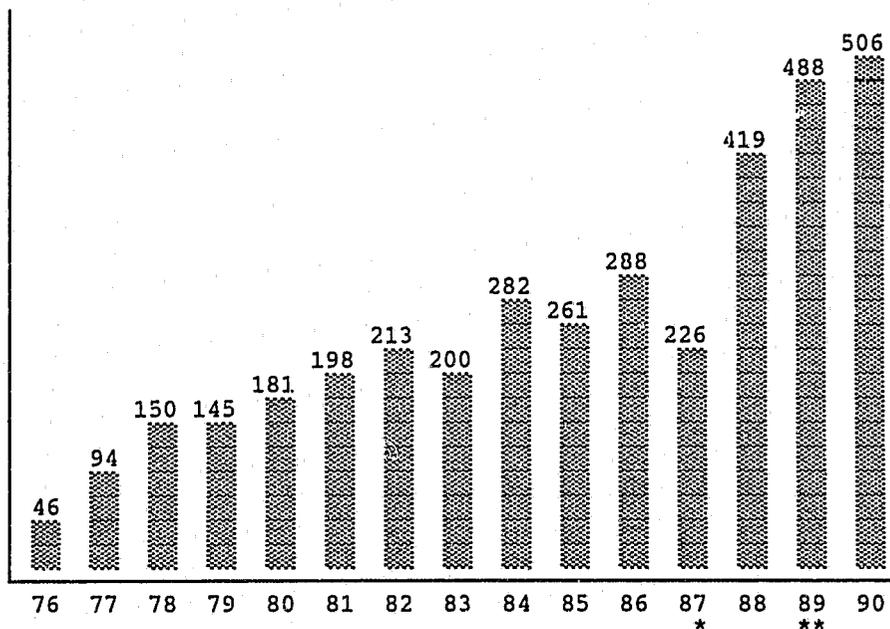
Initially, the response of the state and central law enforcement agencies in sponsoring police personnel for training was rather lukewarm. However, continuous efforts and strategic approaches made in this regard coupled with growing awareness of the relevance of computers in law enforcement have considerably improved the situation with the result that the training courses are now being oversubscribed. A survey of the trainees at the National Bureau's training programmes (excluding in situ courses) is given in figure 3.

To augment the training capacity of the National Crime Records Bureau and to make its coverage more extensive enough to reach the grass root level, four regional training centres have been set up at convenient locations. These centres will be partly funded by the central government and partly by the host states as an extension of the mutual co-operation among the states and between states and the central government in jointly dealing with crime and criminals.

The National Crime Records Bureau plans to involve the premier training and research institutions like National Police Academy, Institute of Criminology and Forensic Science, Indian Institute of Public Administration and others to undertake studies in the field of crime records systems, crime information management strategies in a multi-disciplinary multi-agency environment, modernisation of crime records and organisational reforms which may be of help in crime control.

Figure 3

Personnel Trained at National Crime Records Bureau



- * Training suspended for 3 months due to administrative reasons
- ** Training programmes (3) cancelled due to lok sabha elections.

6. Constraints and New Approaches towards Solutions

As mentioned earlier, the impact of computerisation on crime control has been only marginal and the information furnished by the computer based system has not really helped in the prevention and detection of crime. The reasons for the sub-optimal performance of the existing computerised systems have been analysed and it has been found that the quality of information available in the basic records maintained at the police station level has not been satisfactory. This has happened because the crime investigation work has been increasingly losing priority in the face of ever-increasing demand on the police to attend to public order and the associated

duties. It has also been experienced that the input fed into the computer has not always been accurate and complete. Good quality of data is the soul of any information system, more so of a computer based information system. In order to improve the quality of data and remove other snags in the existing computer input forms, the National Crime Records Bureau has evolved the idea of integrated police forms and have recommended the new forms to all the states and union territories for adoption and implementation. Another approach adopted to improve the data quality is by providing data processing facilities at district headquarters so as to be close to the data generation sources, i.e. police station. The ideal would have been to provide data entry machines at the police station itself, but this stage has not yet come.

Inadequate data collection machinery in the states and shortage of qualified technical staff at the police computer centres are among other problems which have contributed substantially to the slow progress of the computerisation programme and its sub-optimal performance. In order to get on top of the problem it has been thought to create states and district crime records bureaux each under the charge of a full-time senior police officer in line with the recommendations of the National Police Commission. Constant persuasion with the states has led to the establishment of such bureaux in 17 states in line with the model organisational design provided by the National Crime Records Bureau. The establishment of crime record bureaux has led to closer interaction with the field staff on data collection matters. Regarding shortage of qualified technical staff, efforts are afoot to evolve an effective personnel policy for manning the technical services in the police besides providing adequate financial and other incentives to the personnel working in these services.

Another important reason for the sub-optimal utilisation of computers has been identified to be the lack of adequate communication facilities. The Institute of Criminology and Forensic Science's study has gone to the extent of pointing out that there should be computer terminals even at the police station level. This is not feasible at present when efficient and reliable communication lines are not assured even for all the districts of some of the states. The efficacy of the existing computerised system has been considerably inhibited because of this factor. To provide good communication cover to the police forces in the country, a comprehensive scheme for updating police telecommunications estimated to cost about

Rupees 2 billions has been drawn up by a committee of experts. The scheme provides for linking the National capital to all the state capitals through 6 leased lines and each state capital to the districts through 4 leased lines. Each district will be linked to all the police stations on the radio through multi-access radio relay technology which will have the capability of connectivity with the public exchange at the district and police station. One channel in each of these tiers of the network will be earmarked for computer data transmission. The upgrading of police telecommunications providing for variety of facilities and connectivity at vertical and horizontal places as well as with public exchanges has been taken up for implementation very actively. Experiments at two pilot project sites are already in hand.

One of the serious difficulties that have been faced in the police computerisation programme is that of attitude. It has been found that most of the investigating officers do not show much interest in collection of information through the use of computers for investigation of crime. There has been lack of communication and interaction between investigating officers and computer experts again due to an apathetic attitude of the police personnel towards exploiting the modern means of information storage and retrieval. Whatever may be the other shortcomings like lack of communication facilities, rigid formats of enquiry, ambiguous outputs etc., it is felt that even a deficient system has not been exploited to the maximum by the users because of problems of attitude. The systems and equipment can always be improved, but changing of attitude is a long-drawn process. The central agencies like the National Crime Records Bureau have taken a number of steps directly and through state governments to overcome this problem. The main thrust of the National Crime Records Bureau is to demonstrate the success of information technology in a limited manner, module by module despite the constraints and attract the users towards its adoption. This approach coupled with massive training and education drive has already started paying dividends.

The National Crime Records Bureau has formulated broad outlines for a national plan for police computerisation under which computers will be installed at the district, state and national levels according to the hierarchical need and operational information requirements. The implementation plan is already in hand and a monitoring committee for computerisation of crime records in the states and at the national bureau has been constituted with representatives of the concerned ministries and departments including the state police forces. For effective imple-

mentation of this plan, necessary guidelines and operating procedures have been formulated. The National Crime Records Bureau is also attempting to draft a model crime records manual for the states, incorporating therein the requirements of the manual as well as computerised system of records maintenance for bringing about standardisation of procedures, formats, data definitions and coding structure to facilitate exchange of information among districts and states.

The problems and difficulties as depicted, notwithstanding, it is quite encouraging and gratifying that the police computerisation programme is making a headway. The Institute of Criminology and Forensic Science's study has brought out certain positive features favouring the modernisation efforts put in during the last decade which also need to be highlighted in all fairness against the backdrop of shortcomings and limitations highlighted above. The positive features as brought out by the study are as under:

- The investigating officers have acquired general awareness of computer's role in crime investigation;
- 46% of the investigating officers covered by the study are aware of the concept of computer processing;
- 50% of the investigating officers have actually taken help of computers in crime investigation;
- 33% of the investigating officers admitted an increase in their output, i.e. disposal of cases because of help received from computerised information system;
- Investigating officers expressed satisfaction to the effect that they could obtain, with the help of computers, a list of criminals not only from their district but from other districts or from whole of the state within 24 hours;
- 60% of the investigating officers showed awareness of computer based property co-ordination and its utility in their work;
- Over the years data added on to the computer files and inquiries made by

users have shown an upward trend progressively.

The test of the efficacy of the computer system is whether the investigating officers are supplying data to the computer regularly and whether they continue to make enquiries on the computer for seeking information. If these two factors show a progressive growth, as it does in the Indian police, it should be taken as a positive indicator that computerised system is acceptable. The graphs at figures 4 and 5 would reveal that there has been an upward trend in data collection in the states as well as at the National Crime Records Bureau. There has also been constant increase in the number of queries received at the computer centres and the responses sent to the investigating agencies.

Figure 4

Consolidated Data Growth at States

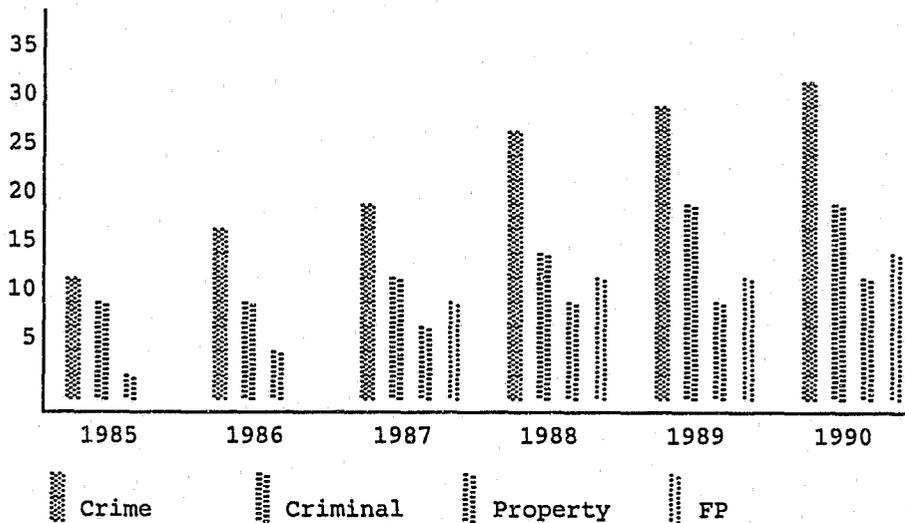
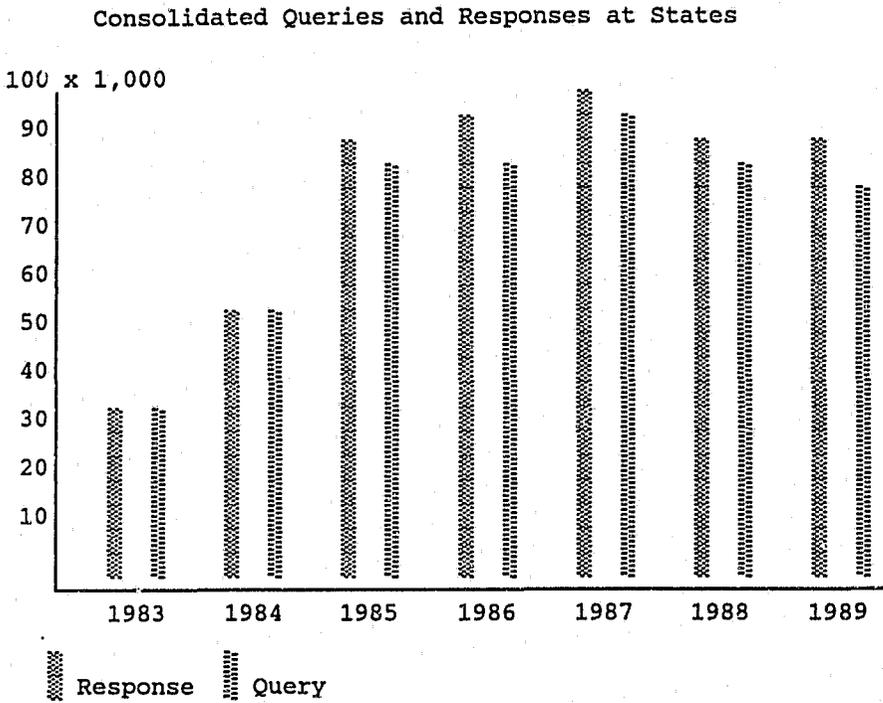


Figure 5



7. Conclusion

The use of modern technological aids, and more specifically computers, for vast storage of data and retrieval of information required by various constituents of the criminal justice system cannot be over emphasised. Maintenance of proper, systematic and up-to-date records in respect of persons who come in brush with the law is necessary so that the law can take its own course speedily and effectively and the correctional agencies can be timely advised to take up reformatory and rehabilitation measures for the delinquents. A beginning has been made initially with the police. For covering other components of the criminal justice system with an effective computer networking with proper linkages, massive funds for equipment and necessary infrastructural and communication facilities will be required. International organisations like the United Nations have a major role in providing the

requisite impetus, expertise and guidance apart from material resources as per the needs of the selected and interested countries so as to show the way to others in this vital field of public peace and order.

Colonel P.P. Varma
National Crime Records Bureau
Government of India
India¹

EVOLUTION OF A COMPUTERISED FINGER-PRINT IDENTIFICATION SYSTEM IN INDIA

1. Introduction

Criminal justice is multi-faceted. Investigation and prevention of crime are among the important subsets of criminal justice. Identification of criminals through the well established art of finger-print matching is a vital technique for both investigation and prevention of crime. Besides, the finger-print records help the reformative and the correctional agencies to identify the recidivists, who deserve the focus of our attention.

In India, the first non-criminal application of identification through finger-prints is being considered for identification of people for payment of compensation to the victims of the worst-ever industrial tragedy of a world-wide notoriety involving leakage of poisonous gas at a Union Carbide chemical plant at Bhopal.

2. History and Background

Historically, the art of finger-print identification was evolved originally in India by Sir Francis Galton and Sir E.R. Henry. The first finger-print office in the world was established in 1897 at Calcutta. Other countries adopted the system of identification through finger-print matching thereafter.

Identification through finger-print matching is based on the fact that for each human being, the finger-print is unique and does not change. Many other unique features like DNA signatures and retinal eye patterns have emerged recently as alternative individual identification parameters; but these features are yet to get

¹The paper has been presented by S.K. Sharma.

technology-proven over time and more important, they have first to become economically viable for large scale usage for adoption in a country of the size of India.

3. Manual System

The manual system, designed by Sir E.R. Henry and later modified by Chatterjee, has yielded the due dividends over almost a century now. Identification of individuals is required for two distinct types of cases i.e.:

- Personal Identification when the finger-prints are available for all the ten digits;
- Chance Print Identification when single digit prints are available - typically lifted from the scenes of crime.

The 10 digit finger-print slips for personal identification are coded as per the Henry - Chatterjee classification system and the single digit records for chance print identification as per the Battley system of classification.

The manual system is simple, reliable, dependable and foolproof, but only suitable for small volumes of finger-print slips. With the massive growth of criminal records, the manual system has gradually become slow and in countries like India, where the records run into millions, the manual system has become so slow, tedious and difficult that it is almost impossible to manage the system effectively any more. Besides, the manual system suffers from a number of limitations like:

- Deterioration of prints over a span of time;
- Misfiling due to ambiguous classification;
- Slow because of accumulation of records;
- Limited chance-print search capability;
- Limited chance-prints database;

- Difficult maintenance (deletion and updating).

Further, chance print identification, which is a very powerful tool for crime investigation and identification of a criminal, has several problems. These are characterised by:

- Availability of only partial and generally poor quality prints;
- Very few minutiae are available for matching;
- Most of the time the class and the digit is unknown;
- Reference points like core/delta may not be available;
- Orientation may not be known.

The limitations of the manual system and the difficulties of manual record management were realised as early as 1970s and with the advent of computers, a computerised system for finger-print identification was the obvious solution.

4. Evolution of Computerised Finger-Print Identification

In India, the computerised method of identification has been evolved in two stages:

- The semi-automatic finger-print identification systems;
- The automated finger-print identification systems.

The semi-automatic era commenced in the early 1970s, while we are now on the threshold of being launched into the automatic phase.

5. Semi-Automatic Systems

The semi-automatic systems aimed at quicker retrieval of the required finger-print slip from the manual records, which are binned according to the Henry classification system by taking the indirect advantage of the fast information processing capability

of computers, which became available in India in the early 1970s. The system consists of two distinct and complementary approaches which have been developed in different phases over a period of about two decades. One approach is of matching on a special 40-digit code and the other is on matching of names. The method of 40-digit coding is useful in cases where the information of the name is either not available or not reliable. Both these approaches are discussed briefly below.

5.1. 40-Digit Code System

In the 40-digit code system, the 10-digit (10 fingers) finger-print record is coded additionally into a relatively more simple 40-digit code, with each finger being represented by a 4-digit code and stored in the data base along with the corresponding Henry classification. The 4-digit code consists of the first two digits representing one out of the 22 specified and easily identifiable pattern codes and the next two digits give information of the ridge count between the core and the delta positions. This 4-digit code is concatenated for the ten fingers in a definite specified sequence starting from the right hand thumb to the little finger and continuing on to the left hand thumb and the other fingers sequentially to form an ultimate string of 40 digits (see figure 1).

Figure 1

40-DIGIT CODING STRATEGY (Semi-Automatic System)

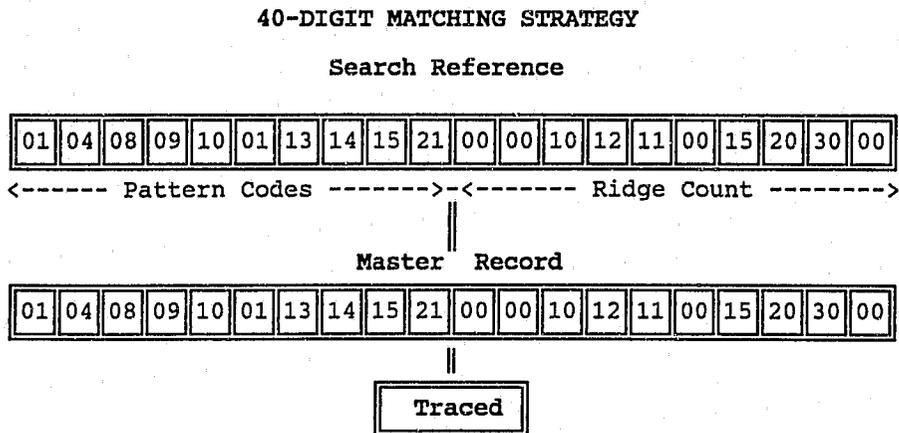
RT	RI	RM	RR	RL	LT	LI	LM	LR	LL
0803	0504	1306	1404	1505	0100	0604	0400	1305	1405
----	----	----	----	----	----	----	----	----	----

== Pattern Code

-- Ridge Count

The search and query slip is similarly coded into 40 digits and matched on a computer with the stored data base of the established and known criminals (see figure 2).

Figure 2



The computer usually produces a short list of possible matches, which can be manually examined and filtered on the basis of the other definite known information of the suspect and the suggested matches. The corresponding Henry classification reference enables quick access to the wanted record. The system also enables linking and updating of the criminal records in the Crime and Criminal Information System. When conviction slips are received, on matching and linking up, the records with earlier provisional criminal number are updated with a regular criminal number.

The system is, of course, useful for 10-digit searches for personnel identification only at present. It is operational at the national level at the National Crime Records Bureau and at 12 out of the 25 states in India, where third generation computers have been installed in phases since 1976.

5.2. Name Indexing System

The name indexing system is a more recently developed system for cases where name information is reliably known. The system works on mainframe computers as well as on AT PCs. In this system, the data bank is created by storing the following information of the criminal:

- Name;
- Father/husband's name;
- Primary classification;
- Secondary classification of the right hand index finger;
- The Henry classification.

Matching is done on all these parameters, i.e. the individual name, father's name, primary classification and the secondary classification of the right hand index finger. The system gives almost a unique match with the corresponding Henry classification to enable quick access to the manual record. For name matching, an algorithm based on the Soundex system, modified to suit Indian phonetic names of all the regions of the country, has been developed. This algorithm has an accuracy of about 97%. We are constantly endeavouring to identify and analyse the failure cases in order to improve the algorithm. The PC version of the system is very useful for small volume local data at smaller districts and at state level finger print bureaux.

6. Future Perspective for Semi-Automatic Systems

An automatic finger print identification system has been developed² and one such system is being installed at the national level for the inter-state type of criminals. Due to the exorbitant cost, it shall take quite some time before the fully computerised systems can percolate down to all the states and the district level finger print bureaux. In the interim period, we envisage extended use of the semi-automatic systems. Even later, when the fully computerised systems will be installed and several faster and accurate successful tracings are effected, we expect that the present dwindling confidence and faith in the finger-print matching technique will be restored among the various investigating agencies and the volume of queries will increase in a snow-balling manner. We are aware that very soon the volume of work-load would exceed the presently designed capacities of the

²See Para. 7, below.

computerised systems, despite the fact that we have catered for some expansion capability to a certain extent based on the existing average volume of search requests and the size of the database. It is during this period, before the capacities are upgraded, the semi-automatic systems are envisaged to be used in conjunction with the fully automatic systems to share the load of work on a selective basis. It is with this perspective that we are still continuing our research and development efforts in improving the semi-automatic systems. One of the thrusts in our research and development endeavour is the development of an effective semi-automatic system for smaller volume chance print identifications for use at districts and some of the smaller states. The other thrust is to improve on the matching algorithms for both 40-digit and name indexing systems.

7. Automated Finger-Print Identification Systems

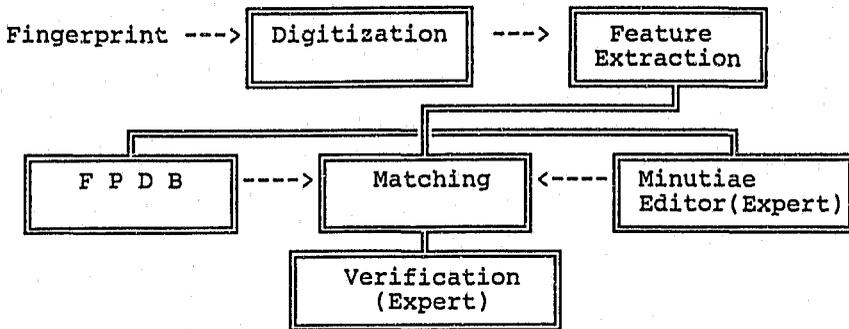
An automated finger-print identification system, named Finger-Print Analysis and Criminal Tracing System, FACTS, has been designed and developed indigenously within the country by own research and development effort which commenced in 1986. India happens to be the fifth country in the world to have acquired this expertise.

This system does not replace the finger print expert but assists him in increasing his productivity and eliminates the drudgery of the manual system. It produces fast and accurate matching with a high rate of identification. It enables effective record management and provides connectivity to the Crime and Criminal Information System. It is modular in design and allows for upgradability.

The system caters for storage, retrieval and matching of 10-digit finger-print slips. The same system caters for single digit records also. The search finger-prints are digitized, encoded for the various minutiae attributes and matched against the stored minutiae data base. Figure 3 illustrates the diagram of the process.

A short list of possible candidate slips is produced in the descending order of their probability and a finger-print expert physically verifies each one of them on the monitor by calling the corresponding stored images of the finger-print along with the image of the search print.

Figure 3



The system enables identification of persons based on 10-digit rolled slips and also for the single digit chance prints lifted from the scenes of crime. The system also provides facilities for updating finger-print records, replacing low quality prints, creating a list of time-barred slips and their deletion, processing death and absconder reports, adding conviction details for known criminals having regular criminal numbers, and their linking to their previous crime/convictions. The system also generates statistical reports on a daily basis as well as the aggregated reports by region, crime, age etc. on periodic basis.

The Finger-Print Analysis and Criminal Tracing System has been subjected to detailed tests over the last three years. The results have been very encouraging. For example, 90% traces have been obtained for personnel identification using rolled prints within the first ten positions of the short list and 70% in case of chance-prints having no information of core/delta and orientation, which is considered as the worst case for such identifications.

The first operational Finger-Print Analysis and Criminal Tracing System is being installed at the national level at the National Crime Records Bureau at New Delhi. It is expected to be fully operational by mid-91. The initial data base being created is of about 0.15 million records of inter-state type of criminals and will also include records of criminals of international notoriety as reported by Interpol.

8. Perspective Plan

The future plans aim for an ultimate nation-wide network of automated finger-print identification systems, improvements in the existing automatic finger-print identification system and the use of artificial intelligence technology to reduce dependence on the human finger-print experts.

8.1. Networking of Automated Systems

Research and development efforts are being made to develop lower capacity and low-cost automatic finger-print identification systems also. These will be commensurate with the requirements of the states and the districts of different sizes and would be compatible to the larger main system at the national level. An AT 386 personal computer-based prototype system is under development at present. Using the experience to be gained at the national level system, smaller versions of the system are envisaged to be installed at the states and all the districts. These will be networked through a wide area network (WAN) and would function on the principle of distributed data processing. The district systems would hold the total data of their jurisdiction, the state systems will hold data of inter-district type of criminals and the national level will store data of the inter-state type and the Interpol type of criminals. These systems will be co-located with the Crime and Criminal Information System and the two systems will be closely integrated at each level for maximum exploitation by all the law enforcement, the criminal justice, the corrective and the reformative agencies. The communication network will be shared by both the Crime and Criminal Information System and the Finger-Print Analysis and Criminal Tracing System. In the interim phase, as mentioned earlier, we plan to use the semi-automatic systems and may be later also, we may still have to use the semi-automatic systems as supplementary to the automatic systems on a selective basis.

8.2. Improvement in Automatic Finger-Print Identification System

At the same time, our research and development effort is continuing to further improve the present automatic finger-print identification system. For instance, the present system requires the core/data positions to be identified on the monitor by a finger-print expert. This activity should be automatic in a computerised

processing environment. Similarly, we want untraced search chance prints to be checked against the library of the earlier untraced chance print cases. The matching algorithms, based on the techniques of statistical cluster analysis of the minutiae attributes, also deserve attention for their continuous review and improvements based on critical examination of the results produced, particularly the failure cases.

8.3. Development of an Expert System

The computerised systems developed so far are only an aid or a tool for the finger-print experts. Good finger-print experts themselves are a rare commodity and require intensive training and extensive on-job experience before they can be deemed to be experts. Our thrust is, therefore, to exploit the artificial intelligence tools and develop a knowledge-based expert system. Preliminary experimental work has been initiated in this field, although it is still in an embryonic stage as yet.

9. Conclusion

It is hoped that by the dawn of the 21st century, India would be fully geared up for effective computerised finger-print identification applications and would be able to actively and effectively contribute in this field towards the international co-operation for crime prevention and criminal justice.

DELEGATION

OF

ITALY

Report

submitted by

Floretta Rolleri

Floretta Rolleri
Centro Elettronico di Documentazione
Corte Suprema di Cassazione
Rome
Italy

PERSEO: A PROGRAMME FOR ITALIAN CRIMINAL JUDGES

1. Introduction

The Electronic Data Processing Department of the Ministry of Justice has developed a programme for individual computer use for the judge's office: Perseo. It is based on the use of a personal computer, considered as a pliable means for different needs, from directly drawing up data to the possibility of being linked to other locally based on-line work stations or data banks that are on a remote control link.

The main aim at developing Perseo has been to provide a complete means (word processing, data base) to carry out court work by giving the judge the possibility of easily managing large quantities of information from different sources and situations.

Acquiring information and data and/or directly writing out texts make it possible to set up a data bank, possibly distributed over various files, in order to retrieve stored texts in view of also showing connections of special data (for example, whenever a name appears connected to another name or to a specific place), regardless of them belonging to different trial records (questioning, witnesses, perquisitions, confiscation, etc.). Thus, the programme permits operating cross-examination control within the same trial or between different trials to point out identical elements, if any, or similar ones.

In addition, gathering and recording information is not aimed at data retrieval or for creating documentation, but allows automatic production of the trial records instead of the traditional form type presentation.

2. Structure of the Perseo Programme

From a structural standpoint, the Perseo Programme is divided into sections, each one having specific functions and features for processing different types of information and their different computer management from storing, retrieval and extraction stand-points.

2.1. The Secretariat Section

The Secretariat Section is aimed at implementing (arrangement and printing) paper documents also on a form basis (standard or personalized by a special command) integrating data and texts that have been directly stored previously or in the Records Section or Data Banks Section.

This envisages the creation of a file for trial subjects, even acquired by transfer lines by the management programme of the general register. The Perseo interface towards word processing (WordStar) is started up and used without having to go out of the programme.

2.2. The Trial Records Section

The Trial Records Section serves to classify data deriving from:

- Documents coming from outside (for example, from the General Register on Crime Information), possibly acquired by transfer lines from a local line or from a remote host;
- Annotations or trial documents directly stored or copied from disk.

Whatever identifies a record or describes it is entered into a sector system (code, progressive number and data, etc.) onto a video card. A record may be followed by one or more notes, that group information according to logical categories (identified by codes) that have already been defined directly into the space reserved for them or by the text processing programme.

Each stored word may be an individual retrieval subject or connected to another

word in "and" in order to select all the texts where the word or words are present in the records or notes at the same time or separately. The Lexicon function permits classifying abbreviations, if any, used in a sort of dictionary to facilitate storage uniformity and, therefore, retrieval.

2.3. The Data Banks Section

The Data Banks Section permits data to be arranged according to a hierarchic structure that, starting from a general topic (file) is divided into a set of sub-topics (documents) which in turn are distinguished into other parts based on a retrieval mask, that can be defined by the user according to specific requirements. Automated retrieval may be carried out for individual data and needs. Automated retrieval may be carried out by individual data or by combining several data among themselves, specifying the sectors where they are to be found.

2.4. The System Functions Section

The System Function Section provides some utilities and permits easy use of the commands of the operation system (MS-DOS).

3. Security Problem

Since the Perseo Programme is essentially for almost personal use as an individual computer means of the judge, the security problem is very important. Protection is thus ensured from different aspects:

- **Firmware:** the presence of a special processor on the parallel slot works as an access key;
- **Logic:** entry to programmes depends on user identification and his keyword;
- **Hierarchic:** it is possible to define different access levels;
- **Cryptographic:** all data concerning files and tables can be cryptographed and, therefore, can not be retrieved without the access key.

4. Design Techniques

The Perseo Programme has been developed in Macro-Assembler language and a friendly user interface has been implemented to guide the user in Italian on the use of individual programmes. For each function an on-line help has been envisaged and all anomaly messages are self-explanatory.

5. Application of the Perseo Programme

The Perseo Programme has been adopted on an experimental basis by different courts (according to type and extent). It will be distributed to all criminal judges, starting at offices mostly involved in the first application of the new code regarding criminal proceedings. A brief training course of how to use this programmes is envisaged before its installation. It is also accompanied by assistance aimed at satisfying individual needs of the specific office both with regard to arrangements for special applications and with regard to adopting proceedings already adopted by other courts.

Currently the most significant applications to be recalled are the following:

5.1. Management of "Maxi Processo" Trials against Organized Crime

The Perseo Programme has been implemented with the collaboration of judges of different courts to facilitate inquiry and aggregation of data related to the so called "maxi processo" trials: trials (especially Mafia trials) on dozens and sometimes hundreds of accused people, formed by thousands of trial records whose subject matter refers to multi-criminal facts. The need to provide the investigating judge and also the trial judges with a means for rapid retrieval of information concerning that specific accused person or that specific fact has led to storing and/or microfilming trial documentation, to classifying data and storing them in data banks. The programme has been applied usefully by large courts (Palermo, Naples, Rome, Turin, Milan) and allow retrieving and regenerating stored texts in view of drafting sentences, often exceeding a thousand pages.

5.2. Data Banks as a Support to Investigation

In the hundreds of thousands of proceedings against unknown persons that arrive at the court offices, the need to treat in different ways the proceedings concerning stolen cheques and/or with false signatures has been shown by the need, for each accusation or charge received, to check the payee and endorsees, if any, as well as the cash presenter in order to determine the probable authors of the offence or crime: theft, receiving stolen goods, fake. Connecting data belonging to different proceedings are indispensable for useful trial management. Hence it was decided to set up a common data base, independently from belonging to this or that trial and assigning the trial to this or that judge, containing all the identifying elements of the proceedings and information gradually arising from investigations by the criminal police. A pilot project at a large court, the Lower Court of Turin, had very successful results: on about 10,000 processed proceedings 815 accused persons have been identified relating to about 2,500 trials.

Following this experience it was considered suitable to use the Perseo Programme for the creation of data banks whenever it was necessary to store information, such as number plates of stolen cars, weapons characteristics, fake permits and documents, also belonging to different proceedings for their subsequent use in view of continuing investigation by the criminal police.

5.3. A Decision Support System for the Judge

A data base system has been set up 20 years ago in the Italian Supreme Court. This data base is divided into over 40 files and hosts over 2 million documents. The aim has been to provide full legal information on all aspects regarding legislation, court decisions and legal theory of a specific issue. This has been fully reached also thanks to an original sophisticated system of information retrieval, called Italgire Find. Link-up on-line is ensured by a network with thousands of terminals on dedicated line in court offices having the possibility of link-up by personal computer switched on by individual judges (even at their private residence).

It is obvious that direct interrogation of the data base is irreplaceable, especially with regard to updating and the possibility of having full information, but it is also obviously useful to store locally legal data that mostly concern specific work of the

individual, e.g. specialist subjects, also in view of being able to use them directly when drawing up the texts. User-friendly inquiry interface (thus called EasyFind), allows downloading on disk of the documents selected through retrieving the system. The Perseo Programme then allows arranging the documents for their subsequent retrieval and use.

The aim is to implement a multi-functional workstation which is easy to use also by a user who does not know about computers. For the Italian criminal judge is available a computer application which he can use not only not only for storing his court activities, but as a help for investigations and contribution to enhance his legal knowledge thus improving his professionalism.

**DELEGATION
OF
THE NETHERLANDS**

Report

by

Henk van Brummen

Henk A. van Brummen
Department Judicial Organisation and Legal Aid
Ministry of Justice
The Netherlands

COMPUTERIZATION OF CRIMINAL JUSTICE IN THE NETHERLANDS

1. Introduction

The Ministry of Justice of the Netherlands is built on 4 columns:

- Department of Legislation;
- Department of Police and Crime Prevention;
- Department of Prison Administration and Youth Protection;
- Department of Judicial Administration and Legal Aid.

The responsibility for computerization in the criminal justice system rests with the Department of Judicial Administration and Legal Aid.

In this paper an outline will be given of the computerization in the criminal justice system in the last few years, as well as of the prospects for the coming years.

2. The Electronic Data Processing Policy of the Ministry of Justice

The responsibility for information technology strategies in the Ministry of Justice rests with senior management of the departments. Senior management is seconded by a central unit for organization and informatics.

Top management of the Ministry of Justice (the Ministry Council, consisting of the Secretary-General and the heads of the above four columns) decides on the program (which systems will be built) and the budget on computerization. Deviations on program and budget must be reported to the Ministry Council. The

Ministry Council also decides on standards of importance to the entire Ministry. Where possible, standardization of hard- and software and data-modelling is pursued.

An information-architecture has been set up for the whole of the Ministry. This information-architecture gives a classification on the providing and sharing of information in information-areas, which are further detailed in system-architectures. In this way the Ministry endeavours to achieve a clear and stable definition of the necessary information-systems.

Information-managers have been appointed according to information-areas. Rapporteur has been appointed the information-manager for the criminal justice information-area. It is the responsibility of the information-managers to promote system-development along the lines of the information-architecture.

In sum: top-management is strongly involved in computerization within the Ministry of Justice in the Netherlands.

3. The Judicial Process

The judicial process in the Netherlands consists of four steps.

- Investigation and enforcement by the police and some special enforcement-agencies like the Railway-Police for travelling without a ticket and the Department of the Inspector-General of the Ministry of Agriculture and Fishery for environmental offences.
- Prosecution of misdemeanours as well as crimes by the Public Prosecutor's Office.
- Sentencing by the Courts.
- The implementation of the sentences by the Ministry of Justice.

4. The Application Systems

The criminal justice system is supported by the following application systems:

- Police: for investigation and enforcement by the police:
 - Traffic offences: Police Ticket Registration-systems
 - Crimes: Police Crime Registration-systems
 - Office Management: Police Office-systems.
- Public Prosecutor's Office and the Courts: the Public Prosecutor's Office and the City and District Courts are supported by the COMPAS-system and the Lex Mulder-system. These applications will be described below in more detail. A criminal records system and a courts system for the Courts of Appeal are at this moment under development.
- Implementation of sentences: the implementation of sentences is supported by a prison-system called MITRA and a fines-system called IBIS.

5. COMPAS in General

When a police ticket has not been paid by the offender, the case is transferred to the Public Prosecutor's Office. Criminal offences are always routed to the Public Prosecutor's Office (after being investigated by the police).

For the routing of cases in the criminal justice system after the police all the way till the implementation of the sentence, an advanced information system has been developed, the COMPAS-system. The COMPAS-system is divided into two phases:

- The pre-court phase;
- The post-court phase.

Most of the administrative handling of criminal cases is done through the Public Prosecutor's Office.

In its design the COMPAS-system sets a platform for all systems that support the criminal justice processes. To this end, the following philosophy has been adopted:

- A data-oriented concept for system development in order to be able to facilitate the integration throughout the criminal justice system-chain (the Ministry of Justice's Criminal Justice Business-Chain).
- The concept of a relational database, in which all information related to a criminal case and/or a defendant is stored once. The relational database-management-system ORACLE has been adopted.

After the facts and the evidence have been reviewed, the COMPAS-system can automatically perform all subsequent procedures, such as producing forms, relating the case to articles of law and producing summons and sentences.

The system has been designed and developed by the Ministry of Justice and subsequently copied 19-fold for the 19 district courts. The technical infrastructure consists of Digital Equipment VAX-computers and Ethernet as network environment.

Annually, approximately 1,2 million offences and 0,4 million crimes are dealt with by the COMPAS-system.

By means of the COMAS-system, the time to deal with criminal cases can be substantially reduced. Now COMPAS is about halfway operational, the handling time as well as the needed manpower have already decreased by 10 to 20%.

6. The Pre-Court phase

The police-warrants are first registered at the Public Prosecutor's Office. As much as possible, the registration is performed by electronic data exchange. The system design promotes one-time, at source data entry in the entire judicial

process. Once entered in a police-system, the data can be used by all subsequent parties in the judicial chain. Data go from the police-systems to the COMPAS-system, because interfaces between these systems are available. This means that much time is saved and mistakes by incorrect retyping of information is avoided.

The COMPAS data-model is as far as possible developed equal to the data-model used by the police in order to obtain maximum possibility of interchange.

In case preventive detention is imposed, for serious crimes, the system monitors the terms of the preventive detention of the defendant and produces automatically all needed forms.

After the first registration additional information is requested, and personal and case data are verified, e.g. at the registrar's office, the driver's licenses-register, the car licenses-register, etc.

Subsequently cases and defendants are divided into files. In the whole process the location of the dossiers and the duration of the cases are carefully monitored. Each case and each defendant has a unique number. The system can at any time produce a complete report of the status and background of all cases and/or defendants.

After all information has been gathered, verified and recorded, the public prosecutor decides on further prosecution of the defendant:

- Financial settlement (an amount to be paid, usually higher than the initial police-settlement);
- Summoning the defendant to appear in court for trial;
- Dismissal of the case for technical or policy reasons, sometimes conditional.

After the decision of the public prosecutor the collecting of fines are dealt with by the system. Payment-orders are dispatched to the defendants. All offences are linked by a unique number or identifier to fixed penalties. The system monitors the payment of the penalties. Unpaid penalties will be brought before

the judge.

In the system an extensive module has been developed for the preparation of the court sessions. This module includes automatic planning of court sessions. Especially for sessions with a large number of cases it is efficient the sequence in which the cases are to appear to be settled by the system, as well as to arrange the order in which the sessions should take place. All kind of planning parameters can be fed into the system's database.

For bringing a case before the court, the defendant has to be summoned. In the summons the offence and the article of law trespassed, must be clearly defined. The system has an extensive reference-table, in which all relevant law data (of approximately 10.000 articles of law) has been input and coded. This information can be automatically linked to any offence, using for example the so-called police-fact-code which is related to the systems fact-code.

The summons are automatically produced by the system. The possibility to input local by-laws or regulations is also included.

After the summons have been dispatched the system monitors the receipt of the summons.

Finally a proposal for the sentence demand by the prosecutor can be produced by the systems database.

After these preparations the court-session will be held. The system can already assist the judge in certain aspects of the process by offering standard sentences and the paperwork related.

7. The Post-Court phase

After sentencing by the judge the information in regard to the sentence is returned to the Public Prosecutor's Office and is registered in the COMPAS-system. After having informed the sentenced person the actual sentence enforcement commences. In case of a fine COMPAS produces a fine collecting order to the fine collecting system. In case of imprisonment the COMPAS-system notifies the

prison-system, which in turn monitors the imprisonment of the sentenced person.

The final implementation and settlement of the sentences are also fed into COMPAS. So there will always be a complete survey of the case in COMPAS.

Within two weeks after the sentence the defendant can appeal. For appeals in case of misdemeanours from the City Court to the District Court the COMPAS-system can automatically handle the administrative aspects of the case. For appeals to the Court of Appeal this will be possible in the near future.

Within COMPAS a number of sub-administrations is being developed, which will be updated after the sentence, such as seizure of property and revoked licenses.

After the whole judicial process an enormous amount of information has been fed into the database. Based on this information the COMPAS-system can generate a number of reports and surveys.

The user is also able to retrieve the database by using the standard query-language SQL, to regain management information. Thereby Compas is a powerful management tool with which the enforcement-policy can be analysed and adjusted effectively.

8. The Criminal Records System

In the Netherlands a criminal records system is kept whereon the committed offences are recorded. At the moment this is done by means of filing cards at the 19 District Courts, which are kept manually.

Currently a computerized central criminal records system is under development, which in fact will be a copy of the COMPAS prosecution system with a history file. The data entry will take place from COMPAS automatically.

This quick means of registering and providing information about the criminal record of a defendant can greatly speed up the handling of criminal cases.

9. The Administrative Fine System

From the first of September 1990 the Law for administrative enforcement of traffic regulations (Lex Mulder) has come into force. In doing so the Minister of Justice will make the handling of the most recurrent and simple traffic offences faster and more efficient. Parking offences, driving through red light, speeding will all no longer fall under criminal law, but under administrative law. Therefore a different set of rules apply. An important change is that the suspect himself must take initiative to appeal to the prosecutor. The person registered as the owner of a vehicle is in most cases responsible for all offences committed with that vehicle.

For the implementation of this law a complete new system has been worked out. The collection and payment of the fines connected to traffic offences will be routed through one central agency, the Central Judicial Collecting Agency (CJIB) in the city of Leeuwarden.

The administrative process can shortly be described as follows:

- A police officer reports an offence. The offence and the car and the person involved are registered in a police ticket-system;
- The data on the reported offence are automatically transferred to the CJIB.
- The CJIB-system checks the information and dispatches the ticket.
- The CJIB-system monitors timely payment of the ticket and dispatches reminders in case of non-payment.
- In case of non-payment the case is automatically transferred to an agency which will take care of the collection of the sanction. Usually this will be by a bailiff.

The CJIB-system receives and sends out a large quantity of information. At this moment the exchange of information is done by tape. In the near future the CJIB will be linked to the datacommunication-system of the police. This network links

26 regional police systems, 19 Public Prosecutor's Offices, the car licences-system, the police investigation-system and eventually the registrar's office.

10. Project Development and Management

For all computerization projects within the justice system standard system development methodologies are used. The system is divided into sub-systems which can be built step-by-step.

Within all systems comparable modules, standards and data-formats are used. The basic standards and data-models are set up in the COMPAS-system and are copied into other applications. Extensive co-ordination with all organizations in the criminal justice chain was and is necessary in order to obtain maximum advantage.

Use is made of the relational database concept. The core of the COMPAS-system is a comprehensive database in which all kind of legal information has been recorded in reference-tables. All postal codes in the Netherlands are also part of the database.

Data-entry is done once and the data can be used for all subsequent procedures. Furthermore these data can be linked to each other in many ways. By means of typing in one code one can retrieve the related articles of law, description of the offence, demands, summons, sentence, etc. from the system.

The system has been established by the active participation of all user-groups. Use was made, inter-alia, of a prototype to define the needs of the user.

In designing the system human and organizational factors were taken into account. The set-up is such that we can speak of user-friendly applications and documentation which greatly shortens the time of implementation.

Besides the active input of users extensive testing by public prosecutors has taken place. The problem is that one has to take into account the wide variety of wishes of the judges and public prosecutors. The differences in procedures and rules between the courts makes it very difficult to uniform these differences into

one system.

The development of the applications follows a previously determined path according to a standardized system development method. The users are committed to the use of this method. In this way it was possible to make up with the special requirements of the complex user-environment.

The final responsibility for the development rests with management.

For the technical and application management and data-administration a central system support organisation has been set up. This organisation performs the maintenance and takes care of the technical infrastructure and communication at the 19 sites, partly by remote maintenance.

The Ministry of Justice has recruited external consultants for the development of the COMPAS-system and of the COMPAS-based applications who support the concept:

- A consultancy firm with wide managerial knowledge and expertise in 4th Generation Languages (4-GLs);
- A hardware firm with an extensive infrastructural product package;
- A Relational Data Base Management- and 4-GLs-supplier who is able to support the above application development concept.

11. Electronic Data Interchange the Future?

As described coping with administrative sanctions is largely automated. The interchange of information among the agencies connected takes place electronically at the moment. One problem herewith is managing the interchange. To ensure that the agencies can keep their autonomy and will not all have to switch to the same system, it is in our view necessary to make use of the concept of electronic data interchange (EDI).

The Ministry of Justice has set up a pilot project which has the following goals:

- Introducing EDI to the police and the judicial agencies;
- Laying down the technical and managerial groundwork for further introduction of EDI at the police and judicial agencies;
- Simplifying the administrative procedures at the police and the judicial agencies.

The objectives of the pilot are to look closely at the possible advantages of EDI. If the pilot is successful the project will be broadened to all datacommunication within the business-chain of the criminal process.

**DELEGATION
OF
SWEDEN**

Report

by

Börje Alpsten

Börje Alpsten
Planning and Budget Secretariat
Ministry of Justice
Sweden¹

COMPUTERIZATION OF CRIMINAL JUSTICE ADMINISTRATION IN SWEDEN

1. Introduction

The theme of this report is computer aided activities in the Criminal Justice System in Sweden. The report will give a broad picture of the connections between computer applications at the Police, the Public Prosecutor's Office, the Courts and the Correctional Administration and stress the organization for the co-operation between the different sectors as to electronic data processing applications.

Applications, developed in the 70s and 80s, were based on main frames. The trends are now to small systems in the authorities in the different sectors.

2. The Organization of the Civil Service

To understand the computerization in the judicial field in Sweden it is important to appreciate the legal status of the Minister of Justice and other Ministers. The ministries are primarily responsible for the framing of policy, the authorities and boards primarily for its execution. The present organization of the Swedish civil service has developed through centuries.

The boards and authorities are subordinated to the government. It should, however, be noted that the government is severely restricted when it comes to issuing directives to authorities concerning the handling of individual matters. When handling private matters, the administrative authorities are generally entirely independent and act on their own responsibility.

¹The paper has been presented by Klas Bergenstrand, Assistant National Police Commissioner, Swedish National Police.

3. The Organization of the Administration of Justice

The Ministry of Justice in Sweden is handling questions on the prosecutors, the courts and the correctional administration. Since some years the Ministry of Public Administration is responsible for the police. Thus, the Ministry of Justice does not cover the whole criminal justice system. In the sphere of the Ministry of Justice you will also find some smaller agencies as the Data Inspection Board and the Crime Prevention Council.

The police organization consists of the National Police Board, 20 County Police Commissioners and 118 Police Districts, some of them very small.

The public prosecution is organized in three instances. The Chief Public Prosecutor in the last instance, 13 Regional Public Prosecutors and the Office of the State Prosecutors for special cases on the regional level and 86 Offices of the District Public Prosecutors on the local level.

The court system is also organized in three instances. Criminal cases and civil actions are handled by District Courts, Courts of Appeal and, as the final instance, the Supreme Court. Swedish courts have a free and independent status. No authority, not even the parliament, may decide how a court is to judge in an individual case. Judges, moreover, have a very secure position.

The correctional organization is headed by the National Correction Administration. The number of National Correctional Institutions and County Correctional Administrations is 32. One will also find 24 Remand Prisons, 56 Local Correctional Institutions and 65 Probation Districts.

4. Systems in the Judicial Field

In the autumn 1966 the government authorized the Minister of Justice to appoint a joint committee of at most twelve members and alternates to prepare the restructuring of routines in the judicial system for electronic data processing and connecting questions. The committee goes by the name of Samarbetsorganet för Rättsväsendets Informationssystem, SARI; Joint Committee on Information Systems in the Judicial Field. The SARI-committee is heading the Rättsväsendets Informationssystem

Project, RI; Information Systems in the Judicial Field Project.

The committee consisted from the very beginning of inter-alia:

- The Under-Secretary of State of the Ministry of Justice (Chairman);
- The Permanent Secretary of the Ministry of Justice (Vice-Chairman);
- A representative of the Ministry of Finance (the principal member for activities in the Ministry of Justice's sphere);
- The Head of the National Police Board;
- The Chief Public Prosecutor;
- The Head of the Court Administration Board;
- The President of one of the six Courts of Appeal;
- The Deputy-Head of the Correctional Administration;
- The Head of the Central Bureau of Statistics;
- A representative of the Agency for Administrative Development.

Today the committee also consists of other members, among them the Permanent Secretary of the Ministry of Public Administration, responsible for police questions. Secretary to the committee is the Head of the Planning and Budget Secretariat of the Ministry of Justice.

During the years in which the committee has functioned, the use of electronic data processing in the judicial system, and by authorities more or less directly connected with it, has increased greatly in scale.

4.1. Objective of the RI Project

The objective of the RI project is mainly to simplify and to improve the exchange of information between authorities in the judicial system, and between these and other authorities with which information is frequently exchanged. In connection with this it is also attempted in various ways to rationalise the office-work of authorities. Another primary purpose of the RI project is to create methods and a basis for analysis and planning within the judicial system.

Research and development are performed within the framework of the regular rationalization work of the authorities. They allocate fairly large resources within their budgets for the study of their common or similar problems. The Ministry of Justice provides some special funds for studies. The Agency for Administrative Development contributes with some studies.

RI is not envisaged as a single data system on one big computer installation with one large data bank, but as a succession of separate sub-systems at different data units. These sub-systems, however, are to be designed in such a way that compilations of data for statistical, economic and other purposes can be made automatically. Whether such compilations are to be made, and if so how they are to be structured, must naturally be judged from case to case taking into consideration among other things the current legislation including the Data Act (1973:289).

4.2. Problem Areas

The emphasis in the work on the RI project during the 70s has been on criminal case procedure on the part of the police, the public prosecutor and the courts, and on routines in the correctional system. Other fields of the judicial system have also been studied. The RI project covers three broader problem areas:

- Systems for criminal case procedure in the broad sense on the part of the police, the public prosecutor and the courts, and for procedures in the correctional system (BROTTSRI²);

²Full Swedish name of BROTTSRI: System för Brottmålsförfarandet i vid Mening och för Kriminalvård.

- Systems for official diaries, registration of decisions, text processing and text retrieval in the ministry and certain authorities, and allied questions (LAGRI/RÄTTSDATA³);
- Systems for planning and follow-up in the judicial field (PLANRI⁴).

There is no sharp boundary between these areas. Parallel with these larger problem areas are certain sub-projects related to them in various ways.

4.3. Work Procedures in the RI Project

A basic approach in organizing the work of inquiry has been, and still is, that the authorities participating in the RI project should be responsible for initiating studies within their respective fields of activity. Another important premiss is that such an authority should be fully responsible for the operation of systems within its sphere.

5. BROTTSRI

Today one will find many systems for criminal case procedure in the broad sense on the part of the police, the public prosecutor and the courts, and for procedures in the correctional system. The systems are integrated and based on main frame applications. The dataprocessing in most of the systems takes place at the computer centre of the National Police Board. Some systems are processed at another state computer centre, named DAFA DATA AB.

In the electronic data processing routine for crime reports at the police organization round 1,000,000 reports are processed every year by the computer centre of the National Police Board. Round 360,000 forms from the police districts on persons suspected of crimes are also processed at the same centre every year.

In principle, the public prosecutors submit the same number of reports to the

³Full Swedish name of LAGRI: System för Lagstiftningsförfarandet i vid Mening och Tåtspraxis; of RÄTTSDATA: System för Råttsdata.

⁴Full Swedish name of PLANRI: System för Analys- och Planeringsdata.

computer centre on their decisions to prosecute or not.

The courts submit their sentences in criminal cases for dataprocessing at the same computer centre. The sentences are written by typewriters with OCR-fonts. Thus, the sentences are read by electronic means without any previous coding at all. The number of sentences are round 90,000 every year. Of these sentences 26,000 are of interest for the correctional administration authorities and the probation agencies. Data on these latter sentences are transferred by the computer centre by electronic means to another computer centre for feeding a special system for these authorities and agencies.

The computer centre stores data on sentences in criminal cases for a system for criminal records. The police agencies are connected to the computer centre by terminals. The question to what extent the public prosecutors and the courts should be connected the same way are now studied.

The number of tickets issued by the police is round 200,000 a year. The tickets are processed by the computer centre. The centre and another unit at the National Police Board are also responsible for a routine of collecting the summary fines.

The public prosecutors have a simple routine for breaches of regulations where they can fine a suspected person in smaller cases. The number of such cases is 90,000 a year. The decisions in such cases are written by typewriters with OCR-fonts. The Police Computer Centre reads them by electronic means without any previous coding. The centre and another unit at the National Police Board are responsible for a routine for collecting the fines.

The National Correctional Administration is responsible for operating sub-systems for registers for sanctions. The National Police Board is responsible for the operation of registers referred to in the Act (1963:197) on the General Criminal Register, and the Act (1965:94) on Police Registers, etc. Regulations governing BROTTTSRI have been published in the Ordinance (1970:517) on Judicial Information Systems (the RI Ordinance). The ordinance stipulates in which cases information shall be supplied to the National Police Board for different sub-systems, how information is to be handled by the board, and the conditions on which it is to be divulged. It also incorporates corresponding regulations affecting the National

Correctional Administration.

6. A New Development towards Smaller Systems

6.1. General Remarks

During the last years the authorities in the judicial field have accomplished comprehensive investigations about the possible use of electronic data processing on different levels in their organisations. They have created strategies for electronic data processing according to guidelines determined by the government and the Agency for Administrative Development. Of special interest in this context is that electronic data processing applications tend to be more rapidly developed than before, and local computers will be used for many new applications. The reason for this development is to a great extent depending on the fast progress of the mini and micro computer technology.

Besides, a national strategy has been formed for the use of local computers for office automation. The authorities have to stick to what we call basic computers of different sizes, giving the possibilities to use the same programmes within different authorities, to communicate between different computers without problems etc.

At the same time we now see another trend where investigations are being made in order to create databanks for information on a broad scale. These databanks are of different kinds and not only used for legal data in a narrow sense.

6.2. Electronic Data Processing Strategies

The authorities in the judicial fields have also to stick to these new guidelines. The development of BROTTTSRI-systems for the criminal procedure in a broad sense for the police, the public prosecutor, the courts and the correctional administration etc. will switch to smaller local computers. The local systems and central systems will form a new pattern.

6.3. Office Automation

In the beginning of the RI project the dataprocessing had to take place on main

frames. In the middle and the end of the 70s the word processors and personal computers change much of what we had learnt before. And today we have a trend against office automation.

Main frame applications often concentrate on some functions at an office but office automation on local computers will effect nearly all routines in an office. The way of development and implementation of main frame applications and of office automation systems are also very different.

6.4. A New Strategy of BROTTTSRI

The joint committee has restructured the strategy of BROTTTSRI. Basic points of the strategy are now:

- Only two national common files for criminal records and suspected persons will be build in the future;
- Some tasks, connected to this two files, will also be common for agencies in the criminal justice system. Examples of such tasks are collecting of fines and producing of some messages to other agencies on the records, etc.

Other applications in the criminal justice system will not be common for the agencies in the criminal justice system. Small systems within the agencies will be developed. The agencies will build them according to standards on concepts and on technique, determined for BROTTTSRI. Thus, compilations of data for statistical, economic and other purposes also can be made in the future. The standards will allow better compilations than those we can make today.

Computerization of Criminal Justice Administration in Sweden

Programmes and Equipment in Co-ordinated Systems within the Agencies in the Criminal Justice System

1. The Computer Centre at the Police Board

A big computer centre at the National Police Board dataprocesses;

- Crime reports from the police;
- Reports on suspected persons from the prosecutors and the police;
- Sentences and other decisions of the courts.

The computer centre is using the data in these documents for many different purposes as:

- Terminal-based files for the police agencies. The police agencies have access to the files via terminals in a network for the police;
- Terminal-based criminal history file. The police agencies have terminal-access to it. Some other agencies have also access to the file;
- Data in machine readable form on sentences to another computer centre for systems for correction and probation;
- Data in machine readable form to systems of the Bureau of Census for Criminal Statistics;
- Data in machine readable form to other systems, e.g. a national system for collecting of fines.

List of items in some of the documents dataprocessed at the Computer Centre of the National Police Board in co-ordinated programs for agencies in the criminal justice system:

- Crime report:
 - Name of the crime
 - Time of the crime
 - Place of the crime
 - If a suspected person have been seen, reporting police authority or in some cases another authority;

- Report on persons suspected of crime:
 - Name of the suspected person and other personal data
 - Name of the crime
 - Some data for connection to the crime report
 - Decision by the prosecutor or, in some minor cases, by the police, e. g. no further investigation, no crime, or prosecution
 - Reporting prosecutor or in some cases police authority;

- Sentence or other decision of the court:
 - Name of the convicted person and other personal data
 - Name of the crime
 - Section of the law
 - Sanction
 - Some data for connection to the report on the suspected person
 - Name of the court.

The above mentioned documents are produced by the local authorities within the criminal justice system, in many cases, in local EDP-systems. The agencies have to send copies of the documents to the computer centre of the National Police Board for dataprocessing for purposes mentioned above.

2. Systems for the Penitentiary Administration

As mentioned the computer centre of the National Police Board has to send data in machine readable form on sentences to another computer centre for loading of

systems of the penitentiary administration. It is a central system for data on inmates, persons on probation and for other data of interest for institutions in the penitentiary system.

3. Programmes and Computers

The computer centre of the National Police Board has a big computer installation of UNISYS computers (1100/74). Most of the programmes are written in COBOL.

The penitentiary system is dataprocessed at a state computer centre on IBM mainframes. The programmes are mainly written in Cobol.

New systems for the police agencies and the prosecutors, for the courts and the penitentiary system agencies trends to be small local UNIX-based applications. However, the new systems will be co-ordinated. Thus it will be possible to exchange data between different sectors and to compile data from different sectors for analyses and for statistical purposes.

**DELEGATION
OF
THE UNITED KINGDOM**

Reports

by

**Christopher Gray Lewis
Tony J.P. Butler**

Christopher Gray Lewis
Head of Statistics Division
Home Office
United Kingdom

**DEVELOPMENTS IN THE USE OF INFORMATION TECHNOLOGY IN THE AGENCIES
OF THE CRIMINAL JUSTICE SYSTEM OF ENGLAND AND WALES**

1. Summary of Paper

The paper starts with a short overview of criminal justice system structures, trends and work volumes and is followed by a summary of developments in particular agencies of the criminal justice system. The paper has been written from a central viewpoint and does not attempt to cover all aspects of information technology in the criminal justice system. It should be read in conjunction with two other papers:

- That on co-ordination of computerisation in England and Wales, also presented by Dr. Chris Lewis of the delegation of the United Kingdom at the plenary session of the First United Nations Workshop on Computerisation of Criminal Justice Information¹;
- That on developments within the Leicestershire Police Force, presented at the First United Nations Workshop on Computerisation of Criminal Justice Information by Dr. Tony Butler of the delegation of the United Kingdom, Assistant Chief Constable of the Leicestershire Constabulary, United Kingdom².

¹Developments in Co-ordinating the Use of Computerisation in the Criminal Justice System of England and Wales; Proceedings of the Workshop, pag. VIII.42 et seq.

²Integrated Criminal Justice Computing: A Practitioner's Perspective; Proceedings of the Workshop, page 449 et seq.

2. Introduction

The institutions and agencies of the criminal justice system in England and Wales are, in general, well-established, with changes taking place gradually, usually in the shape of marginal adjustments. Two exceptions are the Crown Prosecution Service and the Serious Fraud Office which were both set up in the late 1980s. There is a general tendency towards growing pressure on all criminal justice system agencies, broadly reflecting the continuing rise in recorded crime. This has shown a year-on-year increase of about 5% for over 30 years, with occasional falls for one or two years such as in 1988.

Resources devoted to criminal justice system agencies tend to remain relatively fixed as a proportion of national expenditure. However, one area where there has been considerable change in recent years, and which can be expected to develop a great deal in the years ahead is in the use of information technology as an aid to improved efficiency.

The criminal justice system has been generally fairly slow in taking advantage of the new technology when compared to private industry. New systems have been largely designed to automate individual components of the system rather than to alter radically the methods of working. The first priorities were to automate manual systems which, because of the growth of crime, had become expensive or even impossible to use. Little had been done until recently to link information flows throughout the criminal justice system by the use of information technology.

The development of information technology in the criminal justice system has been slow because of the decentralised nature of many criminal justice system agencies and their different degrees of autonomy e.g.:

- Police: there are 43 police forces, each of which has a considerable degree of operational autonomy;
- Prosecution Service: there are 31 local areas, but the service is organised nationally;

- Magistrates' Courts (Lower Courts): these are locally run with little operational control from the centre;
- Crown Courts (Higher Courts): there are 6 main circuits but the service is controlled nationally;
- Prison Service: this is controlled nationally by the Home Office;
- Probation Service: organised in 56 geographical areas each with a considerable degree of operational autonomy.

This has led to great diversification in information technology development, depending on local interests, needs, and expertise.

However some information technology applications within the criminal justice system are long-standing and have had a substantial degree of success; e.g., 4 central systems which have provided good operational and policy service, albeit at high cost:

- The Police National Computer Unit;
- The Prison Index;
- The Statistical Data Base of all Court Results and Associated Offenders Index;
- The Driver Vehicle Licensing Authority computer.

There has been also extensive use of information technology in local police stations and in statistical and research departments. However, only recently has much headway been made in using information technology for local management information in areas such as the courts and the prisons.

However, in all areas there are now major information technology developments. The emphasis is on the providing and sharing of information to manage the criminal justice system more efficiently and effectively. Much of this development has only

recently become technically feasible with the decline in computing costs and the availability of low-cost terminal access to data collection systems.

Because of the diverse nature of funding of information technology, it is not possible to estimate how much has been spent in total on historic information technology developments. In general, large systems, such as the Police National Computer Unit, the Prison Index or the Court Results Database tend to be very expensive because of the large amount of data involved. Staff costs, both in training and maintenance have also been high. Present information technology developments are towards systems which measure performance and emphasise value for money. There is a move to centrally set data and technical standards and software.

Central departments are now developing central computing expertise to advise on new applications and are now able to insist both on value for money and on consistency between various local applications. While projections of information technology investment in the criminal justice system over the next decade exceed 200 million pounds this still represents less than 1% of operating costs.

3. General Descriptions of Crime Trends in England and Wales and a Profile of the Criminal Justice System

Information systems on crime and justice in England and Wales are large and varied. Each local area of each agency keeps some form of information system, many of these using a computer. Typically, early systems were simply an electronic means of accounting for the offences and offenders who had come within the criminal justice system. It is only in recent years that there has been a move towards information systems which are specifically designed with management needs in view, rather than their design being forced by the data that are available.

Police recorded around 4.0 million criminal offences in the year to mid-1990. Local forces keep their own detailed crime information systems, usually on computer but with no common format. A national computer record is also kept of information on known criminals. Other systems have been devised to assist forces in major investigations of serious crimes. For the large number (7 million) traffic violations penalties are usually imposed administratively, outside the court system making extensive use of computers for what is a straight forward operational task of

collecting fixed penalty fines.

All decisions about prosecutions rest initially with the local chief police officer (Chief Constable) but the ultimate decision is made by the Crown Prosecution Service. As a consequence of this discretionary power, a system of waiver of prosecution has become institutionalised so that over 200,000 cautions are given each year by the police (the offender having admitted the crime) - particularly to juveniles - and over 250,000 written warnings are given by the police for traffic violations. It is necessary for the police to keep extensive local records so that appropriate action can be taken if the cautioned person reoffends.

Despite many prosecutions being waived, each year some 2 million proceedings are brought before the courts. The English criminal court system comprises:

- The Magistrates' Courts at which the less serious offences are tried by, mostly lay (unqualified) magistrates, assisted by justices' clerks, who have professional legal qualifications. A few magistrates courts, in the bigger cities, have stipendiary (qualified) magistrates sitting full-time.
- The Crown Court, where the more serious cases are tried by a judge sitting with a jury of 12 members of the public.

Both magistrates and judges have a very wide discretion in the sentence they can give, between an absolute discharge and a maximum penalty. There are very few mandatory sentences.

The vast majority of sentences are fines, and fine enforcement is the task of the magistrates courts assisted by the police. Courts will thus keep extensive records for fine enforcement purposes. Other disposals available to the court are probation, supervision or care orders, community service orders or attendance centre orders. Most such people come under the supervision of the Probation Service, which also keeps extensive record systems. Finally, for the most serious offences there is some form of custodial sentence which places them under the supervision of the Prison Service.

The remainder of this paper is concerned with recent developments in information

technology in the various agencies of the criminal justice system in England and Wales.

4. Police

The use of information technology in the police service is developing rapidly both centrally and in individual police forces. In the Home Office, much work is concentrated in the Police National Computer Organisation, both in maintaining the present service and in planning for enhancements.

The Police National Computer is a national facility which provides all police forces in England, Scotland and Wales with immediate access to up-to-date information about known criminals. Currently this information is stored in a series of separate files, each dealing with a particular subject :

- Stolen and suspect vehicles;
- Vehicle owners;
- Finger-prints;
- Criminal names;
- Wanted and Missing persons;
- Disqualified drivers;
- Convictions.

Other facilities include a Vehicles Descriptive Search, Broadcast and Cross Reference. There is also an application called Crime Pattern Analysis, consisting of a text storage and retrieval package used to hold reports of serious unsolved crimes. This allows regional crime intelligence offices to establish links between crimes committed in different parts of the country, and hence to co-ordinate enquiries, and is of particular relevance to the start of major investigations.

The decision to proceed with a computerised convictions application on the Police National Computer was made in 1983. Each conviction record consists of:

- CRO number;
- For each conviction:
 - Court name
 - Date
 - Force/Station code
 - Crime reference
 - Finger print/Photo indicators;
- For each offence:
 - Offence title
 - Number of other offences taken into consideration by the court
 - All disposals made by the court;
- Impending prosecutions.

The limitations of this system as it stands are that it only covers serious offences (broadly those which warrant the possible imposition of a prison sentence) and only records the title of an offence, and not a detailed description.

The Criminal Names File presently contains about 5 million records, each holding details of a person with a criminal record, e.g. height, date of birth, name, sex, etc. Information may be obtained by the police directly at any time. The response time for a Criminal Names File enquiry is about one second, and there are on average over 5,000 enquiries a day. All police forces have access to the Police National Computer via terminals throughout the country.

Enhancements to the work of the Police National Computer Organisation are at present in three main areas:

- Developing a police information technology standards strategy, with the objective of facilitating the integration of police information technology systems and enable electronic data interchange;

- Developing a police national network, with the aim of interconnecting police systems and improving communication;
- Developing a national criminal record system, which would supply a more complete service than that provided at present at a lower cost.

A further area where information technology can help the police is in the development of major incident systems. For some time the Home Office has been concerned with the development of a system which could be used by all forces in the handling of major investigations. The main problem with such investigations is the large quantities of paper used. Accordingly in 1986 the Home Office initiated an experiment (the Major Incident Room Index) which has now led to the development of a system available to all forces for Home Office Large Major Enquiry Systems (HOLMES).

Pending HOLMES, however, the Home Office devised fairly quickly a workable arrangement based on AutoIndex and a commercial company ISIS developed their own major enquiry system called MICA. AutoIndex was primarily designed for use on microcomputers where there were less than 10,000 records. Provision was also made for an AutoIndex upwards growth path on the Police National Computer.

The above paragraphs have described centrally held or designed computer systems to assist police, particularly in their operations against crime. However, police forces as autonomous units have developed their own systems over the last decade, and in most forces these are relatively well developed covering such aspects as:

Accounts/Finance	Burglar Alarms
Command and Control	Liaison with the Courts
Firearms	Crime Information
Incident Logging	Payroll and Personnel
Stock Control and Vehicles	Training
Statistics	Administrative Support Units
Custody Recording Systems	

The majority of forces have computer systems from most of which some management information is available. The systems have little in common, and frequently been

concerned mainly to automate the previously existing manual systems. Some of the systems are run at local authority level, some at the force headquarters using a mainframe or mini, and others rely on micro-computers at police divisional level, sometimes, but not always, linked to one another.

Some forces have developed further than others, having computer systems which are not only linked within the force but are also linked, or have the potential to be linked, with other local agencies. One such example is described in the paper by Dr. Tony Butler of the Leicestershire Police Force³.

5. Fixed Penalty Systems

Most motoring offences do not come before the courts but are dealt with as fixed penalties, and processed by police central ticket offices, of which there is generally one per police force in England and Wales. Payments are made to magistrates' courts fixed penalty offices. As a result of an increase in the number of fixed penalty offences, central processing of payments within each police force area became more widespread from April 1986. Central ticket offices were computerised and linked with the Magistrates' Courts Fixed Penalty Offices. Each central ticket office system deals with the issue and process of tickets up to and including payment, the provision of statistics and management information. Joint systems also process offences brought to court and deal with fine enforcement procedures. It is open to police to register any unpaid fixed penalties as fines (to which 50% of the fixed penalty is added) in the magistrates' courts nearest to the offenders home and enforcement is as for a fine.

6. Crown Prosecution Service

The Crown Prosecution Service was set up in 1986 and its information technology strategy is centred on a Standard Case Operations System (SCOPE), which is being developed centrally and is planned to be used in all Crown Prosecution Service geographical areas by the end of 1993. The main objectives of this system are:

³Integrated Criminal Justice Computing: A Practitioner's Perspective; Proceedings of the Workshop, page 449 et seq.

- To support Crown Prosecution Service key business goals, in particular:
 - to provide a high-quality and cost-effective service
 - to improve the operation of the criminal justice system as a whole;
- To provide management information to sustain delivery of these objectives;
- To establish an information technology infrastructure in the Crown Prosecution Service for the 1990s.

In keeping with standards set by the Committee for the Co-ordination of Computerization in the Criminal Justice System (CCCJS), SCOPE will comply with open standards to permit future interworking, e.g. GOSIP, POSIX, SQL and the relational data base Oracle is being used.

The Crown Prosecution Service is also developing direct information technology links with Magistrates' Courts with the aim of earlier receipt of court lists and the reduction in the use of telephone enquiries. At present there are around 50 such links in operation with more in the planning stage.

An experiment with police links is also underway in Hampshire, with the aims of:

- Increasing the speed of transfer of documents from the police to the Crown Prosecution Service;
- Reducing telephone calls and delays in response time;
- Improving the quality of documentation from the police.

7. Magistrates' Courts

Nearly 98% of all criminal offences in England and Wales are dealt with by Magistrates' Courts. The administration of each Magistrates' Court is the immediate responsibility of the justices clerk concerned acting under the specific or overall direction that may be given by the Magistrates' Courts Committee for that area. Magistrates' Courts are funded centrally by the Home Office for up to 80% of their costs but have a certain autonomy which has led to a wide variety of administrative

arrangements in the Magistrates' Courts service, particularly in the use of computers.

There are over 600 Magistrates' Courts, ranging from the very large city courts with over 50,000 criminal cases a year to minor rural courts where no computers are used. At the other end of the scale, some larger courts have very complex systems.

Over the last 10 years work on Magistrates' Courts systems has developed in a haphazard way. Three main commercial computer systems have emerged:

- The Police and Magistrates' Courts System (PAMS, later EQUIS) developed for the ABS computer;
- The Magistrates' Courts System (MCS) developed for the ICL computer;
- The Burroughs Courts Information System (BCIS later LCIS) now run on UNISYS computers.

The control and development of each system has proved difficult and there is little standardisation between systems.

Each system supports a number of terminals, typically six or seven, so that data can be input or accessed by various different sections of court administration. Systems tend to cover, inter alia:

- Pre-court work, i.e. the entry of details of cases to the computer, the listing and scheduling of cases;
- Post-court work, i.e. the entry of case disposals, document printing, preparation of registers, summaries of the results of each case, generation of accounts.

However, many potential uses of information technology remain untapped. For example, most courts copy of criminal cases are still copied from registers by the police to complete statistical forms for the Home Office. Proposals to provide this information direct on magnetic media are in hand. 10% is already now passed by

tape transfer and this should increase rapidly during the 1990's.

In 1989 a central team was set up by the Home Office to produce a Magistrates' Courts Standard Specification for computer systems with the objective of developing this standard specification and overseeing its implementation. This team has confirmed the pivotal position of Magistrates' Courts in the criminal justice system: in particular analysis of the volumes of major data items passing through the criminal justice system has indicated the ability to save some tens of millions of pounds by more effective use of information technology for data transfer between agencies of the criminal justice system. It is expected that systems could be ready by the start of 1993.

8. Crown Courts

More serious criminal cases are tried at Crown Courts before a judge and jury. Crown Courts are administered via circuit administrators, directly by the Lord Chancellor's Department and are staffed by civil servants. This central control and the relatively low workload of the Crown Courts, compared to the lower courts, has led to the potential for the development of a common management information system which can serve the needs of each Crown Court as well as providing data for central management.

Central to Lord Chancellor's Department strategy for the Crown Courts is the computer-based management system CREST which has the objective of improved productivity, accuracy and speed of communication, together with standardisation of common practice. Software developments should be completed in early 1991 with complete implementation early in 1993. Central technical standards such as GOSIP and POSIX are being used as is the relational data base Oracle. Court proceedings data will be provided on tape for the Home Office, leading to much more timely and accurate data.

9. Probation Service

The Probation Service comprises 56 autonomous area services which supervise persons given probation orders, supervision orders and community service orders as well as those prisoners requiring aftercare before or after release from custody.

The service also prepares social inquiry reports for the courts before sentence.

Since 1983 an integrated system - PROBIS - has handled the full range of information needed by probation staff. It is now in use in over three-quarters of the probation areas. The system is a tailor-made data base system developed by the Home Office, and operates on low-cost micro-computers. The system has a flexible file structure for extended local use and a powerful enquiry system which also provides cross-tabulations and generates user-defined reports.

PROBIS has been devised with the needs of the user, often inexperienced with computers, in mind. It is currently designed to work on relatively small micro-computers, yet to provide sufficient capacity to be developed into a multi-user office automation and information system. It is a low-cost system, but includes the use of security passwords to prevent unauthorised access to confidential information.

The following list is typical of the types of record included on the PROBIS system:

- Work of the courts;
- Characteristics of clients and contact with them;
- Information about the local community;
- Staffing resources;
- Expenditure;
- Reports completed.

Extensive validation checks are made at data input to maintain a high degree of accuracy in the information contained in the system and hence to increase the value of the information to those who use it. Routine outputs from the system include management summaries of caseload, staff in posts, reports and expenditure, workload and management statistics. The data file of PROBIS can be linked to those of standard commercial packages.

The information needed centrally can be supplied to the Home Office using data interchange on disk, thus avoiding expensive rekeying which is prone to error. This central system exists to produce statistics or the management of the Probation Service as a whole and to monitor the operation of legislation. Statistics are provided both for internal Home Office managers, in answer to Parliamentary Questions, and for the public.

Future developments include the need to interface PROBIS with the computer systems currently in use in Magistrates' Courts so that sentencing and other information of relevance to the Probation Service can be transferred across as well as linked office automation system for the preparation of social inquiry reports, the maintenance of case files and electronic mail between offices and with courts.

The future information system needs of the Probation Service are now being considered by the Joint Standing Committee on Information Strategy for the Probation Service. This committee will consider the future of PROBIS as well as the need to conform to CCCJS standards, etc.

One interesting initiative is taking place in Cheshire Probation Service with the development of a data dictionary. This has the aim of producing common standards for information interchange and a common language for data items and involves links with all other agencies of the justice system.

10. Prison Service

The Prison Index was set up in the Home Office in 1968 as a centrally maintained computer information system about prisoners and now provides an enquiry facility for the location of individual prisoners and a statistical system relating to the prison population. The system enables analyses to be made of the prison population, of receptions into prisons and, to a lesser extent, of discharges from prison, using such variables as:

- Sentence length;
- Age;

- Sex;
- Ethnic origin;
- Type of prison establishment;
- Type of offence;
- Reason for discharge;
- Court sentencing the prisoner.

The information is published regularly and is used by headquarters in the planning and monitoring of changes in policy and practice in running the prison service and other parts of the criminal justice system. It does not provide operational support at the prison establishment level as there is no provision for interrogation from prisons.

An individual computer record is set up when a prisoner is first received with the limited information available at that time. Further information is added as and when it becomes available. Most of the items recorded on the index are obtained from photocopies of administrative records submitted for central statistical processing.

Other systems exist for particular subgroups of the prison population and for other aspects of the prison service: e.g., prisoners considered for parole, punishments and offences against prison discipline.

The Prison Index System is being replaced in 1991 by the Inmates Information System. This system will be fed by computers installed in prisons - Local Inmates Database System - which will also provide operational and management information locally for prisons.

Approaching a half of prisons already have these systems. In a subsequent stage the Local Inmates Database System component will be linked by a telecommunications network to the central system. The local systems will bring considerable benefits to the prisons and as the central system data will be very much more accurate and

timely, there will be substantial operational and statistical advantage.

As it develops through its various stages, the Inmates Information System will become the definitive source of information and statistics about the prison population. It will enable the Prison Service to fulfill many of its tasks more effectively:

- Staff will be able to trace rapidly the whereabouts and entire criminal history of any inmate being held or recently released. New information will accumulate as circumstances change and old information will not be overwritten;
- The system will improve the efficiency of inmate and parole casework. All casework sections will eventually have direct access to the system and parole records will be kept up to date with electronic transfer of data.
- Information from establishments will be available from the Central System data base much earlier than at present. In the final phase establishments will send information electronically each night to the central database.

Tony J.P. Butler
Assistant Chief Constable (Operations)
Leicestershire Constabulary
Leicester
United Kingdom

INTEGRATED CRIMINAL JUSTICE COMPUTING: A PRACTITIONER'S PERSPECTIVE

1. Introduction

The purpose of this paper is to describe the development of a police computer system which is intended to provide a significant foundation for the continuing development of computer integration throughout the criminal justice community in a police force in England. The paper will focus on the concepts and system development rather than the overall functionality. The following areas will be covered:

- The operational context;
- The business problems;
- The guiding principles;
- The development and implementation;
- The achievements to date;
- Future developments.

2. The Operational Context

Leicestershire Constabulary is a medium sized police force located in the centre of England with an authorised police establishment of 1810 and a civilian staff of 812. The county of Leicester has a population of 875,000 with the main centre of this population being the city of Leicester and the surrounding suburbs. In criminal justice terms, the county is serviced by a single Probation Service, a branch Crown

Prosecution Office, a Crown Court and four Magistrates' Courts divisions, operating in eleven locations.

Prior to 1988, the police had a centralised Prosecutions Department based in Leicester, which serviced the Magistrates' and Crown Courts. The Magistrates' Courts are supported by an ICL 2900 series computer which had remote terminals in the Police Prosecutions Department.

3. The Business Problem

During 1987, in response to increased workloads and demands for greater efficiency, the force undertook an internal review of its operations, structure and administrative procedures. The objectives of this review were as follows:

- To increase operational effectiveness;
- To reduce the time spent on administration;
- To streamline procedures.

Before the review took place, two experimental administration support units had been established with the objective of reducing the amount of time spent by operational police officers on clerical and administrative work. During the review, data were collected which demonstrated that there was a potential to reduce the amount of time spent on this work by constables by 15% and by supervisors by 60%.

As a consequence, the force decided to implement a centralised administration support unit which would undertake a wide range of clerical and administrative work formerly undertaken by police officers. The practical implication of this decision was to increase the work that was being undertaken by the existing Prosecutions Department and also to relocate staff from throughout the county to the new unit.

Following this decision, a small working group was formed from existing staff in the Prosecutions Department to analyse the current problems and constraints that were likely to be encountered during the implementation of this decision.

The following issues were identified at an early stage as requiring attention:

- There was an existing micro-based computer system which was used for indexing files. However, it was clear at an early stage that this system would be incapable of dealing with the volume of files that would be generated by the centralisation of procedures.
- There was a substantial duplication of information being recorded or used throughout the system. For example, a large volume of standard letters were produced, all of which used information which had previously been recorded either manually or on the existing micro-computer system. This duplication extended to information typed onto the Magistrates' Courts system. As an example, where an offender had been arrested, his name and address would be recorded fourteen times in the department during various processing stages.
- The volume and complexity of the work created substantial difficulties in obtaining information quickly to respond to external enquiries.
- The system of administering arrest warrants using the manual system was both inefficient and inaccurate.

These business problems were analysed and formed the basis of the planning process. The working group was required to examine in detail all existing procedures and structures within the Prosecutions Department and identify opportunities to streamline them. During this process, the duplication of tasks in the recording of information were identified and the opportunities for automating processes were determined. For example, it was clear at an early stage that, by the use of a simple mail merge facility, the majority of standard letters could be produced automatically, rather than through the then current procedure of typing them individually.

The working group were required in this planning to look outside the immediate police environment and develop a vision of the police prosecutions process within the context of the wider criminal justice community. The purpose of this outlook was to ensure that any decisions made by the police, both in procedures and the use of

technology, would enable other users to make their systems more efficient by the sharing of information through electronic means.

When the working group was satisfied that they had a thorough understanding of their requirements and furthermore, all possible procedural and structural efficiencies had been identified, the market place was scanned for potential computer options and solutions.

Finally, the planning phase sought to identify possible cost benefits, both in the short term implementation and in the longer term vision of integrated computer facilities. This process was assisted by an external consultant.

4. Guiding Principles

If the initial computer procurement for the administration support unit was to be the foundation stone of a process of development towards the integration of criminal justice computing, then it was important that the principles upon which this was most likely to be achieved should be clearly stated at the outset. In responding to this need, the working group identified a number of what were called guiding principles which it believed should be present at the start and continue as a commitment throughout the process. These guiding principles can be summarised as follows:

- All data would be entered once and once only, no matter where or when it was subsequently required in the system;
- Wherever possible, processing was to be automated, with documentation such as standard letters being produced by the system itself, with minimal user intervention;
- All data, with adequate security considerations, should be accessible and retrievable by all users of the system, including non-police users;
- Where links were made to other systems, in the first instance to the Magistrates' Courts computer, they were to be transparent to the user;

- The distributed nature of the police organisation and other external criminal justice agencies required a capability of remote access;
- Where international communications standards existed, they would determine the technical requirements of the hardware, operating system and software;
- In foreseeing the development of distributed processing and links to other police systems, a standard terminal would be adopted to reduce costs and also to facilitate user access.

5. Development and Implementation

A number of suppliers responded to an open tender and, following a short-listing, ICL (UK) Limited was chosen as the prime contractor. The contractual arrangements were agreed in January 1989 and software development commenced. The system was fully installed twelve months later. The system is based on the DRS500 range of machines running UNIX. The software has been developed using Ingres and ICL's office automation product Office Power.

To reduce the disruption on a department that was required to be fully operational throughout the period of change, the computer system was installed in modules which followed the chronological processing of the documentation in the department. The pre-planning and design of the system, together with a significant commitment by the prime contractor and the software house, SEMA Group Limited, enabled a successful implementation to be achieved with minimum disruption to service to operational police officers and the courts. A significant contribution to the successful installation of the system was made by the flexibility and responsiveness shown by both ICL and SEMA Group. During the project, a sense of teamwork developed throughout the department which produced a determination to succeed, rather than seeking out problems.

6. Achievements to Date

The Administration Support Unit is now fully operational within the Prosecutions Department. Additional facilities have been added since the planning phase, and the predicted increases in operational time for police officers have been achieved

through dramatic reductions in the amount of paperwork they now undertake. A description of the full range of functions and the structure of the department is shown in the Appendix to this paper.

The results have demonstrated the benefits of the careful application of practical computer solutions to the criminal justice process. Within a predicted establishment of 115 posts, staffing levels have been reduced by seven since the introduction of the system, despite a 30% increase in workload. Furthermore, tasks which were not originally envisaged as part of the administration support unit have been brought into the unit because staff capacity has been found. This has further relieved administrative burdens on operational police officers. In addition, the quality of service, both internally to members of the force and externally to members of the public, and other criminal justice agencies, has been increased because their requests for information can receive an immediate response by interrogation of the computer system.

A further unpredicted benefit has been enhancement of the professional image of the force within the local criminal justice community. This has led to proposals to work even closer together in the future to share information electronically to the benefit of all. However, the planning of this future development has demonstrated the key position which is occupied by the police. Put quite simply, if their initial collection of the information can be achieved in a format that is readily accessible and capable of transmission to other agencies, their benefits are substantial with only moderate investments in their own equipment. It is perhaps no surprise that the long established recognition of the police role as gatekeepers to the criminal justice system in respect of offenders, is equally true of the capture and processing of information.

7. The Future

The approach taken by the Leicestershire criminal justice community is essentially pragmatic. A working group comprising members of Magistrates' Courts, Crown Prosecution Service, Police and Probation Service, have identified areas where access to information from the police computer system can provide the maximum benefits. Plans are well advanced for the remote location of terminals or the electronic transfer of information from the police to the Crown Prosecution Service.

In the longer term, opportunities will be available to transfer information electronically to a wider audience. For example, routine information to prisons following the commitment of offenders could be made via computer links. The recording of results from court cases could be sent to the police criminal record offices by magnetic tape rather than the current paper system.

In the immediate future, it has been established that the next major step which will provide the most significant cost benefits will be the introduction of a computerised system registering alleged offenders at the point of arrest. By implementing such a system, it will reduce significantly the workload currently undertaken by the administration support unit, and the volume of paper moved through the system; furthermore it will provide far quicker notification of the arrest of an offender to the Crown Prosecution Service, Courts and Probation Service. It has been established that there is a direct correlation between the speed with which these agencies obtain information concerning arrested persons and the overall efficiency of the court listing and prosecution process.

8. Conclusion

In 1988, the planning of the initial foundation stone, the ASU Computer, included a vision of long term benefits for the whole criminal justice community. It is clear that the initial investment has already achieved some of those benefits but more importantly, has confirmed the validity of the initial vision. Fortunately, within Leicestershire there is the goodwill and commitment to pursue future benefits by co-operation and further investment in computer technology.

Integrated Criminal Justice Computing: A Practitioner's Perspective

Leicestershire Constabulary Headquarters Prosecutions Department and Administrative Support Unit

Department Responsibilities:

- Receipt of all reports of alleged motoring and minor non-indictable offences and the decision to prosecute or not;
- Preparation of summonses and relevant paperwork for Magistrates' Courts;
- Warning of witnesses for Magistrates' and Crown Courts;
- Administration of the grant and renewal of firearms and shotgun certificates;
- Administration of licensing matters for the City and Castle Court areas;
- Administration of the fixed penalty and vehicle rectification schemes;
- Administration of road traffic accident records;
- Force Statistics Office;
- Despatch and receipt of all files and correspondence between the Force and the Crown Prosecution Service.

Organisation of the Department:

The Department is headed by a Superintendent, his Deputy, a Chief Inspector, with a Principal Officer and a Senior Officer, both of whom are civilians.

The Department is split into sections:

- Registration and Computer Section;
- HORT and Post Room;
- Process Decision Section;
- Process Enquiry Section;
- Accident Process Decision Section;
- Accident Records and Enquiry Section;
- Court Sections:
 - City Court and Juvenile Section
 - Castle and Outer Courts Section;
- Higher Courts Section;
- Central Ticket Office;
- Warrant Section;
- Licensing and Firearms Section;
- Statistics Office;
- Secretary's Office.

Registration and Computer Section

All new files received in the department are registered on the computer for future updating by other sections.

In addition, the same equipment is used to serve the department in the preparation of all kinds of typed material, reports and general correspondence.

HORT and Post Room

This section deals with all incoming and outgoing post and internal mail for the department, including the service of summonses and allied documents by the recorded delivery post service.

The movement of all offence files to and from the Crown Prosecution Service or sub-divisions within the force is recorded here and message switches, telex and fax documents for the department are sent and received by this section.

In addition, all the yellow copies of the HORT/1s issued by members of the force are received and filed awaiting the receipt of the appropriate HORT/2. When received these are married up and if offences are apparent an offence report is prepared and passed to the process decision section via the Registration Section. If no offence is apparent, the married up forms are returned to the issuing officer.

Process Decision Section

All offence files (except those involving road traffic accidents) received and registered by the Registration and Computer Section are passed to this section. Here they are read through, resulting in any of the following:

- No offence has been committed;

- An offence has been committed and
 - Should be prosecuted
 - Should be cautioned
 - Should be no actioned
 - More information required before a decision can be made.

Should the decision be to prosecute, a statement of facts is prepared where appropriate and the files, together with the appropriate decision are then passed to the Process Enquiry Section.

The Decision Section also receives and vets all charge sheets for arrested offenders, passing them to the Enquiry Section once checked.

Process Enquiry Section

This section updates the files held on computer according to the instructions given by the Process Decision Section, allocating court dates for prosecute files and downloading the information to the Magistrates' Courts computer for the production of summonses, statement of facts and court lists.

Section 9 Statements, caution, or no action letters are automatically produced from the updated system where required. Should further information, statements, etc., be requested by the Decision Section, these are obtained by the staff in the Enquiry Section, attached to the appropriate file and returned to the Decision Section for their attention.

Accident Process Section

All offence files involving road traffic accidents received and registered by the Registration and Computer Section are passed to this section. Here they are read through resulting in any of the following:

- No offence has been committed;
- An offence has been committed and
 - Should be prosecuted
 - Should be cautioned
 - Should be no actioned
 - More information required before a decision can be made.

Should the decision be to prosecute, a statement of facts is prepared where appropriate and the files, together with the appropriate decision are then passed to the Process Enquiry Section.

Accident Recording and Enquiry Section

All road traffic accidents reported to the police in the county are recorded in the Accident Section which keeps details of date, location, people and vehicles involved, together with insurance details and witnesses.

Should further information be required by the Process Section, this is obtained by the Enquiry Section.

This section is also responsible for supplying abstracts of accident files to solicitors and insurance companies representing the parties involved, or direct to the parties themselves, upon request and payment of the appropriate fee. They also arrange for interviews between solicitors and reporting officers in certain circumstances.

Court Sections

The Court Sections are split into groups and overall supervision is by the Courts Administration Officer who has the section supervisors each controlling an individual group.

The Administration Officer co-ordinates the work of the Court Sections and has specific responsibilities for dealing with defence requests, unserved summonses, sine die files and Section 9 paperwork.

Each Court Section operates in the same way, being responsible for maintaining court diaries, obtaining witness availabilities, warning witnesses and preparing and disposing of court files as appropriate and notifying results to other agencies who have a right to such information e.g. disqualified drivers to the Police National Computer etc.

City Court Section

deals with:

- Town Hall Courts - 1 desk;
- Bishop Street Courts - 1 desk;
- All Juvenile Courts in the County - 1 desk.

Castle and Outer Court Section

deals with:

- Castle, Market Harborough and Lutterworth Courts - 1 desk;
- Loughborough, Melton & Belvoir and Rutland Courts - 1 desk;

- Hinckley and Coalville Courts.

- 1 desk.

With the exception of juveniles, there is a desk of staff dealing with a group of courts as shown.

Higher Courts

The Higher Courts Section deals with the more serious cases which have been committed to the Crown Court from the Magistrates' Courts. The section is responsible for preparing antecedents for all defendants who are to appear before the Crown Court, obtaining the availability of all police and civilian witnesses who may be involved and warning these witnesses of the trial date, once set and ensure their attendance. Files are prepared and taken to court by the Court Liaison Officers (detective sergeants), who read out the antecedents to the court, should the defendant be found guilty. Upon completion of the case the files are resulted and the relevant information passed to the various agencies who have a right to it; e.g. New Scotland Yard for the National Information Bureau. Statistical information is also passed to the Force Statistics Department.

Central Ticket Office

All fixed penalty tickets issued by traffic wardens and police officers within the force area are recorded on the Ticket Office's computer system. This system is linked to the Magistrates' Courts Fines and Fees Office who are responsible for the collection of the penalty fees.

There are two types of fixed penalty:

- Endorsable;
- Non-endorsable.

Endorsable fixed penalties may be issued for certain moving traffic offence and require the offender to surrender his driving licence for endorsement. If this is not done within the permitted period, the matter is forwarded to the Process Decision Unit for prosecution through the courts.

Non-endorsable fixed penalties are issued for such things as parking. If the penalty

is not paid within the time limit, nor a request for a court hearing received, the penalty is automatically registered by the Magistrates' Court as a fine against him which includes a 50% increase in the original penalty. If no driver was seen, a notice is sent to the registered keeper who is liable for the penalty as if he were the driver. The keeper has the option of paying or requesting a court hearing. Failure to do either results in the enhanced penalty being registered as a fine against him.

The vehicle rectification scheme is also administered by this section. This scheme involves the issue of a ticket to a driver of a vehicle with certain defects such as defective lights or defective tyres. By having the defects corrected and verified by a Ministry of Transport Test Station and returning the certified ticket to the Central Ticket Office within 14 days, no further action is taken by the police. If, however, the defect is not rectified within the time limit, court proceedings may be initiated.

All letters relating to fixed penalty or vehicle rectification tickets are dealt with within this section.

Warrants Section

The Warrants Section receives warrants for arrest and court documents requiring personal service from the Magistrates' Courts, both within the county and other areas. These documents are logged by computer and their movement and execution are monitored.

Many of the warrants are for non-payment of fines and consequently large sums of cash pass through this section, normally made up of small amounts. Accounts are maintained to deal with this money which is subsequently paid over to the appropriate Magistrates' Clerks' Fines Office.

A team of civilian process servers work from this section, dealing with all non-crime warrants and personal service documents for persons with addresses within the Leicester City area. Those with addresses outside the city are forwarded for execution to the appropriate sub-division.

Licensing and Firearms Section

The Licensing Section maintains a register of all licensed premises, licensees, clubs and betting shops within the force area and receives and checks applications for

hours extensions, occasional licences, alterations to licensed premises and changes of licensees, etc. With the aid of sub-divisions, objections are formulated and lodged where appropriate. A member of the section usually attends the transfer sessions at the City and Castle Licensing Courts.

The Firearms Section maintains a record of all firearms and shotgun certificate holders within the force area and details of all weapons held. They process all applications for the grant of a new certificate, its renewal or variation. Background checks are done regarding each applicant and this is then forwarded to one of the police officers attached to the section for him to visit the applicant, check weapons, security, a reason for requiring, etc. A report of these findings is prepared upon which the final decision is made.

Statistics Office

Force Statistics Office is responsible for the compilation of data relating to crime, breath tests, prosecutions cautions and no further action decisions, both for local use and for submission to the Home Office.

At the end of each calendar month a wide range of information is produced from various computer systems and is disseminated to management and operational staff at all levels across the force. In addition ad hoc enquiry service is provided so that any member of the force may obtain up to date information at any time.

Court statistics are provided to the Home Office each month by tape transfer from the Magistrates' Courts computer. Leicestershire was the first force in the country to be able to achieve this.

**FIRST
UNITED NATIONS WORKSHOP
ON COMPUTERIZATION OF
CRIMINAL JUSTICE INFORMATION**

**Havana, Cuba, 27 August - 7 September 1990
Palacio de las Convenciones**

**COMPUTERIZATION
OF
CRIMINAL JUSTICE INFORMATION SYSTEMS**

Podium Presentations

by

Invited Experts

Report

by

James R. Maher

National Center for State Courts

U.S.A.

James R. Maher
Senior Staff Attorney
National Center for State Courts
U.S.A.

HOW TO INTEGRATE A CRIMINAL JUSTICE COMPUTER SYSTEM

1. Introduction

The National Center for State Courts is a not for profit organization that was founded in 1971 at the urging of then United States Supreme Court Chief Justice Warren E. Burger. The National Center's goal is to improve the administration of justice in the United States' local and state courts.

To achieve that goal, the Center offers a four-pronged program of¹:

- Information exchange through an extensive library of over 18,000 publications and periodicals on courtroom security, judicial salaries, cameras in the courtroom, etc.;
- Specialized education at workshops and seminars for judges and court administrators, and other judicial branch staff on a wide variety of court management issues;
- Research projects aimed at developing reliable and relevant information relating to judicial administration; and devising, evaluating and implementing solutions that address the state courts' most pressing needs;
- Expert assistance to individual courts that have identified a specific need.

To support its goal, the National Center employs the services of approximately one hundred individuals who are accountants, social scientists, educators, attorneys

¹See National Center for State Courts Annual Report, 1989.

attorneys and computer specialists. Four regional offices², the Institute for Court Management in Denver, Colorado, the Washington, D.C. Project Office and the Center Headquarters in Williamsburg, Virginia, provide court management services nationwide.

In light of its commitment to the improvement of justice administration, the Center was extremely pleased to receive an offer to represent the Digital Equipment Corporation at the important and prestigious First United Nations Workshop on Computerization of Criminal Justice Information, held at the Eighth United Nations Congress on the Prevention of Crime and the Treatment of Offenders. This Workshop is important because, as Alexander Hamilton said:

"The ordinary administration of criminal and civil justice ... is the most powerful, most universal, and most attractive source of popular obedience and attachment. It is that which ... contributes, more than any other circumstance, to impressing upon the minds of the people, affection, esteem, and reverence towards the Government."³

2. Background

In the United States, criminal caseloads are expanding at unprecedented rates. Although accurate data regarding the number of criminal cases filed in U.S. courts is difficult to obtain, the Center's own caseload statistics indicate that case filings are increasing each year. Figure 1 shows the number of criminal case filings in general jurisdiction state courts for the years 1985 through 1988.

While the filings are increasing, the rate of increase is also growing. Perhaps a more disturbing issue, and one that is not represented in the table, is the fact that U.S. courts are not disposing of cases as quickly as they did previously. For example, in 1988, only one court in eight managed to keep pace with the flow of new criminal case filings. Since the number of cases disposed during the year fell short of the number of filings, the pending caseload also grew. This slower disposition rate has obvious

²Located in Andover, Massachusetts, Williamsburg, Virginia, Kansas City, Kansas, and San Francisco, California.

³The Federalist No. 17.

Figure 1

Criminal Caseload Filings by Year		
Year	Number (000,000)	Percentage Change
1988	11.9	+ 5.0
1987	11.3	+ 4.5
1986	10.7	+ 3.0
1985	9.3	--

While the filings are increasing, the rate of increase is also growing. Perhaps a more disturbing issue, and one that is not represented in the table, is the fact that U.S. courts are not disposing of cases as quickly as they did previously. For example, 1988, only one court in eight managed to keep pace with the flow of new criminal case filings. Since the number of cases disposed during the year fell short of the number of filings, the pending caseload also grew. This slower disposition rate has obvious and serious implications. Cases are being handled less expeditiously than previously, and U.S. courts and American society are accumulating problems that must be confronted in subsequent years⁴.

These problems include:

- Chronic overcrowding in jails as incarcerated defendants are compelled to wait longer periods for trials;
- Potentially dangerous defendants who would normally wait for trial in jail are prereleased;
- Overworked criminal justice agency staffs;
- Public loss of confidence in the criminal justice system's ability to effectively combat crime;

⁴See State Court Caseload Statistics: Annual Report 1988, The National Center for State Courts (1990).

- Individual criminal justice agency's loss of confidence in its counterparts' ability to uphold their respective responsibilities (which encourages abuses of discretion);
- Victims of crime feel betrayed by the system's inability to deal with timely prosecution and restitution.

Clearly the list can go on and on. The list also calls to mind a phrase that has become so overworked that it now sounds trite and insignificant; a phrase, however, that is still true today: "Justice delayed is Justice denied".

So what is to be done? Should criminal justice agencies surrender to the problem of expanding caseloads by decriminalizing certain offenses? There is already some discussion in America that drug offenses, which probably are directly responsible for the burgeoning criminal caseload, should be removed from the criminal justice process. This is also the approach taken by many jurisdictions with respect to traffic violations. But surrendering to crime - in particular, serious crime - encourages societal instability and anarchy. Therefore decriminalization cannot be seriously considered.

3. Increase System Efficiency and Effectiveness through Criminal Justice System Integration

There is another alternative and that is to make the existing process more effective and efficient. Numerous U.S. jurisdictions, including:

- Harris County, in Houston, Texas;
- Baltimore County, Maryland;
- The State of Arizona;
- The Eighth Circuit in Gainesville, Florida;
- St. Louis County, Missouri,

have all taken significant steps to make the criminal justice process more efficient. What is the mechanism they have employed? They have eliminated the duplicative manual procedures that require copious forms generation and storage facilities and replaced them with a computerized online and integrated system that makes information immediately accessible to all parties in the system.

The key phrase is integrated system. What does integrated system mean? An integrated system is one that gives all of the participants involved in criminal justice the ability to do work, make decisions and generate information. Another more precise definition is: "An automated system that is capable of tracking the complete life cycle of a criminal case through its various stages in diverse agencies without duplication of data collection, data storage or data entry."⁵

There are two practical examples of integrated criminal justice systems. The first is the St. Louis County system, mentioned earlier, that is called the Regional Justice Information System, REJIS. The REJIS system connects police departments, sheriffs' offices, prosecutors, courts, correctional facilities, and parole agencies in four State of Missouri counties, four State of Illinois counties, and the city of St. Louis. The law enforcement agencies use REJIS to analyse crime patterns, allocate personnel more efficiently, and share all data pertinent to ongoing criminal investigations. A principal benefit of REJIS is decreasing the amount of police officer time allocated to administration and increasing the amount of police officer time allocated to patrolling streets⁶. The other integrated system worthy of mention is in Holland. This system, which uses over 1,000 pieces of hardware, ties together two justice agency ministries - the Ministry of Internal Affairs and the Ministry of Justice. In 1987, over 1 million criminal offenses were processed through the system's Tracking, Prosecution, Administration and Execution applications.

Note that the REJIS and Holland systems (and all criminal justice systems) have:

- A single process;

⁵This definition is taken from the National Center's Institute for Court Management's workbook: "Integrated Computer Systems in the Justice Environment" (May, 1990); hereinafter referred to as the "Workbook".

⁶See "Putting the Byte on Crime"; OMNI, August 1990 at 36.

- Participants who are organizationally and possibly constitutionally separate;
- Participants who are independent in action;
- Participants who are totally interdependent in their information needs;
- Effective communication and coordination of information.

The remaining portion of this report discusses how this system integration can be accomplished.

Typically, sound and well designed integrated justice systems have:

- Sharing of information;
- A unique number or identifier for each offender;
- A unique number or identifier for each criminal incident;
- A network of users;
- Each user receives better, more reliable information as a network member than as a single entity on a stand-alone system.

What is meant by unique identifier of defendants and cases? This term refers to fingerprint identifications and offense tracking numbers, preferably generated by standard automated means, that are unchanging and specific to a single individual and to a single offense. Network of users refers to the common circumstance where there are several users on the system who are located in different buildings, cities or countries - all of whom can gain access to the system through devices located at their specific place of work.

Integrated systems also have:

- Common data definitions;
- A data base approach;
- A planned hardware and software architecture;

- A planned network architecture;
- System-wide inquiry.

Let's look at some of these points in more detail. Common data definitions means that each data element in the system such as name, date of birth, offense code, etc. is described uniformly throughout the system. For example, all parties to the system must agree that an offender's name will be entered into the system in a uniform and standardized format. To illustrate, there is more than one way to record a name. It can be surname first, followed by the first name and a possible middle initial. Or it can be entered in the reverse, i.e., first name, middle initial, last name. Similarly, a date of birth can be entered numerically: month, date, and year (in Europe it is date, month and year); or it can be entered alphabetically, i.e., by actually spelling the month. These multiplicities of possible data formats must be standardized and made the same throughout the system. Otherwise the computer will either get lost or it will overlook possible information as it tries to respond to a user's commands.

What is a data base approach? A data base system⁷ is among the most important attributes of an integrated system principally because it promotes one-time, at source data entry that is subject to rigorous validations and controls. To illustrate, in manual systems or non data base computer systems, case names, addresses and charges are copied (entered) and recopied (re-entered) on case folders, docket, notices, etc. as the case moves from department to department and from one case-processing activity to another. The entire process employs largely inefficient, time consuming, error-prone sequential procedures.

In the data base alternative, case information is entered into the system only once - by the party who created the data and is therefore in the best position to insure its accuracy. Other parties who need the newly-created information have immediate online access to it, but normally only the party who created the data can subsequently change or update it. For example, in an integrated data base system, a

⁷A data base system is one that contains a collection of data that is interconnected, non-redundant, serves a multitude of users and is independent of both application software and the system hardware.

criminal defendant's name, address and associated charges are entered into the system by the police department at or near the point of arrest. Police departments are usually in the best position to verify an individual's name and address and to differentiate aliases. Police departments obviously are also in a position to ascertain the preliminary charges against the defendant. The data base system automatically assigns a sequential and unique number to the offense and docket the arresting officer's case information with respect to the defendant. Charge information subsequently is verified and perhaps changed by the prosecutor's office after initial case review. Jail personnel has online access to this newly created information as does the probation department, pretrial services, the public defender's office and other criminal justice agencies, thereby enabling them to better anticipate incoming workloads and make more timely decisions. Additionally, the system automatically transmits the arrest information to other police departments on the network to compare the recent arrest information against outstanding warrant files. As the case is perfected, i.e., as the defendant is prereleased, case is assigned to a court and judge, trial is scheduled, the case is continued and disposed and the defendant rehabilitated, the system tracks continuously both the case and the defendant and generates numerous required and ad hoc case management and financial reports - more or less as a by-product of the process.

The phrase: Planned hardware and software architecture, means that these system components are configured and selected not only from the perspective of individual users' requirements on possible stand-alone, totally dedicated computer systems, but also from the perspective of connectivity and compatibility with diverse hardware and software located in other criminal justice agencies. This topic will be discussed in much greater detail below. Suffice it to say at this point that an important step in the entire integration process is planning for across-the-board hardware and software connectivity.

In conjunction with planning for hardware and software connectivity and compatibility, network planning is also an important step in criminal justice integration. Network planning ensures that data is transmissible on demand and at acceptable baud rates to every user on the system. As is the case with hardware and software planning, care must be taken that whatever network for the system is selected, it is capable of supporting a multitude of diverse hardware and software transmissions.

System wide inquiry means that any user on the system, providing he or she meets the appropriate security protocols, can access data on the system, even if the data is located on another device in another agency. An example that comes to mind can be found in integrated jail/court systems. To illustrate, in most U.S. trials, incarcerated defendants are brought to the courthouse early in the day and placed in holding cells. It is an unfortunate aspect of U.S. court management that cases are frequently continued or rescheduled at the last moment, sometimes very near the day the defendant is to make an appearance. It is extremely useful - and obviously good security - for jail personnel to know prior to moving the defendant to the transport area that the defendant's trial has been rescheduled. Jail personnel, by inquiring from the jail module across the system network to the court's scheduling module, can ascertain easily and efficiently each day's trials and the corresponding defendants before moving the prisoner to the court.

At this stage an integrated criminal justice system has been defined and its more important attributes have been discussed. We now turn to the important discussions relating to how these systems are designed and implemented.

4. Steps in Designing an Integrated Justices System⁹

The first step in designing an integrated justice system involves identification of the mission, goals, and objectives of each related organization. This requires the development of a thorough understanding of each agency's information needs. It also involves:

- Constructing a model of this understanding;
- Defining the information projects (i.e., modules) for the entire justice system;
- Planning for the short and long term projects.

There are basically six steps in the process:

⁹See the Workbook, supra note 5, at Para. 3.

- Construct the plan;
- Review the strategic law and justice concerns;
- Develop the strategic or high-level law and justice functional model;
- Develop the tactical or working-level law and justice functional model;
- Review existing systems and plans;
- Develop information systems projects.

The most important step is the first one: constructing the plan. It has been the experience of the National Center that most unsuccessful automation projects are lost at the beginning of the process and not the end. A successful project begins with a good plan.

There are several key components to constructing a good plan. For example, most good plans have:

- Identified the project's scope;
- Identified the project participants;
- Determined the required analytical techniques;
- Defined the schedules.

Identifying the project's scope establishes the system's parameters. It determines who or what will be included in the project and who or what will not. The scope therefore defines the project's limitations. The scope also determines what the plan deliverable will be. The deliverable may be a document or a presentation. It also may take the format of a matrix of system architectures. Most importantly, it will identify the common information needs among the participating agencies and the gaps in each agency's current individual plans.

The project participants may vary for each integrated system. It is suggested, however, that the following individuals and/or agencies be included in any integrated criminal justice planning effort:

- Police;
- Public Prosecutor;
- Public Defender;
- Representatives from the private bar;
- Courts (including judges and administrators);
- Detention Centers (including juveniles);
- Probation and Parole;
- Corrections.

Including these individuals and organizations on the team of participants will insure that all of the common information requirements are met, the commonality of purpose is emphasized and the mutual interdependencies are recognized and addressed.

The analytical techniques may include interviews on well-defined topics with agency or department leaders and workers, brainstorming, questionnaires, walk-throughs, etc.

The most important component of scheduling is identifying completion dates or milestones for each project activity along with the key deliverable for each project phase.

Once the plan has been constructed, the focus shifts to the establishment of strategic law and justice concerns. The purpose of this exercise is to prioritize the development of individual system components. This involves examining each agencies defined goals, objectives and problem areas and ranking each area's activity in

terms of its importance to the entire system. Principally because each participant has a vested interest in having its own system developed first, this activity has many potential dangers and requires strong leadership to ensure that factionalism does not develop.

After prioritizing the system's modules, a blueprint or high-level functional model for the entire system is constructed. This involves identifying each major function the system will perform. In a court system, for example, this step determines that the proposed computer application must perform:

- Indexing or Inquiry;
- Docketing (recordation of case events);
- Calendaring and Scheduling;
- Notice Generation;
- Management and Statistical Report Generation;
- Financial Management;
- Records Management.

Similarly, for the jail system, this step determines that the system must provide:

- Floor management (i.e., cross-reference prisoners to cells);
- Prisoner personal possession inventories;
- Information relating to co-defendants and other possible incarcerated witnesses to prevent collusion and coercion relating to any forthcoming testimony.

After the high-level functions have been established, the detailed functional model is prepared in conjunction with the departmental experts who perform routinely the

process under review. Using the court example, the detailed functional requirements for some of the previously-defined, high-level functional needs can be represented as shown below:

HIGH-LEVEL FUNCTION	DETAILED FUNCTION
Indexing/Inquiry	Defendant Name Case Number Date Judge Attorney Courtroom Etc.
Docketing	Defendant Name Defendant Address Charges Arresting Officer Attorney Bail Etc.

Earlier some discussion was made regarding the need for common data definitions. It is at this stage of system development that standardization of common data elements is performed. Usually a document called a data element dictionary is prepared that defines and describes each data element and establishes an across-the-board, uniform format for its validation and entry in the system.

When reviewing existing systems and plans, all manual and computer systems are assessed according to:

- Documentation, completeness, flexibility, maintainability, and accuracy;
- Conformity to overall integration plan previously developed;
- Conformity of data bases and data elements to the data elements defined in the

detailed functional analysis described above.

The final step, developing information systems projects, will be discussed in greater detail below. It is perhaps useful at this point, however, to summarize what should be accomplished at this stage of the process. If all of the above-described steps have been performed successfully, the project team will have:

- The mission, goals and objectives that each of the proposed systems will support;
- The problems that each system will solve;
- The agencies that will either use or be affected by each system;
- The functions and processes that each system will perform;
- The data that will be used by each process;
- The current systems and data bases that implement all or a portion of the functions or processes along with the data associated with each system.

So far, only functions and processes have been discussed, and with the exception of a few words on data bases, data elements and networks, little mention has been made regarding the integrated criminal system's technical requirements. The integrated system's technical requirements are significant and a discussion of these needs is required at this time.

To begin the discussion on the technical needs of an integrated computer system, several points must be recalled to mind.

First, the underlying premise of integrated systems is to share information. For information to be shared, it must be accessible. To be accessible, it must be open.

Second, many participants in the criminal justice process have pre-existing stand-alone systems that contain information that is very useful to other system participants - providing it can be accessed.

Third, if increasing the efficiency and effectiveness of the criminal justice process is the goal of computerized system integration, then the participants can ill-afford the time and cost required to completely redesign every pre-existing system so that it conforms to the overall system architecture.

Taking these points as a frame of reference, the technical attributes of an integrated system can be defined.

With respect to information accessibility, any integrated system should follow what is called an open system architecture. Open system architectures generally support operating software systems that can be used on diverse hardware. For example, the UNIX operating system, developed by American Telephone and Telegraph, has been designed to run on a wide-variety of hardware. Therefore, as a generalization, any process application, i.e., the court system described above, that has been programmed to run in the UNIX environment, should be able to operate on Digital, Unisys, Hewlett-Packard, and ICL hardware. Although successful integrated systems have been developed in a non-open environment, the wave of the future is toward open systems. It is urged strongly, therefore, that open system architecture be a departure point for any system development.

In conjunction with the need to conform to an open system architecture, there is also the problem mentioned earlier regarding the need for standardized data elements. A system that characterizes dates alphanumerically (i.e., with letters and numbers) cannot access or read a date on another participant's system that characterizes dates with numbers alone (i.e. numerically) without some form of translator. These translators are called master data files. Preparing master data files obviously can be a complex and tedious process^o. This process is further complicated by the fact that many computer applications are written in different languages such as Cobol, RPG, Fortran, Pascal, etc. It is therefore highly likely that not only will existing

^oThe Office of the Administrator for the Courts for the State of Washington recently made a significant contribution towards simplifying the construction of master data files. Using data modeling techniques that employ "entity relationships", it has created a standardized data set that describes the role and attributes for each data model used in its courts. These data models can be used in virtually every court in the United States. For information regarding the Washington data models contacts: Manager, Data Administration, Office of the Administrator for the Courts, 1206 South Quince Street, Olympia, Washington, 98504-2711.

individual systems on the network employ different data element formats, they will also employ different application software. This means that, in addition to creating master data files, integrating existing systems on the proposed network also may require the use of software bridges that act as software translators for the system. Although there is much emphasis in the industry today toward developing these software bridges, they currently are not as successful as desired. The development of so-called fourth generation languages or 4th GL's that employ flexible, relational data bases as opposed to the more traditional, inflexible, hierarchial data bases may be a way out of the non-integration box created by non-standardized data. 4th GL's, although not guaranteeing that data will be compatible, make it much easier to access, manipulate and convert data to other systems. They also shorten development cycles, facilitate file restructuring and require very little programming experience to operate.

Notwithstanding the advent of 4th GL's, criminal justice agencies that wish to integrate their systems, still have a dilemma: Should they focus their efforts on making existing systems compatible or should they focus their efforts on redesigning their systems, old and new, into a specific and uniform hardware and software architecture? The answer to this dilemma is not clear. It is suggested, however, that by subscribing to the principle of open system architectures, system integrators may achieve significant long-term benefits that more than compensate for the short-term benefits gained by employing an across-the-board, standardized but closed configuration. In more practical terms, however, if the existing applications cannot be cost-effectively converted into an open architecture, developers should begin the process by insuring that all new development incorporates the open system principles.

To this point the problems associated with hardware integration and software integration have been examined. There is the third requirement of complete integration that requires some additional discussion. This third requirement is network integration. Historically, networks suffered from the same problem as hardware and software: incompatibility¹⁰. As the move to open systems is beginning to take effect, however, networking seems to have overcome many of the

¹⁰More precisely defined as non-connectivity.

incompatibility obstacles. For example, the TCP/IP Ethernet¹¹ networking components permit users logged into one host computer to log into a remote computer and execute programs on that processor as if the user's terminal were directly attached to the remote system.

There have been other recent networking developments that facilitate system integration. The Digital Equipment Corporation developed Network Application Support, NAS that provides an open system environment that recognizes the mixed hardware and software realities of large organizations. NAS conforms to standards that provide a common treatment of key software components such as programming interfaces, data representations we discussed a moment ago, and communication protocols. These are all essential for collective software communication and they also enable software to run on different hardware devices or platforms. NAS can tie together applications that operate in UNIX, OS/2, MS-DOS, VMS, MVS, and Macintosh. Imaging technology also can operate on the NAS system. The development of NAS and other similar networking products is therefore a significant step toward total system integration.

5. Strategies for Implementation

Thus far the discussion has been directed toward system design. While design considerations are extremely important, the integration process does not conclude at the design stage. The major problems associated with system implementation still have to be overcome.

These obstacles and stumbling blocks, many of which have been discussed above, may include:

- Incompatible technical architectures;
- Outdated systems;
- Costly hardware upgrades;

¹¹I.e., the Department of Defense's "Transmission Control Protocol/Internet Protocol".

- Data processing staffs perceiving their systems as islands for their own agencies;
- Mistrust of other agencies;
- Over-budget and late delivery of systems;
- Unclear authority;
- Right of privacy; Etc.

By a judicious selection of participants for the design team, some of these obstacles to implementation already should have been solved. For example, by incorporating participants from diverse and possibly constitutionally separate organizations into the process, many obstacles to funding are overcome. Also, aside from insuring that all of the development tasks are completed on time across agency lines, the team approach described earlier sends a clear message to all concerned that, although the organizations are separate, the process is not. Every agency therefore has a vested interest in the overall success of the project.

Given these obstacles, which incidentally will be present during the entire implementation process, the first major question that integrators face with respect to implementation is whether to develop the system in-house or to select a system from the wide variety of vendor-created software applications called packages. There are pros and cons associated with each implementation alternative. The major advantage of package solutions is that, although they are somewhat inflexible with respect to adapting to a system's specific requirements, they have relatively short development cycles and therefore can be implemented quickly. The major advantage of an in-house effort is that, although the in-house development time can be quite long, the resulting system precisely reflects the way an organization does business. There is no correct answer regarding this issue other than stating that the selection process should take into consideration all of the system requirements identified during the design activities described above.

In addition to the package versus in-house development alternatives, it is important to note that the integrated system described above represents a totally different

approach to processing criminal cases and, significantly, it assumes that each department and organization will have, to a certain extent, an undefined portion of ownership in the system. As a generalization, unanswered questions regarding ownership usually create conflict. It is safe to assume that an integrated system containing data whose ownership is unclear will be no exception to this generalization. Also, the system will be composed of a comprehensive data base that is created by and accessible, in varying degrees, to all parties who comprise the criminal justice community. Because the system, in order to be successful, relies fundamentally upon the accuracy of the information in the data base and the ease of access to it, the issues regarding the integrity of the data transmissions become of paramount importance. The most important transmission issue is concerned with control of system data.

What do we mean by control? Remember that the plan developed above was directed toward making the entire system work. The principle resource or asset of the system is information and data. And, like all assets or resources, information and data must be managed, otherwise it deteriorates and wastes away. Entropy sets in.

There are two kinds of system controls:

- External controls;
- Internal controls.

External controls establish who can use the information and define what methods are used in data collection and dissemination. Collection and dissemination may include: screens, forms, reports, and other mediums. Internal controls, which are perhaps better known to many of us by the term system security determine what kind of data can be accessed and define how the data can be manipulated.

There are specific questions that arise with respect to internal controls and system security. The answer to each question is unique to the system being implemented and therefore cannot be given at this time. Although the answers may vary, the questions never do. These specific questions are given below¹²:

¹²See the Workbook, supra note 5, Para. 3.

- If data is integrated and consolidated in a justice system to reduce redundancy, what additional steps are necessary to ensure the proper safeguarding of these important justice system assets?
- If data sharing is to be promoted among justice agencies to streamline data inventory, what data ownership issues need to be addressed to eliminate potential conflicts among users?
- What steps can be taken to ensure that data is not abused by others who do not participate in the criminal justice process?
- How can the potential for misinterpretation of data that results from a lack of understanding of the information system design be reduced?
- How can data be safeguarded from willful or accidental destruction?
- Who specifically has jurisdiction over the information assets of the criminal justice system?

Each of these questions must be examined and answered as the integration project progresses. Using the team approach to formulate answers to these difficult questions, reduces, to a great extent, many of the factional issues that could jeopardize successful implementation.

To conclude the discussion relating to how to integrate a criminal justice system, the United States Government's General Accounting Office developed five principles for managing and implementing information technology that have particular relevance to the overall issue at hand. Taken as a whole, these principles for effective management provide a useful framework for successful integration. These principles are given below¹³:

¹³See "Meeting the Government's Technology Challenge - Results of a GAO Symposium", United States General Accounting Office, Information Management and Technology Division (February, 1990).

Commitment and Vision Begin with the Senior Managers

Without clear direction and support from the senior managers, most technology modernization programs collapse into a loose collection of individual and independent systems. Senior managers should look beyond the next budget cycle to find the best way to meet the public's need. This involves active participation in the formulation of any far-reaching automation plan and subsequent oversight of any system development process.

Partnerships can Help Define the Vision

Creating alliances and partnerships is essential to defining an agency's strategic vision. Access to the best available knowledge and advice from government, industry, and academia is essential to creating the vision and supporting architecture. Within an organization, partnerships between program managers and technical groups promotes communication and cooperative working relationships. These working relationships ensure that concerns, ideas, and solutions from all sides are aired.

Service to the Public Should be the Vision's Cornerstone

Agencies should actively seek to identify and understand society's needs, both now and in the future, and not rely on the perceived demands of the past. Evidence that agencies are listening to society's views encourages a sense of confidence that scarce funds are being used appropriately.

Clear, Flexible Architectures Should Support the Vision

The architecture should drive all major technology purchases. Rather than simply buying technology without a strategy, leaders need a comprehensive plan that dictates the equipment resources required. This reduces the possibility of acquiring duplicate technology and ensures downstream integration.

A clear, well-defined architecture also offers the possibility of building integrated systems one piece at a time, thereby minimizing the risks inherent in an all or nothing strategy. Incremental system development provides flexibility in response to society's needs and technical advances. The incremental development approach also enables the users to begin receiving the benefits of integration sooner than with the large scale development process.

Management Continuity is Needed to Implement the Vision

Traditionally, governmental agencies have had great difficulty in maintaining the management continuity necessary to provide constant direction and clear accountability. This lack of continuity increases development costs, delays implementation and diminishes the prospects for overall project success.

Since retaining highly qualified officials who can maintain continuity is difficult, long-term strategies should be developed that transcend personnel changes thereby mitigating the risks associated with loss of key system development personnel. Using advisory committees and consultants to provide an institutional memory helps achieve continuity.

Report

submitted by

Melissa Davy

Center for Criminal Justice

Harvard Law School

U.S.A.

Melissa Davy
Center for Criminal Justice
Harvard Law School
Cambridge, MA
U.S.A.

PROSECUTOR'S CASE MANAGEMENT SYSTEM: CASE STUDY

1. Introduction

Prosecutors in recent years have come under increasing scrutiny, and have been criticized for their apparent inability to deal effectively with the crime rate in their jurisdictions. Nationwide, the reported rate of serious crime continues to steadily increase, and the criminal justice system has been generally unsuccessful in attempts to reverse this trend. As a consequence, the public is demanding more accountability from elected officials, and prosecutorial programs and operations.

Both public officials and private citizens are critically reviewing the use of physical, financial, and human resources in the delivery of prosecutorial services. The inability of the Prosecuting Attorney's Office to meet the expectations of the communities in which they serve can result in the deterioration of confidence in the effectiveness of the criminal justice system. Once this confidence is lost, it is extremely difficult to re-establish.

Steps must be taken, therefore, to assure the public that they are receiving the possible services given the resources and other constraints under which the Prosecuting Attorney's Office must operate. One method for accomplishing this objective is to possess the capability to rapidly retrieve and analyze information necessary to facilitate strategic and tactical decision making, thereby ensuring the effective utilization of resources.

The Office of the Prosecuting Attorney, for the City and County of Honolulu, recognized this need, and obtained the services of Telesis Consulting Group (TCG), to analyze current operations, design a conceptual model of an integrated case management system, develop software which transforms the conceptual model into

an operational system, and implement the system.

2. Background Information

The Office of the Prosecuting Attorney serves the jurisdiction of the City and County of Honolulu, Hawaii. The Prosecuting Attorney is responsible for the prosecution of all criminal offenses against State Laws or local ordinances, and for certain legal services in state and local court proceedings.

The staff of the Prosecuting Attorney's Office formerly collected, maintained, analyzed, and reported on criminal court information utilizing an IBM mainframe version of the Prosecutor's Management Information System PROMIS developed under a United States Department of Justice Law Enforcement Assistance Administration grant during the late 1970's. Only felony cases were entered into the PROMIS system. The Office also used a mainframe system developed in-house to process and track cases under the jurisdiction of the District Court. In 1988, approximately 270,000 criminal cases were processed by the Prosecuting Attorney's Office. The users of these systems experienced problems due to the increase in the office's workload, and the inability of these case tracking systems to service the needs and requirements of all system users.

3. Telesis Consulting Group Prosecutor's Case Management System

This portion of this document presents the conceptual design for the integrated case management system designed and developed for the Honolulu Prosecuting Attorney's Office. Following a brief introduction, a delineation of design attributes derived from the review of current operations is presented. The next segment details the software components (modules) of the system.

4. Conceptual Design

The conceptual design presented provided the basis for the development of a preliminary software design specification. It is important to recognize the objective of a conceptual design is to provide the reader with an understanding of what features and functions are to be incorporated into the system to be developed, rather than detail how such features and functions will be implemented.

Prior to presenting the conceptual design for the new case management system, there is an important policy issue to be recognized. This issue involves the notion of system independence. Although there are many benefits to be derived by establishing interfaces between the new case management system and other criminal justice systems, it is also important for prosecuting attorneys to establish self-reliance in both developing, maintaining, and using automated case management systems. The primary objective of any new system should be to meet the specific needs and requirements of the Prosecuting Attorney's Office. In order to create a system with engineered flexibility to meet present and future needs, each Prosecuting Attorney's Office needs to establish internal independence in the design, development, operation, management, and maintenance of their case management system.

5. Design Attributes

Presented below are a series of general attributes incorporated in the software design specification developed. The inclusion of design attributes here should not be construed to mean the articulation of system requirements derived from a formal system design process were omitted.

The design attributes inherent in the Telesis Consulting Group (TCG) Prosecutor's Case Management System can be classified into three main categories:

- The first category contains attributes related to system independence;
- The next category of attributes are related to operational characteristics of the system;
- The third category addresses informational attributes.

The Prosecutor's Case Management System embodies certain attributes to enable the Prosecuting Attorney's Office to maintain system independence. These attributes include:

- The system developed allows for the entry of data by both manual and automated means.

- Use of the system is intuitive. It does not require the reading of large manuals and months of training to operate. Users are able to perform data entry and data access tasks with minimal of training.
- The system is flexible and enable users to perform ad hoc querying of the database, and produce ad hoc reports, without the need of programmers or other highly trained professional data processing staff.
- The system is flexible enough to allow for easy modification to meet the changing needs of prosecutors without extensive reprogramming and high cost.

The Prosecutor's Case Management System affords users a higher degree of computer assistance to increase effectiveness in the preparation of cases for court. The system also provide users with timely information related to cases. To meet such operational needs, the Prosecutor's Case Management System possesses the following attributes:

- Provides users with information needed to track or access cases by multiple ways for use by individual users, by working units, and by managers.
- Provides users with an intuitive, menu driven facility to perform ad hoc queries and create ad hoc reports.
- Provides users with the ability to print a screen of data with a single key stroke or print subpoenas or other documents by simply selecting a person or case.
- Provides users with the capability to access multiple tables with a single search criterion. For example, determining all related cases involving a particular defendant.
- Provides users with a function that summarizes the current status of a particular case.

Another important aspect of the Prosecutor's Case Management System is the

inclusion of an easy to use management reporting facility. This provides for the effective management and administration of the Prosecuting Attorney's Office. Through a report generation facility, management can analyze workload statistics to ensure that resources are most productively allocated, prepare budget justifications to acquire additional resources, and provide for the general administration of the office. The Prosecutor's Case Management System embodies the following informational capabilities:

- Provides users with a menu driven facility to generate all needed or required workload statistics or other management information by any user defined selection parameters.
- Report case statistics in conformity with local, state, and federal requirements and needs.
- Provide allied agencies such as the courts and police agencies with data on their respective cases within the Prosecutor's Case Management System.

In aggregate, these design attributes contribute to the comprehensiveness and strength of the Telesis Consulting Group Prosecutor's Case Management Information System.

7. System Components

The Prosecutor's Case Management System consolidates all information processes, providing prosecutors with capabilities and functionality exceeding the limited scope of case tracking. It is important to recognize the operational word is management. The system comprises four main modules:

- Case Management Module;
- Scheduling Module;
- Management Information Module;
- System Utilities Module.

Each of these modules is described below.

Case Management Module

The case management module represents the nucleus of the operational portion of the Prosecutor's Case Management System. In this module, users perform all required activities in the prosecutorial process, from intake through final disposition. The case tracking component of the system is actually composed of three inter-related sub-modules:

- Case Status Sub-module;
- Case Tracking Sub-module;
- Time and Expense Sub-module.

The case status sub-module enables a user to rapidly determine the current status of a particular case, or the status of an individual involved in a particular case. The user additionally is able to ascertain the last date of status change. The case transaction inquiry function provides users with the ability to view every transaction which occurs for a particular case, e.g., hearings, motions, changes in charges. The user is thereby able to view on-line a chronology of events on a case basis.

The case tracking sub-module is utilized by office staff responsible for adding new cases to the system (case screening and intake), and for updating of information about existing cases. Users may also inquire about a specific case, view case information, and print case information.

The time and expense sub-module provides attorneys with an easy to use means of recording the amount of time expended on a particular case. Also recorded is an activity classification, which indicates the type of task performed by the attorney. When expenses are incurred in the prosecution of a case, the expense information can also be recorded via this sub-module. All information entered into the time and expense sub-module can be analyzed, and reported on, through the use of facilities contained within the management information module (described later in this document). It is presently envisioned the time and expense recording function will

be provided through a single key stroke popup window, which can be invoked from anywhere within the Prosecutor's Case Management System.

Scheduling Module

The scheduling module of the Prosecutor's Case Management System is an essential element in the planning for the effective utilization of the resources of the Prosecuting Attorney's Office. This module consists of two main sub-modules:

- Case Scheduling;
- Resource Scheduling;

The case scheduling sub-module provides the Prosecuting Attorney's Office with a facility to maintain a master calendar of all planned (future) events for every case in the system.

The resource scheduling sub-module enables users to maintain a master calendar of all attorneys in the office.

Typical project management features such as resource leveling and resource conflict identification are engineered into the scheduling module of the Prosecutor's Case Management System. Sophisticated, yet menu driven, ad hoc query and report generation facilities are incorporated into the scheduling module.

Management Information Module

The basic objective of this module is enable the senior management of the Prosecuting Attorney's Office to collate, analyze, and report on information collected via the case tracking module. The essence of the management information module are sophisticated ad hoc query and report generation facilities.

The query facility provides users with the capability to perform on-line inquiries of the case management system database. This sub-module will contain a query-by-form facility to enable users to execute three different classes of queries:

- Ad hoc queries are special purpose or non-standard queries created by the individual user;

- Standard queries are pre-programmed queries selected from a query menu;
- The crosstab facility provides a predefined means of obtaining on-line statistical related information that describes the composition of the Prosecutor's Case Management System database.

The results of queries can either be viewed in a text or graphics format. Users will also possess the capability to transform ad hoc queries into standard queries that can be re-used.

The report generation facility provides users with two mechanisms for obtaining printed reports.

- The first method is through an ad hoc reporting facility. In this facility users will have some control over the formatting of reports.
- The second mechanism is through a standard reporting menu, in which the user selects predefined and preformatted reports to generate. These users will, however, have control over selecting the reporting period for all standard reports. Users will also possess the capability to transform ad hoc reports into standard reports that can be reprinted.

System Utilities Module

The system utilities module is composed of four main sub-modules intended for use primarily by those persons charged with the responsibility of administering the Prosecutor's Case Management System. These submodules are:

- Data Exchange;
- Lookup Table Maintenance;
- System Administrator Facilities;
- Table Archive Facility.

Each of these submodules is described below.

The first sub-module, data exchange, affords users the facilities to import and export information to and from the Prosecutor's Case Management System. As part of this module, a mechanism is provided that enables the system administrator user to download information from or upload information to other mainframe computer systems. If required menu driven utilities can also be provided to import and export data between other PC programs.

The second sub-module, lookup table maintenance, enables users to update the information maintained in the various lookup tables used by the Prosecutor's Case Management System. Through the lookup table maintenance function, users are able to perform the following functions:

- Update the values maintained in a specific lookup table;
- Print a report that describes the composition of all or a specific lookup table(s).

The next sub-module, system administrator facilities, consist of a series of four special utilities created specifically for the Prosecutor's Case Management System Administrator. These utilities are:

- **User Maintenance:** A utility that enables the system administrator to add and delete individuals from the table of authorized users, and maintain the access rights and password tables.
- **Table Utilities:** A set of utilities that provide the system administrator with the capability to repair tables that become damaged or corrupted. The user also has the capability to restructure a table from a menu driven facility.
- **System Statistics:** A facility that produces two different sets of statistical information. One set of information contains transactional statistics. These statistics provide detailed system usage information, for management purposes. The second set of statistics provide information regarding the current composition of the Prosecutor's Case Management System database. This information may either be viewed on the display screen or printed as a report.

- **Technical Documentation:** An on-line database comprised of four tables. These tables contain technical documentation about the four components that constitute the Prosecutor's Case Management System. These components are:
 - Databases and Tables;
 - Scripts (programs) and Procedures;
 - Database Dictionary;
 - Report Specifications.

7. Paradox

There were a number of major benefits derived from developing the Telesis Consulting Group Prosecutor's Case Management System under Borland International's Paradox Data Base Management System (Version 3.0.). These benefits are inherent in the many new and enhanced features of Paradox. The enhancements that provide the greatest benefit in developing the Prosecutor's Case Management System include the following:

Relational Enhancements.

The ability to create one to many relationships through multi-table and multi-record forms, linked tables in forms, multi-table reports, and intrinsic referential integrity. The benefit of these relational enhancements is the software developer is now able to design and specify more efficient relationships between tables and data elements, which minimizes the effort required to maintain the database. Through the use of the Paradox 3.0 one-to-many features, a system can be designed that will eliminate the problem of data redundancy.

Query by Example (QBE) Enhancements.

The capability to create data sets, and perform operations on specified sets; the inclusion of an outer join capability, and the controlled sorting of answer tables. The major benefit obtained from the QBE enhancements is greater efficiency in the analysis of data, and the production of reports. Through the use of outer joins and set operations, the user can obtain a desired answer table with a single query,

rather than performing multiple step queries.

Memory Management Enhancements.

New commands included in Paradox's Programming Application Language (PAL) provide software developers with greater control over the manner in which Paradox and PAL applications utilize memory. These enhancements are of particular importance for the proposed project, as memory management is always a critical issue in developing a Paradox application which must operate under a Novell Network.

Presentation Graphics.

The availability of a built-in capability to graphically display information (to the computer screen or printer) and the associations between data facilitates the effortless analysis and interpretation of often complex relationships.

The features provided in Paradox Version 3.0 enabled Telesis Consulting Group to construct the Prosecutor's Case Management System at a lower initial cost, and permits to reduce the costs required to maintain and support the system.

Report

by

Geoffrey T. Campbell

Mobile Data International/Motorola

U.S.A.

Geoffrey T. Campbell
Mobile Data International/Motorola
Schaumburg, Illinois
U.S.A.

THE PRACTICAL APPLICATION OF RADIO DATA COMMUNICATION TECHNOLOGY TO THE PREVENTION OF CRIME

1. Introduction

On a highway 72 miles north of Chicago, in the State of Illinois, U.S.A., police officer Jerome Volstad of the Richmond, Illinois Police Department, pulled over a truck for equipment violations. Moments after officer Volstad punched the driver's license number into his mobile data terminal it flashed a warning that the driver was wanted on a weapons charge and was considered armed and dangerous.

Before leaving his car officer Volstad radioed for backup and successfully talked the driver out of the truck without incident. After the suspect was taken away, officer Volstad approached the vehicle and discovered a green gym bag on the front seat. Sticking out of that bag was the butt of a loaded 357 revolver.

The Richmond Police Department believes that if Officer Volstad had approached the truck alone a second time, he would have been shot.

Two Boston, Massachusetts Metropolitan Police officers spotted a car with a man asleep at the wheel. They ran the car's plate number through their mobile data terminal. The terminal responded that the car was stolen. When they checked the man's driver's license (which listed his alias and not his real name) the FBI computer in Washington, D.C. responded with a caution message - the man was wanted in connection with a four-year-old murder case in Connecticut.

Officer Dermot Quinn, Director of Management Information Systems, attributes this arrest to the officers' immediate access to local and federal databases through their mobile data terminal. The officers said that due to heavy voice traffic it would not have been practical to run a routine check without the terminal.

These are just two examples of how police departments in North America and around the world are making increased use of advances in radio data communication technology to fight crime.

This presentation has been structured as a series of answers to questions that frequently have been encountered in discussion with police departments and other law enforcement professionals around the world.

Although languages, customs and local regulations differ greatly from country to country, the needs of a Police Department in Seoul in Korea, Adelaide in Australia, Montreal in Canada or Buenos Aires in Argentina are remarkably similar when it comes to their communications needs.

2. What is Radio Data Communication?

In its simplest sense radio data allows the police department to replace slow voice communication with the more rapid transmission of text. This itself allows about a ten times improvement in the amount of data that can be transmitted over a single radio channel.

However the true utility of a radio data communication system comes not from simply providing more efficient use of scarce radio channel but it enables people to become more efficient.

To access information today, most police officers call a dispatcher and request that the dispatcher look up some information for them and wait for the dispatcher to call them back. The bottleneck is the human between the officer and the information. A radio data system allows the officer direct access to the information that he is entitled to access without going through another person.

3. What are the Benefits of Radio Data to Police Agencies?

To understand the benefits of using mobile data communications technology one should first understand the computer applications behind them. A mobile data terminal taken in isolation is as useful as a disconnected telephone. The mobile data terminal and the telephone both need to be given power by a network and computers

which run the network.

The four most common uses for mobile data terminals are:

- Messaging;
- Status update;
- Data base access;
- Computer aided dispatch (also known as CAD).

Messaging and status update

Messaging and status update are easy to understand. In messaging, instead of talking into a voice radio the officer types a message on his mobile data terminal as he would using electronic mail. Pre-programmed status messages allow commonly used updates to status such as en route or at scene to be sent back to the dispatch center at the touch of a button.

Direct data base access

It is easy to visualize the benefits of direct data base access from a police car. This is how most police operations work without mobile data:

- The officer requires information and requests a look up from his dispatcher;
- The dispatcher responds and requests specifics;
- The officer carefully describes what he needs often spelling names and reading long license numbers, and in many cases the information is echoed back by the dispatcher;
- The dispatcher looks the information up on the computer if he has time that minute, and the officer waits;
- While the dispatcher is waiting for a response he may handle another matter and return to the original officer with his response as soon as he has time;

- However, in many cases the dispatcher is limited as to what he can say over an open channel, so only limited information is returned to the officer.

One of the largest contributors to radio voice traffic congestion in active police operations is routine look-ups of license plates, drivers identification, and property identification numbers. By placing the dispatcher between the field officers and the computer the dispatcher becomes the bottleneck. The system works fine at low traffic loads but begins to break down during peak periods. The most common concerns expressed by officers in the field is that they cannot get through when they need the information the most, during peak activity. The dispatcher is too busy and tactical information takes precedence over information requests. The result of this is that during peak periods few inquiries are even attempted. An interesting corollary is that during quiet periods few inquiries are made either. It seems that most night shift operations run with a skeleton crew and might resent being deluged with numerous license look-ups.

When an officer does attempt an inquiry he often has to wait a long time for an answer. This hampers his ability to rapidly assess and act appropriately in a hazardous situation. When approaching an unknown vehicle this can represent significant danger. The cumulative effect of repeated long waits for information is a waste of time that can be very significant in a large police operation.

Many countries have restrictions on the type of information that can be transmitted over an open radio channel. This in many cases reduces the amount of information that the officer can receive. Even if all the information can be transmitted over the radio, most dispatchers edit the contents of a report to the bare minimum to conserve air time.

In many areas, all non-emergency inquires over the radio stop during peak periods. Officers return to the station to get information.

After the mobile data terminal system is installed the process is much simpler:

- The officer fills out a form on the terminal's screen;
- The request is routed to the correct computer data base(s);

- Responses are routed back to the originating mobile data terminal, automatically.

By avoiding the bottleneck of the dispatcher inquiries go directly into the computer. Air time is conserved because digital transmission is faster. Dispatcher delays disappear. Officers can make inquiries during peak periods. Many more marginal inquiries are made. In many cases inquiries increase by a factor of 10. Slack time inquiries go up dramatically because the officers do not have to bother the night shift. The net result is more hits. Dispatcher stress goes down. Officer safety goes up.

Computer aided dispatch

The other major application is driven by computer aided dispatch systems, these are also known as command and control systems. The major function of a computer aided dispatch (CAD) system is to match incidents with resources. In this case the incidents are typically triggered by a citizen complaint or an officer's report from the field. Resources are typically police officers or police vehicles that are currently available for assignment.

Prior to installation of a computer aided dispatch system most departments develop sophisticated manual systems for monitoring available units and assigning them to incidents. These often involve incident cards, status boards, frequent voice contact with the field to monitor unit status and a high level of dispatcher mental balancing to keep the operation running smoothly.

As with inquiries, this system can work smoothly if the key individuals running the system (the dispatchers) are experienced and not overloaded. However, most departments report high dispatcher stress levels with resulting turnover. During peak periods, or when the dispatch positions are undermanned or staffed with new personnel the opportunities for mistakes and confusion increase. The other bottleneck in this type of manual dispatch system are the radio channels. A well constructed manual dispatch system or even a computer aided dispatch system without mobile data terminal requires a high level of voice communication to keep the system running smoothly. This greatly increases the load on already crowded voice channels.

Although quite a few benefits can be gained by putting in a computer aided dispatch system alone, the full power is not realized without mobile data terminals. The computer aided dispatch system allows a call-taker to enter information on an incident directly into the computer while the citizen is still on the phone. This record is sent to the correct dispatcher with a list of recommended units in the correct area that are available for dispatch. The dispatcher forwards the same record to the assigned unit. The process can take seconds.

Because the information is entered into the system once, there is less chance for error. Less time is wasted repeating messages and spelling names and addresses. Messages are delivered with a positive acknowledgement. The dispatcher can spend more time managing their area and less time transmitting information verbally. The dispatcher stress level is reduced. In many cases police departments were able to double their work load without adding any additional dispatchers.

The resulting improved efficiency and faster response means improved service to the public. The reduction in dispatcher workload and rehandling of information can mean reduced operating costs. More apprehensions of parking and traffic ticket offenders can actually mean increased revenue. Faster access to information improves officer safety. Faster access to operational summary data can improve police management effectiveness.

And finally, the cumulative effect of taking routine status updates, dispatch messages, and data bases inquiries off of a voice radio system is a potential traffic reduction of over 70%.

4. How does radio data communication work?

Although this paper is not intended to be a one, a practical understanding of how data can be accurately and reliably transmitted from a central computer to a moving police car hundreds of miles away is beneficial.

Transmitting data over radio is trivial. Designing a reliable system that can deliver messages predictably and accurately is not trivial. But it is certainly not magic.

Essentially, data is transmitted over radio much the same way information is sent

over telephone lines. Alternating high and low frequencies represent ones and zeros. Ones and zeros are accumulated into routing information and letters and numbers that make up the actual message being sent.

There are a wide variety of commercially available radio data transmission products that can send information from one unit to another unit over radio. You can find these in ham radio shops and on many cellular phones. These are not the kinds of products that are appropriate in police operations.

The type of system that will be described in this paper is similar to the kind sold by Mobile Data International/Motorola but also describes the significant other suppliers to public safety users reasonably well.

There are three pieces to a typical public safety radio data system:

- the computer application;
- the radio system;
- the terminal itself.

Computer Application

The two major computer applications, direct data bases access and computer aided dispatch, have already been described.

Radio system

The underlying radio technology was developed in the early 1980's to serve an explosion in demand for radio data technology in North America. The essential requirements for public safety systems were high speed data transmission, ability to resist relative heavy radio interference common in large urban areas, ability to cover large areas seamlessly, ease of connection into existing computer systems and positive message delivery.

When the officer types in a message on the keyboard of his mobile data terminal and hits the send key, the terminal encodes and packetizes the message for transmission over the radio channel. This encoding is very important. Although the way ones and

zeros are sent over radio is the same as over a telephone, a radio channel is subject to a wider range of interference and static than most telephone lines. In addition, radio specific phenomena such as Raleigh fading (similar to the Doppler effect) and multi-path interference (the same signal taking a slightly different path to the receiver arrives out of phase with the original) conspire to periodically destroy bits that would render a typical wireline transmission useless.

A robust protocol resists these errors by using a technique called "Forward Error Correction". The encoding protocol inserts enough error detection and correction bits into the transmission to recreate up to 15% of a message that was corrupted or destroyed during a transmission. Those messages that cannot be restored are re-transmitted up to four times without intervention by the officer.

Finally if all these attempts to deliver a message fail, than the officer is notified that the message was not delivered to its destination. In all cases the originating party receives a positive acknowledgement that a message either reached the destination or it did not.

This radio transmission is received at a base antenna site where the message is decoded and forwarded to the network controller. This network controller handles all message routing and radio system management. It can also control multiple base sites and eliminates duplicate messages that were successfully decoded at more than one base site.

The link to the host is a single line that provides a simple communications link without burdening the host computer with any network management, routing, or error correction tasks.

The return message follows the same path in reverse. The host sends the message across the single line to the controller. The controller maintains tables that allow it to select the transmitter site most likely to reach the destination unit. The same encoding decoding system and multiple retries are used for outbound transmissions.

The overall effect of all these radio channel management techniques is an optimized system that balances data transmission speed with seamless coverage, powerful error correction and ease of integration into existing systems.

Terminal

The final piece of a radio data system is the terminal. Most existing users of radio data systems prefer using vehicular (mobile) mounted and/or handheld (portable) data terminals that have been custom designed for use in public safety applications. Very few have been successful when trying to use general purpose computer or laptops, particularly in vehicles.

There are three general types of radio data terminals on the market today. There are:

- Full mobile data terminals which feature a full typewriter-like keyboard and a larger display;
- Smaller dispatch terminals that have limited keyboards;
- Small flat displays, and handheld or portable data terminals that can fit in your hand.

5. Who is Using Radio Data?

The bulk of the radio data systems operational today are located in North America. Approximately 100 systems in the U.S. and 15 systems in Canada are currently installed. However, progressive communities in industrialized nations in Europe, Oceania, and the Far East are beginning to install their first systems and are benefitting from experiences learned by some of the North American pioneers.

The experiences of some of these pioneers: in Dallas in Texas, Suburban St. Paul in Minnesota, Amsterdam in the Netherlands, Adelaide in Australia, Montreal in Canada, and Suburban Chicago in Illinois, will be described below.

Dallas, Texas, U.S.A.

The Dallas Police Department bought the first very large, very complex mobile data system that uses a cellular-like zoning system called ACT (automatic cell transfer). They currently operate 650 units on a ten site system using 5 channels. They were also the first to experiment with portable data terminals. The department issued these portable terminals to special operational units engaged in property recovery

and drug raids. They currently operate 50 portable data terminals.

Hennepin County, Minnesota, U.S.A.

Hennepin County is located in and around St. Paul, Minnesota. Although the county is well populated it consists mainly of smaller communities that individually can not afford individual sophisticated dispatch or communications systems.

The system installed in Hennepin County was designed not only to serve the County Sheriff's communication need but also to provide data communication support to small towns and cities within Hennepin County. The system consists of three channels operating on two sites. There are currently 250 units operating on the system.

Amsterdam, The Netherlands

A new mobile data system will be coming on stream later this year in Amsterdam, Netherlands. Chief Inspector Smit of the Amsterdam police department gave a presentation to the European Chiefs of Police meeting in Vienna on their new mobile data terminal system.

Quoting Chief Inspector Smit: "Direct data base access will be a big advantage ...
"The more information available in the street, the better equipped our officers are
"to handle situations and make the right decisions. The crime rate is rising steadily.
"I don't know how we would meet the demand five years from now without a data
"communication system. It would be impossible with our current system without
"obtaining more radio channels, which is much easier said than done."

The initial system at the Amsterdam police department consists of five transmitter sites and 125 mobile data terminals.

Adelaide, South Australia , Australia

An exciting new system that went operational in August 1990 is on the other side of the world in Australia. The South Australian Police put in the first all handheld public safety data system in the world. All 222 data terminals are small enough to fit in your hand. These units weigh less than two pounds, and contain the keyboard, display, memory, radio, modem, antenna and 8 hour battery. Special holsters have been designed for these units which are now standard issue for each of the uniformed and foot patrol officers.

The first phase of this project is focusing on putting in dispatch capability, phase two will add data base inquiry capability.

South Australian Police Superintendent Alan Giersch summarized their expectations: "Our response time will be reduced significantly and we will no longer experience the frustrations of static or incomplete messages which are typical with voice communications."

Montreal, Quebec, Canada

One of the larger French language cities in the world, Montreal, installed a mobile data terminal system. They have 400 units operational on five transmitter sites using 2 channels.

Suburban Chicago, Illinois, U.S.A.

Another pioneering system was referred to. The Richmond, Illinois police does not own its own radio data system, because it is too small a city. Richmond rents terminals and air time from an agency of the State of Illinois called the Illinois Criminal Justice Information Authority.

The system, called ALERTS (Area-wide Law Enforcement Radio Terminal System), currently covers a six county area around the city of Chicago. There are currently about 250 units operational representing 40 different communities, like Richmond.

One of the ALERTS subscribers is Hinsdale, a western suburb of Chicago. Like many other agencies they share radio channels with four other municipalities. The voice radio took too much time and they couldn't run as many checks as they wanted.

"To implement a new system and have everyone like it is unheard of in this business," said Sergeant Brad Bloom of the Hinsdale Police. "Everyone seems pleased with the ALERTS system. We are running more checks and the system is fast. We are getting results."

Plans are to expand the system to other parts of the state. The system is designed to be easily expandable by adding additional base sites.

6. **What are Common Concerns of Police Agencies regarding Radio Data?**

Two of the most common questions we encounter are:

- Why is this so complicated? Why not just plug a terminal into my radio and another into my computer and use my existing radio system?
- Mobile data technology seems very expensive. How can this expenditure be justified to the politicians that control the department's funding?

The first question is not one that is heard as much in North America any more, but it is still fairly common in other areas of the world.

Motorola has been one of the pioneers of the application of radio technology to law enforcement since the 1930's. In that time, many approaches have been taken to integrate voice and data on a single system. This was especially true in the early and mid 70's. These attempts have ranged from mobile printers, to simple status devices, to full mobile data terminals.

What we learned from that experience was that a dedicated radio data system can accommodate 150 - 200 units with reasonable response time and normal message profiles. When voice and data are mixed, however the system begins to collapse around 20 units.

The second question is more difficult to give a quick answer to. A mobile data system can cost between \$4000 - 8000 per unit exclusive of computer aided dispatch. The real price of mobile data systems has dropped dramatically over the last 10 years. In the early 80's a mobile data terminal alone cost more than a police car, now it is a small fraction of that cost.

Most communities that invest in radio data systems do so for reasons that are not quantifiable. Two exceptions are the City of Phoenix, Arizona, U.S.A. and the City of Vancouver, British Columbia, Canada. Both of these communities did cost justifications for their systems and verified the results. The result of these studies was that the radio data system can be financially justified based on labor cost savings and increased revenue due to more efficient ticket collections.

However, in most cases these are not the reasons that most communities used to justify their systems. Those real reasons fall into three categories:

- Improved internal police operations;
- Benefits to the public;
- Officer safety.

Improved internal operations are hard to quantify to outsiders, but are real to police management. They result in faster response. Officers in the field are more efficient and accurate. Management has access to better and more timely summary reports. The overall field working environment is better.

The public benefits directly from an increased rate of stolen property recovery, especially autos.

But the biggest selling point is officer safety. Putting information in the hands of an officer quickly when he needs it often can mean the difference between life and death. How much value do we put on the life of a police officer?

7. What is coming in the future?

We see two kinds of trends. There are trends in what police departments want to use radio data systems for, and there are trends in technology.

One of the more interesting trends is the growing interest in community oriented policing. In order to be successful, community oriented policing requires efficient ways to capture a lot of information, organize it and have it readily accessible to the field in a timely manner.

We see the need for more and different kinds of data flowing to and from the field. Mobile data terminals of the future will need a lot more processing power and storage capacity. The terminal will need to accommodate mug shots, fingerprints, and automatic vehicle location. In addition, there will be a large variety of peripheral devices including a variety of printers, drivers license readers and credit card

readers.

Technology trends show that mobile terminals will be getting smaller and their functionality will become more like laptops. There will be a larger variety of handheld devices of all shapes and sizes. Transmission speeds will get faster.

Shared systems will be a major trend. Smaller users will band together to purchase systems. International data bases will be accessible from any where in the world.

8. Summary

As the world's law enforcement agencies interlink their criminal justice information systems, the value of quick access to information will increase dramatically.

The press of day to day activity prevents many law enforcement agencies from being as effective as they could be using available information in the field to fight crime. One way of improving access to information is to allow the field personnel direct access to information through radio data terminals.

The net result of implementing this technology is improved public service, more efficient police operations, increased revenue, reduced voice radio congestion and improved officer safety.

Although the concept of data transmission over radio is essentially simple and easy to accomplish, the challenge of designing systems with the appropriate level of coverage, throughput, and resistance to interference is significant.

Leading law enforcement agencies around the world have been using this technology for years. Currently there are over 100 successful installations. Although the largest number of these systems operate in North America, there are systems in the Netherlands, Australia, Germany, Belgium, and Hong Kong, to name a few.

Radio data technology promises to bring many new capabilities to the fight against crime. Officers in the field will have more tools at their disposal because of direct access to information. These tools will allow fast positive identification of individuals in the field. These tools will speed the process of routine police work. These tools

will allow the use of computers to make people more effective, and create a safer public.

Report

by

Henk H. Bosman

Interprogram, Inc.

The Netherlands

Henk H. Bosman
Managing Director
Interprogram, Inc.
The Netherlands

SOFTWARE OPERATIONS MANAGEMENT SYSTEM

1. Introduction

This paper should be read in conjunction with the paper on infra-structure to succesful computerization, also presented at the First United Nations Workshop on Computerization of Criminal Justice Information¹. The paper on infra-structure to succesful computerization discusses the OIQ-concept.

The OIQ-concept by itself is not sufficient to control in all computerization projects. Adequate cost-accounting and risk analysis and management techniques are needed to guarantee the application system to be delivered in time, within the available budget and with good quality.

A method to reduce the costs of computerization is software recycling, i.e. mapping existing software through reverse engineering techniques, and locating re-usable software. By means of reverse engineering the software life cycle can considerably be extended.

2. Function Point Analysis

Function Point Analysis, FPA, is a tool for cost-accounting for the development of information systems. The Function Point Analysis Methodology, developed in the late 1970s by A.J. Albrecht and E.E. Rudolph², was originally meant to measure the

¹Infra-structure to Succesful Computerization, Henk H. Bosman, Proceedings of the Workshop, page 151 et seq.

²See A.J. Albrecht, "Measuring Applications Development Productivity", Proceedings Application Development Symposium, SHARE/GUIDE 1979, page 83 et seq.; and E.E. Rudolph, "Function Point Analysis", Cookbook, 3/1983.

software development productivity within the I.B.M. organization.

By the 1990s, many aspects of software development have changed:

- Programming languages are changing from third to fourth generation;
- The application of system development methodologies in software development;
- Professional project management;
- The development of computer aided software engineering tools (CASE tools);
- The growing importance of cost estimate and resource planning:
 - to design an information system;
 - to engineer an information system;
 - to maintain the information system.

System development methodologies deal with project management and systems engineering activities. Most systems development methodologies contribute to the state of the art of systems engineering by organizing the description of the systems effort in the form of a planning network, describing the major milestones where decisions must be made whether or not to continue further systems efforts. They do not deal, however, with cost-accounting and budget control.

The Function Point Analysis Methodology has developed from a tool for measuring programming productivity into a tool for controlling costs and time in software projects in relation to the functionality to be built³.

With the new generation FPA-tools computerization projects can be quantified in terms of function points and further budgetted in time. They provide an overview

³See e. g. the Function Point Analysis Methodology developed by Interprogram, Inc., IFPA.

of the volume of a computerization project by means of classifying the user requirements in clearly stated and limited variables and quantifying these variables. The volume is stated in function points, a measuring-unit which can only be used in interrelated comparisons. In multiplying the number of function points by an objective productivity rate, measured in hours per function point, an estimate is given of the number of hours required for the project. A more detailed estimate and planning figures can be obtained by including factors which can influence project development. These factors depend on the project or on a given situation. They will adjust the time required - either in a favourable or unfavourable way - and will lead to the actual number of hours required.

The generally perceived shortcoming of the first FPA-tools method is that it only gives reliable figures after the functional design has been completed. The new generation FPA-tools, as IFPA, give reliable figures on time and money during the crucial functional design phase.

The main objective of the new generation FPA-tools is no longer measuring programming productivity, but supplying reliable estimates and calculation of the time needed and the expected costs for the development of information systems.

Next to the development of new information systems, maintenance becomes an ever increasing portion of the workload in electronic data processing. Function point analysis also provides reliable estimates in maintenance projects.

The project information for accomplishing a function point analysis can be divided into five steps:

- Project data;
- User functions;
- FPA-functions;
- Influences upon the project;
- Productivity rates.

Project data primarily concern the internal policy applied in the internal organization as far as equipment and development tools are concerned. Data concerning development characteristics, hardware, database and tools have to be determined as comprehensive as possible since these data may be used as a frame of reference after completing the project.

The user functions are the characteristics, input, output or activity acknowledged by the (future) user, which the final product has to meet. The user may indicate priority to be assigned to each function.

The FPA-function is the subdivision of a user function in one or more original FPA-functions: logic data file, input, output, inquiry or interface.

Influences upon the project are factors, as a percentage of the total number of hours or absolute number of hours, influencing upon one of the development stages. Since the factors that influence upon the budget may be different in each stage, separate influencing factors can be taken into account for the specification stage, stage of the development process in which the specifications concerning the requirements and the wishes of the user are being laid down (feasibility study, definition study, basic design, etc.) and for the realization stage, stage of the development process in which the final product is realized in accordance with the specifications (detailed design, programming, system test, implementation).

By means of the new generation FPA-tools:

- Tenders from different contractors can be compared in-depth by using function points and stating explicitly a price per function;
- Quality can be measured by using the function point as a yard-stick;
- The effect of the use of development tools can be measured and compared with the environment where these tools are not applied;
- Maintenance hours can be related to functionality.

3. Risk Analysis and Management

Risk Analysis is a tool to control the development of information systems. Computerization projects often host many risks and uncertainties, because so many environments all have different characteristics, because new types of hardware are used, because new applications have to be developed and new development tools are used. Modern risk analysis methodologies have the potential of overlooking all conceivable risks during project development and of handling these risks. Risk analysis is a tool to inventory all conceivable risks and their potential effects on project development, as well as to draw up a scenario to cope with and to respond to these risks. Risk analysis and management offer software projects a better chance of timely realization, within budget limits and as specified.

A leading risk analysis and risk management methodology to be mentioned is the Swedish SBA-methodology⁴, developed for the Swedish Government. This paper discusses in brief the RISA-methodology⁵.

The Risk Analysis Management Methodology RISA comprises four steps :

- Tracing and identifying all conceivable risks;
- Analyzing the risks;
- Drawing up the scenario and measures to cope with and minimize the risks;
- Tracking the effects and costs of the proposed measures.

To trace potential project risks, a questionnaire is presented. To structure the questions, keywords which enable to make an extract of the inventory of questions are attached to specific questions. This enables to select only relevant questions.

⁴SBA stands for SarBarchets Analys, also called Security by Analysis.

⁵RISA stands for Risk Inventory Specifying Action, a methodology developed by Interprogram, Inc.

The analysis of the traced potential risks is done by using four risk parameters:

- Size;
- Chance of Occurrence;
- Cost;
- Impact.

Analysis of risks is a subjective activity. Quantification of a baseline is, however, essential for the process of managing the risks in a later stage.

A second aspect of the analysis is the linking of consequences to the identified risks.

A third aspect is compartmentalizing the risks: associating risks with a certain level in the organizational structure. The essence of compartmentalization is that a risk should be tackled at the level where it occurs and exerts influence; risks should be coped with by management responsible at the level concerned to effect measures.

Risk management is defined as dealing with potential risks to prevent them from happening, and minimize their consequences and impact.

After the risks have been quantified, the possible consequences been identified and compartmentalized, decisions have to be made. Management may accept a potential risk and decide not to undertake any preventive action. Management may just note a potential risk and decide to keep it in mind. Management may decide to take action or measures against potential risks. The RISA knowledge base supports management in taking measures. This information base provides information about measures taken in the past against such risks as well as about how successful these measures were in that specific situation. The decision to take a measure remains the responsibility of the risk manager.

The fourth step is tracking the effects and costs of the proposed measures. Measures should be tracked in terms of time. Expected effects of measures and their

actual results are to be recorded. The RISA knowledge base should be updated with the experiences obtained during the project. At tracking dates the risk parameters are adjusted to the state-of-the-risk at that moment. Adjustment of risk parameters justifies the measure. Tracking should be executed as long as the measure is in effect.

Structured risk analysis enables management to highlight all conceivable risk factors, to specify them in terms of chance of occurrence and time and money, and to decide on measures to cope with at any level in a computerization project.

The RISA-methodology distinguishes four areas where risks may occur:

- Objectives: Are the objectives of the project properly defined?
- Starting Points: Is the starting point of the project a good one?
- Activities: Which risks may occur during project development?
- Resources: Are the resources sufficient (in terms of both quality and quantity)?

4. Reverse Engineering

4.1. Introduction

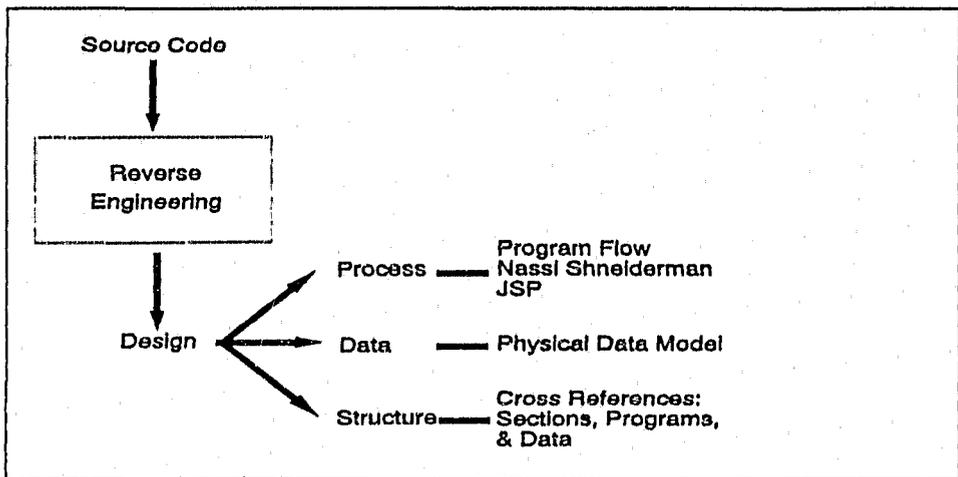
Reverse Engineering is a new technology that can be applied to a wide range of software management areas. This paper discusses in brief the IRET-methodology^a. Examples will be given of application areas of Reverse Engineering.

4.2. Reverse Engineering - Re-Engineering

The core of the IRET-methodology is the reverse engineering tool. This tool produces a design, based on information extracted from the source code of a

^aIRET stands for Interprogram Reverse Engineering Technology, a methodology developed by Interprogram, Inc.

program. This code could, for example, be in RPG, Pascal, Cobol or JCL.



An application design is generally divided into three parts:

- Process Model;
- Data Model;
- Structure.

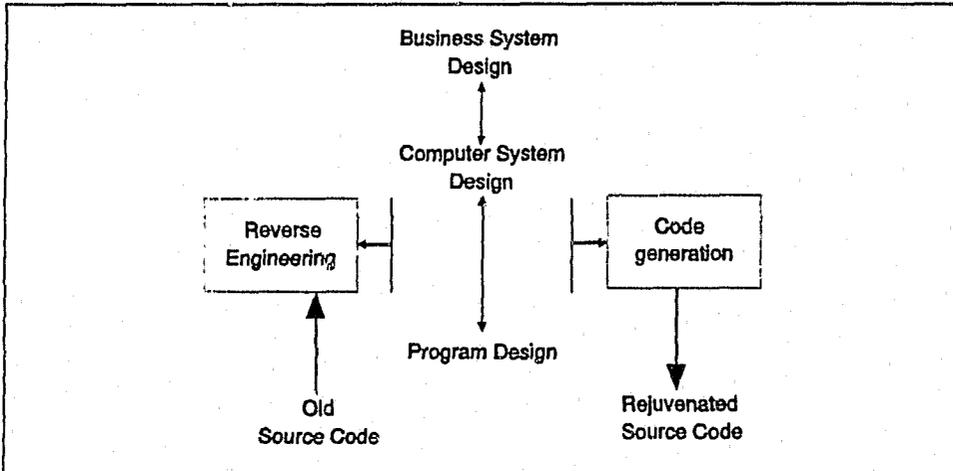
For an overall view of an application one must know the structure of the application: dependencies between processes and their data. The methods used to present the three parts (processes, data and structure) will ultimately determine the success of the tool. All information acquired by the tool is stored in a formalized data dictionary, which gives access to various CASE tools.

Reverse engineering transfers information from the source code of an application to a data dictionary and to simple diagrams. Reverse engineering draws up the technical (and program) design of an application.

The design can be modified, e.g. by restructuring the code according to the

principles of structured design or by effecting naming conventions. Or new requirements, specified in the functional design, may be implemented. If necessary, the functional design may be updated.

An important part of IRET is the code generator. The code generator produces error-free code based on the design. Because there is no human intervention whatsoever during the coding process, the software is error-free.



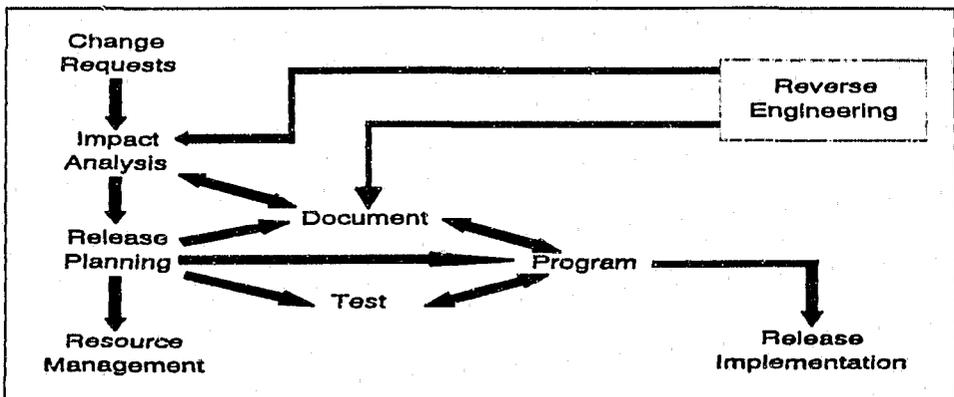
The process of converting old source code through reverse engineering, design, and code generation, to renewed source code, is called re-engineering. Re-engineering is particularly valuable when the source programming language is replaced by another.

4.3. Software Maintenance

The software maintenance process is initiated by a change request from the end user, management or the electronic data processing department. Ideally, the change requests are scrutinized in an impact analysis. This analysis serves to determine the effect and consequences that the proposed changes might have on the software, hardware, and the organization itself. An important product of the impact analysis is the cost/benefit analysis. This analysis can be used to decide whether or not to

implement the change. Reverse engineering is a tool to create a repository or dictionary from which information can be extracted about the impact on the software.

After a release plan has been negotiated between the users, management and the electronic data processing department, programmers start implementing the changes. Often more than half the time needed to implement a change is spent by trying to understand the purpose and function of the old code. Reverse engineering produces accessible, clear and up-to-date documentation for the programmers so that less time is needed to penetrate into the meaning of the old code. Reverse engineering may be an investment, but its pay-back time is usually short.



4.4. Electronic Data Processing Quality Assurance

Quality assurance should be tightly integrated into software development and maintenance methods. There is a need for procedures and practices that ensure high quality development. Reverse engineering is able to support organizations in developing and maintaining software which has the following advantages:

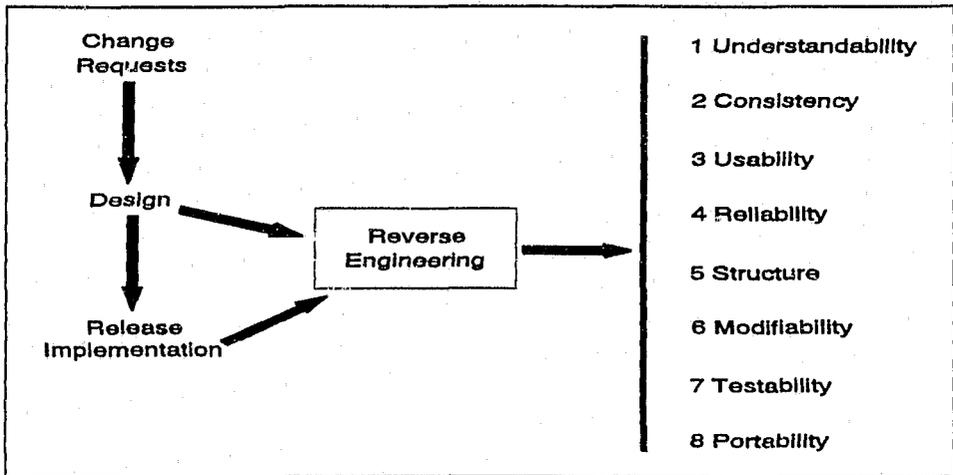
- Satisfying a wide spectrum of user requirements;
- Containing few errors;

- Working efficiently;
- Being easy to implement and easy to use;
- Having good technical and user documentation.

To realize these advantages, a quality assurance group within the organization should be actively engaged in the following activities:

- Developing and implementing procedures that are designed to ensure quality throughout the development life cycle;
- Reviewing and approving requirements as well as design documentation;
- Rendering consultative services to development and maintenance staff;
- Producing comprehensive test material;
- Managing and directing product testing;
- Checking against quality assurance norms.

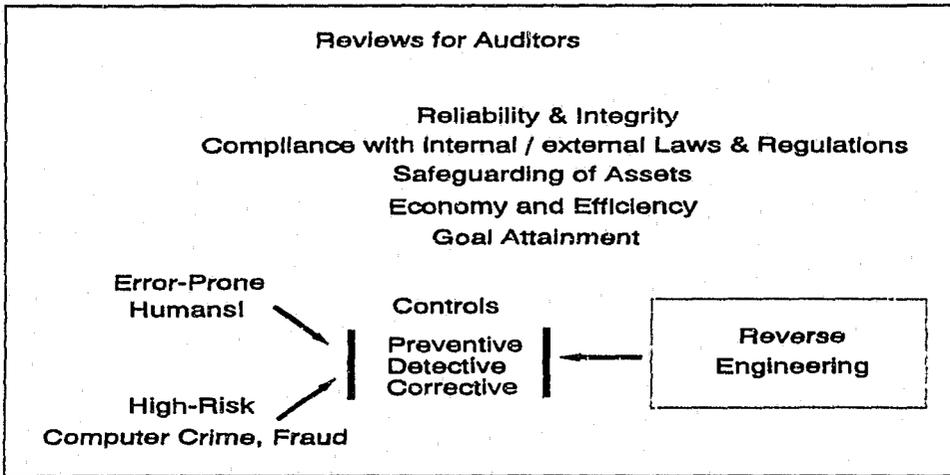
Reverse engineering enables the quality assurance group to compare the application design with the actual released code. For this purpose metrics are used to help rate computer program code quality. Reverse engineering is an adequate tool to verify compliance with stated quality assurance practices.



4.5. Electronic Data Processing Auditing

Internal audit conducting independent reviews and reporting on its findings is an essential management tool. It supplements other means of top management control. Electronic data processing auditing should particularly review general controls in data processing systems to determine whether these controls are designed according to management rules and legal requirements, as well as to determine whether the controls effectively provide reliable data. Electronic data processing auditing should also review application controls of installed data processing applications. Auditing relies on the controls to assess processing data reliability in a quick, accurate, and complete manner. Additionally, auditing reviews the design and development of and adjustments to new data processing systems or applications.

Electronic data processing auditing observes computer processing and performs a data flow analysis by means of reverse engineering. Reverse engineering issues a warning when programs have not been adequately tested or documented. Reverse engineering is an adequate auditing tool in this phase. Instead of having to work through piles of program listings, the auditors can trace potential problems at the conceptual level, by using diagrams. Especially structure diagrams and cross references may be of great help to the auditor to pinpoint problems.



4.6. Package Selection

Many organizations spend substantial amounts of resources (money, people, time) to purchase, modify, and install packaged software. Applications software is produced by hundreds of vendors who market thousands of products. For organizations in industry, finance etc. applications software is a competitive edge in responding to changing customer needs.

Independent software and hardware vendors develop and market standard, off-the-shelf, canned computer programs as software packages. A systematic approach to vendor software evaluation, selection and acquisition has as its objective to determine whether maintainability and modifiability are built in. Another important area is that of security, audit and control features.

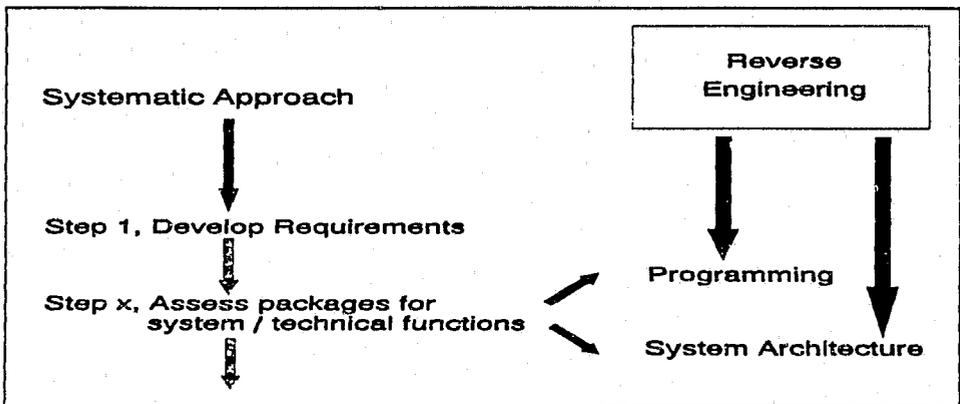
The quality of the system architecture depends on whether structured techniques have been used during analysis, design, programming, and testing of the package. Reverse engineering can be used to examine the structure of software packages. The source code, or a statistical representative sample of it, must be given by the vendor, so that quality features of programming can be evaluated. The following four questions are especially important, that can be answered with the help of

reverse engineering:

- Is all source code written in Cobol or in higher level programming languages?
- Is the source code supported by a data dictionary?
- Are consistent names used throughout the program and the different modules?
- Are there specific user exits in the source code?

4.7. Conclusion

Reverse engineering should not be looked upon as just another tool, but as a methodology that must be carefully applied to an organization. When management has decided to introduce reverse engineering, it should realize that staff's skills and the company's culture will change because of the new technology.



The use of reverse engineering gives organizations greater scope in controlling development, maintenance, and selection of software.