Case Study Series

A REPORT OF THE NATIONAL TASK FORCE ON COURT AUTOMATION AND INTEGRATION

Metro/Davidson County, Tennessee

Criminal Justice Information System

Project Overview and Keys to Success

By Teri B. Sullivan, SEARCH
Michaela Mathews, Office of the District Attorney General, Nashville

Metro/Davidson County[1] has implemented a successful integrated criminal justice information system that can serve as a model for jurisdictions nationwide, both in how the system was organized and implemented, and in how it works technically.

In September 1999, the Office of Justice Programs (OJP) sent representatives to Nashville to review Metro/Davidson County's Criminal Justice Information System (CJIS). OJP is the Federal agency under the Department of Justice that provides grant funding and technical assistance to State and local levels of government to improve the criminal justice system. The following are excerpts from a memo OJP sent to Davidson County following its visit:[2]

In OJP's experience looking at State and local justice information systems nationwide, we find that "integrated" systems are designed from an information visibility perspective and from an information management perspective. Systems built on the information visibility design allow various components of the justice system to "view" data within the system, but do not address the streamlining input, access, and supplementing a record as it moves through the justice process. The information management perspective, however, allows the system to streamline how data is entered and maintained, eliminating redundant data entry and allowing for real-time access to data by all participating agencies.

The Justice Information System currently under construction and testing in Davidson County, Tennessee, is a leading example of an integrated county justice information management system. In our experience, there are only a handful of integrated justice systems, all of which are at the county level, that address the data management issues as comprehensively as the Davidson County JIS.

The successes thus far appear to be linked to the following:

- *County-level executive sponsorship*
- *County governance body representing all necessary components and interested parties to the justice system*
- *A dedicated funding stream for all phases of the project*
- *Commitment from high-level component leaders, i.e. the judiciary, county board members, the District Attorney*
- *A project manager with the vision, experience, and commitment necessary to understand justice integration concepts, contract negotiation, system design, implementation management, and local politics*
- *Trust by the justice components of the project manager and each other*
- *An industry partner dedicated to working with the user community and the project director to implement solutions meeting jurisdictional needs, rather than redesigning business practices to fit previously developed technologies*

The National Task Force on Court Automation and Integration was established in 1997 by the Bureau of Justice Assistance, U.S. Department of Justice, and SEARCH to develop practical resources and to provide technical assistance to state courts in the development of automated and integrated court and justice information systems. The "Davidson County Criminal Justice Information System" is the latest in a series of Case Studies developed under the guidance of the Task Force to document examples of operational intregrated justice information systems. Additional Case Studies and further information on integrated justice information systems are available at **www.search.org**.

This case study is intended to provide background on the Justice Information System (JIS) agency, which was created in 1992 to develop the Criminal Justice Information System (CJIS) for the Davidson County justice community.[3] In addition to providing background on JIS, its purpose and governance structure, this case study also: provides an overview of CJIS; documents the phases of the system; discusses the technical applications; describes cost and funding sources; recommends successful strategies for other agencies undertaking integration projects; and explains the lessons learned by the agencies involved in this ongoing effort.[4]

Background

In the late 1980s, key elected officials from Davidson County attended a SEARCH conference on integrated justice. Based upon the information-sharing principles that were presented, they decided to formally work together to automate and integrate the justice agencies within the county. In order to accomplish this goal, a unique, cooperative organization, JIS, was created by Metropolitan Ordinance Number 092-415.[5]

One of the purposes of JIS was to develop, implement and maintain a comprehensive, automated justice system that would be solely managed and controlled by the members of the justice community. The independent nature of JIS was required due to the extremely important and sensitive nature of justice-related activities. Matters of public safety, confidentiality of certain records and the efficient administration of justice were paramount considerations in establishing this unique organization. JIS is composed of the 14 agencies that comprise the justice community in Davidson County. Figure 1 shows the participating agencies within JIS. Operationally, these agencies cover the major components of a typical local-level justice system, including criminal, civil, chancery and juvenile courts; prosecution and public defense; law enforcement (police and sheriff); and probation.

In addition to developing and implementing the CJIS, the JIS agency is also responsible for:

- Network hardware, including servers and the network operating system, fiber-optic backbone and all hubs, switches and routers.
- 24/7 support of network infrastructure and critical network and software applications.
- Email, including remote access.
- Backup of all user applications and data stored on JIS servers.
- Technical support, including both front-line support to users and backup support to agencies' in-house technical support staff.
- Database and application support for CJIS and Chancery Case Management systems.
- Help Desk services and access to problem-tracking software.
- Training services, materials and facilities.
- VPN (Virtual Private Network) assistance for secure remote access to network resources.

Strategic Value Recognized

The creation of JIS represented recognition by all branches of government in Nashville that a multiagency body was necessary to improve the local justice system through greater coordination and cooperation of elected officials. The member agencies of JIS recognized that it was only through common action and purpose that the goal of establishing integrated justice information systems would be achieved.

Figure 1:
JIS Participating Agencies

Chancery Court

Circuit Court

Criminal Court

General Sessions Court

Probate Court

District Attorney

Public Defender

Juvenile Court

Juvenile Court Clerk

Circuit Court Clerk

Criminal Court Clerk

Metro Police Department

Sheriff's Office

Clerk and Master

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SEARCH is located at 7311 Greenhaven Drive, Suite 145, Sacramento, California 95831, (916) 392-2550.

"The Justice Information System has brought recordkeeping and procedures forward from the 18th century to the 21st century. We have put away our quill pens and grabbed our mouse," said the Honorable John P. Brown, General Sessions Court, Division V. "A major part of our success was made possible by vesting control of JIS in a governing body of users. We have been able to present a unified front to our Mayor and our legislative body."

Purpose of JIS

Under the ordinance, JIS was charged with the following mission:

"*To improve the administration of justice through the creation and operation of comprehensive integrated management information systems and to promulgate and implement minimum uniform standards for all participating agencies. The goals to be accomplished are: create a modern simplified system or systems for managing justice information; provide quick and easy access to information; expedite case processing; enhance productivity and efficiency by the use of technology; reduce costs and increase revenue; and plan for future needs.*"

JIS Organizational Structure/ Governance

Justice agency leaders and decisionmakers in Davidson County recognized that developing a strong governance structure for JIS was a necessary foundation step for this information technology (IT) project. A strong structure provides leadership and accountability, defines the business needs and goals of the participant agencies, analyzes technical environments, policies and solutions, and provides effective policy management.

"While the JIS process and the CJIS system are huge tech advances for the Metro Justice community, I think that another important benefit we have realized has been in the broader area of collaborative decisionmaking," said Ross Alderman, Public Defender and Chair, JIS Policy Committee. "As you know, the process of developing JIS and designing the CJIS required literally years of meetings between representatives of the several member agencies. Since some of the agencies have competing interests concerning how information is gathered, stored and shared, the development and design efforts required that each agency buy into the concept that there is a larger systemwide benefit that could only be realized if each agency was open to discussions about changing the business processes within the justice community. Because we were successful in the development of JIS and CJIS, the Metro justice system agencies have been reinforced in the skills that allow us to meaningfully collaborate on much broader issues such as jail population management."

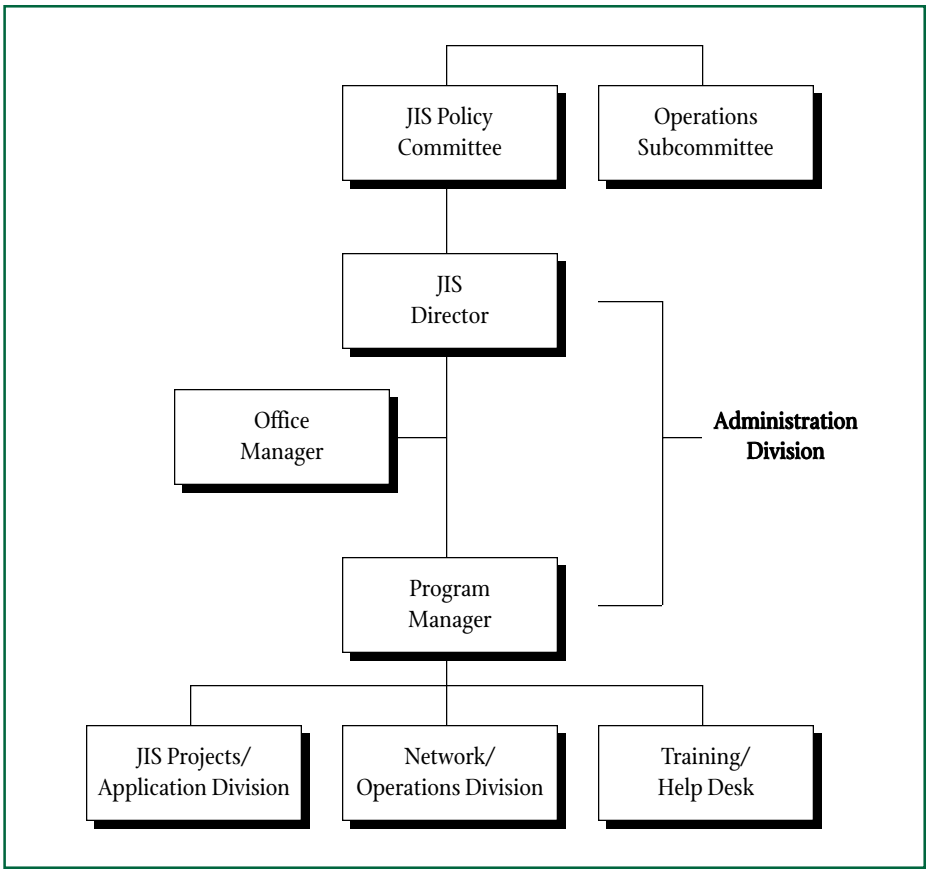

Figure 2: JIS Organizational Chart

Figure 2 provides an organizational chart of the JIS governance structure. The major elements of this structure are as follows:

The **Policy Committee**, comprised of elected and appointed officials, is the primary decision- and policymaking entity of JIS. The Committee coordinates, approves and implements the design, development and ongoing management of JIS. The Committee consists of one judge each from the Criminal, Circuit, Chancery and General Sessions courts. For multi-judge courts, the judges who serve as representatives on the Policy Committee are selected by a majority vote of the judges of each court. Additional members include the Police Chief, Sheriff, District Attorney General, Public Defender, Juvenile Clerk, Criminal Court Clerk, Circuit Court Clerk, and Chancery Clerk and Master.

The **Operations Subcommittee**, a subgroup of the Policy Committee, provides day-to-day assistance and guidance to the JIS Director regarding

financial management and operations. The subcommittee also has the responsibility to review and recommend policies and procedures having multiple organizational impacts; to provide a focus for the current and future justice systems studies; and to provide a knowledge base for understanding the interrelated Metro justice processes, and how changes in any part of those processes will have an impact on the total system.

The JIS **Administration Division** (three staff members) is comprised of the JIS Director, Program Manager and Office Manager. The JIS Director is the highest-ranking staff person at the agency and is responsible for the day-to-day operations of JIS. The JIS Director reports directly to the Chair of the JIS Policy Committee.

The next three elements of this structure report to the Program Manager and, ultimately, to the JIS Director:

- The JIS **Projects/Application Division** (nine staff members) is responsible for the database and functional support of a multitude of justice applications, some of which operate on a 24/7 basis.
- The JIS **Network/Operations Division** (three staff members) is responsible for all network hardware and operating systems for participating justice agencies.
- The JIS **Training/Help Desk** (three staff members) provides various types of support within the JIS community. Software and hardware installation, support and trouble-shooting are provided directly to a number of JIS member agencies.

CJIS Overview

One of the major projects of JIS is the Criminal Justice Information System (CJIS). JIS and Metro/Davidson County partnered with Unisys Corporation and have successfully integrated the diverse needs of the Metro/Davidson County criminal justice agencies into a modern, fully automated, enterprise-level system.[6]

In many areas of operation, users have gone from an entirely manual mode of doing business to a fully computerized business process. Automation has improved the processing, reporting, information access and information management needs of the justice agencies in Davidson County. (See Figure 3 for a partial list of justice tasks CJIS has automated, and the "Phases" section on page 6 for a more detailed description of the system capabilities.)

"The implementation of the CJIS system has produced many benefits throughout the justice system and specifically within the District Attorney's Office," said General Victor S. (Torry) Johnson III, District Attorney General and Vice-Chair, JIS Policy Committee.

"We are now able to track our files and produce all grand jury reports electronically. This has allowed us to reallocate resources and to participate in quality control within the court system. More importantly, the accuracy of the criminal history records maintained in Davidson County has improved. All cases are tied to fingerprint identification and all dispositions are being sent to the State criminal history repository. Also, management information that was previously nonexistent in the manual system is now available."

CJIS has allowed for much greater efficiency in many areas, but more importantly, it ultimately improved *public safety* by reducing the amount of paperwork law enforcement personnel had to manually complete, thereby getting officers back on the street faster, providing precise tracking of prisoner release date calculations, and precisely determining releasability of prisoners in a jail-overcrowding situation.

CJIS Goals/Objectives

One of the major goals of the CJIS program was to streamline criminal workflows and processes through the use of state-of-the-art technology. This automation improved the efficiency and overall information flow within and between the JIS criminal justice agencies. The major objectives/benefits were:

1. **Reduction of repetitive tasks**. Data are collected and input once at the source. For example, once an arrest record is created on the police system, this information automatically flows into and creates records in the case management system.
2. **Enhancement of data quality**. Edit checks, in many cases, are automatically performed on all incoming data to ensure data are input correctly. For example, all dates and charge codes are validated. Additionally, the system is coded to check and report on any incomplete dockets. Some cases require documents to be filed within a fixed number of days, and the system reports on those cases that are approaching or have missed the deadline.
3. **Increased information accessibility**. An automated system allows many people to view the same information at the same time. Also, an automated system allows the users to access and view the data in many different ways. For example, one user may look up a case using party name and date, while another user may use a case number.
4. **Increased organizational integration**. The information on the system is shared between the agencies of the JIS community. Therefore, the data is no longer "mine," or "theirs," but "ours."
5. **Enhanced statistics and monitoring**. This system provides standard statistical reporting, as well as ad hoc reporting capabilities. The users within the different agencies extract and format data in a way that is meaningful and useful to them.
6. **Increased effectiveness**. Information stored in an automated system can perform new functions not practical in a manual environment. For example, the system supports a

master docketing and calendar system and an integrated accounting system.

As these goals were met, better information was available faster to the people who needed it to make decisions, fund programs desired by the public, report on the state of the community, interact with the criminal and juvenile justice system, and improve public safety.

"The CJIS integrated system has allowed the Office of the Criminal Court Clerk to move to the forefront of automated public offices," said Walt Draper, Chief Administrative Officer, Criminal Court Clerk's Office. "The automation of affidavits, warrants, subpoenas, capiases and dockets has vastly improved our ability to serve the justice community and the public both more professionally and more efficiently."

Public Benefits

Additionally, there are many public benefits with the implementation of an integrated CJIS. Some of these benefits are outlined below:

Reduce the time from arrest to trial. Much of the time that passes between arrests and completion of trial is protracted while court and justice officials gather information on criminal histories, research and validate court data, and review and gather defendant information. Having this information available on a single system reduced the amount of time to perform multiple record checks in multiple agencies, so cases could be scheduled faster and disposed of more efficiently.

Reduce continuances because of conflicts. Often a citizen would appear for a court event only to find the event had been rescheduled because of a conflict with another case that the attorney, public defender, police officer or witness would have. A single scheduling system that checks for conflicts and does not allow double booking reduces the number of times a person has to

Phase I		
Agency	**Key Functions**	**Implementation Status**
Criminal Court Clerk/ State Trial Court	Judicial Commissioners	April 1999
	Warrant and Bond	September 1999
	General Sessions Division	October 1999
	Case Management	October 1999
	Accounting/Collections	January 2000
	State Traffic	January 2000
	Criminal Division	January 2000
District Attorney	Grand Jury Processing	January 2000
Police Department	Arrest and Incident Entry	March 1999
	Police Interface to CJIS	March 1999 – January 2000
	Officer Scheduling	January 2000
	Police Criminal History	January 2000
Phase II		
Probation	Adult Probation	January 2000
	DUI School/Safety Center	February 2000
Public Defender	Case Management (unique view)	March 2001
	Attorney Time Tracking	March 2001
Pretrial Services	Case Management	First Quarter 2003
Juvenile Court Clerk/ Juvenile Court	Intake	February 2003
	Case Management (Delinquent/Dependent Case Processing)	February 2003
	Accounting/Collections	February 2003
	Records/Minutes	February 2003
	Juvenile Probation	May 2003
District Attorney	Case Management (unique view)	July 2001
	Victim/Witness Module	Spring 2003
Phase III		
Sheriff's Office	Inmate Intake/Classification	August 2000
	Transportation	August 2000
	Civil Warrants Service Processing	August 2000
	Inmate Release	August 2000
	Interfaces with CJIS/Police Mainframe/Circuit Clerk	August 2000
Additional Features and Upgrades		
Feature		**Implementation Status**
Web access to dockets		April 2002
Web access to CJIS case search (case number or name)		April 2002
Upgrade version of DB engine and application code (Oracle 9i and PowerBuilder 8)		December 2002
Integrated imaging component (Adult/Juvenile)		Second quarter 2003
Upgrade to storage area network (SAN) for disaster recovery and high availability (with seamless failover)		December 2002
Convert to browser-based system		2003-2004

Figure 3: CJIS Overall Enterprise System Solution Implementation Phases

appear at the court, and makes it possible for the public to schedule its court- and justice-related actions more efficiently.

Record criminal history information faster and more accurately. Since information is transferred automatically from the courts to the police system following the disposition of an individual's case, the records accessed are more up-to-date. The more accurate information allows the justice system officials to make more informed decisions when a complaint is brought forward.

Produce audit trails for tracking money due to the court, witnesses or victims. The county now finds it easier to track moneys due. Often, a single individual owes several types of fines, fees and support to the county. It is difficult, if not impossible, in a manual system to track what is owed on a defendant-by-defendant or fund-by-fund basis. Coordinated financial records and tracking assist in accurately reporting what funds are due and for what reason.

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— Walt Draper
Chief Administrative Officer
Office of the Criminal Court Clerk

CJIS Phases

Due to the extensive scope of change associated with the automation of many of the participating agencies' business processes, funding cycles, and to mitigate project risk, it was decided that a phased development and rollout of the systems would result in the most successful outcome.

Phase I

Phase I of the CJIS application was designed to meet the business processing requirements of the Davidson County Metro/State Criminal Courts and criminal justice agencies. These requirements included records management functions, calendaring, grand jury case processing, financial processing and police interface functions. The records management functions included affidavit, charging instrument, bond and case management. The calendaring requirements consisted of the ability to set up calendar docket sessions in which cases could be scheduled. The ability to set caps for the number of defendants and cases was included, as well as conflict checking for judges, police officers and attorneys.

The system meets the case reporting requirements of the State Administrative Office of the Courts and the arrest/disposition reporting requirements of the Tennessee Bureau of Investigation (TBI). The CJIS application also handles financial processing for Criminal Court, General Sessions and Juvenile cases. Financial processing includes the assessment of fines and costs through case events, collection of fines and costs, automatic posting of received funds to the General Ledger, and disbursement of collected funds to the appropriate entities.

Phase II

Phase II of CJIS allows users throughout the Metro criminal justice system to have access to the most up-to-date information. Data from CJIS are used to initiate cases in the Public Defender, District Attorney, Pretrial Services and Probation systems, eliminating the need for duplicate data entry. The DUI School uses data from the Adult Probation system to initiate DUI School cases, when possible. Court dates, dispositions and other court events, maintained in the Criminal Court Clerk's office, are viewable by all users. The Juvenile Court and Clerk will also have a new system that will process civil cases, such as neglect/dependant, child support and delinquent cases. Juvenile Probation will use data from the Juvenile Court system to initiate its cases. The Public Defender and District Attorney systems interface with both the Juvenile and Adult systems. Additionally, bar-coding technology has been integrated into the CJIS Phase I, II and III modules with imaging capabilities to follow.

Phase III

Phase III of CJIS is comprised of functions necessary to provide a fully integrated Jail Management System (JMS) and interfaces to facilitate interagency data access and exchange between JMS and other components of CJIS. The CJIS JMS replaced the existing mainframe-based inmate tracking system with a comprehensive jail management system. The JMS supports a relational database of name, demographic, arrest and behavioral information relating to individuals who are currently in jail, as well as information on previous incarcerations. The JMS

includes a Warrants module that tracks the service status of papers served by the Sheriff's Office. Additionally, several interfaces are coded to exchange information with internal Metro and external State agencies.

"With the development and implementation of our new CJIS program, I am able to keep tabs on my court dates, cases, defendants and dockets all in one program. I can tell what caseloads look like and what adjustments need to be made in order to keep moving forward and not waste anyone's time," said the Honorable Michael Mondelli, General Sessions Court, Division VI. "In the near future I will also have the ability to check my traffic docket for caseload information and be able to avoid congested courtrooms, which lead to frustrated scenarios and rushed results. CJIS is a good tool with potential."

Development Methodology

In order to produce high-quality software, the development organization must have a well-defined, documented process that guides software development. Unisys followed the development process described in this section, which was tailored for the CJIS program.

The Unisys system development approach was a disciplined methodology that used a combination of established methodologies to best capture the information required to engineer the system. A controlled development effort and continuous customer participation were key aspects of this approach. Implementation of this approach resulted in reduced risk, improved product quality and maintainability, and a cost-effective solution. By involving the customer as an integral part of the process, it ensured the system was designed to meet the needs of the users.

The methods and techniques Unisys introduced into the system development approach included:

- **Data and process modeling.** Both data and process modeling were performed to capture the data and processing requirements based on information obtained from existing documentation, and from interviews/casual analysis. The Metro staff had full visibility of the models, and Unisys worked with the Metro staff and users to verify and validate all models produced.
- **Evolving development (prototyping).** Prototyping was introduced early in the requirements phase and evolved to become operational at the deployment phase. Graphical User Interface (GUI) builders greatly enhanced the development of prototypes by allowing rapid generation of user interfaces and on-line modification based on customer interaction. The PowerBuilder development environment was used for this purpose.
- **Incremental development.** The initial system was a small, central core of functionality, and the desired system was enhanced by integrating additional functions and modules. As the new functions were added, the existing functions were constantly refined and tested. This method provided for continual testing by the user and early detection of problems, thereby minimizing the impact on subsequent software modules.
- **Phased planning.** As each phase of the development process concluded, plans for the next phase were made and any risks were assessed and resolved.
- **Customer involvement.** The system was developed for the users with participation of the users throughout the development process. From the definition of requirements — using business process reengineering techniques and interviews — to system testing, ***the customer was involved at all levels***, thereby providing the validation and verification of the evolving system.

"With the development and implementation of our new CJIS program, I am able to keep tabs on my court dates, cases, defendants and dockets all in one program. I can tell what caseloads look like and what adjustments need to be made in order to keep moving forward and not waste anyone's time. In the near future I will also have the ability to check my traffic docket for caseload information and be able to avoid congested courtrooms, which lead to frustrated scenarios and rushed results. CJIS is a good tool with potential."

— Honorable Michael Mondelli
General Sessions Court, Division VI

Technical Overview

The CJIS application is a three-tier Client/Server application with a GUI front-end and distributed databases employing a Relational Database Management System. (Figure 4 shows the CJIS Architecture for Phases I, II and III.) The GUI is the client portion of the system. The databases consist of structures to store data (SQL Schema), business rules and transactions (Stored Procedures), and system utilities to support the business functions (Replication, Periodic Process Scheduler, Backup Scheduler, etc.).

Under the original environment, the GUI was intended for a Windows 95 or 98 or higher client and was developed using the PowerBuilder 5.0.4 32-bit object-oriented development environment. The databases were implemented using Oracle 7.3.x with the stored procedures developed using PL/SQL.[7] The GUI gathers input from the user and passes it to the database by invoking System Business Transactions (SBT) implemented through PL/SQL stored procedures on the Oracle servers. The GUI retrieves data for presentation to the user employing Standard Query Language (SQL).

The CENTralized Repository Interface with Object Databases (CENTRIOD) application/database middleware switch system was developed in response to the need to transfer data between two or more Oracle databases or between an Oracle database and some other type of system, such as the Police mainframe. The CENTRIOD is comparable to a post office that acts as a central location for the movement of information between systems. For example, when the arrest process is started for the defendant, a file containing all defendant demographic information is created by the Police mainframe and placed in a folder on the CENTRIOD server. The CENTRIOD application picks up the file from the folder, retrieves all of the data from the file, and then inserts the data into specific tables in the CJIS database to be processed. This example is typical of how all data are processed through the CENTRIOD. It acts like a post office by picking up the data (from a file or directly from an Oracle database), determining where it needs to go, and placing it in the correct location for further processing. This system allows the transfer of data to and from all systems in the CJIS enterprise transparently, smoothly and with enough flexibility to allow for additional exchanges as needs arise.

Business Process Reengineering

One of the primary goals of JIS was to streamline criminal justice workflows, which meant the agency had to avoid simply automating the existing manual processes. In order to help accomplish this goal, operational project teams (comprised of vendor representatives, JIS staff and justice agency staff members) were formed and educated on basic reengineering principals. In order

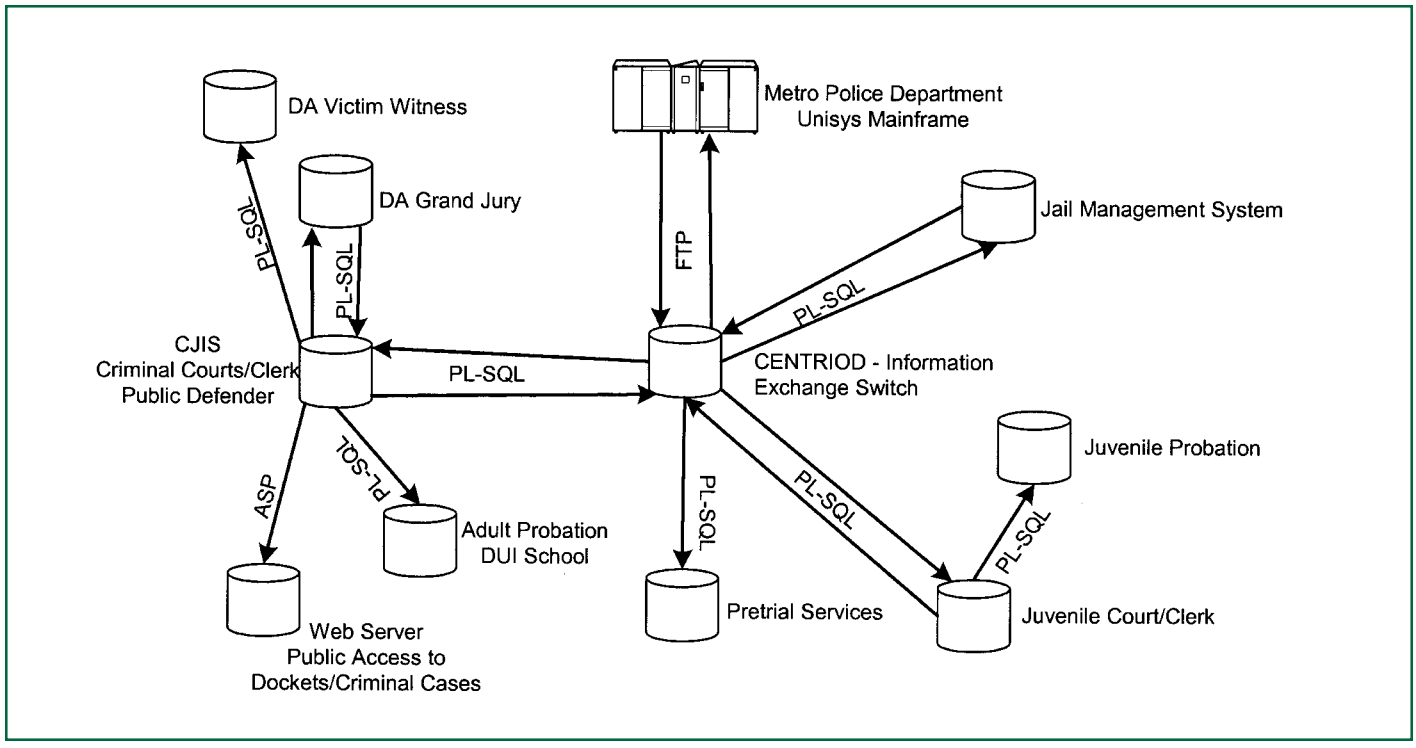

Figure 4: CJIS Architecture, Phases I-III (Distributed Oracle Database)

to electronically document the business processes of Metro/Davidson County's justice agencies, Popkin's System Architect was chosen as the case/process-modeling tool. The teams used the IDEF[8] component of the tool, which was a structured modeling methodology widely used to improve business processes and systems. The IDEF models provided a graphical representation and consistent interpretation of the business processes, and enhanced the communication between the technicians and the justice users.

The first step in the process was to develop the "AS IS" business model. Each agency had to document its existing workflow down to the smallest detail. To develop the enterprise model, interagency process flows were documented and all existing paper forms were collected and analyzed to determine the information exchange points. The next step was to develop the "TO BE" business model, which is how they wanted the system to be designed. The two models were then compared and from that comparison the functional requirements for the system were developed. The teams spent over a year on this part of the project for each of the phases.

This detailed analysis enabled the teams to design the future integrated system, identify how each agency fit into the overall "big picture," determine which parts of the system would be automated and which would remain manual, identify the processes that would be modified and their resulting effect on the organizational resources, and gain a better understanding of how each agency's processes impacted the overall justice system.

JIS/CJIS Funding

Approximately $10 million was expended for the development and implementation of CJIS. This amount included funding for the network infrastructure, hardware and personal computer purchases needed to support the software. It did not include money for salaries or fringe benefits. Local bond funds were attained for the custom development of the CJIS program and can be broken down by phase: Phase I — $2.6 million, Phase II — $2.7 million, and Phase III — $3.2 million. Ongoing support and maintenance is funded from JIS' annual operating budget.

JIS funding falls in either a recurring or non-recurring category and comes from four sources:

- Metropolitan Davidson County annual operating budget;
- 4% County funds (used to purchase hardware/network components);
- Bond funding enacted to procure CJIS; and
- State and Federal grants, which have been obtained on an ad hoc basis.

Keys to Success

The JIS organization has learned a great deal from the CJIS project efforts to date. Based on its experiences, JIS offers the following recommendations for other jurisdictions undertaking integration efforts:

Develop a Comprehensive Plan: Avoid Simply Automating the Existing System

The success of the CJIS project to integrate Metro/Davidson County criminal justice agencies into an automated, enterprise-level system began with a comprehensive plan that considered the range of user needs, identified automation and integration priorities, and analyzed existing and potential technology and data standards.

— Model your processes

Implementing a good process-modeling tool is key to a successful project. JIS dedicated more than a year to this part of the project. Each agency was asked to draw out or diagram its existing workflow in detail. To be effective, do not assign this project to a small team of upper-level administrators; the elements of CJIS that are working the best involved every member of the staff during the planning and reengineering phase of the project. Each agency diagrammed its workflow as it existed at the start of the project. Within several months, each employee's daily activities — including every piece of paper they touched and each document they produced — was analyzed. This detailed analysis enabled them to design the integrated system as they wanted it to be in the future. Teams of employees were able to identify the areas of each agency that should be part of CJIS. They were able to identify the area of the system that should be computerized, and which forms and reports should be built into the system as a PowerBuilder document. That preliminary exercise prepared them to specify the systems requirements.

Taking as much time as necessary on this part of the project will save money in the long run. Many of the costly changes made in the Davidson County CJIS in the past several years were often a result of a lack of a complete analysis of the workflow. If problems arise, the time spent documenting your future system will also provide the proof that you will need to get the system fixed while it is still under warranty. You will be able to prove that it is not performing as designed. There is a huge difference between a bug (fixed at no-cost under warranty) and an enhancement (a potentially high-cost system addition). If possible, you need to avoid this type of frustration and additional costs that can lead to project failure.[9]

— Involve users

A side benefit to this analysis was the teamwork. All employees contributed to the design of the new system. They understood why it was being built and were interested in its success. Some employees were asked to do additional work that traditionally would be handled by other agencies in the criminal justice system. By being

involved in the design, they were ultimately willing to do data entry that would benefit agencies other than their own. For the first time all the players in the system understood how the other agencies were organized, recognizing that each had different needs.

The system analysis also allowed managers to understand how CJIS would impact each organization's resources and to effectively plan for the changes before the system went "live." It enabled all the individuals in the system to begin to redesign jobs. By the time the system was put into operation, employees had clear ideas of their new jobs and how to function within the CJIS environment. By involving each employee in the initial design, good trainers were identified who could assist after CJIS was built.

Testing! Testing! Testing!

Initiating your own testing is integral to the project. Do not rely solely on vendor testing. The first step will be to identify the employees with the most experience, enthusiasm for their jobs and imagination. The chosen team will design test scripts to challenge the system. They will need to imagine as many different and difficult situations as possible. Specific demographics will need to be written for each person type — defendant, victim, witness, attorney, etc. Each form and report will have to be checked after altering any data.

Because all parts of the justice system were to be integrated, end-to-end tests had to be designed. Profiles of fake individuals were created in the Police Department mainframe, and the testing started at the booking process where the team checked whether demographic information would come through the interface between the mainframe and CJIS. Next, the test information was processed through the General Sessions court module; some cases were disposed of in the lower court, and others through the grand jury. If the cases were disposed of in the lower court, the test team verified that the disposition information was transferred to the Police Department mainframe and the Sheriff's Office JMS. During the grand jury testing, charges were changed and added, defendants were added, and grand jury reports were generated. At this point, the testing proceeded to the State Trial Court module for motions, trials and dispositions, and was finally completed when the outputs from the court processing were electronically transferred to the Police Department mainframe and the JMS. These end-to-end tests allowed the users to verify that information was flowing correctly from the initial booking process, into the grand jury and court systems, and back into the Police criminal history records.

This step is a difficult and time-consuming process, but it will pay dividends. The more time and imagination expended in this activity, the better the system will perform. The agencies in the CJIS project that spent the most time in designing test scripts and testing now have the fewest problems.

The difficult part of testing the system is that it never ends. The system must be retested after each new build or upgrade.[10] It is inevitable that something that worked before an upgrade will be damaged after the enhancement or replacement. Locating the ripple-effect errors *before* an upgrade is rolled out to the user community will save time and trouble. A full end-to-end test of CJIS requires several people from each agency working full-time on the project for at least three weeks.

Agencies should maintain records of their tests; doing so will result in cost savings. Accurate records will assist an agency's case if the agency needs to show the vendor that a particular part of the delivered system worked the last time the test scripts were run, and the current problem was created by the vendor's most recent upgrade.

Identify an Incentive

Asking a group of employees to disrupt their workflow and expend a great deal of time and energy to provide input into the development of a system requires an incentive, or "hook." Something is needed that will get people interested and excited about what they will be working on when they are designing your system. This goal, or hook, will be different for each agency. Finding one will result in a motivated group that will put in the time and effort to make the project a success.

For example, the CJIS goal for the Office of the District Attorney General was the creation of a complete criminal history record for each defendant that would then be transmitted to the State criminal history repository and on to the Federal system. This goal has now been spotlighted by the current emphasis on homeland security.

The criminal justice system had been relying on the Police Department mainframe to transmit criminal history data to the FBI. The District Attorney General's Office had been relying on a manual system of record cards. Once CJIS forced a detailed analysis of the data from the mainframe, large gaps were found in the old system. The old system worked very well in the lower courts where there was a one-to-one relationship between an arrest on a single warrant and a later disposition of that warrant. However, it did not work well in the felony court system after indictment by the grand jury.

Working on CJIS has allowed representatives from the District Attorney General's Office, the Police Department and the Criminal Court Clerk's Office to correct those errors. The system requires each defendant to be identified by fingerprint in order to be scheduled for court. It will track the merger of warrants into a single count in an indictment, alternative theories of a crime added in the grand jury, co-defendants who are at different stages in the court system, additional charges that were not part of the initial arrest but were added in the grand jury, and all the charges that are contained in sealed indictments.

These solutions require:

1) A positive ID of *all* defendants.
2) Police Department cooperation in rebuilding the legacy system.
3) Increased data entry by employees of the District Attorney General.
4) Each count of an indictment having all the data elements that tie it to a particular arrest.
5) All agencies agreeing to a multitude of new numbering schemes.
6) The creation of tables that tie every criminal offense by name and code number to a particular law enforcement identifying number.
7) Ongoing implementation meetings that bring all the agencies together on a regular basis to work on problems as they arise.

By achieving the goal of electronically compiling and maintaining complete criminal history records of defendants, the prosecutors now have a more complete picture of a defendant's background and this helps them make more informed decisions on how to prosecute a case. Consequently, the employees at the District Attorney's Office have been willing to accept a system that requires a huge increase in data entry by their office. (CJIS offers hundreds of ways that data can be shared. Figure 5 illustrates a small example of interactive, integrated data sharing in CJIS.)

Lessons Learned

As with any project, there were elements of the CJIS project that should have been handled differently. It is important to identify those issues throughout the project so past mistakes are not repeated. The following is a summary of some of the critical "lessons learned" from the CJIS project:

- Issues are mostly political, not technical.
- Funding must include development, as well as maintenance costs.
- Identify cost/benefit measurement tools in the initial planning process.
- Development and implementation are complicated, time-consuming processes.
- Do not overlook the infrastructure (network) and need for stability in that area.
- Ensure executive-level members have a clear understanding of the amount of time and resources the project will require.
- If possible, implement the system in phases that reflect flow of information through the criminal justice system.
- Have full-time administrative help for the project.
- Assign key personnel from the user community to the project full time.
- Keep records of all design meetings/decisions with vendor.
- Carefully manage the vendor's Project Manager.
- Establish an effective error-tracking system.

In summary, there is no exact formula that guarantees a successful system implementation. But by effectively managing the process of technological change, the risk factors can be greatly reduced.

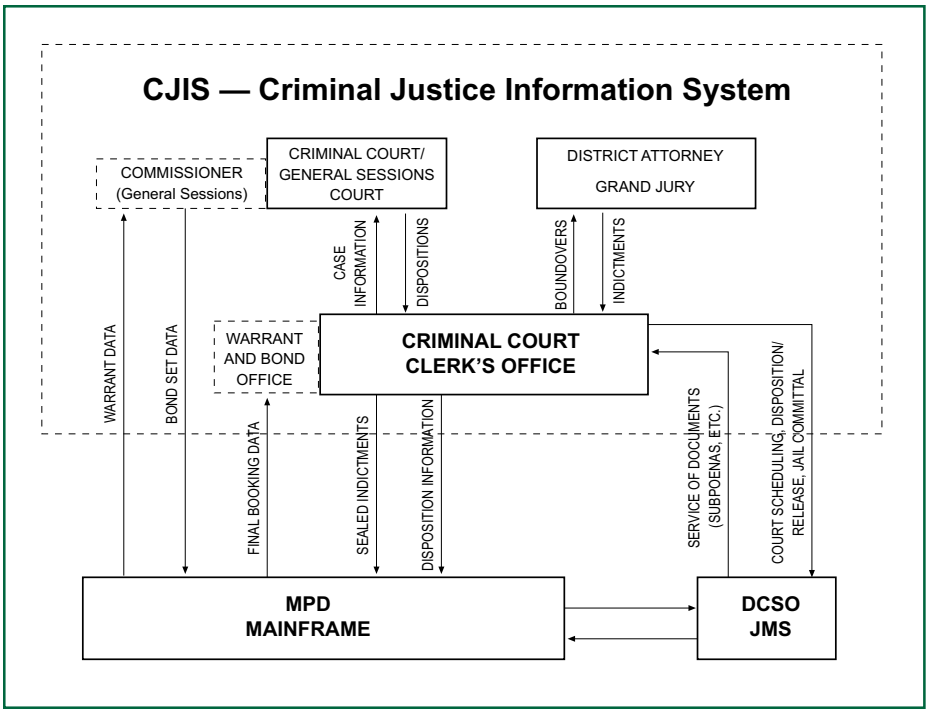

Figure 5: Example of Interactive, Integrated Data Sharing

Conclusion

One of the critical success factors of the Davidson County CJIS project was the continued dedication and commitment from the members of the project teams and the JIS staff, and the unfailing support of the Operations Subcommittee and the Policy Committee.

This spirit of cooperation in working toward the seemingly unattainable goal of building a truly integrated justice system has been a remarkable achievement that benefits the government as well as all citizens of Davidson County.

For additional information on the Davidson County project, contact Ms. Nikki Meyer, JIS Director, at nikkimeyer@jis.nashville.org or (615) 862-6195, ext. 109.

SEARCH, The National Consortium for
Justice Information and Statistics
7311 Greenhaven Drive, Suite 145
Sacramento, CA 95831

Update: 100% Disposition Matching

Beginning in May 1999, Davidson County deployed the initial phase of an integrated CJIS that had been designed and built in cooperation with Unisys Corporation. As of late 2002, it is in final testing with the Tennessee Bureau of Investigation to clear 100 percent of all case dispositions (felonies and misdemeanors) in the Davidson County justice system each night to the State's criminal history repository located at the Bureau. The final implementation of this process will complete a major milestone in the CJIS project, and will provide accurate criminal history dispositions tied to fingerprint identifications to the State criminal history repository and on to the Federal repository.

Endnotes

[1] Davidson County has a metropolitan form of government. The State capital of Nashville is the seat of that government. In 2001, Metro/Davidson County had a population in excess of 540,000, according to the U.S. Bureau of the Census.

[2] Memorandum from Anne Gardner and David Boyer, September 1999.

[3] JIS created and maintains a Web site, **http://www.jis.nashville.org/**, to inform the public and Davidson County justice agency participants of the status of the CJIS project, as well as the support provided by the JIS agency.

[4] Information contained in this case study was compiled through interviews and personal observations, and from the JIS Web site and system documentation. Ms. Sullivan is a Justice Information Systems Specialist with SEARCH. Prior to joining SEARCH in 2001, she served as Director of JIS. Ms. Mathews is an Assistant District Attorney General with the Office of the District Attorney General, Nashville. She was involved in the CJIS project from the RFP release until system implementation and has served as a voting member of the Change Control Board for 4 years.

[5] The full text of Metropolitan Ordinance Number 092-415 is available at: **http://www.jis.nashville.org/ORDINANCE%20NO2.pdf**.

[6] The system was designed and developed by the Justice and Public Safety Division of Unisys Corporation. The application is written in Oracle and PowerBuilder and was installed on Microsoft Windows NT servers running on a Novell Network. More information about Unisys Corporation is available at: **http://www.unisys.com/index.htm**.

[7] After the upgrade in December 2002, the current technical environment consists of Windows 2000 clients that will utilize PowerBuilder 8 and Oracle 9i.

[8] IDEF means "integrated definition," a group of modeling methods that can be used to describe operations in an enterprise.

[9] "Failure" in this context is defined as a project that cost more or took longer to implement than planned, did not meet user expectations for functionality, and/or negatively impacted the organizational culture.

[10] The testing process has evolved over time. Davidson County has created test scripts that are now run through an automated testing tool. This automated tool allows them to speed up the testing as well as have an objective statistic on response time for "before" and "after" results.