Court Case Management System Functional Standards: A Development Road Map

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Brief History of Case Management System Functional Standards

Building upon efforts rooted in the late 1980s, the National Center for State Courts (NCSC) has been working almost continuously with court leaders across the country to develop national court case management system (CMS) standards. Beginning with functional standards for systems designed for a single major case type, this effort has expanded and evolved over time to accommodate a wider array of courts and case types, keep pace with technology industry advances, and both support and capitalize upon national efforts to develop global justice information exchange standards and a national information exchange model. It has encompassed numerous projects over the years and considerable work from teams of dedicated volunteers comprising expert practitioners from courts, justice agencies, and other public and private sector organizations.

Between 1999 and 2004, functional standards were developed for civil, criminal, domestic relations, juvenile, and traffic case management systems. Each set of standards was developed and produced as a separate document dedicated to a single case type. During the latter half of 2004 and continuing through 2005, NCSC worked to consolidate the separate functional standards into a unified format with more consistent organization and wording. Descriptions of functions common to multiple case types were revised to be more generic or universal, while functions unique to a single case type were identified and distinguished from common functions.

Using the consolidated document as a basis, NCSC next developed a court CMS business process model to better reflect the process flow and relationships between activities. In addition to the advantages of using both diagrams and text to describe the functional standards, the model approach provided a much more flexible vehicle through which to make additions and changes. The software tool used for the modeling is capable of generating an updated report document at any time containing both diagrams and the full textual descriptions formerly contained in the consolidated standards document. Version 0.10 of the consolidated model will be submitted to the Joint Technology Committee (JTC) of the Conference of State Court Administrators (COSCA) and the National Association for Court Management (NACM) at its December 2005 meeting to begin the approval process.
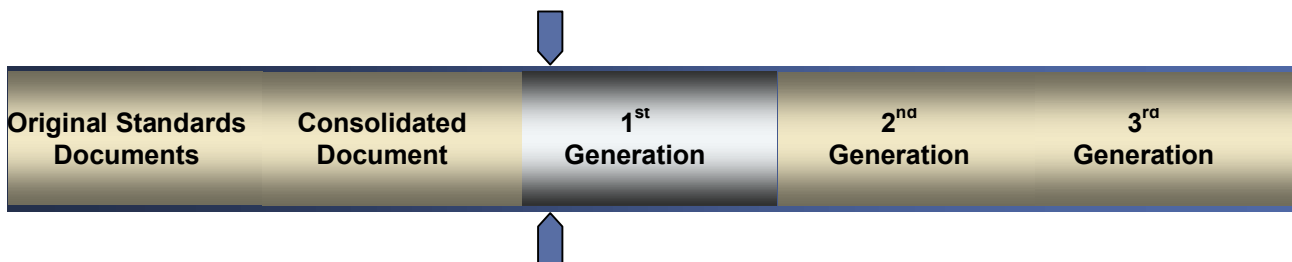
Original Standards Documents	Consolidated Document	1st Generation	2nd Generation	3rd Generation

Figure 1: CMS Standards Development Phases

Figure 1 depicts the CMS standards development process, beginning with the original standards documents, indicating the current standards product (Version 0.10), and projecting future development into the next three to five years. By the end of this progression, NCSC plans to have developed and established a national set of CMS service components that can be used by all courts and CMS vendors to build or overhaul highly effective case management systems. This document describes the past, present, and future development efforts, the global factors at work, and the benefits of moving forward with the planned approach.

Current Environment and Relevant Initiatives

Global Justice Information Exchange Sharing Initiative XML Data Model (GJXDM)

In recent years, the U.S. Department of Justice, through its Office of Justice Programs (OJP) has sponsored a major initiative aimed at improving the exchange of information between and among members of the justice community. The Global Justice Information Sharing Initiative (Global) Extensible Markup Language (XML) Data Model (Global JXDM) began in March 2001 as a project to reconcile critical data definitions among agencies. It soon mushroomed into a broad-based effort to develop a standardized XML framework to facilitate the sharing of information among justice and public safety communities at local, state, and federal levels. Since the initial pre-release version of the Global JXDM (GJXDM) in April 2003, the model has continued to undergo extensive review and validation by the justice and public safety community, with subsequent revision and improvement. Version 3.0.3 was released in September 2005, and justice and public safety agencies are now using the GJXDM in more than 50 information-sharing projects around the country.

NCSC has been closely involved in the vetting process for the GJXDM to ensure that the data model adequately reflects the needs of state and local courts as partners in the exchange of justice-related information. Moreover, NCSC has contributed substantively to the effort to provide education and tools to facilitate the understanding and application of the GJXDM. For example, NCSC's Wayfarer software was developed for internal use but is now widely used to explore and navigate the structure of the GJXDM.

National Information Exchange Model (NIEM)

In February 2005 the Department of Homeland Security (DHS) and the Department of Justice (DOJ) announced a partnership to develop a National Information Exchange Model (NIEM). The model will be based upon the GJXDM, but the NIEM initiative is intended to provide the foundation and building blocks for more extensive national-level interoperable information sharing and data exchange across many domains in addition to the justice domain. DHS and DOJ announced the first release, NIEM 0.1, of this model in October 2005. This preliminary release is based directly on GJXDM 3.0.3. A target date of June 2006 has been set for release of NIEM 1.0, which will be the first official production version. As NIEM evolves further, it is anticipated

to subsume the GJXDM, with the components of GJXDM that apply exclusively and specifically to justice information exchanges becoming the justice domain-specific components of NIEM. Meanwhile, GJXDM development will continue moving forward, with an alpha (pre-release) of GJXDM 3.1 expected in early 2006.

Information Exchange Package Documentations (IEPDs)

A key aspect of both ensuring the viability of the GJXDM and providing an effective mechanism for its adoption and utilization by justice organizations is the development of Information Exchange Package Documentations (IEPDs) for specific information exchanges via XML. Formerly called Reference Exchange Documents, IEPDs provide baseline models to enable local and state courts and law enforcement agencies to more easily develop targeted information exchanges that conform to the GJXDM, NIEM, or any future models. For example, NCSC has conducted projects with volunteer work groups from the courts and related organizations to help develop a series of IEPDs for exchange of information for warrants, protection orders, traffic citations, sentencing orders, and court statistical reporting. These draft IEPDs are undergoing a vetting process and will be submitted to a formal approval process for adoption as a standard during 2006. NCSC also anticipates beginning development of additional IEPDs of importance to the courts as they are identified by the COSCA/NACM Joint Technology Committee. Similar efforts are being conducted by other organizations for exchanges among law enforcement, prosecution, and corrections agencies.

Court Component Library (CCL)

The development of IEPDs is a difficult and time-consuming process. Working groups and analysts must go through most of the same steps regardless of an IEPD's purpose or targeted information exchange. In the majority of exchanges, furthermore, many of the same data elements (e.g., names, addresses, organization identifiers) are involved. The cumbersome process relies on a combination of manual methods and varying software tools. It can be problematic to make revisions consistently throughout the different artifacts encompassed within a single IEPD. Further, it requires much effort to ensure that parallel choices of data components are made when different groups develop different IEPDs. Such inconsistencies lead to confusion and dilute the very concept of standardization that is the underlying goal.

To help overcome these problems, NCSC has created a repeatable process for developing court-related IEPDs. The Court Component Library (CCL) was established to facilitate the use of consistent, reusable components for subsequent development of local data models. It will encourage the development of a court-specific vocabulary and structure for models used for data exchanges. As such, it will maintain an effective bridge between the needs of the courts and the evolution of the GJXDM, NIEM, or other emerging framework. This "one degree of separation" can enable the non-technical court domain expert to focus on proper identification of IEPD components using familiar, consistent, court-relevant terminology without becoming mired in the complexity of the extensive global data model. It will help create a common language and understanding between domain experts and technical experts. As the GJXDM or NIEM

continues to evolve, the CCL will be revised over time as needed to maintain the proper bridging to the model, avoiding any delays in IEPD development or non-substantive revision of existing IEPDs.

From Here to There: the Road Ahead

While much has been accomplished already, much work lies ahead. As the momentum generated by parallel related effort grows, so does the sense of urgency for moving forward. With organizations already beginning to incorporate draft standards and preliminary tools in developing new systems and information exchanges, the potential benefits of these efforts are emerging more clearly. The combined result will be not only more effective use of resources by courts and other justice organizations, but also more effective administration of justice and coordination of information among courts and law-enforcement organizations. Increasingly important in today's unsettled world, this work should significantly enhance national security as well.

Status and Limitations of Current Functional Standards

The Consolidated Case Management System Functional Standards (CCMSFS) have two important purposes. First, and most obviously, they serve as a national resource to help guide courts and software vendors in their efforts to develop, overhaul, or assess case management systems by depicting the general, core functional requirements common to court case management systems. But the functional standards also serve as a stepping stone toward identifying the data requirements of the courts. The court community discovered years ago that, before it is practical to define the data used within a case management system, one must first identify the functions that the system is expected to perform. Although defining standards for the full spectrum of internal data requirements remains a future goal, a key subset of CMS data requirements is the specific data required for exchanges.

Exchanges can be both internal and external. Internal exchanges are those points at which one process or function within a CMS must pass data to another process or function. For example, when a court staff interacts with the CMS to schedule a case for trial, the scheduling function or module must pass certain information (e.g., case number and trial date) to the docketing module to enable that module to generate an entry in the register of actions. Internal exchanges may also be between a module and an off-the-shelf software application package that may be employed to provide some of the functionality needed by the module. External exchanges, on the other hand, are those points at which the CMS needs to provide information to, or obtain information from, an external system or organization, such as a pre-trial services unit or a law enforcement agency. Another type of external exchange is the extraction and aggregation of data for statistical reporting from a court to the state and national levels. While the functional standards do not specify the data required for either internal or external exchanges, they do begin to identify the touchpoints and, at least, the general nature of the data to be exchanged.

The external exchanges are, of course, the main focus of all the effort going into the GJXDM, NIEM, and development of IEPDs. The IEPD process identifies data needed for exchanges by working backwards, in a sense, from traditional manual information exchange mechanisms such as forms and documents. The functional standards, approaching the exchanges from the other direction, can provide the essential bridge between CMS design and the IEPDs that contain the specifications for GJXDM-compliant exchanges. The standards need considerable further work, however, before this and other goals for them can be fully realized.

The unapproved draft Version 0.10 of the Consolidated Case Management System Functional Standards (CCMSFS) now exists as a business function process model and report document. While highly useful compared with any previous form or version of the standards, it is incomplete and inadequate in many aspects. The joint standards development (JSD) team of NCSC staff, consultants, and practitioners from the courts and justice entities identified numerous gaps, limitations, and needed improvements during the development and review process, including the following:

- Information exchanges are not completely identified or defined; touchpoints should be specified for both internal (e.g., among functional modules and between a module and its supporting off-the-shelf software components) and external (e.g., with other justice agencies' systems)
- Potential additional functions need to be identified
- Functional requirements for appellate courts (currently under development) and other trial court case types must be incorporated into the consolidated standards
- A functional standards implementation guide should be developed and should include examples for specific case types
- The functional standards should include links to *The State Court Guide to Statistical Reporting*, *CourtTools*, data exchange models, E-filing standards, and other evolving standards and tools
- The standards should be expanded to include outside (other) actors
- The coverage of management and statistical reports requirements should be expanded
- Requirements for code translation tables should be updated and expanded
- Data needed to support all functions should be identified and documented.

These deficiencies must be addressed in future work. Of particular importance to the ongoing national data model and IEPD initiatives, the CCMSFS must have external data exchanges fully described, management and statistical reports data specified (including linking to the *State Court Guide to Statistical Reporting*, CourTools, and other available or emerging resources), and the underlying CMS data requirements defined to support all exchanges, including data for code translation tables and related operational rules tables. The ultimate goal is to move toward a court information model that will be compatible with the GJXDM and NIEM—however they may evolve—and can be easily maintained over time. At the same time, the functional standards should be transitioned from their traditional, stovepipe design origins to reflect a service-oriented architecture.

Phased Approach to Standards Development

This movement can be accomplished in orderly phases, with version controls that both define major releases and permit interim improvements and rapid adaptation to developments in global systems and data exchange initiatives. Table 1 depicts the phases of standards development from the initial production of separate functional standards documents for each case type, through the completion of the current 1st generation CCMSFS Version 0.10 model, and on to the projected 3rd generation service-oriented model. A brief description of the products from each phase follows. As with all work to date, future phases will be conducted with the extensive involvement of a JSD team comprising both experienced court and justice practitioners and technology experts.

Table 1: Phases of CMS Functional Standards Development

Version	Original Functional Standards	Interim Consolidated Document (not released)	1st Generation	2nd Generation	3rd Generation
Time Period	1998 - 2004	2004 - 2005	2005 - 2006	2006 - 2007[1]	2008 - 2009[1]
Type	Individual documents: one per major case type	Single document consolidated across original 5 major case types	Process model and report	Enhanced process model, rudimentary data model, and report	Component-based model
Characteristics	• Stovepipe • Document-centric • Textual • Detailed to case type	• Document-centric • Textual • Universal descriptions • Examples for specific case types • Unique requirements identified	• Diagrams and text • Universal descriptions • Concept of reusability introduced • Some data introduced • IEPDs introduced • Versioning process	• Reusability expanded • Internal/External exchanges defined • Gaps filled • External actors added • Expanded data identification • Supplemental material by case type • IEPDs expanded	• Extensive reusability • Vendor neutral: mix and match • Faster, flexible system design • More affordable • Service-oriented architecture (SOA) • Web services
Supplemental Tools			Tailorable requirements spreadsheet	Rudimentary specification wizard	More advanced specification wizard

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[1] Timeline is dependant on available funding

Original Functional Standards

The first version of case management system functional standards was developed as five separate documents produced under five independent projects, conducted during the years 1999 to 2004, through the work of five different project teams. Each project focused on CMS requirements for a single major case type (civil, criminal, domestic relations, juvenile, and traffic) in a typical state trial court environment. Each strictly textual document contained terminology specific to the case type (e.g., "defendant" or "juvenile" rather than "party"). To amplify functional descriptions, each document included examples germane to the specific case type. Although each document followed the same general pattern of organization, numerous differences existed between them with respect to how the detailed functions were grouped, how a particular requirement might be phrased, and how relationships between functions were described.

Interim Consolidated Functional Standards

Following the completion of the fifth project, which produced functional standards for a traffic court CMS, NCSC sought to address the problem of inconsistencies between the standards documents and, perhaps more importantly, move toward a set of standards that identified the common, core functions universal to a CMS irrespective of case type orientation. The reality of effective system design approaches requirements from conceptual to concrete, or high-level to detailed. That is, a developer first tries to identify the general nature of a needed function, and then focuses on the detailed variations that may need to be developed to handle specific processes and data. The docketing function for any case type, for example, must provide a method to capture and record court events, even though the specific events and associated case data may vary somewhat from case type to case type.

NCSC project staff laboriously examined and compared the five standards documents, identifying and compiling common functions regardless of where they were located or how they were worded among the different documents. Working from this analysis, they then prepared a consolidated standards document characterized by more universal descriptions and terminology for common functions, coupled with identification and differentiation of requirements unique to an individual case type. For common functions, examples for multiple case types are included in the description where needed to more clearly explain the function.

1st Generation Consolidated CMS Functional Standards

Version 0.10 of the CCMSFS is the latest product of the functional standards initiative as of fourth quarter 2005. It consists of a business function or process model compatible with the Unified Modeling Language (UML) that represents the consolidated requirements for case management systems. Consistent with UML, the model includes both diagrams and text to depict business functions, the activities within each, and the relationships between them. For example, *use case diagrams* show the intended interactions between the users or *actors* (e.g., calendar

clerk, judge, attorney) and the functions performed by the system. *Activity diagrams* in turn show the series of processing steps that achieve the desired behavior of the function. More importantly, the model is graphically interactive, enabling substantive changes to be made easily at the conceptual level. The software tool NCSC uses to create and maintain the model can generate a report document containing both diagrams and text to completely describe the CMS requirements.

The power inherent in the modeling approach permitted the project team to introduce the concept of *reusability* in the 1st generation model. For example, once a "Case Closure" function has been defined, it may be *utilized* in more than one location in the model (e.g., within Case Disposition and again within Post-Disposition Compliance and Execution) without being redefined. The 1st generation model also begins to depict some of the key interchanges, or touchpoints, at which data must be exchanged internally or externally. The tool provides the means to establish a link between a function within the model and any IEPDs that have been developed for the data exchanges related to the function. Finally, and obviously, the 1st generation model introduces the version control process to ensure that future updates can be identified and distributed without confusion. To the extent that available funding and products of related efforts permit, some of the gaps identified above will be addressed in the near future, likely resulting in one or more interim releases beyond Version 0.10.

2nd Generation Consolidated CMS Functional Standards

The next major iteration of the functional standards will be an improved model that builds on the inherent advantages of this approach to produce a more complete and useful resource. The model will be expanded to include a more complete set of functions and improved descriptions of some existing functions. Supplemental material relevant to specific case types will be added. Information exchange touchpoints will be more completely identified and characterized, both for internal and external exchanges. To help define external exchanges as well as to depict more clearly the relationships between CMS functions and external entities, the model will include external actors in applicable use case diagrams. In addition, existing and newly developed IEPDs will be linked more directly to the model. These improvements, coupled with the more complete specification of statistical and management reporting requirements, will enable significantly expanded identification of data as well as functional requirements. Also, because parallel exchanges and repetitive processes will be detected through refining the model, the 2nd generation CCMSFS will demonstrate expanded reusability when it is released.

3rd Generation Consolidated CMS Functional Standards

With most of the existing gaps addressed and a mature business model released and refined, work on the 3rd generation model is anticipated to be a migration to a Service-Oriented-Architecture (SOA). Reflecting the current trend in delivering application system services to businesses and other organizations, this model will be based on defining a set of web services to provide the common functions required by courts.

The Web services approach enables CMS vendors to develop discrete components to provide specific functions and deliver them on an as-needed basis via the Internet. More importantly, it enables a court to obtain the CMS functions it needs without investing in either a major technology infrastructure or a major application development effort. In effect, therefore, a CMS can be designed, configured, and implemented much more quickly, inexpensively, and flexibly than is possible with conventional approaches. In addition, the scalability of web services can more readily accommodate both larger and smaller courts.

Furthermore, SOAs provides inherent vendor neutrality, permitting the court to select various components from different vendors on a mix-and-match basis. Because components from all vendors must conform to the standard functional specifications and standard data exchange protocols, compatibility is assured. Since courts purchase services rather than software and hardware systems, they can change vendors for a particular component relatively easily and inexpensively as service contracts or subscriptions expire. Finally, with vendors free to develop and offer as narrow or wide a range of service components as they wish, the web services environment should foster widespread participation and competitive pricing.

As work on the standards progresses to the 3rd generation model, NCSC, under the direction of the Joint Technology Committee, will develop and host a National Court CMS Services Registry to facilitate both development and use of service components. With funding from the Bureau of Justice Assistance, NCSC is already working on a pilot registry for hosting IEPDs. This current work will help lay the foundation for the much more extensive National Services Registry.

Specification Wizard

By design, the CCMSFS represents a very general, universal view of the common set of requirements for a CMS. To employ this resource properly, each state or court wishing to develop specifications for a CMS must refine the standards to meet the specific requirements for their system. This process is neither simple nor quick. In addition to the relatively easy task of eliminating any functions that the court, for some reason, does not wish to have its CMS perform, courts must revise and reword many of the numerous functional descriptions contained in the standards to reflect their specific needs. Moreover, courts are expected to provide the business rules, local conventions, and other details referenced in many of the descriptions. Because the standards cover only common, core requirements, courts also must develop and document additional requirements that are unique to their operation. Finally, the consolidated standards must be tailored to the specific case type to be processed by the CMS.

Throughout the process of developing, reviewing, and publicizing the functional standards, court managers have expressed a strong desire for a tool or procedure to help them apply the national standards more easily and effectively. They need a resource to assist them in moving from the general, universal level of the standards to the creation of RFP or internal development specifications for their court's CMS. Such a resource might function as an automated guide or software wizard, using the CCMSFS as its source and interacting with the user step by step to generate a customized version of the requirements based on user input.

The 1st generation CCMSFS took the first, rudimentary step toward this goal by including a customizable requirements spreadsheet as a supplemental tool. The spreadsheet permits a court user to edit the standard requirements, add new requirements, create a column for mandatory or desirable requirements or a checklist for vendor capabilities. Work on the 2nd generation CCMSFS model will include development of an improved tool for this purpose. Although the characteristics will be determined after this work begins, the tool is anticipated to provide more automation of the customization process. The 3rd generation model is expected to include a more advanced specification wizard to assist courts with tailoring web services requirements.

Next Steps

As funding permits, NCSC is moving ahead along the described path. Considerable work will be required along numerous fronts. Some of the steps envisioned at this point include:

- Complete the approval process for Version 0.10, culminating in its public release
- Identify and analyze gaps in consolidated functional standards, including:
  - Business processes not yet defined or inadequately defined
  - Information exchanges (internal and external) not yet defined or inadequately defined
  - Links between management and statistical report standards and *State Court Guide to Statistical Reporting* and other available resources
- Address gaps and produce updated version(s) of functional standards:
  - Establish version control conventions and mechanism
  - Incorporate requirements of additional court and case types, such as appellate courts and drug courts and other special courts
  - Identify and define any additional business processes needed
  - Identify and define additional internal and external information exchange touchpoints
  - Add links to the *State Court Guide to Statistical Reporting*, CourTools, data exchange models, E-filing standards, and other evolving standards and tools
  - Expand management and statistical reports requirements
  - Update and expand code translation tables and rule-based description
  - Develop accompanying implementation guide including examples for specific case types
  - Identify and include outside (other) actors where appropriate
- Identify data needed to support business processes, information exchanges, and management and statistical reporting; coordinate with completed or ongoing IEPD efforts (e.g., court-law enforcement exchanges, statistical reporting EIPD)
- Develop strategy for drawing upon business process use cases combined with supporting data to develop standardized service components that could be provided independently by software developers with assured interoperability and compliance with GJXDM/NIEM
- Develop descriptions for GJXDM/NIEM-compliant, standardized service components to provide functionality required by consolidated standards.
- Conduct pilot projects to develop and test service components
- Monitor continued GJXDM/NIEM development to ensure court standards remain compliant.

A few of the immediate next steps are already in progress or being planned as part of existing funded projects. For example, Version 0.10 is being submitted to JTC to begin the approval process. A rudimentary version control process is already in effect and will be refined. In addition the appellate court requirements currently under development (through funding contributed by several states) will be incorporated into the consolidated model and will appear in future interim releases of the 1st generation model. However, accomplishing the bulk of the work necessary to move ahead on the desired path will require additional projects and funding sources. It is essential to begin addressing the gaps in the current standards as soon as possible and move toward developing the improved process and data model envisioned for the 2nd generation CCMFS model.

While the majority of funding and project resources will be targeted for particular sets of tasks required to achieve these objectives, funding must also be made available to support coordination of efforts both directly and indirectly related to advancing the standards. Leveraging the work accomplished through other ongoing and new future projects involving court and justice processes and data (e.g., court statistics, performance standards, court security, child support enforcement, neglect and dependency) can result in significant cost savings when relevant findings and developments can be channeled into the work on CMS standards and information exchanges. Conversely, such coordination can help ensure that those other efforts are conducted with awareness of the standards and national exchange models, thereby reducing the possibility that products or recommendations resulting from those projects would be inconsistent or incompatible with current standards and national models.

Conclusion

There is tremendous momentum currently gathering among the justice and public safety community as the result of the data exchange conceptual centerpiece generated through development of a national exchange model. Rather than laboring on traditional silo projects in each sector of this community, law enforcement and corrections agencies, public safety organizations, and courts increasingly are embracing projects oriented toward common goals and methods for exchanging data. Thanks to cross-agency national organizations and working groups, coordination and voluntary cooperation across such efforts has reached unprecedented levels. This atmosphere of cooperation and widespread progress toward data exchange standards is an ideal one in which to springboard off the work accomplished to date on court CMS standards and move forward with development of a national court information model that supports the national data exchange model.

Technological advances and industry trends call for moving to a service-oriented architecture for future system development. Once NCSC, working under the direction of JTC and with the invaluable input from voluntary working groups of justice community practitioners, has successfully addressed the gaps identified in the current CMS standards and produced the improved standards model, the transition to an SOA model can begin. Meanwhile, courts and CMS vendors, under increasing pressure to develop capable and cost-effective systems that also support standardized data exchanges (including management and statistical reporting to state and

national levels), will benefit tremendously from the availability of 1st and 2nd generation CMS standards.

The road ahead is neither short nor smooth. It will require substantial and continual effort. There is no doubt that some clumsy or misguided steps will occur before all the pieces come together to yield the desired results. Furthermore, it is likely to be a dynamic process that evolves to keep pace with other initiatives, national events, and technology advances. Finally, it will be characterized by iterative efforts that develop, refine, and expand rather than by genesis of complete, final products. It is, however, a journey that must be taken to ensure that the nation's state and local courts will be prepared and equipped to participate effectively in the emerging national framework for information exchanges.

Conditions are ideal for travel, and the road beckons. Let the journey begin.