THE NATIONAL DATA EXCHANGE (N-DEX) IMPLEMENTER’S TRAIL GUIDE
## Document Change Tracking

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# CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>II</td>
</tr>
<tr>
<td>CONTENTS</td>
<td>III</td>
</tr>
<tr>
<td>PREFACE</td>
<td>1</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>IJIS Institute Overview</td>
<td>1</td>
</tr>
<tr>
<td>N-DEx Overview</td>
<td>2</td>
</tr>
<tr>
<td>FOUNDATION</td>
<td>3</td>
</tr>
<tr>
<td>National Information Exchange Model (NIEM)</td>
<td>3</td>
</tr>
<tr>
<td>Logical Entity eXchange Specification (LEXS)</td>
<td>3</td>
</tr>
<tr>
<td>N-DEx Information Exchange Packet Documentation (IEPD)</td>
<td>4</td>
</tr>
<tr>
<td>N-DEx IEPD as a National Standard</td>
<td>4</td>
</tr>
<tr>
<td>N-DEx Incident/Arrest IEPD v2.1.1</td>
<td>4</td>
</tr>
<tr>
<td>N-DEx Incarceration/Booking/Probation/Parole IEPD v2.1.0</td>
<td>4</td>
</tr>
<tr>
<td>Federal Bureau of Investigation (FBI) Criminal Justice Information Services Division (CJIS)</td>
<td>4</td>
</tr>
<tr>
<td>N-DEx Program Management Office (PMO)</td>
<td>5</td>
</tr>
<tr>
<td>N-DEx Liaison Specialists</td>
<td>5</td>
</tr>
<tr>
<td>Criminal Justice Information Services Division (CJIS) Systems Officer (CSO)</td>
<td>5</td>
</tr>
<tr>
<td>Data Submission</td>
<td>6</td>
</tr>
<tr>
<td>Data Aggregators</td>
<td>6</td>
</tr>
<tr>
<td>Data Quality</td>
<td>6</td>
</tr>
<tr>
<td>Data Networks</td>
<td>7</td>
</tr>
<tr>
<td>N-DEx–NIBRS Single Submission</td>
<td>8</td>
</tr>
<tr>
<td>Tools, Facilities, and Guides</td>
<td>9</td>
</tr>
<tr>
<td>N-DEx Data Connectivity and Submission Guide</td>
<td>9</td>
</tr>
<tr>
<td>N-DEx Data Integration (Mapping) Guide</td>
<td>9</td>
</tr>
<tr>
<td>N-DEx Policy and Operating Manual</td>
<td>9</td>
</tr>
<tr>
<td>Conformance Testing Assistant (ConTesA)</td>
<td>9</td>
</tr>
<tr>
<td>CASE STUDY</td>
<td>10</td>
</tr>
<tr>
<td>South Dakota Implementation</td>
<td>10</td>
</tr>
<tr>
<td>CONCLUSION</td>
<td>10</td>
</tr>
<tr>
<td>APPENDICES</td>
<td>11</td>
</tr>
<tr>
<td>Appendix A – Acronyms and Abbreviations</td>
<td>11</td>
</tr>
<tr>
<td>Appendix B – About the IJIS Institute</td>
<td>12</td>
</tr>
<tr>
<td>Appendix C – South Dakota Case Study</td>
<td>13</td>
</tr>
</tbody>
</table>

IJIS Institute, CJS Program Advisory Committee
**PREFACE**

*The National Data Exchange (N-DEx) Implementer’s Trail Guide* (known hereinafter as ‘Trail Guide’) is written for companies providing software and related services to law enforcement and other criminal justice agencies. The purpose of the *Trail Guide* is to give the reader sufficient background to get started. It is also a reference source for expanding the reader’s knowledge of N-DEx. Agencies using these systems and services will also find this *Trail Guide* useful, especially for planning and procurement purposes. The underlying goal of the *Trail Guide* is to make participation in and use of N-DEx easier, quicker, and more economically viable.

This *Trail Guide* should be considered a work in progress. It was prepared by and will be maintained by CJIS Program Advisory Committee (CPAC) volunteers, and will be hosted by the IJIS Institute. We invite you, the reader, to treat this *Trail Guide* as “Open Source” and encourage you to submit your experiences to CPAC so they may be added to future releases.

Topics included in the *Trail Guide* are covered at an introductory level—in each instance, references are provided to assist the reader in finding more comprehensive coverage of the topic. These topics are followed by a case study that demonstrates how the leadership in one state decided to get started, found resources, and then aggressively embarked on developing a statewide repository that now feeds data to the N-DEx system for others to query.

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**INTRODUCTION**

*IJIS Institute Overview*

From its early days as the Industry Working Group (IWG), the IJIS Institute has had an advisory committee to stay abreast of the national information reporting systems administered by the Federal Bureau of Investigation (FBI). Initially, it was the National Incident-Based Reporting System (NIBRS) Advisory Committee. As N-DEx was conceived, it became the N-DEx/NIBRS Advisory Committee. Later, at the request of the FBI, it became the CPAC.

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1 See *Appendix A* for a fully defined list of acronyms and abbreviations.

2 To contact the NISS Help Desk: Live technical support is available Monday through Friday from 9:00 a.m. to 8:00 p.m. (ET) by Telephone at 1.877.333.5111 or 703.726.1919 or by Email at NISShelp@ijis.org; and, online support is available 24/7 at http://it.ojp.gov/NISS/helpdesk.
It is the goal of this committee to keep industry abreast of the status and plans for the national information reporting systems and to provide feedback and other input to the FBI on these programs. With N-DEx, this committee has played a very active role, including being the sponsor for the adoption of the N-DEx Information Exchange Package Documentation (IEPD) as a national standard.

The IJIS Institute, through the CPAC, should be considered as a resource for companies developing and implementing plans to incorporate N-DEx into their products and programs.  

**N-DEx Overview**

The FBI’s N-DEx environment is both comprehensive and complex. It was conceived in response to a Presidential Directive that created the Law Enforcement Information Sharing Program (LEISP). N-DEx is built upon the standards that have evolved under LEISP to foster far-reaching information sharing:

- N-DEx includes inputs from law enforcement and other criminal justice agencies at all levels of government—local, state, tribal, and Federal.
- N-DEx is designed to accept data at every stage of the collection process, including data that is “raw” or unverified.
- N-DEx data is continually updated. As newer or more accurate information is received, it replaces earlier versions.
- N-DEx is for investigative purposes; it supplements systems, like the FBI’s National Crime Information Center (NCIC), which are more tactical in nature.
- N-DEx data must be verified through contact with the agency of record before action is taken on that data.
- N-DEx is designed to enable agencies to control the access of the data they have contributed.

N-DEx provides immediate access to records that span the full criminal justice lifecycle, including incident/case report information, pretrial, probation and parole reports, booking and incarceration reports, traffic citations, mug shots, and images of individuals’ scars/marks/tattoos.

Records are contributed to N-DEx by law enforcement and other criminal justice agencies at all levels of government. Even though these data are stored in a national repository, ownership of data shared through N-DEx remains with the agency that provided the record. N-DEx supplies controls to allow law enforcement agencies to decide what data to share, who can access the data, and under what circumstances the data can be accessed.

Data are either directly contributed from an agency or contributed via an aggregator at the state or regional level. Like the other programs administered by the FBI Criminal Justice Information Services Division (CJIS) Division, the CJIS Systems Officer (CSO) plays an important role in determining how this information is submitted and accessed in that state.

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3 See Appendix B for more information on the IJIS Institute.
4 See the CJIS CSO section of this report for more details on the role of the CSO.
Through N-Dex’s services and capabilities, N-Dex allows participating agencies to detect relationships between people, places, things, and crime characteristics; to link information across jurisdictions; and, to “connect the dots” between apparently unrelated data without causing information overload.

N-Dex was first operational on March 19, 2008; and, the full operating capability was deployed the end of 2010. Although law enforcement was the primary focus during early efforts, the ultimate goal of the program was to incorporate the full criminal justice community; and, in 2012, the program was expanded to enable other criminal justice users (e.g. corrections, courts, and other justice stakeholders) to access the system.

N-Dex uses nationally-developed standards, including the National Information Exchange Model (NIEM), Logical Entity eXchange Specifications (LEXS), and the N-Dex IEPD. Introductions to these and other specifications are included in later sections of this Trail Guide.

For more information about N-Dex, visit:
- http://www.fbi.gov/about-us/cjis/n-dex

FOUNDATION

National Information Exchange Model (NIEM)
The advent and adoption of eXtensible Markup Language (XML) greatly enhanced information sharing—and, the justice community was an early adopter. The Department of Justice (DOJ) Global Justice Information Sharing Initiative (Global) launched an effort to standardize the use of XML. This evolved into the Justice XML Data Model, which was quickly replaced by the Global Justice XML Data Model (GJXDM).

As other agencies—most notably, the U.S. Department of Homeland Security (DHS)—analyzed GJXDM, it became readily apparent that this was just the starting point for a much broader data model that could be used across a wide range of agencies and applications. This evolved into the NIEM; and, N-Dex is built on NIEM.

For more information about NIEM, visit:
- https://www.niem.gov/Pages/default.aspx

For more information about the NIEM 2.0 specification, visit:
- http://release.niem.gov/niem/2.0/

Logical Entity eXchange Specification (LEXS)
LEXS is a comprehensive, NIEM-based framework for the development of information exchanges. Initially developed for LEISP, LEXS is now being widely used in the criminal justice community at large, as well as homeland security, intelligence, and other communities. LEXS is being further developed to support the primary objectives of LEISP and minimize the impact of the changing requirements and varied demands on law enforcement information data sources and consumers for information sharing.
LEXS is intended to address two aspects of information sharing:
1. Define and consistently describe units of information to be shared; and,
2. Define interfaces and protocols to provide (publish) and request (subscribe, search) such information.

For more information on the LEXS 3.1.4 specification and the LEXS user guide, visit:  
- http://130.207.211.107/

**N-DEx Information Exchange Packet Documentation (IEPD)**

**N-DEx IEPD as a National Standard**
IEPDs are used to define the details of a more specific information exchange. N-DEx IEPDs, at the data element level, are very detailed. There are two prominent IEPDs used by N-DEx:
1. Incident/Arrest (IA)
2. Incarceration/Booking/Probation/Parole (IBP2)

In 2008, major law enforcement groups—including the International Association of Chiefs of Police (IACP), Law Enforcement Information Technology Standards Council (LEITSC), the National Sheriffs’ Association (NSA), and the IJIS Institute—endorsed the use of the N-DEx IEPD as a national standard to be used for exchange of incident and arrest reports for interagency sharing and contributions to N-DEx.

In December 2008, the FBI Advisory Policy Board (APB) formally adopted the N-DEx IA IEPD as the standard for these purposes. The goal was that, by having and following this national standard, any system should be able to communicate IA data with any other system.

For more information on these and other standards, visit the Justice Standards Clearinghouse:  

**N-DEx Incident/Arrest IEPD v2.1.1**

This version of the N-DEx IA is based on NIEM 2.0 and LEXS 3.1.4.:  

**N-DEx Incarceration/Booking/Probation/Parole IEPD v2.1.0**

This version of the N-DEx IB IEPD is based on NIEM 2.0 and LEXS 3.1.4.:  

**Federal Bureau of Investigation (FBI) Criminal Justice Information Services Division (CJIS) N-DEx Program Management Office (PMO)**

As the name implies, the FBI’s CJIS N-DEx Program Office is responsible for all facets of the N-DEx program.
The N-DEx Program Office has representatives on CPAC. In this capacity, CJIS staff provides presentations at user group conferences, and participates in roundtable sessions at IJIS Institute National Symposiums (formerly, the ‘Industry Briefing’). The N-DEx Program Office also makes their staff available to meet with service providers.

The N-DEx Program Office provides technical support through two channels: (1) FBI CJIS personnel assist agencies with data extracting, mapping, and submission; and, (2) FBI CJIS makes a series of tools available to agencies and industry to assist in mapping and testing of N-DEx submissions.

**N-DEx Liaison Specialists**
The N-DEx Program Office has a team of liaison specialists available to assist agencies with N-DEx matters.

NOTE: As advice to industry, when working with an agency on matters dealing with N-DEx, it is a good idea to contact a liaison specialist, as they are a great resource—and, getting them involved as early as possible is the best policy.

N-DEx Liaison Specialists can be contacted via email at:
- ndex@leo.gov

**Criminal Justice Information Services Division (CJIS) Systems Officer (CSO)**
Consistent with the other CJIS programs, the CSO decides how data are submitted in their state. Some states maintain very close control over how data gets to N-DEx, while others leave it up to local agencies. The key is that the CSO has control over how his/her state, including the local agencies, interacts with N-DEx.

NOTE: It is essential that a service provider know the policy of the state before moving ahead with N-DEx data submission and/or access strategies in that state.

**Data Submission**
There are several models for submitting data to N-DEx. Some local agencies directly submit to N-DEx; others submit their data to the state that, in turn, passes it on to N-DEx; while others submit their data to an aggregator who may or may not go through the state.

Data submissions to N-DEx can be made using either Secure File Transfer Protocol (SFTP) or via a web service. Agencies submit data in the N-DEx standard, either directly to N-DEx or via a regional aggregator. In many cases, state law enforcement aggregators are adopting the N-DEx IEPD not only for submission to N-DEx but also internally to receive submissions from local agencies.

In some cases, the state aggregators have developed their own user interface for searching state data; however, in others, they instruct local agencies to search via N-DEx.
Data Aggregators
The preferred approach for the local agency submission of data to N-DEx is via an aggregator, such as a state system, or through a regional system, such as the Automated Regional Information Exchange System (ARIES) in Northern California, Automated Regional Justice Information System (ARJIS) in San Diego, IBM® i2® COPLINK®, Northrup Grumman Law Enforcement Information Exchange (LInX), and others.

In the case of a service provider with a large base of records management system (RMS) clients in the same general area, the service provider can, in fact, become an aggregator to provide a single feed to the state or N-DEx for multiple agencies.

Data Quality
Regardless of data submission approach, structured and consistent data is not only easily exported into N-DEx but is more useful in general. When evaluating RMS implementation, the following considerations and attributes are important to maintaining data quality both specifically in exports to N-DEx and in general:

- More uniform formats and content can be achieved with the use of user-maintained dropdown tables, type-ahead selection of dropdown table lists, and auto completion of common phrases and values.
- Appropriate use of mandatory fields ensures that valuable data needed for complete records as well as searching are available and are well-formed.
- Use of the naming conventions and structures of NIEM and LEXS standards can enable service providers to make their data more easily shared.
- Electronic exports of data to the N-DEx system enable provision of accurate data with minimal manual effort. Automation and scheduling of these electronic exports ensure timeliness of records in N-DEx and other systems, as well as further reducing the workload of system maintainers.
- Inclusion of the narrative in the N-DEx submissions greatly enhances the value of the N-DEx record by showing modus operandi and many other behavioral details that may be in common with other cases.
- Inclusion of spelling and grammar checking devices for the narrative enhances the readability of this most critical part of the incident reports.
- Relational and association linkages indicated in the data enhance investigative functions by identifying both obvious and non-obvious relationships (e.g. between persons, cases, addresses, weapons, vehicles, etc.).
- Complete definitions (e.g. of types of addresses, telephone numbers, etc.) are helpful in understanding data related to a case.
- Address verification of all address fields is essential.

Additional best practices for agencies, RMS, and data mapping submission practices can be found in the N-DEx guide, Agency Data Quality Best Practices and Lessons Learned. The CPAC Data Quality subcommittee has also prepared a report on data quality. For more information on either document, contact the NISS Help Desk.
Internationalization is not just for software sold overseas. An RMS needs to properly deal with characters (mostly in proper nouns) that are not from the standard American Standard Code for Information Interchange (ASCII) character set.

The N-DEx database today contains millions of records—and, adherence to these practices will help reduce the number of submissions that are incomplete, are missing key data elements, or contain inconsistent code values. This will ensure the overall completeness and quality of the data, especially as service providers assist new agencies in submitting data to N-DEx.

**Data Networks**

Authorized users may access N-DEx via a web-based portal that provides structured and unstructured searches, as well as advanced geo-visualization and link visualization capabilities. Though N-DEx access can be integrated into the agency's own systems via a web service, the most common method of accessing the N-DEx portal is through the Law Enforcement Enterprise Portal (LEEP)\(^6\), which serves as a “gateway” for multiple criminal justice information sharing services. While users can gain access to LEEP by obtaining individual Law Enforcement Online (LEO) accounts, a single sign-on capability is available to agencies via a trusted Identity Provider using Global Federated Identity and Privilege Management (GFIPM) attributes and Security Assertion Markup Language (SAML). This effectively allows an agency to seamlessly integrate LEEP and, by extension N-DEx, into their existing RMS or information sharing environment.

Many of the submission aggregators noted above have become—or, are in the process of becoming—trusted Identity Providers to offer user-access capabilities through their respective applications. In addition, a planned collaboration between N-DEx and Regional Information Sharing Systems (RISS)\(^7\) networks will expand access options for state and local agencies.

It is important to note that an agency submitting data to N-DEx and an agency accessing N-DEx, while potentially involving the same RMS and service provider/aggregator applications, are different processes that require unique connectivity strategies. A graphic depicting the connection overview is presented below. In addition, establishing a submission connection is not predicated on the establishment of an access connection—though, if resources and policy permit, then this can prove to be an efficient strategy for maximizing agency participation in N-DEx.

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\(^6\)LEEP is a 24-hour-a-day, 7-day-a-week, online, information sharing system that is accredited and approved by the FBI for the transmission of sensitive but unclassified (SBU) information throughout the world to the local, state, tribal, Federal, and international law enforcement, criminal justice, and public safety communities. LEEP provides these communities a secure “anytime and anywhere” mechanism to share critically needed information in real-time across any Internet connection.

\(^7\)RISS offers secure information sharing and communications capabilities and supports thousands of local, state, Federal, and tribal criminal justice agencies. RISS is congressionally funded and administered by the DOJ's Bureau of Justice Assistance (BJA). BJA provides funding oversight and program management for the RISS Program. Although RISS is congressionally funded, it is locally managed.
**N-DEx–NIBRS Single Submission**

Much like the N-DEx program, the FBI CJIS Division’s Uniform Crime Reporting (UCR) program also adopted NIEM as standard for data submissions. An analysis of the N-DEx IEPD by the UCR Program Office found incompatibilities with the needs of the NIBRS and, as a result, a NIBRS data submission IEPD is currently being developed.

Because the two programs require the use of different IEPDs that share many commonalities, the software provider and law enforcement communities have encouraged FBI CJIS to produce a single IEPD that can encompass both submissions. The IJIS Institute, spearheaded by CPAC leadership, has been one of the voices in this discussion.

A single IEPD could dramatically simplify the work required by RMS provider companies to meet the needs of both programs and could, therefore, expand the adoption and quality of data submissions for both programs. Fortunately, there are several initiatives underway that are pushing toward implementation of the single-submission IEPD.

The Bureau of Justice Statistics (BJS) has, in partnership with CJIS, commenced the development of a National Crime Statistics Exchange (NCS-X). Under NCS-X, BJS will collect crime data from a sufficiently large and diverse set of agencies so as to have a statistically accurate model of crime in America.
In support of this program, there is a strategy to expand the NIBRS program by harvesting N-DEx data to produce NIBRS data. There is promise for this program, as there is the possibility of grant funding to encourage greater NIBRS participation. CPAC is advocating the use of a single-submission IEPD, which would expand and promote N-DEx, as well as NIBRS.

FBI CJIS has partnered on a pilot project with Harrison County, Mississippi, to implement the single-submission IEPD. Harrison County would submit data to N-DEx, including populating a NIBRS-ready ‘flag’. When that flag is set, N-DEx would forward the NIBRS elements of that record on to the UCR Program. The UCR Subcommittee of the IJIS Institute CPAC has been invited to observe this pilot, and meets monthly with staff from the UCR and N-DEx Programs to track progress and to offer industry’s perspective.

RMS companies should take NIBRS elements into consideration when mapping RMS data to N-DEx. They must also ensure that the functionality of the RMS supports an indicator showing that records are ready for NIBRS processing once they have been validated.

**Tools, Facilities, and Guides**

**N-DEx Data Connectivity and Submission Guide**

The purpose of this document is to provide agencies with an informational overview on submitting data to the N-DEx system.


**N-DEx Data Integration (Mapping) Guide**

The purpose of this guide is to document the process for preparing test data submission to N-DEx.


**N-DEx Policy and Operating Manual**

The purpose of this manual is to integrate Presidential Directives, Federal laws, FBI directives, and the CJIS APB decisions to provide criminal justice agencies with policy and procedural requirements for participating in N-DEx and to protect and safeguard criminal justice information.


**Conformance Testing Assistant (ConTesA)**

The purpose of this program is to validate XML instances against the business rules of known specifications as a submitter prepares their data for insertion into N-DEx.

- [https://contesa.ittl.gtri.org/contesa/](https://contesa.ittl.gtri.org/contesa/)
CASE STUDY

South Dakota Implementation
The state of South Dakota N-DEx implementation was selected as a case study for the Trail Guide because it was a fairly recent implementation and the state is relatively small. The Trail Guide team collected information and interviewed practitioners and service providers who had participated in the effort.

- See Appendix C for the complete case study.

CONCLUSION

During the process of compiling resources for the Trail Guide, information was collected from service providers who had gone through the process of extracting and creating N-DEx data submissions.

The biggest impediment in implementation was a lack of understanding with the interrelationships between LEXS and the N-DEx IEPD, as well as not knowing what data to put where. Problems were also encountered when trying to load both historical and current data due to inconsistencies of data over different time frames. Companies became frustrated and delays were encountered as people simply tried to figure things out as they went along.

Another issue was with delays encountered in the N-DEx verification process. The response time between submitting data and getting feedback was unpredictable and created difficulty in scheduling project personnel. CPAC and the N-DEx Program Office are collaborating on steps that can be taken to minimize project delays and disruptions.

Due to the significant learning curve associated with the large number of components involved, it is recommended that, as service providers embark on their support program for N-DEx, they consult with or involve others who have already gone down this path.
## APPENDICES

### Appendix A – Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Acronym or Abbreviation</th>
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</tr>
<tr>
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<td>Information Exchange Packet Documentation</td>
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</tr>
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<td>Law Enforcement Information Sharing Program [FBI]</td>
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<tr>
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<td>Law Enforcement Information Technology Standards Council [DOJ]</td>
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</tr>
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<td>Logical Entity Exchange Specification</td>
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<tr>
<td>NCS-X</td>
<td>National Crime Statistics Exchange</td>
</tr>
<tr>
<td>N-DEx</td>
<td>The National Data Exchange [FBI]</td>
</tr>
<tr>
<td>NIBRS</td>
<td>National Incident-Based Reporting System</td>
</tr>
<tr>
<td>NIEM</td>
<td>National Information Exchange Model</td>
</tr>
<tr>
<td>NISS</td>
<td>National Information Sharing Standards (Help Desk)</td>
</tr>
<tr>
<td>NSA</td>
<td>National Sheriffs' Association</td>
</tr>
<tr>
<td>PMO</td>
<td>Program Management Office</td>
</tr>
<tr>
<td>RISS</td>
<td>Regional Information Sharing Systems</td>
</tr>
<tr>
<td>RMS</td>
<td>records management system</td>
</tr>
<tr>
<td>SAML</td>
<td>Security Assertion Markup Language</td>
</tr>
<tr>
<td>SBU</td>
<td>sensitive but unclassified</td>
</tr>
</tbody>
</table>
### Appendix B – About the IJIS Institute

The IJIS Institute unites the private and public sectors to improve mission-critical information sharing and safeguarding for those who protect and serve our communities. The IJIS Institute provides training, technical assistance, national scope issue management, and program management services to help government fully realize the power of information sharing.

Founded in 2001 as a 501(c)(3) nonprofit corporation with national headquarters on The George Washington University Virginia Science and Technology Campus in Ashburn, Virginia, the IJIS Institute has grown to nearly 320 member companies and individual associates from government, non-profit, and educational institutions from across the United States.

- For more information:
  - Follow us on Twitter [@ijisinstitute](https://twitter.com/ijisinstitute);
  - Read the [IJIS Factor Blog](https://www.ijis.org/blog);
  - Join us on LinkedIn at [Justice and Public Safety Information Sharing](https://www.linkedin.com/group/11901084).

The IJIS Institute thanks the CPAC for their work on this document. The IJIS Institute also thanks the many companies who have joined as members that contribute to the work of the Institute and share in the commitment to improving justice, public safety, and homeland security information sharing.
Appendix C – South Dakota Case Study

CASE STUDY

NATIONAL DATA EXCHANGE (N-DEx)

South Dakota

7/31/2013
CASE STUDY | National Exchange (N-DEx) | South Dakota

TABLE OF CONTENTS

TABLE OF CONTENTS ........................................................................................................... ii

List of Figures .................................................................................................................. 1
List of Tables .................................................................................................................... 2

EXECUTIVE SUMMARY .................................................................................................... iii

DESCRIPTION OF THE STATE CRIMINAL JUSTICE ENVIRONMENT ........................................ 1

Law Enforcement Agencies ............................................................................................. 1
The Courts .......................................................................................................................... 2
Jail Detention .................................................................................................................... 3
Prosecution ....................................................................................................................... 3
Probation .......................................................................................................................... 3

GETTING STARTED ............................................................................................................ 3

Taking Advantage of Available Resources ................................................................. 3
Governance ...................................................................................................................... 4
Establishing Inter-Agency Agreements ......................................................................... 5
Forming a Development Team ..................................................................................... 5
Inviting All to Participate ............................................................................................... 6
Phase I Goals .................................................................................................................. 7

ESTABLISHING THE TECHNICAL ENVIRONMENT ............................................................. 7

Designing the Functions and Features .......................................................................... 7
Taking Advantage of “Single Sign-on” Security ......................................................... 9
The Technical Hurdle: The Learning Curve ................................................................. 11
Getting Prepared ........................................................................................................... 11

THE PHASE 2 PROJECT .................................................................................................. 13

FLATTENING THE LEARNING CURVE FOR N-DEX SUBMISSIONS .................................. 14

A Detailed, Step-by-Step Workbook for the Entire Process ....................................... 15
Much Quicker Turnaround on Technical Issues from N-DEx ......................................... 15

APPENDICES .................................................................................................................... 16

APPENDIX A: FBI-NDex Homepage .............................................................................. 17
APPENDIX B: ConnectSD Query Page .......................................................................... 18
APPENDIX C: Persons Interviewed .............................................................................. 19
APPENDIX D: Acronyms and Abbreviations ................................................................. 20

List of Figures

FIGURE 1. MAP OF SOUTH DAKOTA ............................................................................. 1
FIGURE 2. AGENCY STATUS AS OF 8/13/13 ................................................................. 6
FIGURE 3. CONNECTSD CONFIGURATION .................................................................. 9
FIGURE 4. RISSNET CONFIGURATION ...................................................................... 10
FIGURE 5. RISSNET AUTHENTICATION LOGON ........................................................ 10

List of Tables

TABLE 1. SOUTH DAKOTA LAW ENFORCEMENT AGENCIES ........................................ 2
TABLE 2. PUBLIC INTEREST GROUP RESOURCES ..................................................... 4
TABLE 3. TECHNICAL RESOURCES ........................................................................... 11
EXECUTIVE SUMMARY

While pursuing the goal of providing a trail guide to assist industry providers and agency engineers in preparing and submitting their information to the Federal Bureau of Investigation’s (FBI) N-Dex system, it was thought that a case study of a recent successful project would be very useful. An inquiry was made to the N-Dex Program Office and others for recent endeavors so the experience and processes would reflect currency rather than experiences that were out of date.

The South Dakota experience was singled out as one that was statewide in nature and one in which the executives involved brought in a lot of outside help from organizations such as the IJIS Institute, the Institute of Intergovernmental Research (IIR), the National Governors Association (NGA), the Regional Information Sharing System (RISS), and the N-Dex Program Office to get a faster start.

South Dakota is very much a rural state with fewer agencies than many other areas of the nation; however, it is that simplicity that helps the reader see what decisions were made, how the executives organized themselves, and how they progressed from the planning stages to the successful conclusion of Phase I operation.

South Dakota is now in the middle of Phase II and is basically infilling agencies that were not able to connect and query the state database in the initial phase. Data submissions are picking up as more system providers are mapping and connecting their client data to the state repository. The additional data and agency connections continue to make their system more effective.

Relatively speaking, the agencies were able to make significant progress in a short period of time. Their approach was to create a statewide system that also feeds data to N-Dex. This way, users are able to quickly query state and local data, while agencies would be able to upload information to the N-Dex system for others to query on a national basis.

This study describes the environment and the steps followed to create the statewide system (known hereinafter as ‘ConnectSD’) and to connect this system with N-Dex. At the conclusion of this case study are some recommendations for assisting future agencies with developing N-Dex submission guidelines.
DESCRIPTION OF THE STATE CRIMINAL JUSTICE ENVIRONMENT

Law Enforcement Agencies
ConnectSD was developed to help both the large and small county sheriffs and law enforcement agencies throughout the state share information and to track records in a comprehensive way.

South Dakota covers 77,121 square miles with a population of 825,000. South Dakota law enforcement services are provided by the State Division of Criminal Investigation (DCI), the State Highway Patrol, 65 county sheriffs, and 75 city police departments.

FIGURE 1. MAP OF SOUTH DAKOTA

The following table displays additional information about law enforcement agencies in the state.
The Law Enforcement National Data Exchange (N-DEx) Implementer’s Trail Guide – V1.3

CASE STUDY | National Data Exchange (N-DEx) | South Dakota

<table>
<thead>
<tr>
<th>TABLE 1. SOUTH DAKOTA LAW ENFORCEMENT AGENCIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATE</td>
</tr>
<tr>
<td>South Dakota</td>
</tr>
<tr>
<td>State Agencies</td>
</tr>
<tr>
<td>Tribal Agencies</td>
</tr>
</tbody>
</table>

**The Courts**
The state court system is made up of the South Dakota Supreme Court, South Dakota Circuit Courts, and South Dakota Magistrate Courts. The Supreme Court is the state’s highest court. It consists of a chief justice and four associate justices who are appointed to the office by the Governor from five appointment districts. In addition to its judicial functions, the Supreme Court administers the statewide unified court system.

The counties in the state of South Dakota are divided into seven judicial circuits. There are 41 circuit judges serving in the seven circuits. The circuit courts are the general trial courts of the Unified Judicial System. These courts have original jurisdiction in all civil and criminal cases. They are the only court where a criminal felony case can be tried and determined, as well as a civil case involving more than $10,000 dollars in damages. Circuit courts also have jurisdiction over appeals from magistrate court decisions.

The third tier of courts in South Dakota’s unified system consists of magistrate courts presided over by lay magistrates or magistrate judges. Generally, magistrate courts assist the circuit courts in processing minor criminal cases and less serious civil actions. Magistrate courts presided over by magistrate judges share additional authority with the circuit courts. These courts may conduct preliminary hearings in all criminal cases, act as committing magistrate for all purposes, and conduct misdemeanor trials. Magistrate judges may also decide temporary protection orders, try civil cases where claims do not exceed $12,000 dollars, and try small claims cases not exceeding $12,000 dollars.

**Jail Detention**
There are 55 locally administered jails (primarily county jails) in the state, and, six state operated corrections facilities, including:

1. Jameson Annex
2. Mike Durfee State Prison
3. South Dakota State Penitentiary
4. South Dakota Women’s Prison
5. Redfield Trustee Unit
6. Yankton Trustee Unit

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2. Ibid
CASE STUDY | National Data Exchange (N-DEx) | South Dakota

The South Dakota corrections system also has the following Juvenile Corrections System network of juvenile facilities:

1. State Treatment and Rehabilitation Academy (STAR Academy)
2. STAR Evergreen High School
   - Serves as the middle and high school for delinquent youth
3. Youth Challenge Center and the Patrick H. Brady Academy
   - Serves young men
4. QUEST and Excel programs
   - Serves young women
5. West Farm
   - Serves as the juvenile transitional care facility for boys who are about to go back into their communities

Prosecution
Prosecution services are provided by state attorneys who prosecute adult and juvenile crimes occurring in the county jurisdictions.

Probation
Probation services are provided through the state Unified Judicial System Court Services for both adult and juvenile cases.

GETTING STARTED
In the Spring 2010, at the annual South Dakota Sheriffs and the South Dakota Police Chiefs Association’s annual meeting, the attendees were challenged to join together to begin sharing their crime incident and jail information statewide and to submit their information to the N-DEx system. They accepted the challenge and began working with a variety of Federal agencies and non-profit organizations dedicated to homeland security information sharing.

They applied for and received a grant of $500,000 from a 2010 Bureau of Justice Assistance (BJA) Cross-boundary Information Sharing program to establish the backbone of their new sharing environment entitled “ConnectSD.” Their time frame for performance was established at 18 months.

Taking Advantage of Available Resources
The Oversight Committee wisely took advantage of other government and public interest group resources that were available which helped them get the project underway much faster than would normally be possible. These included:
### Table 2. Public Interest Group Resources

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IJIS Institute</td>
<td>The team requested technical assistance from the IJIS Institute who sent a team out early in 2011 for a 3-day Technology Assistance (TA) engagement to gather information and to help draft a Request For Proposal (RFP) for building ConnectSD.</td>
</tr>
<tr>
<td>DOJ Global Justice Information Sharing Initiative (Global)</td>
<td>Global standards were used to decide the key data elements related to incarceration, arrest, and booking that were to be shared.</td>
</tr>
<tr>
<td>IIR; and, NGA</td>
<td>Former members of IIR and current members of NGA visited with Oversight Committee members to help them adopt privacy policies and to provide line officer training to help protect privacy and civil rights of persons whose data may be shared.</td>
</tr>
<tr>
<td>National Information Exchange Model (NIEM)</td>
<td>These standards for NIEM N-DEx IA &amp; IB Information Exchange Package Documentation (IEPDs) were followed to ensure compatibility with N-DEx data formats.</td>
</tr>
<tr>
<td>RISS</td>
<td>This system provides: (a) a secure login environment; and, (b) role-based permissions through a RISS implementation of Global Federated Identity and Privilege Management (GFIPM) that provided “single sign-on” for users of the ConnectSD.</td>
</tr>
<tr>
<td>N-DEx Demonstration</td>
<td>N-DEx visited and demonstrated the systems capabilities to potential partners.</td>
</tr>
</tbody>
</table>

### Governance

An oversight committee was formed and the primary responsibility for the day-to-day operation of the ConnectSD System was assigned to the Administrator / DCI Assistant Director of Field Operations. Primary responsibility for enforcement of this Privacy Policy was assigned to the Connect South Dakota Administrator / DCI Assistant Director of Field Operations (or designee), who was also appointed as the Connect South Dakota Privacy Officer.

Membership of the governance body is composed of representatives of state, county, and city law enforcement agencies. Under the leadership of the state DCI, and with support from the state Secretary of Public Safety, as well as the chiefs, sheriffs, and tribes of South Dakota, the project got underway.

The oversight committee is guided by a trained Privacy Officer. The Privacy Officer: receives reports regarding alleged errors and violations of the provisions of this Privacy Policy; receives and coordinates complaint resolution under the Connect South Dakota Project’s redress policy; and, serves as the liaison to help ensure that privacy protections are implemented through efforts such as training, business process changes, and system designs that incorporate privacy-enhancing technologies.

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3 An Information Exchange Package Documentation (IEPD) is a collection of artifacts (e.g. documents, schemas, diagrams, sample XML code, etc.) that describe from both a technical and functional perspective the requirements of a particular data exchange between or among databases.

4 The Global Federated Identity and Privilege Management (GFIPM) demonstration project was initiated in 2005 under the auspices of Global Security Working Group. The goal of the GFIPM demonstration project was to prove that users of one federation partner system could access resources of another partner’s system after authenticating only to their own system while allowing the information owners to retain complete control over access to their resources. The foundation of this project was the exchange of identity credentials based on Security Assertion Markup Language (SAML).
Establishing Inter-Agency Agreements
The original participants signed on to a Joint Powers Agreement (JPA) establishing the Connect South Dakota Project to facilitate the sharing of information, records, and data in the possession of individual state and local law enforcement agencies through the use of a state operated information sharing system (i.e. ConnectSD).

Forming a Development Team
Ross Uhrig, an employee of the DCI, was appointed as the Project Manager. He was assisted by Jamie Freestone, an intern with the DCI.

An RFP was disseminated and Zuerker Technologies, LLC of Sioux Falls, South Dakota was selected as the winning bidder. The fact that they already served many of the agencies in South Dakota with their computer-aided dispatch (CAD), records management system (RMS), and jail management system (JMS) products was one of the factors that favored their selection.

Faced with a short project completion timeframe, the development team contracted with Sypherlink, Inc. who had previous experience interfacing with the N-DEx system and who provided a “Harmonizer Hub” to interface the ConnectSD database to the N-DEx system over a Secure File Transfer Protocol (SFTP)™ channel. The Harmonizer Hub creates a translation of law enforcement data elements to conform to NIEM and (LEX) standards and facilitates the submission of properly formatted data to the N-DEx system.

The team focused on developing a state-wide information sharing database and web services methodology for all authorized users to query the aggregated data first. Their next task was to submit data to N-DEx in the proper formats and data quality.

The figure below shows the agencies that are submitting or planning to submit their records to N-DEx.

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5 Secure File Transfer Protocol (SFTP)™ is a program that uses Secure Shell (SSH) to transfer files. Unlike standard FTP, it encrypts both commands and data, preventing passwords and sensitive information from being transmitted openly over the network. It is functionally similar to FTP, but because it uses a different protocol, standard FTP clients cannot be used to talk to an SFTP server, nor can one connect to an FTP server with a client that supports only FTP.
Inviting All to Participate

The Oversight Committee reached out to police chiefs, sheriffs, and tribal agencies throughout South Dakota very early in the process to listen to their concerns and suggestions and to invite them to participate – knowing that the more agencies that shared their data and used the system to query the data, the greater likelihood of solving cases and increasing interagency collaboration.

Some agencies were concerned about having significant local control over the information they submitted. The N-DEx staff came to the state and demonstrated the query function of the N-DEx program. Visitors from the IJIS Institute, IIP, and NGA helped assure local agencies that they could have control over their submitted data.
CASE STUDY | National Data Exchange (N-DEx) | South Dakota

**Phase I Goals**
The Oversight Committee established the following initial goals:

- Share information across South Dakota agencies regardless of geographic location or current RMS/JMS through the ConnectSD hub;
- Gain participation in N-DE;
- Secure data with appropriate access controls;
- Protect privacy/civil liberties of citizens;
- Implement low-cost solutions and use national standards;
- Improve investigative search capability; and,
- Establish a statewide system while maintaining local control.

**ESTABLISHING THE TECHNICAL ENVIRONMENT**
The technical environment was established in DCI facilities in Pierre, South Dakota where their National Crime Information Center (NCIC) access point and system is operated on an AS400 platform. The DCI then installed a cluster of Hewlett-Packard blade servers with the VMware® configuration on virtualized servers6. The state Bureau of Information Technology provides the general IT services and the DCI provides the management and help desk services to the application.

**Designing the Functions and Features**
The project team first had to determine what the governance committee and client agencies wanted ConnectSD to become. It is one thing to submit data to the N-DEx program; however, perhaps the greater value was to share information closer to home where more linkages among persons and crimes likely existed. So their vision from the beginning was to collect and share data statewide, while also contributing data to the N-DEx repository. They had to consider the following technical questions:

1. **What specific data elements would be of the most value to the searchers and would the agencies want to share that data from their systems?**

   They used Global standards to narrow down approximately 400 data elements related to arrest and incident reporting plus incarceration, arrest, and booking, probation and parole, or IA and IB in the N-DEx nomenclature.

---

6 A physical server can have its Central Processing Unit (CPU) partition its random access memory (RAM) and other resources among logical virtual servers so that more programs and applications can be run on a single hardware device. During time periods when a server might be idle on a dedicated server, a single computer configured with additional logical servers can service many more requests from users, making more efficient use of the computer's resources by reducing the time the hardware is idle. It allows the user to share resources, save files on a hard drive, route print jobs to printers, run concurrent jobs, etc.
2. How would they help the agencies prepare their data for submittal to the ConnectSD environment?

This was a simpler determination because all of the early submitters were using the Zuerker Technologies CAD and RMS (and some JMS), so this task would be uniform with each contributing agency having the same interfaces, scripts and triggers. Each agency needed to determine which data elements they wished to share and Zuerker Technologies, who was building the target ConnectSD database, could standardize among their participating clients. The other major vendor serving local agencies in the state was the New World system, and they were preparing some of their client’s data for sharing in ConnectSD as well.

3. What method would be employed to obtain the information from each agency? Would the application read data directly from the agencies’ host servers in ‘real time’?; or, would it physically pull data out and clone it in the new system? Would each agency develop its own method of pushing data manually or automatically; and, how frequently they would they upload?

They determined that each agency would determine the data elements they wished to share, as well as what frequency they would submit (e.g. overnight, more frequently etc.).

4. How were they going to store information (e.g. a database, a data warehouse, XML files, flat files, etc.) if it were to be transferred from the agencies to ConnectSD servers and then on to N-DEx?

They decided to build a SQL database with all the required data and lookup tables to house the incoming data and search targets at the DCI facilities in Pierre.

5. How would the user community want to search the aggregated data? What would they expect to see on the web page in terms of presentation? What search parameters would they most likely want to use to access the data; and, could they copy, cut, and paste, or export out to Excel or Word or other formats when they found the information they wanted?

Using Agile Development methodology, they worked closely with agency subject matter experts to identify and implement the functions and features they wanted with prototypes followed by user suggested refinements.

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*Agile Development is a popular methodology that involves the users and the developers in a very close, very quick turnaround and development process with users giving immediate feedback and suggestions on making the system more friendly, efficient, and intolerant of inaccuracies. Developers take the users’ initial requirements and construct a prototype then refine and grow it based on user feedback. This is usually a much faster development cycle because the developers have to quickly show something, and, the users feel a part of the process and can help shape the system to their satisfaction.*
6. How would the application be accessed? Would it be client-server, standalone systems in each agency\(^8\), Web services on the Internet, or an Intranet?

They implemented a secure Web services Intranet (or, a private cloud) in a Java-based environment. They were already using a secure environment through RISS system, so it made sense to continue this because: (a) the built-in security structures; (b) users could use their same single sign-on credentials to access ConnectSD; and, (c) the RISS administration was very willing to accommodate their needs—thus, saving a lot of time and expense.

*Figure 3. ConnectSD Configuration*

Vmware\(^6\) was selected as the virtual server methodology and HP blade servers were installed with SQL 2008 R2. They considered using the State Homeland Department of Public Safety servers; however, the SypherLink Hub was not configured to interface with them.

**Taking Advantage of “Single Sign-on” Security**

The use of RISS and RISSNET single sign-on and user management also made an enormous impact on the scope of the project. ConnectSD was able to ensure a secure environment, use dual factor authentication, and access over 1,000 accounts created by South Dakota Law Enforcement Officers (LEOs) through RISSNET. Incidentally, RISSNET was upgrading their technology just ahead of ConnectSD and provided great help in integrating the new project into their upgrade plans. As a result, DCI was able to start configuring their GFIPM so officers did not need a separate login for the secure, web-based application.

\(^8\) Some of the smaller agencies do not have automated systems at this time.
The Technical Hurdle: The Learning Curve

To address the complexities of the N-DEx system, the technical team from Zuercher Technologies undertook the task of learning as much about the N-DEx technology as possible with respect to their adaptation of the NIEM standards, as well as the related artifacts they wanted to adapt to for the successful preparation of their data flows to the SypherLink hub. Because of their aggressive schedule in their Federal grant, any legitimate shortcuts they could take would be essential.

It is beneficial, but not necessary, for a vendor or agency needs to have programming and/or development experience with a substantial background in XML, HTTP (or other web capability), SQL, and some DBA skills for creating a normalized database, coding queries, scripting, triggers, etc. Skills in C, C++, C# will be very useful as well. Experience with Web services and Java would also be helpful.

These development skills are generally outside the job description that most law enforcement and criminal justice agencies have in-house, especially the very small agencies. The IT staff in most justice agencies have their hands full keeping their networks running, providing a help desk, installing and fixing things, protecting their data, etc.; however, most are neither developers of professional applications nor programmers or database administrators. They often obtain assistance from their County or municipal IT departments for network assistance, however, these resources also generally lack development and programming experience in the above defined environment.

Assistance and support for most criminal justice applications (e.g. CAD, RMS, JMS, etc.) at the local level are provided by the agencies’ hardware and software vendors.

Getting Prepared

The technical team had a good handle on what the users wanted for the state-wide sharing application but now needed to understand the N-DEx standards and how to comply with them within their own user requirements and limitations. By using a SypherLink hub, which could handle the backend translation to N-DEx, the team could focus on obtaining and formatting the agency data on the front end for uploading data to the hub.

Because all the early participating agencies were operating Zuercher Technologies’s products, the team did not have to deal with a diversity of database brands (e.g. Oracle, SQL, Informix, Mainframe flat files, etc.) and could develop a uniform add-on module to each of their customers to feed N-DEx conformed data to the SypherLink Exchange Hub.

The Zuercher Technology engineers consulted the following DOJ sources in their preparation.

<table>
<thead>
<tr>
<th>TABLE 3. TECHNICAL RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESOURCE</td>
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<tr>
<td>----------</td>
</tr>
<tr>
<td>N-DEx Home Page</td>
</tr>
</tbody>
</table>
The team studied the approximately 2,500 data elements in N-DEx with a goal of understanding what the data elements were and why they were or were not important to South Dakota agencies. They selected approximately 400 data elements that were deemed important but assured the local agencies that each had veto power over any element they wished to omit.

For example, the ‘Incident Report Narrative’ text that is so carefully constructed in incident reports is usually rich in searchable text strings but some agencies are reticent to submit because they are concerned that cases could be inadvertently compromised if certain information were available to a wider audience.

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Because these reports are scrutinized and sometimes the focus of cross examinations, they are generally written carefully and reviewed by supervisors for content, facts, grammar, etc.
CASE STUDY | National Data Exchange (N-DEx) | South Dakota

Therefore, like all data in ConnectSD, that decision is honored for each department and is currently not being submitted by any of them10.

The team also studied the XML relationships in N-DEx to see how the data elements are related and began designing their front end Java based Web Service to enable the early participants to begin connecting and submitting data.

They sought technical assistance from the N-DEx Program Office but experienced response times to requests that could run 1.5 to 2.0 months. In the meantime, they then had to try to figure out their own solutions. They created an early prototype to show users and the Oversight Committee and to gain feedback on modifications and additional features they would like.

Technical Tools Used
- .NET
- Archiving Tool – Winzip
- Data mapping Tool – Altova Mapforce
- Diagramming Tool – Visio
- ISS
- Issue Tracker – JIRA
- NIEM Code List Generator Tool
- NIEM Schema Subset Generation Tool (SSGT)
- Schemacentral.com – Excellent Website
- Spreadsheet Worksheets – Excel
- Style Sheet Editor – StyleVision
- Text Editor – MS Word
- UML Editor – ARGO
- Web Browser – Internet Explorer, Firefox, etc.
- XML Editor – Altova XMLSpy

THE PHASE 2 PROJECT
The project is underway with Phase 2 of their project with the following goals:

- Provide a direct access, web-based, basic RMS system for those agencies in the state (including Tribal Police) that may not currently have an electronic system.
- Upload images and photos to the database, including scars, marks, and tattoos.
- Establish a simple, but powerful notification process for agencies to securely collaborate with email, attachments, and SMS text messaging.

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10 Because the section of arrest reports is so rich, the N-DEx administrators would really like to have those text strings included, but many submitters still omit them from their submissions.
CASE STUDY | National Exchange (N-DEx) | South Dakota

- (Future) Enable real time submissions of Suspicious Activity Report (SAR) to Fusion Centers.
- (Future) Enable users in their vehicles or on desktops to check the box "[x]" for routing messages to other agencies.
- (Future) Facilitate sharing of ConnectISD data with neighboring states.
- (Future) Enable other state, local, and tribal agencies to upload data to the system, including the state Department of Corrections (DOC) and parole data.

FLATTENING THE LEARNING CURVE FOR N-DEx SUBMISSIONS

When the law enforcement and other criminal justice agencies and their system providers decide they want to connect to N-DEx and begin the process, they find it is not so easy to do.

1. The technology and available tools are not readily understandable – even to persons of considerable technical background, let alone agency IT staff that may lack development experience.
2. There are no concise, step-by-step training classes available for mapping data and creating the scripts and programming needed to get underway. The NIEM training provided is usually general and removed from the specifics of creating the data and interfaces needed to test and submit individual records with individual file names\(^\text{11}\) to N-DEx.

In the case study, the technical teams studied the IA and IB Excel files to try to understand what was expected of them. The example files in the IEPD area were very helpful; however, the documentation could be a lot simpler, more user-friendly, and workflow-oriented with a starting point and each step thereafter clearly mapped out.

Step-by-step, hands-on training with a case study, to work through from NIEM concepts to the in-class creation of the IEPDs, would help programmers to go home and to adapt their knowledge to their particular needs. The available materials are written with a lot of unstated assumptions, which leaves the technical staff of the providers confused and wandering for some time before they can determine where to dig in and start.

More sophisticated but simpler training methodologies beyond PowerPoint slides and complex Excel spreadsheets would accelerate learning the principles. It is difficult to remember procedural comments and required progressions through a set of spreadsheets with multiple tabs when one tries to transfer training to the development tasks. The engineers assigned by the provider firms spent several months of time and expense struggling through the documentation to understand what needed to be done to ascend the learning curve mountain before they could get started.

\(^{11}\) Each record is a single file name with the XML data stream contained within including many nulls (or blanks) where an agency cannot or does not want to submit the data. If one submits 100,000 records, then they are uploading 100,000 files with the submitting agency's Originating Routing Indicator (ORI) coded into the file name.
CASE STUDY | National Data Exchange (N-DEx) | South Dakota

Further, there needs to be more incentives for vendors to take the time, preparation, and expense to upgrade their products to incorporate N-DEx extractions and submissions in or out of their normal product upgrade cycles. As each new wave of technology emerges, or new features are introduced by a competitor, or new standards are mandated by funding agencies (and RFPs), the provider must calculate the disruption to their installed base, the financial impact, and the short- and long-term risks/rewards of adopting or not adopting these changes.

Such is the case for the N-DEx program where providers could aggressively modify their products to conform to the latest justice IEPDs and add a feature for automatic (configurable) exports of date/time stamped records for submission to the N-DEx program – if, or when, they decide it is to their benefit. They will most likely add those features to their products either when their customers demand it or when their competitors provide it; however, there may be some who want to be pioneers and leaders in their field for “the good of the order.”

The FBI relies on agencies and service providers to invest resources (e.g., time, money, personnel, infrastructure, etc.) with an eye towards enhancing information-sharing capabilities for their state and local users. The FBI is not a grant funding agency, although DOJ has provided limited funding opportunities for such projects like ConnectSD. It is doubtful that ConnectSD would have happened without the incentive provided by the Federal grant.

There are two things that could be done to “flatten the learning curve.”

A Detailed, Step-by-Step Workbook for the Entire Process

The creation of a detailed, electronic example document that would take the technician through all the steps from the kickoff process through successful uploads of data to the N-DEx system would help the process. Many people learn by example, which is particularly true in the technical arena. A workbook that shows, for a particular database, the mapping to the N-DEx system (or the use of commercial tools such as MapForce or others), as well as what decisions were made right on through testing with ConTestA, would remove months of searching, reading, interpreting, and indecision for the willing technician.

Much Quicker Turnaround on Technical Issues from N-DEx

Also, it is our understanding that the N-DEx Program Office has always been and is currently involved in actually doing the mapping and preparation for some agencies of their data for submission to N-DEx. If they had hundreds of engineers involved in doing that (which they do not), then the progress and momentum in expanding the value of this important N-DEx program for 23,000 or so law enforcement agencies in the nation would still be slow. The engineers involved in the ConnectSD project reported that they would submit telephonic or emailed requests for assistance or clarifications and would wait weeks and sometimes months to get a response back. In the meantime, they would be assigned other projects by their management and would have to report slips in their N-DEx schedules because of the slow turnarounds.

When one has burrowed down deep into complicated development processes, as are involved in the programming for submission to N-DEx, it is difficult enough to maintain focus when working on it every day but a hiatus of weeks and months makes it very difficult to intellectually find your way back into the project and to ascertain where you left off and where to restart.
APPENDICES

- APPENDIX A: FBI-NDEx Homepage
- APPENDIX B: ConnectSD Query Page
- APPENDIX C: Persons Interviewed
- APPENDIX D: Acronyms and Abbreviations
APPENDIX B: ConnectSD Query Page

CASE STUDY | National Data Exchange (N-DEx) | South Dakota

Search for People, Vehicles, Locations, and Reports.

Identification
- Driver License
- SSN
- FBI Number
- Passport Number

Address
- Street, City, State, etc.

Description
- DOB
- Age
- Height
- Weight
- Sex
- Race
- Skin Tone
- Hair Color
- Eye Color

Search
## APPENDIX C: Persons Interviewed

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<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Organization</th>
<th>Phone</th>
<th>Email</th>
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<tbody>
<tr>
<td>Bryan Gortmaker</td>
<td>Director</td>
<td>DCI</td>
<td>605-773-3331</td>
<td><a href="mailto:Bryan.Gortmaker@state.sd.us">Bryan.Gortmaker@state.sd.us</a></td>
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<tr>
<td>Ross Uhrig</td>
<td>CONNECTSD Project Manager, and, Communications Network Analyst</td>
<td>DCI</td>
<td>605-773-2883</td>
<td><a href="mailto:ross.uhrg@state.sd.us">ross.uhrg@state.sd.us</a></td>
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<td>Michael Zuerker</td>
<td>Zuerker Technologies</td>
<td></td>
<td>605-274-6081</td>
<td><a href="mailto:Michael@Zuerker.com">Michael@Zuerker.com</a></td>
</tr>
<tr>
<td>Yasmin Mahmutovic</td>
<td>Zuerker Technologies</td>
<td></td>
<td>605-271-6081</td>
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</tr>
<tr>
<td>George Shemas</td>
<td>Vice President</td>
<td>Sypherlink Inc.</td>
<td>614-652-8878</td>
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<td>Dwight Hunter</td>
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<tr>
<td>Cory Casanave</td>
<td>Model Driven Solutions</td>
<td></td>
<td>703-992-9105</td>
<td><a href="mailto:Cory.trusted@casanave.us">Cory.trusted@casanave.us</a></td>
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<tr>
<td>James Dennig</td>
<td>New World Systems</td>
<td></td>
<td>248-268-1000 x1179</td>
<td><a href="mailto:James.dennig@newworldsystems.com">James.dennig@newworldsystems.com</a></td>
</tr>
<tr>
<td>Jody Frye</td>
<td>North Sioux City PD</td>
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<td>Major Leon Baier</td>
<td>Department of Public Safety</td>
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<td>Lt. Don Everson</td>
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<td>Chief Brian Paulsen</td>
<td>Yankton, SD PD</td>
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<tr>
<td>Captain Passick</td>
<td>Yankton, SD PD</td>
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<tr>
<td>Asst. Chief Curt Jacobs</td>
<td>Spearfish</td>
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<td>Captain Lee McPeek</td>
<td>Watertown PD</td>
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12 Some information has been omitted for privacy considerations.
### APPENDIX D: Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>ACRONYM OR ABBREVIATION</th>
<th>DEFINITION</th>
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<tbody>
<tr>
<td>BJA</td>
<td>Bureau of Justice Assistance</td>
</tr>
<tr>
<td>CAD</td>
<td>computer-aided dispatch</td>
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<tr>
<td>CPU</td>
<td>Central Processing Unit</td>
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<tr>
<td>DCI</td>
<td>Division of Criminal Investigation [South Dakota]</td>
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<td>DOC</td>
<td>Department of Corrections</td>
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<td>DOJ</td>
<td>Department of Justice</td>
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<td>DPS</td>
<td>Department of Public Safety</td>
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<td>FBI</td>
<td>Federal Bureau of Investigation</td>
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<tr>
<td>Global</td>
<td>Global Justice Information Sharing Initiative</td>
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<tr>
<td>IEPD</td>
<td>Information Exchange Package Documentation</td>
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<tr>
<td>IIIR</td>
<td>Institute of Intergovernmental Research</td>
</tr>
<tr>
<td>JMS</td>
<td>Jail Management System</td>
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<td>JOA</td>
<td>Joint Powers Agreement</td>
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<td>LEO</td>
<td>Law Enforcement Officers</td>
</tr>
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<td>LEX</td>
<td>Logical Entity Exchange Specification</td>
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<td>NCIC</td>
<td>National Crime Information Center [FBI]</td>
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<tr>
<td>N-DEx</td>
<td>National Data Exchange [FBI]</td>
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<tr>
<td>NGA</td>
<td>National Governors Association</td>
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<td>NIEM</td>
<td>National Information Exchange Model</td>
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<tr>
<td>ORI</td>
<td>Originating Routing Indicator</td>
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<td>RAM</td>
<td>Random Access Memory</td>
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<tr>
<td>RFP</td>
<td>Request For Proposal</td>
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<tr>
<td>RSS</td>
<td>Regional Information Sharing System</td>
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<tr>
<td>RMS</td>
<td>Records Management System</td>
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<tr>
<td>SAML</td>
<td>Security Assertion Markup Language</td>
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<tr>
<td>SAR</td>
<td>Suspicious Activity Report</td>
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<td>SFTP</td>
<td>Secure File Transfer Protocol</td>
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<td>SSH</td>
<td>Secure Shell</td>
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<tr>
<td>TA</td>
<td>Technology Assistance</td>
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