



# **NIEM Focus Group Report**

## **Focus Group Findings and Recommendations**

**From the**

**NIEM Focus Group Meeting  
June 25–26, 2008  
Washington, DC**

**Sponsored by  
NIEM Communications and Outreach Committee (NC&OC)**

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## Change History

No.	Date	Reference: All, Page, Table, Figure, Paragraph	A = Add. M = Mod. D = Del.	Revised By	Change Description
1.0	08/25/2008	All		NC&OC and Mark Perbix	Initial version
2.0	09/23/2008	All	A, M	Russ Moody, IIR	Edits and reformat to integrate spreadsheet into report
3.0	09/25/2008	All	A, M	NC&OC and Russ Moody	Addition of Appendix B, Minor edits
4.0	09/29	All	A, M	NIEM Fellows	Minor edits

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# 1 Objective

The NIEM Focus Group was sponsored by the NIEM Communications and Outreach Committee (NC&OC). The Focus Group was convened for the purpose of bringing together a small group of individuals who have been working with NIEM in implementing actual exchanges to discuss their experiences with using the model. The primary objective in convening the Focus Group was to gain insight into how the model is actually being used and to identify potential issues that may have been uncovered as the model was put into productive use in real-world exchanges. For any such issues that were uncovered and found by the Focus Group to be worthy of remedial action, the intent was to seek the Focus Group's recommendations for actions that might be taken by the NIEM Program Management Office and NIEM committees.

A secondary objective was to identify areas where NIEM is performing well so as to guard against the potential of degrading this performance, possibly as an unintended consequence of addressing shortfalls identified by the Focus Group.

# 2 Focus Group Product

The principal Focus Group product is the issues spreadsheet. It is provided as a table in Appendix A to this report. The spreadsheet contains 51 issues with the following information provided for each issue.

- Issue number provided for reference
- Issue priority, 1–4, assigned through a Focus Group consensus process
- Issue category
- Issue title
- Issue description
- Issue discussion/recommended resolution
- Resources, expertise, related work, and points of contact

Appendix B provides a summary of current NIEM Program initiatives that are addressing each of the 11 categories of issues listed in Appendix A. Not all issues are currently being addressed; however, the three NIEM operational committees—NTAC, NBAC, and NC&OC—are collaborating on Focus Group issue resolution and will take actions and make recommendations to the NIEM Program Management Office as appropriate.

# 3 Background

The National Information Exchange Model ([www.niem.gov](http://www.niem.gov)) Program was launched on February 28, 2005, as a partnership between the U.S. Department of Homeland Security (DHS) and the U.S. Department of Justice (DOJ). For the next two and one-half years, NIEM experienced a rapid development phase with numerous releases and several homeland security and justice pilot projects conducted at the federal, state, and local levels.

The release of NIEM 2.0 in July 2007 marked a significant turning point as NIEM transitioned from a pilot project to an operational program. This change brought on new opportunities and challenges as federal, state, local, and tribal jurisdictions and agencies nationwide began aggressive programs to adopt and use NIEM. With the significant accomplishments that led to the release of NIEM 2.0 and the many challenges that lay ahead with the rapid adoption and use of NIEM, the NIEM Communications and Outreach Committee felt that this would be an opportune time to reach out to the NIEM development community to seek advice and recommendations that can help set the course for NIEM's way forward.

## 4 Focus Group Approach

The Focus Group approach was as follows.

- Identify a small group (15–20) of NIEM developers and implementers who have real-world IEPD development and IEP implementation experience, and who represent a cross-section of the NIEM user community including federal, state, and local agencies and programs.
- Pose three questions to these developers and implementers.
  - What are the strengths of NIEM in building information exchanges?
  - What are the weaknesses of NIEM?
  - What changes should be made to make NIEM more useful?
- Solicit answers to these questions prior to a scheduled face-to-face meeting. These answers provided a starting point for discussion at the face-to-face meeting.
- Conduct a one and one-half day face-to-face meeting to review and flesh out the strengths and weakness and provide recommendations. The meeting was held on June 25–26, 2008, at the Marriott Wardman Park Hotel in Washington, DC. The morning of June 25 was a general session that included review and discussion of the answers submitted by the developers. The developers were then divided into three breakout groups for the afternoon breakout sessions to identify and flesh out the high-priority issues. Each subgroup was free to select whatever issues they perceived as high priority. The subgroups reconvened on the morning of June 26 to present their findings and review the consolidated list of issues.
- Conduct a follow-up WebEx meeting. Since the group was unable to review the entire consolidated list (more than 70 issues)<sup>1</sup>, a WebEx meeting was held on July 7 to review the remainder of the issues.

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<sup>1</sup> As a result of the June 26 general meeting and the follow-up WebEx meeting, the 70 issues identified in the breakout sessions were consolidated into the 51 issues presented in this report.

- Report the results and findings in a Focus Group report provided to the NIEM PMO, NBAC, NTAC, and NC&OC.
- Follow up with Focus Group members in the resolution to the issues.

## 5 Focus Group Participants

The NIEM developer and implementer participants invited to this meeting represented public and private developer organizations that have been known to be heavily involved in the efforts to apply the NIEM to real-life exchange scenarios. Some participants have been working on implementing specific exchanges and others on the introduction of NIEM into products that provide NIEM exchange services.

Mr. Paul Wormeli, Executive Director of the IJIS Institute and NC&OC cochairperson, set the stage at the June face-to-face meeting with opening remarks. The June face-to-face meeting and July WebEx meeting were moderated by Mark Perbix, National Consortium for Justice Information and Statistics (SEARCH). Seventeen developers/implementers participated in the June meeting. NIEM PMO staff members provided facilitator and recorder support for the June meeting breakout sessions. The Institute for Intergovernmental Research (IIR) provided logistical and administrative support for the June meeting. The following table lists the participants in the June face-to-face meeting by breakout group. Individuals who also participated in the WebEx meeting are highlighted in gray.

**Table 1-1. Breakout Group**

Breakout Group A
Pat Brooks, Missouri Office of State Courts Administrator
Mike Hulme, Unisys
Joe Mierwa, Crossflo
Iveta Topalova, Analysts International
Greg Toth, DHS, U.S. Customs and Border Protection
Sudhi Umarji, Trusted Federal Systems Inc.
Jim Pingel, NBAC Committee Support Manager (facilitator)
Alex Nuñez, IIR (recorder)
Breakout Group B
Scott Came, SEARCH
Becki Goggins, Alabama Criminal Justice Information Center
Aaron Gorrell, Waterhole Software
Anthony Hoang, DHS EDMO
C. J. Lee, TSC Software Development Center
Patrice Yuh, FBI-CJIS
Russ Moody, NCOC Committee Support Manager (facilitator)
John Thierwechter, NIEM PMO Staff (recorder)
Breakout Group C
Rick Brown, FBI
James Dyche, JNET, Pennsylvania
Randi Lorah, JNET, Pennsylvania (WebEx only)
Chris Holmes, DHS Terrorist Screening Center
Ashwini Jarral, IJIS Institute
Kate Silhol, Nlets

Maria Cardillos, NIEM PMO Deputy Executive Director (facilitator)
Pisey Frederick, NTAC Committee Support Manager (recorder)
Sam Lampert, NIEM PMO Staff (facilitator)
<b>WebEx Review Only</b>
Webb Roberts, Georgia Tech Research Institute
Denis Gusty, DHS, NC&OC Cochairperson

## 6 NIEM Strengths

In setting the course for future NIEM development, expansion, maintenance, and user support, it is as important to understand what NIEM's strengths are and what is working well as to understand its shortcomings. The NIEM Focus Group identified the following strengths of the NIEM Model and NIEM Program. The following "Strengths" are listed in no particular order. In some cases, there are costs associated with the strength. In these cases, the cost is identified in a footnote.

- NIEM continues to provide a solid foundation for structuring common elements (NIEM Core components) and domain-specific elements.
- NIEM has effectively leveraged technology to achieve high levels of interoperability.
- NIEM is designed using object-oriented concepts, facilitating development and reuse.
- NIEM 2.0 hierarchy groups various criminal justice elements logically.
- Refinements made by adding the concepts of associations, substitution groups, and object augmentation are useful in exchange development.
- NIEM complies with all W3C XML guidelines.
- NIEM includes multiple domains and supports addition of new domains.
- NIEM provides a common information model that is responsive to state, local, and federal information sharing needs, e.g., FBI and Nlets.
- NIEM provides advanced robust data modeling capabilities, making it easier for data architects to model exchanges.<sup>2</sup>
- NIEM provides a common vocabulary and a standardized method for organizing and exchanging data.
- NIEM's consistent definitions make it easy to understand what is meant by the terminology used by various agencies and domains.
- Standard use of naming conventions allows implementers to easily understand and follow the meaning of NIEM elements while defining the local elements.

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<sup>2</sup> Leveraging NIEM's advanced data modeling capabilities can potentially result in higher implementation costs. This challenge might be mitigated by changing the way these advanced data modeling capabilities are implemented in NIEM.

- NIEM provides the flexibility (via extension schemas) to create an exchange that has all of the information that needs to be shared, along with lots of optional information.
- NIEM defines an IEPD development process that allows tailoring for a wide range of exchange requirements.
- NIEM tool development strategy has been reasonably effective.<sup>3</sup>
- Once a developer with XML knowledge is comfortable with NIEM and with using the Wayfarer tool and the SSGT, and after the business data requirements are defined, the developer can build IEPDs relatively quickly.
- NIEM outreach and training provide a valuable resource.<sup>4</sup>
- NIEM provides solid help desk services that are very responsive.
- NIEM's collaborative approach to producing a model ensures a practitioner-driven model and stakeholder buy-in.
- NIEM common standards reinforce community sharing, provide a catalyst for collaboration at the program level, and have accomplished the goal of widening relationships and partnerships.
- NIEM provides a new level of collaboration between industry and government.
- Conceptually, the idea of a central IEPD registry and repository for publishing and reusing IEPDs is a good strategy.<sup>5</sup>
- NIEM IEPD reuse opportunities are increasing.
- NIEM provides the potential for long-term cost saving in the development and implementation of Information Exchange Package Documentation (IEPD).

## 7 Issues and Recommendations

The NIEM Focus Group identified 51 issues. These issues were grouped into the following categories:

- Value proposition (3)
- NIEM conformance (5)
- Governance (8)
- Best practices (1)
- Change management (2)

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<sup>3</sup> The NIEM Focus Group consensus was that the NIEM tools are very useful. The group identified several issues associated with potential enhancements to the NIEM tool set.

<sup>4</sup> The Focus Group identified IEPD implementation as an area that might benefit from additional training.

<sup>5</sup> There are some challenges ahead in achieving the full benefits of IEPD sharing and reuse. Several issues related to these challenges were identified by the NIEM Focus Group.



- NIEM architecture (3)
- NIEM content (5)
- IEPD development (5)
- Implementation (4)
- Training (3)
- Tools (12)

Governance issues were further divided into three categories: NIEM governance (3), domain governance (4), and IEPD governance (1). The categories are not mutually exclusive. For example, there is only one issue in the best practices category, which addresses the overall management and visibility of NIEM best practices. However, best practices are also the subject of issues in other categories, e.g., governance, implementation, training, and tools. The following paragraphs summarize the issues for each category. The details are contained in the Appendix A issues spreadsheet.

***Value Proposition:*** With the production release of NIEM in July 2007 and the resultant increase in adoption and use, NIEM is becoming central to information management and sharing investment decision-making nationwide at the federal, state, and local levels. The issues addressed both the need to accurately estimate the investment costs and expected return on investment (ROI), as well as the need to be able to articulate the ROI and benefits to a wide range of policymakers, particularly at the state and local levels.

***NIEM Conformance:*** As the rate of NIEM adoption and use increases, a clear definition is needed of NIEM conformance and the requirements for NIEM conformance for the NIEM Core and domain models, IEPD development and implementation, and for “NIEM-enabled” products and services. Issues include how to include NIEM requirements in procurements and product evaluations, conformance testing, and conformance validation authority.

***Governance:*** Governance is a cornerstone of the NIEM Program. With the rapid increase in the number of NIEM users and participants in the NIEM Program, and with the prospect of several new NIEM domains, there is an increasing need to ensure that governance business rules and processes are in place and that adequate resources exist to sustain governance activities and processes on a continuing basis. Issues address governance requirements for the NIEM Model and Program, NIEM domains, and NIEM IEPD management, including authority/ownership, participation, and resources.

***Best Practices:*** With the rapid increase in IEPD development and implementation, best practices and lessons learned are emerging from many different NIEM initiatives and programs. Evaluating these best practices and lessons learned and reconciling them into a cohesive NIEM-recommended set is a major challenge. The NIEM Help Desk and Knowledge Base have made great progress in meeting this challenge. This issue addresses the need for a collaborative forum where NIEM developers can access and share best practices and lessons learned on a real-time basis.

***Change Management:*** Two issues were raised—the need to resolve issues submitted to the Help Desk and NIEM Configuration Control Tool (NCCT) more quickly and the need to provide more information on the NIEM change management process and more timely information on planned and scheduled changes (releases).

**Model Architecture:** Three issues were raised—problems associated with the inclusion of code tables, issues associated with augmentation and extensions, and tradeoffs associated with NIEM’s complexity.

**Model Content:** Model content issues include some shortfalls in NIEM element and component definitions, the need for continuous harmonization, issues of domain versioning and versioning independence, and the need for better representation of Arabic and Slavic names.

**IEPD Development:** IEPD development issues include the need for increased IEDP reuse, the need for clarification of the NIEM scope with respect to routing and addressing standards, the application of NIEM for cross-domain exchange development involving multiple standards, tradeoffs between inline and referential metadata, and the level of IEPD collaborative development and IEPD standardization, e.g., the cost/benefit tradeoff between local development versus collaboration on a regional or nationwide IEPD development.

**Implementation:** Implementation issues include the runtime limitations in handling large code table enumeration lists, the need for a “roadmap” for building language bindings for NIEM schemas, problems with multiple different restrictions of the same type, and the need for best practices.

**Training:** Training issues include broadening the training program to include legacy data handling and IEPD reuse and prequalifying students in the area of XML technologies and development knowledge and capability.

**Tools:** There were a large number of tools issues, which reflects the importance and the high level of use of the NIEM tools. Issues addressed shortfalls in tool capability, the need for additional tools, the need for tools selection support, and the need for more intuitive tool interfaces.

## 8 Summary and Conclusions

Stakeholder input is critical to NIEM’s success. With the increase in IEPD development in the last year and the continuing IEPD development and increase in IEP implementation and operational use in the upcoming year, input from the IEPD developer and implementer community is particularly critical. The NIEM Focus Group is a key component of the NIEM outreach strategy for this community.

The NIEM Focus Group identified 51 issues in 11 categories, as well as the many strengths of the NIEM Model, processes, and Program. The issues and recommended resolutions will provide key input to the NIEM PMO planning process, as well as ongoing NIEM developments in several key areas being addressed by the NTAC, NBAC, and NC&OC.

## 9 Appendix A—Focus Group Issues Table

The Focus Group Table contains 51 issues with the following information provided for each issue.

- Issue number provided for reference
- Issue priority, 1–4, assigned through a Focus Group consensus process
- Issue category
- Issue title
- Issue description
- Issue discussion/recommended resolution
- Resources, expertise, related work, and points of contact

The table is color-coded to identify which Focus Group meeting breakout group identified the issue. Breakout group members are listed in the Focus Group report.

- Blue—Group A
- Green—Group B
- Yellow—Group C
- Red—Multiple groups

Number	Issue Priority	Issue Category	Issue Title	Issue Description	Issue Discussion/Recommended Resolution	Resources, Expertise, Related Work and POCs
1	1	Value Proposition	Convincing policymakers of the importance of NIEM	Need a clear concise explanation of NIEM and the benefits of NIEM to be able to hand over to policymakers and other nontechnical folks. The benefits of information sharing are easily grasped, but it is difficult to articulate the level of resources needed for NIEM adoption and use at the local and state levels. City councils, county commissions, and legislators all support data sharing to help combat crime. However, it takes time and money to create NIEM-conformant services, and it is a little difficult to explain to someone who has no concept of what NIEM is all about in the first place.	NIEM PMO/Committees should engage stakeholder community to obtain real-world value proposition case studies.  NIEM PMO/Committees should engage stakeholder community to obtain NIEM-related metrics being collected by stakeholders.	NC&OC and NBAC, NBAC value proposition task
2	2	Value Proposition	Convince state and local IT managers of the worth of reengineering existing data sharing services to be NIEM-conformant	Need to demonstrate the ROI for reengineering existing data sharing services to NIEM.  Why should we change our existing exchanges? What is the value of NIEM-based information sharing?  How can we measure and “sell” immediate NIEM ROI?	NIEM PMO/Committees should engage stakeholder community to obtain real-world value proposition case studies involving data sharing services reengineering for NIEM conformance.  Provide stakeholders with 10–15 bullets, backed up with talking points, that relate to tangible recognizable benefits, e.g., N-DEx, Florida adoption and use.  NIEM PMO/Committees should engage stakeholder community to obtain NIEM-related metrics being collected by stakeholders.	NC&OC and NBAC, NBAC value proposition task
3	2	Value Proposition	Promoting IEPD reuse	Need to provide the benefits of reusing NIEM IEPDs to the COIs.	NBAC is currently working on a value proposition framework.	NC&OC and NBAC, NBAC value proposition task

Number	Issue Priority	Issue Category	Issue Title	Issue Description	Issue Discussion/Recommended Resolution	Resources, Expertise, Related Work and POCs
4	1	NIEM Conformance	Need clear definitions of NIEM conformance and related terms	<p>Need to define and provide a common understanding of what it means to be NIEM-conformant so that there is a common understanding among the vendors/service providers, consulting community, and user agencies.</p> <p>Need to define NIEM conformance-related terms, e.g., compliance, verification, validation, certification.</p>	<p>Need to distinguish conformance requirements for NIEM Core model, domain-specific models, IEPD, and vendor products.</p> <p>Revise conformance and conformance-related terms in the NIEM Terms and Definitions document.</p> <p>Develop standard language that defines NIEM conformance.</p>	<p>IJIS Institute IPSTSC Committee</p> <p>DHS EDMO</p>
5	2	NIEM Conformance	Need a process for conformance testing and validation of conforming products	Who is the validation authority for NIEM conformance, and how is conformance testing performed?	<p>Address two types of conformance: structural and semantic.</p> <p>Schematron-based conformance testing can address structural conformance. Semantic conformance testing is largely a human activity.</p>	NTAC, Schematron developments
6	2	NIEM Conformance	Lack of tools for validation of schema and check for conformance	Development of validation and conformance tools would be beneficial.	Schematron-based conformance testing can address structural conformance.	NTAC, Schematron developments
7	1	NIEM Conformance	NIEM IEPD Conformance requirements set too high	Current NIEM conformance requirements are set so high that there may not be a single NIEM conformant IEPD out there (including NIEM itself). Need a more realistic goal set. Compliance to all 180 NDR rules is probably not attainable.	A subset of these rules (if consensus can be reached) would be ideal (similar to CALEA compliance). The process might be as follows: establish guidelines for what makes an NDR rule a candidate for conformance, e.g., the rule must be capable of being validated automatically, and the NDR rule must have a significant and demonstrable impact on interoperability.	NTAC 1.3 Revision of NDR
8	1	NIEM Conformance	Need a model for writing NIEM-related requirements into RFPs	How do I write an RFP that is NIEM-specific?	Provide standard language that defines NIEM conformance.	Kate Silhol, Rick Brown

Number	Issue Priority	Issue Category	Issue Title	Issue Description	Issue Discussion/Recommended Resolution	Resources, Expertise, Related Work and POCs
9	1	NIEM Governance	Code table governance	Need guidance on how NIEM handles code table governance and management, including versioning. Domain management of code tables must be identified as it affects interoperability success.	Provide governance, guidance, and best practices for governing and managing code tables.	Rick Brown, James Dyche
10	2	NIEM Governance	Leveraging volunteer for governance support	Dependence on volunteers makes it difficult to continue moving NIEM work forward and to perform normal day-to-day work. Need stakeholder organization management support.	Send letters to high-level state, local, tribal, and federal managers to request support and to thank them for efforts and/or to solicit new participation. The IJIS Institute already sends out some thank-you letters. Define requirements and guidelines for the scope of domain contributions/responsibilities. Institutionalize governmental support for NIEM domains so it becomes a part of governmental policy and operations.	Rick Brown, NBAC, NTAC, and NC&OC
11	1	NIEM Governance	Mission people at DoD Ucore need be more engaged/involved	More representation/participation of Ucore (and other bodies) in NBAC.	Task NBAC to get a representative. Identify core elements—harmonize definition of the content (i.e., biometrics). Provide mapping between standards.	NBAC
12	2	Domain Governance	Resolve possible need for a biometric domain	Should NIEM have a separate domain for biometrics? Need to know how NIEM wants to deal with this issue. There are inconsistencies in the model, e.g., biometrics and other business area data are handled differently in different domains. “Biometrics” is different in the justice and immigration domains.	Next Generation IAFIS (NGI) is tied into this and may offer a good opportunity to make change. Harmonization/governance.	Rick Brown, Kate Silhol
13	2	Domain Governance	Need domain governance and management structure	New domains need a strong domain governance and management structure. High-level support versus detailed/more focused support (general issue). Governance is weak to near nonexistent.	Include governance and management in the NIEM requirements and guidelines for standing up a new domain. Establish mechanisms for governance and participation per domain. Improve domain governance.	PMO Domain Governance Effort, NBAC Domain Governance paper
14	2	Domain Governance	Lack of intelligence domain representation	Lack of intelligence community participation in NIEM—lack of participation and governance structure. Need more communication/direction.	Reach out to the ODNI.	Jim Feagans, ODNI-OCIO

Number	Issue Priority	Issue Category	Issue Title	Issue Description	Issue Discussion/Recommended Resolution	Resources, Expertise, Related Work and POCs
15	1	Domain Governance	Domain and element points of contact	Need a POC for each of the NIEM domains and for the NIEM data elements? Who owns the element definition (domain and NIEM Core)?	Tiger team under way to address the policy issues on this. Need more national outreach from federal agencies to state government for continued support.	Ashwini Jarral
16	1	IEPD Governance	Oversight and direction for nationwide standardization of IEPDs	Which IEPDs will be considered for standardization? We should have a group overseeing all standard IEPDs to ensure consistent use of data components within the IEPDs.	Provide a formalized authority and process for determining when an IEPD is a national standard. Process should include a user input path and a PMO path.	Rick Brown, Ashwini Jarral
17	1	Best Practices	Best practices forum needed/collaboration	Need some sort of forum where people can exchange ideas, best practices, and lessons learned on how best to develop NIEM-based schema. How to share lessons learned, tips, and tricks among developers? Better methods and tools for collaboration are needed. Help desk provides 1:1 visibility of issues.	Provide a developer forum. Provide management and usability enhancements to the NIEM best practices and lessons learned knowledge base. Adopt open-source online collaborative practices/list serv. Include in the NISS Knowledge Base, provide better indexing and visibility into the Knowledge Base.	NCOC. A listserv tool is being evaluated.
18	1	Change Management	NCCT issue resolution	The NCCT issues seemed to be pushed to the back burner. Need to listen to the customers. Problems and issues not well recorded.	NTAC is aware and is working on it. NBAC needs to collaborate. Will report on 7/15.	NTAC, NBAC, NCOC, Rick Brown
19	2	Change Management	NIEM release information to stakeholders	Release/change management feedback to the customers. In which release will which issues be addressed?	Assign prioritization and provide estimate for when issues will be resolved. A good version architecture is needed.	NTAC version architecture, Rick Brown, James Dyche

Number	Issue Priority	Issue Category	Issue Title	Issue Description	Issue Discussion/Recommended Resolution	Resources, Expertise, Related Work and POCs
20	1	Model Architecture	Code tables	Inclusion of code tables has proven problematic.	Remove code tables from the schema (use text fields). Use few (or zero) elements at runtime for validation. Consider multiple approaches, Web services, exporting code tables, manual updates. Put codes into the service layer (as opposed to the schema). There is a need for code's domain owners to maintain them, provide updates to GTRI, and allow automated updates. Potentially remove codes from the schema (needs to be discussed). Provide NIEM schema to define code tables as opposed to the codes themselves (definitions, description, etc.).	Rick Brown, James Dyche
21	3	Model Architecture	Augmentation versus extensions	Augmentation has caused multiple issues and typically still results in major extensions. What is the value of augmentation if so much extension is still necessary?  Why maintain the augmentation container if extensions are necessary anyway?	Need info/training on purpose of augmentation. Need best practice, guidance, structure. Issue has been identified by NCCT; when will it be addressed? Help Desk Ticket Number 080404-000000.	NTAC, NCOC
22	1	Model Architecture	Complexity is a barrier to adoption and use	NIEM is a bit too complex. Complexity allows for flexibility but creates a barrier to implementation. There are too many options/choices (data elements, etc.). Need to have the capability to superset certain subsets that have been created. Simplify NIEM (may reduce flexibility slightly but could increase adoption and use). Associations make IEPD development more complicated (i.e., DL association of vehicle plates, individual versus plate versus other). Developers more challenged than DBA.	Simplify implementation process through an abstraction layer that presents the user with a "NIEM Lite" view of NIEM, e.g., a business-component layer.  This may also be a training issue.  Consider super-setting some of the subsets as a possible resolution.	NBAC Business Component Library, James Dyche, Rick Brown



Number	Issue Priority	Issue Category	Issue Title	Issue Description	Issue Discussion/Recommended Resolution	Resources, Expertise, Related Work and POCs
23	1	Model Content	Need better description of NIEM components	<p>It would be helpful to include usage examples in the component descriptions to illustrate the intended usage. For example, how should the attributes (for nc:PersonFullName) languageCode, scriptCode and transliterationCode be used? They appeared to have very similar definitions. What is the design rationale for nc:TransportationAssociation (the component has a nc:ConveyancePassengerFemaleQuantity value and a nc:ConveyancePassengerMaleQuantity value)? Why does the gender of the passengers in this case matter? Is there an example (use scenario) that this design is targeting? Some definitions are the same as the tag name.</p>	<p>Need process to require adequate definitions and explanations, annotations. Take proactive approach. Need process to engage broader involvement, e.g., stakeholders, NIEM interns, masters' students in justice program. Not a help desk issue. Provide stakeholder forum. Need to add contextual definition, e.g., Arrest Date is under Activity Date. Need to add extra information about specific use. Need to add better definitions, especially for elements where definitions match names. Consider using domain trade dictionaries to provide similar keywords and enhance the search ability of elements by automatically populating the keywords and then manually refining them when a requirement is identified.</p>	<p>NCOC, NBAC, IJIS Institute, James Dyche</p>
24	2	Model Content	Proper refactoring (harmonization) and completeness of the model	<p>Continued diligence to proper refactoring (harmonization) and completeness of the model (e.g., filling in definitions, removing duplication, being diligent about not representing associations and roles as properties). We have made a lot of progress in this regard in NIEM 2.0, so we should feel very good about that. But there is still more work to do. Multiple tags duplicated across domains. Data definitions are still rather weak. NIEM terminology needs to be adjusted to include more business terms.</p>	<p>Conduct a broad pass-through model and identify 20–30 biggest issues (~80% of impact). Harmonization design principles developed by NBAC (once and only once) December 2007 in Crystal City. Appendix B NDR 1.2.</p>	<p>NBAC, Rick Brown, James Dyche  NDR 1.3 Harmonization principles</p>

Number	Issue Priority	Issue Category	Issue Title	Issue Description	Issue Discussion/Recommended Resolution	Resources, Expertise, Related Work and POCs
25	2	Model Content	Versioning/ Independent release schedules for NIEM's domains	Since several NIEM domains are still at a developing stage (e.g., screening), more updates are needed for this domain than for other NIEM domains (e.g., NIEM Core). It would be more beneficial to the user community to have a different release schedule for different domains to meet users' needs and to minimize backward compatibility issues.	Define a versioning process that allows independent release of domain models. Better communication.	NTAC Version Architecture Tech Note
26	3	Model Content	Versioning	Adequate support for Arabic and Slavic names is lacking.	Add transliteration and scripts tag. Form a tiger team to look at the issue. Extend TWPDES and harmonize into NIEM.	Chris Holmes
27	3	Model Content	Harmonization	The person model is very flat. Physical characteristics are grouped together. Multiple descriptions sometimes need to be grouped, especially in the intelligence domain. A person might be using multiple identities, have multiple hair colors, two eye colors, etc.	Different structures that may conflict during harmonization.	Chris Holmes

Number	Issue Priority	Issue Category	Issue Title	Issue Description	Issue Discussion/Recommended Resolution	Resources, Expertise, Related Work and POCs
28	1	IEPD Development	Lack of IEPD reuse	<p>People are reinventing IEPDs that are already available rather than reusing or extending. There are some reference IEPDs such as Warrant and SAR, but we need more of them. This will further promote reusability. Some of the reasons for not leveraging work of others include:</p> <ol style="list-style-type: none"> <li>1) Unaware of what work has been done and how to find it, need for tools and training.</li> <li>2) Not sure how to reuse IEPD work that has already been done. This may be an all-or-nothing problem. Even if I know that a similar IEPD exists, how do I extend or use only the parts I need without recreating a totally new IEPD?</li> </ol> <p>The concept of IEPD lineage. This is closely related to LEXS. When existing IEPDs such as LEXS are reused, the different restriction schemas of the same NIEM namespace cause the implementers to do "double-pass validation." This is very undesirable. Is there a way to work with the namespaces to avoid this problem? NIEM offers no alternative for a consistent and compatible IEPD development for reuse.</p>	<p>Require that instance documents be included in the IEPD. Instance documents are the principal go-to artifacts in understanding the IEP. Need to promote and explain reuses. Communicate who is working on common issues. NIEM Cookbook/Roadmap. Training needs to be geared towards populating existing IEPDs. Feed business objects (driver's license) back into the domain. National initiatives to standardize specific needs (such as rap sheets). The greater the input, the greater the reuse. Use the JIEM tool to identify the communities of interest. White papers that guide reuse (starting with domain model, identifying requirements, etc.). Examine using UML modules to create an IEPD. Use mailing lists, wikis, news groups. Lower the barrier of entry to building the community. Managing the security side of issues so the justice community can discuss it. DOJ created LEXS to help encourage reuse. PA's pyramid for the value of reuse depends on what is being reused. Requiring input of clearinghouse template into IEPD. Consider some central or official (governance) body that will create and maintain core/common IEPDs. Relates to the Business Component Library effort by NBAC. Create top-10 list of most reused IEPDs. Identify reference IEPDs. Develop rating system.</p>	<p>NCOC, GJXDM/NIEM IEPD Clearinghouse, NBAC BCL initiative</p>

Number	Issue Priority	Issue Category	Issue Title	Issue Description	Issue Discussion/Recommended Resolution	Resources, Expertise, Related Work and POCs
29	1	IEPD Development	NIEM should include routing/addressing standards Routing (content) info in message structure	Need to articulate where NIEM's border/scope is with respect to the messages/roadmaps. Within criminal justice and public safety integration, there are several defined ways of handling routing. These include EDXL and LEXS-SR. With the need to exchange information to many partners, we should have a standard set of elements and implementations by JRA SIPs to handle message routing. Many of the mature exchange standards (HL7, NEIEN, and others) have been faced with this problem and have defined a standard set of elements to keep everyone from creating their own. There needs to be a standard way to specify the routing. Sometimes, the spec identifies what needs to be in the routing standard, and sometimes it does not.	NIEM should consider routing capability in the messages. Form a tiger team engaging stakeholders. Suggest tags for interoperability for all the different types of routing. Standard structure of the header. Provide guidance on where NOT to include transactional routing information. Do not include it in the data layer. Apply NIEM semantic to read elements that are beyond the industry spec for the routing envelope. Take a coordinated approach with GISWG, PM-ISE, DHS on messaging. Present decision/alternative memo to NBAC. Guidance on how to provide transport and data layers. The issue of using NIEM to essentially describe elements for routing should be further reviewed. This is essentially what LEX and EDXL are doing. That is using NIEM to describe elements in the routing. If we state that NIEM should not be used in messaging routing, then effectively, LEX and EDXL are not adhering to these new standards and others cannot effectively use NIEM for such either. We need to effectively define standards or models (where the routing specification ends) for use of justice elements. A couple of examples are ORI or GIS locations. Neither of these will be included in a WS, an eXML, or any other routing specification. We need to effectively use the NIEM model/semantic wherever possible—including the message envelope and routing.	James Dyche, GISWG, PM-ISE, DHS EDMO
30	3	IEPD Development	Use of multiple standards	Constraints for legacy applications affect multistandard use of NIEM (e.g., LEXS + NIEM as the backbone).	Use two constraints on the same type.	Chris Holmes

Number	Issue Priority	Issue Category	Issue Title	Issue Description	Issue Discussion/Recommended Resolution	Resources, Expertise, Related Work and POCs
31	2	IEPD Development	Enterprisewide versus Project or Exchange IEPD development	Where is greater (and faster) ROI? Should users be developing IEPDs enterprisewide or per project or exchange?	Wantlist repository (should be used in the IEPD context in which it was generated—reuse/reusability; strive for consistent national exchanges.	NIEM NPEP
32	1	IEPD Development	Metadata handling (related or correlated)	Metadata use reference versus inline, which causes implementation difficulties	This issue has been entered into the NIEM Help Desk (Ticket Number 080404-000005).	James Dyche
33	4	Implementation	The size of enumeration list/code tables	XMLBeans has a size limitation on the number of values in an enumerated list (~ 200). For example, NCIC code list VMO/VMA contained more than 5,000 values. Even though there is a workaround (use union technique), enumerated lists of more than 200 values are rarely necessary in a particular exchange. All enumerated lists should really be substitution groups so that the user can customize the list based on the application domain. A few sample lists can be created to standardize the list value terminology, but a deterministic list really belongs to each specific exchange rather than a framework like NIEM. N-Dex 52 enumerated list is a possible problem.	Consider free text alternative.	C. J. Lee
34	3	Implementation	Need a roadmap for building language bindings	Building language bindings for NIEM-based schemas is nontrivial and seems to be beyond what many of the LEXS implementers seem able to do. So something documenting a roadmap for how you would do it might be useful. Level of challenge related to size of the schema. Related to architectural issues.	Include implementation in training. Include use cases that go all the way to the development of a WSDL.	IJIS Institute

Number	Issue Priority	Issue Category	Issue Title	Issue Description	Issue Discussion/Recommended Resolution	Resources, Expertise, Related Work and POCs
35	4	Implementation	Multiple different restrictions of the same type is still a design problem	As stated in the GJXDM Focus Group Report back in April 2004, there is often a need to restrict a NIEM type in different ways at different locations in the same IEPD. One workaround is to create multiple types (e.g., nc:IdentificationType1, nc:IdentificationType2). The maintenance of such an IEPD gets complicated. Moreover, when existing IEPDs such as LEXS are reused, this issue causes the implementers to do "double-pass validation." This is very undesirable. Is there a way to work with the namespaces to avoid this problem?	Schematron solution. ID type extension. Need best practices sharing. Resolved XSD restriction in NDR 1.3. Identify what is in and outside scope of schema.	C. J. Lee
36	1	Implementation	NIEM Cookbook Best practices	Cookbook or roadmap needed to assist implementers.	Create roadmap for implementers who use (Java, .net, etc.). Show implementers what does and does not work.	User Guide Volume II
37	2	Training	Broaden training curriculum	The NIEM Program does not recognize the diversity of the NIEM stakeholder community. For example, NIEM training focuses on the development of the IEPD and the IEPD lifecycle while very, very few people develop IEPD schemas from scratch. Training is not specific to the audiences. Need training that focuses on the actual exchanges (e.g., IEPD is already developed, but not training on how to make occur at runtime).	Provide specialized training, e.g., for implementers. White paper describing (in general terms) the process flow—like the IEPD process flow. Alternatives to in-class training —10 NIEM slides. Best practices for using an IEPD (on the NIEM Web site)—mapping tools, etc. Reference implementation (i.e., for .Net server) for implementation profiles (high level, at first). How to read an IEPD. Webinar hosted in niem.gov on how to implement and IEPD.	NC&OC and IJIS Institute, User Guide Volume II
38	1	Training	NIEM IEPD development	Participants who take these courses do not know XML.	Need a prerequisite course on XML prior to taking NIEM IEPD training course. Need to qualify students—W3C online course is available. Is XML included as a prerequisite to NIEM class?	NC&OC

Number	Issue Priority	Issue Category	Issue Title	Issue Description	Issue Discussion/Recommended Resolution	Resources, Expertise, Related Work and POCs
39	3	Training	Need to use transformation for legacy data (e.g., N-DEx IEPD)	Difficult to get state's legacy data into an IEPD in order to feed into N-DEx. Need for NIEM to provide strategy/training for dealing with legacy data.	Address legacy data issues in training for states.	NCOC
40	2	Tools	Schema packaging	Need best practice/standard for schema folder packaging. Both IEPD and (JRA) services.	JRA is working on the SSGT issue, which affects packaging of IEPDs. Sudhi Umarji to elaborate. Working on normative rules for packaging.	James Dyché, Iveta Topalova, Scott Came, Sudhi Umarji
41	3	Tools	Exchange mapping process improvements	Modify the exchange mapping process to generate XSD schemas instead of manually creating it.	Spreadsheet (GJXDM) method being used now. Can do schema generation for about 60%–70% now.	NTAC
42	3	Tools	Tool categorization	Tools do not allow for categorization, e.g., need to distinguish sensitive items (i.e., sensitive data section; commercial or in-house tools).	Do not expose all work through publicly accessible tools.	NTAC, Greg Toth
43	3	Tools	SSGT Web Service	SSGT would be nice to have as a Web service.	Improved tool portability and accessibility. Having the SSGT "consume" the wantlist.	NTAC, Joe Mierwa
44		Tools	Best practices	Best practice needed for how to use tools.	Incorporate into user manual?	NTAC, NCOC
45		Tools	Mapping tool	Problem with approach; logic versus physical data model.	Need to improve Map Information Exchange on NIEM Web site.	Joe Mierwa
46	2	Tools	Tools capability	Tool needed to more quickly generate constraints. Need more capability to set context. Tool needed to help modify existing artifacts. There is a gap between perceived and actual capabilities.	Add ability to capture cardinality in SSGT. Add capability to set context.	NTAC Tools Strategy
47		Tools	Searching capability	Need to find the right data element to fit the business need. Need to be able to search IEPDs by exchange; by business need/function.	Need to use bottom-up approach. Expand definitions; add synonyms; search by domain.	NTAC Tools Strategy
48		Tools	Collaborative development	Collaborate on tool use online; mapping, etc.	Provide Enterprise edition tools.	NTAC, NCOC

Number	Issue Priority	Issue Category	Issue Title	Issue Description	Issue Discussion/Recommended Resolution	Resources, Expertise, Related Work and POCs
49		Tools	Tool usability	Make tools more intuitive.	Use recognition versus recall metric in tool interface design.	NTAC
50	1	Tools	Need for additional tools	A utility program for reviewing IEPDs and confirming that an IEPD conforms to the NIEM NDR would be helpful. Need more tools developed by NIEM to promote use.	N-DEx created mapping tool to relate to NDR/business rules (e.g., Contessa). Contessa is used to ensure that the submission is conformant to the N-DEx IEPD/LEXS. Document the conformance process and tools. GTRI is building a tool (in progress) to check conformance to the NDR. Panel of experts to check conformance. Guidance on using external/legacy schemas. Desktop version of the SSGT (something that works on a non-Internet machine).	Ric Brown, Chris Holmes, Kate Silhol
51	2	Tools	Lack of support for tool selection	Need information that provides a basis for tools evaluation and selection. Multiple tools without recommendations and a basis for tool selection can cause confusion.	Provide a matrix of tools versus capability (e.g., personal, professional, enterprise) and IEPD lifecycle.	NTAC Tools Strategy



## 10 Appendix B—Current NIEM Program Initiatives Addressing Focus Group Issues

There are a number of current NIEM Program initiatives that are addressing the issue categories identified in Section 7 of the NIEM Focus Group Report. The categories and the number of issues in each category are listed below.

- Value Proposition (3)
- NIEM Conformance (5)
- Governance (8)
- Best Practices (1)
- Change Management (2)
- NIEM Architecture (3)
- NIEM Content (5)
- IEPD Development (5)
- IEPD Implementation (4)
- Training (3)
- Tools (12)

The following paragraphs summarize the current NIEM initiatives addressing each of these issue categories. These initiatives are directly addressing some of the issues and are providing the framework for addressing others. Several issues require further study. The three NIEM operational committees—NTAC, NBAC, and NC&OC—are collaborating on Focus Group issue resolution and will take actions and make recommendations to the NIEM Program Management Office as appropriate.

***Value Proposition:*** The “Value of NIEM” brochure provides a qualitative description of the operational and cost/time benefits of NIEM but stops short of addressing the specific needs of NIEM stakeholders trying to make the case for NIEM within their organization. The NBAC has a task under way to develop quantitative measures of the potential value of NIEM given an organization’s operational needs, legacy information exchange systems, and readiness level for NIEM adoption and use.

***NIEM Conformance:*** The NTAC recently published the NIEM Conformance document on [www.niem.gov](http://www.niem.gov). This document, along with the soon-to-be released revision of the NIEM Naming and Design Rules (NDR 1.3), will address many of the questions and concerns related to NIEM conformance. These documents are not expected to address all the issues, but they will provide the foundation for reconciling these issues.

***Governance:*** Two efforts are under way to address governance. The NBAC has developed a draft Domain Governance White Paper that has gone through several internal reviews and is being updated. The purpose of this white paper is to describe the processes for establishing domains, ensuring that those domains are able to collaborate effectively, and contribute efficiently to the NIEM model as a whole. The NTAC has developed the NIEM High-Level Version Architecture (HLVA) document which was posted to the NIEM Web site on August 13, 2008, for a 30-day comment period. The HLVA document describes how NIEM

governance bodies update the data components and schemas that make up NIEM. The NC&OC is developing a template for a NIEM Domain Web page. Each domain will have a separate page on the NIEM public Web site with descriptive and contact information. These efforts either directly address or provide the framework for addressing the Focus Group domain governance issues. The IEPD governance issue is being addressed as part of the effort to recast the mission and scope of the NIEM Priority Exchange Panel (NPEP).

**Best Practices:** The principal mechanism for capturing, managing, and sharing best practices and lessons learned is the NIEM help desk and knowledge base. The NC&OC is evaluating the help desk and knowledge base tools and processes in light of the Focus Group issues, including the possibility of setting up some sort of NIEM developer collaboration/information sharing forum, e.g., Wiki.

**Change Management:** The NTAC has recently refocused efforts to address the NIEM Configuration Control Tool (NCCT) issues and has dispositioned the large backlog of these issues. The NC&OC is reassessing the issue resolution process to identify opportunities to streamline the process. Lack of sufficient resources is a continuing challenge.

**NIEM Architecture:** The Code Table and Augmentation issues have been assigned to the NTAC. These issues are related to previous help desk issues that are currently being dispositioned by the NTAC. The NIEM complexity issue is multifaceted and will require further evaluation by the NTAC, NBAC, and NC&OC Committee Support Managers. The NBAC and NTAC initiatives to assess the value of a NIEM Business Component Layer or a Business Component Library (BCL) may offer a partial solution by providing an abstraction layer that insulates the developer from some aspects of NIEM's complexity. Training improvement might better prepare developers to deal with NIEM's complexity. Further study is needed to assess the IEPD development and runtime impacts of the complexity issue.

**NIEM Content:** The content issues are being addressed from several angles. The issue of inadequate or no definitions for as many as 600 data elements is being addressed as part of the upcoming NIEM 2.1 minor release. Release 2.1 will also include harmonization of many elements across the DHS-sponsored domains. Further improvements in the harmonization process will be implemented in 2009. Processes and tools are being defined to facilitate domain independence.

**IEPD Development:** The five IEPD Development issues cover several areas. Current NIEM initiatives addressing some of these areas include NIEM adoption and use tracking (NC&OC), NIEM Business Component Library (BCL) (NBAC/NTAC), NIEM development tools (NTAC), and NIEM Value Proposition (NBAC). The issue of NIEM's role in routing standards is a policy, as well as technical, issue and is under study. Further work is needed in the important area of IEPD development.

**IEPD Implementation:** Resolution of implementation issues is critical to achieving the NIEM vision for operational information interoperability and sharing. With the rapid increase in IEPD development over the last year, the NIEM PMO expects to see a dramatic increase in IEPD implementation in the coming months. The multifaceted approach to addressing implementation issues will include model refinements, development of implementation guidelines and best practices, and expansion of NIEM training modules to address implementation.

***Training:*** Training program improvement is an ongoing process. The training issues identified by the focus group will become primary drivers for this process. In particular, improvements to address specific stakeholder needs are being assessed.

***Tools:*** Multiple tool issues were identified by the Focus Group. These issues are providing critical input to the tools improvement process including the recent development by the NTAC of the High-Level Tools Architecture.

## 11 Appendix C—Glossary and Acronyms

<b><u>Term</u></b>	<b><u>Definition</u></b>
<b>BCL</b>	Business Component Library
<b>CALEA</b>	Communications Assistance for Law Enforcement Act
<b>CJIS</b>	Criminal Justice Information System
<b>COI</b>	Community of Interest
<b>DHS</b>	U.S. Department of Homeland Security
<b>DOJ</b>	U.S. Department of Justice
<b>EDXL</b>	Emergency Data Exchange Language
<b>HL7</b>	Health Level Seven—American National Standards Institute (ANSI) standard
<b>HLVA</b>	High-Level Version Architecture
<b>IEP</b>	Information Exchange Package
<b>IEPD</b>	Information Exchange Package Documentation
<b>IPSTSC</b>	IJIS Public Safety Technical Standards Committee
<b>IT</b>	Information Technology
<b>JRA</b>	Justice Reference Architecture
<b>LEXS</b>	Logical Entity eXchange Specifications <sup>6</sup>
<b>NBAC</b>	NIEM Business Architecture Committee
<b>NCOC</b>	NIEM Communication and Outreach Committee
<b>NCCT</b>	NIEM Configuration and Control Tool
<b>NDR</b>	Naming and Design Rules
<b>NEIEN</b>	National Environmental Information Exchange Network
<b>NGI</b>	Next Generation Identification
<b>NIEM</b>	National Information Exchange Model
<b>NIEM PMO</b>	NIEM Program Management Office
<b>Nlets</b>	The International Justice and Public Safety Network ( <a href="http://www.nlets.org">www.nlets.org</a> )
<b>NTAC</b>	NIEM Technical Architecture Committee

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<sup>6</sup> LEXS originally stood for LEISP Exchange Specifications.

<b><u>Term</u></b>	<b><u>Definition</u></b>
<b>ODNI</b>	Office of the Director of National Intelligence
<b>PMO</b>	Program Management Office
<b>ROI</b>	Return On Investment
<b>Schematron</b>	A rule-based validation language for making assertions about the presence or absence of patterns in XML trees
<b>SIP</b>	Service Interaction Profile
<b>SSGT</b>	Subset Schema Generation Tool
<b>WSDL</b>	Web Service Definition Language