NIEM and SDOs

An overview of issues related to NIEM aligning with a Standards Development Organization (SDO).

5/7/20

The NIEM program is in the process of establishing its products as standards, by establishing itself as a standards development organization, through a vetting process with NIST.

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# 1. Introduction

NIEM is a technical standard, or a set of technical standards. The NIEM organization is not a recognized standards developing organization (SDO)

# 2. Objectives of an SDO strategy

What does NIEM hope to get out of an SDO strategy?

## 2.1. Make NIEM a standard

A common argument made is that NIEM is “not a standard”. NIEM is currently classified as a *voluntary consensus standard*, which is self-asserted, and carries little weight. Although NIEM is a standard, its claim is weakened by not being aligned with a recognized standards development organization. NIEM's alignment with an SDO, or the NIEM organization becoming an SDO, would resolve this complaint.

This begs the question of what NIEM products to standardize through a standardization process (q.v.).

## 2.2. Increase adoption of NIEM

Establishing NIEM products and standards is expected to increase adoption and use of NIEM in some communities. Establishing NIEM products as standards is expected to benefit adoption within:

* NATO
* Other international organizations and users
* DOD / MilOps users

## 2.3. Increase participation

Aligning with an SDO could bring more participants into the governance process. This would result in products that better represent a larger community. Products would also receive more scrutiny, testing, and review, resulting in stronger products.

A caveat is that it is important that the participants in governance represent the user community; many

## 2.4. Increased alignment with other standards

An advantage of working with an SDO may be better alignment of NIEM products with the other products of an SDO.

* Alignment with OMG would lead towards a UML-centric set of products, ensuring NIEM would work with UML tool sets, and appeal to the UML-using community.
* Alignment with OGC may lead to NIEM being modified to work well with GML tools, models, and methodology.
* Alignment with W3C may lead to better integration of NIEM with XML standards, JSON-LD, and RDF/RDFS/OWL.

# 3. Problems with SDO participation

There are hazards associated with aligning with an SDO.

## 3.1. Increased cost of participation

Participation in an existing Standards Development Organization can be expensive. Many SDOs require that participants in governance become members, with annual fees. Many SDOs require that governance takes place at large in-person meetings, requiring time and travel for participants, as well as conference fees.

NIEM has been governed by government employees, who usually have limited ability to pay for memberships, or to pay for travel and conference fees.

## 3.2. Mismatch of participation

Many standards organizations are governed by vendors.[[1]](#footnote-1)[[2]](#footnote-2) Participation by companies entails that the principles and priorities will benefit the vendors, rather than NIEM users.

NIEM is governed by its user community, primarily government employees and their contractors. This ensures that NIEM products serve the needs of its users.

Moving from governance by users to governance by vendors (or another community) will change the focus of NIEM and its products, and may reduce the function of NIEM for its users.

## 3.3. Increased cost of operations

NIEM operations are minimally funded. Governance of the model is conducted with a small amount of contractor support.

SDO requirements for increased process, visibility, and more complicated artifacts, will increase the expense of governing and supporting the NIEM program.

## 3.4. Startup costs

Initiating alignment to an SDO will entail costs. Meetings, analysis, and updating of tools and artifacts, all will cost time and labor.

## 3.5. Loss of control of participation

Although individual governance bodies within the NIEM organization are basically autonomous, the NIEM management office has a great deal of control of the direction of the program, and who participates in governance.

With an SDO approach, this level of control may be reduced. This may lead to difficult situations.

For example, a problem user may participate and stonewall NIEM operations, leading to slower or ineffective governance processes.

## 3.6. Restricted distribution of products

Many SDOs restrict availability of their standards to members or require payment for copies of standards, limiting their usability to the users.

For example, ISO charges 198 Swiss francs for a single GML standard.[[3]](#footnote-3) ANSI charges $232.00 for the PDF, while ANSI members can purchase it for $185.60.[[4]](#footnote-4) No single standard stands alone; a user may require a dozen related standards to specify a solution, and costs can run into thousands of dollars.

NIEM standard products are freely available on the open web, ensuring that they can be used or reviewed by any interested party.

## 3.7. Long timelines for updates

Governance processes can take a lot of time, even in the best of circumstances. An SDO can extend processes to a much longer timeline. For example, an ISO standard can take years to certify, and more years to update.

NIEM's current timeline is an annual cycle, a much shorter and more frequent update cycle than most SDOs support.

# 4. NIEM engagements with SDOs

NIEM has engaged directly with SDOs in the past.

## 4.1. OMG NIEM-UML Profile

The NIEM-UML profile was created and shepherded through the OMG standardization process by ModelDriven, a vendor and member of OMG. The process was driven by the vendor, with little guidance from the NTAC. The latest draft of the NIEM-UML specification is not up to date with the latest NIEM release, due to lack of continued funding for the vendor to maintain it. The resulting product has not been found to fit the purpose for which it was envisioned.

## 4.2. ANSI/NIST Biometrics

Kamran Atri, in his work with DHS, had NIEM products certified as standards through an engagement with ANSI and NIST. This is the same process currently being embraced by the NIEM Management Office.

## 4.3. OGC Geo4NIEM

The Geo4NIEM effort occurred within OGC's Testbed 11. It was a cooperative effort to integrate NIEM data with OGC data and services. The engagement was a success, and led to small changes in the NIEM release to facilitate use of GML data within NIEM messages.

# 5. Products that can be standards

NIEM has many different products that could become standards.

## 5.1. Core NIEM specifications

Including:

* The NIEM Naming and Design Rules
* The NIEM JSON Specification
* The NIEM Code Lists Specification
* The NIEM Conformance Targets Attribute Specification

## 5.2. NIEM IEPD usage specifications

Including:

* The NIEM Model Package Description (MPD) Specification
* The NIEM Conformance Specification

## 5.3. The NIEM data model

The NIEM data model could be standardized. This may involve:

* The NIEM Schema release
* Metamodel products

# 6. NIEM's current direction

The NIEM Management Office is working with Kamran Atri on a standardization approach with NIST and ANSI that may be nearly ideal. The effort focuses on certifying the NIEM organization as an SDO, with open, verified processes and artifacts.

The ANSI process will certify NIEM as an *ANSI-Accredited Standards Developer* (ASD), which will enable the NIEM organization to certify its products as *American National Standards*. This will involve a good deal of work by all parties associated with NIEM, but should allow NIEM to control its governance, and to ensure that products meet the requirements of NIEM users.

The NIEM management office has begun analyzing a set of requirements based on an ANSI document.[[5]](#footnote-5). The plan is to execute the ANSI requirements within the NIEM organization. This will involve updating organizational charters, documenting and updating processes, and revising products to incorporate ANSI language.

## 6.1. Relevant text from ANSI Essentials

The following text is from the ANSI Essentials document.[^ANSI\_Essentials]

§4.1 Accreditation of American National Standards Developers

A standards developer whose procedures meet the requirements of due process and criteria for approval and withdrawal of American National Standards contained herein and is incorporated, registered or otherwise recognized as a legal entity, may apply to ANSI for accreditation. To be accredited by ANSI, the developer’s procedures and practices for standards development shall meet the criteria for accreditation as set forth below. The ANSI Executive Standards Council (ExSC) is the accrediting body for developers of American National Standards. Accreditation is a pre-condition for submitting a standard for consideration for approval as an American National Standard.

§4.2 Approval of actions in connection with American National Standards

A standard developed by an ANSI-Accredited Standards Developer may be approved as an American National Standard by the ANSI Board of Standards Review (BSR) or by an ANSI Audited Designator

§4.7.2 Continuous maintenance of American National Standards

Continuous maintenance is defined as the maintenance of a standard by consideration of recommended changes to any part of it according to a documented schedule for consideration and action by the consensus body. The standard shall be maintained by an accredited standards developer. A documented program for periodic publication of revisions shall be established by the standards developer.

# 7. Conclusion

The NIEM program appears to be engaged in a productive process that will align NIEM existing governance and products with a standards certification process. The result should be a NIEM organization that functions to satisfy the needs of its users, with products that are certified as recognized standards.

1. W3C Current Members: <https://www.w3.org/Consortium/Member/List> [↑](#footnote-ref-1)
2. OMG Current Members: <https://www.omg.org/cgi-bin/apps/membersearch.pl> [↑](#footnote-ref-2)
3. ISO 19136-1:2020: Geographic information — Geography Markup Language (GML) — Part 1: Fundamentals. <https://www.iso.org/standard/75676.html> [↑](#footnote-ref-3)
4. ANSI WEBSTORE: ISO 19136-1:2020: Geographic Information - Geography Markup Language (GML) - Part 1: Fundamentals. <https://webstore.ansi.org/Standards/ISO/ISO191362020> [↑](#footnote-ref-4)
5. ANSI Essential Requirements: Due process requirements for American National Standards. January 2020. [link](https://share.ansi.org/Shared%20Documents/Standards%20Activities/American%20National%20Standards/Procedures,%20Guides,%20and%20Forms/2020_ANSI_Essential_Requirements.pdf) [↑](#footnote-ref-5)