HL7 C-CDA SURVEY AND IMPLEMENTATION-A-THON FINAL REPORT

Duteau Design Inc.
EXECUTIVE SUMMARY

The C-CDA 2.1 Survey and Implementation-A-Thons project was focused on the discovery of C-CDA content inconsistencies via surveys and in-person Implementation-A-Thons and was designed to be delivered in three parts:

- Create a survey to assist HL7 in identifying C-CDA inconsistencies;
- Plan, create and conduct two Implementation-A-Thons; and
- Create and distribute a report reflecting the results of the survey and Implementation-A-Thons.

The project team wished to integrate survey and Implementation-A-Thon (IAT) findings with the delivery of the C-CDA R2.1 Companion Guide project. High-level processes included:

1. Review of:
   1. 2015 Certification Requirements
   2. C-CDA R2.1 Standard
2. Incorporate review analysis in content surveys
3. Incorporate survey results in IAT Scenarios
4. Conduct IAT workshops
5. Incorporate IAT findings in C-CDA R2.1 Companion Guide

Two surveys were created. Survey #1 was issued on November 10, 2015 and was focused on identifying C-CDA R2.1 pain points. Survey #2 was issued on March 7, 2016 and was intended to gauge respondent awareness and review of CDA-related resources (i.e. education, HL7 listservs, HL7 Helpdesk, C-CDA R1.1 Companion Guide, etc.). Both surveys closed on June 16, 2016.

Key Findings:

- C-CDA has issues with Terminology, Optionality and Complexity
- Out of CCD, Discharge Summary, Referral Note and Care Plan, CCD has the greatest implementation readiness and support
- Respondents expressed an interest in the concept of an Implementation-A-Thon
- Awareness and utilization of help/education resources is low

Industry participants were invited to two IATs. While the IATs are open to all C-CDA implementers, the target audience was "heavy implementers" such as vendors and providers that perform their own programming.

Two IATs were conducted. IAT #1 was held January 7-8, 2016 at the University of Central Florida, Executive Development Center in Orlando. IAT #2 was held April 14-15, 2016 at the DePaul University Student Center in Chicago.
The purpose of IAT #1 was two-fold:

- Work through clinical scenarios to uncover issues with C-CDA 2.1 and/or Meaningful Use rules
- Set a baseline IAT approach that could be evaluated and adjusted for IAT #2 if necessary

IAT #2 had a similar purpose:

- Work through clinical scenarios to uncover issues with C-CDA 2.1 and/or Meaningful Use rules - with a focus on the Common Clinical Data Set
- Continue to evaluate the baseline IAT format and review for suitability for future IATs

The IATs uncovered specification-related issues - grouped into four broad categories:

- Terminology - e.g. units of measure not valid UCUM
- Understanding - e.g. only allowing a binary advanced directive (i.e. yes/no) as opposed of details of the advanced directive
- Interpretation - e.g. variations in some data points (e.g. start/end dates, dosing instructions - i.e. dosage of 5 mg vs 5 mg once daily)
- Specification Ambiguity - e.g. It is not always clear what should be documented in each section

IAT #2 identified a number items to be addressed by the C-CDA R2.1 Companion Guide Project, including:

- Use of the Medical Equipment section to communicate information about implanted devices.
- How to capture Birth Sex and Gender Identity
- Approaches for documenting "No Known Allergies" - including differences between "No Known Allergies" and "No Information about Allergies"
- Guidance regarding use of "entries required" section templates
- The difference between a "Health Concern" and a "Problem"
- Approaches to recording a tapered dosage for medications
- How to document lab tests with results and lab tests without results
- How to document current vs. historical smoking status

The Project Team makes the following recommendations:

- Recommend HL7 focus on addressing issues identified in the survey - i.e. the community is largely unaware and unsure of the value proposition of education offerings, and the community does not feel HL7 has a forum geared strictly towards implementers or those looking for definitive answers to C-CDA questions.
- Recommend HL7 consider continuing the use of IATs as a way to interact directly with the implementer community
- Recommend HL7 consider the suitability of IATs for other HL7 C-CDA standards
BACKGROUND

The C-CDA 2.1 Survey and Implementation-A-Thons project was focused on the discovery of C-CDA content inconsistencies via surveys and in-person implementation-a-thons and was designed to be delivered in three parts:

- Create a survey to assist HL7 in identifying C-CDA inconsistencies. Distribute the survey to industry constituents, including people who have taken an HL7 C-CDA educational course over the past two years, as well as ‘heavy users’ of C-CDA such as Sequoia, Massachusetts eHealth Collaborative (MAeHC), Connect Virginia and/or other Health Information Exchanges (HIE) participants. In addition, the survey should be issued to large healthcare systems such as to Intermountain Healthcare, Kaiser, Mayo, etc.
- Plan, create and conduct two Implementation-A-Thons; one planned for November 2015 at the HIMSS Innovation Center in Cleveland, Ohio and the other planned for March 2016 in connection with the HL7 Implementation Workshop. While the Implementation-A-Thons can be open to all C-CDA implementers, the target audience should be ‘heavy implementers’ such as vendors and providers that perform their own programming.
- Create and distribute a report reflecting the results of the survey and Implementation-A-Thons. The report should also provide data needed to identify C-CDA inconsistencies as well as prioritize and recommend the necessary resources to implement consistent results.

Specifically, the above mentioned report should include:

a) A list of the top technical inconsistencies reported across current implementations
b) A list of undesirable optionality, requiring complex coding or parsing requirements
c) Guidance and polices from HL7’s Vocabulary Work Group and Terminology Authority for standardizing terminology across document types, sections and use cases
d) Other issues impacting syntactic and semantic interoperability
e) Enhancements that need to be made to C-CDA testing tools, such as the Substitutable Medical Apps and Reusable Technology (SMART) Program
f) A list of recommendations and best practices for resolving inconsistencies found in a) through d) above, and which will form the basis for a Companion Guide
APPROACH

The project team wished to integrate survey and Implementation-A-Thon (IAT) findings with the delivery of the C-CDA R2.1 Companion Guide project - which was also managed by our team. This integration is illustrated below and high-level processes included:

1. Review of:
   1. 2015 Certification Requirements
   2. C-CDA R2.1 Standard
2. Incorporate review analysis in content surveys
3. Incorporate survey results in IAT Scenarios
4. Deliver IAT
5. Incorporate IAT findings in C-CDA R2.1 Companion Guide

SURVEYS

Two surveys were created. Survey #1 was issued on November 10, 2015 and was focused on identifying C-CDA R2.1 pain points. Survey #2 was issued on March 7, 2016 and was intended to gauge respondent awareness and review of CDA-related resources (i.e. education, HL7 listservs, HL7 Helpdesk, C-CDA R1.1 Companion Guide, etc.). Both surveys closed on June 16, 2016. Survey respondents that only completed Survey #2 were given the opportunity to answer questions from Survey #1 as part of completing Survey #2.

FINDINGS

SURVEY RESPONDENTS

While targeted at large-scale implementers, respondents of survey #1 included:
- Vendors (36%)
- HIEs (34%)
- Providers (9%)
- Government, University or Non-Profit organizations (9%)
- Other (12%)

Figure 1: Survey #1 Respondent Categories (n=68)

Survey #2 also targeted large-scale implementers, respondents included:

- Vendors (37%)
- HIEs (13%)
- Providers (13%)
- Government, University or Non-Profit organizations (13%)
- Consultants (12%)
- Payers (3%)
- Other (10%)
Finding #1 - Common Issues with C-CDA include:

- Terminology - Inconsistent terminology usage, issues with value set accessibility and use of non-compliant vocabulary by implementers
- Optionality - More than one way to do things and inconsistent implementations across vendors
- Complexity - The C-CDA standard is difficult to understand and consume and is exacerbated by a lack of clearly documented examples

Finding #2 - Of the three document types discussed in survey #1, CCD had the greatest support.
Finding #3 - Respondents had interest in attending Implementation-A-Thons

Finding #4 - Awareness and utilization of help/education resources is low

- Very few have taken advantage of CDA education offered by HL7. Reasons for not taking advantage of education included cost concerns, a lack of awareness and uncertain value proposition.
- Very few make use of the Structured Documents Listserv. Reasons included a lack of awareness of what it is as well as too much noise to signal ratio.
- Very few take advantage of the HL7 CDA Help Desk. Reasons included a lack of awareness that it exists and not being aware of what kind of assistance could be provided.
- The C-CDA R1.1 Companion Guide was a useful but largely unknown resource. The extra rationale, descriptions and comparison between document templates was useful, but many were not aware of its existence.
IMPLEMENTATION-A-THONS

One of HL7’s first strategies for improving consistency of C-CDA implementations across health IT developers is to directly engage with industry players (vendors, healthcare providers, payers and health information exchanges) to identify existing C-CDA issues and formulate best practices. Industry participants were invited to two IATs. While the IATs are open to all C-CDA implementers, the target audience was "heavy implementers" such as vendors and providers that perform their own programming.

Two IATs were conducted:

- January 7-8, 2016 at the University of Central Florida, Executive Development Center in Orlando
- April 14-15, 2016 at the DePaul University Student Center in Chicago

IAT #1 - ORLANDO

The purpose of IAT #1 was two-fold:

- Work through clinical scenarios to uncover issues with C-CDA 2.1 and/or Meaningful Use rules
- Set a baseline IAT approach that could be evaluated and adjusted for IAT #2 if necessary

APPROACH

The philosophy for IAT #1 was to be one of "observe and document" while participants capable of creating CDA instances created files for consumption and import by participants capable of consuming CDA Instances. The project team wanted participants to work through pre-defined scenarios at the event so that issues experienced by participants as well as their thought process for addressing issues could be observed and documented as an input for the C-CDA R2.1 Companion Guide project. Four scenarios were developed for each document type with the aim of exercising each section template across the scenarios:

- Common Clinical Data Set. This scenario would include all information required by the 2015 Edition Certification Criteria Data Set to Consolidated CDA.
- C-CDA R2.1 Minimum Mandatory. This scenario would include the minimum amount of information as allowed by the C-CDA R2.1 document template.
- C-CDA R2.1 Minimum Mandatory with Unknown Sections. This scenario would include the minimum amount of information as allowed by the C-CDA R2.1 document template and would use nullFlavor declarations (e.g. unknown, no information, etc.) where permitted.
- C-CDA R2.1 Full. This scenario would include all of the section information as defined in the C-CDA R2.1 document template.

Leading up to the IAT, a series of conference calls were held on December 16, December 22, December 29 and January 5. The purpose of these calls were to:
• Gauge participant capabilities - e.g. can they create, can they consume, what document types do they support, etc.
• Socialize the approach and notional agenda for the IAT
• Address participant questions in advance of the IAT

During the event itself, participants were able to use the SITE C-CDA Validator (http://sitenv.org/c-cda-validator) with ONC technical support on site at the event. CDA Instances created by participants were saved as XML files and exchanged using flash drives as opposed to having creating systems connect directly with consuming systems.

AGENDA

THURSDAY, JANUARY 7, 2016

0900-1000 Introductions
1000-1200 CCD Testing
1200-1300 Lunch
1300-1400 CCD Testing (continued)
1400-1700 Discharge Summary Testing

FRIDAY, JANUARY 8, 2016

0900-1200 Referral Note Testing
1200-1300 Lunch
1300-1500 Discussion about Testing
1500-1600 Discussion about next IAT
PARTICIPANTS

- Joginder Madra (Facilitator)
- Jean Duteau (Facilitator)
- Dave Hamill (HL7)
- Karen van Hentenryck (HL7)
- Matt Rahn (ONC)
- Nagesh Bashyam aka Dragon (ONC)
- Dr. Julia Skapic (ONC)
- Calvin Beebe (Mayo Clinic)
- Ben Flessner and Dave Sundaram-Stukel (Epic)
- Dave Camp, Peter James and Kenny Tomlinson (Wellcentive)
- Raychelle Fernandez and Ozlem Kurt (Dynamic Health IT)
- Dave Carlson (Mieweb)
- Lisa Nelson (Life over Time Solutions)
- Joe Lamy (Aegis / Sequoia)
- Russ Leftwich (Intersystems)
- George Cole (Allscripts)
- Angel Pinzón (APS Puerto Rico)
- Linda Michaelsen (Optum)
- Luis Jimenez, Michele Boursiquot, Clint Walker, and Luis Silva (Document Storage Systems)
- Dmitry Shalamov (NextGen)
- Dante Hoyte (USF)
- Mario Nears (USF)

IMPLEMENTATION-A-THON #1 OBSERVATIONS AND FINDINGS

VENUE

The venue was excellent and the room was well-suited to the agenda. Participants were able to easily engage in conversations with each other and people were able to grab coffee, lunch etc. from the attached break room without disturbing others. Some participants did have issues with connecting to VPNs or non-Exchange based email. In speaking with venue staff, this was a function of the limitations placed on guest access to the UCF network. The only way to address the concerns would be to set up at least one named account for use by participants. However, there was not enough time to do this once the event had started.

PARTICIPANTS

Participants were largely drawn from vendor organizations, though independent consultants and students were also in attendance. Interaction between participants at the event was very good and contributed largely to the collaborative nature of the event. At various points in the agenda, participants would engage in conversations with each other as they worked through issues.
FINDINGS

Specification-related issues uncovered by participants can be grouped into four broad categories:

- Terminology
- Understanding
- Interpretation
- Specification Ambiguity
<table>
<thead>
<tr>
<th>Terminology</th>
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<th>Interpretation</th>
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</tr>
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<tbody>
<tr>
<td>• LOINC codes were not always understood</td>
<td>• Some systems only support a single primary language</td>
<td>• Some variations in some data points (e.g. start/end dates, dosing instructions - i.e. dosage of 5 mg vs 5 mg once daily)</td>
<td>• It is not always clear what should be documented in each section (e.g. Plan of Care)</td>
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<tr>
<td>• Units of measure not valid UCUM</td>
<td>• Some systems only allow a binary advanced directive (i.e. yes/no) as opposed of details of the advanced directive</td>
<td>• Some variations in document template choice (e.g. CCD ambulatory vs. CCD)</td>
<td>• There are multiple places to record medication information (e.g. Medications, Admission Medications, Discharge Medications, etc.). It would be good to clarify which sections are used in which circumstances.</td>
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<tr>
<td>• Different vocabulary (i.e. codes, code systems) used for procedures, problems, etc.</td>
<td>• ID usage is a problem place - e.g. systems assigning their own IDs where IDs already exist or are not present</td>
<td>• ID usage is a problem place - e.g. systems assigning their own IDs where IDs already exist or are not present</td>
<td>• Because document templates are open, it appears that one could legally use a CCD and add discharge summary sections (e.g. discharge medications) for discharge summary usage scenarios. It would be good to provide clarification on how discharge summary information should be structured in the Companion Guide.</td>
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<td>• Stylesheet usage can be an issue if receiving systems use vendor stylesheets as they may have errors. Although the base standard indicates that it documents should be stylesheet agnostic.</td>
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<td>• It is important to remember that there is a different context for medications, admission medications, administered medications and discharge medications. Important to have guidance on when to use which and if it is appropriate to &quot;repeat&quot;</td>
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<td>• It is difficult to determine if information on a clinical document pertains to the patient or to an encounter (i.e. is this information something that was determined during the encounter or is this information something that was associated with the patient prior to the encounter?)</td>
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<td></td>
<td></td>
<td>• Ambiguity</td>
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July 15, 2016
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<td>information for the sake of adding sections to meet certification requirements. Use of subsections could help, but there is no guidance to vendors in terms of how section/subsection information should be consumed or displayed to end users.</td>
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<td>• Common misunderstanding of what information should be in procedures sections vs. what information should be in results section.</td>
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<td>• Companion Guide should highlight the necessity to drill down (i.e. ask more than one question) when the patient is a non-smoker as the concept of non-smoker does not exist in the abstract as the existing concepts are &quot;never smoked&quot; and &quot;former smoker&quot;.</td>
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<td>• Examples Task Force is leaning towards having UDI's in the medical equipment section. Companion Guide project will need to provide guidance on how to handle medical equipment.</td>
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July 15, 2016
PARTICIPANT FEEDBACK

Participant reaction to the event was overwhelmingly positive as evidenced by formal evaluations as well as comments during the event itself. Specific feedback provided by participants included:

- Receiver show and share session was valuable
- Data entry takes a lot of time. It would be helpful to have scenario information in advance.
- Participants suggested using collaboration tools such as skype channels to continue discussion amongst the community
- Some of the discussions waded into areas where there may be different stakeholders/participants/SMEs. Future IATs may need to consider different tracks.
- Having ONC representation was valuable and the impromptu "Ask the ONC" sessions were very well received
- In-person participation is conducive to collaboration
- Consider having a common set of samples that are created ahead of time for consumption by receivers during the IAT and review how info was consumed perhaps in conjunction with having a strong, robust narrative for physicians to enter in advance to see if different entry styles would affect interoperability
- Strong suggestion to keep approach of taking transport considerations out of the IAT - i.e. continue to exchange documents via shared folders or USB drives

C-CDA SAMPLE ANALYSIS FINDINGS

There was only one C-CDA Scenario that was completed by all the vendors. Some of the differences can certainly be attributed to the participant's knowledge of clinical terminology. This led to the feedback that it would have been helpful to have the scenario information in advance so that proper entry could have occurred. Notwithstanding this, some broad post-event analysis of the various samples led to the following findings:

CCD Header

- Ethnicity not properly coded in all cases
- The given ID was not used in all cases
- Although only an Author was specified, some samples included extensive provider information, i.e. Responsible Party, Authenticator, etc.

Allergies and Intolerances

- Although all samples conveyed the concept of "No Known Allergies", there was no consistency in how this concept was conveyed.
Medications

• The only difference between the samples was in the Dosage Instructions.

Problems

• All samples provided the two scenario problems, but the code systems were different - ICD10, ICD-9 and SNOMED CT were used.

Procedures

• Only one sample had a Procedures section.

Results

• The samples were consistent in how they conveyed the lab test results.

Vital Signs

• The samples were consistent in how they conveyed the vital signs information.

Immunizations

• One sample provided summary information
• The other samples were consistent in conveying the Immunization data.

Medical Equipment

• Only one sample had a Medical Equipment section.

Plan of Treatment

• Although most samples had a Plan of Care section, only one sample contained the actual scenario Plan data.

*C-CDA SAMPLE CONCLUSIONS*

• The proper data in the CDA Header needs to be explained. This might have been a lack in our scenario data but we expected to only see Author information.
• There is still a need to focus on the Common Clinical Data Set in C-CDA implementations as these mandatory sections were not implemented consistently.
• Implementers need to have a consistent means to convey "No Known <information>". The C-CDA Examples Task Force has examples that should be pointed out to implementers.
IAT #2 - CHICAGO

The purpose of IAT #2 was two-fold:

- Work through clinical scenarios to uncover issues with C-CDA 2.1 and/or Meaningful Use rules - with a focus on the Common Clinical Data Set
- Continue to evaluate the baseline IAT format and review for suitability for future IATs

APPROACH

The philosophy for IAT #2 continued the "observe and document" approach taken in IAT #1 where participants capable of creating CDA instances created files for consumption and import by participants capable of consuming CDA Instances. The project team wanted participants to work through pre-defined scenarios at the event so that issues experienced by participants as well as their thought process for addressing issues could be observed and documented as an input for the C-CDA R2.1 Companion Guide project.

There were a few adjustments to the approach for IAT #2:

- Patient information was released in advance so that participants could minimize time at the IAT dealing with patient set up.
- An additional four CCDS-focused scenarios - i.e. "Homework Scenarios" - were provided to participants in advance of the IAT with the expectation that participants would arrive at the IAT with these instances ready for consumption.
- HL7 set up a Slack room and invited IAT #2 participants to join. Slack was used to share scenario and event information to participants and provided participants a forum to interact with each other and the project team in advance of the event.

Leading up to the IAT, a series of conference calls were held on February 16, March 8, March 15, March 22, March 29 and April 5. The purpose of these calls were to:

- Gauge participant capabilities - e.g. can they create, can they consume, what document types do they support, etc.
- Socialize the approach and notional agenda for the IAT
- Address participant questions in advance of the IAT

Participants were again able to use the SITE C-CDA Validator (http://sitenv.org/c-cda-validator) with ONC technical support on site at the event. CDA Instances created by participants were saved as XML files and exchanged using Dropbox as opposed to having creating systems connect directly with consuming systems.
AGENDA

THURSDAY, APRIL 14, 2016

0900-1000 Introductions/Housekeeping
1000-1100 CCD Homework Scenarios
1100-1200 Discharge Summary Homework Scenarios
1200-1300 Lunch
1300-1400 Referral Note Homework Scenarios
1400-1500 Care Plan Homework Scenarios
1500-1700 CCD In-Session Scenarios

FRIDAY, APRIL 15, 2016

0900-1100 Discharge Summary In-Session Scenarios
1100-1200 Referral Note In-Session Scenarios
1200-1300 Lunch
1300-1400 Referral Note In-Session Scenarios (cont.)
1400-1600 Care Plan In-Session Scenarios
1600-1700 Wrap Up and Discussion

PARTICIPANTS

- Joginder Madra (Facilitator)
- Jean Duteau (Facilitator)
- Dave Hamill (HL7)
- Karen van Hentenryck (HL7)
- Wayne Kubick (HL7)
- Matt Rahn (ONC)
- Nagesh Bashyam aka Dragon (ONC)
- Calvin Beebe (Mayo Clinic)
- Brett Marquard (River Rock Associates)
IMPLEMENTATION-A-THON #2 OBSERVATIONS AND FINDINGS

VENUE

The venue was excellent and the room was well-suited to the agenda. Participants were able to easily engage in conversations with each other. Learning from the experiences from IAT #1, HL7 worked with venue staff to set up participant accounts prior to the event. DePaul University staff were on hand to help with any technical issues during the IAT and participants did not report any issues with internet or VPN access.

PARTICIPANTS

Participants were largely drawn from vendor organizations - with many IAT #1 participants returning for IAT #2. Interaction between participants at the event was very good and contributed largely to the collaborative nature of the event. At various points in the agenda, participants would engage in conversations with each other as they worked through issues.

FINDINGS

More time was spent uncovering questions with respect to CEHRT requirements and proposing approaches to be documented in the Companion Guide. The IAT produced consensus with respect to the following guidance:

- All devices must be noted in the Medical Equipment section. In the circumstance where the procedure that implanted the device is known, the device information may also be noted in the Procedures section.
- To meet certification requirements, the C-CDA recordTarget/Administrative Gender is the field used to record the Birth Sex and must be coded as follows: M (male), F (female) or a nullFlavor of 'UNK'.
• Gender Identity concepts are to be captured as an observation within the "Social History" section.

Participants also suggested the following items to be addressed in the Companion Guide:

• Approaches for documenting "No Known Allergies" - including differences between "No Known Allergies" and "No Information about Allergies"
• Act.code differences between C-CDA R2.1 and C-CDA R1.1 in the "Discharge Medications" template and how to properly keep backwards compatibility.
• Guidance regarding use of "entries required" section templates and if an "entries optional" template ID needs to be included as well.
• The Care Plan document template specifically precludes the inclusion of a "Plan of Treatment" section.
• The difference between a "Health Concern" and a "Problem".
• Approaches to recording a tapered dosage for medications.
• How to document lab tests with results and lab tests without results
• How to document current vs. historical smoking status

PARTICIPANT FEEDBACK

Participant reaction to the event was again overwhelmingly positive as evidenced by formal evaluations as well as comments during the event itself. During the event wrap up, Dave Hamill asked participants about the viability of future IATs - including the possibility of remote participation. Participants indicated the value they received from participating in the event(s) and strongly indicated their preference for an in-person event as they found in-person interaction with other participants to be invaluable.
LESSONS LEARNED

LESSONS LEARNED FROM THE IATS

- The use of pre-event communication mechanisms such as conference calls and Slack channels with registered participants was very helpful.
- For IATs, facility network security requirements should be explored well in advance of the event so that mitigation strategies (e.g. creating account credentials) can be explored.
- The timing of IAT #1 conflicted with other events such as the IHE Connectathon which affected attendance. Timing of future events should be carefully considered to avoid participant conflicts.
- The "Ask the ONC" portion of each IAT was well received. Any future IATs should have authoring stakeholders (ONC in this case as they authored the 2015 Certification Rules) present to respond to queries about the materials being tested.
NEXT PHASE RECOMMENDATIONS

The Project Team makes a number of recommendations for HL7 to consider:

**Recommendation #1 - HL7 should focus on addressing issues identified in the survey**

The community is largely unaware and unsure of the value proposition of education offerings. Respondents did not take advantage of education offerings (citing cost or value concerns), did not make use of the CDA Help Desk nor did they find value in the Structured Documents Work Group list serv. The survey results suggest people are looking for a way to seek out definitive answers to questions.

**Recommendation #2 - HL7 should consider continuing the use of IATs as a way to interact directly with the implementer community.**

Response to the first two IATs has been overwhelmingly positive. Conversations with vendors at HIMSS indicated a great deal of interest in the concept. While past IAT participants speak strongly in favor of in-person participation, there were some organizations that have asked the project team to look into the possibility of remote participation.

**Recommendation #3 - HL7 consider the suitability of IATs for other HL7 C-CDA standards**

While the first two IATs were geared towards supporting C-CDA R2.1 for the purposes of meeting certification requirements, the positive response to those events suggest that HL7 should evaluate the use of IATs as a way to interact with implementers for other HL7 C-CDA standards.