HL7 C-CDA Implementation-a-Thon
#1 Event Summary

Duteau Design Inc.
1 Introduction

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 will be invited to two Implementation-a-Thons (IAT). While the IATs are open to all C-CDA implementers, the target audience will be ‘heavy implementers’ such as vendors and providers that perform their own programming.

IAT #1 - held at the University of Central Florida Executive Development Center in Orlando on January 7-8, 2016 - was the first of two such planned events in the execution of this strategy.

2 IAT #1 Goals

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

3 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.

4 Agenda

**Thursday, January 7, 2016**

0900-1000 Introductions
1000-1200 CCD Testing
1200-1300 Lunch
1300-1400 CCD Testing (ctnd)
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
5 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)
- 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 Pinzon (APS Puerto Rico)
- Linda Michaelsen (Optum)
- Luis Jimenez, Michelet Boursiquot, Clint Walker, and Luis Silva (Document Storage Systems)
- Dmitry Shalamov (NextGen)
- Dante Hoyte (USF)
- Mario Nears (USF)
6 Observations and Findings

6.1 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.

6.2 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.

6.3 Findings

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

- Terminology
- Understanding
- Interpretation
- Specification Ambiguity

These findings are summarized in Table 1.
### Table 1- IAT #1 Findings

<table>
<thead>
<tr>
<th>Terminology</th>
<th>Understanding</th>
<th>Interpretation</th>
<th>Specification Ambiguity</th>
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</thead>
<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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<td>• Units of measure not valid UCUM</td>
<td>• Some systems only allow a binary advanced directives (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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<td>• Different vocabulary (i.e. codes, code systems) used for procedures, problems, etc.</td>
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<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</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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|             |               | 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?) | structured in the Companion Guide.  
• 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 "repeat" 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.  
• Common misunderstanding of what information should be in procedures |
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<td>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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6.4 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

6.5 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.

6.5.1 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.

6.6 Recommendations for Implementation-a-Thon #2

Based the experiences leading up to, during and immediately after IAT #1, the project team makes the following recommendations to be considered during the planning of IAT #2:

• The use of pre-event conference calls with registered participants was very helpful and should be considered.
• 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 IAT #2 should be carefully considered to avoid participant conflicts.
• In order to maximize productive time, some scenario information (i.e. patient and provider information) should be distributed in advance so participants can pre-load those into their systems.
• There should be a continued emphasis on the participant "show and share" approach.
• There should be a greater emphasis on Discharge Summary and Referral Note scenarios as very few participants in IAT #1 were able to create these documents. Many indicated the ability to create these was in their product pipelines but not in time for IAT #1.