NCPDP Standards and the XML DERFS of August
Model Based Development

Presented By
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July 16 and 22, 2010
Purpose of the Webinar

• Introduce XML
• Focus on business perspective
• Provide the background knowledge needed for review of the MTM and XML Foundation (aka SCRIPT) DERF
• A strategic change for standards development
Background

• NCPDP standards are based on multiple architectures and syntax as needed by industry at the time (Telecom versus SCRIPT)
  – This may cause multiple implementation technologies
• Due to the historical attempt to harmonize, there were also divergent vocabularies and code sets
• Industry need is to adopt more universal external terminologies
  – SNOMED
  – RxNorm
  – Federal Medication Terminologies (FMT)
Background

• NCPDP standards over the years
  – Keeping abreast of technologies

• Converging paradigms
  – Business
  – Information
  – Technology

• A path forward
Why is a new approach needed?

- Increasingly complex data
- Internal and external pressures on standards development
  - Regulatory
  - Business
  - Economic
- Need for harmonization and interoperability
  - Among NCPDP standards
  - With other healthcare standards – HL7, X12, etc.
- Expanding scope demands reusability
What is XML?

• XML (eXtensible Markup Language)
  – A set of rules for encoding documents electronically
    • W3C Recommendation
    • Like HTML, based on SGML (ISO Standard)
  – Designed for data transport and storage
• Widely accepted for communication over the internet
• Widely used for internal business processes
  – Message manipulation / transformation
  – Including many NCPDP member organizations
XML Advantages

• Ability to define structures for specific business purpose
  – XML Schema (XSD)

• Allows
  – encoding information as both
    • machine-readable
    • human-legible
  – supports interoperability between disjointed systems

• Ability to easily “render” information into other presentations
  – Extensible Stylesheet Language (XSL or XSLT)
  – Humans don’t have to read the raw message
XML Impact?

• Currently
  – NCPDP has used XML since SCRIPT version 8.1
  – about 60% of SCRIPT transactions exchanged use XML*

• Changing our technical approach to XML
  – Now based on information model, not legacy structure
  – Legacy translation possible but not an ongoing requirement

• XML-based transactions being developed for
  – MTM
  – Central Fill
  – Tax Advantage
  – Return

*Source: Surescripts
What’s changed?

- The “source” of the definition
  - Information Model vs Message Structure
  - Keeping future development consistent
  - Better enables interoperability

- The definition – The XSD
  - Tag names
  - Structures
  - Usage rules
What’s the same?

- **Content (for the most part)**
  - The information is the same, just presented a little differently
- **Functionality**
  - Still need to accomplish the same result
- **Transactions**
  - Partners still have to exchange information
Model-Driven

What, Why, and How
What does Model-Driven mean?

- Model-Driven Architecture is an approach where a overall model is used to produce various artifacts (XML Schemas, Source Code, Documentation) by applying automated and repeatable transformations to the model
Why Model-Driven?

• Model-Driven is a
  – Investment in *business rules* NOT *technology or platform*
    • *Today’s Java is yesterday’s COBOL*
  – Harmonization vehicle by providing common concepts, definitions and a means for reuse
    • A Patient is a Patient
Why Model-Driven?

• Model-Driven is a
  – Repeatable process
    • Assures consistency across standards and implementation guides through generation
  – Development process
    • Current software development validation and change management are easily integrated
Tools of Model-Driven Work

NCPDP’s Model-Driven Setup

– Rational Software Modeler RSM
– Open Source Eclipse Extensions
  • hyperModel
  • Business Intelligence Reporting Tool (BIRT)
  • Eclipse Modeling Framework
Steps of Model-Driven Work

1. Create Central Platform/Standard Independent Model (PIM)
   - UML Model (Standard Based)
2. Generate XSD (Platform Specific Model)
   - Apply UML to XSD Transformation (hyperModel)
   - Use UML to Word Report Transformation (BIRT)
Creation and Implementation

1. Generate ECL Excel Document, (Platform Specific Model)
   – Use UML to Excel Report Transformation (BIRT)

2. Generate Java Source Code to Create, Consume, and Validate XML documents
   – Use UML to Java Transformation (EMF)
   – Or
   – XSD to Java (JaxB)
NCPDP Migration to a Modeled Development Environment

XML
MTM DERF
XML Foundation DERF
MTM DERF

Medication Therapy Management Data Element Request Form (MTM DERF) came forward in May 2010

Materials have been updated to be in sync with XML Foundation DERF coming forward in August 2010
Contents of the MTM DERF Packet

- DERF.942.Background
  - An overview
- Publication.Background
  - A brief overview of the schemas with application to publishing quarters and impacts on schemas
  - Includes examples of publishing quarters based on example DERF impacts
- NCPDP.XML.Standard document
- NCPDP.Specialized.Implementation.Guide
- Schemas
- MTM.DERF.Documentation
  - Data Dictionary/External Code List requirements
- Analysis document (reference only)
  - Working document of analysis of reusability of “types” in preexisting SCRIPT schema
XML Standard Document

- Foundational requirements of NCPDP implementation guide XML usage
- Common XML use for any NCPDP XML implementation guide
- Common transactions for any NCPDP XML transaction
  - GetMessage
  - PasswordChange
  - Verify
  - Status
  - Error
MTM DERF

• Specialized Implementation Guide
  – Business and Transaction requirements of
    • Census
    • MTM
    • Futures: Central Fill, Tax Advantage, Return Credit
XML DERF is the joint product of the WG11 XML Task Group and the MC Modeling and Methodology Task Group.

SCRIPT sunsetting EDI syntax in version 010.011 and moving to XML-only for future versions.
Contents of the XML Foundation DERF Packet

- **Publication.Background**
  - A brief overview of the schemas with application to publishing quarters and impacts on schemas
  - Includes examples of publishing quarters based on example DERF impacts
- **NCPDP.XML.Standard document**
- **NCPDP.SCRIPT.Implementation.Guide**
- **Schemas**
- **DERF.XML.Documentation**
  - A log of revisions made
  - Data Dictionary/External Code List requirements
- **Analysis document (reference only)**
  - Working document of analysis of reusability of “types” in preexisting SCRIPT schema
Contents of the XML Foundation DERF Packet

Packet also includes
- DERF.942.Background
  - An overview of how we got here
- NCPDP.Specialized.Implementation.Guide
  - Just as reference
- NCI References
  - Reference only. We have been working with National Cancer Institute (maintainers of the NCI Codes for strength, form, etc) to have downloads directly for NCPDP members use. This is a working document to bridge the gap between previous publications of the ECL and the schemas for use of which code sets. The information pointers to the code sets are include in the schemas as annotations. The guidance will also be updated in the Introduction section of the ECL document.
XML Foundation DERF

• XML Standard (same as in MTM DERF)
  – Foundational requirements of NCPDP implementation guide XML usage
  – Common to any NCPDP XML implementation guide

• SCRIPT Standard Implementation Guide (XML only)
  – Transaction requirements of
    • All electronic prescribing transactions
The NCPDP XML Schemas
XML Schemas

There is an organization to the schemas generated from the model

<table>
<thead>
<tr>
<th>Schema</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>transport.xsd</td>
<td>The NCPDP transport.xsd defines the envelope structures for the transactions and highest level elements for each transaction.</td>
</tr>
<tr>
<td>structures.xsd</td>
<td>The NCPDP structures.xsd defines common and reusable domain structures typically composed of datatypes and potentially other structures.</td>
</tr>
<tr>
<td>ecl.xsd</td>
<td>Vocabulary constraints for a business transaction.</td>
</tr>
<tr>
<td>datatypes.xsd</td>
<td>The NCPDP datatypes.xsd defines small, static, reusable structures (structural components) whose usage and validation is not typically impacted by the context of it use. For instance, ZipCode structure and validation is not impacted if it used as part of a pharmacy address or a patient's address.</td>
</tr>
<tr>
<td><strong>Transaction schemas</strong></td>
<td><em>(examples but not limited to....)</em></td>
</tr>
<tr>
<td>script.xsd</td>
<td>The NCPDP script.xsd defines SCRIPT domain transactions</td>
</tr>
<tr>
<td>specialized.xsd</td>
<td>The NCPDP specialized.xsd defines Business Domain Transactions.</td>
</tr>
</tbody>
</table>
Transport Schema

Includes the version of the schemas used for runtime verification and parsing.
Includes the TransactionDomain (SCRIPT, Specialized).
Transport Schema

Routing, identification, fields used in SCRIPT today.
The transactions we know and love....
Elements with common and reusable domain structures. The “base” structure is in datatypes; a specific use (such as mandatory or optional element settings) is an instance in structures.
Datatypes Schema

Small, reusable structures – the “base” structure or element. Datatypes also contains base element sizes – an..2, an..15, n..2, ANDOR, etc.
• Values for elements
  – ChangeofPrescriptionStatusFlag
  – CompoundCode
  – ErrorCode
  – ReasonCode
  – SourceofInformation
The NewRx transaction

The transaction is a request for a new prescription and is sent from the prescriber to the pharmacy.
Specialized Schema (for MTM DERF)
Specialized Schema (for MTM DERF)
Version and Release

• From complex to direct
  – Will be publication date

• Easier identification of schemas (using version elements in transport) and implementation guides – same convention
  – Schemas version 201008
  – Imp guide version 201008
  – Dictionary, ECL version 201008

• See Publication Background document in DERF packet for guide, examples
Download the DERF packets from the Maintenance and Control (MC) member page:

  
  - Scroll to August DERF section

- DERFs should be posted during the week of July 19th
NCPDP Migration to a Modeled Development Environment

Timeline for Migration
To Date

- SCRIPT – 2010
- Specialized
  - MTM and Census – 2010
- Telecommunication
  - Very limited analysis at this point
Next XML Development

• Specialized transactions in development
  – Central Fill – 2011
  – Tax Advantage – 2011
  – Return Credit – 2011
• Telecommunication – analysis to begin but will take awhile
• Telecommunication-related implementation guides – TBD
• Other NCPDP implementation guides - TBD
Next XML Development

Publication from the Model
• ECL
• Data Dictionary
• Implementation Guides
Presentation and Webinar Copies

• A copy of the presentation may be downloaded from the NCPDP Maintenance and Control Web Page
  http://www.ncpdp.org/members/mc/NCPDP_Standards_DERFs_August.pdf

• A copy of the recorded Webinar may be downloaded from the NCPDP Maintenance and Control Web Page following the July 22, 2010 Webinar
  http://www.ncpdp.org/members/mc/NCPDP_Standards_DERFs_August_Webinar.wmv
How to Join the Fun

• August WG Meeting – August 4, 2010 1:30 – 5:00 PM – MC Modeling & Methodology Task Group

• To join the MC Modeling & Methodology Task Group email sthompson@ncpdp.org

• To join the WG11 XML Task Group email lgilbertson@ncpdp.org
Questions?
Thank you to the Veterans Health Administration for the belief in the project, the practical application, and the important participation of Galen Mulrooney, Sean Muir, and Freida Hall.

Thank you to the active participants of the MC Modeling & Methodology Task Group and the SCRIPT XML Task Group.

You are all very much appreciated!
Thank You For Participating

See you in August