HDD Access

Achieving and Maintaining Interoperability Across the Enterprise: Open Source Solutions in Connecting Vendors and Health Systems.

An Open Source Solution for Interoperability
What is HDD Access?

- A publicly available version of the 3M Healthcare Data Dictionary (3M HDD)
- Publicly available terminology content
- Open source software and information models
- Supported by the US Department of Defense (DoD) and Department of Veterans Affairs (VA)
- Maintained by 3M Health Information Systems, Inc.
- Growing community of users
HDD Access Components

Terminology Content

Terminology Software

HDD Access Community
HDD Access Terminology Content

- Subset of content from 3M HDD
- As of August 2013
  - 319,902 concepts
  - 1,878,448 relationships
  - 1,652,724 representations

<table>
<thead>
<tr>
<th>Data Dictionary Component</th>
<th>HDD Access Solution</th>
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<tbody>
<tr>
<td>Consistent Terminology</td>
<td>Discrete Clinical Concepts that exist in both Standard and Local Terminologies</td>
</tr>
<tr>
<td>Knowledge Base</td>
<td>Meaningful Relationships Between Concepts</td>
</tr>
<tr>
<td>Meaningful Context for Data</td>
<td>3M Information Models</td>
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HDD Access Status – Content Domains

- Diagnosis
- Allergies
- Medication
- Laboratory
- Imaging
- Language
- Religion
- HIPAA Standard
- Code Sets
- Vitals
- Specimens
Standard Terminologies Included in HDD Access

- ICD-9-CM Diagnoses (codes and hierarchies)
- ICD-9-CM Procedures (codes and hierarchies)
- ICD-10-CM (codes and hierarchies)
- ICD-10-PCS (codes but not attributes/hierarchies)

- HCPCS Level II
- HCPCS Modifiers
- MS-DRG
- TRICARE/CHAMPUS MS-DRG
- APC
- CMS-DRG MDC
- TRICARE/CHAMPUS MS-DRG MDC
HDD Access Software Features

- Installer for Windows and Linux
- Web services API, including HL7 CTS v1.2 and 3M services
- Web-based Browser & Search Engine

<table>
<thead>
<tr>
<th>Product</th>
<th>HDD Access</th>
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<tbody>
<tr>
<td>Release date</td>
<td>August 23, 2013</td>
</tr>
<tr>
<td>Installer version</td>
<td>2.2</td>
</tr>
<tr>
<td>Database software version</td>
<td>3.0</td>
</tr>
<tr>
<td>Web services API version</td>
<td>2.0</td>
</tr>
<tr>
<td>Browser version</td>
<td>3.2</td>
</tr>
<tr>
<td>Content version</td>
<td>13</td>
</tr>
</tbody>
</table>
HDD Browser Features

Search Capabilities

• Search by text string
• Constrain text search by domain
• Search by NCID (Numeric Concept Identifier)

Terminology Authoring

• Update terminology content
• Request a local extension
• Add, edit and delete local content

Import and Export Capabilities

• Import namespaces into an installation of HDD Access
• Export namespaces into the XML format
• Version the content in local namespaces
Getting to Interoperable Data

Standard terminologies for ‘Meaningful Use’ in the EHR

Paper Records → Text Databases → Interoperable Data

Scanned Images, Coded Data, Actionable Data
Challenges in Interoperability

**Standardization**
- Multiple Standard Terminologies
- Variable Versions
- Gaps in Standard Terminologies

**Integration**
- Variable Release Formats
- Synonymous concepts with different Identifiers
- Lack of a Common Language

**Organization**
- Flat Lists of Codes
- Variation in Granularity
- Inconsistent implementation of Standards
Standardization
HDD Access Solution

- Single source for obtaining standard terminologies
- Stay up to date with standard terminology versions
- Capture structured coded data for which there is no standard terminology code
Standardization
HDD Access Solution

- Numerical Concept Identifier (NCID)
  - Acts as a primary key to identify unique concepts
  - Translates between legacy codes, standard terminology codes as well as text representations
Standardization
HDD Access Solution

- Reduces Terminology Management Efforts
  - Utilizes the most up to date version of standard terminologies
  - Monthly content and software updates available for users to download
  - Centralized Mapping is more efficient than point to point mapping
Standardization
HDD Access Solution

- Addresses Gaps in Standard Terminologies
  - No designated standard terminology for ‘orders’ domains or ‘supply chain’
  - Some concepts such as ‘pharmacologically paralyzed’ do not have a standard terminology code

There are still local concepts, proprietary assessments and domains of health care data for which there is no standard terminology code.

*It is impractical to replace all legacy systems.*
Integration
HDD Access Solution

- Eliminates variability in release format
- Incorporates an endless number of representations and synonyms for each concept
- Provides one common language by using NCIDs

Variable Release Formats

Synonymous concepts with different Identifiers

Lack of a Common Language
Integration

HDD Access Solution

- HDD Access operates under multiple Database Management Systems
  - Oracle 11g
  - MySQL 5.5
  - H2 1.3
  - Microsoft SQL Server 2008
Integration
HDD Access Solution

- Each representation of a concept is assigned a unique identifier (RSForm_ID)

- Representations can be human readable text, alphanumeric codes, consumer friendly terms, abbreviations or even common misspellings

- Each RSFORM_ID links the representation to the NCID

- There is no limit to the amount of representations for a concept
Integration
HDD Access Solution

- NCID acts as the crosswalk between local representations, standard terminology codes and synonyms
- This allows HDD Access to incorporate and operationalize multiple reference terminologies
  - Long text designation
  - Problem list abbreviation
  - Consumer friendly term

**Myocardial Infarction**
NCID 160949

<table>
<thead>
<tr>
<th>MI</th>
<th>Heart Attack</th>
<th>Cardiac Infarction</th>
</tr>
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**Examples:**
- MI
- Heart Attack
- Cardiac Infarction
Organization
HDD Access Solution

- Uses relationships between concepts to establish a knowledge base
- Supports multiple levels of granularity
- Addresses inconsistent implementation of Standards
Many Organizations are unaware of how different applications structure terminology

HDD Access provides dynamic meaningful relationships between concepts

Static groupings provide high level organization to concepts but are often outdated

Flat lists of codes lack an easy way to obtain secondary data use

Dynamic Groupings

High Level Groupings

Flat File Lists of Codes
Organization
HDD Access Solution

- Hierarchical Relationships
  - Has Member
  - Has Child

- Non-Hierarchical Relationships
  - Has Brand Name
  - Has Ingredient & Ingredient Strength
  - Has Form
  - Has Route
Organization
HDD Access Solution

- Relationships are customizable
  - Link diagnosis to lab tests
  - Link diagnosis to medications
  - Link symptoms to Diagnosis
HDD Access supports multiple levels of granularity

- Pre-coordinated terms & post coordinated terms are both supported
- Managed by relationships
Different vendors ‘pick’ different codes to use in their systems and this can limit interoperability.

HDD Access acts as the translation or reference between the codes from different systems.

HDD Access is vendor agnostic.
Organization
HDD Access Solution

- HDD Access organizes each representation using different contexts
  - The context tells where the representation originates from or where the representation occurs
Local Extensions

- A local extension allows you to author content, without modifying the core content
- We will provide you a range of NCIDs unique to your organization
- Local extensions can be shared with other HDD Access users
- Documentation to describe how to author content in local extensions
  - Create code systems
  - Create concepts
  - Add representations
  - Add relationships
HDD in Action

Interface Engine and APIs

- Laboratory Information System
- Legacy Systems
- Electronic Health Record
- Electronic Health Record 2
- HIM Billing Systems
- Standard Terminology
- Data Normalization with NDCs
- 3M Information Models
- Clinical Data Repository
- Enterprise Data Warehouse
HDD Access Solution:

- Make the data from all your systems semantically interoperable for exchange, analytics, decision support, alerts and reminders
- Accelerates implementation of electronic health records
- Enables structured clinical data capture, queries and analytics
- Organizes healthcare data to support requirements under meaningful use