Master Data Management for State Government

Rationale, Strategy, and Approach

Hao Wang, PhD, MPA 10/29/2010
• Why Master Data Management (MDM) is Important
• MDM and Data and Information Governance (DIG)
• MDM and other Data Initiatives
• Strategy and Approach for MDM
• Multi-agency MDM Pilot and Targeted Learning
Why do we need MDM in NYS Government?

- **Transparent government** requires broader access to government data, leading to more citizen engagement and greater accountability of the government. The government data cannot be inaccurate, incomplete, or inconsistent.
- **Evidence-based public policy making** requires accurate, consistent, reliable, and ambiguity-free data and information.
- **Cost saving** through data consolidation, selective de-duplication, and fraud detection and prevention.
- **More efficient and better government service** requires resource sharing, collaboration, and citizen-centeredness.
IBM estimates that worldwide data volumes are doubling every two years.

“... more than 25% of critical data in Fortune 1000 companies will continue to be flawed ...”

IDC study reported that the size of the digital record will grow by a compound annual growth rate of 60%, which means, from 2006 to 2010, the amount of electronic data grew by 10 fold.

A strong Data and Information Governance (DIG) is needed for the state government, of which Master Data Management is a critical element.

Data and Information Governance based on Master Data Management is the only effective way to cope with the explosive growth of data in the State government.
MDM is a Critical Element for Data Governance

- Good data governance requires the involvement of key stakeholders from data owners to data stewards
- Data quality depends on accurate and consistent master data management
- Metadata management and data classification are enablers for process integration
- MDM is an indispensable part of enterprise architecture that encompass infrastructure, application, data, and business processes

Based on the IBM Data Governance Council Framework

Master Data Management (MDM) and Data and Information Governance are increasingly converging. Good MDM is a foundation for a sound Data Governance program.
Agency Example: MDM and DIG Hand-in-Hand in Driving Data Sharing for Better Healthcare
Mission

1. Improve data and information management practices and services through:
   a. Data and Information Stewardship
   b. Processes, Procedures, and Performance Improvement
   c. Control, Audits, and Change Management
2. Establish data and information management policies and procedures that improve quality of service and operation efficiency through better data quality
3. Drive the adoption of industry data and information standards
4. Better meet compliance, regulatory concerns, and security policies about data
5. Enable and govern cross-organizational collaboration on data sharing; improve data management practices with external entities doing business with OMH

OMH Data and Information Governance (DIG) Board was established in the summer 2009 to improve management of government data; drive standardization; enable cross-boundary data sharing and collaboration, and enhance the ability of evidence-based policy making.
**Mission/Scope**

**Authority**

**Structure**

**Membership**

**Process**

### Data and Information Governance Board
- Prioritizes the order in which data issues are addressed
- Approve data management policies, procedures, and data quality standards
- Govern data usage and exchange for cross-organizational collaboration

### Data and Information Stewards

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Office of Planning</td>
<td>FOs/ Facilities</td>
<td>Office of Consumer Affairs</td>
<td>Office of Diversity Management</td>
<td>Center for Human Resources Mgt</td>
<td>Division of Forensic Services</td>
<td>Office of the Medical Director</td>
</tr>
</tbody>
</table>

- Lead detailed analysis to assess data quality issues
- Finalize standards for data elements within their domain
- Approve the metrics to monitor data quality
- Facilitate and manage data cleansing activities
- Enforce policies & procedures
- Define and interpret business rules

### Information Domain Workgroups
- Support Data and Information Governance Policies
- Support data cleansing activities
- Develop data domains and elements
- Report issues to their Data and Information Stewards

### Data and Information Governance Program Team
- Administers MDM project
- Provides technical support
- Implement software solutions
- Ensures adequate data security
- Incorporates Data Governance into Project & Software Lifecycles

### OMH Data and Information Governance (DIG) Board
OMH Data and Information Governance (DIG) Board is truly business driven, customer centric, and collaboration focused. It drives business process integration in one of the largest state agencies. It involves all lines of business in data ownership and data stewardship.
How can State Data Initiatives Work Together?

- Sound data and information governance at the policy level needs to be comprehensive.
- State data initiatives usually fall into:
  - Data Warehouse
  - Business Intelligence
  - Information Security
  - Content Management
  - Master Data Management
- No single data project can encompass all disciplines for all agencies.
- To various degrees, MDM is an important ingredient in all types of government data initiatives.
- While data initiatives need to be business driven at the agency level, sharing and coordinating MDM best practice across agencies is important.

Based on the Data Management Association International (DAMA) Functional Framework.
New York State Department of Motor Vehicle (DMV)’s myDMV.ny.gov illustrates that Master Data Management (MDM) and Identity and Access Management (IAM) are closely connected data initiatives. In many cases, they can be regarded as two sides of the same coin.
At the agency level, we need to provide data stewards and data owners tools to manage data.

MDM architecture needs to be defined at the agency level to facilitate business process integration.

MDM architecture also needs to be defined at the state level to enable collaboration and interoperability.

Entity (hierarchy) relationship management is critical for linking customer, service, and business together.

Master person registry enables accurate linkage of citizens’ data that is often dispersed in government silos.

While all agencies need most of these MDM components, some agencies have more authoritative data for state-wide sharing.
### Sample: Harmonized Citizen Centric Electronic Record

<table>
<thead>
<tr>
<th>Data Domain</th>
<th>Domain Summary</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient Information</strong></td>
<td>Demographic and personal information, emergency contacts, PCP, etc.</td>
<td>HIPAA ASC X12N</td>
</tr>
<tr>
<td><strong>Family History</strong> **</td>
<td>Possible health threats based on familial risk assessment</td>
<td>CCR/CCD</td>
</tr>
<tr>
<td><strong>Physiological Info</strong> **</td>
<td>Physiological characteristics such as blood type, height, weight, etc.</td>
<td>CCR/CCD</td>
</tr>
<tr>
<td><strong>Encounters</strong></td>
<td>Encounter data in inpatient or outpatient settings for diagnoses, procedures, etc.</td>
<td>HIPAA ASC X12N</td>
</tr>
<tr>
<td><strong>Medication</strong></td>
<td>Medication history such as medication name, prescription date, dosage, etc.</td>
<td>HIPAA NCPDP</td>
</tr>
<tr>
<td><strong>Immunization</strong> **</td>
<td>Information regarding immunizations such as vaccine name, vaccination date, etc.</td>
<td></td>
</tr>
<tr>
<td><strong>Providers</strong></td>
<td>Information regarding clinicians who have provided services to the individual</td>
<td>HIPAA ASC X12N</td>
</tr>
<tr>
<td><strong>Facilities</strong></td>
<td>Information regarding facilities where individual has received services</td>
<td>HIPAA ASC X12N</td>
</tr>
<tr>
<td><strong>Health Risk Factors</strong> **</td>
<td>Patient’s habits, such as smoking, alcohol consumption, substance abuse, etc.</td>
<td>CCR/CCD</td>
</tr>
<tr>
<td><strong>Advance Directives</strong> **</td>
<td>Advance directives documented for the patient for intubation, resuscitation, IV fluid, etc.</td>
<td>CCR/CCD</td>
</tr>
<tr>
<td><strong>Alerts</strong> **</td>
<td>Patient’s allergy and adverse reaction information</td>
<td>CCR/CCD</td>
</tr>
<tr>
<td><strong>Diagnosis</strong></td>
<td>The primary and secondary diagnosis by clinicians that justify medical necessity. Diagnosis is made using DSM, ICD, and other techniques expressed in NYSCRI.</td>
<td>DSM/ICD/NYSCRI</td>
</tr>
<tr>
<td><strong>Other Domains</strong></td>
<td>Employment, Legal Involvement, Legal Status, etc.</td>
<td>NYSCRI</td>
</tr>
<tr>
<td><strong>Plans of Care</strong> **</td>
<td>Individual Action Plan (IAP) based on assessed needs, objectives, goals.</td>
<td>NYSCRI</td>
</tr>
</tbody>
</table>

Data and terminology standards enable consistent and ambiguity-free representation of government data to businesses and citizens in New York State.
Guiding Principles and Implementation Strategy

**Guiding Principles**

- Business driven, customer centric, and collaboration focused;
- Adopt industry standards and enforce regulatory compliance;
- Optimize cost-effectiveness and reduce time to market.

**Implementation Strategy**

- Implement data and information governance policies and procedures at both agency and state levels
- Let business be in charge of the overall program
- Be flexible with implementation styles – achieve both agency level master data management and state-wide interoperability
- Develop data architecture based on best practice of Service Oriented Architecture (SOA)
- Focus on business process integration and collaboration
- Harmonize data and information industry standards
- Take incremental steps and trials to deliver business value immediately
MDM can be

- Centralized
- Distributed
- Federated
- Multi-tenancy
- Data Mashup

Deciding factors:

- Business needs
- Cost – benefit
- Existing investment

One size does not fit all. Centralized MDM is not necessarily the most effective way for all scenarios. Leveraging existing investment and avoiding cost fits current economic situation. Pressing government business priority can override technological aesthetic.

(derived from the book Enterprise Master Data Management – An SOA approach to managing core information)
3 Fundamental Business Use Cases for MDM

- **Business Use Case #1: Cross-agency Data Sharing and Collaboration on Data Management**
  State agencies have to learn how to share common data and effectively maintain the best records. Specifically, the multi-agency MDM pilot will
  - Leverage existing behavioral health provider registry and relevance provider data sources from additional agencies
  - Establish best records using common provider data
  - Implement change request process and validation workflow
  - Establish synchronization of best records in suppliers/consumer systems

- **Business Use Case 2: Use Batch Services to Solve Business Problems**
  State agencies can use MDM services for batch level record matching to
  - Identify high priority population
  - Timely use government transaction information to support evidence-based public policy making

- **Business Use Case 3: Link Citizens’ and Business’ Data Together**
  State need to link dispersed New York citizens’ and business’ data together across agencies
CIO Council EA Committee Objectives:

- Collaborate on 2 of 3 key business use cases for cross-agency MDM:
- Emphasize alignment with agencies’ business
- Stimulate discussion of reference architecture
  - **Consensus building for state-wide MDM implementation styles**
- Focus on operating model for data sharing and collaboration
Business Use Case #1 – Collaboration

Provider Sources:
- National NPI Registry
- NYS Medicaid Provider Registry
- NYS OMH Provider Registry
- NYS OMH/CASAS/OPWDD Shared Provider Registry

Other NYS Data Sources:
- NYS DCJS
- NYS DOL
- NYS OCFS
- NYSED

Citizen Sources:
- NYS OMH Patient Data
- NYS DCJS Criminal Case Data
- NYS DOL Employment Data

Third Party Data Sources:
- NYS DCJS
- NYS DOL
- NYS OCFS
- NYSED

Core Master Data Management Services

- Load
- Organization Data
- Location/Address Data
- Case Data
- Master Data Extract

Interoperable Communication Conduit at Either Agency or State Level

Enterprise Service Bus (ESB)

Enterprise Data Warehouse

Applications

Master Person Index
- Patients
- Practitioners
- Organizations
- Employee

Relationships
- Provider/Organizations
- Provider/Location
- Provider/Patients
- Patients/Households

Data Steward Interface
- Data Steward/Analysts
- Adhoc Search and Query

MDM Admin
- Configuration
- Monitoring
- Access mgmt
Business Use Case #2: Shared Data Services

Provider Sources
- National NPI Registry
- NYS Medicaid Provider Registry
- NYS OMH Provider Registry
- NYS OMH/CASAS/OPWDD Shared Provider Registry

Other NYS Data Sources
- NYS DCJS
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Data Steward Interface
- Data Stewards and Analysts
  - Data Stewardship
  - Adhoc Search and Query

MDM admin
- MDM Admins
  - Configuration
  - Monitoring
  - Access mgmt

OMH Patients
- OMH Patients in DCJS File
- OMH Patients in DOL File
Governance and Stated Objectives of the Pilot

Steering Committee Members
Hao Wang, OMH (Chair)
Adam Gigandet, DMV (Co-Chair)
Rachel Block, DOH
Anne Roest, DCJS
Benny Thottam, DOL
David Walsh, SED
Brian Scott, DOH
William Travis, OCFS
David Gardam, OASAS
Robert Vasko, OPWDD
Tom Meyer, OMIG
Kevin Belden, OSC

Goals and Objectives
- To recommend state-wide MDM strategy and approach
- To identify the necessary policies and procedures
- To define viable operation models for MDM
- To recommend feasible deployment model(s) for agencies and the State
- To identify industry standards for harmonization
- To address various issues related to protocols for data interoperability
Master Data Management is an enabling technology for State government to support transparent government; evidence-based public policy making; cost reduction; and better efficient government services.

Data and Information Governance based on Master Data Management is the only effective way to cope with the explosive growth of data in the State government.

The Guiding Principles for Master Data Management programs are
- Business driven, customer centric, and collaboration focused;
- Adopt industry standards and enforce regulatory compliance;
- Optimize cost-effectiveness and reduce time to market.

Data and Information Governance (DIG) Board are needed at both agency and state levels. DIG needs to be business driven, customer centric, and collaboration focused.

Industry Standards need to be harmonized to enable consistent and dis-ambiguous representation of government data to businesses and citizens.

Cost effective and flexible implementation styles are needed for both agency level MDM and state-wide interoperability.
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