MDM in the Context of Data Governance for Healthcare Management
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Partner at Ajilitee

- Former Engagement & Project Manager for Fortune 1000 companies: HP, Knightsbridge, Forte, Seer, Pansophic, Accenture
- Focus on: BI, data integration, data governance, BI/DW, MDM
- Data governance strategist
Content

- **Case Study: A client’s data challenge**
- **Business drivers of DG and MDM initiative**
- **Approach and timeline**
  - Data governance
  - Tool selection: MDM, Metadata, 3rd Party DQ & Enrichment Vendor (by data domain)
  - MDM pilot
  - MDM implementation (in progress)
- **Outcomes and looking forward**
Where’s the cat?

Sure we are collecting our data. But finding the “right” data when you need it can be challenging.
The Need for Data Governance and MDM
That is...to bring control and order to our data
The Information Challenge we faced

We need to be able to synthesize & govern data across silos & sources
Data Governance

- Data Governance is a management function with direct accountability which establishes and enforces a set of processes to help manage data as an asset.
- Revolves around People, Processes and Technology for governance of data.
- Key discipline areas for Data Governance include:
  - **Steering Committee**
    Defines and champions the strategy. Sets direction and high-level priorities. Conveys the EIM strategy to the community.
  - **Data Governance Council**
    Establishes the roadmap, prioritization and schedule. Communicates standards for Stewardship and hold stewards accountable.
  - **Data Stewards**
    Provides data ownership, defines how data is used and defines enterprise metrics.

Successful DG programs have responsibility and trusteeship vested in the lines of business.
Master Data Management (MDM)

• Master Data Management (MDM) is the practice of cleansing, rationalizing and integrating data into an enterprise-wide “system of record” for core business activities

• Business information problems MDM tries to solve include:
  – Data duplication
  – Lack of standardization
  – Process disharmony
  – Difficulty in integrating similar data from disparate sources
Transactions pull together the different types of data:
- Master
- Control/Reference
- Transactional (values)

**CONTROL / REFERENCE DATA**
Generally controlled through Approved Lists of Values (LOVs)

**MASTER DATA**
(Who, what, where)

**TRANSACTIONAL DATA**
(How many, how fast, how much)

INFERRRED through the Master Data
Provider Type
Provider Specialty

**SAMPLE PATIENT**
- Patient name, address, phone
- Relationship
- Diagnosis (DX)
- CPT
- TIN
- Billing provider

**MEDICARE**
- Insured name, address, phone
- Insured Number
- State
- Birthdate
- Gender
DG & MDM – Developing a Common Language

Understanding syntax, processes, and purpose across all business functions provides a framework for establishing a common language.

Semantic modeling defines the business context of the data across all business areas, functions, & processes.
Case Study: A client’s data challenge

Business drivers of DG and MDM initiative

Approach and timeline
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  ◦ MDM implementation (in progress)

Outcomes and looking forward
DG and MDM: No Respect?

- On a team comprised of Business stewards, subject matter experts, IT Data Governance and MDM architects, designers and developers --

...establishing a program which is influential and impactful is a challenge

*How does a program become successful?*
Scenario

Healthcare Organization which started DG and MDM from scratch

- Terminology:
  - “Payer” – the ones who process the claim and reimburse (and charge) you, reimburse the doctor, the State
  - Provider – more then “doctor”. Can be an individual physician or dentist, a group of physicians, a hospital, a lab, a clinic, etc.
  - Member – subscriber (the one who is primary for coverage), dependents (spouses, children) and all the accompanying rigmarole such as Enrollment, Group Plans, Products offered, Benefits covered, etc.
Provider and Member DG/MDM Value Proposition

Unified view of Provider and Member Data across enterprise applications and lines of business, improving collaboration and quality of care and reducing costs

**Provider Types**
- Physicians
- Groups
- Hospitals
- Diagnostics & Labs
- Durable Medical
- Dental & Vision
- Retail Health Clinics
- Delegates

**Member & Provider Collaboration**
- Claims
- Reimbursements
- Authorizations
- Referrals
- Customer service
- Network management
- Case Management
- Care Management
- Pricing
- Portals
- Marketing
- Segmentation
- CRM Strategy
- Service & Billing
- ACO

**Provider Profile**
- Contracting
- Networks
- Capitation

**Member Profile**
- Demographics
- Subscribers
- Contacts
- Segmentation
- Preferences
- Patients

Enabling a unified, consistent, accurate, and timely view of Master Data
The MDM Value Proposition

- **Data Fragmentation**
  - Problem: Master data is fragmented across multiple systems vertically & horizontally
  - MDM: Bring together data from multiple systems and build whole records and data sets using match & merge

- **Data Duplication**
  - Problem: Same Master data attributes exist in multiple systems, leading to data divergence (DOB: System A = 6/1/80, System B = 1/6/80)
  - MDM: Pick “best” value, based on trust scores

- **Data Quality**
  - Problem: As with all data, Master data quality deteriorates over time
  - MDM: Pre-cleanse and standardize data (e.g., gender)

- **Single Source of Truth**
  - Problem: Multiple systems have “slices of truth” with inconsistent data quality and standardization
  - MDM: Bring together and present “single source of truth” for consumption by users and systems

- **Bridging the Gap**
  - Problem: “Vertical” systems don’t bridge well across Members, Providers, Products, Customers, Employees, etc.
  - MDM: Provide visibility across multiple data domains (e.g., providers that are also members)
Additional Benefits

- **Standardize data services**
  - Deliver consistent information to members and providers across channels
  - Decouple and insulate downstream systems from changes to upstream systems

- **Retire obsolete components from infrastructure**
  - Reduce the cost of maintenance
  - Reduce data inconsistencies across systems and improve business and IT operational efficiencies
  - Increase agility with faster time to implement new business functionality

- **Enable portals and self-service administration**
  - Implement necessary workflows to authorize changes
  - Improve operational efficiency, customer satisfaction and regulatory compliance

- **Enable reporting and analytics**
  - Unified view of providers and members across all plans, lines of business and market segments
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How We Phased the Implementation

- **One subject area at a time for Data Governance and Stewardship**
  - Definitions, identifiers, valid reference values
  - Provider: Individuals, groups and organizations, provider types
  - Member: Subscribers, dependents and patients

- **MDM Tools Selection**
  - Determine needs and MDM style (Integration, Registry, Hub)
  - Single-domain versus multi-domain

- **MDM Pilot**
  - Focus on how the Business uses provider data
  - Engage Data Stewards to prototype match/merge and trust rules

- **MDM Lab**
  - Focus on new functionality and product upgrades to be tested
  - Simulate Production-like environment before starting development (Adopt ‘Lessons Learned’ mentality)

- **Initial Rollout – Provider Directories, Member and Provider portals and communications**
  - Individuals, groups, organizations
  - Service and billing locations
  - Provider and Member email and contacts
Preparation – preliminary steps to identify key participants, key data elements & sources, and individuals to be interviewed; intent is to socialize operating model with key stakeholders; define scope and approach

Discovery – gain understanding of the data and processes in the current environment, introduce Data Governance concepts, best practices and roll-out of Data Governance program

Analysis – pinpoint and clarify key data touch points, data handling processes, issues and work-arounds; bridge from discovery to synthesis, with focus on clearly defining the current environment

Synthesis/Recommendation – generate informed recommendations based on discovery and analysis. Tailor and define the near & future state policies and procedures, including gaps and potential remediations
How Did We Triage Data Policies and Issues? - The Data Governance Process

1. Steward or Stakeholder(s) discovers and logs an issue.
2. Steward completes (or delegates) root cause analysis.
3. Steward sends prioritized issue log and root cause analysis to DG Core Team.
4. Stakeholders review data quality issue, gauge potential system impact (if any) and advise Steward of same.
5. DG Core Team acts as escalation point.
6. DG Core Team sends recommended action list to Steward.
7. DG Core Team posts decisions to Sharepoint.
8. Steward communicates recommendations to Stakeholders for implementation.

Populate:
- Enterprise Metadata Manager
- Root Cause Analysis
- Enterprise Data Issue Log

If needed:
- Impact Analysis
- Impact Assessment

Create

Data Steward

Provide Input

Data Profiling Requirements Logs

Data Stewards
- Subject Matter Experts
- IT Custodians
- Stakeholders
- Project Teams
- Solution Architects

Requestor (Stakeholder, PM)

Review and update:
- Enterprise Data Issue Log
- Decision Matrix
- Root Cause Analysis

Notify

Approve

Stakeholders

Solution Architects

Data Stewards

Stakeholders

DG Core Team

DG Governor

Post to Sharepoint

Review and update:
- Enterprise Data Issue Log
- Decision Matrix
- Root Cause Analysis

Approve

Approve

DG Council

Notify

Stakeholders
Enterprise Data Model: Single-Domain versus Multi-Domain

- **Multi-domain solutions versus Single-domain**
  - We chose to leverage and reuse a single tool to master Provider, Member, and reference data
  - Eliminates cost of buying multiple tools and creating competencies around multiple, domain-specific tools/apps

- **Multiple MDM instances versus Single MDM instance**
  - We chose to integrate provider and member master using a party model that aligns with the enterprise data model we are designing

- **Key value of having a single instance is the ability to identify and manage relationships**
  - Physicians <-> Patients <-> Members <-> Employer Groups
MDM Implementation Time Lines

<table>
<thead>
<tr>
<th>Activity</th>
<th>Q3 FY11</th>
<th>Q1 FY12 – Q2 FY12</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Oct 11</td>
<td>Nov 11</td>
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<tr>
<td>Data Analysis</td>
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<tr>
<td>Requirements</td>
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<td>Design</td>
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<td>Development</td>
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<td>SIT Testing</td>
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<tr>
<td>UAT Testing</td>
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<tr>
<td>Production</td>
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</tbody>
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- Validate the capabilities of MDM solution for 2 domains, 6 data sources and systems
  - Data Integration: Integrate Provider and Member data from multiple sources
  - Data Quality Improvement: Enrichment Data using Third Party data providers
  - Data Governance: Generated workflows to support data stewardship
  - Consolidated outputs: Produce data extracts to demonstrate “full lifecycle” MDM value
MDM Tool Selection Evaluation Criteria

**MDM Business Value Categories**
- Third party data service integration
- Data Stewardship support
- Workflow and rules
- Multi-domain and Payer data models
- Match/merge technology
- Training and professional services
- Total cost of ownership
- Health plans customer success

**MDM Technical Value Categories**
- Extensible data models
- Integration with enterprise applications
- Change and release management support
- Pre-canned web services
- Supports common MDM styles
- Integration with infrastructure services
- Integration with BPM tools

**MDM Evaluation Activities**
- Written questions
- Demonstrations
- Technical deep-dive sessions
- Use case run-throughs
- Total cost of ownership
MDM Data Architecture

**Source**
- Extract Validation
- Change Capture
- Convert to ASCII

**MDM Preprocessing**
- Structural Transform
- Cleanse
- External Lookup
- Address Validation
- Technical Standardization

**MDM Processing**
- Straight Move
- Address Cleanse
- Apply Trust Rules
- Business Standardization
- Match
- Merge / Unmerge

**Master Data Services**
- Apply Distribution Rules

**Data Sources**
- RAW Data
- ASCII Delta
- Common Record Format
- Ready to load data

**MDM Preprocessing**
- Temporary MDM land area

**MDM Processing**
- Temporary MDM stage area

**Master Data Services**
- Mastered Data
- Ready to publish data in consumer format

**Interface Hub**

**Balance & Control**

**Error Handling**

**Audit & Logging**
MDM Data Architecture – Extract Layer

• **Purpose:**
  ◦ Extract layer is expected to perform data extraction, delta detection and conversion to ASCII format if needed
  ◦ Also provide ability to meet:
    - Audit & Traceability
    - Recoverability and Reload

• **Decision Points**
  ◦ Extract Format (Files v Relational, etc.)
  ◦ Extraction / Delta detection Method

• **Assumptions**
  ◦ All data to be sourced in file format. File could be a full snapshot or incremental. File format could be flat, XML, Mainframe
  ◦ Batch-only mode for all sources with lowest refresh rate of once per day
  ◦ Delta detection can be performed at source or in MDM pre-processing region depending on the source
# Third Party Data Selection Criteria: for DQ and Enrichment

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Evaluation Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>What is the pricing model (Geography, Type, Frequency, etc)? What are the contract lengths and terms? What are the costs for the offered menu of data and/or services?</td>
</tr>
<tr>
<td>Data Coverage</td>
<td>What is the provider or member match rate? What data elements are offered?</td>
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<tr>
<td>Data Model Fit</td>
<td>How well does the vendor’s data model map to the use cases and Data Model?</td>
</tr>
<tr>
<td>Data Quality Lift</td>
<td>What quality improvements and enhancements have been measured?</td>
</tr>
<tr>
<td>Data Sourcing</td>
<td>Which data elements are sourced a) by the vendor b) from public sources c) from third parties?</td>
</tr>
<tr>
<td>Metadata &amp; trust rules</td>
<td>What metadata is provided for defining trust and usage rules?</td>
</tr>
<tr>
<td>Reporting/analytics</td>
<td>What analysis does the vendor provides around the data?</td>
</tr>
<tr>
<td>Data Security</td>
<td>The vendor must completed a Vendor Information Security Risk Assessment Survey. IT Security and Legal approval are required before sample data can be sent to the vendor.</td>
</tr>
<tr>
<td>Batch Data Publishing</td>
<td>Details around a unidirectional vendor to company’s data feed for specific states.</td>
</tr>
<tr>
<td>Batch Data Matching</td>
<td>Details around providing a bidirectional data feed with a data service to match and append upplied data.</td>
</tr>
<tr>
<td>Online Lookup</td>
<td>Details around vendor offered portal, web site or application so that company staff can perform ad-hoc lookups.</td>
</tr>
<tr>
<td>Real-time Web Service</td>
<td>Details around vendor offered real-time web services that can be integrated with company’s MDM solution.</td>
</tr>
</tbody>
</table>
MDM Pilot Results

- Data profiling analysis of Provider and Member data sources
- Preliminary match/merge and trust rules
- Performance metrics
- Master Data metrics (Totals, # Golden Records, # Overlaps)
  - Counting noses and belly-buttons
    - Individual Providers and Members
    - Individual intersections
    - Members who are also Providers
    - Dependents who are also Subscribers
  - Postal and email addresses
  - Refined trust rules based on analysis of results
- Cases requiring data steward decisions
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Multi-Domain MDM Hub as a Solution

Disparate data reliably resolved
Future State MDM Solution

**Stewardship Process**
- Distribution Request
- New/changed Master Data Request
- Quality Improvement Initiative
- Operations & Quality Monitoring

**Acquisition & Authoring**
- Real-time/Near
- Batch
- Change Capture

**Suppliers**
- Authoritative Sources
- End-user Authoring

**Data Quality**
- Validation
- Audit, balance & control
- Quality Tracking

**Workflow Services**
- Review and Correction
- Approval and Publishing
- Exception escalation

**Metadata**
- Metadata shopping
- Impact analysis
- Operations Monitoring
- Quality Investigations

**Master Data Management**
- Historical Data Management
- Storage services
- Schema services
- Mapping/alignment Services
- Hierarchy Management

**Administration and Maintenance**
- Change management
- Security management
- Operational support
- Process monitoring
- Performance management

**Distribution**
- Self-service (pull) interface
- Publishing (push) interface
- Messaging-oriented interface

**AIM Governance & Stewardship**

**Workflow Services**

**Metadata Services**

**Master Data Management Services**

**Data Quality Services**

**Administration Services**

**Maintenance Services**
Enabling the Consumer 360° Using MDM

Integrating customer related data from internal and external sources is a key enabler with MDM.

**Consumer 360° View - Data Elements**

### Member Information

<table>
<thead>
<tr>
<th>Data</th>
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</thead>
<tbody>
<tr>
<td>• Basic</td>
</tr>
<tr>
<td>• Preferences</td>
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<tr>
<td>• Extended</td>
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<tr>
<td>• Prospect/Lead</td>
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<tr>
<td>• Broker</td>
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<tr>
<td>• Health Risk</td>
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<tr>
<td>• PHR</td>
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<tr>
<td>• Provider, PCP</td>
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<tr>
<td>• Alternate Programs (e.g., ACO, etc.)</td>
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<tr>
<td>• COB &amp; other Ins.</td>
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</tbody>
</table>

### Products & Benefits

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<thead>
<tr>
<th>Data</th>
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<tbody>
<tr>
<td>• Product</td>
</tr>
<tr>
<td>• Benefit</td>
</tr>
<tr>
<td>• Renewal</td>
</tr>
<tr>
<td>• Ancillary Product</td>
</tr>
<tr>
<td>• Wellness &amp; Disease</td>
</tr>
<tr>
<td>• HSA/FSA/HRA</td>
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</tbody>
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### Interactions

<table>
<thead>
<tr>
<th>Interaction Data</th>
</tr>
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<tbody>
<tr>
<td>• Service Requests</td>
</tr>
<tr>
<td>• Messages</td>
</tr>
<tr>
<td>• Care Messages</td>
</tr>
<tr>
<td>• Correspondence</td>
</tr>
<tr>
<td>• Payment</td>
</tr>
<tr>
<td>• Member Provider Interactions</td>
</tr>
</tbody>
</table>

### Transactions

<table>
<thead>
<tr>
<th>Interaction Data</th>
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</thead>
<tbody>
<tr>
<td>• Claims</td>
</tr>
<tr>
<td>• Pre-Cert &amp; Pre Authorizations</td>
</tr>
<tr>
<td>• Care Management</td>
</tr>
<tr>
<td>• Appeals &amp; Grievances</td>
</tr>
<tr>
<td>• Billing</td>
</tr>
<tr>
<td>• Delegate Partner Data</td>
</tr>
<tr>
<td>• EOB</td>
</tr>
</tbody>
</table>
Lastly: Big expectations for Data Stewards

- Completeness
- Accuracy
- Consistency
- Structure
- Validity

- Data Model
- Data definitions
- Data security & usage

- Customer
- Product
- Corporate culture
- What (& Who) you know

- Persuasion / Negotiation
- Re却ation / acknowledgement
- Faciliation

DATA QUALITY

DW, BI AND DATA INTEGRATION

BUSINESS KNOWLEDGE & EXPERIENCE

PERSONAL TRAITS

OPERATIONAL SYSTEM RESPONSIBILITIES
One DG/MDM Program does not fit all!

- Assess your own organization: key is deciding which governance functions will be included
  - Different mix for each institution
  - Mix will define “protect and manage data as a corporate asset”
  - Do not over commingle responsibilities
  - Prioritize the implementation of the functions
  - Determine implementation sequence

- Important functions to make sure are covered:
  - Data quality / certification
  - Data ownership / stewardship
  - Meta, reference and master data

- Important stewardship growth must include:
  - Subject matter expertise in data domain(s)
  - Subject matter expertise in data management best practices
  - Tools & technologies competencies
  - Leadership competency
Final Lesson! -- DG + MDM

- A cohesive team to accomplish great things!
Suggested Reading and Connecting

- DAMA
- TDWI
- Data Governance & Information Quality (DGIQ) conference – debtechint.com. Has a DG conference twice a year in San Diego (June) and Ft. Lauderdale (Dec)
- Datagovernance.com
- Dataversity – offer DG-related webinars
- Join some LinkedIn ‘DG Groups’ (search on data governance and/or MDM)
- Look at the websites of vendors who have tools in ETL, DB, metadata, data modeling, etc. (p.s. Ajilitee.com has some white papers and presentations available too)
  - Lots of good white papers
- Look for articles, papers, etc. from key DG and DQ speakers: David Loshin, Danette McGilvray, John Ladley, David Plotkin, Aaron Zornes, Daragh O’Brien (great stuff on IQM), et al
Questions?
Thank you

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