DATA MANAGEMENT: HOW SWEATING THE "SMALL STUFF" CAN PAY BIG DIVIDENDS

Dan Rounds and Stephanie Crabb, Co-Founders, Immersive | November 15, 2018
About Us

Presenters

Stephanie Crabb
Co-Founder, Principal

- 25 years of healthcare experience
- Strong background in regulatory and governance program adoption and maturity in healthcare entities
- Serves on several industry boards and committees helping to influence the direction of technology in healthcare
- Key positions:
  - Synergistek - VP
  - CTG Healthcare Solutions - Director
  - WebMD – Regional Director
  - The Advisory Board Company
- Loves data

Dan Rounds
Co-Founder, President

- 20 years healthcare experience
- Broad IT, functional, and operational knowledge of healthcare organizations.
- Diverse work experience (hospitals, vendor, and consultant)
- Recognized expert in healthcare data management, data governance, interoperability, analytics, security, privacy, and compliance
- Key positions:
  - Noesis Health – CEO
  - iSirona – CDO
  - Santa Rosa Consulting – Partner
  - Synergistek – VP of Security Solutions
  - CTG-Director of Advanced Technologies
  - MedPlus – Director eMaxx
- Loves data more than Stephanie
Learning Objectives

- Explore the data and information management landscape – what surveys and practice are telling us
- Understand the value (or not) of frameworks, models and organizational structures for data management
- Enumerate “most valued” and “most challenging” data management functions and what’s driving the effort
- Where to focus to get the highest reward…short- and long-term
AGENDA

The Healthcare Data and Information Landscape

Data Management Fundamentals

Operationalizing Data Management to Maximize Gains

Discussion and Wrap Up
THE HEALTHCARE DATA AND INFORMATION LANDSCAPE
Lofty Ambitions. Tactical Urgency.

- Cost of Care
- Quality, Decision Support and Outcomes
- Population Health
- Personalized Medicine
- Care Management & Patient Engagement
- Research
- Patient Experience
- Digital Transformation
- Regulatory Compliance
- Patient Safety
What the Surveys Say...

Healthcare views its data-enabled opportunities similarly to those of other industries.

Real-time processing is critical to timely decision-making, patient safety, etc.

DaaS is more than just offloading data to the cloud – it is about data quality and data access – both paramount as healthcare moves increasingly to self-service analytics.

IoT/Connected Devices are healthcare’s primary path to patient engagement/experience and personalization.
What the Surveys Say...

Data is no longer viewed as "nice to have" but critical to competitive advantage.

The competitive landscape in healthcare is being shaped, in part, by a new data and digital economy.

2018 Global Data Management Benchmark Report - Experian
But our data are challenging...

**Data 911**

Why is healthcare data so complex and difficult to manage?

<table>
<thead>
<tr>
<th>Complexity: claims data, clinical data, myriad variables related to an amalgam of systems, shifting business rules and definitions</th>
<th>Definitions: inconsistent, variable and subjective definitions based on the source...and new knowledge keeps this target moving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format: text, numeric, paper, digital, images, multimedia, video...and the same data can exist in different systems in different formats</td>
<td>Location: healthcare data tends to be created and reside in multiple places</td>
</tr>
<tr>
<td>Structure: structured vs unstructured despite best efforts to leverage the EMR as a platform for consistent data capture</td>
<td>Regulatory Requirements: despite the shift to reduce reporting burden, the rise of data and analytics will likely translate into different regulatory requirements - there may be less of them, but likely more complex</td>
</tr>
</tbody>
</table>
...the inputs, outputs and processes that comprise the modern healthcare data architecture are very complex...
...and data management is not a mature discipline for most

Derived from Immersive clarityDG™ Data Management Model
What we see - People

- **Resources and Roles**
  - roles creation/dedication for BI, data science
  - roles not being created/dedicated for all data management functions
  - data management functions are “a part” of someone’s job but not always well defined/clarified

- **Old School, New School**
  - “analyst” does not necessarily mean what it used to or what we need it to be

- **Talent Management**
  - lack programs and pathways to grow internal talent into roles of the future
  - scarcity of resources

- **Workforce Engagement and Enablement**
  - Lack awareness and training content on data management in our workforce education/training plans
What we see - Process

**Governance**
- 40% of providers have adopted enterprise DG
- 20% of providers have adopted DG at departmental level
- 40% of providers are exploring or not pursuing DG
- DG means different things to different organizations

**Framework/Standards Adoption**
- Limited evidence of framework adoption for data governance, data maturity, data quality
- Limited evidence of standards adoption to promote data quality, usability, interoperability

**Data Management Operations**
- Largely “ad hoc” at the enterprise level except for better organization around analytics
- Driven from and within IT in most organizations but increased engagement from ACEs, CDOs and PopHealth
- Highly variable data management practices within business units and departments
Frameworks and Standards Exist...but what about adoption?
What we see - Technology

EIM Roadmap
few organizations have a thoughtfully constructed roadmap for EIM technology

It’s all about Analytics
prioritized investments in analytics at the expense of other foundational data management technologies

“Haves” and “Have Nots”
inconsistent availability of tools and technology across business units resulting in inconsistent output

Suboptimal Use/Procurement of Technology
silo/focused use of technology creates blind spots for broader uses

lack of understanding re: technologies that are essential to prepare/maintain data for productive use

variable adoption of and support for “self-service analytics”
The Goals of Data Management

- Ensure the availability of clean, consistent, complete and current data
- Support reporting, analytics and operational use cases
- Enable data migration or modernization efforts
- Guide better decisions and actions
Most organizations implement some form of data governance in advance of, or in parallel with, more concerted data management activities.
The relationship between data governance and data management

Derived from Immersive clarityDG™ Data Management Model
# Critical Data Management Functions

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Enterprise Reporting and Self-Service Management</td>
<td>This function creates and maintains critical data/information “catalogs” of production reports and other data/information assets to support performance management/improvement and to foster self-service across the organization.</td>
</tr>
<tr>
<td>Analytics and Business Intelligence (ABI) Services Bureau</td>
<td>This function establishes a fulfillment process for net-new ABI support, reduces duplication of effort, ensures an effective use of resources, produces greater consistency, and increases the chances of a request being addressed correctly the “first time”.</td>
</tr>
<tr>
<td>Master and Reference Data Management</td>
<td>Master Data Management (MDM) is the discipline in which business and IT work together to ensure the uniformity, accuracy, stewardship, semantic consistency and accountability of the organization’s shared master data assets. This function establishes much needed discipline to improve data quality, usability, trustworthiness via the development of policies and procedures, and procurement of supporting tools/technologies to address the creation, maintenance, and use of Master Data.</td>
</tr>
<tr>
<td>Terminology and Classification Management</td>
<td>MDM starts with foundational and disciplined data/information terminology (e.g. dictionaries, business glossaries, etc.) and classification management. This function establishes and formalizes this expertise and supporting processes to create and/or adopt clear standards and shared understanding for the good of the organization.</td>
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## Critical Data Management Functions

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<tr>
<td><strong>Data Quality Management</strong></td>
<td>Data quality management (DQM) is the process to discover data inconsistencies and take action on anomalies that are identified. This function establishes the program, priorities, measures, and processes to achieve data quality targets that ensure trustworthiness and fitness of data for its intended purpose.</td>
</tr>
<tr>
<td><strong>Data and Information Lifecycle Management</strong></td>
<td>Information life cycle management (ILM) is an approach to data/information asset management that recognizes that the value of data and information changes over time and that it must be managed accordingly. This function seeks to classify data/information according to their business value and establish policies and processes to ensure proper disposition of those assets.</td>
</tr>
<tr>
<td><strong>Content and Records Management</strong></td>
<td>This function further formalizes and elevates what many organizations already have in place based on data and information management standards.</td>
</tr>
<tr>
<td><strong>Data Architecture Management</strong></td>
<td>This function designs, builds, and maintains an organization’s data blueprints – data models, databases and table structures, key data flows and integrations - that ensure a ready and responsive data environment.</td>
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<tr>
<td>Data Technology Management</td>
<td>This function maintains the systems, platforms, tools, technologies and processes that enable enterprise data and information management.</td>
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<tr>
<td>Data Security Management</td>
<td>This function harmonizes data management directives and operations with existing information security, privacy and compliance program activities.</td>
</tr>
<tr>
<td>Data Project Management</td>
<td>Most projects in an organization today (and not just “IT” projects) have a data component. This function serves to establish data project management specialists that either serve a larger enterprise PMO or standalone to enable data awareness and extend data expertise into new projects.</td>
</tr>
<tr>
<td>Issue Resolution</td>
<td>This function, typically established in data governance, establishes clear policies, procedures and operational support for data-related issue management such as conflicting data definitions, data usage concerns, problems with how data is sourced, how it is integrated, how it is protected, or a myriad of other issues.</td>
</tr>
</tbody>
</table>
# Data Management Functions – A Deeper Dive

<table>
<thead>
<tr>
<th>Analytics &amp; Business Intelligence</th>
<th>Standard Reporting &amp; Self-Service</th>
<th>Issue Resolution</th>
<th>Data Quality Mgmt</th>
<th>Terminology Classification Mgmt</th>
<th>Master &amp; Reference Data Mgmt</th>
<th>Data Lifecycle Mgmt</th>
<th>Data Architecture</th>
<th>Content &amp; Record Mgmt</th>
<th>Data Technology Mgmt</th>
<th>Data Security</th>
<th>Data Project Mgmt</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI Reporting &amp; Visualization</td>
<td>Static Reporting</td>
<td>Data Issue Intake &amp; Triage</td>
<td>DQ Assessments &amp; Data Profiling</td>
<td>Business Glossaries</td>
<td>Master &amp; Reference Data Mgmt</td>
<td>Retention &amp; Disposition Compliance Auditing</td>
<td>Data Modeling &amp; Simulation</td>
<td>Digital Asset Mgmt</td>
<td>Logical Data Warehouse Platform Mgmt</td>
<td>Access Mgmt</td>
<td>Data Readiness Evaluation</td>
</tr>
<tr>
<td>Analytics &amp; Discovery Self-Service</td>
<td>自助服务 Reporting Mgmt</td>
<td>Data Help Desk</td>
<td>DQ Measurement, Monitoring &amp; Benchmarks</td>
<td>Data Dictionaries &amp; Metadata Mgmt</td>
<td>Linkage &amp; Relationships</td>
<td>Legacy Data Archiving</td>
<td>Data Warehouse &amp; Database Administration</td>
<td>Content Discovery &amp; Audit</td>
<td>Data Acquisition &amp; Delivery</td>
<td>Compliance</td>
<td>Project Management</td>
</tr>
<tr>
<td>KPI &amp; Metrics Mgmt</td>
<td>Data Extraction</td>
<td>Normalization Cleansing &amp; Enrichment</td>
<td>Data Classification</td>
<td>Data Integrity &amp; Stewardship</td>
<td>Content Management</td>
<td>Big Data</td>
<td>Content Classification</td>
<td>Data Analytics Platform Mgmt</td>
<td>Data Preparation Tools</td>
<td>Privacy</td>
<td>Planning, Forecasting &amp; Performance</td>
</tr>
<tr>
<td>ETL</td>
<td>Discovery &amp; Search</td>
<td>Vocabulary Standards</td>
<td>Data Matching</td>
<td>Backup &amp; Availability Mgmt</td>
<td>API Management</td>
<td>Knowledge Base Mgmt</td>
<td>Data Preparation Tools</td>
<td>Data Classification</td>
<td>Data Quality Tools</td>
<td>Security Controls</td>
<td>Resource Mgmt</td>
</tr>
<tr>
<td>Data Normalization &amp; Enrichment</td>
<td>Lineage &amp; Provenance</td>
<td>Vocabulary Mapping</td>
<td>Data Enrichment</td>
<td>Application &amp; Device Integration &amp; Data Flow</td>
<td>Data Virtualization</td>
<td>Data Quality Tools</td>
<td>Security Controls</td>
<td>Resource Mgmt</td>
<td>Content Mgmt (MDM, Content Mgmt, etc.)</td>
<td></td>
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</tr>
<tr>
<td>Adv. Analytics (Embedded, Stream, NLP, etc.)</td>
<td>Linkage &amp; Relationships</td>
<td>Taxonomies</td>
<td>Duplication Mgmt</td>
<td>Usage Monitoring</td>
<td>Data Science</td>
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**Change Mgmt** | **Policies** | **Procedures** | **Standards** | **Oversight** |
OPERATIONALIZING DATA MANAGEMENT TO MAXIMIZE GAINS
Data Classification

What it is
Data classification is the process of organizing data into categories to enhance its use and management.

Taking Action
- Establish a data classification schema – start simple (e.g. restricted, private, public) and grow complexity over time
- Create supporting policies
- Systematically implement with departments

Its impact
- Data Protection
- Regulatory/Legal Response
- Information Lifecycle Management
- Effective and Efficient Data Use
## Data Standards Adoption

### What it is

Data standards define the rules by which data are described and recorded – format and meaning.

Other standards that support data standards include content, terminology and privacy/security.

### Taking Action

Look to Standards Development Organizations like the Office of the National Coordinator’s Interoperability Standards Advisory (ISA) for standards specifications and implementation guidance ([www.healthit.gov/isa](http://www.healthit.gov/isa)).

Collaborate with partners.

### Its impact

- Information Sharing and Interoperability
- Patient Safety
- Analytics
Data Quality

What it is
The ability of data to serve an intended purpose

Taking Action
Develop definitions and attributes of key concepts, data, and metrics
Implement a Data Asset Catalog/Metadata Repository/Report Catalog
Integrate basic stewardship into system implementations

Its impact
Provide clarity, comprehension, and trust of data
Accelerate use of data management, analytics, and interoperability activities
Enable self-service
What the surveys say...

Chart 6
Strategic drivers for maintaining high-quality data

- Increase efficiency: 52%
- Improve cost savings: 40%
- Protect the organization’s reputation and brand: 39%
- Enable more informed decisions: 37%
- Reduce risk or fraud: 37%
- Enhance customer or citizen satisfaction: 37%
- Capitalize on opportunities with customer profiling: 36%
- Accelerate data initiatives: 31%
- Create a single customer view: 30%
- Comply with regulation: 29%
- Help the environment: 20%

U.S. data, 2018

2018 Global Data Management Benchmark Report - Experian
What the surveys say...

Chart 8
Top factors contributing to data inaccuracies

- Human error
- Lack of internal communication between departments
- Inadequate data strategy
- Inadequate senior management support
- Lack of internal manual resources
- Insufficient budgets
- Inadequacies in current relevant technology
- A lack of relevant technology
- Lack of skill needed to correctly use existing technology

U.S. data

2018 Global Data Management Benchmark Report - Experian
Data Ownership

What it is
Assigned responsibility for definitions, policy, and practice decisions (administrative control) over a data domain or data set, no matter who collects or manages the data.

Taking Action
Implement data stewardship program...or not.
Align data ownership with master data management - which business owners best understand how data is created, used, etc.
Start with a domain or data set.

Its impact
Data Protection – Access and Appropriate Use
Lifecycle Management – Disposition
Change Control
Data Quality
Data Integration

What it is
Data integration is the combination of technical and business processes used to combine data from disparate sources into meaningful and valuable information.

Taking Action
Architect and manage ETL, EAI, EDI, Medical Device Integration, Streaming Data, ESB, and Data Virtualization holistically.
Eliminate redundant technologies – standardize.

Its impact
- Reduced complexity and cost
- Improved visibility
- Better performance
- Accelerated results
- Improved data quality
Data Preparation

What it is
The cleansing, standardization deduplication, and other transformations performed on data so that they can be used in analytics

Taking Action
Prioritize data sets
Implement shared metadata, persistent managed storage and reusable transformation/cleansing logic
Explore AI and ML technologies

Its impact
Data Usability and Trustworthiness
Can be costly if manual – up to 44% of analyst time relate to data preparation
Accelerator for AI and ML to improve efficiency
“Data is rarely in an appropriate condition to be used for analytics when it is extracted from a source repository.”

2018 Global Data Management Benchmark Report - Experian
Data Enrichment

What it is
The process of augmenting enterprise data with third-party data to yield new opportunities for more meaningful analytics

Taking Action
 Identify use cases
 Inventory the DaaS landscape...HIEs, registries, DaaS providers...who has what you want/need and procure it
 Anticipate the role that third-party data sources will play in the organization’s data ecosystem

Its impact
Data Quality - particularly master data sets (e.g. provider data, patient identity)
Population Health and Personalized Medicine Initiatives
Data Ethics

What it is
The moral responsibility related to data collection and use by persons and artificial intelligence.

Taking Action
Identify principals and values of the organization (mission, risk, compliance, common sense, social acceptance)
Develop strategy, policy, and education and evaluate
Evaluation of current practices

Its impact
Transparency
Protection of individual and group rights
Risk reduction
Personalized medicine
Final Thoughts

• Enterprise data and information management functions should be formalized and operationalized to achieve greatest benefits
• Data management functions can and should be activated in alignment with strategic and tactical business needs
• Even if critical data management functions are not formalized and operationalized, value-creating activities can and should be pursued
• Consider people + process + technology considerations
Keep in touch

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