

Preparing for Big Data:

Laying the Foundation with MASTER DATA MANAGEMENT

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Big data, the avalanche of healthcare information on its way, represents a significant opportunity for pharmaceutical manufacturers. New sources of information, including electronic medical records, social media, real-world evidence, personalized medicine, and track-and-trace systems, promise companies better clinical and commercial insights for competitive advantage.

But first, pharmacos must have the technology platform and processes in place to accept and make use of the data. Big data pose a challenge in their volume, the variety of their formats, and the speed of their expansion. A sound master data management (MDM) strategy and framework, while helpful today, will become crucial to being able to mine the rich information resources on their way.

The Bedrock of Commercial Activities

Master data are information common to multiple functions in the enterprise. For commercial organizations, this includes data on: providers, provider affiliations, plans, products, and employees. How this information is managed falls under the broader domain of “information management,” but has its own set of challenges and guidelines. Primary among them is the need for master data to reflect “one version of the truth,” serving as *the* authoritative source.

IMS conducted in-depth interviews with industry operations and IT leaders late last year to confirm its views on their MDM priorities. Participants stressed the importance of MDM in:

- » Becoming customer-focused and accelerating multi-channel sales and marketing
- » Supporting compliance with legislative requirements, including aggregate spend reporting
- » Measuring performance and predicting trends
- » Driving operational efficiencies in operations, sales planning, and manufacturing
- » Facilitating integration and migration projects

Trends in Master Data Management

Over the past 25 years, MDM

has evolved dramatically — from tending to data within functional silos to it becoming enterprise-wide undertaking. As companies adopt more sophisticated approaches to MDM, their use of data can move from understanding what has happened to seeing what is happening and finally to determining what they can make happen.

With the availability of new, more detailed data, the degree and pace of change in MDM is greatly increasing. Big data sources tend to deliver high volumes of transactions which can sometimes be unstructured, of suspect quality, and incomplete. Such big data are best used for purely analytical purposes to spot trends, identify behaviors, and categorize segments. However, if this insight is to drive business actions, the MDM strategy will need to address how to incorporate it into operational data.

As the figure below illustrates, companies generally fall into one of three stages of MDM maturity:

Bootstrapped MDM

Companies in this stage have developed point-to-point interfaces between systems to



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share information as needed. Such targeted solutions generally cannot support additional information demands without creating redundancies and inconsistencies. The environment is defined and maintained by IT, and data quality issues are handled in a “fire fighting mode.”

MDM Driven by CRM

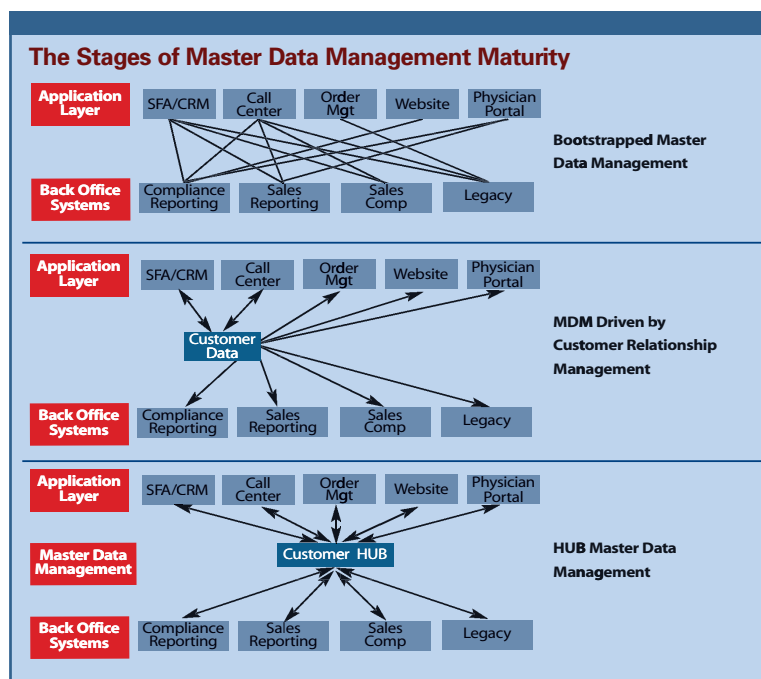
Here, the Customer Relationship Management (CRM) environment serves as the data warehouse for customer data, which can be tapped by other systems. The database likely captures information on the majority of key customers, but tends to focus only on targets and has limited, cross-organizational value. Stewardship and governance of the data resides with IT, and attention to data quality is reactive.

Hub-Based MDM

In this structure, master data are retained in a central hub, with a focus on consistency, accuracy, and timeliness. Appropriate applications, warehouses, and back-office systems across the enterprise interface with the hub, but remain independent of one another. The MDM strategy is aligned to the business strategy, and a governance strategy — developed jointly by the business and IT — sets standards, dictates policies and procedures, and defines responsibilities.

Achieving the Ideal

In the ideal structure, master data are accessible by all commer-





cial functions as needed to operate the business (e.g., for campaigns, incentive compensation, segmentation, targeting, and speaker programs). It also supports analytical processes using less-than-perfect big data for other purposes, some of which have yet to be imagined (including compliance trends, targeted messaging, fraud detection, and treatment protocols).

A model MDM system will have well-established governance and stewardship roles with the authority to manage the definition, quality, distribution, and integration of data across business functions.

The first step in achieving this ideal is to develop an MDM strategy that extends the company's broader information management strategy, supports the organization's business goals, and accommodates both the operational and analytical uses of big data. Questions to be addressed include:

- » What information will support the business' strategic objectives?
- » What metrics are needed?
- » What are the types of data that are needed (persistent/occasional)?
- » Where will the data come from (internal/external)?
- » What level of quality is needed for each application?
- » How will quality be maintained and reported?
- » How will the data be structured?
- » What system will be required to support the organization?
- » How will we handle changes in volume, variety, and velocity?
- » How will information be delivered?
- » When do I build vs. partner/outsource?
- » Is our culture and organization ready for a higher-order MDM system?

How these questions are answered will define the MDM roadmap and investment priorities — so from this point on, the planning process is very individualized. A company's level of maturity in information management and MDM will dictate what it can and should do next.

Master Data Management as a Service

The trend is to develop an MDM framework that can be managed as a service by firms that claim MDM as a core competency. This model frees manufacturers from investing in, maintaining, and updating the technology. Too often, companies that create their own internal infrastructure find that the technology ages quickly and upgrades are difficult to resource and fund. A services model provides an alternative for companies that want to create an analytical MDM so-

The Ideal Master Data Framework

There are seven essential steps to managing master data:

- 1: Data sourcing.** This includes proprietary data from within the organization as well as third-party data.
- 2: Loading & cleansing data.** Source files are converted to a standardized format and scrubbed of defects.
- 3: Matching, merging, and enriching.** Clean records are matched and duplications eliminated. The end result is the "golden record," the purest, most accurate information possible.
- 4: Stewardship.** Through a combination of people, processes, and technology, all gray areas related to matching are reconciled. Quality is monitored and measured against enterprise standards and definitions.

- 5. Reporting and auditing.** At this stage, operational and quality reports are produced, cross-references are maintained, and a history is kept of all changes.
- 6. Publishing.** This requires a standard, outbound interface and Web services for data access.
- 7. Consuming.** Systems are integrated to enable downstream use of the integrated data.

Underpinning all of these steps is a foundation of governance. The governance process must clearly articulate roles and responsibilities, set standards, develop a communications framework and link to an information management strategy.

lution for Big Data and maintain their existing operational processes.

Interestingly, companies at either end of the maturity spectrum can more readily outsource MDM from this point forward. Emerging companies that have yet to invest heavily in a technology infrastructure can easily begin with a hosted solution and accommodate additional master data domains as they grow. Likewise, companies on the upper end of the maturity curve can make the move to a hosted solution fairly easily because they've already corralled their data and established some of the necessary disciplines (governance, data quality, and lifecycle management).

Those companies in the middle of the maturity curve—that have only partially integrated their data sets and rely on IT for data stewardship—have more work ahead of them in defining their business rules and integration requirements before they can entrust MDM to a partner.

Internal Data Governance

Regardless of how a company sources its MDM solution (to include data quality assurance, integration, and hosted storage and maintenance), it must retain ownership of data governance. This responsibility, shared between users and IT, has three basic components:

- » **Setting standards** around data definitions and taxonomy, metrics and measures, technology and tools, and reference data.
- » **Determining policies and processes** related to data definitions, monitoring, measurement, change management, and access and delivery.
- » **Establishing organizational readiness** to include defining roles and responsibilities, identifying training requirements, and applying change management techniques.

A company's data governance approach should balance the needs of multiple stakehold-

ers, and so should be made by those who use the data and understand the industry. Thus, the best practice is to create a Data Governance Council — with representatives from IT, business strategy, HEOR, observational research, clinical development, market research, commercial analytics, legal, and compliance — that can ensure data decisions support the company's business goals.

Realizing Big Data's Potential

By adopting a holistic framework for managing master data, pharma companies can realize synergies in data sources and efficiencies in data processing. A well-conceived MDM strategy that is governed by a cross-functional body will ensure that the necessary data are accurate and readily available to all who need them. The MDM strategy must accommodate operational MDM as well as analytical MDM, which may include less-than-perfect data — and lots of it. Establishing the right infrastructure and discipline around managing master data is a prerequisite to handling and exploiting the potential of Big Data. **PV**

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