The Devil Is in the Details: How Methodical Data Quality Management Delivers Headline Results

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Data quality management has never been and will never be "exciting": It is difficult, and progress is often incremental. However, the potential long-term improvements in efficiency and insight from using the right approach can help reenergize pharmaceutical sales and marketing operations. Companies that can tame data volatility and growth to support top-quality data operations—with the right quality management techniques—can transform data quality management from a problem into a competitive advantage.

In terms of a technology solution, there is no silver bullet for ensuring data quality, but a structured approach focusing on a framework, the right combination of automation and human judgment, and proper governance will yield significant improvements that are sustainable over the long term.

Table of Contents

Introduction

For the pharmaceutical industry, managing data has become a major struggle. The amount of data and number of vendors are exploding, and companies use data in complex ways, and in areas like advanced selling models, marketing and contracting analytics, and performance analysis.

These are difficult issues, and your company may be like many others: When there are data problems, you aren't sure where to begin looking for the root issue. This leads to fire drills in which data stewards examine what data was provided to customers, and delve into sources for anomalies. Management teams conduct conference calls to diagnose the issue, find ways to address the issue and deliver a resolution.

Unfortunately, this approach leads to unhappy customers, overworked employees, and upper management losing confidence in the data operation. To cope, you hire extra data stewards and ask for more capacity. But the additional costs exceed the benefits, and you're back at square one.

We see this situation at many pharmaceutical companies, and you've probably seen it at yours. However, a structured, deliberate approach to data quality management (DQM) can boost executives' confidence in the company's data management operations, cut costs and boost revenues, not to mention reduce the number of downstream data errors and irate phone calls that come with them.

Paying Attention but Losing Ground?

To put it simply, managing data quality is hard. It can be costly and is hugely complex. Companies often struggle to gather and integrate data from multiple sources and reconcile it for use across the organization. Based on an informal survey of information processing professionals in the pharmaceutical industry, companies spent about 15% of their resources in large operational analytical processing or reporting environments on managing data quality. On average, companies spent an additional 8% on reprocessing data due to data issues. That's 23% of overhead in chasing down and fixing data issues.

Meanwhile, the industry's long-term issues with data quality are likely to worsen. Detailed, customer-level data is now extremely important to marketing, while the number of data sources is growing, adding enor-

mous complexity. And because different vendors generate affiliations data, managed-care data, multichannel interactions and other data, it's a major challenge to integrate the information.

Other issues are arising even as they present opportunity. Emerging EDI-sourced sales data is enticing, but it is difficult to reconcile with traditional distributor-sourced sales data or pharmacy-sourced prescription data. Restatements in account sales data and gaps strain operations; competitive pressures will require marketers to derive as much insight out of data as possible.

Managed-care data represents an enormously important customer segment, as it constantly changes formularies and plans, and hard-to-unravel relationships between organizations. These factors alone make data management inherently volatile. In addition, pharmaceutical companies are figuring out how to use data in new applications such as closed-loop promotions, and multichannel and digital marketing.

Emerging Sunshine Act requirements mandate pharmaceutical companies to report payments to doctors accurately. "Dark spots" in data coverage due to non-reporting pharmacies—and in the past, due to blacked-out states—mean pharmaceutical companies must find new ways to leverage data in certain areas to reach the right customers. These requirements pose a big challenge for companies to get it absolutely right, all the time.

In facing these realities, DQM is not simply a matter of adding people or technology, but requires a cost-effective, scalable process. So how do companies put together a DQM process that can bridge multiple vendors and create a reliable yet affordable system? How can they determine how good is good enough?

Balance Is the Key to DQM

The key to such a process lies in automating the part of DQM requiring human insight, coupled with an approach that can grow with increasing data.

It is essential to strike a balance between the experience of human stewards and the efficiency of automation. Data quality has relied upon data stewards catching errors that automated pass-fail checks cannot, but data stewards are not always cost effective. Conversely, automated checks are cost-effective, but cannot replace human judgment entirely.

Companies also need to expand this idea to automating the pass-fail threshold or figuring out the right parameters for data quality.

Emerging tools and processes allow companies to automate what once was confined to the realm of human judgment. Combining these two results in a superior approach—using one alone does not work well, as seen with two companies described below.

The Problem With Extremes

When two pharmaceutical companies of similar size tried improving data reliability, they both took singular approaches: One added data stewards, while the other tried fully automating data checking.

The company that hired data stewards cut the amount of time doing rework in half, and the percentage of error-free deliverables increased from 85% to 90%. However, the benefits of extra stewards did not justify the additional cost. The company that embraced full automation saw the opposite happen: While costs declined because of reduced head count, data accuracy was only slightly better, remained static or in some cases declined. Neither company enjoyed the transformative effect they had anticipated.

Like many companies, these two had to "do more with less." They also had to maximize opportunities that did not exist a few years ago, including information from click-stream data, closed-loop promotion inferences, continuing medical-education programs and data from mail campaigns. Ensuring data quality underlies all efforts to improve quality, reduce costs and take advantage of new opportunities.

But what does "quality" mean in this context, and how does DQM actually work in the pharmaceutical industry?

How DQM Works

Though there's awareness that DQM is effective, it's usually not embedded in a structured framework. In a recent survey of data stewards for multiple pharmaceutical reporting systems, all respondents felt that DQM was key to a successful analytics process—but fewer than half reported they *actually had* a structured quality management framework.

An effective structure for managing data quality includes clear definitions of data quality responsibilities with regard to data suppliers, processors and consumers; a DQM framework within those boundaries and a governance structure that manages data issues and growth within and across boundaries. (This article does not focus on definitions and governance aspects, but using the right DQM framework for data checks, which relies on the right combination of technology, domain knowledge and governance.)

As data proliferates, the volume of data quality management will grow as data checks incorporate additional human judgment (because not all checks are straightforward pass-fail decisions). The most sophisticated operations incorporate integration and look-ahead checks to see how clients are using data (see Figure 1).

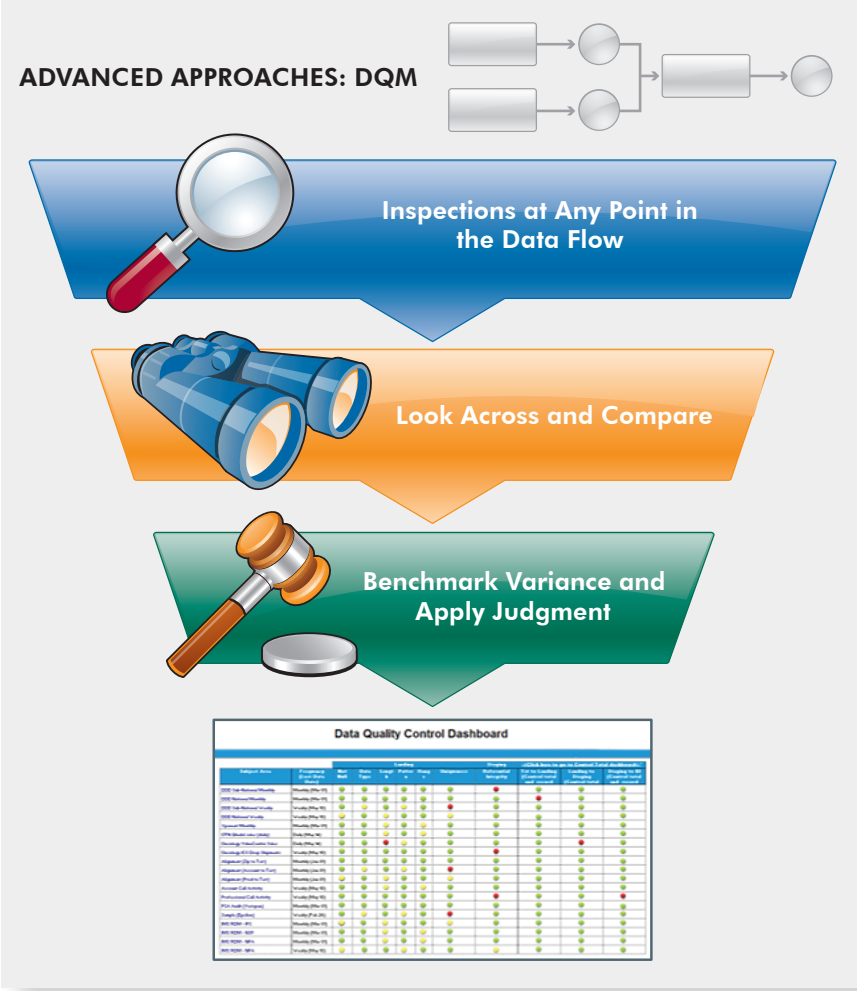


Figure 1. Sophisticated DQM operations employ integration and automated checks to see how clients are using data.

Data management operations are often designed to check individual data elements; for example, to audit numbers within reasonable ranges and categorical fields having a predetermined set of values. DQM entails diagnosing issues quickly and accurately, and automating processes while engaging human judgment appropriately and sparingly.

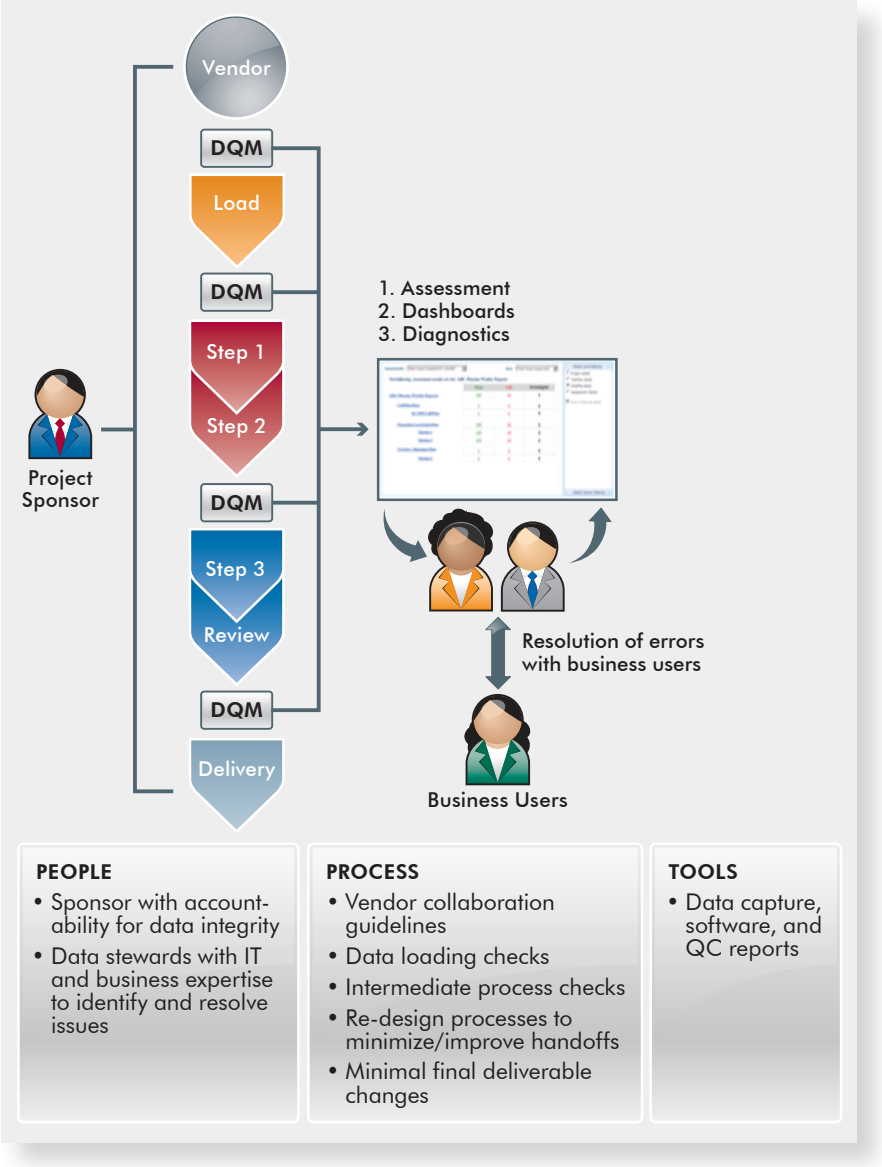
A key to successful data quality management is that the process should automate data checking and the assessment of the results, leading to appropriate levels of warning for data stewards. This kind of judgment should be based upon expected data variance to allow a process to continue, and should remove outliers to make exceptions. Over time, the system should "learn" how to make and administer judgment. The key to making the warnings effective is to grade them based on downstream use of the data.

At its most fundamental, a DQM framework consists of three steps:

1. A data management process needs to be sliced into parts, allowing the company to apply a framework based on SIPOC: suppliers, inputs, process, outputs and customers. This will help identify where issues may have originated and engage data suppliers in managing quality.
2. Using the SIPOC approach, the problem needs to be diced and broken down, using a combination of automated data inspections and quality assessments, incorporating expert, human insight into the assessment. This will make the process more efficient.
3. To ensure adequate operational and stakeholder support, the company needs to set up a governance structure that gives guidance when issues arise, and keeps DQM functional over time.

We have seen the above approach help realize significant cost and efficiency gains, result in easy and cost-effective ways to scale systems over time, and help create dialog between information suppliers and users of the data (see Figure 2).

Figure 2. Successful DQM has three fundamental steps and involves many interested constituents.



A case study shows how this approach works in the real world.

CASE STUDY

The Client

A large pharmaceutical company wanted to improve its sales operations through better targeting—each individual rep would deliver the right message to the right physician. To improve targeting, the company would have to optimize its call planning to determine which doctors were the most valuable, the frequency of doctor visits in a given cycle, and the type of promotion each doctor should receive.

Aligning reps with the proper physicians involves the integration of extensive customer profiling data, promotion response curves, business rules and other information. Call planning is also critical to other downstream sales operations processes like reporting, crediting, incentive compensation and refining segmentation.

The Problem

When it was trying to build its call planning operations, the company faced formidable data management issues. It had more than 25 data feeds, and many of these individual feeds had different versions. Data formats were fluid, which threatened to derail proper quality control, while volatile business rules meant the company might have to frequently change integration and processes of quality checks.

The company's existing DQM process focused more on outputs than inputs, which resulted in some errors making it all the way through the system. Because call planning entails complex, volatile business rules, expert data stewards had to do half of the checks, which made DQM time consuming and expensive. The end result: Data checks took longer than ever, and mistakes weren't caught until far downstream, which resulted in significant rework.

The Solution

Because the existing DQM approach could not support effective call planning, the company, taking advantage of external assistance, took several steps to address the issue:

- Designed a comprehensive quality test plan, which helped identify mistakes in input feeds and catch errors before they became flawed outputs.
- Standardized the format and frequency of received data files to reduce the number and types of feeds; shifted accountability for some data checks to data suppliers.
- Configured a DQM tool that automated quality checks, replacing many data steward checks with a repeatable, flexible process that was easy to reconfigure when business rules changed.
- Created reports that highlighted key statistics—such as outliers and missing targets—that provided true insight into the business implications of data variations.

The Results

These changes took several weeks. As unexpected implementation challenges are common, the company's methodical approach helped overcome issues that might have otherwise derailed it.

The hard work delivered tangible results. When paired with a change management process, the new approach to DQM resulted in a huge upturn in quality: While in the two quarters prior to starting the DQM upgrade the company had suffered numerous errors, there were zero data errors in field deliverables for the most recent two quarters.

In general, an effective call-plan process can increase revenues 10% to 15%. In addition, because automation reduced human error, the company caught more mistakes early, eliminating rework, which had constituted about 15% of the total amount of effort prior to the DQM project. The company improved its overall sales performance while reducing the time it took to finish the process 10%.

Conclusion

Data quality management has never been and will never be exciting: It is difficult, and progress is often incremental. However, the huge long-term improvements in efficiency and insight from DQM can help reenergize pharmaceutical marketing operations. Companies that can tame data volatility and growth to support top-quality data operations—with the right quality management techniques—can transform DQM from a necessary evil into a competitive advantage.

We have seen this type of methodical approach, like the one detailed in the case study, improve data quality in numerous situations. And the importance of impeccable data quality is only growing. In ad hoc projects like product launch scorecards, which require marketers to process a wide range of data in an extraordinarily short time span, proper DQM is paramount to success. In major projects such as building foundational enterprise data warehouses to improve efficiency, proper DQM ensures a smooth workflow.

There is no silver bullet for ensuring data quality, but this kind of structured approach focusing on a SIPOC framework, the right combination

of automation and human judgment, and proper governance will yield incremental improvements that will accumulate over the long term. We feel that incorporating automated checks to mimic human judgment is a new, and essential, element to proper DQM, but this idea alone cannot magically transform data quality—no one thing can.

Like data quality management overall, automating the process is difficult and nobody's idea of a glamorous assignment. But once companies can automate the process and get better-quality results and true insight because of DQM, the results are anything but boring.

About the Authors

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