

The Complete Guide to Data Quality Management

Go for the Gold

The goal of an organization's data quality management practice should encompass both the accuracy of the information and its ease of use.

Data quality is the key to success for your data-centric, insights-driven organization. With careful attention to managing data quality, you can finally achieve the goal of data-driven decision-making at all levels. It has the potential to change everything, from customer experience and bottom-line profitability to even employee behavioral workflows.

This whitepaper explores what data quality management is and how the right strategies and tools can make it possible to use all of your omnichannel data.

What Is Data Quality Management?

Let's start with the idea of data quality. The phrase "garbage in, garbage out" from the early days of computing still applies. If information isn't completely accurate, over time it leads to increased complexity, poor decision-making, and loss of time and money. In fact, it's estimated that bad data costs businesses \$3.1 trillion annually.¹

Data quality management seeks to ensure higher data accuracy and better data delivery, that is, in formats that make it easier to analyze and enable effective and efficient decision-making.

Continuous data improvement should be a best practice for every organization, particularly because data is always changing. But the ultimate rules for master data management and data quality management vary according to your goals, software, and how you want to use your data.

¹ Redman, Thomas C. Bad Data Costs the U.S. \$3 Trillion Per Year, Harvard Business Review, September 22, 2016. <https://hbr.org/2016/09/bad-data-costs-the-u-s-3-trillion-per-year>

Think about all the internal and external sources from which you collect data:

- Accounting
- Mobile and web customer interactions
- Human resources
- Physical locations
- Sensors in parts or products
- Compliance activities
- Partners
- Sales
- Vendors

Once data is of acceptable quality, it should be consistent (carry the same information) across the multiple applications, databases, and systems that support your business processes. The goal of an organization's data quality management practice should therefore encompass both the accuracy of the information and its ease of use.

Why Data Quality Management Is Important for Your Business

Data quality—or the lack of it—can have a massive impact on your business. In one particularly significant example, due to a glitch in the company's data, Hawaiian Airlines charged its rewards customers for tickets in dollars rather than miles. This meant that a 17,500-mile ticket that should have been paid for in rewards points was priced at \$17,500. Customers were understandably upset when they saw their credit card charges.

While this is a very public and humiliating example of what happens when good data goes bad, imagine these scenarios:

- Duplicate customer data causes the marketing and sales teams to send the same materials multiple times. This raises costs and annoys customers, giving them the impression that the company doesn't have its act together.
- Supply chain vendor data is inaccurate, and the inventory count is off, so now automated ordering is based on unreliable information. Items have to be back-ordered, causing customers to seek products from competitive vendors.
- Financial reporting is inconsistent, and running the same query in different systems results in different results. This leads to a loss of stakeholder confidence.

These are just a few examples of how poor data quality can impact a business and its customers. Bad data can also grind business productivity to a halt. Imagine how much more productive your business could be if data was accurate and wasted time could be a thing of the past.

If It Were Only Easier

For all the benefits of high-quality data, there are often just as many roadblocks to achieving it.

The Benefits of Good Data Quality

Good data helps you respond to marketplace changes more effectively. Benefits of improving data quality include:

- More informed decision-making at every level
- Better targeting of prospective audiences
- More effective marketing campaigns
- Better customer relationships
- Greater competitive advantage
- Higher profits
- Streamlined operational workflows
- Less waste

Given these advantages, why wouldn't you look for new ways to improve the quality of your data? The answer is, that for all the benefits of high-quality data, there are often just as many roadblocks to achieving it.

Roadblocks to Good Data Quality Management

The burden of data quality, of cleaning data for use, often falls to IT or the business user. Far too much time is spent by users trying to get their data into a usable form.

This problem is exacerbated by data silos, making it even more difficult to harmonize across sources. Manual processes for addressing these problems not only waste the IT teams' time, but throw up a roadblock to fast, effective, and real-time decision-making.

Another roadblock is siloed data intake. With customer data flowing into your organization from multiple channels — e-commerce, brick-and-mortar outlets, customer service interactions, social media, and many others — critical data can quickly become fragmented throughout multiple siloed systems.

As your data becomes more dispersed, it gets harder to know which application has the most accurate or up-to-date information, and by the time your data scientists and data analysts have finished collecting, cleaning, and splicing together all the pieces of your data puzzle, the data's value has decreased or been lost completely.

There's also the sheer volume of data you hold and are capturing every day. According to Forbes,² the amount of data generated in the U.S. alone is staggering. A brief snapshot of the data created in just one minute:

² Martin, Nicole. How Much Data Is Collected Every Minute of the Day, Forbes, August 7, 2019. <https://www.forbes.com/sites/nicolemartin/2019/08/07/how-much-data-is-collected-every-minute-of-the-day/>

- 4.4 million gigabits of internet data
- 188 million emails
- 18 million texts
- 390,030 apps

Data proliferation shows no signs of slowing. IDC predicts the world will generate 175 zettabytes by 2025.³ To make data volumes less troublesome, organizations are turning to cloud storage and to data quality management companies to apply AI automation to manage its effectiveness.

Best-Practice Steps to Achieve Data Quality

The most significant step you can take in achieving better data quality is to ensure you are collecting high-quality data, which starts by implementing best practices:

1. Prioritize data quality program objectives.

Not all data is created equal. Priority should be given to ensuring the accuracy, consistency, and completeness of data required for regulatory compliance and key decision-making. Business stakeholders play a vital role in prioritizing the business outcomes that can be most affected by data quality improvement.

2. Understand your data sources.

Once you know the business outcomes you'd like to improve, the next step is understanding the data that fuels those outcomes to identify any missing, duplicate, or erroneous data that may need correction.

3. Set data quality rules and standards.

With an understanding of typical data patterns, you can identify anomalies (departures from those patterns) and work with stakeholders to refine the rules for cleansing, deduplicating, and standardizing format(s) across all relevant platforms.

4. Enforce rules early and often.

Cleanse data as close to its capture as possible and integrate reusable services into data pipelines for all sources and channels. Ensuring the quality of the data as soon as it enters your network frees up IT resources and citizen data analysts to spend more time on producing business value and less time on data preparation.

5. Monitor and manage data.

This is not a one-and-done process. Changes in data quality metrics can uncover other issues critical to the business. Plan to report on data quality regularly with scorecards, dashboards, and visualizations.

³ Patrizio, Andy. IDC: Expect 175 zettabytes of data worldwide by 2025, December 3, 2018, NetworkWorld. <https://www.networkworld.com/article/3325397/idc-expect-175-zettabytes-of-data-worldwide-by-2025.html>

Key takeaways for success:

- Ensure stakeholder buy-in for strategic data initiatives.
- Showcase business cases that illustrate the importance of data quality.
- Integrate data quality everywhere—including front line operations.
- Assign a data steward for every department or function.
- Collaborate with business users to build the value of data-driven decision-making.
- Leverage AI and machine learning (ML) to automate repetitive tasks.
- Achieve a single source of truth using a data warehouse that integrates your omnichannel data streams.
- Leverage the cloud whenever possible.

Best Tools for Data Quality Management

Technology is evolving to handle monumental volumes of data. AI and ML show great promise for extracting value (key information) from data provided through multiple channels and making it actionable for the average decision-maker. But, quality data is also needed for these critical tools to perform as expected. It is imperative that you choose a data and analytics software provider that offers:

- Augmented data cleansing and profiling features that automate identification of metadata, validate the data source, and manage the cleansing of it.
- Data quality and integrity checks that establish rules for data integration along with error reporting during processing.
- Consistent, reusable services that can be implemented with other data management capabilities, like master data management and reference data management.
- No-code interfaces that facilitate contributions from citizen data analysts.
- Full connectivity with all data sources. Look for an enterprise-level omnichannel data analytics platform that can support data of any format or complexity, whether unstructured or structured, hierarchical or flat, modern or from a legacy platform.

Assessing, integrating, and monitoring data quality can be a massive undertaking. There is simply no way to bring all your data together — from the cloud, on-premises, the Internet of Things (IoT), mobile, web, and more — and achieve usable quality data without using automation to systematize, improve, and integrate it.

Data quality solutions offered by TIBCO can serve as an analytical overlay for all of your data sources. You can establish a customized platform that standardizes and structures data in real time and establishes interoperability between data siloes.

Data quality for better decision-making is the difference between successful organizations and those mired in the uncertainty that comes with multiple versions of the truth. TIBCO's data quality platform helps you:

- Explore and integrate all your data
- Spend less time gathering and preparing data and more time analyzing and using it for decisions
- Collaborate across teams with accurate, relevant, high-quality data
- Make your organization's data actionable with an intelligent dashboard that democratizes information gathering and analysis



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