

Information Quality Management (IQM)

Assessing Your IQM Practice



Data is the engine behind your business: optimizing business processes, supporting strategic decisions, and helping to grow your business. How you approach and manage the quality of information is critical to success in these areas. Trillium Software offers a practical guide to assess your information quality maturity level and provide you a framework to align your information quality management practice to business objectives and results.

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Executive Summary

For many organizations, grappling with vast quantities of data to deliver meaningful information that will enable processes and improve decision support is a struggle. Organizations are inundated with data that is often hard to use, challenging to manage, and frequently in suboptimal condition (incomplete, misfielded, and incorrect or absent all together).

Productivity is driven both by the optimization of steps and processes that businesses put in place as well as the quality of information used at key transition points and handoffs in these processes. To meet business objectives, as well as CxO demands for accurate information and actionable business insight, organizations have come to understand that they need to invoke more systemic strategies to manage the quality of information across the enterprise. To this end, Trillium Software has developed a best-in-class approach and methodology, aligning business processes and strategic insight with peak-condition information. We call this Information Quality Management (IQM) and provide a framework, assessment, and roadmap to achieve results.

Our framework and assessment of an organization's Information Quality Management efforts help determine the effectiveness and efficiency of aligning data with business processes and strategic decision support. Organizations can refer to the Trillium Software Information Quality Maturity Model to optimize their information quality practice to achieve the best results. By applying the philosophy proposed in the Information Quality Maturity Model, organizations can invoke a plan that aligns enterprise data to both business needs and information consumption demands across lines of business.

Case for Investing in Information

Strategically managing information is the foundation for business success. Data is no longer something that is just captured, stored, and used for a limited purpose. When transformed into high-value information, data becomes fundamental to competitive advantage, operational efficiency, risk management, and, ultimately, stockholder value. This is why more and more business executives are focusing a keener eye on the quality of their data.

According to a Gartner report, companies lose, on average, \$8.2 million annually due to issues with their data, a figure that can increase when dealing with regulatory compliance and public safety issues. So why is it that too little is being done too late to improve data quality?

Hyper-Evolution of the Digital Universe

The complexity of managing enterprise data is ballooning with the amount of data collected and monitored. No longer confined and controlled within the walls of the enterprise, information is now distributed to the cloud, enterprise applications, partners, and online networks. Even customers can supply, modify, and exchange information through various levels of relationships and interactions. This fluid and expanding universe presents both opportunity and challenge.

Consider these statistics:

- **By 2012 the digital universe will be five times larger than it was in 2008.**
- **Data storage requirements are growing at an annual rate of 60%.**
- **In 2008, there were 45GB of data for every person in the world, or 281GB billion. By 2011, that will balloon to 1,800GB billion.**
- **70% of the digital universe is created by individuals.**
- **Corporations are responsible for the security, privacy, and reliability of 85% of the data.**

(From IDC 2008 Research)

The value that corporations reap from all this data can, if managed properly, help drive the business forward. Yet maintenance, storage, and accessibility of vast quantities of data present many challenges. How can companies rely on what is collected and exchanged to make decisions? What sources of information can be trusted to achieve business goals? What assurance do companies have that, after expending precious resources and significant investment in information management, the resulting information will actually contribute to business performance and success? The answers to questions such as these all hinge on the quality of data.



Ministry of Defence

The Challenge

- Improve supply effectiveness while reducing costs.
- Assess data quality across multiple systems in preparation for integration.
- Manage supply chain issues – codifications, packaging, logistics, and volumes shipped.
- Ensure accurate and safe delivery of supplies.
- Continuously assess the level of quality of the new integrated system.

The Results

- The Trillium Software System identified data errors that interrupted accurate order placements, proper handling, and storage.
- Automatically validated 1.7 million records of inventory in one hour.
- Identified 56,000 rogue or missing inventory entries.
- Achieved savings and cost benefits of \$40M USD over a two-year period.

Information Quality Is a Key Performance Indicator for Business Initiatives

To keep up, IT organizations have invested in a variety of technologies and approaches to address the ever-increasing amounts of data collected and consumed by companies: enterprise data warehouses, enterprise integration, Master Data Management, and application development, to name a few. Such solutions have been put in place to make sure that the business has the information it needs, when it needs it, where it needs it. Initiatives such as these, however, have fallen far short of their promise to deliver a consistent and accurate view to business stakeholders. They are costly and take longer than anticipated, and the quality of information delivered fails to meet business user expectations. The return on investment is never realized because the quality of data is not treated as a key performance indicator for the project.

The challenge to support the information consumption needs of the business has focused IT departments on the basics of data integration, aggregation, and display. Although these activities may take care of rudimentary needs for cleansing address data, organizing data into application structures, and synthesizing a single view of a customer or product profile, they do not resolve all data quality issues. To gain a high-quality, high-value version of the truth, enterprises must place that truth into an appropriate context that is meaningful for business use while still delivering on requirements related to process, insight, and strategic objectives. The process of optimizing data quality can be measured and managed according to business needs. We illustrate this point with the Ministry of Defence case synopsis, which shows how improving data better supports inventory management. Interested parties may download the entire case study at www.trilliumsoftware.com.

What Is Information Quality Management?

More than simply data hygiene, Information Quality Management emphasizes managing data the way you would manage any enterprise asset. IQM is a practice intended to overcome the disconnect that today's Enterprise Data Management (EDM) practice creates between data infrastructure management and the business context and use of information. At IQM's foundation: What value does the business need to extract from its data? The practice starts with the business objective in mind and then leads to an assessment of the business and data environment.

Four Cornerstones of IQM

- Define the impact information has on business process and decisions.
- Map data capture, change, and consumption through the course of business operations.
- Manage and control applications and systems that capture, change, utilize, or deliver data.
- Define policies and business rules that result in “peak-condition” data.

Approaching IQM Maturity

Recognizing that managing the quality of your data is a first step toward attaining your business goals and objectives is a fundamental premise in data management. Implementing an IQM practice and cultivating it to a mature level across six key service areas will help you maximize the value you get from your information. We recommend that you invest the time to assess your own organization’s practices against the Information Quality Maturity Model to determine how to get started and expand over time.

Where you are in your ability to leverage information for the highest business impact depends on your information quality maturity level for managing the quality of that data. These are defined as pillars of information quality; they define the activity areas that contribute to peak-condition information. Although many organizations apply some measures across the different stages of the Information Quality Maturity Model, these approaches can be minimal, lack consistency, or exist in silos of data operations, analysis, and business process activities. These deficiencies will substantially limit the positive impact on the business. To optimize efforts, we recommend that organizations analyze their existing efforts and practices within this framework to help establish areas to prioritize, processes to put in place, and the appropriate technology to automate and facilitate a true enterprise-wide IQM practice.

The first three pillars, as illustrated in Figure 1, are where most businesses focus their efforts. As a result, they are only part of the way to achieving a best practice in aligning peak-condition information to business processes. To truly harness the value of information, companies need to address the last three pillars of information quality. Practices around monitoring and measuring information quality, incorporating mechanisms to cross-reference and confirm data validity, and aligning data to not only be a product of a process but also to be a driving factor within a process help ensure that information strategically drives the business.

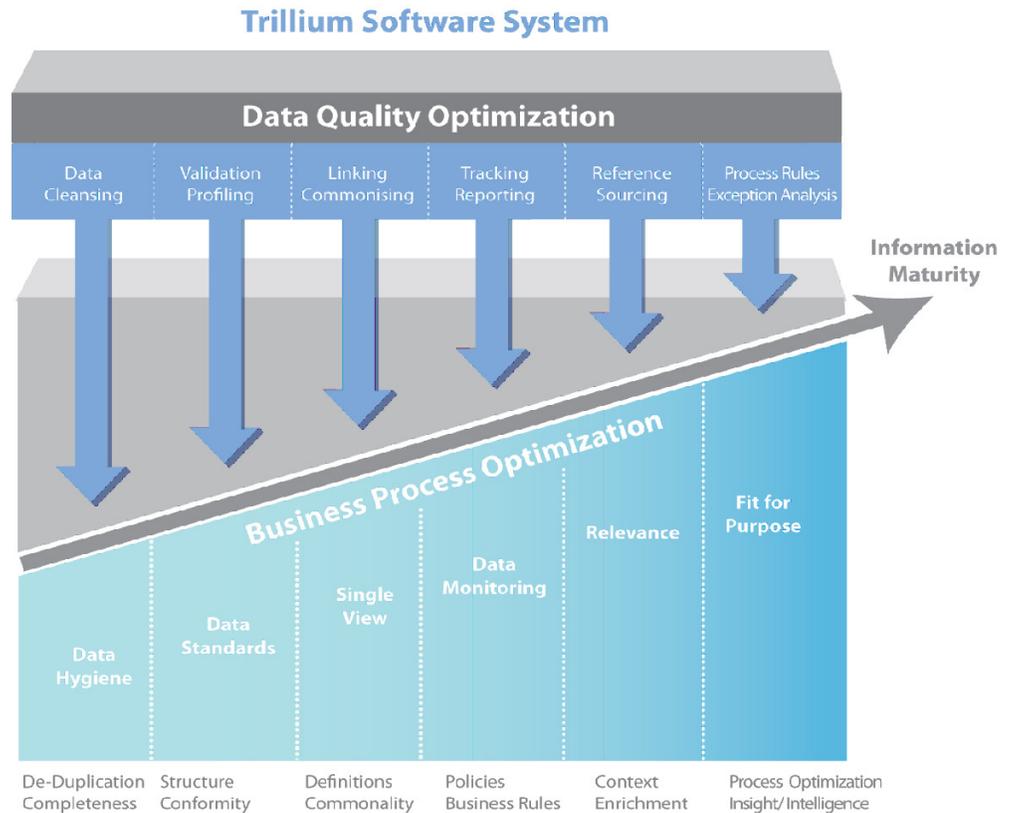


Figure 1 Information Quality Maturity Model

Pillar One – Data Hygiene Best Practices

Cleansing of records may be conducted in existing data quality technology, but typically effort is still required to keep information accurate, complete, and up to date. This happens in everyday processes when customers are on-boarded after a sale, new products and SKUs are established, or data is collected through Web interactions. It can also occur when business units utilize data service providers to improve their data as well as their own internal manual efforts.

The challenge arises when all these investments neither keep up with business need nor the volume of data growing within the organization. Furthermore, when these activities and technologies are discordant, they contribute to data issues rather than mitigating them. To improve information, the organization needs to assess the flow of data and the points at which the business and technology intervene.

Characteristics of best-in-class data hygiene processes are:

- Cleansing activities occur in regular, coordinated efforts.
- Cleansing and de-duplication processes are consistent and repeatable.
- Data changes that occur in one process or service are validated; ensuring accurate data is not overwritten.

Pillar Two – Data Standards Best Practices

When organizations establish data standards, they create structure and conformity for their information. Only then can this information help them to understand:

- Whether a company is a customer or prospect.
- Format and naming conventions of data elements, such as phone numbers, product descriptions, etc.
- Rules that determine what values are allowed in a given data field of a database or application.

Creating data standards is often a source of angst for organizations, since it impacts a variety of business aspects. How many ways does your company define a customer? Is that information organized in applications and reporting systems that render information with accuracy and in context? There may be a wide range of definitions across the organization. IT may only focus on a single definition or on the way data should fit within the technology architecture. At the operations level, the automation and enforcement of standards can exist in multiple sources across applications and data warehouses, within business owners' spreadsheets, and in data integration technology such as ETL (extract, transform, load), data mining, and SQL scripts.

Data standards are effective and overcome these challenges when:

- There is consistency in the data within business categories and data elements.
- Data is regularly reviewed to ensure conformity to business requirements.
- Standards are enforced through business rules and controls.

Pillar Three – Best Practices in Creating a Single View

The single view is top of mind for the business, whether it presents customer, financial, supplier, or product information. Until now, attaining this holistic perspective of business information has eluded organizations, particularly as the volume and the federation of data have increased. Master Data Management (MDM) has attempted to fill this void by providing a hub and console to create and enforce hierarchies and relationships in distributed data.

MDM's struggle, however, has been the ability to adequately account for or manage the quality of information. Data quality tends to be confined to address cleansing without taking into account quality in metadata (data standards) or in transactional elements that are determining factors to assess and improve information. Add to this the cost of an MDM solution, its implementation, and the time it takes to deploy, and the benefits to the business can be a long way off.

Businesses require more agility in the way information management systems are designed and deployed. As a stopgap, many business units continue to manage customer relationships, vendor profiles, or products and parts in spreadsheets and/or desktop database systems, or they create naming conventions in systems to help review and report on data entities (customer, product, household, etc). Rather than making things better, this can lead to data corruption, particularly when manually managed outside a process or when nonstandard information is entered into application fields.

You have mastered the single view when:

- Consistency and enforcement have been achieved in the definition of hierarchies between a defined business process and supporting reporting environment.
- Accounting for contextual information in profile data, transactional events, and other supporting data elements produces a peak-condition golden record.
- Agility and low total cost of ownership (TCO) are achieved in the analysis and management of hierarchies and relationships.

Pillar Four – Best Practices for Data Monitoring

Data will evolve as your business evolves, requiring consistent vigilance and governance to ensure that it conforms to business policies and rules. Regularly profiling and monitoring data, for improvement or degradation, transitions an organization from a reactive approach to a proactive practice for Information Quality Management. Improving the quality of your information is more than just a project; it is about building a practice. Data monitoring provides a window into the changing conditions of your data and enables you to proactively diagnose and remediate data anomalies as they occur.

The challenge most businesses face is their ability to both measure data conditions and connect them to business impact. The business needs to take responsibility and own this aspect of IQM, but it usually lacks the skill sets or the tools to consistently and accurately analyze data conditions. Due to the large volumes of information, the disparity in systems, and the sophistication of conditional tests, data monitoring can become inconsistent or nonexistent. Furthermore, the value and impact an IQM practice has on the business has to be determined through use cases and a broader understanding of processes, business objectives, and goals. When an IQM effort is project based, it is usually far removed from its business impact. There is often a disconnect between the condition of the data and the business requirements.

A mature data monitoring practice ensures that:

- Business policies and use cases are linked to the condition of data.
- Lines of business can generate repeatable, automated reports that assess and trend key quality dimensions for daily remediation (data stewardship), management insight (governance), and executive transparency (business impact of practice).
- Remediation practices for regular and ongoing maintenance of data are outlined and implemented.

Pillar Five – Best Practices to Achieve Relevancy

The ability to enrich and enhance data is crucial to relevancy. The ability to review and analyze data within a larger context aligns with the business need. Relevancy enables organizations to distinguish between information that is nice-to-have versus information that is mission-critical. And allowing the information consumers—the business—to manage and prioritize information quality based on a business process, insight, or goal allows companies to operate more efficiently.

Although practiced within many organizations, relevancy may not leverage a disciplined approach. Often it is limited to assumptions or a hidden knowledge of how information supports the business. Mismanagement of data and higher costs often result from a lack of communication as to why information is important and, in turn, how it will be used.

Companies that have achieved relevancy within their data have:

- Determined and documented the critical data elements based on impact to the business.
- Engaged in proactive remediation and management of critical data elements.
- Created enrichment practices aligned to business, industry, and regulatory standards.
- Provided for seamless integration of reference sources into data quality processes for enrichment.

Pillar Six – Best Practices to Ensure that Your Data Is Fit for Purpose

The objective of any Information Quality Management practice is for information to improve business processes and insight. In this context, information that is fit for a given purpose encompasses transactional, operational, and strategic requirements. Rather than existing as a static entity, trusted data should be able to automate and streamline processes and decisions within the organization. “Fit for purpose” assumes that data is governed by sophisticated rules aligned to decision points within and across business processes.

In every IQM effort, the objective is always to make data fit for purpose. However, without the bigger picture that a strategic information quality management practice provides, data is kept in its discrete elements. These elements typically are aligned to more tactical and smaller-value business benefits.

Companies master fit for purpose by:

- Creating business rules and quality processes that align to business policies and practices.
- Aligning business performance management with information quality measurement and management.
- Establishing a Data Governance committee, a critical factor in and contributor to corporate governance, compliance, and risk management practices.

Conclusion

Organizations are starting to make the connection between making information available for consumption and leveraging it to be more agile and productive. But there is still much that can be achieved. It is becoming apparent, as businesses look to improve productivity, that systems are requiring more accurate, complete, and consistent data. The challenge remains: we must fundamentally change the way we think about data. Data is more than just an outcome of a business process; it should inform and drive the business. Organizations need to better link business process and performance management to data and information quality.

By implementing the six pillars of data quality optimization, your organization can incrementally improve the quality of the data that drives all your operations. When you optimize your information, you optimize your business processes, which results in better decisions and better business.

¹ **Enterprise Data Management** or **EDM** is:

1. A concept – referring to the ability of an organization to precisely define, easily integrate, and effectively retrieve data for both internal applications and external communication.
2. A business objective – focused on the creation of accurate, consistent, and transparent data content. EDM emphasizes data precision, granularity, and meaning and is concerned with how the content is integrated into business applications as well as how it is passed along from one business process to another.

Source: Wikipedia