

Total Information Quality Management: A Complete Methodology for IQ Management

This article contains material published in the Cover Story in [DM Review](#) magazine, September, 2003

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by Larry P. English

Introduction

A colleague of mine recently told me he has gone to work for a consulting firm on an IQ project with a client where they were just “‘playing’ at data quality,” not really “doing” it. As he shared some details, we both agreed it was a sad state of affairs. This article is about what is required to really “DO” information quality and describes a methodology for *how* to do it.

It would be really nice if we could solve Information Quality (IQ) problems by implementing a one-time project and—*POOF*—the problems are gone. But IQ problems cannot be solved that way, because IQ problems are *caused* by broken, out-of-control processes, which are influenced by industrial-age, ineffective management systems that reward the wrong things.

It would also be nice if we could solve IQ problems by simply dropping IQ software systems into place and—*POOF*—the defective data is completely cleaned up, never to return again. Alas, IQ problems cannot be solved that way either. Software cannot completely remediate the limitations and weaknesses of broken processes outside the software system, nor can it completely eliminate the factors introduced by the human element in information production. IQ problems cannot be solved permanently unless you address the organization’s management systems that set performance measures and influence employee behavior.

There is no panacea or silver bullet for Total Information Quality Management; any more than there was a panacea or silver bullet for manufacturing quality management. To get there from here requires a sound, defined set of processes that are implemented and executed with discipline.

TIQM® Poster Inside This Issue

Inside this issue, for the first time, I am pleased to have included a Poster of the Six Processes of TIQM® and the 14 Points of Information Quality for your edification.

I wish to thank the sponsors whose financial contributions made this possible. They are:

- DataFlux
- DataLever
- Search Software America

A word of caution here. Putting this poster on your wall will no more automatically increase the quality of your information than putting up a *Playboy* or *Playgirl* magazine pin-up. The poster is not a panacea or a silver bullet. Do not use this as simply a “slogan” or wallpaper.

But I guarantee that if you study, understand and implement the Six Processes of TIQM and the 14 Points of IQ you can transform your organization for the better.

Why Methodology is Important for IQ Management

Every process that produces quality results consistently requires the process to be:

- Defined, so that it is repeatable,
- Controlled, so that it is consistent, and,
- Improved, so that it eliminates the causes of defects or error

This is true whether the process is manufacturing a car, filing a tax return, taking a phone-in catalog order or processing an insurance claim. This is also true whether the process is developing an application system, developing an enterprise data model, or whether conducting an IQ assessment or facilitating an information process improvement.

Five Reasons to Implement TIQM as Your IQ Methodology

1. TIQM was developed using proven quality management principles, methods and techniques successfully applied to manufacturing and other industries.

When I got into IQ management, Tom Redman had not yet written his first book (published in 1992). There was no formal program of IQ at any university. I got into Information Quality by discovering W. Edwards Deming, first through Mary Walton’s book, *The Deming Management Method*, and from that directly to Deming’s *Out of the Crisis*, in which he outlines his famous Fourteen Points of Quality.

Deming’s 14 Points transformed my professional focus and consulting practice. I recognized immediately that quality management principles were not *ancillary* to information, they were *directly applicable* to data as the product of business processes in the same way an automobile is the product of manufacturing processes. Then I read Masaaki Imai’s *Kaizen: The Key to Japan’s Competitive Success*. It confirmed what I learned from Deming, that quality management is a continuous improvement of processes to eliminate the causes of defects. Another major influence was Philip Crosby’s *Quality Is Free: The Art of Making Quality Certain*. I confirmed again that the business case for information quality is the same as the business case for quality management in general—measure and eliminate the costs of scrap and rework. I also learned from Crosby the five distinct stages of organizational maturity in its journey and transformation to an effective culture of quality management and business performance excellence.

In addition to these quality gurus, I studied Joseph Juran (*Juran on Planning for Quality*), Kaoru Ishikawa (*Guide to Quality Control*), Yoji Akao (*Quality Function Deployment: Integrating Customer Requirements into Product Design*), and the Baldrige National Quality Program’s *Criteria for Performance Excellence*. Now I am studying

Six Sigma and have mapped TIQM's Process Steps into Six Sigma's DMAIC (Define-Measure-Analyze-Improve-Control) methodology.

TIQM was NOT developed by looking at other Data Quality or Information Quality methods and techniques, but by studying Quality Management principles, techniques and processes from the leaders of the Quality Management Revolution, understanding them and then applying them to information.

If you doubt the pertinence of manufacturing quality management principles to information, please note that before Deming went to Japan and taught the Japanese his quality management principles, he applied them at the U.S. Census Bureau in the 1940 national census process—a *pure* information quality application!!!

2. TIQM is IQ software tool “open”

TIQM is not biased to any specific software tools. Rather, it provides a framework for exploiting IQ Software as well as other quality tools and techniques. It classifies the capabilities of IQ software and where they fit in the TIQM process methodology. Tool categories include: Assessment; Rule Discovery and Analysis; Reengineering, Cleansing, and Transformation; Enhancement, Defect Prevention; and Quality Control and Management.

You may ask, “why should our company implement TIQM; after all we have implemented IQ software, or we already have our own methodology?”

First, if you already have an IQ methodology, compare it to TIQM and augment it if necessary. Remember that every process is a process that can be improved (Deming's Point 14)—even IQ processes.

Many of you may have excellent IQ software in which the supplier has provided a methodology. Do NOT throw that methodology away. BUT, examine it against TIQM to see if there are gaps. Before I got into IQ consulting I noted that when third-party software suppliers develop methodologies to augment their products, those methodologies were biased based on the features of their products. Important methodological steps were missing if the product did not provide a function to support that step. The same omissions can happen in IQ software provider's methodologies. For example:

- IQ assessment software suppliers may provide a methodology for IQ assessment that includes steps to define, measure and report completeness and validity assessments. Does the methodology have a step to measure *accuracy* by physically comparing data to the real world object (or a recording or observation of an event)? Accuracy, one of the most important IQ characteristics to knowledge workers and end customers, cannot be conducted electronically. Comparing data to a reference database such as a Postal database does NOT represent a measure of accuracy. It represents a measure of “consistency.” In order to *interpret* the result of this comparison, you must know the “accuracy” of the reference data. For example, an address may be determined to be a valid address, but the person supposed to live there has long since moved.

To measure accuracy requires one to actually compare the data to the real world object or event the data represents to confirm the correctness of the data values to the

real world object characteristic represented. TIQM describes how to conduct a physical accuracy assessment step depending on the different object types, such as person or organization, physical object, location, intangible object, or event.

If your methodology only measures validity and not accuracy, you may actually have a false sense of the real level of quality of your data. Your data may meet every validity measure but be inaccurate to a costly degree. For example a US Federal Agency acted on “reasonable” data in providing funding. An audit showed it misallocated 11% of its funds in one program in one year, including making \$1.7 Billion—*not* million—in *excess* payments and underpaying an additional \$600 Million entitled by worthy recipients!

- Data cleansing software suppliers may provide a methodology for cleansing that includes steps to correct the data only as it is moved from the source to a target database. Does it include steps to update the data at the source databases if the data is still being used there? Failure to correct data at the source creates a new IQ problem of inconsistency of data in the target and data in the source. It also causes processes using the data at the source to continue to fail because of the uncorrected data. Furthermore, the methodology may omit altogether the process of PDCA (Plan-Do-Check-Act) to analyze root causes of the defective data that requires cleansing and the process improvements required to prevent recurrence of the defective data.

If your methodology only cleanses data but does not improve the processes, it actually institutionalizes the information scrap and rework of “continuous data cleansing” rather than “continuous process improvement.” Take the above example of \$1.7 Billion dollars in overpayments. Data cleansing by itself will *NOT* prevent the continuation of misallocating funds. TIQM defines a process for process improvement.

- Even IQ software suppliers that provide defect-prevention capability may have a methodology with steps only for implementing the defect-prevention capabilities of their tools but may completely miss inclusion of steps to analyze process improvements for the overall process such as form and screen design, manual procedure and error-proofing techniques that minimize human error.

Does this mean you not use IQ Software supplier’s methodology? No. Software providers’ methodologies tend to be optimized *for the capabilities of the tool*. At the same time, those methodologies may be *limited* by the tool capabilities. Maximum benefit is achieved when you should implement tool-oriented methodologies in the context of an umbrella IQ management system, like TIQM. This assures you have a complete methodology that (1) addresses the full scope of IQ management and (2) optimizes the capabilities of the IQ software.

3. TIQM is a complete methodology for Information Quality management

- TIQM includes a process to measure the costs of nonquality information and then the value of improvement. This is the business case, and may be the only measurement that management cares about. So what is the business motivation from the fact the

product database contains 7.3% errors? The real business case is “those 7.3% errors cost the company \$9.3 million dollars in lost sales and cause \$3.4 million in compensation to alienated customers, and lost customer lifetime value of \$15.2 million.”

- TIQM defines a process for process improvement that applies Plan-Do-Check-Act to information processes. In fact, TIQM’s Six Processes and their steps have been mapped to Six Sigma’s DMAIC methodology.
- TIQM defines the principles for the culture change required to accomplish the transformation of organizations from vertical function management to horizontal value-chain management. It furthermore provides a road map for you to tailor to your unique situation to begin and sustain your journey toward Information Quality and Business Performance Excellence.

4. TIQM defines a process for establishing the business case for IQ

TIQM provides a process to measure the most significant aspect of nonquality—its cost to the business in the form of process failure, information scrap and rework, lost customer lifetime value and missed opportunity. When you need to make a business case for management to invest in IQ, conduct a P3 initiative (see TIQM process P3 below).

5. TIQM is supported by documentation and training

TIQM is described in the book, *Improving Data Warehouse and Business Information Quality*, published by John Wiley & Sons. Part II describes each of the five discrete TIQM processes, listing the process steps and purpose, inputs, outputs and activities of each process step. TIQM Process 6, “Establish the Information Quality Environment,” is described in Part III, includes a detailed description of the 14 Points of Information Quality, adapted from Deming’s 14 Points of Quality, along with a description of the steps to implement an effective information quality environment.

Detailed training is available for all aspects of TIQM, including detailed training for Information Quality practitioners, training for business management (“IQ Management: What Managers Must Know and Do”), and training for information producers and knowledge workers to help them understand how to improve their processes and error-proof their work.

Some organizations have licensed TIQM education and have certified instructors to teach it within their organization.

The Six Processes of TIQM:

TIQM consists of five discrete processes of measurement and improvement and an umbrella process of implementing a cultural transformation to grow an “environment” of valuing information customers, a mindset of process excellence, and a habit of continuous process improvement. Figure 1 illustrates the Six TIQM Processes and their relationships. Note: The methodology is not sequential; you may start at any process.

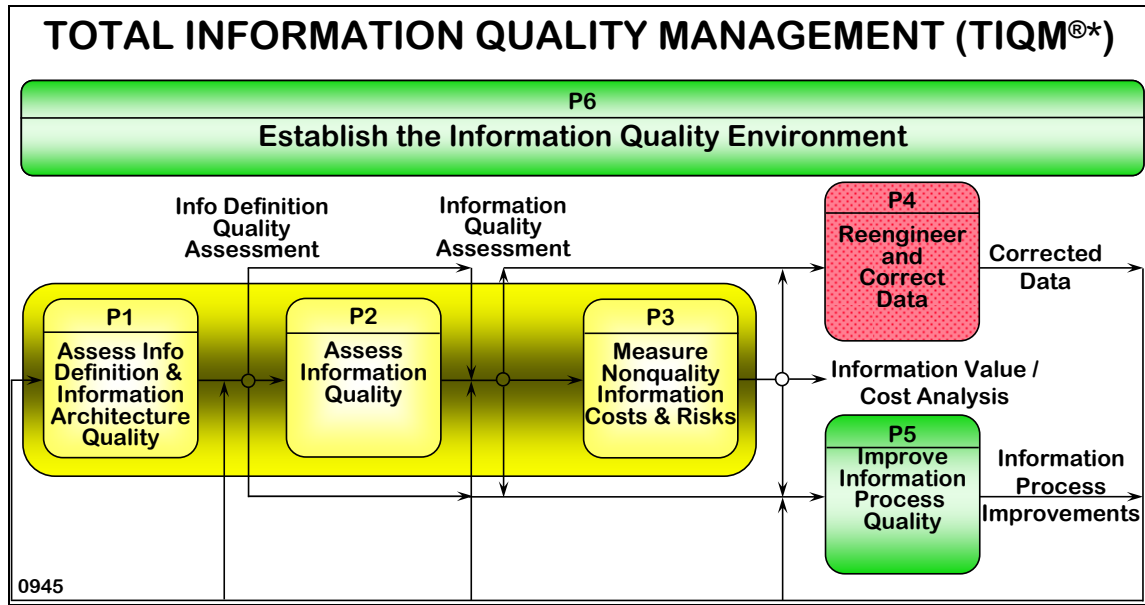


Figure 1 The Six Processes of TIQM

The first three processes are assessment processes. P4 is a process of defective data improvement (data correction) and data movement control. P5 is a process of process improvement to prevent recurrence of defects. P6 is a “process” of culture transformation.

- P1. Assess Data Definition and Information Architecture Quality.** This process defines how to measure the quality of data definition to meet the requirements of the knowledge workers to know what they need to know and to understand the meaning of the information they require. This process also defines how to measure the quality (stability, flexibility and reusability) of data models and database and data warehouse designs.
- P2. Assess Information Quality.** This process defines how to measure the quality of information to meet the various quality characteristics, such as accuracy, completeness, non-duplication and consistency across multiple databases, as required by its information customers. This process measures either the state of IQ within a database or data collection or the IQ produced by a current process.
- P3. Measure Nonquality Information Costs and Risks.** This process defines how to establish the business case for Information Quality Management. By measuring the costs of process failure, information scrap and rework, alienation of customers and lost business, and missed opportunity, you can “speak with data” (as Kaoru Ishikawa says) that is presenting in business terms to business management.
- P4. Reengineer and Correct Data.** This process defines how to conduct data correction projects, transform information and control data movement processes for data warehouses or data conversion projects. The process of data correction is NOT a stand-alone process, but one to be conducted along with a P5 initiative

to improve the processes to prevent recurrence of the defects having to be corrected.

P5. Improve Information Process Quality. This process is **required** to call a methodology a “quality management” methodology. This process implements the Shewhart Cycle known as PDCA or Plan-Do-Check-Act. It describes the tried and true process improvement technique defined by Walter Shewhart, and used by W. Edwards Deming, Joseph Juran, Masaaki Imai (in the Kaizen quality system) and other proven quality management systems. It is through P5 that you deliver value to the enterprise by improving broken processes that cause defective data definition, data content or data presentation which in turn causes downstream process failure and high costs of information scrap and rework.

P6. Establish the Information Quality Environment. This umbrella step is not a discrete process with a defined beginning and end. It describes the 14 Points of Information Quality that must be inculcated into the culture of the enterprise to create and sustain an environment for business performance excellence and the habit of continuous improvement.

Conclusion

TIQM is a complete methodology for IQ management and improvement. Developed from proven quality principles and processes that have transformed the economics of the Industrial Age, TIQM can help transform the economics of the Information Age. Be part of the IQ Revolution:

- Please take the TIQM poster out of this issue, unfold it and study it. Read and understand its definition of Information Quality.
- Read what TIQM is about in the descriptive statements.
- Read and contemplate the 14 Points of IQ.
- Analyze the Six Processes of TIQM and evaluate them in the context of your environment.
- Then apply them to increase your organization’s IQ to eliminate the high costs of low quality information and increase your organization’s process excellence.
- Then let me hear about your successes.
- But, please, whatever you do—don’t let it be just wallpaper.

What do you think?

About the Author:

Larry P. English, President and Principal of INFORMATION IMPACT International, Inc., Brentwood, TN., author of *Improving Data Warehouse and Business Information Quality: Methods for Reducing Costs and Increasing Profits*, provides consulting to help organizations implement TIQM within your enterprise to improve your enterprise’s IQ.

To see a pdf of the TIQM poster, visit [click here](#):

To request a free reprint of the TIQM poster, email Larry.English@infoimpact.com.