The TIQM® Quality System for Total Information Quality Management: Business Excellence through Information Excellence

ABSTRACT-----------------------------

Mr. English describes the essentials of the six processes required for sustainable information quality management as a way out of the information quagmire. W. Edwards Deming, Joseph Juran, Philip Crosby and Masaaki Imai taught the world how to apply sound quality management principles to manufacturing. Mr. English describes how you can apply the same quality management principles to information quality.

Mr. English describes the processes to measure IQ and to improve information processes to prevent defects. He describes how to implement a sustainable information quality environment. He illustrates case studies of how successful organizations have implemented information quality processes that result in business and information system process effectiveness.

- The emerging “Realized” Information Age: Coming soon!!!
- What Information Quality Management is and why it is essential to enterprise effectiveness
- Information Value Circles: Managing the horizontal enterprise
- Core competencies for sustainable “Total Information Quality Management”
- How to establish a culture for sustainable Information Quality

BIOGRAPHY-------------------------------

Larry P. English
President and Principal
Information Impact International, Inc.

Larry P. English, president and principal of INFORMATION IMPACT International, Inc., is an internationally recognized speaker, teacher, consultant, and author in information and knowledge management and information quality improvement. He has provided consulting and education in ~ 40 countries on five continents. Mr. English was featured as one of the “21 Voices for the 21st Century” in Quality Progress. DAMA awarded him the 1998 “Individual Achievement Award” for his contributions to the field of information resource management. He has chaired Information Quality Conferences in the US and Europe and is a co-founder of the International Association for Information and Data Quality (IADQ).

Mr. English’s TIQM® Quality System for information quality improvement has been implemented in several organizations worldwide. Mr. English’s widely acclaimed book, Improving Data Warehouse and Business Information Quality, has been translated into Japanese by the first information services organization to win the Deming Prize for Quality. His new book, Information Quality Applied: Best Practices for Improving Business Information, Processes and Systems, is available in mid 2009.
Larry P. English
President and Principal

Mr. English is an internationally recognized speaker, educator, author and consultant in information and knowledge management and information quality improvement. He also provides consulting and education in information stewardship, strategic information visioning, information technology evaluation, information resource management and data administration, data modeling and facilitation, and value-centric application development methods. Mr. English has developed the TIQM® Quality System applying Kaizen® quality principles to information quality management. He chairs Information Quality Conferences around the world and he is a co-founder of the International Association of Information and Data Quality (IAIDQ).

Prior to founding INFORMATION IMPACT International, Inc. (www.infoimpact.com), Brentwood, TN, over twenty years ago, Mr. English was Vice President of an international IRM consulting firm. Before that, he was manager of systems development and then for information management with a large publishing firm. Before positions as Senior Instructor for a computer manufacturer and Information Systems Training Coordinator for a major insurance firm, Mr. English began his career with Sears, Roebuck, and Co., as a programmer and systems analyst.

He was featured as one of the "21 Voices for the 21st Century" in the January, 2000 issue of Quality Progress. DAMA awarded him the 1998 "Individual Achievement Award" for his contributions to the field of information resource management. Mr. English has served as an Adjunct Associate Professor in computer science. He is a member of the American Society for Quality and is a former advisor for DAMA. He has also been an active member of various ANSI (American National Standards Institute) standards committees, and he is an editorial advisor for DM Review.

A magna cum laude graduate of Hardin-Simmons University, Mr. English holds a Masters Degree from the Southern Baptist Theological Seminary where he was a Luther Rice Scholar and a Garrett Fellow. He is listed in Outstanding Young Men in America and Who’s Who Worldwide. He has provided consulting and educational services in more than 30 countries on five continents to such organizations as Aera Energy, Air Canada, American Express, Belgacom, Boeing, British Telecom, Coca-Cola Foods, Dow Chemical, Eastman Kodak, Eli Lilly, the FDIC, Hewlett-Packard, The Hartford, IBM, L. L. Bean, NTT DATA, Optical Fibres, Sprint, Telener, Toyota Motor Sales, UNUM Life Insurance Co., the U.S. Navy, Western Health Alliance and Weyerhaeuser.

A frequent keynote speaker, Mr. English writes the monthly “Plain English about Information Quality” column for DM Review, and is the author of the highly acclaimed Improving Data Warehouse and Business Information Quality, also available in Japanese, and numerous articles for publications in the US and Europe.
The ABCs of the TIQM® Quality System Agenda

A. Assessment: Principles & Processes
   • Assessing Information Quality Mgt. Maturity
   • Assessing Information Quality
   • Measuring Costs of Poor Quality Information

B. Betterment: Plan-Do-Study/Check-Act for Process Improvement
   • Improving Information Process Quality
   • Information Corrective Maintenance

C. Culture Change: Principles of Transformation
   • Implementing an IQ Environment and Culture
A. Assessment: Principles and Processes

“The unexamined life is not worth living”  Socrates

“Meten is Weten” (“To measure is to know”)  Dutch Proverb

INFORMATION QUALITY MANAGEMENT MATURITY GRID

<table>
<thead>
<tr>
<th>Measurement Categories</th>
<th>Stage 1: Uncertainty (Ad Hoc)</th>
<th>Stage 2: Awakening (Repeatable)</th>
<th>Stage 3: Enlightenment (Defined)</th>
<th>Stage 4: Wisdom (Managed)</th>
<th>Stage 5: Certainty (Optimizing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Management understanding and attitude</td>
<td>No comprehension of information quality as a management tool. Tend to blame Data Management or IT org for “information quality problems” or vice versa.</td>
<td>Recognizing that information quality management may be of value but not willing to provide money or time to make it all happen.</td>
<td>Making progress through information quality improvement program. Learn more about quality management; becoming supportive and helpful.</td>
<td>Participating. Understand absolutes of information quality management. Recognize their personal roles in continuing emphasis.</td>
<td>Continual information quality management an essential part of company system.</td>
</tr>
<tr>
<td>2. Information quality organization status</td>
<td>Data quality is hidden in application development departments. Data quality probably not part of organization. Emphasis on correcting bad data.</td>
<td>A stronger information quality role is “appointed” but main emphasis is still on correcting bad data.</td>
<td>Information quality organization exists, all assessment is incorporated and manager has role in development of applications.</td>
<td>Information quality manager reports to CIO; effective status reporting and preventive action.</td>
<td>Information quality manager is part of management team. Prevention is main focus. Information quality is a thought leader.</td>
</tr>
<tr>
<td>3. Information quality problem handling</td>
<td>Problems are fought as they occur; no resolution; inadequate definition; lots of yelling and accusations.</td>
<td>Teams are set up to attack major problems. Long-range solutions are not solicited.</td>
<td>Proactive action communication established. Problems are faced openly and resolved in orderly way.</td>
<td>Problems are identified early in their development. All functions are open to suggestion &amp; improvement.</td>
<td>Except in the most unusual cases, information quality problems are prevented.</td>
</tr>
<tr>
<td>4. Cost of information quality as % of revenue</td>
<td>Reported: unknown  Actual: 20%</td>
<td>Reported: 9%  Actual: 18%</td>
<td>Reported: 10%  Actual: 15%</td>
<td>Reported: 8%  Actual: 10%</td>
<td>Reported: 5%  Actual: 5%</td>
</tr>
<tr>
<td>5. Information quality improvement actions</td>
<td>No organized activities; no understanding of such activities.</td>
<td>Trying obvious “motivational” short-range efforts.</td>
<td>Implementation of the 14 point program with thorough understanding and establishment of each step.</td>
<td>Continuing the 14 point program and starting to optimize.</td>
<td>Information quality improvement is a normal and continued activity.</td>
</tr>
<tr>
<td>6. Summation of company information quality posture</td>
<td>“We don’t know why we have problems with information quality.”</td>
<td>“As it absolutely necessary to always have problems with information quality?”</td>
<td>“Through management commitment and information quality improvement we are identifying and resolving problems.”</td>
<td>“Information quality problem prevention is a routine part of our operation.”</td>
<td>“We know why we do not have problems with information quality.”</td>
</tr>
</tbody>
</table>

IQMM® is a registered trademark of Information Impact Int’l. L. English, Improving Data Warehouse and Business Information Quality, pg. 428

MIT Information Quality Industry Symposium, July 15-17, 2009
Information Quality is NOT about what is in databases (*well, it is, but that is not all)

Information Quality (IQ) is ABOUT business, service and manufacturing performance excellence by improving information process quality for mission accomplishment

TIQM addresses:
- Quality of information definition, models, DB designs
- Quality of information content
- Quality of information presentation
- Quality of business communication

**Total** Information Quality Management results in:
- Increased *Customer* satisfaction
- Increased *Employee* satisfaction and productivity
- Decreased costs and increased profits / surplus

**Components** of Information Quality:
- Information Product Specifications (Definition and Business Rules) and Information Architecture
- Information Content
- Information Presentation

"Consistently meeting* all knowledge workers’ and end-customers’ expectations" through information and information services so:
- Knowledge workers accomplish enterprise objectives
- Customers are successful

Larry P. English, TIQM®

World-class organizations do not stop here—they strive to "delight" their customers
THE DISCIPLINE OF INFORMATION QUALITY MANAGEMENT

The application of proven Quality Management principles, processes and practices to information as a product of the enterprise processes (business, manufacturing & service) to meet or exceed information Consumers’ expectations

Larry P. English

Quality Management Interdependent Components:
- Understanding Information Consumer requirements
- Analyzing root causes of defective processes
- Designing quality in to information processes
- Statistical quality control of information processes
- Ensuring Information Consumer satisfaction
- Establishing the Information Quality Culture

THE FUNDAMENTAL QUALITY PRINCIPLES

- Customer Focus
  - Market focus
  - Customer satisfaction
  - Supplier / Customer Partnership
- Process Improvement to reduce waste
  - Process definition
  - Product specification (customer-focused)
  - Team work
  - Continuous Process Improvement (CPI)
  - Business Process Re-engineering (BPR)
- Proven, scientific Methods
  - Statistical quality control
  - PDSA or PDCA (Shewhart cycle)
  - SIPOC*
- Management Accountability

CPI = Continuous Process Improvement
BPR = Business Process Re-engineering
SIPOC = Supplier-Input-Process-Output-Customer

MIT Information Quality Industry Symposium, July 15-17, 2009
TIQM®* QUALITY MANAGEMENT SYSTEM FOR INFORMATION

Process Overview

P6
Establish the Information Quality Environment

Information Product Specification Quality Assessment

P1
Assess Information Product Specification Quality

P2
Assess Information Quality

P3
Measure Poor Quality Information Costs & Risks

P4
Improve Information Process Improvements

P5
Correct Data and Control Redundancy

P6
Establish the Information Quality Environment

Poor Quality Information Cost and Risk Analysis

Corrected Data in Source and Controlled Redundancy

*Formerly TQdM®

“Success is a journey, not a destination”
Improving Data Warehouse and Business Information Quality, Chapter 13, pp 421 - 454

P1: Assess Info Product Specification & Architecture Quality

“You cannot measure what is not defined.” . . . . Paul Strassman, Information Payoff

*Formerly TQdM®
DATA DEFINITION
Examples

Poor: CUSTOMER:
- A person who has a record in the customer table

Better: CUSTOMER:
A person who has purchased, or expressed active interest in purchasing ACME’s products and/or services. This includes prospects, current customers and previous but now inactive customers

Poor: ITEM-REORDER-POINT:
- Tells when to reorder an item

Better: ITEM-REORDER-POINT [QTY]:
The quantity value for an Inventory-Item that automatically triggers a reorder of stock when the Item-Inventory-On-Hand-Qty falls below that quantity

Example: If the Item-Reorder-Point-Qty for “Blue widgets” is 150, and its Item-Inventory-On-Hand-Qty falls from 175 to 148, a stock reorder is generated
TIQM® QUALITY SYSTEM FOR INFORMATION

P2: Assess Information Quality

Establish the Information Quality Environment

P1 Assess Data Definition & Information Architecture Quality
P2 Assess Information Quality
P3 Measure Poor Quality Information Costs & Risks
P4 Improve Information Process Quality
P5 Correct Data and Control Redundant Data
P6 Implemented Information Process Improvements

"One accurate measurement is worth a thousand expert opinions."
Grace Hopper (1906-1992), Admiral, U.S. Navy

P2.2 INFORMATION QUALITY CHARACTERISTICS*

- **Definition Conformance**: value consistent with definition
- **Completeness**: 1) values, 2) occurrences & 3) fact type
- **Validity**: 1) values set, 2) business rules & 3) derivation
- **Accuracy**: as compared to the real world object / event
- **Precision**: of data values to meet all purpose(s)
- **Non-duplication**: of one record = one real world object
- **Equivalence**: of distributed or redundant data
- **Timeliness**: of access for all knowledge workers’ uses
- **Currency**: of the data for each knowledge worker use
- **Objectivity**: of presentation: format clarity, no bias
- **Relevance**: to knowledge workers’ purpose(s)

*Measure what is important to information customers
WHY YOU MUST MEASURE ACCURACY NOT JUST VALIDITY

Marital Status

<table>
<thead>
<tr>
<th>Status</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incomplete</td>
<td>16.0%</td>
</tr>
<tr>
<td>Invalid</td>
<td>0.0%</td>
</tr>
<tr>
<td>Inaccurate</td>
<td>23.3%</td>
</tr>
</tbody>
</table>

IQ Assessment 2000+ Persons
CUSTOMER INFORMATION ACCURACY
p Control Chart 2000-2003

UCL
Mean
LCL
Short Term Target
Long Term Target

Inaccurate data
Mean
Upper Control Limit
Lower Control Limit
Accuracy Temp Std

CUSTOMER INFORMATION ACCURACY
p Control Chart 2000-2003

TIQM® QUALITY SYSTEM FOR INFORMATION
P3: Measure Poor Quality Information Costs & Risks

“Go slow so you can go fast.” . . . . . . Japanese saying
THE BUSINESS CASE FOR IQ MANAGEMENT:
Poor Quality Information Costs

- "As much as 40 to 50% or more of the typical IT budget is really ‘information scrap and rework’” and waste of moving and transforming data to disparately defined redundant databases*

- "Poor quality information often causes 40 to 60% of manufacturing scrap and rework costs”

- "The direct costs of poor quality information, including irrecoverable costs, rework of products and services, workarounds, and fines and customer compensation can be as high as 15 to 25+ percent of a large organization’s [operating] revenue or budget."**

*L. English, Improving Data Warehouse and Business Information Quality, p. 12

**L. English, Improving Data Warehouse and Business Information Quality, p. 12
Total Costs of Ownership of Information Process Quality

Information Quality 5-Year Cost of Ownership

- \$113.2 million
- \$114.7 million

Savings of \$46.1 M (41\%)

Defective Process Data Cleansing Only Process Improvement

One-time Improvement Cost Incremental Improve Cost Information Scrap & Rework Cost

TOTAL COSTS OF OWNERSHIP OF INFORMATION PROCESS QUALITY

B. Betterment:
Plan-Do-Study/Check-Act for Process Improvement

“Assessment is not the end—it is a means of knowing.”
“If you are not improving—you are dead or dying.”
“There is absolutely no reason for having errors or defects in any product or service.”

P. B. Crosby

“Measure twice, cut once.”

Carpenter’s Rule of Thumb

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TIQM® QUALITY SYSTEM FOR INFORMATION
P4: Improve Information Process Quality

Establish the Information Quality Environment

Data Definition Quality Assessment

Information Quality Assessment

P1
Assess Data Definition & Information Architecture Quality

P2
Assess Information Quality

P3
Measure Poor Quality Information Costs & Risks

P4
Improve Information Process Quality

P5
Correct Data and Control Redundant Data

Poor Quality Information Cost and Risk Analysis

Corrected Data and Controlled Redundancy

Plan-Do-Study/Check-Act (PDC/SA)

Plan

Do

Check

Study

4

1

3

2

1. PLAN

2. DO

3. CHECK/STUDY

4. ACT

Shewhart Cycle

P4.1 Define Project for Information Process Improvement

P4.2 Develop Plan for Information Process Improvement

P4.3 Do Implement Process Improvements

P4.5 Act to Standardize Information Process Improvements

Plan

Do

Check

Study

4

1

3

2

1. PLAN

2. DO

3. CHECK/STUDY

4. ACT

Shewhart Cycle

P4.1 Define Project for Information Process Improvement

P4.2 Develop Plan for Information Process Improvement

P4.3 Do Implement Process Improvements

P4.5 Act to Standardize Information Process Improvements

Plan

Do

Check

Study

4

1

3

2

1. PLAN

2. DO

3. CHECK/STUDY

4. ACT

Shewhart Cycle

L. English, Improving Data Warehouse and Business Information Quality, p. 290. In here, this process is numbered P5. P4 is the permanent new #.

Plan-Do-Study/Check-Act (PDC/SA)

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EFFECTS OF QUALITY IMPROVEMENT ON COSTS


DATA CORRECTION PRINCIPLES

- Treat data correction as a:
  - Conduct a process improvement initiative(s) prior to correction to prevent continuance of defects
  - Correct data as a One-time event for a data set
  - Implement processes to update data subject to decay
- If information quality issues are significant, take immediate stop gap actions and improve the process first to eliminate the cause
- Do not correct errors produced upstream—send defective data back to process manager (ultimate goal)
- Always correct data in the source database if still used
  - Only exception is legal or real business requirement, then maintain original and corrected data
- Create policy / procedure to correct & communicate correction to source process managers
CORRECTING DATA DOWNSTREAM ONLY: Problems Caused

- NO after-the-fact data correction initiative will be able to correct all errors, let alone cost-effectively
  - Cost to correct is often 10 times as much or more as to capture accurately at the point of creation
- Sub-optimizes the cost of correction—only downstream knowledge workers benefit
- Processes using the defective source data still fail
- A new IQ problem is created—Inconsistency
  - Queries from the two databases will NOT match
  - Drill down processes will NOT balance
- Defective data in the source can subsequently corrupt the downstream database

C. Culture Change: Principles of Transformation

"The unfortunate thing about this world is that good habits are so much easier to give up than bad ones." — Somerset Maugham
TIQM® QUALITY SYSTEM FOR INFORMATION

TIQM® is not a program; it is a value system, mind set, and habit of continuous improvement of:

1. Application and data development processes
2. Business processes

By integrating quality management values, principles and methods into the culture

Establish the Information Quality Environment

SUB-OPTIMIZED VALUE / COST CHAIN

Value Chain: “An end-to-end set of activities that begins with a request from a customer and ends with a benefit to a customer.”

Dysfunctional Enterprise

Functional Optimization

Customer Request

Customer Benefit

Customer Request

Partial Capture

Rediscover (2-6 hours)

Repair Order

Facts

Svc Date: ________
Equip Type: _____
Problem Desc: ____________________
Ord Date: 3/12/00
Cust ID: 44123
Tel Num: 555-1234
Time: 3 hours
OPTIMIZED VALUE CHAIN

IQ Point 9: “Break down barriers between business areas.”

“Value chain” (Enterprise) Optimization = Effective Learning Organization

2-6 hours Rediscover

Complete, Accurate Capture

Shared Data Controlled Distribution

Me

Customer Benefit

Repair Order Facts
Svc Date: 3/15/00
Equip Type: M12AB01
Problem Desc: Poor volume out
Ord Date: 3/12/00
Cust ID: 44123
Tel Num: 555-1234
Time: 3.2 Hrs

QUESTIONS?
or COMMENTS!

Larry.English@infoimpact.com
INFORMATION QUALITY MANAGEMENT
MATUREITY AND THE COSTS OF QUALITY

Stage 1
Uncertainty

Stage 2
Awakening

Stage 3
Enlightenment

Stage 4
Wisdom

Stage 5
Certainty

Information Quality Costs

Danger point:
Information Scrap & rework & process failure costs

Data correction costs

Assessment costs

IQ Improvement, environment investments

Enterprise Optimization

Enterprise Failure

“Quality is free. It’s not a gift, but it is free.” P. Crosby

Thank you for your valuable time. Please share your feedback and comments as you apply your new knowledge (Larry.English@infoimpact.com)

Larry P. English

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- Review and link to IQ Products
- Links to Other IQ Resources
- Recommended reading in the Information Professional’s Reference Library

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