MATURING FROM DATA QUALITY TO INFORMATION QUALITY TO BUSINESS QUALITY:

Keys to Business Performance Excellence

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by:

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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 Total Quality data Management (TIQM®) methodology 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 nineteen 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, Telenor, 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.

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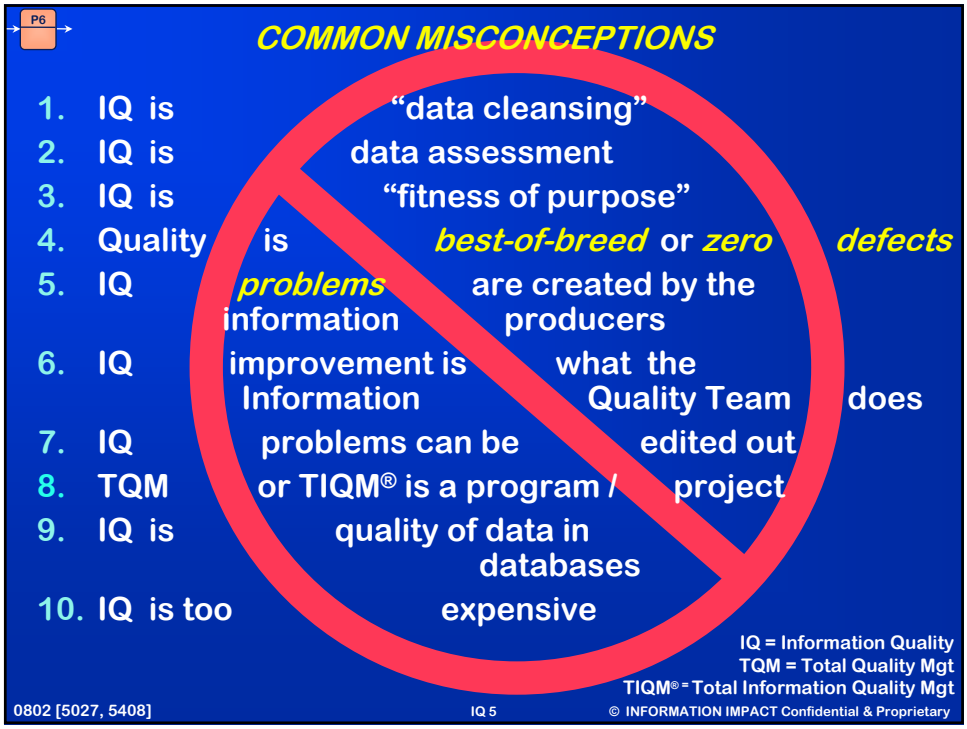
MATURING FROM DATA QUALITY TO INFORMATION QUALITY TO BUSINESS QUALITY

- The Stages of IQ Management Maturity
- Taking Inventory: Where are You?
- Establishing a Vision: "Begin with the End in Mind"
- Planning your Next Steps: "Put First Things First"
- Controlling Processes to "Hold the Gain"
- Moving to Certainty: Measuring the Value Delivered


P6
COMMON MISCONCEPTIONS
1. IQ is "data cleansing"
2. IQ is data assessment
3. IQ is "fitness of purpose"
4. Quality is best-of-breed or zero defects
5. IQ problems are created by the information producers
6. IQ improvement is what the Information Quality Team does
7. IQ problems can be edited out
8. TQM or TIQM® is a program / project
9. IQ is quality of data in databases
10. IQ is too expensive
IQ = Information Quality
TQM = Total Quality Mgt
TIQM® = Total Information Quality Mgt
0802 [5027, 5408]
IQ 5
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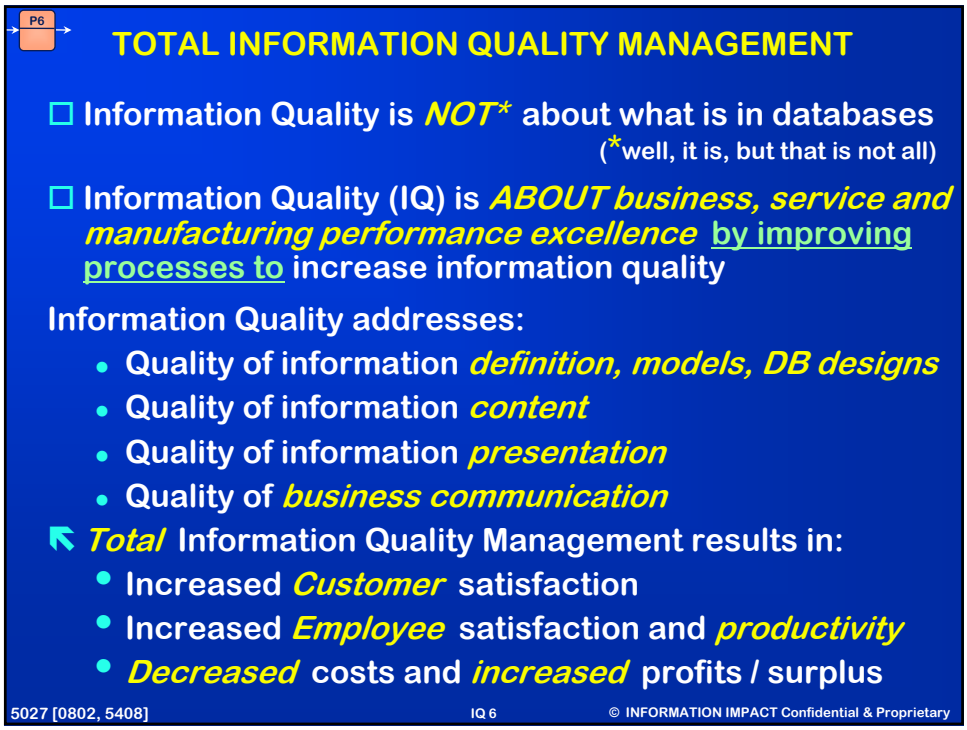
P6
TOTAL INFORMATION QUALITY MANAGEMENT
Information Quality is NOT* about what is in databases
(*well, it is, but that is not all)
Information Quality (IQ) is ABOUT business, service and manufacturing performance excellence by improving processes to increase information quality
Information Quality addresses:
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
5027 [0802, 5408]
IQ 6
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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

5233Q [5240MQ, 5236M, 5237KM] IQ 7

P6

INFORMATION QUALITY

"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®

Components of Information Quality:

- Information Product Specifications and Information Architecture (Definition & Rules)
- Data Content
- Information Presentation

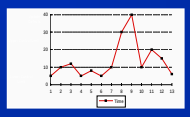
*World-class organizations do not stop here—they strive to "delight" their customers

3851 [3891Gov] IQ 8

P2.2

THE FUNDAMENTAL QUALITY PRINCIPLES

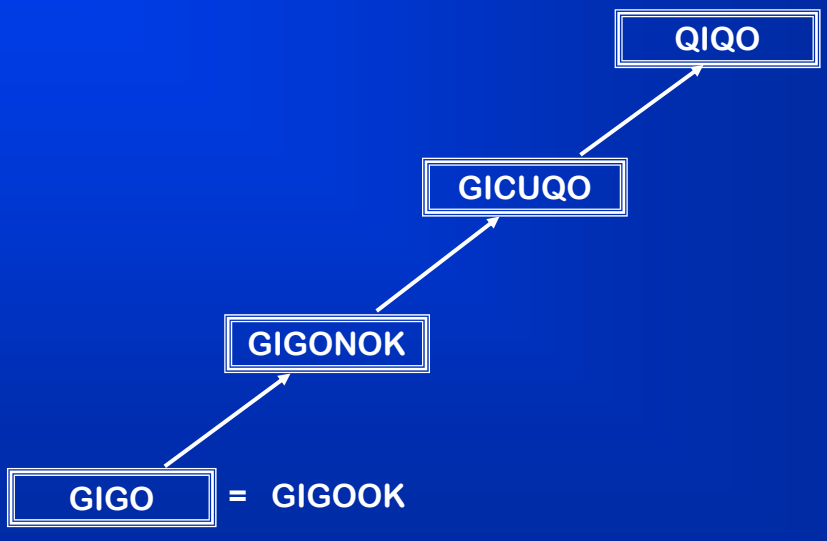
- ☐ *Customer* Focus
  - Market focus
  - Customer satisfaction
  - Supplier / Customer Partnership
- ☐ Process *Improvement* to reduce waste
  - Process definition
  - Product specification (customer-focused)
  - Team work
  - Continuous Process Improvement (CPI)
  - Business Process Re-engineering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

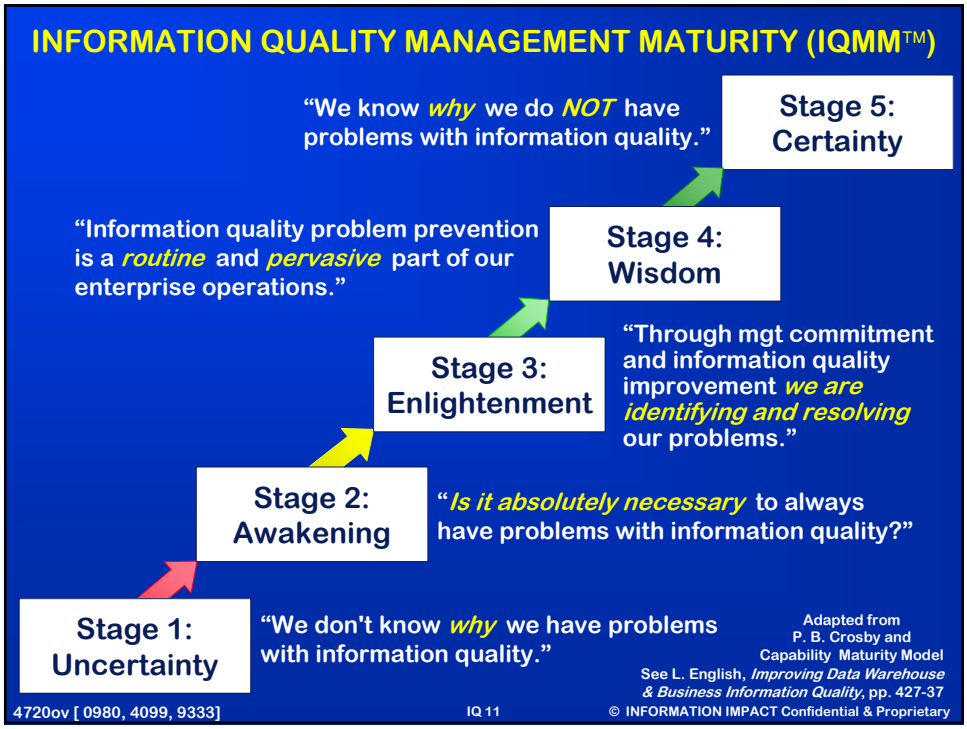


CPI = Continuous Process Improvement
BPR = Business Process Reengineering

P6

INFORMATION QUALITY MATURATION





P6

INFORMATION QUALITY MANAGEMENT MATURITY GRID

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

Adapted from P. B. Crosby & Capability Maturity Model

IQMM™ is a trademark of Information Impact Int'l
0980ov [4719-20, 0811, 0921, 4057]
L. English, *Improving Data Warehouse and Business Information Quality*, pg. 428
IQ 12
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P6 Pt 7

IQ 7. INSTITUTE LEADERSHIP FOR INFORMATION QUALITY

- Management is *Leadership*—not "supervision"
  - Leaders enable workers to improve their processes
  - Most supervisors are just the opposite, because they implement inappropriate measures and rewards
- Information Quality ramifications:
  - Take the *lead* in information quality improvement
  - Educate and *coach* executives
  - Implement management *accountability*
  - Learn how your customers use information
  - Measure and reward the right things:
    - ↓ Teamwork, customer satisfaction, waste reduction, total cost of ownership

Source: L. English, *Improving Data Warehouse and Business Information Quality,* p 367+

0865 [4832-45, 4714-16] IQ 13

P6 Pt 14

IQ 14. TAKE ACTION TO ACCOMPLISH THE TRANSFORMATION FOR INFORMATION QUALITY

- Management must put everyone to work to transform org.
  - Must organize itself to administer the other 13 points
  - Senior management must feel the pain of status quo
  - Senior management must communicate to a critical mass of people why change is necessary for all
  - Every activity is a process that can be improved
- Use the Shewhart Cycle

4. Roll the process out and study the results– what did we learn?

1. Study a defective process to identify root cause(s) and define improvement(s)

3. Observe the effects of the "improvement"

2. Implement the improvement in a controlled way

Source: L. English, *Improving Data Warehouse and Business Information Quality,* p 350+

0879 [5144, 4832-45, 4714-16, 4979-93, 0899, 5562] IQ 14

P6

ENTERPRISE EXCELLENCE VISION

Customer-Centered, Shared Vision + Capable, Trained, Empowered People +

Defined, Improved, Controlled Processes that delivers Quality Just-In-Time Information =

4767 [2089, 8921II] IQ 15 © INFORMATION IMPACT Confidential & Proprietary

P6

INFORMATION QUALITY MANAGEMENT
Mission / Vision

By implementing and performing sound and proven quality management principles and processes to our information processes, we enable the accomplishment of:

[*ENTERPRISE MISSION HERE*]

We do this by [e.g., " 'Increasing customer satisfaction' by preventing errors in customer information, such as name misspelling, invoicing, sending wrong items." or,

" 'Decreasing operating costs' by decreasing costs of process failure, recovery and information 'scrap and rework' caused by poor quality information."]

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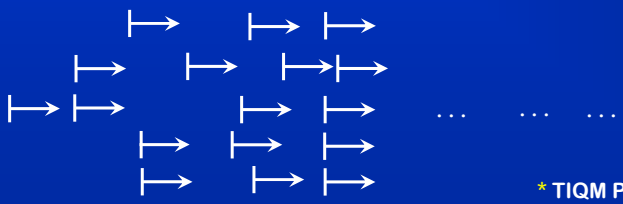
P6 Pt 1

TWO SETS OF PLANS FOR INFORMATION QUALITY

1. Long range Plan
   - Process P6:* Establish the IQ environment

2. Immediate "Improvement Initiative" Plan(s)
   - Processes P1-P5:* (1 or more)



* TIQM Process numbers

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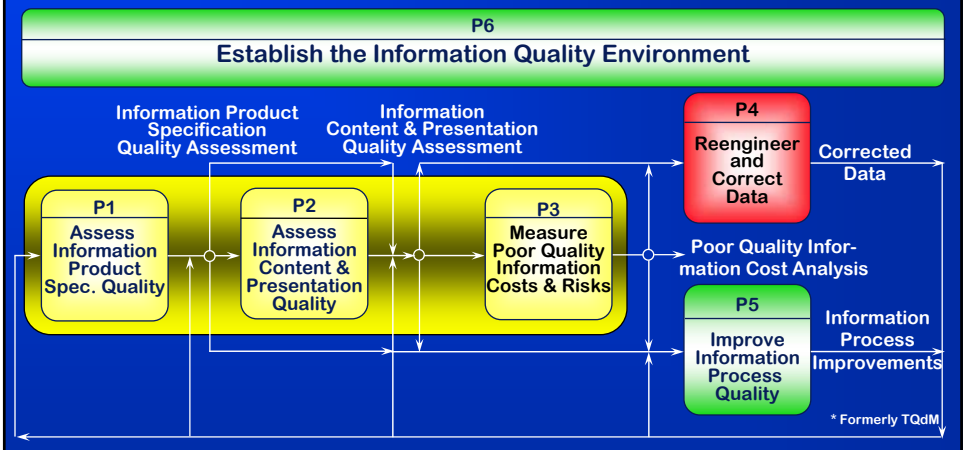
TOTAL INFORMATION QUALITY MANAGEMENT (TIQM®*)
Methodology Overview



"Success is a journey, not a destination"

Improving Data Warehouse and Business Information Quality, Chapter 13, pp 421 - 454

*Formerly TQdM®

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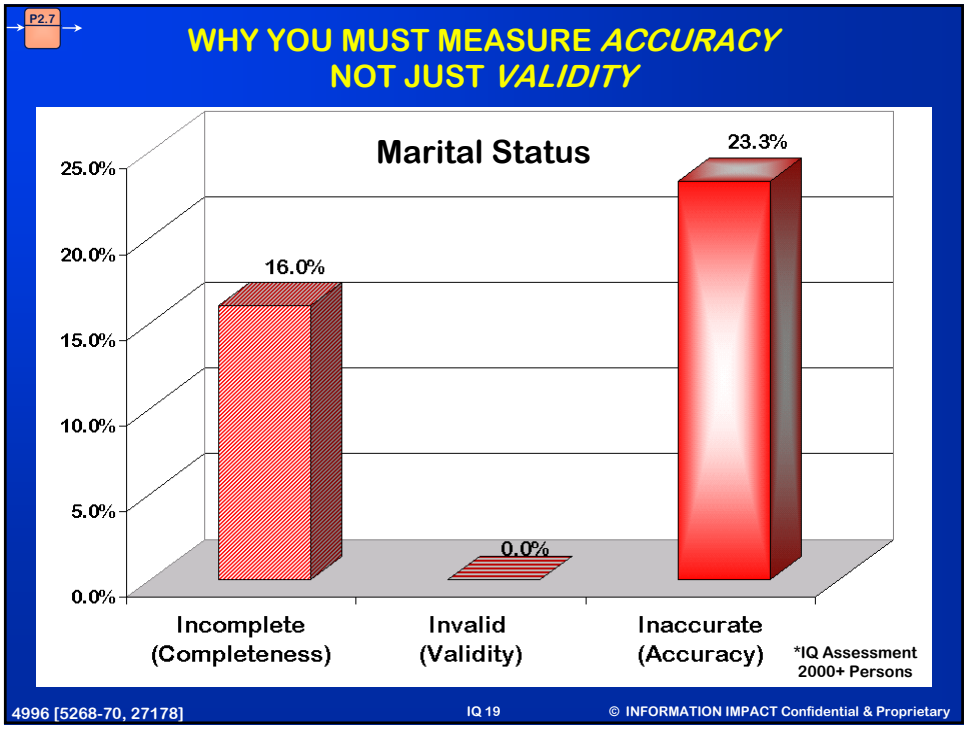
P2.7
WHY YOU MUST MEASURE ACCURACY
NOT JUST VALIDITY
Marital Status
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
16.0%
0.0%
23.3%
Incomplete
(Completeness)
Invalid
(Validity)
Inaccurate
(Accuracy)
*IQ Assessment
2000+ Persons
4996 [5268-70, 27178]
IQ 19
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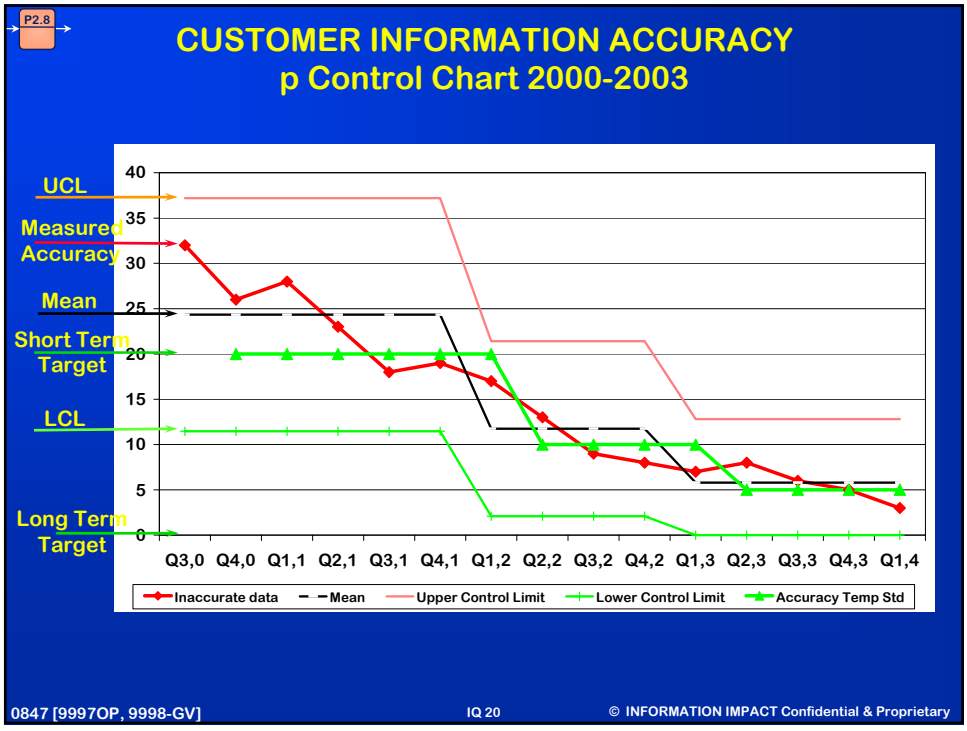
P2.8
CUSTOMER INFORMATION ACCURACY
p Control Chart 2000-2003
UCL
Measured
Accuracy
Mean
Short Term
Target
LCL
Long Term
Target
40
35
30
25
20
15
10
5
0
Q3,0 Q4,0 Q1,1 Q2,1 Q3,1 Q4,1 Q1,2 Q2,2 Q3,2 Q4,2 Q1,3 Q2,3 Q3,3 Q4,3 Q1,4
Inaccurate data
Mean
Upper Control Limit
Lower Control Limit
Accuracy Temp Std
0847 [9997OP, 9998-GV]
IQ 20
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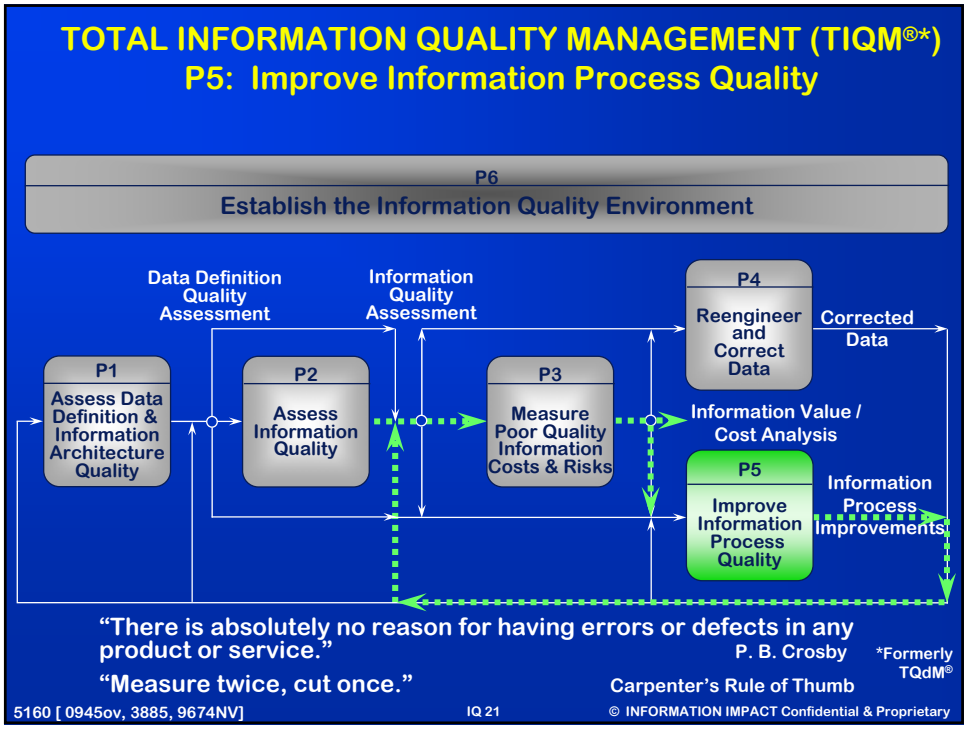
TOTAL INFORMATION QUALITY MANAGEMENT (TIQM®*)
P5: Improve Information Process Quality
P6
Establish the Information Quality Environment
Data Definition Quality Assessment
Information Quality Assessment
P1
Assess Data Definition & Information Architecture Quality
P2
Assess Information Quality
P3
Measure Poor Quality Information Costs & Risks
P4
Reengineer and Correct Data
Corrected Data
Information Value / Cost Analysis
P5
Improve Information Process Quality
Information Process Improvements
"There is absolutely no reason for having errors or defects in any product or service."
P. B. Crosby
*Formerly TQdM®
"Measure twice, cut once."
Carpenter's Rule of Thumb
5160 [0945ov, 3885, 9674NV]
IQ 21
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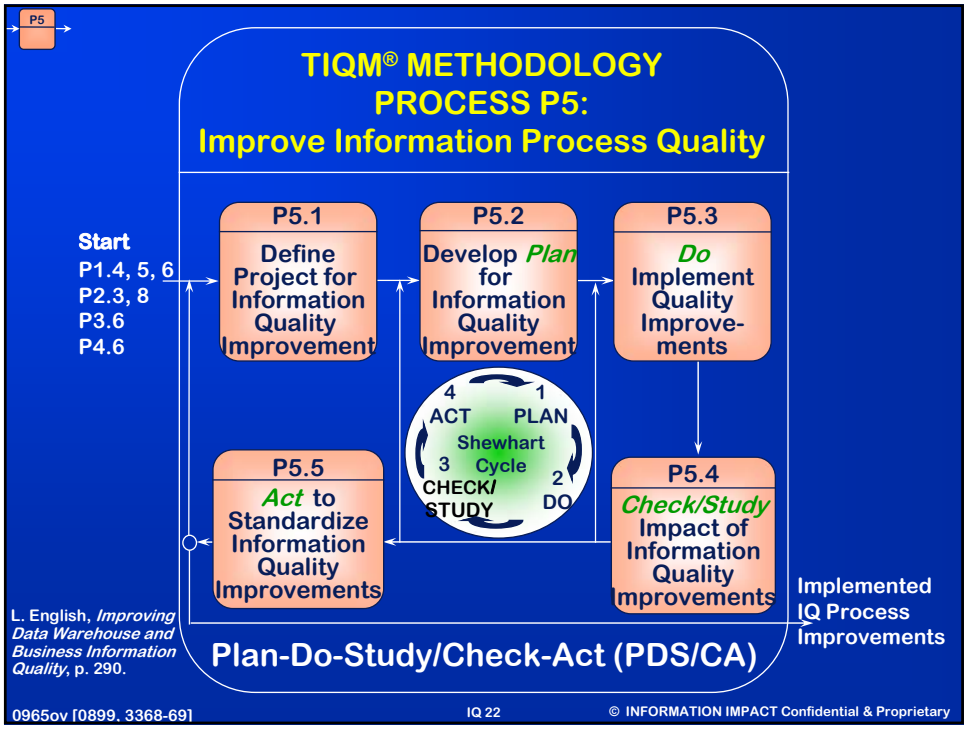
P5
TIQM® METHODOLOGY
PROCESS P5:
Improve Information Process Quality
Start
P1.4, 5, 6
P2.3, 8
P3.6
P4.6
P5.1
Define Project for Information Quality Improvement
P5.2
Develop Plan for Information Quality Improvement
P5.3
Do Implement Quality Improve-ments
4 ACT
1 PLAN
Shewhart Cycle
3 CHECK/ STUDY
2 DO
P5.4
Check/Study Impact of Information Quality Improvements
P5.5
Act to Standardize Information Quality Improvements
Implemented IQ Process Improvements
L. English, Improving Data Warehouse and Business Information Quality, p. 290.
Plan-Do-Study/Check-Act (PDS/CA)
0965ov [0899, 3368-69]
IQ 22
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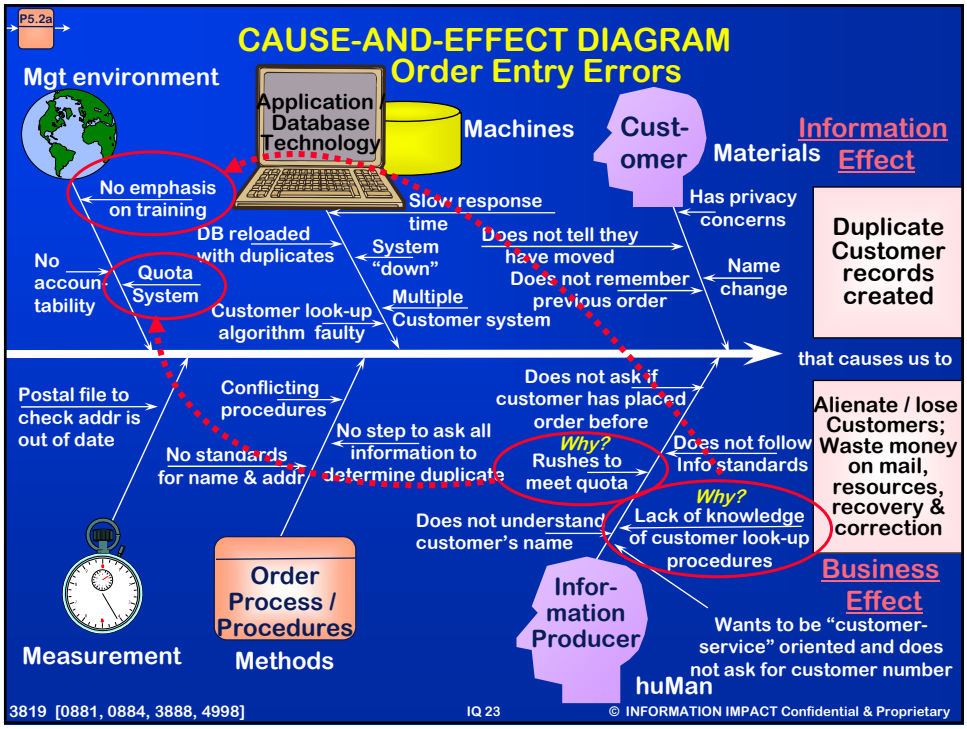
P5.2a
CAUSE-AND-EFFECT DIAGRAM
Order Entry Errors
Mgt environment
Application
Database
Technology
Machines
Cust-
omer
Materials
Information
Effect
No emphasis
on training
Slow response
time
Has privacy
concerns
DB reloaded
with duplicates
System
"down"
Does not tell they
have moved
Duplicate
Customer
records
created
No
accoun-
tability
Quota
System
Multiple
Customer system
Does not remember
previous order
Name
change
Customer look-up
algorithm faulty
that causes us to
Postal file to
check addr is
out of date
Conflicting
procedures
Does not ask if
customer has placed
order before
Alienate / lose
Customers;
Waste money
on mail,
resources,
recovery &
correction
No step to ask all
information to
determine duplicate
Why?
Rushes to
meet quota
Does not follow
Info standards
No standards
for name & addr
Why?
Lack of knowledge
of customer look-up
procedures
Does not understand
customer's name
Business
Effect
Order
Process /
Procedures
Infor-
mation
Producer
Wants to be "customer-
service" oriented and does
not ask for customer number
Measurement
Methods
huMan
3819 [0881, 0884, 3888, 4998]
IQ 23
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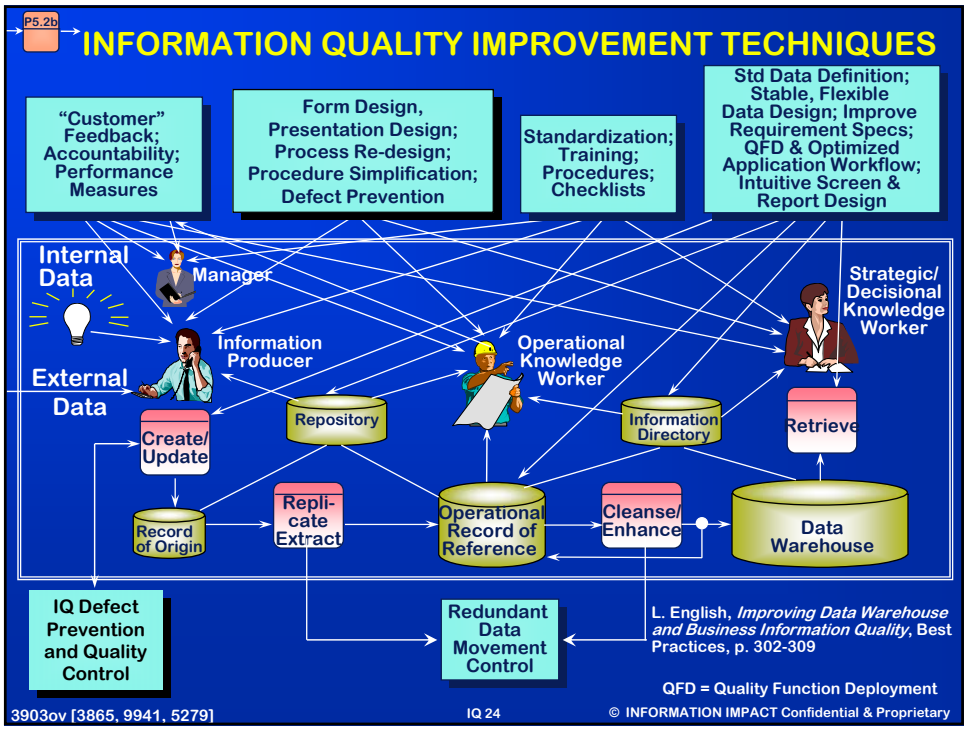
P5.2b
INFORMATION QUALITY IMPROVEMENT TECHNIQUES
"Customer"
Feedback;
Accountability;
Performance
Measures
Form Design,
Presentation Design;
Process Re-design;
Procedure Simplification;
Defect Prevention
Standardization;
Training;
Procedures;
Checklists
Std Data Definition;
Stable, Flexible
Data Design; Improve
Requirement Specs;
QFD & Optimized
Application Workflow;
Intuitive Screen &
Report Design
Internal
Data
Manager
Strategic/
Decisional
Knowledge
Worker
Information
Producer
Operational
Knowledge
Worker
External
Data
Repository
Information
Directory
Retrieve
Create/
Update
Record
of Origin
Repli-
cate
Extract
Operational
Record of
Reference
Cleanse/
Enhance
Data
Warehouse
IQ Defect
Prevention
and Quality
Control
Redundant
Data
Movement
Control
L. English, Improving Data Warehouse and Business Information Quality, Best Practices, p. 302-309
QFD = Quality Function Deployment
3903ov [3865, 9941, 5279]
IQ 24
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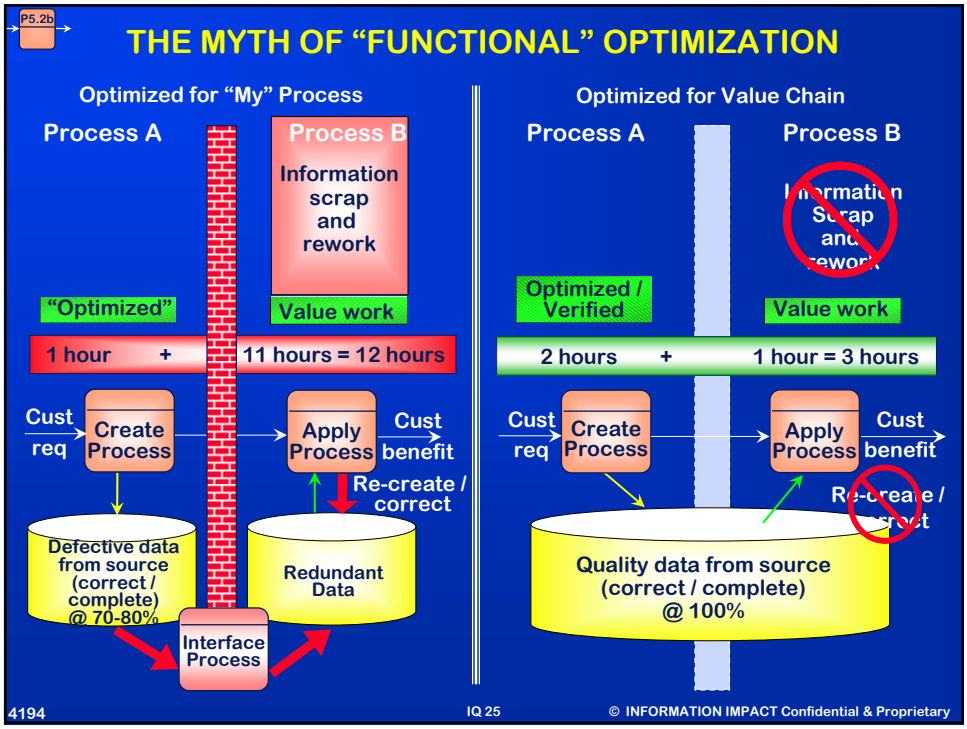
P5.2b
THE MYTH OF "FUNCTIONAL" OPTIMIZATION
Optimized for "My" Process
Process A
Process B
Information scrap and rework
"Optimized"
Value work
1 hour + 11 hours = 12 hours
Cust req
Create Process
Apply Process
Cust benefit
Re-create / correct
Defective data from source (correct / complete) @ 70-80%
Redundant Data
Interface Process
Optimized for Value Chain
Process A
Process B
Optimized / Verified
Value work
2 hours + 1 hour = 3 hours
Cust req
Create Process
Apply Process
Cust benefit
Quality data from source (correct / complete) @ 100%
4194
IQ 25
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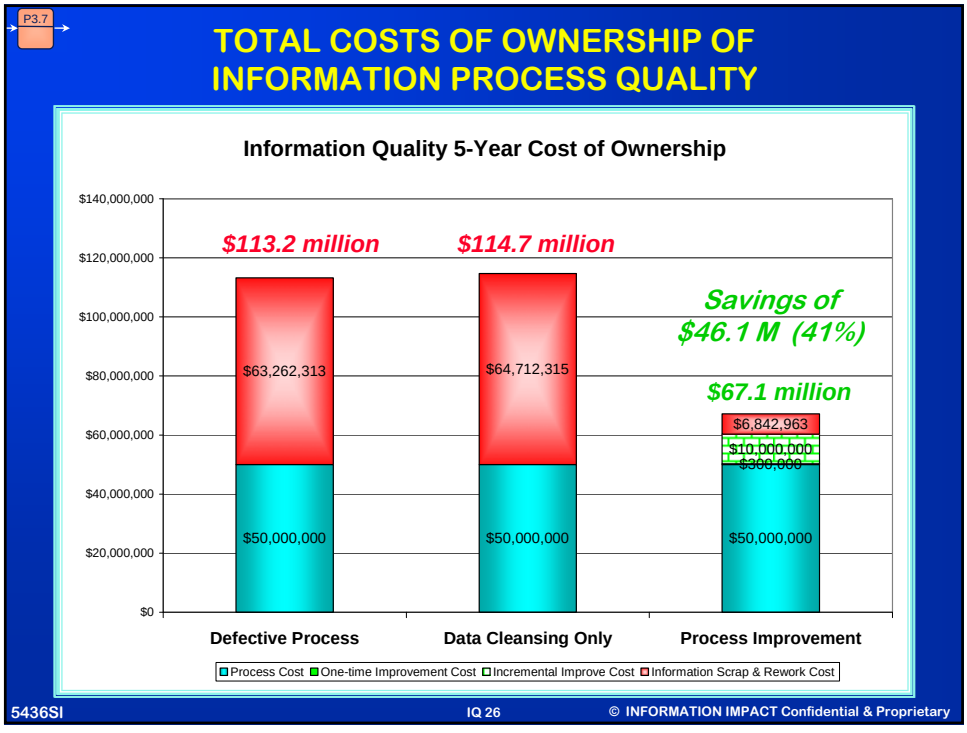
P3.7
TOTAL COSTS OF OWNERSHIP OF INFORMATION PROCESS QUALITY
Information Quality 5-Year Cost of Ownership
$140,000,000
$120,000,000
$100,000,000
$80,000,000
$60,000,000
$40,000,000
$20,000,000
$0
$113.2 million
$114.7 million
Savings of $46.1 M (41%)
$67.1 million
$63,262,313
$64,712,315
$6,842,963
$10,000,000
$300,000
$50,000,000
$50,000,000
$50,000,000
Defective Process
Data Cleansing Only
Process Improvement
Process Cost
One-time Improvement Cost
Incremental Improve Cost
Information Scrap & Rework Cost
5436SI
IQ 26
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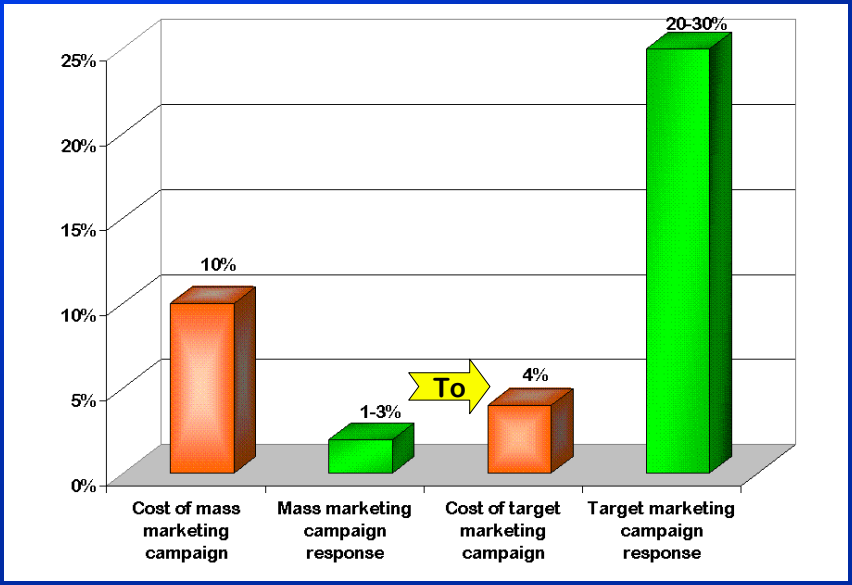
P6

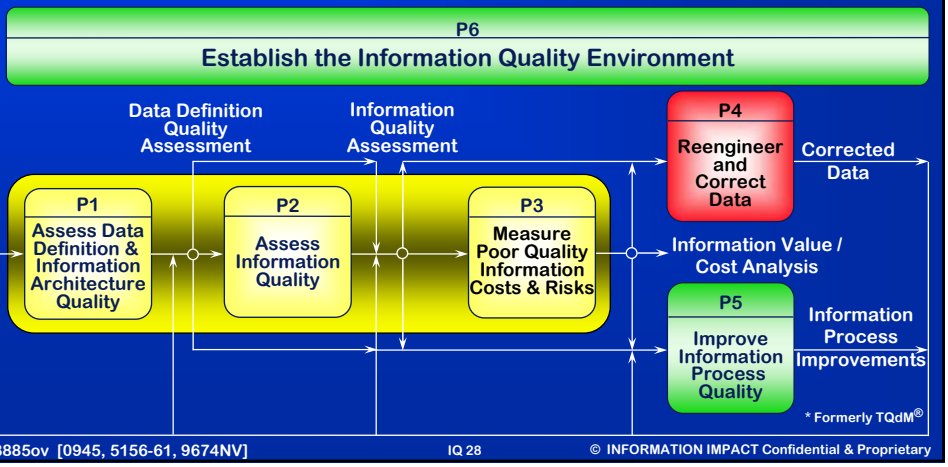
VALUE OF QUALITY INFORMATION TO TARGET MARKETING CAMPAIGN RESULTS



TOTAL INFORMATION QUALITY MANAGEMENT (TIQM®)

- 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*



P6

TOTAL QUALITY MANAGEMENT
Deming's 14 Points

1. Create constancy of purpose toward improvement of product and service, with the aim to become competitive and to stay in business, and to provide jobs.
2. Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.
3. Cease dependence on mass inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.
4. End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item, on a long-term relationship of loyalty and trust.
5. Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.
6. Institute training on the job.
7. Institute leadership. The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of overhaul, as well as supervision of… workers.

Source: Deming, *Out of the Crisis*
Larry English, *Improving Data Warehouse and Business Information Quality,* p338

0812 [0819, 0820, 4092-98] IQ 29

P6

TOTAL QUALITY MANAGEMENT
Deming's 14 Points (Cont.)

8. Drive out fear, so everyone may work effectively for the company
9. Break down barriers between departments. People in research, design, sales, and production must work as a team, to foresee problems of production and in use that may be encountered with the product or service.
10. Eliminate slogans, exhortations, and targets for the work force asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force.
11. a. Eliminate work standards (quotas) on the factory floor. Substitute leadership.

    b. Eliminate management by objective. Eliminate management by numbers, numerical goals. numerical goals. Substitute leadership.
12. a. Remove barriers that rob the hourly worker of his right to pride of workmanship. The responsibility of supervisors must be changed from sheer numbers to quality.

    b. Remove barriers that rob people in management and in engineering of their right to pride of workmanship. This means, *inter alia*, abolishment of the annual or merit rating and of management by objective.
13. Institute a vigorous program of education and self-improvement.
14. Put everyone to work to accomplish the transformation. The transformation is everybody's job. Management will explain by seminars and other means why change is necessary, and that the change will involve everybody. Deming, *Out of the Crisis*

Larry English, *Improving Data Warehouse and Business Information Quality,* p338

0813 [0819, 0820, 4092-98] IQ 30

TOTAL INFORMATION QUALITY MANAGEMENT: 14 Points

1. Create constancy of purpose for improvement of *information* product and service: Long term plan; the obligation to the *knowledge worker* never ceases
2. Adopt the new philosophy of quality *shared information* as a tool for business improvement: "Reliable (*quality*) shared information reduces costs"
   - Means *transformation* of I / S & business management
3. Cease reliance on data and application *inspections alone* to achieve information quality: *Design quality in* to the information design and production processes
4. End the practice of developing applications on the basis of "on-time," "within budget" measures alone and capturing data at the lowest cost: *Develop single data creation programs and trust* in information producers*

*Note: Contract with your information suppliers

* Adapted from Deming's 14 Points, See L. English, *Improving Data Warehouse & Business Information Quality*, ch 11

4714 [4092-93, 0854, 0858-9, 0861, 4832-45, 9675NV] IQ 31

TOTAL INFORMATION QUALITY MANAGEMENT: 14 Points

5. *Improve constantly and forever the processes* of application and information development and service and of information production, through a *habit* of continuous "information defect prevention"
6. *Institute training* on information quality for all employees, especially management and producers
7. Institute leadership for information quality: appoint a full-time information quality leader; *management must assume accountability for* information quality
8. Drive out fear of data uncertainty or data correction: Implement incentive programs for finding / and correcting problem *causes; do not blame or punish*
9. *Break down barriers* between business areas: information management and application development; IT and business; business area and business area units

* Adapted from Deming's 14 Points, See L. English, *Improving Data Warehouse & Business Information Quality*, ch 11

4715 [4093-94, 0863-67, 4832-45, 9676NV] IQ 32

TOTAL INFORMATION QUALITY MANAGEMENT: 14 Points

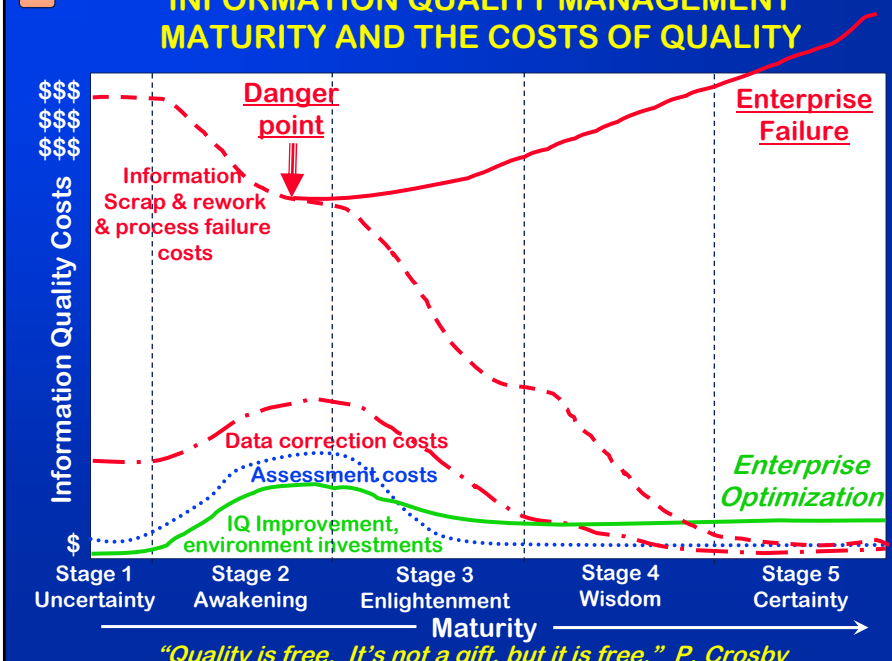
10. Eliminate slogans and exhortations [only]; *replace with actions for information quality improvement*: Implement a Plan-Do-Check-Act process for information quality improvement
11. Eliminate quotas of "productivity" that increase errors and costs of scrap and rework: *Customer satisfaction*
12. Remove barriers to pride of workmanship; *empower information producers* to fix the broken processes
13. Institute a vigorous program of education and *self-improvement* for all people: understand the paradigm shift and learn tomorrow's skills
14. Take action to accomplish the transformation for IQ: *Senior management must* feel the pain of the status quo, organize itself and communicate to a critical mass
    - Every process is a candidate for improvement

* Adapted from Deming's 14 Points, See L. English, *Improving Data Warehouse & Business Information Quality*, ch 11

4716 [4095-96, 0872-73, 0877-79, 4832-45, 9677NV] IQ 33

P6

INFORMATION QUALITY MANAGEMENT MATURITY AND THE COSTS OF QUALITY



"Quality is free. It's not a gift, but it is free." P. Crosby

4090 [4099, 4068] IQ 34

27124

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

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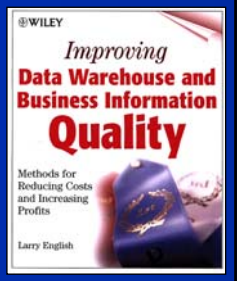

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0688ov [0689-91, 27124] IQ 35 © INFORMATION IMPACT Confidential & Proprietary