Information Quality Processes and Technologies: *Information Quality in Practice*

National Institute of Statistical Sciences
Telcordia Technologies

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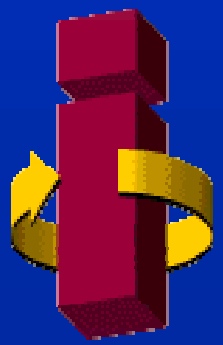
by:

Larry P. English



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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 (TQdM®) methodology applying Kaizen® quality principles to information quality management. He chairs Information Quality Conferences around the world.

Prior to founding INFORMATION IMPACT INTERNATIONAL, Inc. (www.infoimpact.com), Brentwood, TN, over twelve 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. Active in several professional organizations, he has been an officer of the Nashville DPMA Chapter and is a co-founder of the Nashville DAMA Chapter. He is a member and a strategic business partner of the American Society for Quality (ASQ). Mr. English has 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 25 countries on five continents to such organizations as Aera Energy, Air Canada, American Express, Belgacom, Boeing, British Telecom, Capital Bank, 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, UNUM Life Insurance Co., the U.S. Navy, Western Health Alliance and Weyerhaeuser.

A frequent keynote speaker, Mr. English writes the monthly "Plain English on Data Quality" column for *DM Review,* and is the author of the highly acclaimed *Improving Data Warehouse and Business Information Quality*, now available in Japanese, and numerous articles for publications in the US and Europe.

INFORMATION QUALITY
Agenda

- Information quality: what is it and what it isn't
- Trends in information quality processes and methods
- Classifications of and trends in information quality technologies
- Information quality improvement: the maturing of information management
- Systemic culture change requirements to sustain information quality initiatives

ERRONEOUS ASSUMPTIONS

1. Quality is superiority, best-of-breed or zero defects
2. Information quality is “fitness for purpose”
3. Information quality is intangible and therefore not measurable
4. Information quality is quality measurement
5. Information quality is data cleansing
6. Information quality *problems* are created by the information producers
7. *Information quality* improvement is performed by in the quality department
8. IQ problems can be edited out with business rules
9. TQM or TQdM® is a program or project
10. Information quality is too expensive

INFORMATION QUALITY

"Consistently
meeting
knowledge worker and end-customer
expectations"
through information and information services

Larry English, TQdM®

Quality of:

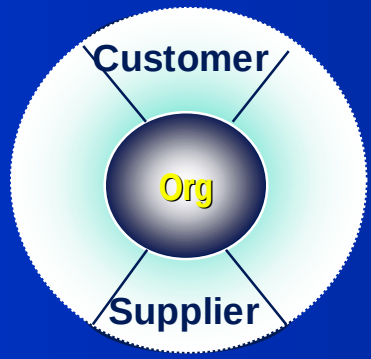
- Data Definition (*all* business metadata)
- Data Content
- Data Presentation

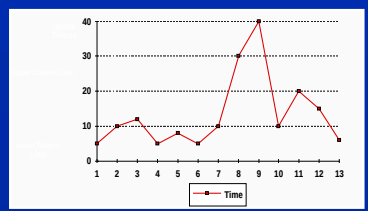
INFORMATION QUALITY

Characteristic:		*Knowledge Worker Benefit:*
❑ The *right* data	=	the data I *need*
❑ With *completeness*	=	*All* the data I need
❑ in the right *context*	=	whose *meaning* I know
❑ with the right *accuracy*	=	I can *trust* and rely on it
❑ in the right *consistency*	=	I have a *single* version of the *truth*
❑ in the right *format*	=	I can *use it easily*
❑ at the right *time*	=	*when* I need it
❑ at the right *place*	=	*where* I need it
❑ at the right *cost*	=	I create *value for money*
for the right *purpose*	=	*so I can accomplish our objectives and delight our customers*

QUALITY PRINCIPLES

- Customer focus
  - Market focus
  - Customer satisfaction
  - Partnership
- Process improvement
  - Process definition
  - Product specification (customer)
  - Team work
  - Continuous process improvement (CPI) and 6 Sigma
  - Business process re-engineering (BPR)
- Scientific methods
  - Statistical quality control
  - PDCA (Shewhart) cycle
- Management accountability

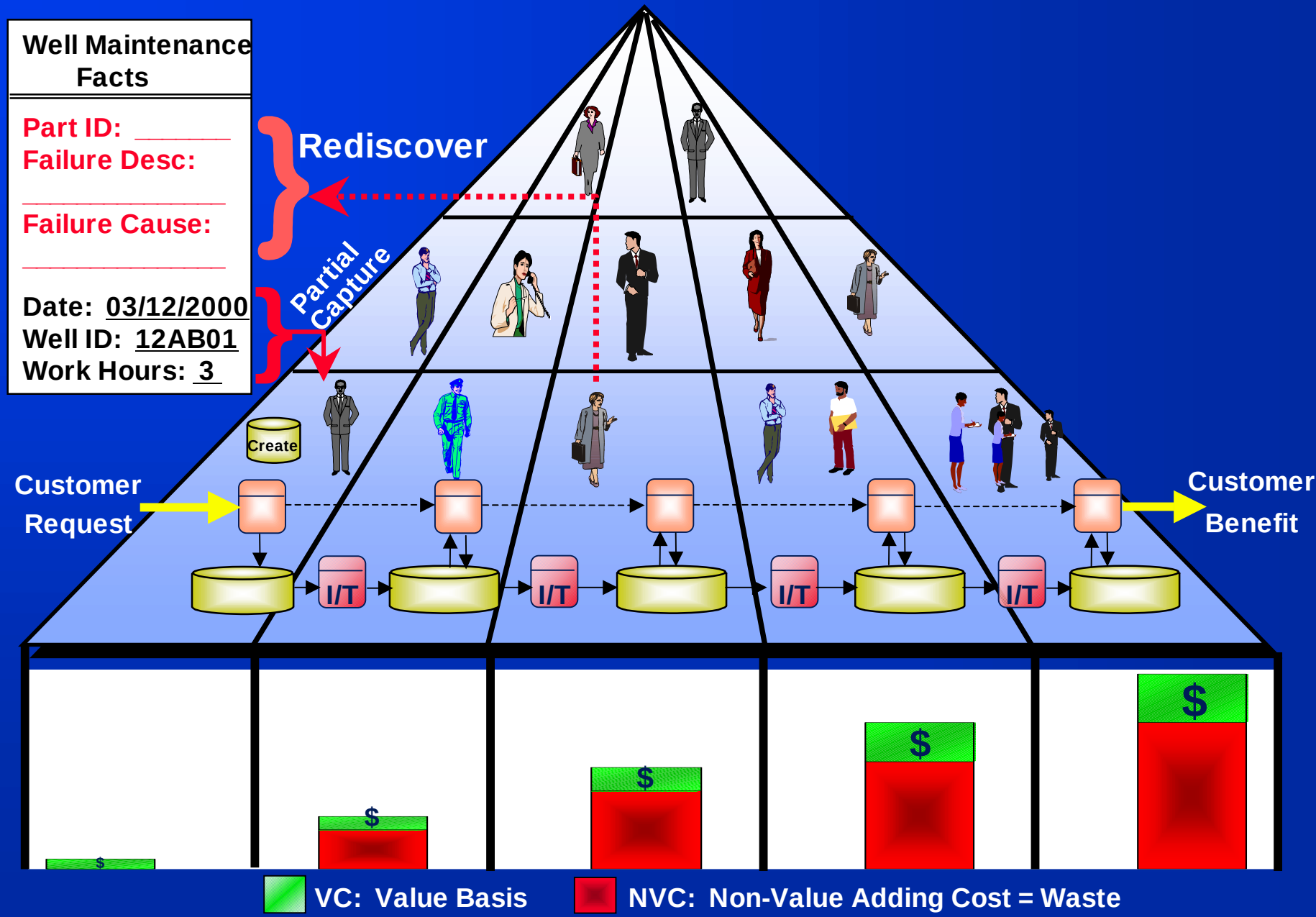




CPI = Continuous Process Improvement

BPR = Business Process Reengineering

SUB-OPTIMIZED VALUE CHAIN



INFORMATION PRODUCTS AND INFORMATION CUSTOMERS

Process Owner / Manager

Process Owner / Manager

Supplier-Customer Relationship

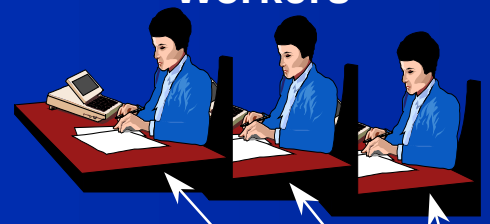
Information Producer

Data Material

Data Intermediary

Information Producer

Knowledge Workers *



Information Product

Create

Create

Update

Retrieve

Data Material

Data Product

* There is no concept of "users" if we subscribe to information quality

Data Resource

Repository / Info Directory

Information definition and specification

KAIZEN AND INFORMATION QUALITY
Major Concepts

Kaizen and Management. **Two major functions:**

- **Maintenance of current management and operating standards for information quality**
- **Improvement, elevating information quality standards, including innovation**

The next process is the customer. **Every information process has a supplier and a customer**

- ***Process versus result.*** **Focuses on human effort, and therefore fosters process-oriented thinking**
- ***Following the Plan-Do-Check-Act and Standardize-Do-Check-Act cycles.*** **Stabilize and *standardize* the process, then *improve* it**
- ***Putting quality first.*** **Sacrificing information quality for price risks the life of the business**
- ***Speak with data.*** **To solve a problem, you must understand the facts**

Adapted from: Masaaki Imai, *Gemba Kaizen*

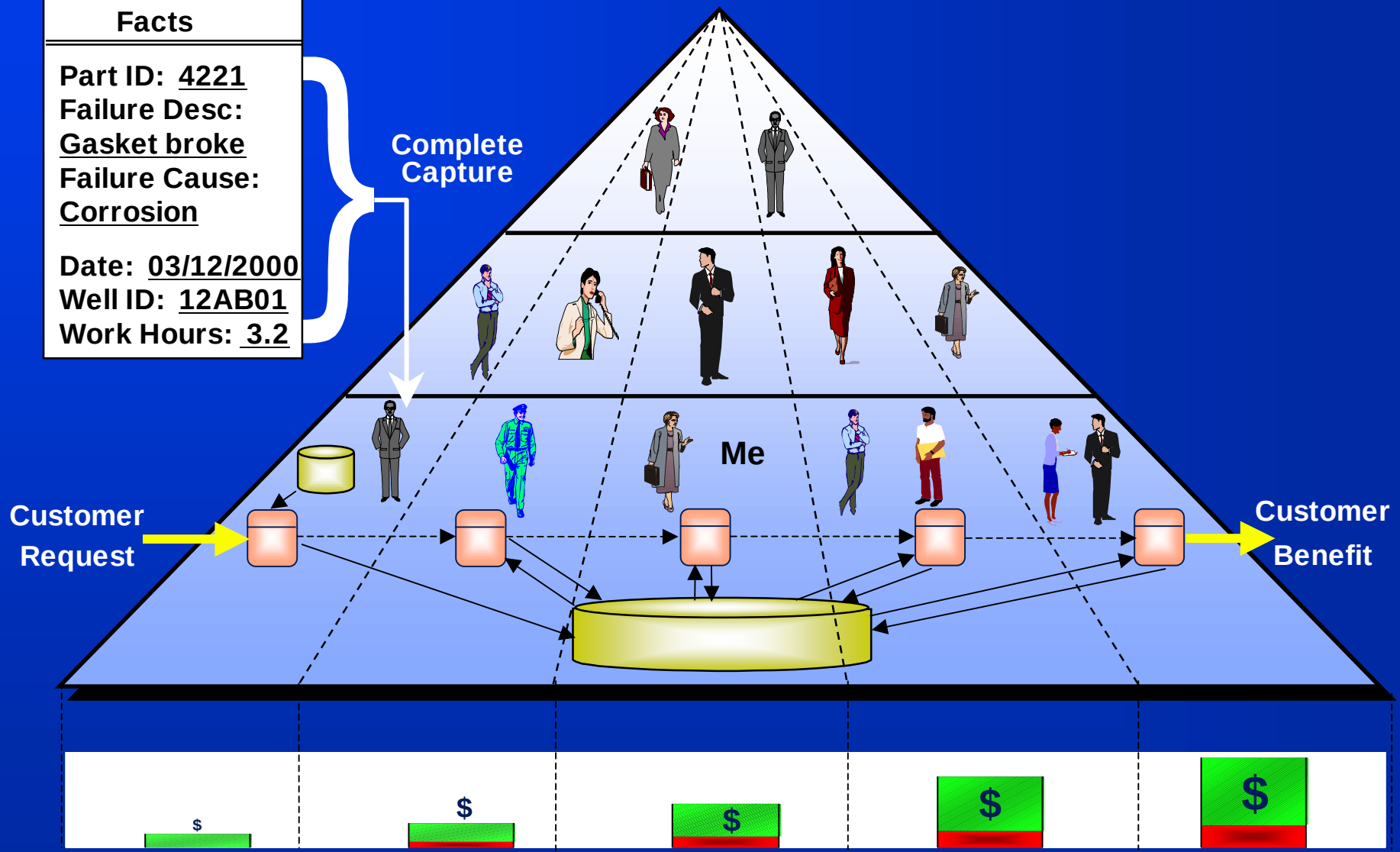
OPTIMIZED VALUE CHAIN

Well Maintenance Facts

Part ID: 4221
Failure Desc:
Gasket broke
Failure Cause:
Corrosion

Date: 03/12/2000
Well ID: 12AB01
Work Hours: 3.2

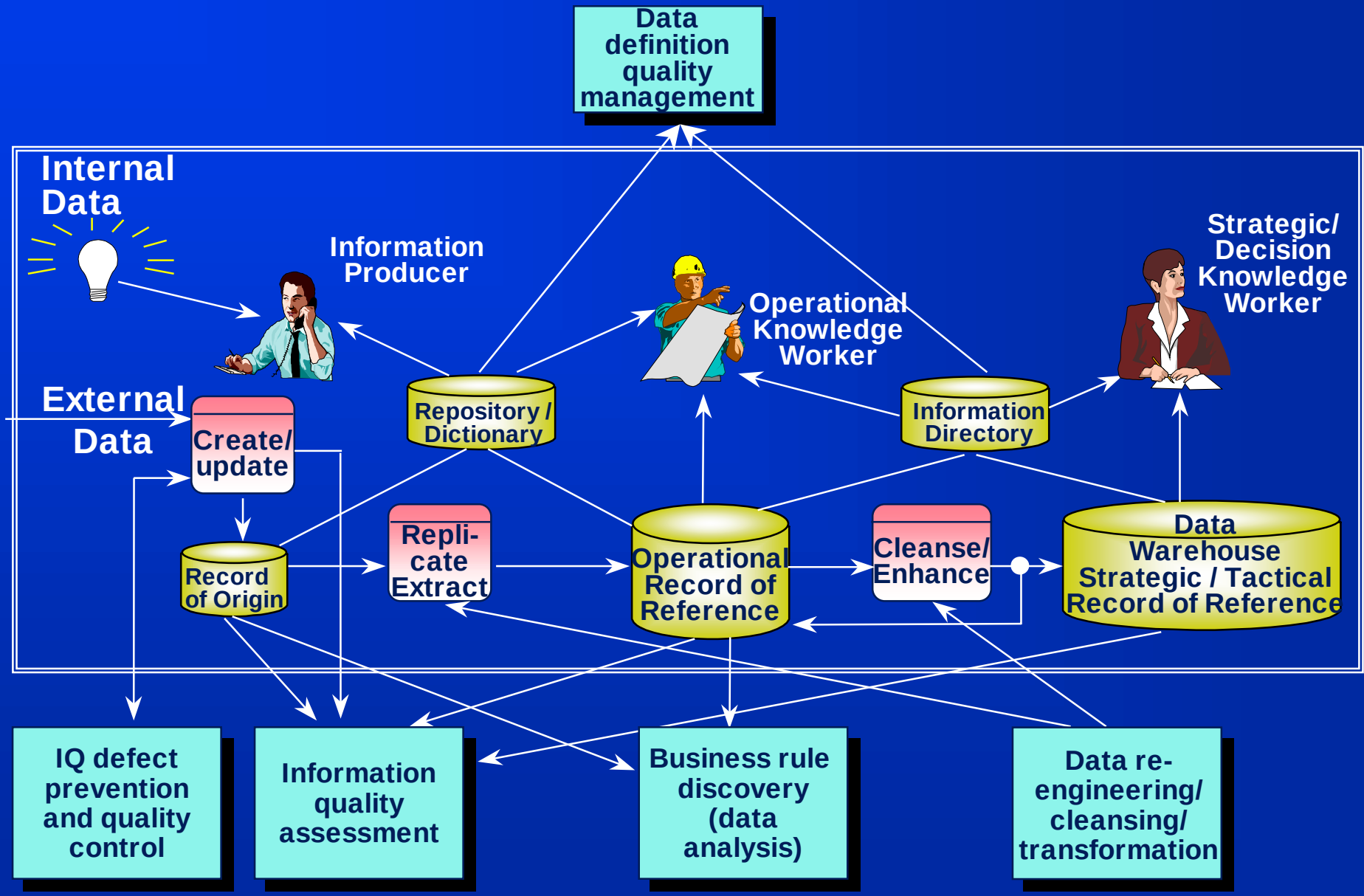
Complete Capture



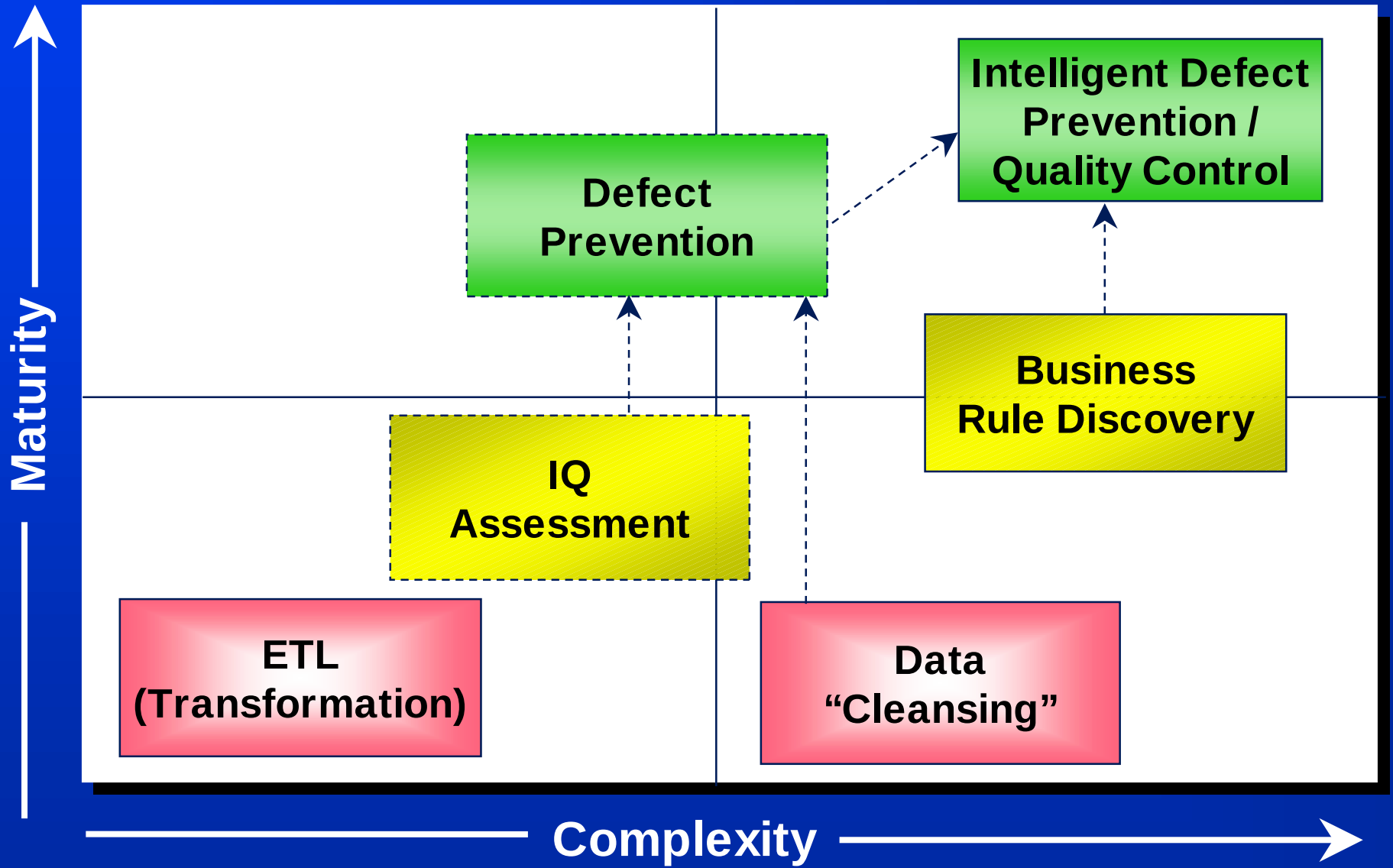
VC: Value Basis

NVC: Non-Value Adding Cost = Waste

INFORMATION QUALITY TOOLS IN THE INFORMATION VALUE CHAIN



INFORMATION QUALITY PRODUCT MATURATION



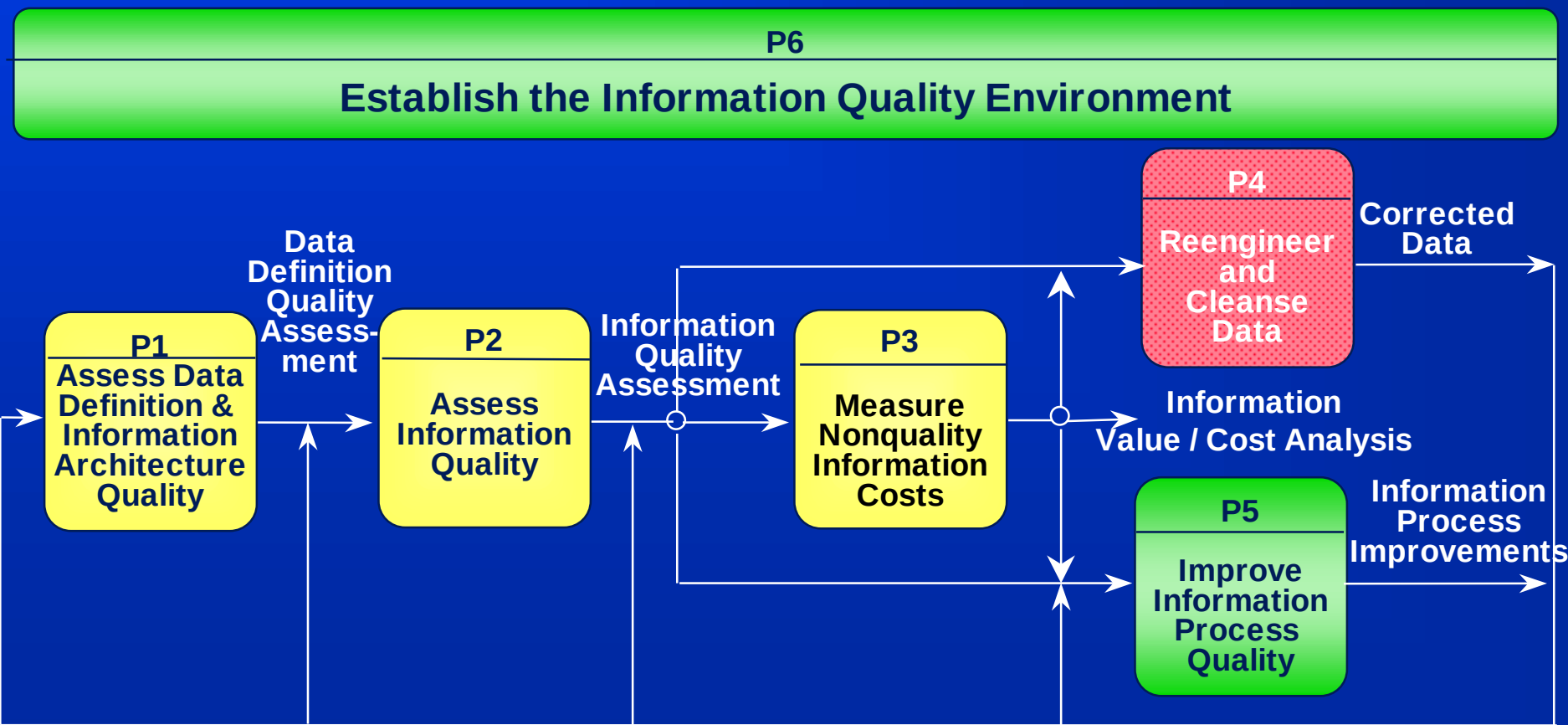
Preventive Maintenance | Inspection | Corrective Maintenance

TOTAL QUALITY data MANAGEMENT (TQdM®)

TQdM® 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 *beliefs*, *principles* and *methods* into the *culture*



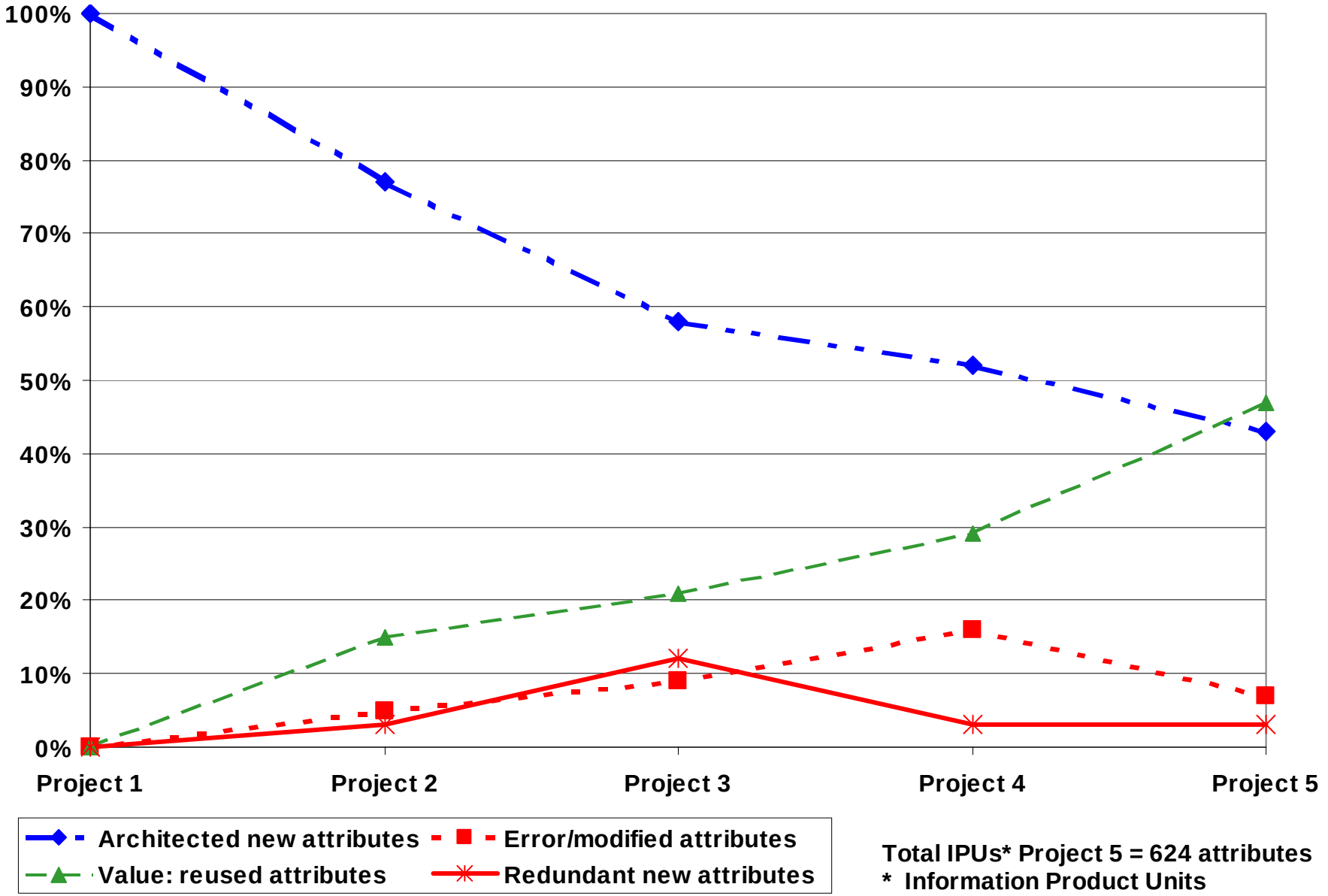
DATA DEFINITION QUALITY MEASURES

Meaningful enterprise data standards / guidelines

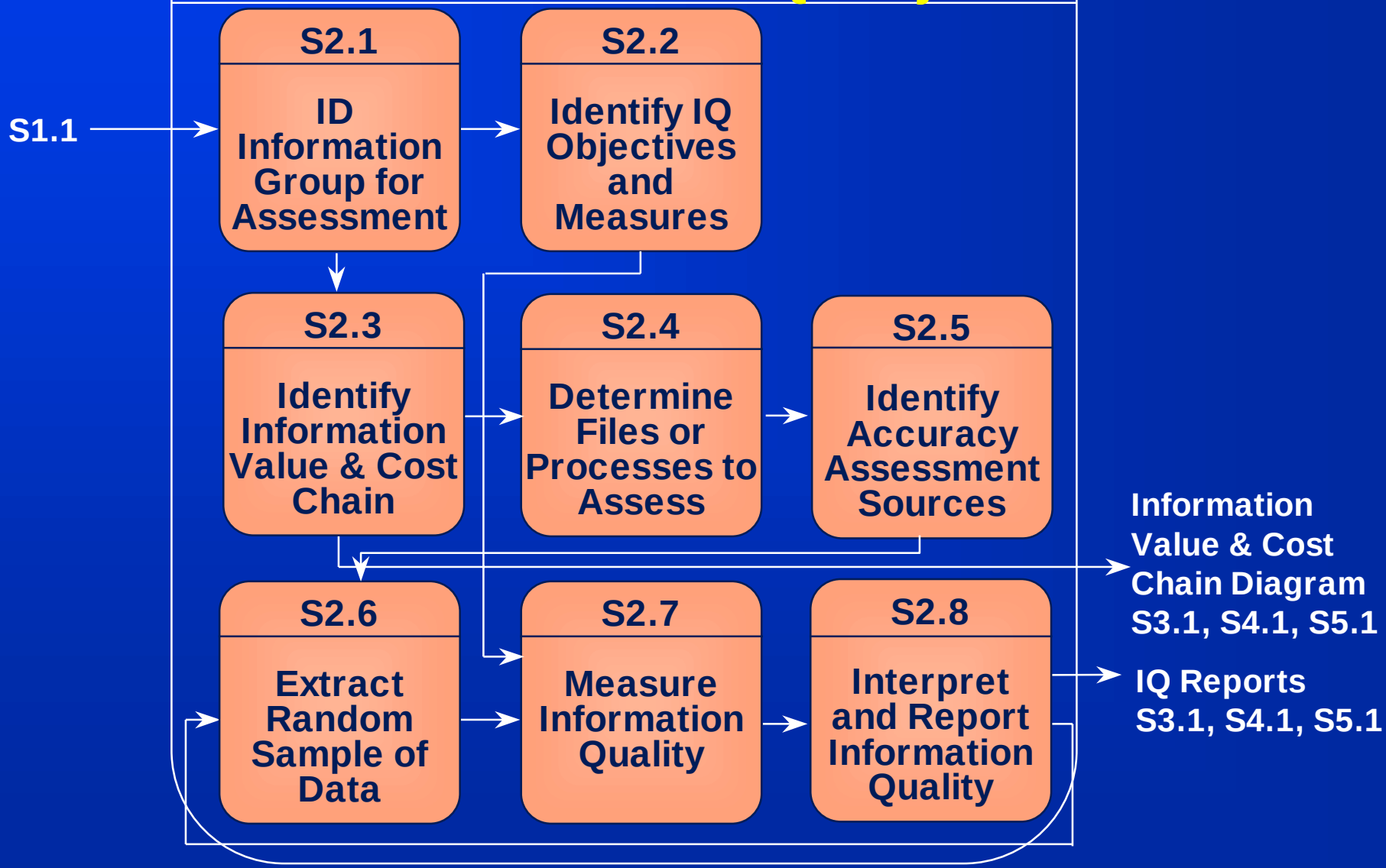
- Conformance to *meaningful* enterprise standards
- Meaningful business names, terms and abbreviations
- Consistency of data names
- Clear, precise, complete, consensus definition
- Singularity of definition
- Complete, domain values with definition
- Complete, unambiguous domain values
- Completeness, correctness and usefulness of business rules

Understandable to knowledge workers and information producers using customer satisfaction surveys

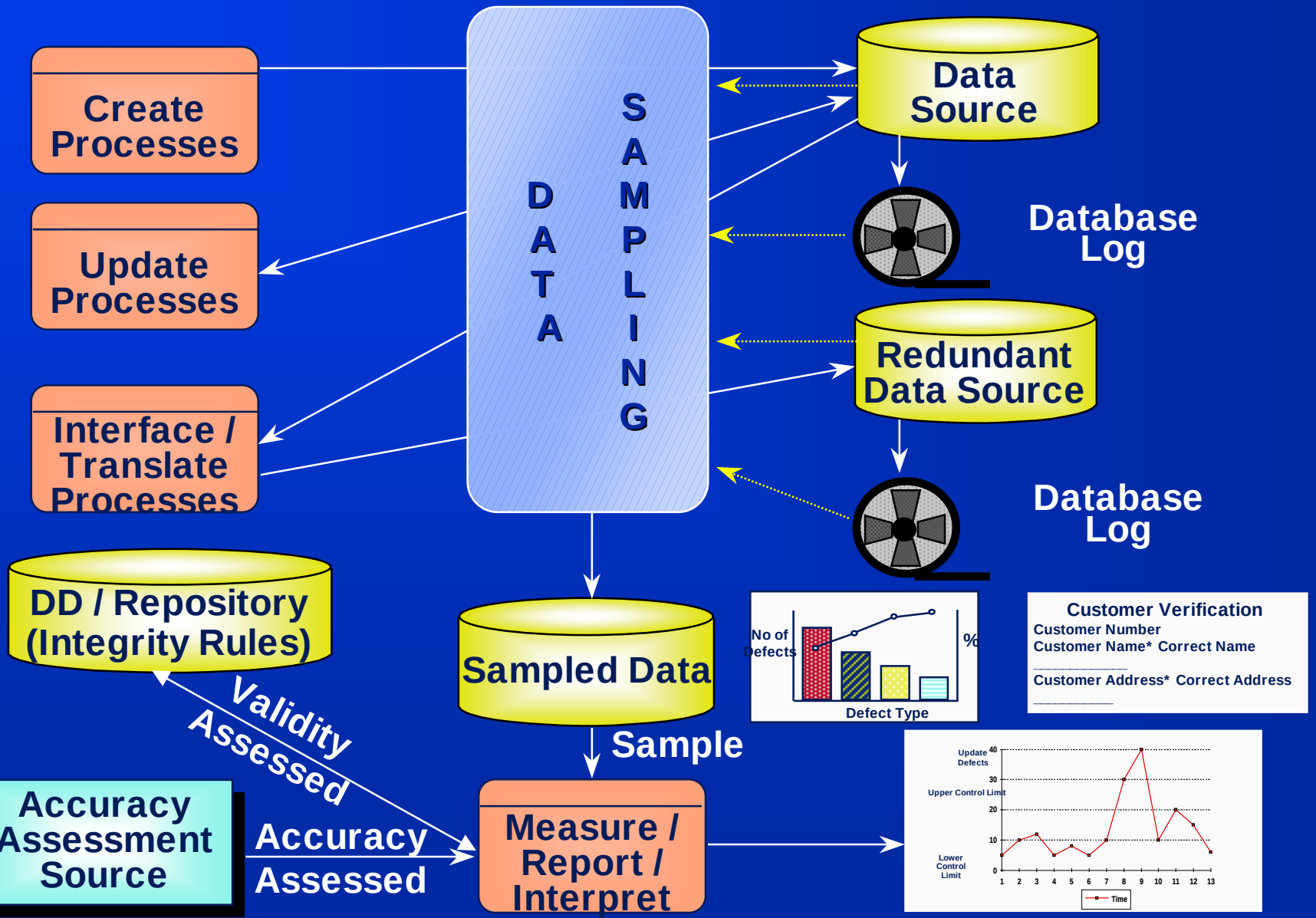
INFORMATION RE-USE QUALITY
AVERT [Nonquality Definition] Chart



TQdM® METHODOLOGY PROCESS P2: Assess Information Quality

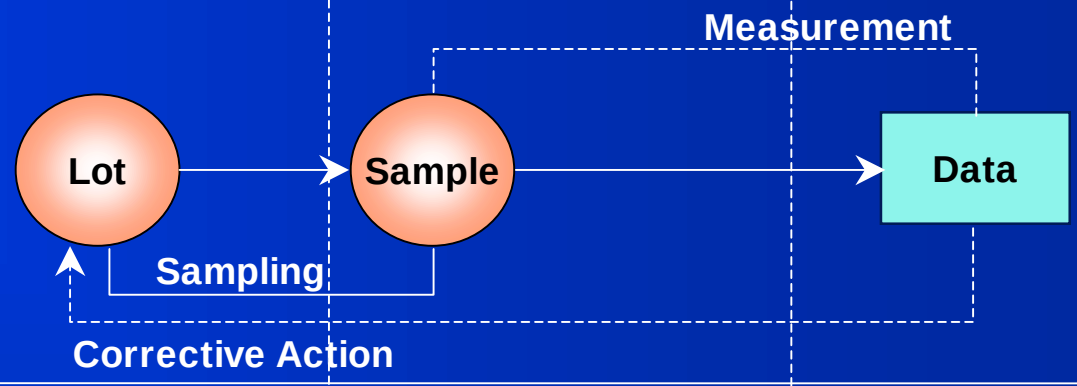


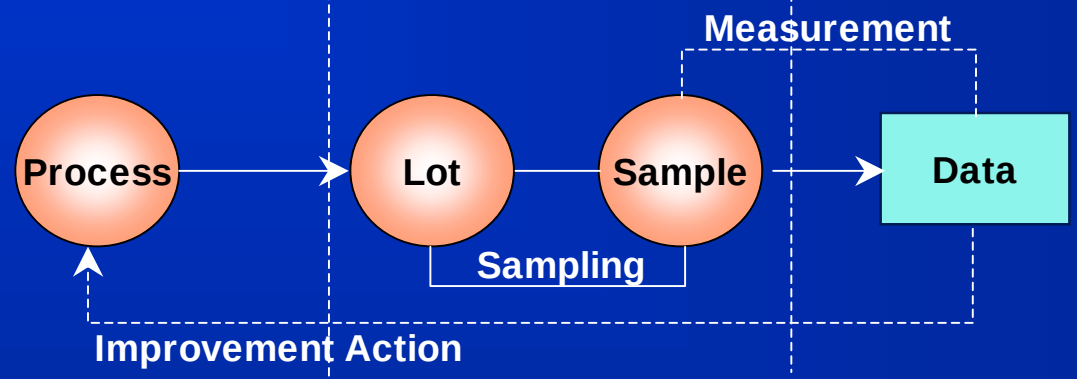
DATA CONTENT QUALITY ASSESSMENT SYSTEM
Components



QUALITY CONTROL IN MANUFACTURED PRODUCTS

Objective	Population	Sample	Data
(a) Corrective action on a lot Inspection Estimation of product quality			
(b) Improvement action on a production process Process control Process analysis Design of measurement experiments			





The relation between population, samples, and data

Source: Ishikawa, *Guide to Quality Control*

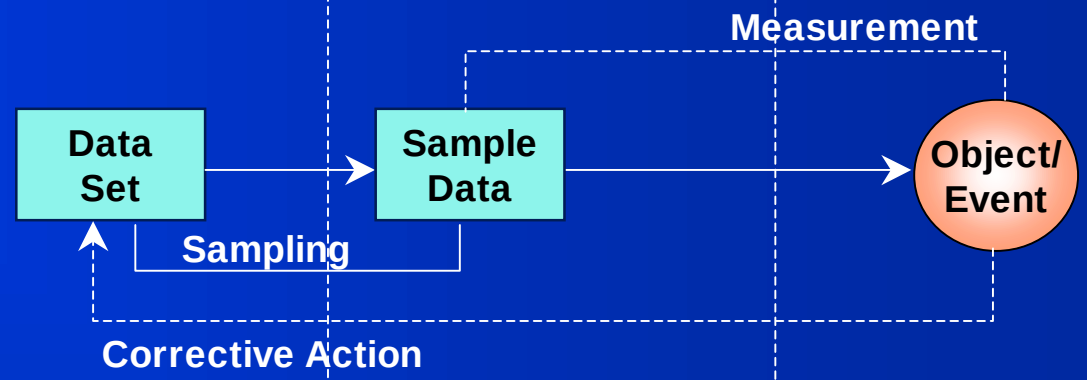
QUALITY CONTROL IN INFORMATION PRODUCT

Objective	Data Population	Sample	Object / Event

(a) Corrective action on a data set

Inspection

Estimation of information quality

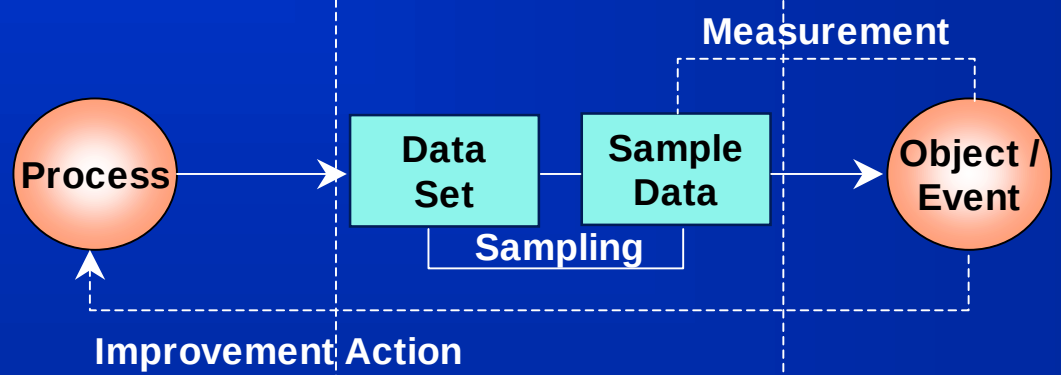


(b) Improvement action on a production process

Process control

Process analysis

Design of assessments



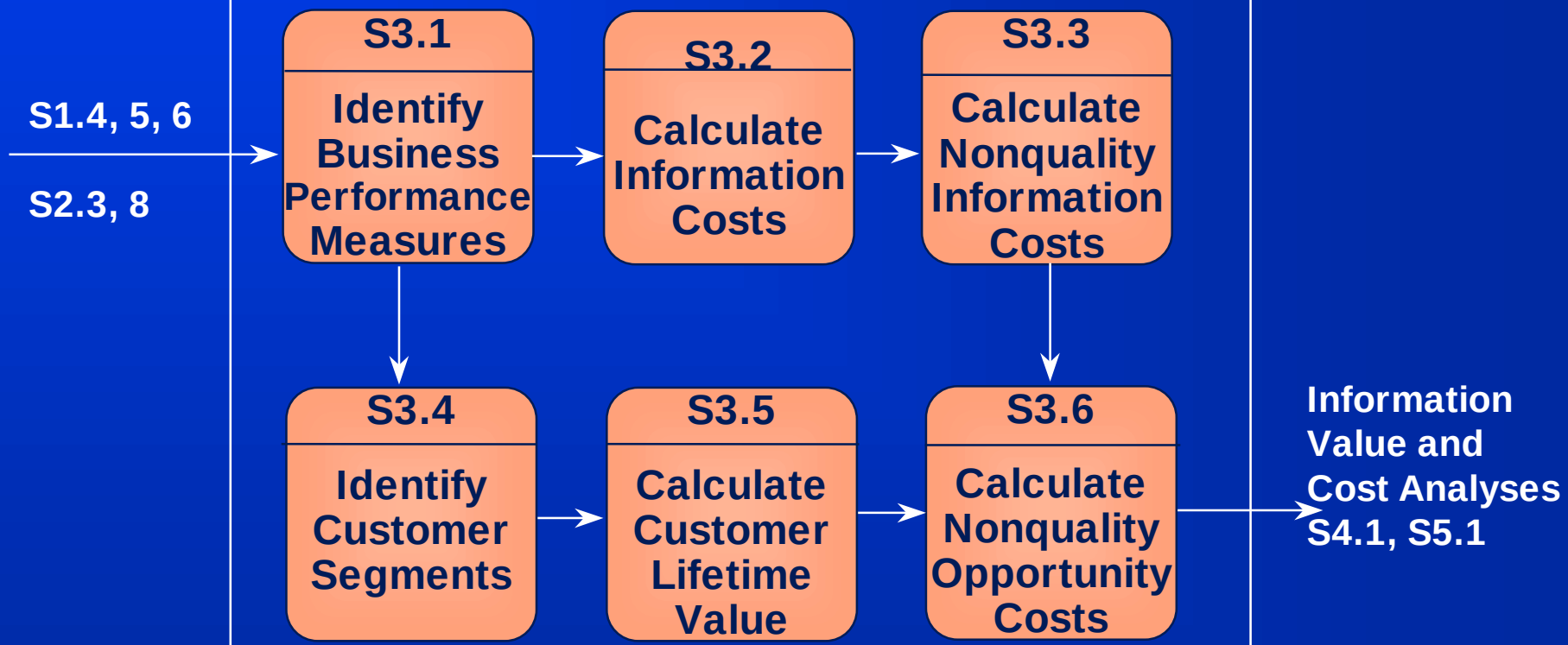
The relation between data population, object / event

Source: L. English, Derived from Ishikawa

INFORMATION QUALITY ASSESSMENT SYSTEM
Pitfalls

- Measuring the wrong things
- Measuring at the wrong time
- Measuring only validity
- Bias in sample or measurement
- Measuring with information producer knowledge or control
- Not setting expectations
- Perception of *people* performance assessment
- Managing the *measurement* system

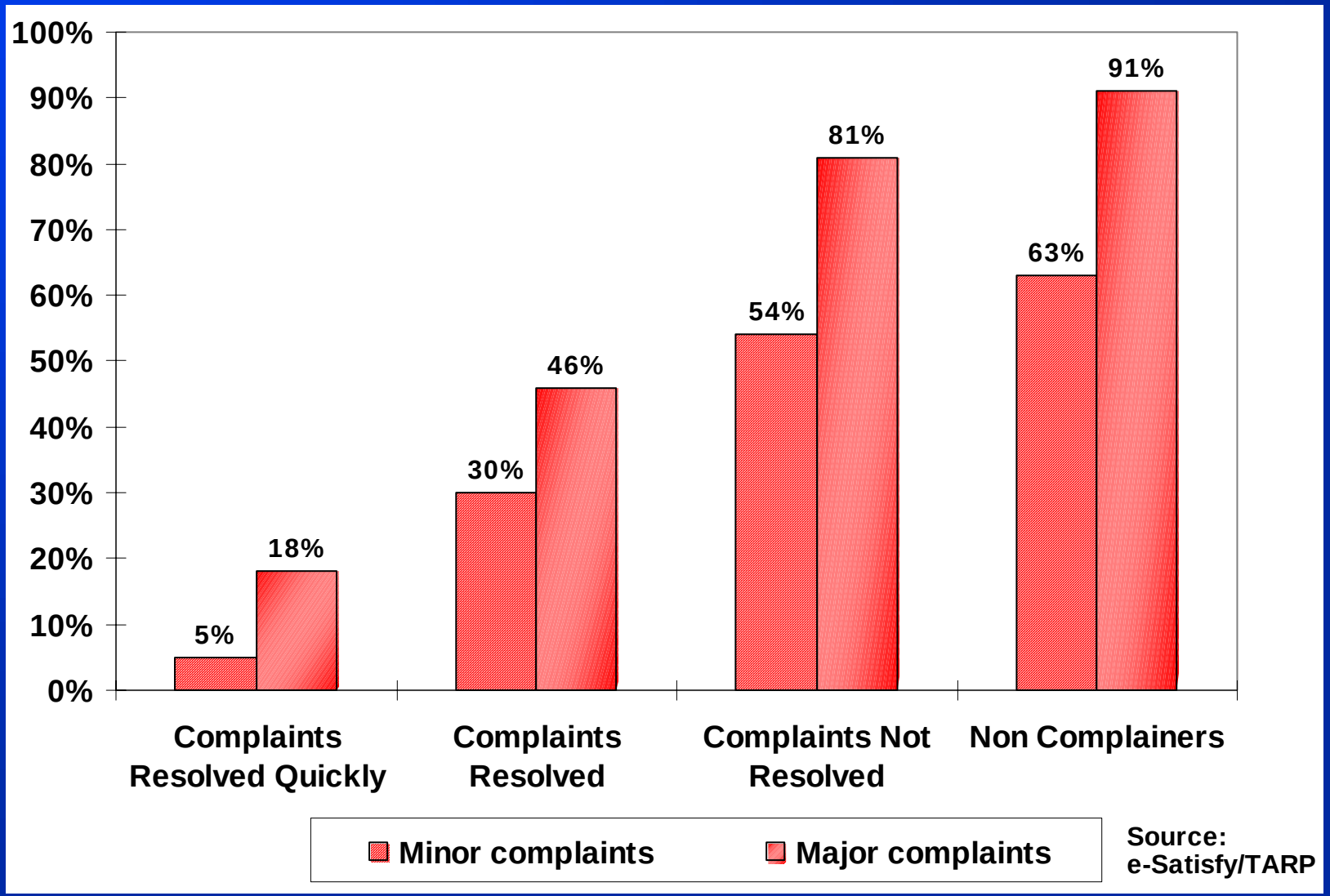
TQdM® METHODOLOGY
PROCESS P3:
Measure Nonquality Information Costs and Value



NON-QUALITY DATA COST COMPONENTS

- Time
  - Business personnel
  - I / S personnel
- Money
  - Direct payments and credits
  - Fines
  - Future revenue lost / missed
- Materials
  - Raw materials consumed
  - Products scrapped
  - Supply / support materials consumed
- Facilities and Equipment
  - Space requirements
  - Equipment
- Computing resources
  - CPU cycles
  - Network / communication
  - Data storage

HOW MANY OF YOUR CUSTOMERS WITH A COMPLAINT WILL *NOT* BUY FROM YOU AGAIN?



- Only 4% of customers with a complaint will tell you
- People with complaints will tell 8-10 other people

L. English, *Improving Data Warehouse and Business Information Quality*, p. 234.

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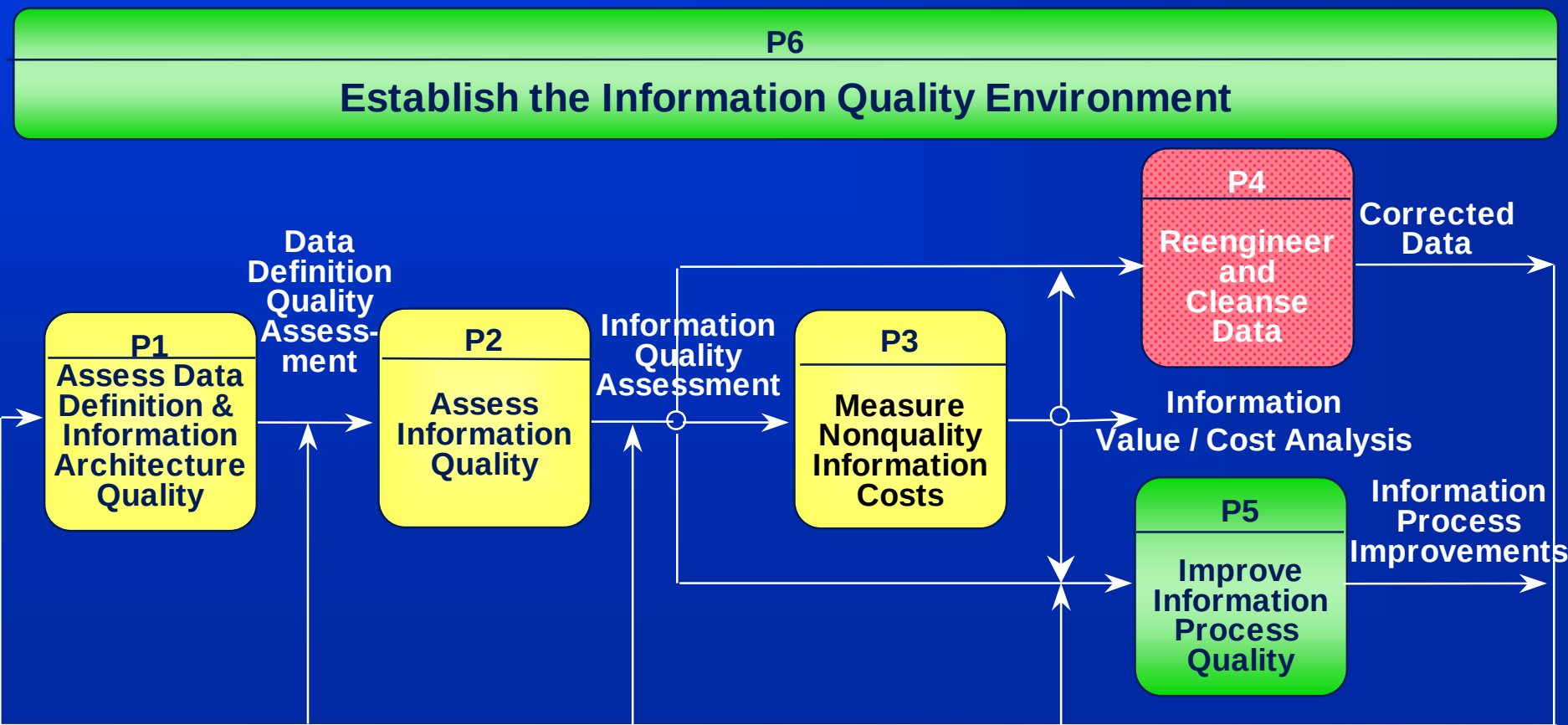


TQdM® METHODOLOGY PROCESS P5: Improve Information Process Quality

L. English, *Improving Data Warehouse and Business Information Quality*, p. 290.

S1.4, 5, 6
S2.3, 8
S3.6
S4.6

S5.1 Select Process for Information Quality Improvement

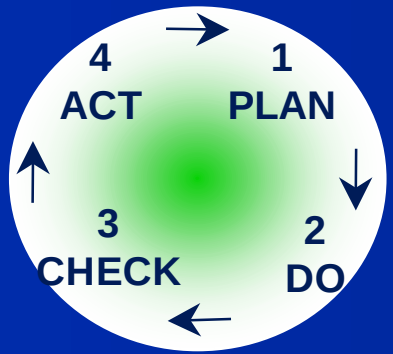
S5.2 Develop *Plan* for Information Quality Improvement

S5.3 *Do* Implement Quality Improve-ments

S5.4 *Check* Impact of Information Quality Improvements

S5.5 *Act* to Standardize Information Quality Improvements

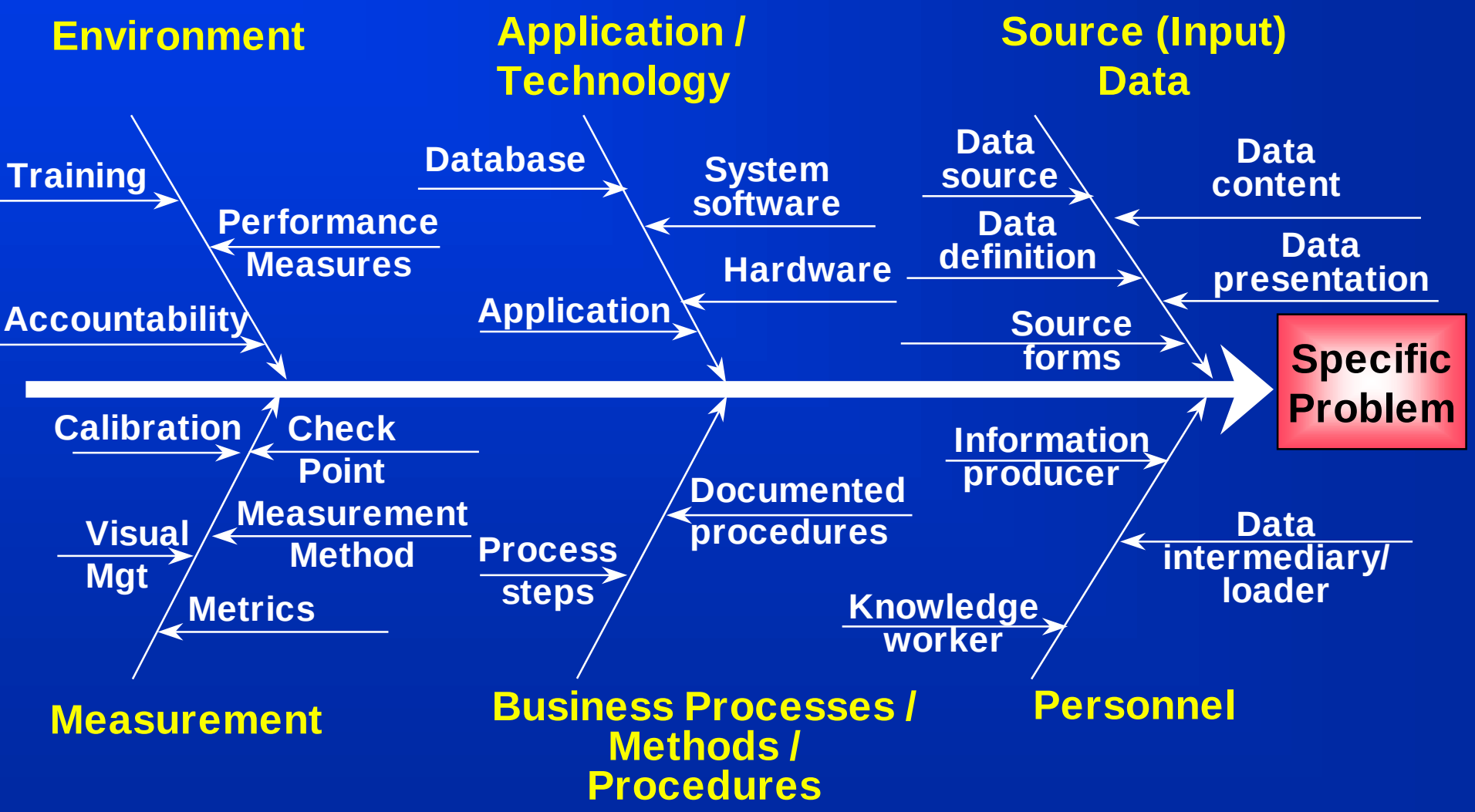
Plan-Do-Check-Act (PDCA)



Shewhart Cycle

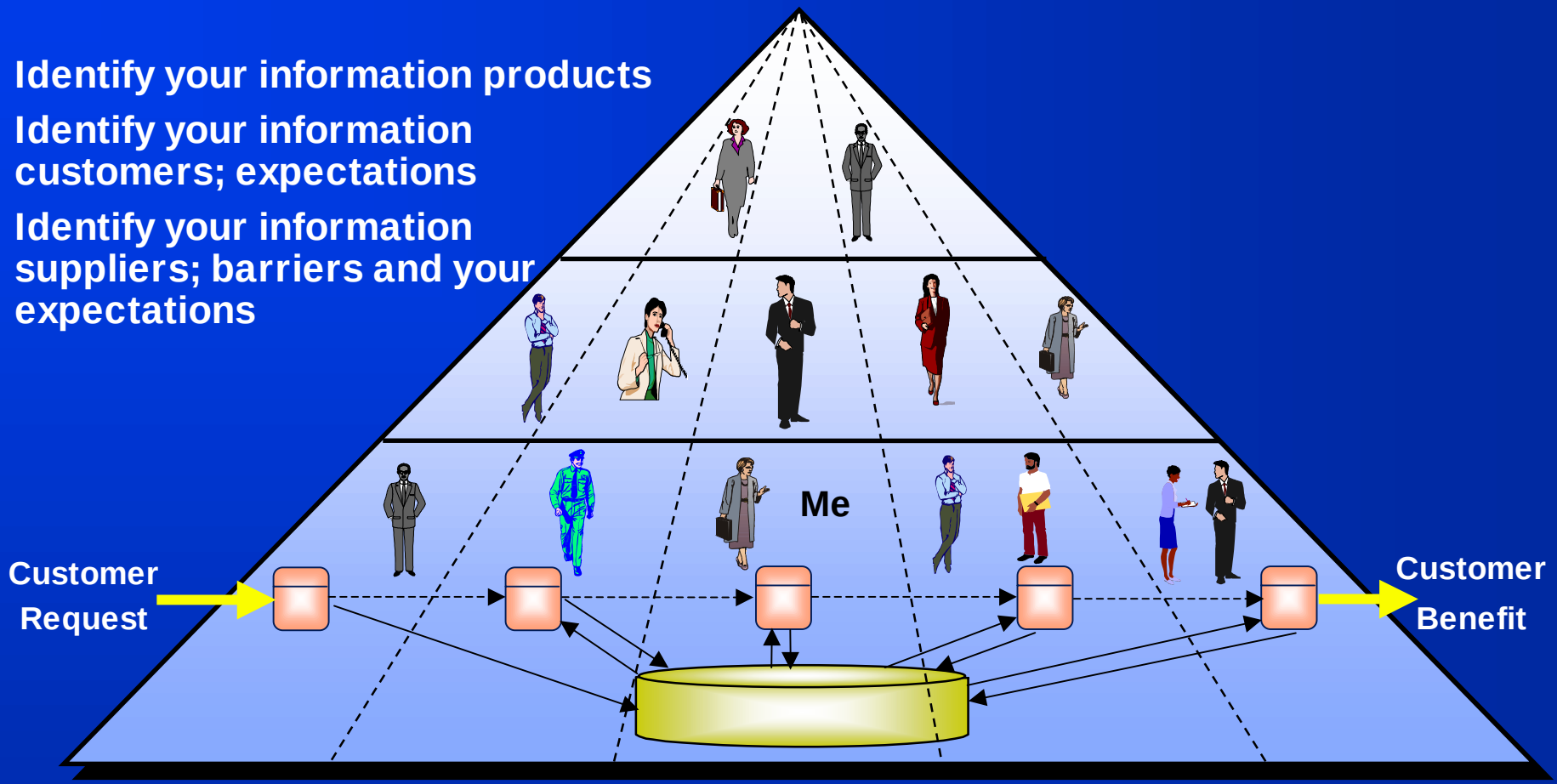
Information Quality Improvements

CAUSE-AND-EFFECT DIAGRAM
For Information Quality
(Business Process Quality)



INFORMATION CUSTOMERS AND INFORMATION SUPPLIERS

1. Identify your information products
2. Identify your information customers; expectations
3. Identify your information suppliers; barriers and your expectations



3. My Information Suppliers	1. My Information Products	2. My Information Customers
_____	_____	_____
_____	_____	_____
_____	_____	_____

14 Points of TOTAL QUALITY data MANAGEMENT (1-4)

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 data* 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 into data design and data production processes and establish management accountability
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 as the authoritative source

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

14 Points of TOTAL QUALITY data MANAGEMENT (5-9)

5. Improve constantly and forever the process of application and data development and service and data production and maintenance: Implement a plan-do-check-act process for information quality improvement
6. Institute training on information quality for all employees, especially information producers
7. Institute leadership for information quality: appoint a full-time information quality leader; management must enable workers to improve processes
8. Drive out fear of data uncertainty or data correction: Implement incentive programs for finding / and correcting problem causes
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

14 Points of TOTAL QUALITY data MANAGEMENT (10-14)

10. Eliminate slogans and exhortations, and replace with actions for information quality improvement: develop a habit of data "defect prevention"
11. Eliminate quotas of "productivity" with quality metrics: Customer satisfaction of information products
12. Remove barriers to pride of workmanship; allow information producers to fix the problems in the processes
13. Encourage education and self-improvement for all people in the information value chain: 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

EPILOGUE

"Quality is free. It's not a gift, but it is free. What costs money are the unquality things–all the actions that involve not doing jobs right the first time.

"Quality is not only free, it is an honest-to-everything profit maker. Every penny you don't spend on doing things wrong, over, or instead becomes half a penny right on the bottom line. If you concentrate on making quality certain you can probably increase your profit by an amount equal to 5 to 10 percent of your sales. That is a lot of money for free."

Philip B. Crosby, *Quality Is Free*

To re-iterate:

"QUALITY IS FREE. IT'S NOT A GIFT…"

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

Larry English

www.information-quality.com

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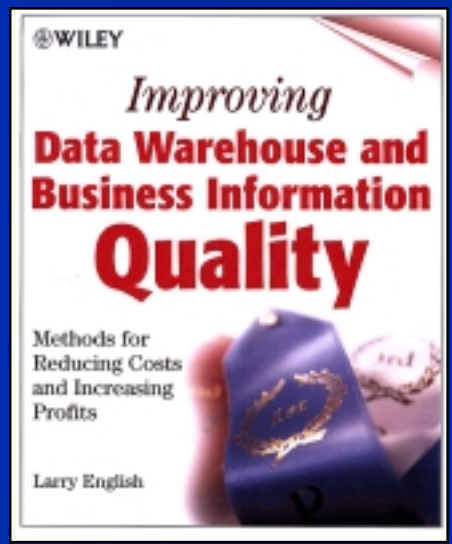

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