Product and Service "Information and Data Quality" FRAMEWORK

Nailing Jello

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USEPA 27th Annual National Conference on Managing Environmental Quality Systems
Seattle, Washington
April 22-24, 2008

American Society for Quality ENERGY AND ENVIRONMENTAL DIVISION ASQ

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Jeffrey Worthington- BIO

- **Director of Quality for the USEPA Office of Environmental Information**. Jeff served as the Director of Quality USEPA ORD National Risk Management Research Laboratory (NRMRL) and as the Director of Quality Assurance for TechLaw, Inc. He is an American Society for Quality (ASQ) Certified Quality Manager and ASQ Certified Quality Auditor. Jeff is a Fellow of the ASQ, a founding member of the Government Division, Past-Chair of the ASQ Energy & Environment Division, and a member of the ASQ Division Affairs Council. He is a founding member and past Director of the International Association for Information and Data Quality (IAIDQ). Jeff served as Editorial Board member for Quality Assurance, Science, and the Law, the Journal of Environmental Forensics, Environmental Laboratory magazine, and Environmental Testing and Analysis magazine.
- He has been with the Federal Government since 1994. Jeff co-led a team authoring the combined quality and management system for EPA's Environmental Technology Verification (ETV) program. He co-led the EPA team developing EPA's Information Quality Guidelines. Jeff co-authored peer review journal papers receiving 1)the USEPA Science and Technological Achievement Award (STAA), Level III for equating EPA policies and procedures to U.S. Supreme Court Sound Science Criteria (2002) and 2)an STAA Honorable Mention for developing electronic recordkeeping QA parameters (2006).
- Jeff received a National Security Telecommunications and Information Systems Security (NSTISSI) 4011 Certificate for information systems security (INFOSEC) professionals at the National Defense University (NDU) Information Resources Management College (IRMC) and is currently studying Chief Information Officer curriculum at IRMC.
- Jeff served as a Peace Corps Volunteer in Kpandu, Ghana from 1977-1979.

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ABSTRACT

Many disciplines establish a central "body of knowledge" (BOK) that serves as a reference point for concepts, theories, processes, facts, and other agreed to aspects of that discipline. An information and data quality BOK would rest firmly on a BOK for the quality discipline. The quality BOK includes elements such as quality planning, quality assessment, continuous improvement, quality control processes, reliability, maintainability, statistics, inspection processes, etc. At this time, there is no firm information and data quality BOK. In lieu of the needed BOK, professionals working with information and data quality can rely on a basic Information and Data Quality Framework. The purpose of the framework is to provide a roadmap to considering how to plan, implement, and assess processes that develop information and data products and services. This presentation considers key elements of an information and data quality framework including:

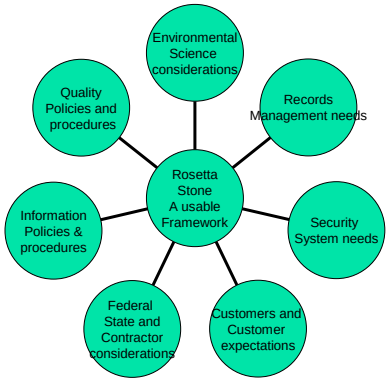
- Identification of information and data products and services
- Identification of information and data features, definition, and measures
- Organizing information and data features into logical management groups
- Recognizing information states and mapping those information states to features and supporting information processes
- Relating governance processes (i.e., quality and information policies) to the organization's information and data quality

The framework provided is enough to form a basic structure for an entire information and data quality BOK and helps knowledge workers to answer some key questions:

- What are information or data products and services?
- What is "quality" for information and data?
- How do I adjust my planning and documentation process to adequately capture information and data product quality?

Can jello be nailed to a wall?

Aligning all the factors that contribute to information and data quality can be like.....



Nailing Jello to The wall

OVERVIEW

- Background
- Why an information and data quality framework?
- Revisiting quality basics
- Quality Models for information and data quality
- Categories of products and services
- Features mapping for products and services
- Governance considerations
- Key questions for managers and next steps
- Conclusion

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Background

EPA's Quality Model has been changing....

- Proposed new quality policy for EPA
  - Before: quality for environmental measurements and environmental technology
  - After: quality for all products and services
- 2002 EPA Information Quality Guidelines
  - IQ includes objectivity, utility, & integrity
- "Information type" products recognized, not only data and data quality
- OEI needs to have its own framework to plan to meet evolving quality needs

Why an information and data quality framework?

We need a model to frame:

- **Our discussions**
- **Our planning**
- **Our communications**
- **Our successes**

Seek simplicity, then distrust it.
Alfred North Whitehead

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Revisiting quality basics 1

- Quality Management Systems are Management Systems about the Quality of the *products*

- *Products* = goods and services.....

It is convenient to think of it in terms of:

- Products
- Services
- Processes

Why are quality features important?

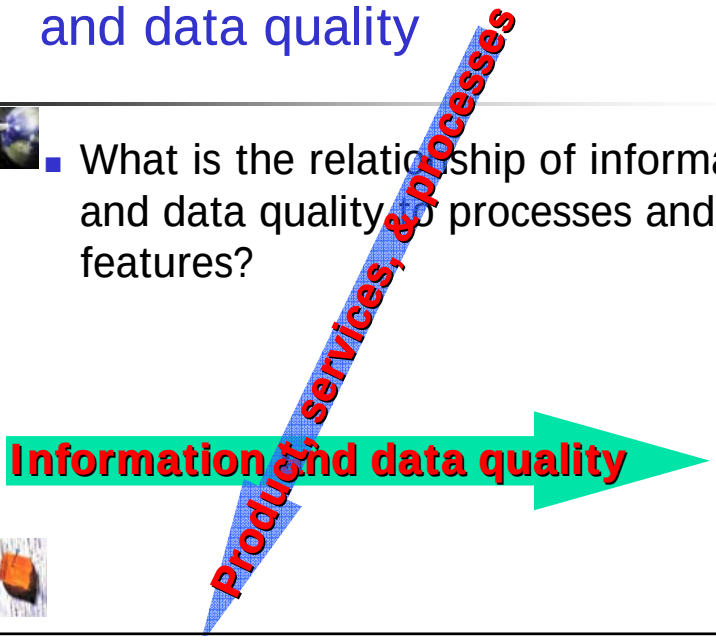
You need to be able to say what you mean by "quality." You can't manage something if you cannot describe what it is.

Revisiting quality basics 2

- Quality can be expressed as 4 components
  - Features – does the product have the features or characteristics that I desire?
  - Defects/errors or controls – do the features work all the time, are there are problems or mistakes?
  - Customer service – are the people easy to deal with? Am I comfortable when contacting them?
  - Efficiency and effectiveness – can I afford to make the product or buy the product? Do I know there is value for the purchase or manufacture?

Quality Models for information and data quality

- What is the relationship of information and data quality to processes and features?



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Review - Quality Models for information and data quality

- Model 1 – overview of associated processes
- Model 2 – Information Quality Cube
- Model 3 – Quality in Depth

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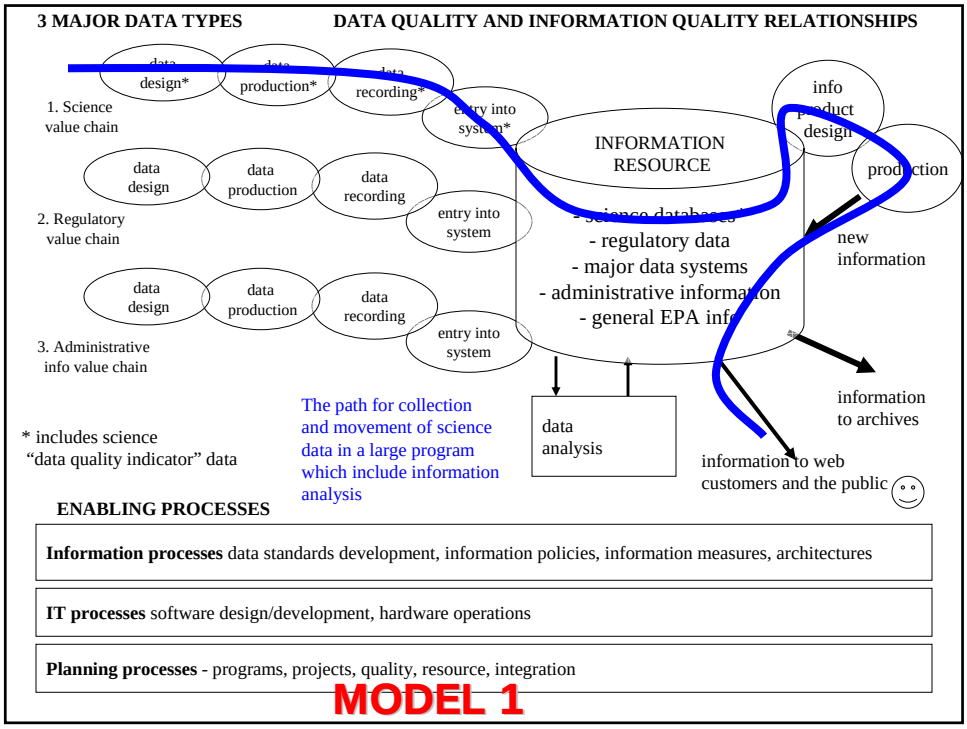

McCumber Model "the cube"

SIDE ONE - Critical Information Characteristics

- Confidentiality
- Integrity
- Availability
- (non-repudiation)
- (authentication)

SIDE TWO -Information States

- Transmission
- Storage
- Processing

SIDE THREE - Security Measures – the "safeguards"

- Education, training, and awareness
- Policies and practices
- Technology

MODEL 2

Benefits of the McCumber Cube Model

3 choices X 3 sides =

27 listings of security measures – “safeguards”

MODEL 2

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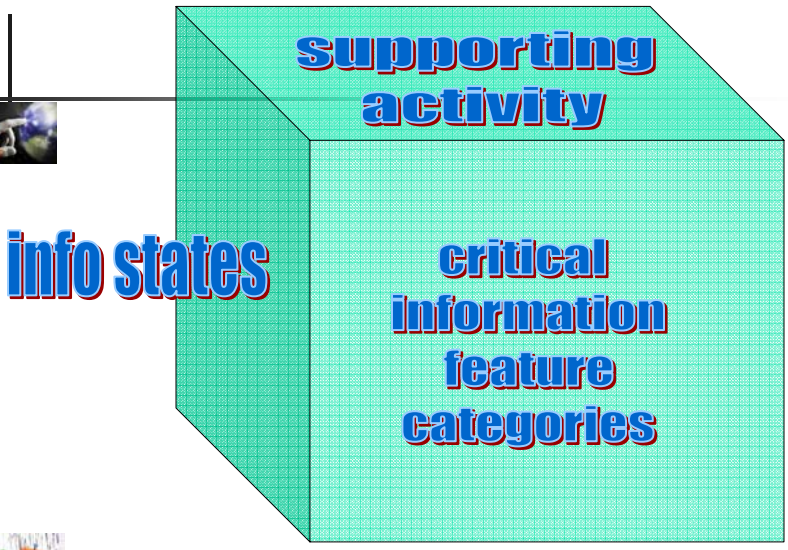
Information Quality Cube



MODEL 2

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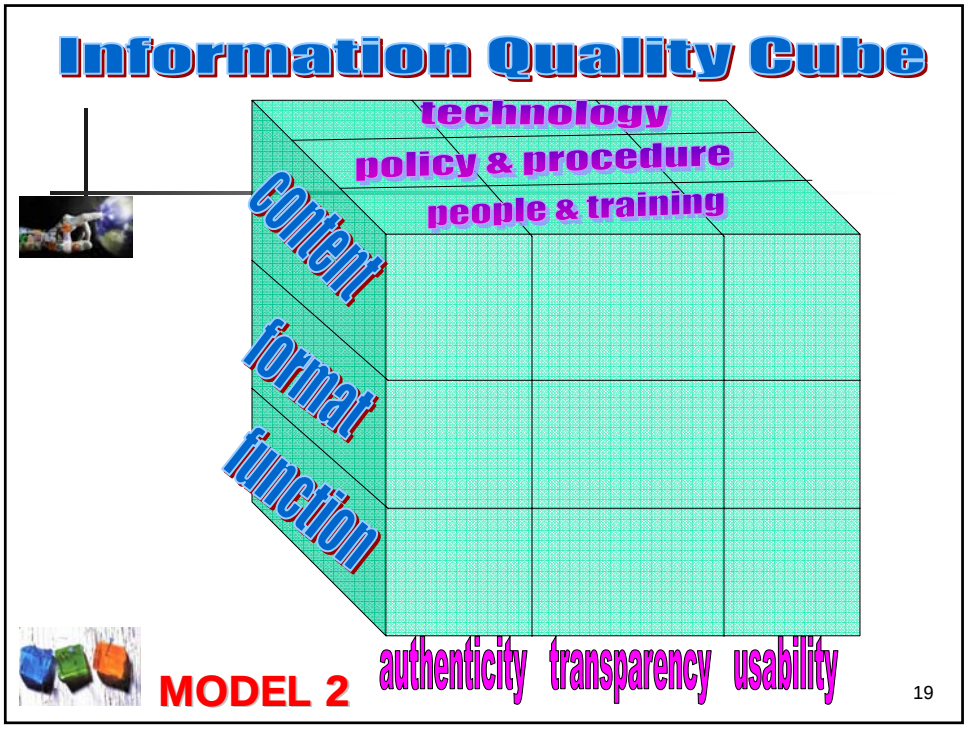
Information Quality Cube
technology
policy & procedure
people & training
content
format
function
authenticity
transparency
usability
MODEL 2
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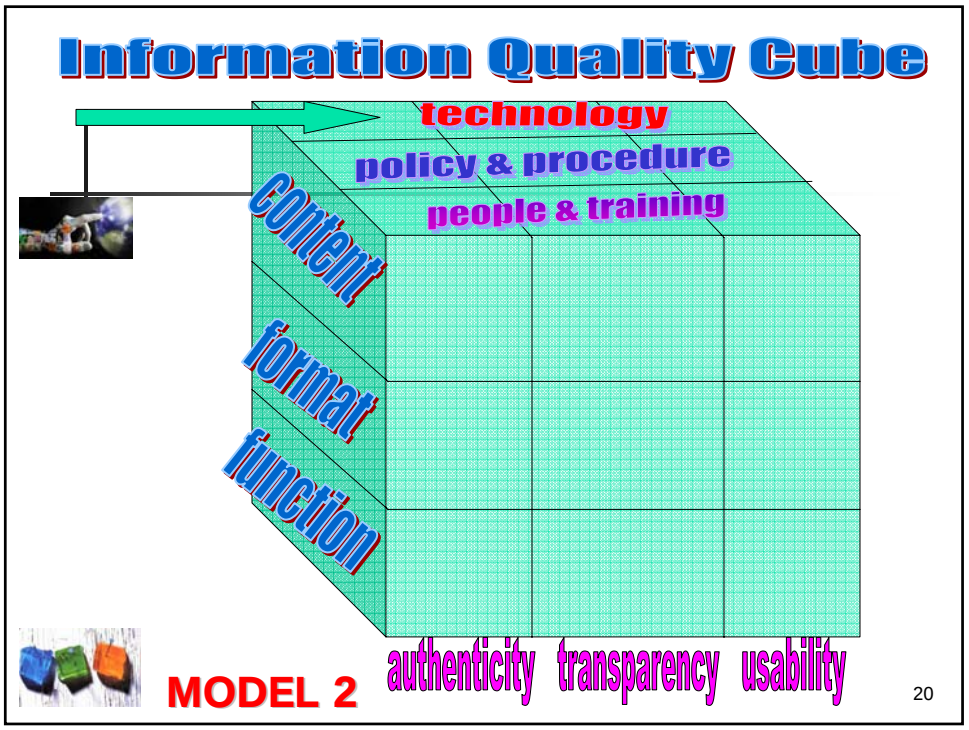
Information Quality Cube
technology
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transparency
usability
MODEL 2
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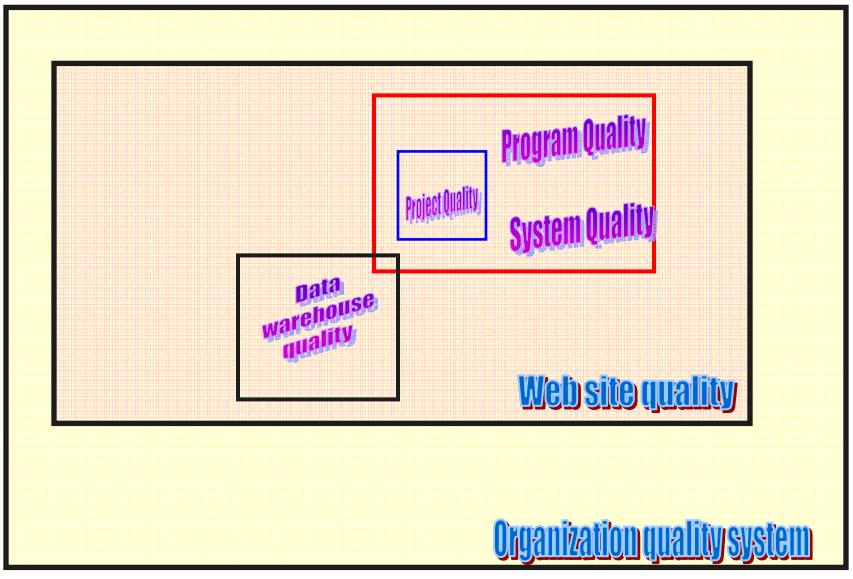
Original analysis: mapping features and terms: TECHNOLOGY

	authentic	transparent	Usability
Content	Accurate Representative Correct Comparable	Recorded methods Recorded work	Complete Current Timely Correct Integrity
Format	Representative of content	Reproducible/repeatable understandable	Informative Correct Clear Concise Presentable Accessible understandable
Function	Well-designed Reliable Integrity IT security	Ease of use Recorded methods Recorded work Documented IT security	Serviceable Accessible Informative Maintainable Available Reliable Confidential integrity

MODEL 2

Quality in Depth



MODEL 3

Is it always about information and data? NO

- What are the products?
- What are the services?
- What are the processes?

Information and data quality considerations must be looked at relative to the actual products and services.

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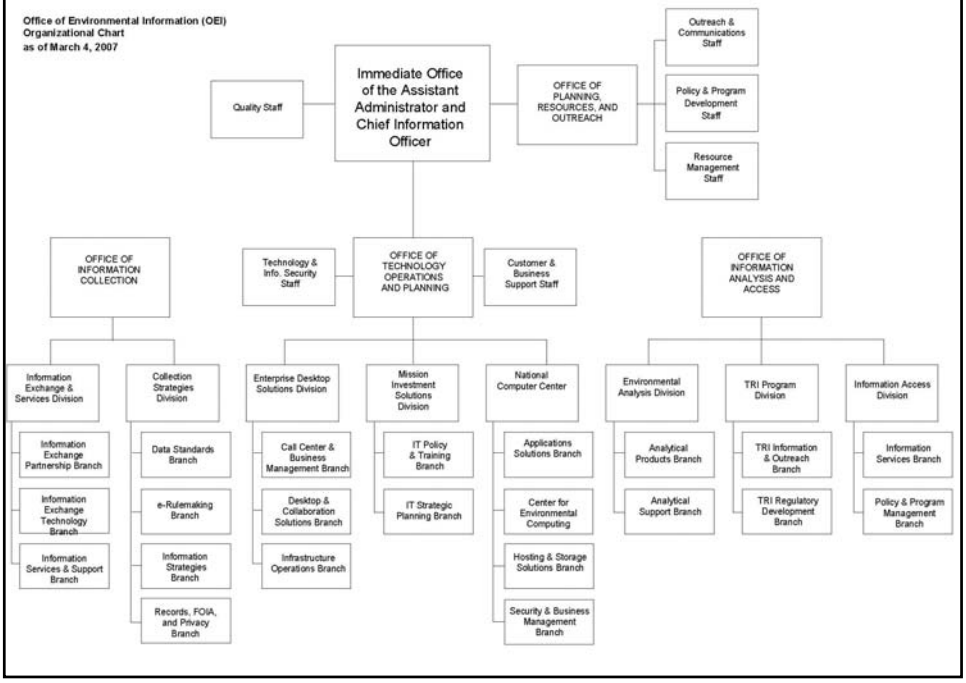
Product/Services/Process Framework

Info and Data Quality Framework

Quality Staff Product & Service Categories FY07/08 QAARWP instructions

- Reports
  - Progress, performance, characterization reports
  - Fact sheets
- Data and Information Systems
  - Environmental
  - Administrative
- Guidance
  - Programmatic
  - State/local
- Assessments
  - Risk assessments
  - Scientific assessments
  - Remedial investigations & feasibility studies
- Research
  - Scientific
  - Economic
- Environmental technology
  - Planning
  - Development
- Information management and technology
  - Planning
  - Development
- Grants
  - State/local/tribes
  - othe



Example OEI Products and Services 1

- Working Capital Fund examples
  - Data storage
  - Customer support
  - Telecommunications
  - Subscription services
  - Remote access
  - Security
  - Email
  - Teleconferencing
  - System development

Example OEI Products and Services 2

- Agency quality system
- Agency administrative processes
- Information policy development
- Software development
- Information collection
- Agency portal
- Interactive web products
- Information Analysis
- Grants program
- Web management

Possible categories - products

- Hardware
  - Purchase
  - Installation
  - Configuration
  - Reliability
  - Maintainability
- Software
  - Purchase
  - Plan, Design, Test, Maintain, Operate
  - Reliability
  - Maintainability

Possible categories - products

- Information system
  - Plan, Design, Test, Maintain
  - Accessibility and availability
- Database/data warehouse
  - Format consistent with data architecture
  - Stewardship
  - Governance and data standards

Possible categories - products

- Web
  - Overall web maintenance
  - Web page design
- Reports
  - Readability & Clarity
  - Quality Review
  - Peer and product review

Possible categories - products

DIMENSIONS OF SERVICE QUALITY Parasuraman 09.13.02

- Access
- Communications
- Competence
- Credibility
- Reliability
- Responsiveness
- Security
- Tangibles
- Understanding/knowing the customers
- Customer service

Possible categories - products

E-service Quality – Service via the internet

Parasuraman 01.11.04

- Access
- Ease of navigation
- Efficiency
- Customization/personalization
- Security/privacy
- Responsiveness
- Assurance/trust
- Knowledge
- Site aesthetics
- Reliability
- Flexibility

Governance considerations

Products and services and the processes to produce products and services may need to comply with:

- Administrative requirements
  - FMFIA
  - GPRA
  - Peer review
  - Products review
- CIO “administrative” policy requirements
  - Records management
  - Privacy policy
  - 508 accessibility
- CIO “technical” policy requirements
  - Data standards
  - Configuaration requirements
- CIO information system policy requirements
  - System Development Lifecycle

Proposed approach – Mapping products and services to quality areas Filling in the blanks

PRODUCTS	Basic quality areas				
	Features	Controls for defects	Customer service	Efficiency effectiveness	CIO policy conformity
WCF services					
Hardware					
Software					
Info systems					
Databases					
Web site					
Reports					

Key questions for managers and next steps

- What are my products and services?
- What are my quality expectations for the products and services?
- Do I know the quality of the products and services?
- How do I modify my quality planning to accommodate all products and services?
- What policies and procedures do I need to incorporate into my quality planning?

Conclusion

- Frameworks will be useful for planning, implementing, and assessing quality
- Frameworks should tie product and service types to possible features and associated measures

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