

Information Stewardship: Accountability for Information Quality

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“Who then is the faithful and wise steward, whom his master will put in charge of his household.”

—Bible, Luke 12:42

Background

Implementing automated edit and validation routines in application programs cannot guarantee information accuracy. Implementing business rules or edit and validation routines can prevent gross errors such as creating a date of “February 29, 2003,” or the fact that someone has 97 children when they really have 3. But implementing business rules can only guarantee “*validity*” that the data values are from the valid value set or conform to the tested business rules.

Accuracy of information can only be created and assured by people. Real time data captured by software, such as call data captured by the switches or medical information captured by medical devices such as EKG machines must have the business rule and program specifications and tests verified for accurate performance by subject matter experts and assured by the process owners.

Information stewardship is an essential element in an information quality environment. Kaizen, or continuous process improvement, means everyone in the organization takes responsibility for the process to continually improve *everything* in the business.

In this chapter we describe what information stewardship is and why it is required for information quality.¹ We then identify and describe business and information systems roles in their accountability for their respective roles in information development, production, and use. We conclude with a description of the kinds of support resources required for empowering and sustaining information stewardship.

Guideline

Information Quality and Accountability

Every manager, employee and contractor in an organization has accountability for their role or roles in information. Information is just as much a product as the tangible products produced or services delivered by the organization. Every person, whether business or systems, performs one or more of the information stewardship roles described in this white paper.

Information producers will create information only to the quality level for which they are trained, measured, and held accountable. Managers will only provide resources and training to information producers if they themselves are held accountable for the quality of information produced by the processes they oversee. Real and sustainable information quality improvement can only be achieved by implementing *management* accountability for information like accountability for other business products and resources. If managers have no accountability for information quality, there is no incentive for removing barriers that prevent information producers from creating correct, complete, and timely information.

Without information stewardship, it is virtually impossible to foster trust in sharable databases. Organizations routinely discover operational data that satisfactorily supports departmental processes but is woefully inadequate for cross-functional information or data warehousing needs.

Quality for any business product, including information, requires:

- Identifying all customer groups who represent the market for the product
- Understanding customer requirements and expectations
- Designing processes that produce products that meet customer expectations
- Training in how to produce products that meet customer expectations
- Developing performance measures and incentives that motivate personnel to produce quality
- Measuring quality to assure process effectiveness
- Defining a process for process improvement
- Empowering all employees to improve their work processes
- Holding management accountable for work product quality

Information is a business product in the same way as manufactured products and delivered services; therefore, information quality requires the same ingredients. Information quality *improvement* requires changes in training, performance measures, and accountability. That's the formula for information stewardship.

What Is Information Stewardship?

Peter Block defines stewardship as “the willingness to be accountable for the well-being of the larger organization by operating in service of, rather than in control of those around us.”² People are good “stewards” when they perform their work in a way that benefits their internal and external “customers” (the larger organization), not just themselves or their department. Valuable workers understand how others depend on their work products, and *work to provide customer service*.

Information stewardship is “the willingness to be accountable for a set of business information for the well-being of the larger organization by operating in service, rather than in control of those around us.”

Stewardship is not ownership. An owner possesses the rights to something. The historical use of the term *steward* refers to one who has accountability for managing something that belongs to someone else. Shareholders who own the tangible assets of the corporation also *own* the information assets. *All* employees, then, are stewards of the information assets.

The term *data ownership* is problematic. True ownership of information, like other assets, belongs to the shareholders of the enterprise or to the stakeholders of public entities. Laws governing information may actually specify that certain personal information is the property of the individuals themselves. Other registered information, such as trademarks and copyrighted information, is the property of the trademark or copyright holder. The enterprise itself is a steward of its information resources. Neither information producers, nor process “owners,” nor departments “own” the information they may create. Rather, they are stewards of that information for other stakeholders who depend on it.

The objectives of information stewards are reflected in Table 1.

Table 1 Information Stewardship Objectives

Intermediate Objectives	Ultimate Objectives: In Order to:
Business accountability for information quality	Improve the value and quality of information, and decrease the costs of poor quality information
Clear and robust business definition of business data	<i>Increase business communication, understanding and productivity</i> through data as a common business language
Data conflict resolution mechanism	<i>Maximize data value</i> through quality shared data with common definition, and <i>minimize data costs</i> through eliminated non-shared or redundant databases, interfaces, and applications
Improve business and information systems partnership	Improve internal team effectiveness and end-customer satisfaction

Information Stewardship Roles

Seven major business roles and nine major information systems roles comprise information stewardship. Everyone in the organization has a stewardship responsibility for their role in defining, building data models and databases, and creating, updating or using information.

The following discussion will use the term “steward” for various roles of information accountability. This does not imply a “title” or a required “label” for personnel. Many organizations do use the term “steward” in the role name, using instead terms such as “trustee,” “custodian” or “pilot” instead.

The term data “owner,” however, is problematic in that it implies “possessiveness” that can exacerbate the vertical, departmental view that “this is *my* data.” This problem of private, proprietary databases is one of the very problems information stewardship seeks to solve. Data must be defined, built and created as a shared enterprise resource

Business Stewardship Roles

The business roles are listed in Table 2 with a brief statement of information accountabilities. The roles are described afterwards. Most people will play more than one role. For example, an information producer who creates some information will also be a knowledge worker who uses other information to do so.

Table 2 Business Information Stewardship Roles and Accountabilities

Business Role	Stewardship Role	Accountability
Knowledge worker	Knowledge steward	Accountable for my work outcomes. Also accountable for use of information, including upholding any policies or regulations governing its use.
Information producer	Operational information steward	Accountable for the quality of information I produce. The producer creates or updates actual information content.
Data transcriptionist	Data transcription steward;	Accountable for transcription (from a paper form to a vis-à-vis electronic record) Not accountable for content, but for completeness and accuracy of transcription
Data translator	Data translation steward	Accountable for the interpretation or translation of data from one form, such as engineering specs or medical records (e.g., X-rays, EKG readings) to an electronic digitized form. Accountable for correct interpretation.
Process (production) owner or manager	Managerial information steward	(1) Accountable for the integrity of the processes performed under their charge and for the quality of information produced to meet all needs. (2) Accountable for the proper use and protection of information in their charge
Process (definition) owner	Process steward	Accountable for the integrity of the definition of a business process or business value chain.
Executive business manager	Strategic information steward	Accountable for establishing information policy and performance measures for resource management.
Business subject matter expert	Business information steward	“Accountable” for assuring the correctness, completeness and clarity of data definition, including specification of valid values and business rules specifications.

Knowledge Workers and Knowledge Stewardship

Knowledge workers who use information to perform work are information “consumers”—they apply information to do their jobs. They are knowledge stewards, accountable for their work outcomes. This accountability is the most generally understood and applied. People are accountable for their work outcomes, regardless of whether they use information as input or not.

However, knowledge workers are also accountable for *how* they use information, including upholding all internal policies that specify protection and use of the information as well as any external regulations and laws that govern the information and its use. For example, “insider trading” in the form of buying or selling shares of stock on the basis of proprietary or confidential information not available to the general investor is illegal in the United States and other countries.

Knowledge workers are supported by business information stewards who must understand all information customer groups and their information requirements in order to assure clear, accurate definitions of the information. Operational information stewards support knowledge workers by providing complete, accurate, and timely information to meet their needs.

Information Producers and Operational Information Stewardship

Information producers, whose work processes create or update data, are information “suppliers.” They create or capture knowledge or information content, whether electronically into a database, on paper, in a report, or for a Web page. Information producers are operational information stewards, accountable for the completeness, accuracy, and timeliness of information products to meet both *intradepartmental and interdepartmental* knowledge workers’ needs. Knowledge workers depend on information producers to become good stewards when they create data that benefits their internal and external information customers.

Information producers may create information or they may update information to keep it current and correct. If I am responsible for keeping product prices current, I am the producer of product price information.

Information producers are supported by business information stewards who assure clear and accurate data definition and business rules. Information producers need to know who their own information customers are, what processes use the information they create and what are the costs of poor quality? They need feedback from them to know how well they are meeting their information customers’ needs.

Data Scribes or Enterers and Information Transcription Stewardship

Data “scribes” are those who take information in one format, as in data on a completed order form or medical history form, and transcribe the information into another format, such as into a database. Data intermediaries are like translators who translate speech or written text from one language to another. The result should have the same meaning in the translated speech or text. Intermediaries do not produce content; they translate content from one form to another, without losing information or introducing error. As such, data scribes are accountable for accuracy, completeness, and timeliness of the transcribed information.

Much of the time, data intermediary work does not add value. It only adds the cost and time of an additional step in the value chain. However, there are times when the cost is economical relative to the value of the information produced. Consider the following: A consulting company “automated” the project time reporting process to eliminate paper. Time data was entered electronically by each consultant, rather than on paper forms submitted to a clerk. What used to take the consultants from 30 seconds to a couple of minutes each week, took from 5 to 10 minutes per *day*, or about one-half to one hour per week, to enter into the new “state-of-the-art” client-server system.

Data scribes can add value, however, when they become experts in the subject matter. They provide value when they identify and correct errors in the original information, or complete missing data and enter it faster than the originating information producer, *and* when they provide feedback to the originating information producers who eliminate future errors. By helping to eliminate future errors, they add value to an otherwise cost-adding activity.

Scribes depend on the information producers for their input, and the business information stewards for the definition of the data. They should also know all knowledge workers who depend on their work and what processes use it. In this way, they can have a sense of value knowing how their information is used.

Managers and Managerial Information Stewardship

Process (production) owners and business managers are managerial information stewards accountable for integrity of the performed process. They have ultimate accountability for the quality of their processes’ information products. This accountability includes information quality to meet the downstream knowledge workers’ needs, not just their own department or business area.

Managerial information stewards are accountable for:

- Quality of information produced by their processes or in their business area to meet their downstream information customers' quality requirements
- Implementing information policy and assuring compliance
- Providing resources and training to information producers and scribes to assure quality standards are met
- Developing plans consistent with information sharing to maximize reuse value of information and minimize information costs

The mechanics of operational and managerial information stewardship are easy—there is historical precedence for it. Accountability, or stewardship, is a fundamental principle of resource management. I must take care of resources in my charge to assure they are maintained, protected, and used wisely. Industrial Age organizations have written accountability for financial and people resources into managers' job descriptions and hold them accountable.

Information Age organizations write information accountability into managers' job description and hold managers and information producers accountable for their information products. Why? Processes in one business area depend on information created in other business areas. Managerial and operational information stewardship is *not* optional. Every business manager is accountable for assuring that information created or updated within his or her processes is accurate and complete to satisfy all knowledge workers. Cominco Ltd., a mining company has accountability for information not only written into its manager's and miner's job descriptions, but also written into the collective agreement with its contract miners.³ Figure 1 is a sample manager job description that contains a statement of information accountability.⁴ Without information stewardship, no enterprise can successfully reengineer cross-functional processes or effectively achieve sharable databases and integrated applications.

MANAGEMENT ACCOUNTABILITY

Position Description: <u>Manager / Supervisor,</u>
Position Purpose / Summary: <p style="text-align: center;">Overall responsibility for all activities of the department including financial, safety, security, education and training . . .</p>
Responsible to / authority relationship: <u>Director,</u>
Responsibilities / Accountabilities: <ol style="list-style-type: none"> 1. Responsible for management and control of fiscal resources. Develop budgets and manage expenses within approved guidelines. 2. Responsible for personnel management of the department. Provide employee development. Uphold policies, schedule, oversee salary administration of staff, resolve staff problems. 3. Responsible for management, control and use of information. Maintain quality of information created or maintained within the process or department to meet our information consumers' needs, both within and outside our business areas. Ensure information policy is understood and followed. Provide training of personnel in information quality principles and standards and provide resources to accomplish information quality goals.
Education: . . .
Experience: . . .
Skills / Abilities: . . .

See *Improving Data Warehouse & Business Information Quality*, pg. 407

Figure 1: Information-Age Manager Job Description with Information Accountability

Process (Definition) Owners and Process Stewardship

Process (definition) owners are senior managers who have accountability for the definition of key business processes or business value chains that may span multiple business units or functional areas. They are not accountable for performing the processes. Line management is responsible for performing all or some of the activities of the processes. These line managers are the ones responsible for the quality of both information and tangible products produced. The process definition owners are responsible for defining the process specification to insure process integrity and consistency, where required, among all line managers who oversee the units that perform the processes.

Business Subject Matter Experts and Business Information Stewardship

Consider the following entity type definition: “Customer is ‘a person who has a record in the Customer table.’” Or consider the following attribute domain value set: “gender-code domain: ‘1 = male; 2 = female; 3 = initials; 4 = unrecognizable; 5 = ambiguous.’” Both of these definitions are incredible, incredulous, and fail miserably at the first data definition quality test—does the data represent a real world object, event, or fact the enterprise should know? How will the business respond if its data mining tool discovers a trend that “small widgets” tend to be the predominate choice of the “ambiguous” customers, and recommends a marketing campaign to that segment? These definitions did not come from the Dark Ages “data processing” shops in backward organizations. These definitions actually came from respected businesses that have “mature” and relatively large information resource management functions.

The problem with the gender-code “valid value” stems from the fact that the attribute is used for two purposes. On the one hand, gender-code here is used to mean the sex of a person. The second—and inappropriate—use of the attribute is to indicate why a gender-code value cannot be “assigned” to a person based on first-name value. That reason is because the name is “initials” only, “unrecognizable,” not able to be associated with one sex over the other, “ambiguous,” or a name that is characteristic of either a woman or a man. This violates the principle that one fact should mean only one thing. This discussion of gender does not seek to oversimplify the realities of sex transformation or sexual orientation. Some organizations, in fact, must know these attributes. These attributes are separate attributes, if these characteristics should be known by the enterprise. The problem of unknown gender is solved by using a single domain value of “unknown.”

What is the problem here? The problem is that both of these definitions were defined from a technical or functional perspective. Business subject experts were not responsible for these definitions. Both definitions came from well-intentioned information systems personnel who were looking at the data through “data processing” eyes.

What is the solution? Involve business subject matter experts as stewards of the definition of business data. Here’s why and how.

“Operational” and “managerial” information stewardship is business accountability for information (content) quality. Data *definition* quality or business “accountability” for assuring the accuracy of data definition is business information stewardship. There are also two levels of accountability for data definition quality: “strategic” and “business” information stewardship. Every executive manager in the enterprise is a “strategic information steward” accountable for enterprise resources and business performance. Business information stewards are subject matter experts *appointed* because of their knowledge of a given set of data and for their ability to see the impact of that data across the enterprise.

If data is a strategic enterprise resource, then the enterprise *must* apply the same principles of resource management as it applies to other strategic resources, such as human and financial resources. One of these principles is clear, accurate, and agreed-upon and consensus definition. Job positions are accurately defined so that anyone in the organization knows what is expected of one holding a given job position. General ledger account codes are accurately defined so that anyone working with a budget or financial report knows exactly what kinds of revenue or expenses are included in a specific account code.

Product specifications and bill-of-materials are precisely defined in order to control the product manufacturing processes. So must information be clearly and precisely defined to assure effective communication across the enterprise.

Without clear, accurate, and common data definition, knowledge workers can only “assume” the meaning of the data they use. Information producers, who create the data, will not know the right values to create.

Business information stewards either define or validate data definition, domain values, and business rules for a discrete and specific set of entity types or subtypes and attributes. Their role is to assure that data definition meets the needs not just of their own business area, but also for all other business personnel who require that data to perform their business processes. Business information stewards generally establish the information quality standard for the data in their information group. They may also participate in the actual information quality assessments. They work with the data resource management group to assure the quality of data definition and to approve any definition changes to production databases.

Business information steward “accountabilities” include one or more of the following:

- Definition of, or review and approval of data definition, domain value specification, and business rule specification for a set of business data to meet all information customers’ needs
- Resolution of data definition among the stakeholders of that information
- Establishment of information quality standards
- Resolve information conflicts
- Establishment of data access security classification when security is truly required. Most information should be open for *read* purposes to all employees. Only data that requires training for understanding its meaning or legal responsibilities and confidentiality should be restricted.
- Access approval to classified data
- Identification and documentation of regulatory or legal restrictions, including retention, governing the data. This may involve the legal counsel as steward or co-steward
- Championing the use of the “official” set of enterprise data
- May establish information quality standards for the data to represent the quality requirements of all knowledge workers dependent on the data
- May work with information quality team for the assessment, reporting and improvement of information quality
- Champion process improvement

It is important to note that the term **accountability** for data **definition** is very much a voluntary responsibility in business personnel. Actual **accountability** for the information resource rests with the Information Resource Manager who is responsible for defining the processes by which the enterprise specifies, defines, models and implements the information resources. Any business information stewardship program must seek ways to minimize the time element of persons who take on this role. Guidelines for success include:

- Keep the size of the stewardship information groups small, (20 to 80 entity types & attributes)
- Focus first on only the high-priority data, that data with a high degree of data sharing and where errors have high costs.
- Use facilitated data definition workshops to define data initially.
- Rotate business information stewards from time to time.

- Provide training, documentation, and other resources to minimize steward time.

In global or multidivisional enterprises, one single steward may not be able to validate data definition requirements for data common to many countries or business units. In multidivisional enterprises, one information group may have several local business stewards, each of whom represents one or more countries or business units, with one business information steward serving as a coordinating team leader for that information group.

Characteristics of effective business information stewards:

- Predominant stakeholder and customer of the information group. Business information stewards who will be assuring definition quality should be a major customer of the data.
- Knowledgeable in business subject.
- Authority to resolve business issues concerning the information. This comes from both their standing in the enterprise and the appointment from senior management.
- Decision-making ability. They must weigh differing viewpoints and come to a win-win decision when necessary.
- Credibility with peers. They have the respect of others.
- Understands enterprise as a whole and importance of data across business value chains. They have the ability to see the big picture and how the data in their charge impacts the whole of the enterprise.
- Awareness of the impact of shared data on other knowledge workers. Stewardship means the willingness to be accountable for the larger organization. They look out for the needs of others, not just their own functional area.
- Diplomat with people skills. They can create a win-win among people with differing viewpoints.
- Visionary. They solve tomorrow's problems. They care about what information may not be known today but is required to be known for tomorrow's success and effectiveness in the global economy.

Executive Management and Strategic Information Stewardship

The executive or senior management team members who are responsible for the performance of the enterprise are in fact, strategic information stewards. They establish information policy, like other policy, to guide all employees in their accountabilities and in proper handling and safeguarding of the enterprises second most important resource next to its people resources. Executive management establishes performance measures related to information quality and management and use of information to accomplish the enterprise mission and goals. Executive management sponsors the culture change required to transform an organization's treating data as merely a *byproduct* of business processes to treating information as a primary and strategic product—and business resource—of business processes. Each senior manager has accountability for one or more key business processes that tend to be associated with one or more key business information subjects, such as customer information (Marketing and Sales), product information (Production or Operations), financial information (Finance), or human resource information (Human Resources). Each executive manager will be naturally associated with one or more major information subjects, and therefore becomes the strategic information steward of that subject.

Each strategic information steward appoints or gives authority to selected business information stewards to be accountable for specific subsets of information. This authority provides the business information steward the authority to bring resolution to data name, definition, and business rule issues. Senior management becomes the ultimate point of resolving conflict related to the data definition and business

rules, should the business information steward not be able to achieve consensus for critical shared or potentially sharable data.

Information Systems Stewardship Roles

Business personnel alone are not the only ones who have accountability for the information resources. Information systems personnel have accountability for the role in the resource.

Table 3 Information Systems Stewardship Roles and Accountabilities

Systems Role	Stewardship Role	Accountability
Chief Information Officer	Strategic information and systems steward	Accountable for information strategy and for integrity of information technology, sharable database, and integrated application implementation and for the effectiveness of information systems to transform how business processes are performed and how enterprise knowledge is managed.
Information resource manager or data administrator	Information architecture steward	Accountable for the “structural” quality of information models. Accountable for effective data standards, defining processes for managing the information resources as strategic business assets and repository for data definition. They facilitate data definition.
Repository or data dictionary manager	Information resource data steward	Accountable for maintaining an accurate current inventory of information resource data (meta data).
Database manager	Database steward	Accountable for the “structural” integrity of physical databases & redundant data consistency. Not accountable for content, but for fidelity to information architecture, physical security, recoverability, & performance of <i>sharable</i> databases to meet multiple needs.
Systems analyst/ or project leader	Application requirements steward	Accountable for the integrity of application requirements specification and design as a component in a business process or business value chain and to meet knowledge workers’ and information producers’ expectations.
Application developer	Application steward	Accountable for application (information acquisition and presentation) integrity to implement specifications and meet knowledge workers’ and information producers’ expectations.
Information technology manager	Information technology steward	Accountable for information technology architecture and infrastructure integrity.
Strategic information manager	Strategic information architecture (data warehouse) steward	Accountable for the “structural” quality of the data warehouse information model and database design. Accountable for facilitating data definition to support strategic and tactical business processes.
Virtual information manager	Virtual information architecture (internet/intranet) steward	Accountable for the “structural” quality of the Internet and intranet information model and database design. Not accountable for content, but for facilitating information content that is integrated with existing data and to meet external and internal information customer knowledge expectations.
Data Security Officer	Physical data security steward	Accountable for assuring integrity of access to enterprise information resources.

Systems Role	Stewardship Role	Accountability
Computer operations mgr	Data operations steward	Accountable for the operational integrity of computer operations to support the business processes.
Information quality manager	Information process improvement steward	Accountable for defining processes for assessing data definition and information architecture quality, information quality, and for process improvement and cultural transformation to a value system and habit of information quality improvement.

Information Stewardship Teams

The “structure” of information stewardship is informal and ad hoc to accomplish the objectives, but not to become another layer of bureaucracy. There are two key stewardship teams: the business information stewardship team and the executive information steering team. The relationships of these teams can be seen in Figure 2. The steering team either appoints business information stewards or gives authority to the selected stewards to carry out the responsibilities they have. This authority includes making the time available from the stewards’ schedules to provide the business validation for data definition. The responsibilities of the teams are described later in the article.

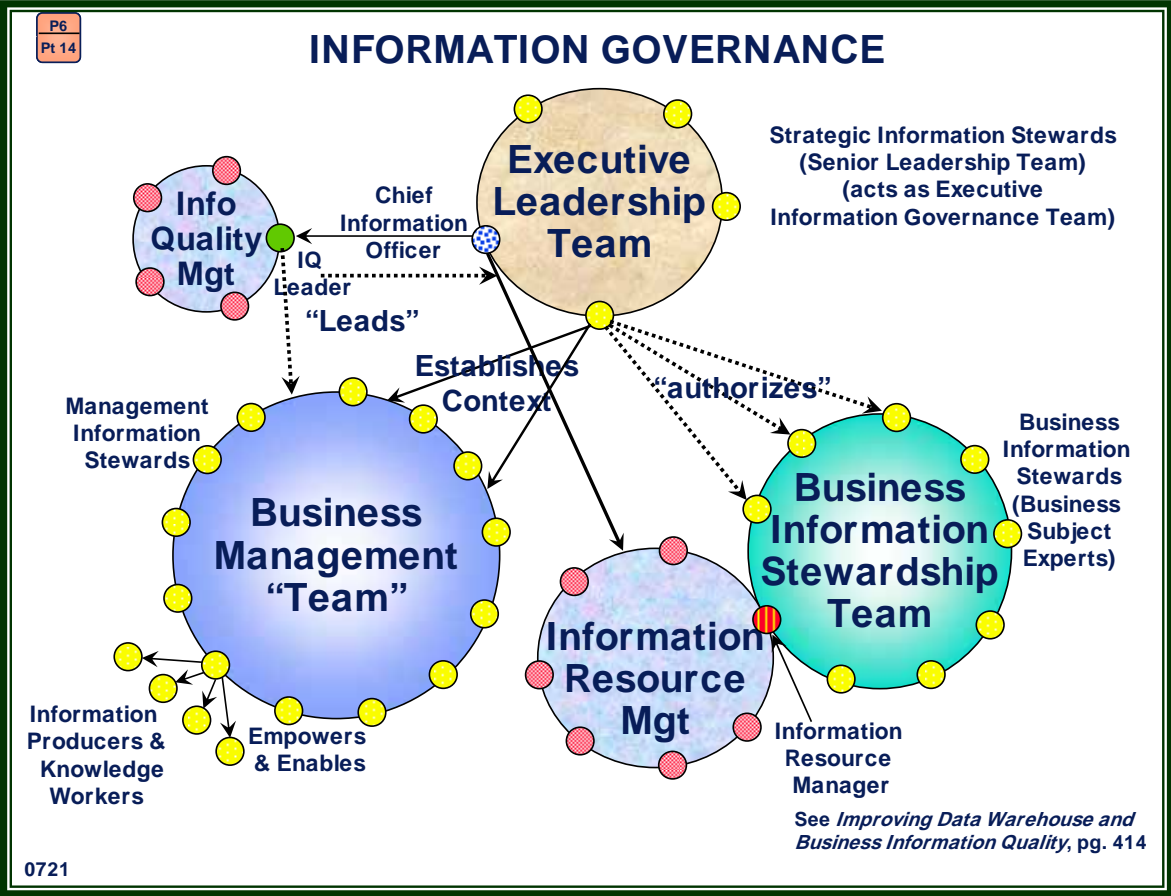


Figure 2: Information stewardship team relationships

Figure 3 is a variation of Figure 2 and is a model for large or global enterprises. Where there are multiple divisions and it is not feasible for a single business expert to be able to represent all stakeholders of the information, there may be multiple business information stewards for a single information group, such as common Product information. A local information stewardship team is made up of two or more subject matter experts for a single information group, each steward representing a geographic or business unit or division stake in the data.

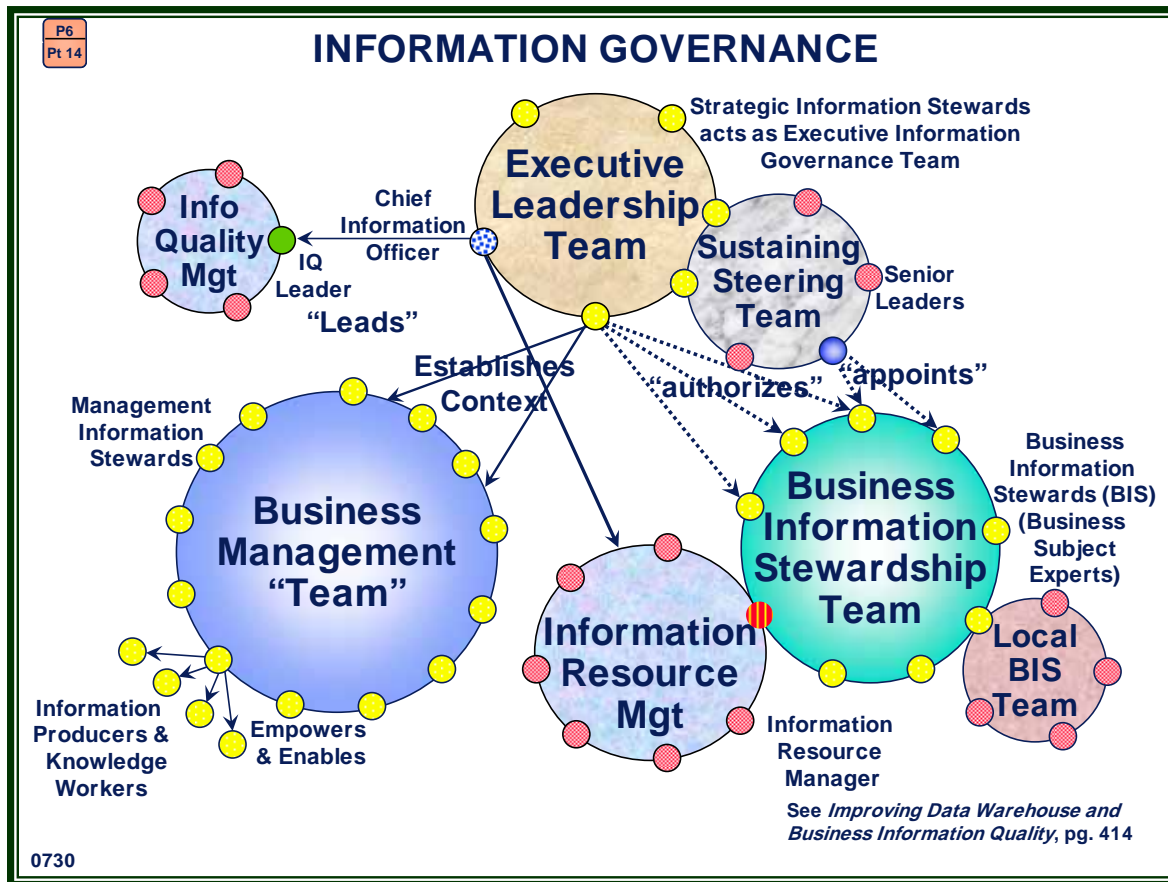


Figure 3: Strategic information team relationships in a multidivisional or global environment

Business Information Stewardship Team

This team or council consists of all or a subset of the business information stewards. This team generally is chaired or facilitated by the data resource manager. Typical responsibilities of this team include:

- Resolve information-related issues across information groups or issues that cannot be resolved by a business information steward or local stewardship team.
- Provide support and knowledge transfer among business information stewards.
- Provide or recommend education for stewards at all levels.
- Identify or recommend information policies.
- Identify, recommend, or approve data standards.

Executive Information Steering Team

This team or governance council is made up of the senior management team, and may be facilitated by the Chief Information Officer or other executive. Some large organizations may have an information steering team appointed by and accountable to executive management for the steering committee role.

As a steering team, responsibilities include:

- Establishing enterprise vision, mission, values, and strategies for the enterprise, including those that address information as a strategic business resource
- Being accountable to the information stakeholders, such as customers, shareholders, employees, communities, and external regulatory entities
- Establishing and issuing information policy, like financial and human resource policies
- Resolving major information-related issues that cannot be resolved by the business information stewardship team
- Establishing performance measures for information
- Effecting culture change for information accountability and information quality as a management tool

Data Definition Team

The most effective way to establish common and consensus data definition is to conduct facilitated data definition sessions involving representatives of all business areas that have a stake in a business subject or common collection of information. Business subjects are information groups centered around the business resources, such as human resources, financial resources, customer resources, product and material resources, and so forth. The business information stewards for the respective information groups would participate in these sessions.

Some organizations have not utilized data modeling workshop sessions effectively. Critical success factors that are often overlooked include:

Defined and authoritative business charter for the team and workshop outcomes. The team must be empowered to reach a consensus definition for the enterprise. Executive management must sanction the workshops and communicate that at the opening of the data modeling workshop.

Clear objectives and scope. The team must have a clear scope of the information subject being modeled.

Involvement of the right business personnel. They must be knowledgeable in the subject, and the collection of participants must represent both the breadth and depth of the enterprise. *Breadth* means all information views or stakeholders are represented, including knowledge worker and information producer. *Depth* means both high-level or strategic and tactical information views as well as operational information views are represented.

Strong facilitator. The facilitator must be results oriented and time driven. The goal is the essence of the definitions without unnecessary wordsmithing or laboring over the “perfect” definition. This can be accomplished later by the business information steward, if necessary. They must have diplomatic people skills as well as technical modeling skills.

Clear guidelines for name and definition. Having guidelines for data definition minimizes the tedium and increases consistency.

Rapid data definition and model support. The team must be able to rapidly capture electronically the information created and turn it around quickly for immediate feedback.

An effective process for data definition conflict and issue resolution. Figure 4 illustrates an appeals process and the relationship of these ad hoc data modeling teams to the information stewardship teams. Simply having an appeal process empowers the team to achieve consensus. Organizations using such “appeal” mechanisms have rarely had to take issues up-line. Only truly significant issues affecting business policy tend to be taken to the executive steering team.

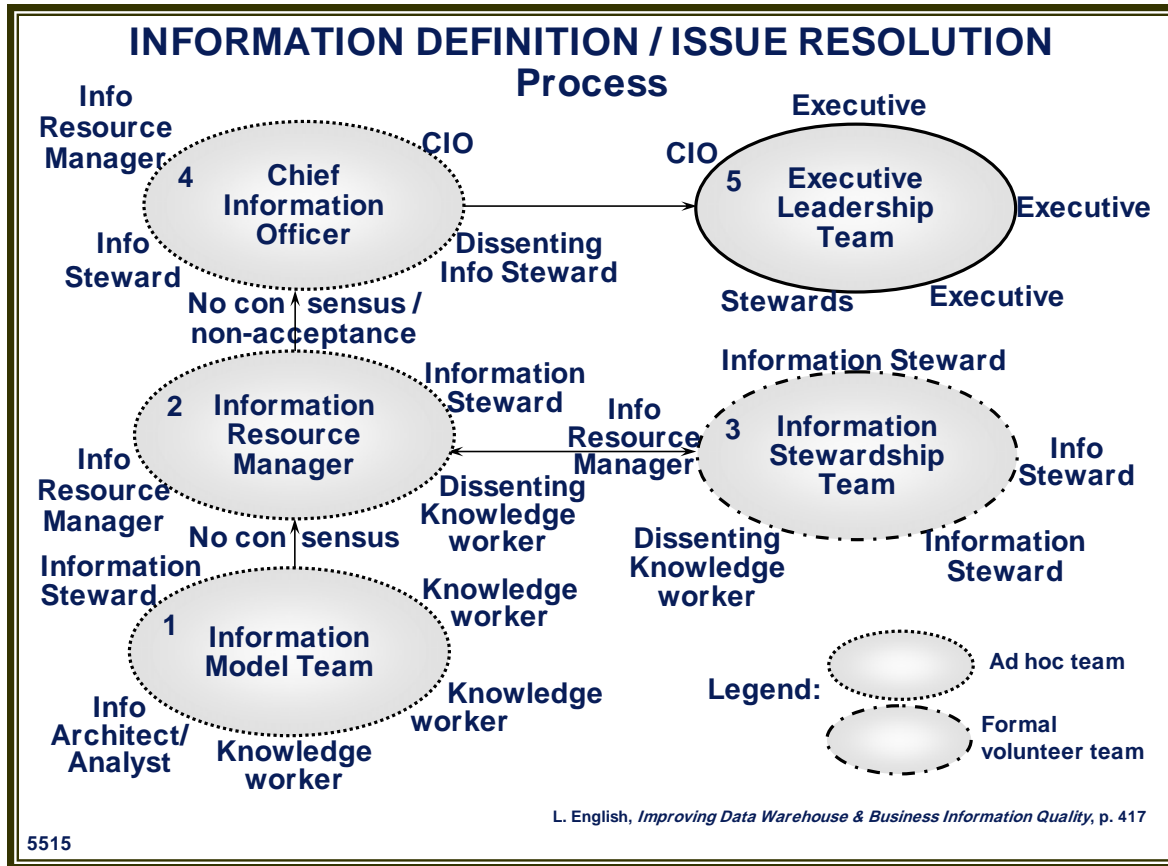


Figure 4: Data definition conflict resolution process

Data model teams create the initial data definition. They provide the basic definition of data. This minimizes the time requirements for the business information stewards.

Support Tools for Information Stewards

Information stewardship does not just happen. Training and support tools are required for effective guidance and for sustaining a “volunteer” group in an environment of competing demands. Support tools include:

Information policy. Information policy provides the enterprise view of the importance of information and the organizational behaviors expected of all.

Training. Focused training for all information stakeholders is found in Table 4.

Information stewardship guidelines. This is often handled in the form of an information stewardship handbook or manual. This is best maintained online in an intranet document or other sharable resource. This resource should contain illustrated guidelines for all tasks that stewards will perform. Topics should include an introduction to the definition and purpose of stewardship, role and responsibility descriptions, support resources available, guidelines for data definition, information quality standard setting, data access classifications, and other tasks.

Table 4 Education and Training for Information Quality

<i>Audience</i>	<i>Training Topics</i>	<i>Duration</i>
All new employees	<ul style="list-style-type: none"> • General orientation on information policies, information management and quality principles, accountabilities 	2 hours
Information producers	<ul style="list-style-type: none"> • Information quality standards, guidelines, resources • Data definition, values, business rules • Information value chain and processes requiring the information produced • Knowledge worker expectations of information quality 	2-4 hours As required
Knowledge workers	<ul style="list-style-type: none"> • Information policy regarding use; responsibilities for update • Information value chain and processes producing information • Data definition, values, business rules 	2-4 hours As required
Business management and process owners	<ul style="list-style-type: none"> • Information policies, principles, accountabilities • Information techniques & resources to provide staff • Downstream knowledge worker expectations • Information value chain management, and • Creating the Information-Age Organization 	2 hours “awareness” 1 day + refresher
Executive leadership	<ul style="list-style-type: none"> • Information management principles, information policies, information as strategic enterprise resource • Information quality principles and roles • Information stewardship roles and accountabilities • Creating the Information Age organization (strategic view of information management) 	2 hours + updates Series of 2-hour modules
Business information stewards	<ul style="list-style-type: none"> • Information stewardship: roles/responsibilities, data definition guidelines, information quality principles • Information management principles • Information value chain and information stakeholders 	1 day + 2 hours
Information resource management staff	<ul style="list-style-type: none"> • Information resource management • Conceptual Data Modeling and Advanced Data Modeling • Information stewardship • Information quality improvement 	3 days 3 + 3 days 2 days 3 days
Application development staff	<ul style="list-style-type: none"> • Information management principles, roles, responsibilities • Data modeling and value-centric information systems engineering principles • Information quality process, application and presentation guidelines 	1 day 2-3 days 1/2 day

Audience	Training Topics	Duration
Data warehouse staff	<ul style="list-style-type: none"> • Information management principles • Conceptual Data Modeling and Advanced Data Modeling • Information quality improvement principles • Information quality assessment and data transformation and movement control principles 	1 day 1-2 days 1 day 2 days
Information quality staff	<ul style="list-style-type: none"> • Information management principles • Information stewardship • Information quality improvement 	1 day 2 days 3 days
Information systems management	<ul style="list-style-type: none"> • Creating the Information Age Organization • Value-centric information systems engineering • Information stewardship • Information quality principles 	1-2 days 2-3 days 1 day 1 day

Conclusion

All the edit routines in the world can be embedded in applications, but the resulting information quality can still be abysmal. Sustainable information quality requires stewardship of information; in other words, the willingness to be accountable for the information I produce that you need to meet your expectations. I am willing to do this because I know you and others are willing to be accountable for the information you produce that I need.

About the Author:

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¹ This paper has been adapted from Chapter 12, "Information Stewardship: Accountability for Information Quality," in Larry P. English, *Improving Data Warehouse and Business Information Quality*, New York: John Wiley & Sons, 1999.

² Peter Block, *Stewardship: Choosing Service over Self-Interest*, San Francisco: Berett-Koehler, 1993

³ English, *Improving Data Warehouse and Business Information Quality*, p. 309.

⁴ *Ibid.*, p. 407.