Chapter X

Everything That Can Communicate Will: Aspects of Digital Asset Alignment and Management

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ABSTRACT

The concept of aligning and managing digital assets is a reaction to the evolution of digital production and digital networks. The understanding of this evolution is rooted in experiences in library and museum communities, the digital solutions and design disciplines, the communications and entertainment industries, and law. Aligning and managing digital assets is predicated upon the notion that everything that can communicate will and, in a sense, begins to approach what neuroscience has been telling us for quite some time — that everything actually does communicate in some way or other. There are a number of levels of digital assets. Digital assets are created and maintained in support systems architecture, in digital production tools, in digital content development, in taxonomy development, in user destination designs, in audience

interactions, and in legal monitoring. Being digital means everything can be accounted for, everything can communicate, everything has value, and everything can last. Acquiring, merging, or divesting a digital enterprise requires comprehensive digital asset management at every level.

NO THERE THERE

Digital communication has become ephemeral content. There is no object, such as a bound book or celluloid film; rather, content exists as a digital asset to be accessed. The issues are how to make the digital assets accessible, how content can be widely distributed, and how the components that created the content can be reused. There are a number of misconceptions about digital asset production and distribution that should be acknowledged:

- Digital asset creation costs less than physical analog production. Digital asset creation can be more expensive than physical production depending upon what kind of strategic treatment the material is given.
- Digital asset creation is easier than that of older physical forms. Digital asset production is often not easier than traditional mediums because there are so many new options available in the digital realm.
- Digital asset production is as coherent as traditional forms. Digital is evolving as it is being understood, which makes it very difficult to know exactly what the best choices are at any given moment.

Traditional publishing practices have radically changed. Pricing-based units of information (books), libraries as distributors, intellectual property, royalties, marketing as the primary means of stimulating sales, and the shifts away from container-based infrastructures like the packaging of paper books have all altered the practices of publishing.

What have been required are strategies for going between object-based and content-based pricing. Transitional strategies include providing individual and institutional access to electronic materials, developing digitized content, digital access tools, and the consumer purchase of print as well as electronic forms. The development of digital accounting standards and digital intellectual property rights are paramount in digital asset management processes. In digital asset creation novelty becomes the required. The rapid demand for hyper-links, interactive graphics, full motion video, and sound on the Web are all evidence of novel ideas becoming standards.

Digital technology facilitates the creation and exchange of data, information, and knowledge across ever expanding networks. This condition raises

issues in digital asset liquidity, digital asset continuity, and digital viability for utilizing assets for prediction, risk analysis, and decision making,

What are the current technical requirements for digital alignment? What are the strategic forces shaping architecture asset management? What do digital assets actually represent? What may the economics of digital asset management become? How can an organization position itself to make maximum use of digital assets in the future?

WHAT IS DIGITAL ASSET ALIGNMENT?

Digital alignment is the seamless coordination of digital liquidity, digital continuity, and digital viability. Digital liquidity refers to the ways in which digital assets are created and used. Factors that influence the degree of liquidity are strategic plans for maximizing a return on the initial investment in digital production; anticipated types of screen destinations such as mobile, PC, broadband and/or print; plans for re-purposing various types of production; and interface design.

Digital continuity refers to how digital assets are stored and accessed. The longevity of digital materials is a topic of high interest. Digital technology produces fragments of projects in great quantity. Strategic planning for format conversion, migration, and usage frequency involves understanding and implementing evolving standards, metadata, storage formats, and search/access tools that involve sophisticated common vocabularies. Attention to digital continuity ensures the long-term use of assets.

Digital viability is concerned with how the use of assets is measured. Increasingly, the digital enterprise must justify budgetary expenditures for liquidity and continuity methods and practices. Tools for measuring return on investment, tools for modeling opportunities, and tools for risk analysis and decision making are beginning to be developed to track the viability of assets into the future.

Enterprises that manage digital liquidity, continuity, and viability create architectures of assets that must be aligned and integrated so that assets communicate on all three levels. Committing to digital solutions that seamlessly address these concerns is serious, core business practice. Solutions need to be considered for proactive management of digital assets that focus on reducing production costs and creating new revenue opportunities, as well as protecting content. Digital inventories are ever expanding. The growing usage of the Web, e-commerce, broadband, the proliferation of peripheral media devices, the consumer demand for streamlined access to exciting new forms of content, the

increasing deployment of streaming media, the necessity for legal protection of assets, and the quest for new revenue streams and improved workflow efficiency all require deep solution strategies.

The focus on efficiencies is especially relevant. Efficiencies maximize production budgets, prevent asset loss or redundant asset production, ensure asset availability for cross-platform distribution, provide security for valuable assets, support partner relationships, and provide platform specific access modes for internal or business to business (BtoB) operations. Successful digital alignment and management allows the realization of new revenue opportunities, protects asset rights, tracks asset usage, and allows for incremental asset utilization.

Currently, industry terminology for systems that manage digital liquidity, continuity, and viability are Digital Asset Management (DAM), Content Management Systems (CMS), and Digital Rights Management Systems (DRM).

Digital Asset Management systems digitize physical media assets into storage systems. These systems leverage metadata structures to support asset cataloging and rights licensing policies. Content Management Systems (CMS) support Digital Asset Management by providing intelligent access tools to asset storage and archival facilities. Content Management Systems also enable edit capabilities to support the pre- and post-production phases of content development. Digital Asset Management and Content Management Systems identify most valued assets based on liquidity, reusability, scalability, interoperability, and accessibility. They design asset cataloging and metatagging foundations, digitize and archive priority assets, create core licensing rules, and identify critical legacy system integration initiatives. *DAM/CMS* validate current core technologies, search features, processes, rules, manage risks of asset loss or redundancies, ensure asset availability for cross platform distribution, and ultimately optimize user experience.

Digital Rights Management (DRM) solutions help to solve legal and logistical business problems through asset security and rights protection. Digital Rights Management solutions control asset usage and enable the collection of usage fees. Digital Rights Management implements asset tracking, builds order management, enforces access, enables cross-markets with partners and enterprise divisions, and bills for asset usage. DRM encourages the exploration and implementation of various tools for securing assets, creates new business models around monetization and digital distribution of content, and enables licensing/syndicating content and/or interactive programs. It can facilitate wireless/e-games (subscription, pay-per-use) and the creation of custom applications for classroom learning, airlines, and entertainment venues. DRM

can facilitate ad-wrapped content, product placement, merchandising, allow for consumer data collection and targeted marketing, implement usage tracking systems, capture user profile information, and monitor and bill for usage.

REQUIRED INFORMATION SYSTEMS

Digital content is content that is understood at a human level and, simultaneously, understood and interpreted on the computer level. This is the distinguishing factor of digital asset production. Unlike a printed work, digital information simultaneously interacts with humans and with computer systems. With the advent of the World Wide Web, an electronic publication speaks to the world of humans as well as to the world of computer systems. The depth of asset creation is staggering. The communication alignment is absolutely essential.

The technologies that support "containerless content" are network systems. Networked digital technology used for production and distribution is a multi-layered system. There is a standard *seven-layer* (level) technical model[1] for networked digital technology that describes ways in which lower levels affect higher levels and ways in which higher levels do not (and cannot) know the details of lower levels.

The lower levels provide common functionality that can be used by different implementations of the higher levels. The standard levels are traditionally numbered from the bottom (1) to the top (7), the top being what the system user sees and interacts with. Levels 8 to 10 are here added to represent additional concerns, now apparent in digital asset creation and distribution. Everything starts with the physical (machines, wires, etc.), so that is why it is level 1.

Top

10. **Distribution:** Web, warehouse, navigation schemes, strategic design, graphic look and feel, audience mediation, content administration, and maintenance.
9. **Content and medium:** appropriate media**,** writing, editing, design, development, production, and marketing.
8. **Production application:** specific programming for publishing, metadata, and conversion from print to electronic.
7. **Application:** Layer where instructions or requests are received and executed at the operating system level.

6. **Presentation:** File Transfer Protocol program and Netscape browser window.
5. **Session:** Individual connection to network.
4. **Transport:** TCP (Transmission Control Protocol), which works over IP (Internet Protocol).
3. **Network:** Includes routing, IP network addresses, and everything else needed to make the Internet work no matter what specific network technologies are at the lower levels.
2. **Datalink:** Includes Ethernet protocol or PPP (Point to Point Protocol) over a T-1 line.
1. **Physical:** Machines, cables, wires, etc.

Bottom

Hardware engineers deal with level 1. Systems engineers commonly speak of working on a layer 2 or 3 problem. Communications engineers deal with levels 4 and 5. A user or an applications developer interacts with the top levels 7 through 10, which represent access (a login window, for instance) to the application (Netscape) and content (electronic book).

The digital production may use application- layer software to display or to interact (link) with other material. The electronic author can use application software to "write" material that is interactive.

The final material, however, has been shaped based on its content, not by arbitrary uses of the lower technology. The electronic author need not technically know how any of the underlying levels work, but he/she must be aware of the potentials and limitations of levels 7 through 10 in order to make judgments on how to treat content. Authored material is administrated into various schemes for navigation purposes and for visual impact at the distribution level.

The top three (8 to 10) levels must work in parallel. Content must be developed and seamlessly created for the specific medium in which it will be distributed. Content creators must work directly with applications developers and distribution designers. Users interact with content, pass communication back to content creators who interact with applications to apply feedback to improve infrastructure, and so on down the chain. Ultimately something may affect hardware as a final solution to a content reaction — a new scanner is needed because users do not like the quality of a digital image, for instance.

At every level a different form of digital asset is created and will require maintenance over time.

An electronic article comparing an impressionist painter to a post-impressionist painter might instruct a person to access related images by expressionist

painters. An interpreted applet (small, one-function application) would instruct a computer to pass data to a network server (which can be anywhere in the world) to access the file of images as can the reader of the article.

Digital assets are " architected" as well as authored. That is, the content is designed so that it communicates with the computer on whatever level necessary to make the content perform for the user. Adding a "link" to a text is now a common "information architecture" on the Internet that makes the computer layers perform in such a way as to connect the user to some other system, document, or program. At the same time, it transports the reader to other content separate from the document with which he/she is involved.

DIGITAL ASSET COMPLEXITY

It should become obvious that digital assets are created at every level of systems architecture. Until very recently, digital assets were mostly thought of as content or as electronic publication. In the most general sense, an electronic resource that requires "editorial review" is a digital "publication". Publications are assets, products that an organization puts forth as a representation of its commitment to a field or area of business endeavor. As long as editorial review is involved in the production of an information resource, that resource can be viewed as a publication asset of an organization.

Other electronic information assets may not require editorial review in that they are software developments that require code review. The search engine developed for the Getty's *Bibliography of the History of Art* (BHA), the *Getty Provenance Index*, and *Avery Index to Architectural Periodicals* CDs is an example of this type of software asset. Because all of these projects are capital publication projects (the CDs are sold), the search engine can be considered a capital asset because it is the necessary software that allows the databases to function as a searchable publication.

The search engine software is in a category of medium or long-term capital asset. This is essentially a subclass of fixed assets that are neither working capital nor fixed capital. These assets are not furniture, equipment, or publications. This class of asset is a form of intellectual property similar to a patent. Third-party costs for developing these kinds of assets can be amortized over fixed periods and may be tied to the economic life of a product such as a book, which may remain in print for five or 10 years. Other costs that may fall into this category of capital assets might include online versions of capital publications, whose longevity is tied to the longevity of the print version. A system could be

developed to track this process whereby electronic asset closeouts would parallel print publication closeouts.

ECONOMICS OF DIGITAL ASSETS

The price determinants of digital assets are the presentational demands of the material, production demands, the scope of services that the material may support, how long those services need to be maintained, the anticipated uses of the material, and the breadth of the targeted audience.

A long-range planning time frame of twelve to eighteen months is very important for digital asset production. It is the amount of time needed to synchronize pricing determinants with possible shifts in the market.

There are a variety of cost-recovery models for digital publications:

- CD-ROM/DVD products with proprietary interfaces and licenses for single computer/user rights
- CD-ROM/DVD products with proprietary interfaces and network licenses
- CD-ROM/DVD delivery of projects on local servers under domain or subnet restrictions
- Internet publications on FTP (File Transfer Protocol) sites
- Internet publications with Gopher interfaces
- Online projects with proprietary interfaces and time-base charges
- Online (non-Internet) projects with proprietary interfaces and multiple tier-based charges (shopping cart model: each abstract at x rate, each article at y rate, etc.)
- Internet projects with Web interfaces and multiple tier-based charges (shopping cart model: each abstract at x rate, each article at y rate, etc.)
- Internet projects with Web interfaces under password-restricted access and simultaneous-user restrictions
- Internet projects with Web interfaces under domain-access models price-based on full-time enrollment
- Internet projects with Web interfaces under domain-access models with site-license restrictions on usage of materials
- Internet projects with Web interfaces under domain-access models with usage unrestricted

Change may be very near in the form of "micropayments"[2]. Charges for digital information could start as low as two hundredths (0.02) of a cent. They

would be a very swift debit/credit transactions at very low transaction costs — a 10th of a cent and up, depending upon security, volume, and speed. And they would be done by automated systems. Micro-payments would be necessary in a "disintermediated" system — a system that is direct to the consumer via electronic delivery.

Prices are dependent upon transaction costs; the costs of shipping, storage, markup, promotion, advertising, and storage; as well as production costs such as editing, markup/typesetting, and server. In the micro-payment scenario, transaction costs will drop to virtually nothing and micro-payments will allow instantaneous payment, thus taking the billing costs out of the charge.[3] In the new micro-payment option, transaction and intermediation costs plummet; and prices become dictated by the nature of publisher, author, and content, almost exclusively. In the micro-payment world there could be:

- Five- or 10-year cost recovery timetable, without any significant cost for storage
- Continuous-update subscriptions
- Fragment fees of 0.02 worth per paragraph, section, article, or segment
- Variable quality with expense based on the desired quality of resolution
- Image with explanatory background for extra cost
- Pricing by audience demand
- Pricing by audience type
- Pricing by time in broad or narrow increments of minutes, days, month
- Shareware knowledge
- Pricing by knowledge level/filtration/server processing
- Pricing by update frequency
- Institutional discounts
- Association membership discounts

Standard variables such as content, the audience, the author's demands, and the ongoing costs are now compounded by a potential for a wide variety of consumer desires unique to electronic publishing, such as print on demand or usage of portions or fragments of publications. The new demands on the producer may be:

- Development of support infrastructure
- Explanatory material
- Ethical choices regarding prices
- Acquisition strategy changes
- Rethinking of the "unit" (the book, periodical, etc.)
- Flexibility of production

- Direct relationship with customer
- Multiple intermediaries
- Subsidiary rights/contractual diversity
- Micro-royalty mechanisms

ART COLLECTIONS vs. INDUSTRY COLLECTIONS

It is instructive to understand the differences between traditional cultural museums/archives and industrial collections. In museums individual objects are of value and increase in value over time, requiring stable long-term systems of asset management. Industry Archives are composed of individual objects, groups of objects, production artifacts, and marketing materials that can be of value depending on historic and market demands. Industry Archives require variable, flexible, scalable, strategic systems for asset evaluation and management.

An arts organization is unique in that it functions as a school, a museum, a library, a laboratory, and a fiduciary. It is public and private, academic and corporate in its management. It serves both the general public and a variety of highly specialized audiences, from art historians to the general public. It may give grants, sell products, and distribute products freely as a public service. The introduction of networked digital technology into the organization will affect internal and external communications, publishing, record keeping, accounting, financial services, and investing activities. The following partial list offers an example of the complexity and number of computing systems in an arts organization:

- General computers, servers, network and telecommunication systems
- Collections management systems
- Public kiosks
- Visitor reservations system
- Contact management and mailing list system
- Facilities work order management systems
- Human Resources Management Systems
- Financial Information Systems
- Library and collection management systems
- Specialized database systems
- Web browsers
- Image Collection Systems

- Subscription system
- Publication inventory and fulfillment systems
- Bookstore inventory systems
- Web e-commerce

At some point, most of these systems will need to communicate with each other in order to have an efficient means for cataloging, researching, producing, advertising, distributing, archiving, accounting, rights verification, revenue projection, licensing, and communication, both internally and externally. These systems will be the infrastructure of intranet, extranet, and Internet[4] use of digital publications.

SHAPING FORCES

Digital production appears to be shaped by eight forces, all of which are necessary to production and distribution. All of these forces seem to be constantly changing and shifting.

- **Concept:** Information design — the future of words and images in the digital domain. These are the creative factors that drive the initiation, development, and implementation of digital resources.
- **Product:** Editorial, time constraints, physical media limitations such as the capacity of a CD-ROM/DVD; non-physical media such as the Web, etc. These are the realities that constrain the form of the final product.
- **Accounting:** Capital and operating expenses, revenue, online subscription, license fees, budgeting for maintenance of digital material over time, etc. These are the constraints that determine the asset status and future repurposing of digital assets.
- **Legal:** Intellectual property such as copyright, trademark, licensing agreements. These are the risk factors inherent in doing business as a digital producer.
- **Technical:** Software and hardware required, bandwidth limitations, future opportunities, etc. These are both the opportunities and the constraints inherent in free-market technology.
- **Archival:** Asset management, preservation, re-use, record keeping, etc. These are the long-term realities of committing assets to a digital form.
- **Transactional:** E-commerce, advertising, promotion, audience data gathering, etc. An ever-evolving electronic marketplace requires participation in order to gain competence.

- **User:** Audience, communication, relationship building, marketing, etc. These are the forces of individual choice, mass appeal, and asset value.

All of these forces make some kind of demand upon technical infrastructure, as well as shape the quality of the product. All of these forces have to be considered when creating and implementing information architecture as well as content. The forces must be integrated, both technically and conceptually, for successful production.

INTEGRATION OF FORCES

A brief look at the history and evolution of the *Bibliography of the History of Art* (BHA) and the *Thesaurus of Art and Architecture* (AAT) from print publications to electronic publications gives an interesting perspective on how electronic publishing has occurred at the Getty Center.

Cumulative reference works such as bibliographies and thesauri are naturals for the digital domain because they are works that are essentially never complete. Their contents accumulate from a variety of sources, and they are published at regular intervals. The BHA, for instance, was created in 1991 by merging two older bibliographies: the *Repertoire d'Art and Archeologie* (RAA) and the *International Repertory of the Literature of Art* (RILA)[5]. Both of these bibliographies continued to be in print until 1989. The BHA was begun as a print publication in 1991 and was still in print as of November 2000, when the final print edition (Volume 9) ended the print publication. The merged RILA and RAA as part of BHA began a parallel CD-ROM publication in 1991. This electronic version also became online resources with the Research Library Group (RLG) and Questel in France in 1996. The Getty and the French organization Institut National de l'Information Scientifique et Technique (INIST) of the Centre National de la Recherche Scientifique (CNRS) also became joint copyright owners of the BHA in 1991.

All of this is to point out that the BHA began as two print publications merged into a third print publication, which then took on a parallel electronic production that has now resulted in a quarterly CD-ROM edition of the BHA, two archival CD-ROMs of RILA and RAA, and online versions hosted by third party vendors with joint copyright held by French and American entities. The print component of the mix will be discontinued in favor of the CD-ROMs and online access to the material.

The production of the BHA CD-ROM had its editorial offices in Williamstown, Massachusetts. (This has since moved to the Getty Center in late

2000.) It does the data compilation at the Getty Research Institute in Los Angeles; data processing for the CD-ROM at Inforonics in Littleton, Massachusetts; the CD-ROM packaging at Getty Trust Publication Services in Los Angeles; the CD-ROM production coordination at Co-Operations in Portland, Oregon; the disc manufacturing at Sony in Oregon; and the distribution through the Getty Trust Publications warehouse in Calabasas, California. Although the entire process appears quite cumbersome, in the electronic publication world it is not unusual at all. In fact, over the years of its electronic incarnation, the process has been quite efficient and cost-effective. The BHA returns revenue from the CD-ROMs and online royalties are significant enough to cover CD-ROM production costs.

The process successfully accommodates all the forces that shape an electronic publication from concept to user. The BHA conforms to the force matrix:

- **Concept**: Large-scale bibliographic database for the study of the history of art
- **Product**: CD-ROM and online subscription
- **Accounting**: Capital publication, capital cumulative asset, sold and licensed
- **Legal:** Joint international copyright
- **Technical:** Based on software engine held jointly by publisher and vendor
- **Archival**: Cumulative update that can migrate to any digital media – currently CD-ROM and online access
- **Transactional:** CD-ROM subscription, third-party nonexclusive online license with royalties
- **User:** Well-established user base with good new user market opportunities — need for the publication and information never becomes dated

The *Art and Architecture Thesaurus* (AAT) celebrated its 10th anniversary in 1990 with the print publication by Oxford University Press. Development of the idea began in 1979-1980 and took 10 years to bring to press.[6] The thesaurus, like the bibliography, embraces the cumulative reference concept and collaborative authorship style that make it a natural for digital publication. It collects synonyms for describing works of art and architecture from a variety of international sources, vets the terminology, and establishes standard vocabularies. The decade after its inception witnessed the development of the microcomputer, the proliferation of online databases, and the beginnings of collection management software. This had an effect on the automation of art and

architecture collections. From its beginning, the AAT was thought of as a standard vocabulary tool for the new electronic databases. The notion of a print version was somewhat secondary to the necessity for an electronic version. Researchers and scholars, in describing their work, had clearly articulated the problems:

- The agony of tracking down information when indexes are inadequate
- The difficulty of organizing visual and written information
- The threat of loosing information due to lack of certainty of what the information is called in different indexing systems
- The impossibility of finding what you need in unindexed archives[7]

The AAT first appeared as a three-volume print publication in 1990. In 1992 the *Authority Reference Tool* (ART) software was created to allow computer access to the data in the first edition. By the time the second edition was published in 1994, ART was improved to allow immediate access to the data, to make it easy to navigate through the thesaurus, and to make it possible to copy terms from the thesaurus to a database record. This last feature made the AAT a production tool as well as a reference tool.

ART was designed to run on PC-DOS or MS-DOS and was never updated for Windows 95 or Windows NT. Since 1996 it has not been very useful. Since 1997 the AAT has been available as a licensed download from the Getty website without any accompanying software. Licensees incorporate it into their own software applications or have an interface built for it. The AAT was also prototyped as a filtering agent for search engines in 1997-1998 and proved very successful as a way to narrow searches on the Internet. This last application has carried the AAT from a print publication to a computer application to an Internet browser to an Internet search enhancement. The *Art and Architecture Thesaurus* is a prime example of the way developments in technology parallel the utility of a cumulative reference literary form. If we apply the forces matrix to the AAT:

- **Concept:** Large-scale thesaurus for art and architecture terminology
- **Product:** Licensed download
- **Accounting:** Capital cumulative asset, licensed
- **Legal:** Getty copyright
- **Technical:** hierarchical text, no software
- **Archival:** Cumulative update that can migrate to any digital media — currently as ftp access
- **Transactional:** Nonexclusive license for sliding scale of fees

- **User:** Well-established user base with good new user market opportunities — including search engine market, need and information never becomes dated

The examples of the BHA and the AAT are important on many levels. They make the case that publishing does not mean books per se. Publishing means the shaping of content. Content created to perform in the constraints of the paper page may be freed by digital publishing to become not only new content, but a variety of new opportunities as well.

Both of these examples point to larger issues having to do with production. Digital transmittal, the integration of publication databases, online licensing, conversion of pre-press materials to a variety of formats, issues of digital workflow, archiving, re-purposing, dynamic publication catalogs, third-party agreements, and how to establish criteria for deciding what form a publication might take are all concerns that make managing aligning digital assets critical.

Production of digital assets may take place internally within an organization's IT group and may be done in cooperation with a number of design and research groups. A Digital Asset Services Group might review and comment on contracts, agreements, permissions, and licenses for distribution of electronic products as a responsibility of managing most fiscal aspects of a publications budget. Publication Services may, when appropriate, research and recommend third-party distribution opportunities such as licensing existing products to Internet content service providers.

Digital Asset Services could research and propose projects that will facilitate efficient infrastructure such as the electronic vendor transmittal system for moving manuscript materials to printers via the Internet, online licensing, or database integration projects.

Digital Asset Services could work closely with the intellectual property manager of a legal department to ensure that all digital products are properly registered and annotated.

THE FUTURE

One area that will be increasingly important to the future of digital asset production is an inventory of intellectual property rights for materials in electronic form. In its broadest implication, an intellectual property assessment generally means determining:

(1) whether or not you have all the necessary rights to exploit an item in whatever venue or media you intend to use it (print, electronic, advertising, performance, etc.); and
(2) whether or not you have taken or can take the necessary steps to adequately protect the item from unlawful use by others in current and future media.

The answers to these questions will depend, to a large extent, on the way an organization decides to use its intellectual properties. At this point, it is difficult even to estimate the scope or cost of this kind of review without knowing how complex the histories of the various properties are. A complete review might focus on the developers and/or creators of the items, their relationships to the organization at the time the items were acquired or developed (e.g., employees, contractors, or contributors, etc.), and the sort of agreements they have or had with the organization.

Some initial issue spotting could be done before a definitive plan was implemented. For instance, a sample of properties from the various parts of the organization could be looked into as a way to model the process. The range of intellectual property issues is broad and could include:

- Publications
- Public Affairs materials
- Contemporary works
- Web materials
- Contracts
- Licenses
- Scholarly works
- Agreements
- Software
- Library materials

Typically the process for developing successful communications architecture alignment involves intensive strategic planning including an asset inventory, a needs assessment, a thorough understanding of existing systems and practices, and an examination of data collection criteria. Planning and preparing reviews of standard vocabularies for describing assets, reviewing standards for continuity and longevity, understanding cross-media definitions, and applying insights into methods and practices are critical. Solutions require defining requirements and alignments and, in most cases, customization of systems and configurations.

POLICY FOR INFORMATION ARCHITECTURE

Organizational information systems need to be interoperable, have consistent technical compatibility for future relationships, and develop a core of criteria for judging functionality. Resources for production, development, communication archiving, and accounting — both financial and intellectual property accounting — become increasingly dependent upon consistent overall technology architecture. Internal and external uses of digital material have effects upon intellectual property rights, storage and preservation of digital assets, leveraging advantages vis-à-vis Internet use, and the strategic long-term goals and mission of the organization. The organization's digital library and asset management systems, electronic publishing initiatives, image delivery systems, digital archives, and cumulative digital assets will need to be seen as threads that require careful management. New threads are constantly being added, such as Customer Relations Management systems (CRM).

When customer call centers began using software to collect data on each caller, computer telephony integration (CTI) became a business function. The logical extension of this became CRM (Customer Relationship Management) with the move of the CTI database information back into the organization. Managing relationships with customers is not a new idea, but the notion of a level of sales automation with CRM is irresistible. This means that information from the sales force could be retained and potentially used to guide product development. Costs are attached to integrating CRM systems with existing IT systems; aligning information architectures, and creating links to other digital assets, content, and rights management systems. Systems alignment and integration costs can be three to five times the costs of initial CRM licensing. CRM has to be thought of strategically rather than a repository for customer data. CRM is most effective when it wins new customers and retains existing ones. CRM can prompt sales people with information significant to customers needs and lifestyles, including dates and events that personalize the customer experience. Continuing Education departments at some universities are beginning to use CRM systems to track what courses students have taken and inform them of new offerings that may be of interest to their career directions. The notion that continuing education is "life-long learning" makes CRM an attractive tool for retaining students far into the future and keeping enrollment at peek levels. The education consumer is not a new idea for universities, but CRM makes it possible to communicate with students in a substantive way that provides the university with data on educational trends while encouraging brand

loyalty from customers. The data that these CRM systems generate is invaluable in marketing campaigns and kept over long periods, can reveal potential sources of future revenue as well as guide institutional investment.

THE NEW PAST

With the advent of digital technology, the great variety of options open to creating content in different forms is constantly expanding. Asset production now includes knowledge of complex digital systems, electronic distribution, industry directions, and vision of future opportunities. This is especially true where highly sophisticated development requires that everyone involved must understand something about every aspect of a digital project — from the mission of the organization to the nature of source material as well as the quality of design, production, distribution, audience, and technology. The client and the service are merged by alignment in digital communication. The continuity of the resulting assets is rapidly becoming a new kind of digital currency.

ENDNOTES

1 In the 1980s the European-dominated International Standards Organization (ISO) began to develop its Open Systems Interconnection (OSI) networking suite resulting in the Basic Reference Model, or *seven-layer model*. (From *Connected: An Internet Encyclopedia*, www.freesoft.org/CIE).

2 From Michael Jensen, Director of Publishing Technologies for National Academy Press, 1997. Since Jensen's lecture at the Getty in 1997, ebrary, Inc., an electronic publisher associated with Adobe Systems, Inc., has begun (June 2000) to institute the micro-payment concept for accessing online materials by allowing users to copy parts of free documents for a minimum payments of 15 cents per page. Payment is made with the on-line equivalent of a phone card.

3 When databases provide human-free billing, the phone bill will drop even further

4 Intranet for internal uses, Extranet for uses with external partners, collaborators, etc., and Internet for the global public

5 RAA began in 1910 and gained the support of the CNRS in 1963 to become fully automated in 1973. The print edition was issued from 1910-

1990. RILA began in 1975 and merged with RAA in 1989. The print edition was issued from 1975-1989.

6 The 1994 second edition of the AAT is still available from Oxford University Press in five volumes for $395.00.

7 The J. Paul Getty Trust Bulletin (Fall 1987): 4-5*, Introduction to the Art and Architecture Thesaurus,* 2nd ed., "The History of the AAT," by Toni Petersen, 1994.

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