

# XrML and Emerging Models of Content Development and Distribution

*Rights management and the new infrastructure for truly dynamic  
product development for publishers of all kinds*

*Bill Trippe, The Gilbane Report  
April 23, 2002*



# Executive Summary

---

Publishers and entertainment companies face both great opportunity and great challenge in the new digital economy. While early ventures into the digital content business have had mixed results, there have been some successes. Significantly, these successes have two things in common—the organizations invested wisely in foundational content technology, and they have been flexible and innovative in introducing and changing business models and offerings.

Yet a key missing ingredient for even these successful sites has been the implementation of comprehensive and flexible DRM technology. This has partly been because of perceptions that DRM is solely about “protection” and not about enabling new business models. With the publication of XrML 2.0, ContentGuard provides an open, flexible, and extensible means of expressing digital rights that not only addresses copy protection, but, as importantly, offers a much broader and powerful means for publishers to experiment with and deploy new business models.

To analyze XrML 2.0’s utility in digital content business models, we developed four notional scenarios of complex content development and distribution businesses. While these scenarios are speculative, they were developed with input from publishers, entertainment companies, and consumers. While the overall scenarios may be notional, the requirements are quite real, and are representative of the myriad development and distribution challenges publishers now face.

We analyzed the XrML 2.0 specification with these scenarios in hand, read the related documentation and use cases, and interviewed ContentGuard personnel. We are satisfied that XrML 2.0 will meet the DRM requirements described in each of these scenarios.

As a result, we see great promise in XrML 2.0 to address publishers’ needs, and we look to DRM vendors, content management vendors, and publishers to adopt it.

# The Building Blocks of Flexible Content Development

The Internet, wireless platforms, MP3 music distribution, and new means of distributing movies and video have spelled both enormous opportunity and enormous challenge for publishers and entertainment companies. Content developers and owners have responded by digitizing their assets and investing in technology to allow them to better create and distribute their content in electronic form.

Not every investment in digital content development has been a success, of course. The now legendary “dot bombs” included many content businesses, and both publishers and entertainment companies have started and since aborted pricey ventures into Web sites, eBooks, online music, and video. But many ventures have hung in there, and a few have even thrived.

The successful content ventures have two things in common—they have invested wisely in some key infrastructure technologies, and they have responded quickly to the changing business climate by adding features, experimenting with new offerings, and modifying pricing and business models. In short, their technology has allowed them to be adaptable—to create products flexibly, and to be equally flexible with how they conduct business.

Take the example of Factiva, the Dow Jones & Reuters Company that provides world-class global news and business information through its Web sites and content integration solutions. Reuters has been around since 1851, with Dow Jones & Company founded in 1881. Through the use of content management and other digital distribution technologies, the new entity, Factiva, successfully supplies business information and customized solutions drawn from more than 8,000 sources to the vast majority of Global 500 companies.

Another good example—although a relative newcomer compared to Reuters—is Morningstar. In 1984, the first Mutual Fund Sourcebook was published, and the Morningstar, grew to include Internet-based mutual fund and other financial instrument-related data, analysis, and editorial content, plus the software tools to use the data effectively. Today, Morningstar also provides institutional and corporate clients with a wide range of customized services and consulting that addresses their investment-information analysis, reporting, communications, and investment product building needs.

Both of these information-based companies have used the Internet to expand their distribution. But these companies have also gained significant new numbers and classes of customers by expanding their offerings and services through the application of other kinds of electronic publishing technologies, such as syndication, taxonomy indexing, and customized Web publishing.

### Common Threads Among Successful Ventures

There are several key infrastructure technologies in which the successful content ventures have invested. While there are many differences among the wide range of successful digital content and publishing businesses, all content enterprises, regardless of medium, have done the following things:

- They have been working hard on digitizing and databasing their content, which includes addressing the *digital asset management* (DAM) problem, where they are enhancing their content with metadata. For music publishers, this might mean creating and data-basing track-by-track metadata for online catalogs. For book publishers, this might mean creating metadata for packaging eBooks, or, as is the case with Factiva, by applying taxonomy-based indexing and retrieval metadata to over 8000 different information sources representing everything from local newspapers to Web sites.
- They have developed some mechanisms for *dynamic assembly* of products. A music site, for example, might provide a means for creating a custom CD from a catalog. An educational publisher might give a professor the ability to create a custom textbook for his students to purchase. Content management systems provide the technology that enables dynamic assembly of content. Morningstar provides its customers with a wide range of publication options, including tailored 401(k) reports and services for HR departments, to data research and investment guides that can be delivered individually or as part of an enterprise information portal.
- They have been developing marketing partnerships and channels to put their content in the right *contexts*. In some cases, they have developed their own Web sites, but publishers are historically used to selling through retailers, so the solution has often been to deploy their content to a number of other sites. Personalization and search engine technologies are among the technologies employed toward this end. Morningstar offers sets of online investment planning tools to financial service providers such as Merrill Lynch Investment Managers (MLIM) that expand business for each company.
- Specifically, publishers have been establishing *syndication* arrangements. The more automated the syndication, the more reach a publisher can get without incurring prohibitively high costs. Presentation and branding issues can be addressed through syndication technologies. Reuters, one of the parent companies of Factiva, has been instrumental in Web-based syndication development.

What has lagged behind these other technologies has been the deployment of *digital rights management* (DRM) technologies. This slower deployment of DRM has several likely causes. Some publishers see DRM as the “final” building block, and have been delaying implementation until the above-mentioned core technologies are in place. In other cases, DRM is seen in a limited light as having a sole purpose to provide persistent protection of content at the point of distribution, with resulting adverse market reaction. While many early DRM technologies in fact only focused on protection, DRM technology is increasingly becoming a flexible technology for implementing new and varied business models.

### **XrML: A Meta-Lingua Franca for Key Content Management and Distribution Technologies**

Recently, ContentGuard published version 2.0 of XrML, their extensible, XML-based language for expressing digital rights. We see in XrML 2.0 a fully realized, feature-rich language for DRM. In particular, we see an approach to DRM that will help publishers of all types fully realize their investment in content management and distribution technology. With advancements like the publication of XrML 2.0, it is now accurate to see DRM as fundamental for content businesses, and as a necessary and integral aspect of each “building block” content technology. There are several key connections between DRM and other content infrastructure technologies, as follows:

- DRM and DAM are intrinsically linked at the stage that content is digitized and metadata is added, since rights-related metadata that drives commerce and business models can be included.
- Dynamic assembly and DRM are linked, since the assembled content needs to be packaged, protected, and embedded with appropriate business rules. Integrating content assembly and DRM enables publishers to create, aggregate, and dynamically distribute content.
- Providing the right contexts for content often means tying content metadata to search engines, as one example. If the DRM technology works in concert with search engines, for example, the more automated “reach” publishers will have. DRM services that place protection upon content so that the content can be accessed for search engine indexing is an important requirement, especially for high-value or proprietary content, and metadata about the content—including access rights—is needed to match content to the right audiences in the right context.
- The combination of flexible syndication technology and DRM is an essential step, since, as requirements for commercial success, publishers need to be able to quickly come to agreement with syndication partners and integrate their content at little cost and with automated processes.

Content infrastructure building blocks, then, can each be seen as being supported by XrML-enabled DRM technology, or perhaps more accurately stated, by “embedding” XrML technology within these building blocks.. This requires publishers to view DRM as “managing the rights” at each stage of the process, where, for example, DRM provides the mechanism that gives the syndicator the right to publish content. XrML can be used at each stage to express the rights (not just protect the content) that are available and the rights that can be “transferred” to the next stage.

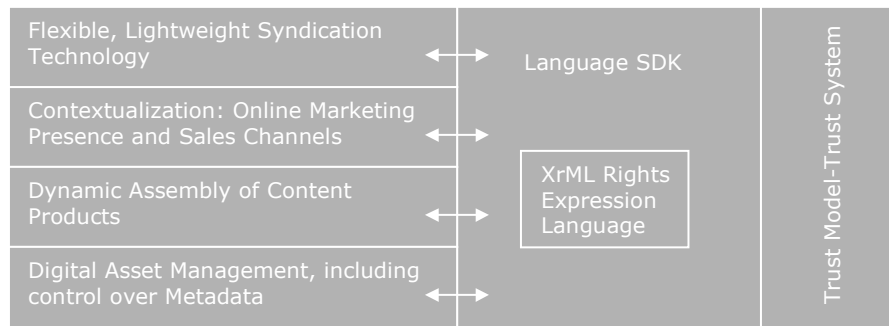


Figure 1. The key content technology building blocks (at left) are brought together into a trust model of publishing through XrML. Enforcement of rights are assumed to be part of the technologies and products illustrated in the diagram, defined as follows:

- Language SDK: Software toolkits enable the generation and interpretation of rights expressions in XrML. For example, specifying rights and conditions at one layer and interpreting the rights and conditions at the same or another layer
- XrML Rights Expression Language is the XrML specification
- Trust Model – Trust System: Allows trust assertions for the rights expressions. Enables the verification (for trustworthiness) of rights expressions, principals (authentication). A trust system could be a PKI or a single sign-on system like MS passport

Significantly the publisher is going to reach more customers through widespread *syndicated* content. For publishers to quickly establish a wide network of syndicators, the syndication arrangements must be lightweight, flexible, and easy to integrate into a variety of other sites and platforms. The XrML-enabled DRM approach to syndication supports this.

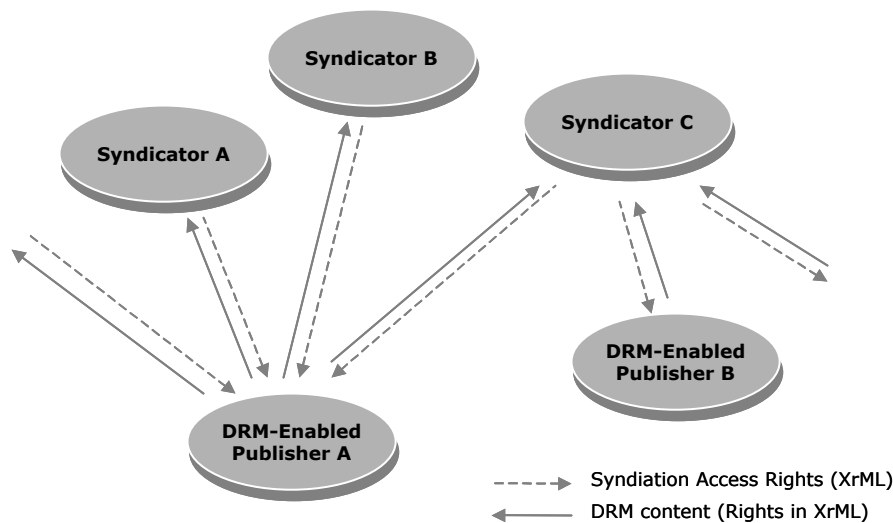
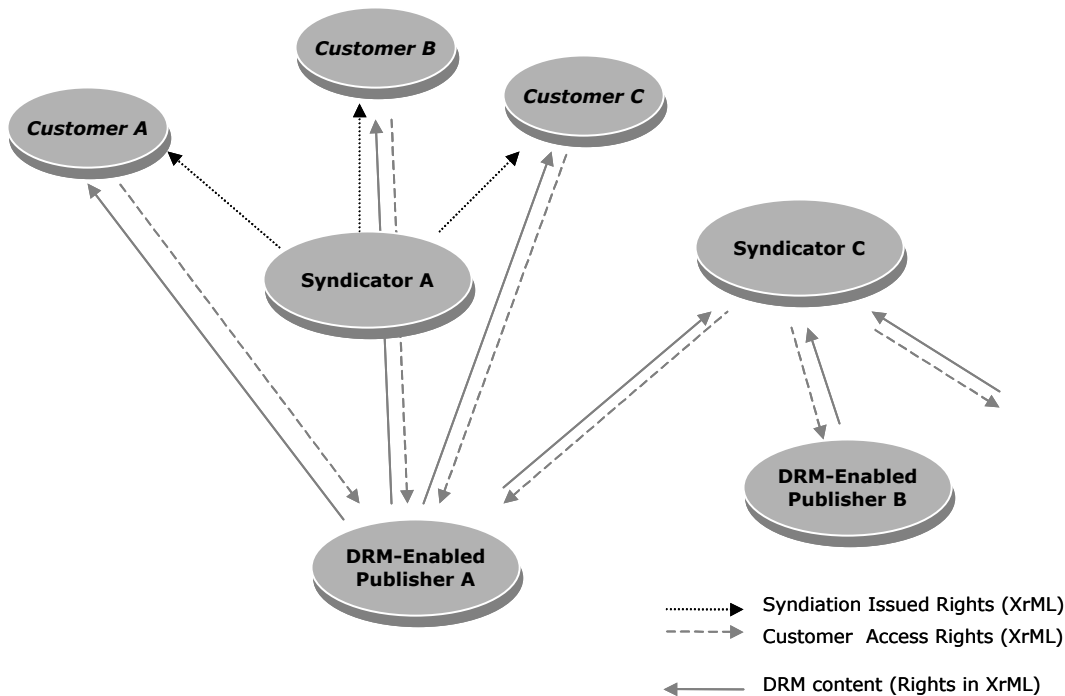


Figure 2. Widespread content syndication requires a multi-platform-capable mechanism for describing and enforcing digital rights. The XrML-enabled publisher is much better positioned because syndication arrangements can be quickly integrated.

Indeed, the notion of syndication can be taken one step further, in which publishers are able to *automatically* syndicate content by making their content available in syndication networks that can dynamically determine which parties have rights to content from other parties, or, when they don't have the right, determine under what conditions—such as payment—such a right can be obtained. This situation requires that digital rights and the business rules associated with those rights can be determined and transacted upon in practical ways, which the XrML approach to DRM supports. A further and significant advantage for syndication networks and publishers that use a common rights language includes the dynamic and automated assembly of custom content sets, either from within one publisher's content set or among a wide and continually growing set of content partners. Figure 3. Widespread deployment of content through syndication, when supported by a practical and standardized



DRM language such as XrML, can also provide a large market of customers with dynamically customized publications.

Finally, XrML offers another key feature—it is a standards-based approach. Up until now, DRM vendors have produced a complex mix of proprietary technologies that, in turn, need to integrate with the many content management technologies and platforms that are in place across wide-ranging businesses and publishers today. ContentGuard is evangelizing XrML to the appropriate standards bodies, giving some promise to the idea that DRM integration will be a more flexible, extensible, open process than in the past.

# Envisioning New Models of Content Management and Distribution

XrML, together with the other content technology building blocks of DAM, CMS, and syndication, give publishers a foundation for highly automated development and distribution of content, where new products can be created, assigned their appropriate metadata, and made available for sale. XrML provides a universal mechanism for allowing such transactions in a protected environment. This rights environment is one in which the *resources*, *principals*, *rights*, and *conditions* can be automatically discovered and acted on, and *licenses* can be granted.

These terms are important to understanding XrML, and are worth delineating here.

XrML Term	Definition
Resource	Content assets. The digital object or service—anything from a single file to access to a Web service.
Principal	The party or parties involved in the transaction—rightsholder, syndicator, potential buyer.
Rights	The specific actions that are being granted to the principal with regard to the resource. This could be actions such as “open,” “print,” or “play” for a digital object.
Conditions	The terms, conditions and obligations under which rights can be granted.
Grant	A grant is the element within the license that conveys to a particular principal the sanction to exercise an identified right against an identified resource, possibly subject to first fulfilling some conditions.
License	A license contains a set of grants that convey to certain principals certain rights to certain resources under certain conditions.



This section outlines four scenarios where publishers could take advantage of XrML-enabled content technologies to develop new businesses. The range of examples reflects different publishing businesses and challenges. The four scenarios are as follows:

1. A publisher of financial information facing the increasing need to enable end users (e.g., investors) of its high-value financial information to access it through many different channels. The main challenge is to manage the complex relationships that exist among other financial publishers, institutions, aggregators, and distributors that provide access to this publisher's content.
2. A publisher of engineering standards and specifications that needs to provide continuous access to changing, mission critical documentation being used by multiple parties to manage major construction and manufacturing products. The main challenge, in addition to managing the relationships among the publisher, aggregators and distributors, and users, is to impose control over the use and alteration of the content as it may impact upon safety and regulatory issues that may extend to compliance requirements.
3. A content service that provides consumers with the ability to manage ubiquitous access to the content information and entertainment they've purchased, regardless of their location or device. The main challenges are to enable new services for content publishing across media, while expanding the users' options for acquisition, playback, and management of their content, while creating a trust environment that protects and encourages rights compliance in flexible and effective ways.
4. A publisher of general and specialized reference content pursuing increasingly diverse markets and varieties of subscribers with ongoing and new content services drawn from databases. The main challenge is to enable the participation of many types of partners, aggregators, syndicators, and other kinds or re-sellers (including individual end-users) to insert themselves within the value chain by providing a rights management tagging system that is highly granular and applicable across many publishing and transaction platforms.

---

### **Example 1: High-value, time-critical financial information**

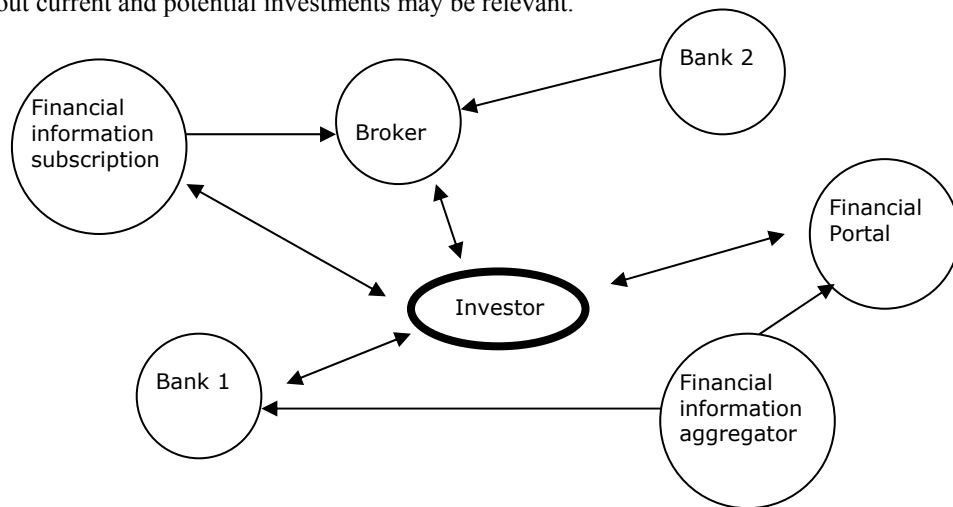
*Providing active investors with real-time access to high-value information, while honoring complex relationships that exist among financial publishers, aggregators, and distributors.*

How do publishers of financial information address the needs of the individual investor with continuous access to free, pay-per-use, and subscription-based information and services, or otherwise support the ability of financial and investment portals, financial institutions, and investment consultancies to likewise provide this investor such information?

As it stands now, an individual investor has many points of entry into the pool of information related to investments. An active individual investor receives information in the mail, by phone, over the Web, and through email. He or she may have online accounts with brokers, through employee 401K accounts, and through banks. Depending on the value of the portfolios—and the brokerage and banking arrangements—such investors may have discounted or free access to high-value investment information such as equity research reports from the likes of J. P. Morgan and mutual fund analysis from Morningstar.

In short, there is likely to be a complex web of relationships between the individual investor, his or her broker, bank, and various suppliers of content. Add, as well, organizations such as Multex, which act as aggregator and distributor for the various financial information suppliers, and which also often serve as the selling channel and clearinghouse for the brokers and banks. Thus, any individual investor presenting himself to his bank in one transaction, through his employer 401K site next, and through his broker in the next, may be presented with the same content, sometimes directly from the supplier, sometimes through a distributor, perhaps with a variety of terms and conditions. Indeed, the investor may have access to high-value information as a condition of the service level provided by a brokerage firm, while another financial service may not make this information available to the investor as part of its service commitment to him or her.

Any active investor will want to have immediate and unencumbered access to all useful content, and under the most favorable terms and conditions possible. The investor will want to know what he or she has already purchased, what is available for updating, and what news about current and potential investments may be relevant.



*Figure 4. There can be a complex web of relationships between the individual investor, his or her broker, banks, and various suppliers of content, including through direct subscriptions and through information services such as aggregators or distributors that often serve as the selling channel and clearinghouse for the brokers and banks.*

The challenge there then is to give each business a flexible, extensible means to ensure this customer can make his or her transactions automatically and accurately. This requires the following:

- The content suppliers need to be able to securely publish their content, along with pricing and discounting information, such that it can be accessed, distributed, and sold directly, through distributors, and through trusted partners such as brokerages and banks.
- The distributors need to be able to continuously access an array of content suppliers, and automatically distribute and sell a variety of content products, under varying terms and conditions through many partners and points of access.

- The banks, brokerages, and financial portals need similar access as that which the distributors need, and they need to cultivate their customers without worrying about losing them to the content suppliers or distributors.

*Financial analyst reports are typically expensive, time critical, and highly valued by the consumer. Consumers often have a financial stake in the information, use it to make important decisions, and are accustomed to paying for the content—either directly, or as a benefit of the value of their portfolio and their relationship with the brokerage or bank. Because of the value of the information and the controlled distribution, the information must be protected. The customer for this content is likely to have multiple business relationships, and content is likely sold—or could be accessed—through a variety of sources.*

How does XrML support complex webs of relationships? On the supply side, content owners will deal with multiple distributors and aggregators. XrML can specify what each of these distributors can do (through a “distributor license”) and what each of the customers can do (through the issuance of a “usage license”). Each distributor will be issued a separate license and often with distinct rights and conditions. Each distributor is then bound to those conditions when they issue content to their users.

Specifically, XrML allows for a licensee to, in turn, grant other licenses. This issuing mechanism can be used in this type of content syndication, where the syndicator needs to be given the authority to issue certain rights. It can also be used to specify peer-to-peer distribution, where a peer is allowed to issue a license with specific rights to another peer.

On the demand side, individual customers will be able to use content based on their possession of a “usage license” This usage license ties the resource to the user, specifying the rights and conditions under which the rights can be rendered. The user, acting with different “roles” will be able to obtain the appropriate licenses from the various distributors.

This scenario assumes some kind of sign-in or authentication process to determine who the user truly is (and what role), as well as a specific DRM technology to enforce the rights. The key point, though, is that XrML-enabled DRM technology would allow the publishers, distributors, and various businesses to conduct these complex, multi-tier transactions. Moreover, XrML would allow these transactions to be automated, using contemporary programming environments such as Web services to enable such relationships to be managed on the fly.

---

### **Example 2: Specialized, mission-critical engineering information**

*Providing continuous access to changing, mission critical documentation being used by multiple parties to manage major construction and manufacturing products.*

How does a provider of specialized engineering information such as a publisher of construction standards and specifications make sure that their materials, used on major construction projects and in manufacturing processes, are available and up to date? Engineers may need these materials in the office, on the assembly line, at the project site, and elsewhere in the field, so flexible delivery and continuous access are essential. The goal would be to give this publisher a flexible, extensible means by which it can make the content available as a Web service, with access provided to a mix of ad hoc and established customers.

Because laws and regulations often mandate reference to standards and specifications, there is also the issue of compliance that the publisher must address for its customers. How can the use of rights language enforce compliance or meet legal requirements for both the publisher and its content users? One way a rights language can help is to define and require specific relationships and actions to be taken on the part of the content user as conditions for use, with the means to interact with the relevant systems supported by a standards-based technology.

Finally, standard and specification publishers are often managers of many outside contributors (such as industry experts, boards, and *ad hoc* testing and review committees). How is the collaborative publishing environment affected by rights language meta tagging? Ideally, the rights language would describe the various actors upon the material—writing, editing, commenting—and the scope of the actions permitted—such as review or approval.

*Standards organizations, typically, not only wrestle with huge numbers of contributors and reviewers in the production and updating of standards and specifications, but also serve a de facto or actual role in regulatory compliance within a large and diverse content user community. Such information must be protected from inadvertent change, while also being made available across a wide variety of distribution and re-distribution channels. Some industries (such as air transport, pharmaceuticals, and nuclear energy) have imposed upon them strict legal requirements regarding critical standards information, with compliance issues for specification publishers, manufacturers, and the users of the content.*

With the widespread and intensive use of the construction materials, the publisher in this example services a complex web of users, with multiple access points among the architect, builder, engineer and client, all of whom need to understand intimate details of the project, and some of whom must meet conditions of regulatory compliance. Quick access to performance standards for everything from manufactured beams to windows and doors provides multiple distribution and collaboration opportunities among all the parties for detailed construction and engineering information.

Take an issue seemingly as simple as fenestration (windows and doors). Does the client want wood framing, vinyl over wood, metal, metal over wood? What R factor? Double glaze or triple glaze? Gas fill? With easy access to the engineering standards, the architect, the builder and the client can all make these decisions quickly, without having to travel, and base the decisions on the same information set, clearly displayed and easily accessible.

Each of these potential consumers of the information may have prior relationships with the publisher, or may be acting as subcontractors or prime contractors through which clients gain access to the information. A large architectural firm, for example, may already have a complete library of electronic content, but the small, specialized engineering firm may be reliant on the architectural firm for access to the content.

In this example, XrML enables the timely availability of these mission critical documents by allowing machine processing of the rights and conditions at each step of the publishing and distribution process. This automation shortens the time-factor in this scenario: when the publisher completes an update to one of the engineering documents, the publisher wants to then make it immediately available in a controlled manner through various distribution points or portals. Assuming the publisher is packaging the content with XrML-enabled DRM technology, the rights and conditions for each stage of the distribution and even for the end-

user access can be specified in its totality at this first stage. This allows (or controls) the rights at each stage of the distribution without having the need to “check back” with the source.

In this scenario, the publisher would have greater knowledge of—and control over—the means in which their documents are being used. For example, the prime contractor in this example may have a site license for all documents, and all updates, at all times, on any device. When an employee of that prime contractor attempts to get a license to the updated document, the XrML-enabled DRM technology will be able to successfully grant that license.

As importantly, in our view, XrML can be used to describe not only who can access the information, but what can be done to the content. From simple issues such as access, copy, and print, to more complex actions such as addend, change, or verify, conditional states can be added to the content too. The role of XrML, in combination with version and approval controls of workflow, is especially interesting in publishing efforts that draw from large contributor sets.

We also view regulatory compliance as an important factor driving XrML technology, even in this relatively simple example. For instance, use of the specific door choice content could require an automatic submission of the building plan to an Americans with Disabilities Act (ADA) clearinghouse, with approval from that third-party service needed before the building plan could be made available (with specifications included from the publisher) to contractors.

---

### Example 3: The personal Web library

*Providing ubiquitous customer access to the information or entertainment they've purchased—regardless of their locale or device*

Here is an oft-discussed problem these days, with the promise of being an even bigger problem in the years ahead: How does a consumer who purchases broad rights to some content—say, music—apply his or her lawful expectation for flexible access to this content, even while the content owners protect themselves from loss from unlawful copying and dissemination? In this scenario, the consumer should have access to the music whether on an in-home music system, in a car, on portable music system, or on a PC, even if the consumer might or might not own any physical media, but rather the rights to access the music via a personal library account. This personal account needs to be available through a number of channels, including music players at home, in cars, and on portable devices.

*Music publishers are producing many formats for a wide variety of playback media. Currently, both illegal copying and inconvenient playback management of legal music is prevalent. An opportunity exists to make the management of rights to content a key element of a content management system—acquisition, management, and playback across many devices—that can be extended down to the level of the individual's interest.*

The scenario asks and answers the question: Can consumers reasonably presume that they can purchase content at a fair price and access it when that they want to? Indeed, music customers have the expectation and the tradition of presuming exactly this, and have been disappointed when the actual rights have been much narrower—playing limited to a single device, for example. Can XrML-enabled DRM technology provide a more flexible means for

consumers to access content, given the many contexts they may be seeking to access the content?

Our reading of the XrML standard concludes that it can specify the “full context” of the rights. This means XrML specifies the resource (the content), the principal (this being the role of a user or a rendering application or a device); and the rights and the conditions under which the rights can be exercised. XrML can also specify the trust model (or who can be trusted) and, in turn, use industry standard security software to specify digital signatures and encryption mechanisms. Having an XrML license is all you need to consume the resource, whether it is a single file or a Web service streaming content. Furthermore, because the XrML license is comprehensive and self-revealing, it could be saved and stored in a web-file system, making it readily available from any connected device.

Many different business models can be expressed with XrML because of the following two concepts in XrML: “existRight” and “prerequisiteRight.” In this example, the user maybe be given permission to a collection of songs if the user was ever issued the right for the first issue—existRight. In other words, other licenses have as condition the existence of a particular license (valid or not). A user may be granted a right if another right is still valid—prerequisiteRight. For example, a user is granted access to a collection if the right to the first issue has not expired.

Using the music example, if the consumer wanted to hear Love Shack, by the B-52’s, rather than rummaging through a stack of CDs, the customer would simply punch in the title and the band or speak the command and the system would pull out that specific song in seconds. The consumer could thus program hours worth of music in a matter of minutes or simply call up a song on a whim. The “personal library” would determine if the consumer already has the rights, obtain them with the consumer’s approval, and then store the resulting licenses and content.

Much of the focus of DRM has been from the protection perspective, and not the expanded service side. We think the duality—protection from copying, or ease of access—is artificial. With robust rights language expression, convenient content use services can become the norm, and with the ability to grant and revoke rights inherent in DRM, the better the service makes for the better the compliance with rights obligations, since non-compliance could threaten access to the rights management service itself. We believe that the benefits to rights-managed content users (both consumers and professionals) and the services built upon XrML can be a driving force for involvement and compliance with the underlying trust system.

One can easily imagine this personal-library concept described above extending to books, reference materials and periodicals—even giving the consumer the option of audio access or visual access depending on the consumer’s need at the time. In this sense, the Web personal library would far exceed the value of a real-world library.

This personal library could also extend to a user’s own content, where the person could access a research project via a notebook computer over coffee at Starbucks with a colleague, broadcast an entire presentation to a board via PowerPoint or develop the project further while in a hotel room, or at 4 a.m. from home when insight strikes. The person would, in effect, have instant access to all personal notes and research and to all other content for which he or she has access rights, without fear that the content may be taken and used by others without permission. This access could work for virtually any field from creative professionals such as

writers, film crews, artists and architects to the professional worlds of doctors, lawyers, engineers or educators.

XrML-enabled DRM technology would ensure only the persons with rights to the material would be able to access the client's personal library and also protect the client from intellectual theft or theft of company secrets via industrial espionage. It could also provide a mechanism where the user, as existing rightsholder, could in turn grant a license to another trusted user.

---

### **Example 4: Dictionary publisher with expanding subscriber base**

*Providing increasing numbers and varieties of subscribers with ongoing and new content services drawn from databases of specialized and general information*

How does a dictionary publisher maintaining growing databases of both general reference content and specialized information including business, legal, and medical terms, as well as terms from science and technology deal with an expanding list of subscribers? Specifically, the publisher wishes to efficiently and effectively expand and serve its markets in the following ways:

- The publisher licenses its content to large and small companies and organizations, schools, and individual subscribers.
- The initial installation and download of the dictionary software and database is accomplished through a secure e-commerce server, but the publisher would like to provide the updates through a common, easily accessible Web service.
- The publisher's customers want ongoing access to database updates, and are willing to pay for it, but updates have proven difficult and time consuming to do without reissuing the entire database.

Ideally, it would be better to allow subscribers continuous access to the content, and be able to download updates as they requested or needed them. As in the other examples, the different subscribers may have differing relationships with the publisher. One customer may have purchased the database through Yahoo, and another customer through AOL. A different customer may be a student at a major university who has access to the general reference subset of the publisher's database through a licensing agreement between the school and the publisher, perhaps paid for, in part, through student fees or as part of a campus subscription. Another customer, in medical school, may be provided limited access to the medical dictionary free, through a medical Web site, but if the customer becomes a premium subscriber to that Web site, one of the benefits is full access to the entire medical reference database.

The medical Web site should be able to automatically provide the customer free access to the medical dictionary only, and not the rest. Similarly, customers may be interested in the business dictionary only, and may be accessing it through one or more financial portals.



*Dictionary, encyclopedia, factbook, and directory publishers have content that represents huge investments by editors, lexicographers, researchers, designers, and, today, programmers, developers, database managers, and many more expensive professionals. By definition, the granularity of the content is very fine, and the potential application—whether as component content in a larger database, on-line references, specialized sub-sets, to name a few—of the content presents attractive opportunities for the publishers.*

One of the interesting aspects of this scenario is that the dictionary database itself represents a complex Web of content. Each word is tagged (using XML) as a separate content element, allowing dynamic assembly and reassembly of content products, based on factors such as keywords, subject matter, part of speech, and so on. Thus, a customer accessing the business words and a customer accessing the legal words are in fact accessing the same Web of information. Indeed, the publisher can dynamically package subject-oriented dictionaries of varying lengths, and using various features such as with and without spoken pronunciations, or with and without profanity, for a younger audience.

Given the flexibility of the database, channels and resellers have many options for selling. Ideally, they could present the customer with a menu of products, with choices for customization and premium add-ons. Such products could then be dynamically assembled, rights assigned, packaged, and downloaded to the customer in a secure container.

Once again, XrML-enabled DRM technology would meet these complex requirements. Using the “existRight” and “prerequisiteRight” notions in XrML, existing rightsholders will be identified, and thus will have access to updates, for example, assuming they meet other conditions. Also, this example, and two others, has the complex requirement that individual users may also be part of groups, and the groups themselves may have certain rights. In fact, XrML is capable of specifying “groups” of principals and “groups” or resources. This means that a license does not need to change as the group of subscriber expands (since they are in the same group) or the group of content expands. That is, if the publisher could decide to grant all AOL subscribers extended access to their database, perhaps for a set period of time.



## Conclusions

These scenarios, while notional, represent business models and approaches that publishers have envisioned, but have so far been unable to implement. Even when they have had the kinds of success we discussed early on—mainly through their investment in content management technology—they have typically not had great flexibility in trying new business models, pricing, special offerings, and the like.

Our analysis of XrML 2.0 suggests that the proposed standard approach to expressing digital rights is well positioned to bring content businesses to the next level. As these scenarios show, XrML-enabled DRM technology is flexible, open, generic, and yet powerful enough to allow publishers of all kinds of content to implement complex, multi-tier distribution and syndication arrangements.

We look for broad adoption of XrML among DRM technology vendors in particular, and content management vendors in general. We also see publishers looking to XrML as a standard means for applying metadata to their content.

There are some concerns about XrML being the intellectual property of ContentGuard, and not yet being managed by an independent standards body. However, ContentGuard has made clear its intent to turn XrML over to an independent standards body and make their patents, if needed to implement a system using XrML, available under “Reasonable and Nondiscriminatory” terms. Furthermore, they have recently announced their involvement with OASIS by chairing a new OASIS technical committee, *The OASIS Rights Language Technical Committee*, and will contribute XrML to this committee. With those two things in place, the question of XrML becoming the standard should rest on its merits as a rights expression language. And from that point of view, we are impressed with version 2.0 and see great promise in its implementation.

# Sponsoring Company

For more information about XrML and Content Guard, please visit [www.contentguard.com](http://www.contentguard.com) or [www.xrml.com](http://www.xrml.com), or contact:

ContentGuard, Inc.  
6500 Rock Spring Dr.  
Suite 110  
Bethesda, MD USA 20817-1105  
1-240-694-1200 (phone)  
1-240-694-1297 (fax)  
[info@contentguard.com](mailto:info@contentguard.com)

Sponsored by:

