MANAGING CHANGE: THE CHALLENGE OF RIGHTS MANAGEMENT IN THE NEW MILLENNIUM*

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This paper will identify and discuss rights management issues that have to be solved in the digital domain to ensure the continued viability of music-related commerce. It discusses the principles of copyright ownership and how they may be upheld through the development and evolution of information management standards.

WHOSE RIGHT IS IT ANYWAY?

Copyright is a strange creature. It is extremely easy for a composer to claim a copyright, although proving he is the original creator, at a given date, is somewhat more complicated. There can be many different creators who, over a period of time, have an input into a larger and more complex creation, such as a film or game, and each of these parties may have an influence on the exploitation of the final copyright. The simple idea of creators being able to assert ownership and control over their creations becomes extremely complicated as soon as more than one person becomes involved.

The use of technology to manage, protect, and control the distribution of digital content should theoretically ease the administration of copyright, but this requires an integrated information management infrastructure that is still on the drawing board. This article discusses the challenges facing the music industry to administer copyright in the age of digital reproduction and network-based distribution of content. It examines the current and prospective information management infrastructure being put into place.

Some creators consider exercising their copyright as primarily a means of generating income. For others it is a moral and cultural issue, requiring tools to control the use of works both in context and adaptation. This latter point is relevant when considering rights issues, because copyright is not just an economic right. To be allowed to use a right without directly seeking permission (as is possible under jurisdictions that allow for statutory licensing), provided an appropriate fee is paid, may seem to many people to be a suitable compromise given the probable scale of rights use in digital content. It does, however, completely miss the point about copyright. The creator of any intellectual property must have the right to decide what happens to that creative expression. At the most basic level, the name of the creator is associated with it; and in the same way that you would not expect to be able to use a famous person's name without her permission to support a business, project, or image of any sort, so it is the same for the use of a creator's work.

The problem is that the digital world that has been embraced wholeheartedly by the music industry has moved forward at a pace far exceeding the scope of its existing rights administration practices. Consequently the industry is going through a transition in which it has become extremely time consuming and costly to clear and control rights usage. While the industry struggles to find short-term solutions to administer copyright, it recognizes that in the longer-term seamless automated solutions for rights management must be developed to match the advanced requirements of digital content distribution.

Copyright and the core concept of copyright is not the problem; the administration and control of it is. And the responsibility to implement a complete solution lies not with the music industry alone, but with all the intellectual property industries to find collective solutions. The delivery of audio content can no longer be divorced from the delivery of multimedia content in which all manner of rights may exist. This will require a fundamental shift in the business dealings of all the creative industries. And because they have never had to work together before in this manner, it will not be an easy change.

In all my dealings and assignments as a consultant to rights holders and technology companies developing solutions for the management and protection of rights, the same conclusion is drawn. The main problems do not lie solely with constraints in technology—they are also cultural, societal, and legal in origin. The capabilities of new technologies are simply prising open the gaps between the cultural differences of industries, businesses, and consumers, often by geographical terri-

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tory, which, having developed independently for many decades are now being forced into the same environment. Different societal groups demand alternative services to meet contrasting consumption requirements; a situation that presents its own challenge to global network-based commerce. Likewise the many legal jurisdictions in the world based on historical practices within different geographical territories need to be accommodated in new international trading models.

Copyright is an extremely important principle, and without it the incentive to create would be significantly weakened. The future health and well-being of the digital world demands creators and their content. Unless there is an adequate and efficient information management system in place to protect copyright, all the evolving channels for the delivery of digital content may as well deliver white noise.

EVOLUTION OR REVOLUTION?

Paul Feyeraband in 1981 in his book *How to Defend Society Against Science*, said, "Methodology has by now become so crowded with empty sophistication that it is extremely difficult to perceive the simple errors at the basis. It is like fighting the hydra—cut off one head and eight formalizations take its place."

The current means of administering music rights has evolved over many decades. It is a multibillion-dollar worldwide business. And although the present administration systems can at best be described as clunky, they do the job of protecting and remunerating intellectual property rights owners in a reasonably effective way.

As with any industry experiencing rapid business change, the music industry is having great difficulty in managing the shift from one paradigm to another. As mentioned above, the cultural challenges in the music industry are considerable. Because this migration may also demand a fundamental change in the way we assess and administer the value of intellectual property rights, there is the danger of undermining current proven income streams for potential future income. This increases the difficulties ten-fold.

This migration issue lies at the heart of many of the current tensions within the music rights community. Although many accept the need for change, opinions on the precise nature and timing of it vary dramatically.

It seems as though the natural desire to evolve a new rights administration infrastructure will undermine the ability of that infrastructure to deal with the revolutionary demands of music users. Resolving these issues is a high priority within the music industry.

Today we can update the Feyeraband quote above to read MP3 instead of the hydra. It is a natural reaction to criticize the MP3 compression standard and all who use it because it is clearly threatening the core business of record companies, music publishing companies, and the income of rights holders. But the question must be asked. Why do people choose to use MP3 files in the first place? If it is because they are presently available for free, then that is one issue; but one can also argue it is because they are easy to use, easy to transfer, and can be used in a way the consumer wants and in a manner that is not presently being satisfied by any traditional markets.

In some cases it may be even simpler than that. For example, you cannot (usually) get a credit card if you're under 18. Since the primary means of paying for music on the Internet is by credit card, those younger people, one of the largest Internet music demographic age groups, cannot pay for music without using their parents' credit cards.

We should proceed on the basis that technology can do anything; if we base our business models on understand- ➥

Rights Management Acronyms

BIEM	Bureau International des Sociétés Gérant les Droits d'enregistrement et de Reproduction Mécanique
CISAC	Confédération Internationale des Sociétés d'Auteurs et Compositeurs
DRM	Digital Rights Management
EAN	European Article Number
EMD	Electronic Music Delivery
IFPI	International Federation of the Phonographic Industry
INDECS	Interoperability of Data in E-Commerce Systems
ISRC	International Standard Recording Code
ISWC	International Standard Musical Work Code
MPEG	Moving Picture Experts Group
RDD	Rights Data Dictionary
REL	Rights Expression Language
RIAA	Recording Industry Association of America
SRDB	Sound Recording Database
UPC	Universal Product Code
URI	Uniform Resource Identifier
WIPO	World Intellectual Property Organization

ing the users and their preferences, we will be better able to maintain the resulting income streams. The Internet, for example, mimics a large dynamic community that works against you if you do not work with it. Instead of generating eight formalizations by removing the hydra's head, you could have millions. The Internet user community has successfully demonstrated that it has the collective power to influence markets in online commerce and will resist undesirable technological solutions being forced upon it. We must seek to understand and educate that community about the rights issues and learn what the real and perceived value of music is in the new emerging markets. The public wants music, and they don't always expect to get it for nothing. Users must perceive the value of the music, a perception that currently eludes many. In a recent survey over 1,000 people representing a cross-section of consumers were asked how much they would be willing to pay to listen 10 times to a piece of music on-demand in their home. There was no consistent response, because most of those surveyed had no real conception of the monetary worth of a digital music file.

Digital media is all about opportunity and new markets. It is up to the music industry to find out how its customers wish to consume audio content and how much they are willing to pay for it.

SUPPLY AND DEMAND

Regardless of the business model that finally emerges during the course of this period of rapid change, two elements are most likely to influence the business architecture and shape events more than others.

The first element is represented by the generic role of creation providers and their ability to facilitate the availability of content and creative material for supply and distribution. Creation providers play a critical intermediary role in the content supply chain. They enhance the creative process by adding value to a creation in preparation for its distribution. This added value may take many forms including design, production, publication, and editing. But of even greater importance in the electronic environment, creation providers will frequently be responsible for obtaining permission in the form of licenses from rights holders to copy, distribute, and broadcast copyright material. In addition, they are likely to take responsibility for the management of the identification of the creations which they are packaging for onward distribution. This is appropriate as the creation provider is the responsible party within an electronic copyright management system for passing creations for media distribution. In other words, they move creative material from a private, protected, and controlled environment into a public and less-restricted environment where it becomes accessible to both legitimate purchasers and vulnerable to less scrupulous activities such as fraudulent distribution and piracy. While the major record labels have begun to shape the role of such intermediaries in their support of Pressplay and MusicNet, in the future there will inevitably be many others offering solutions tailored to meet the needs of all music producers.

The second influential element is represented by the choices made by the purchasers, consumers, and end users of the commerce chain who are responsible for creating the demand for goods, information, and whatever else will be supplied in digital form. The European Commission-funded Imprimatur Project (see Fig. 1) conducted considerable research into the different types of business models likely to predominate. The project analyzed established Web sites and then distilled the results. It produced a conceptual business model that identifies and defines a view of the essential roles that will be required in an electronic trading environment, and which will require Electronic Copyright Management System (ECMS) functionality for the management and protection of copyright material. The Imprimatur business model offers a detailed explanation of the roles of creation provider, purchaser, and end user in an electronic trading environment; it provides a useful starting point for further examination of these functions. The conceptual representation of the model illustrates the different roles and the division between the controlled ECMS environment of the creation provider and the currently less-controlled world of the media distributor.

WHAT'S IN A NUMBER?

Evolution of Existing Music Industry Identification Systems

It has become increasingly evident that among the identification systems which have evolved in recent decades, many do not adequately meet the requirements to support the identification of information managed in computerized databases. The volume of material to be identified has by and large been considerably underestimated; and the relative arguments for and against the use of meaningful numbers have not always been sufficiently reasoned. Nowhere is this criticism more applicable than within the creative industries managing identification and description about the creations they publish, distribute, license, and track. More than other industries they have frequently failed to grasp both the significance and the value of managing integrated identification systems to uniquely identify their principle assets.

The best explanation for this is perhaps centered around the historical retail trading model of physical product. Taking the music industry as an example, it has traded packages of physical media, such as vinyl records, music cassettes, compact discs, videocassettes, and minidiscs. These packages have been uniquely identified for sale and distribution purposes by bar codes with a European Article Number/Universal Product Code (EAN/UPC). Retail companies use the codes to monitor sales and facilitate ordering and stocking. In the case of the record industry, no requirement existed and hence no attempt was made to uniquely identify the component creations associated with the package. No standardized description scheme accompanies the EAN/UPC code to identify the individual recordings on a trade product and the underlying abstractions (musical works) from which they have been manifested.

With the growing awareness of the demands of the approaching digital age, in 1989 the International Fed- ➥

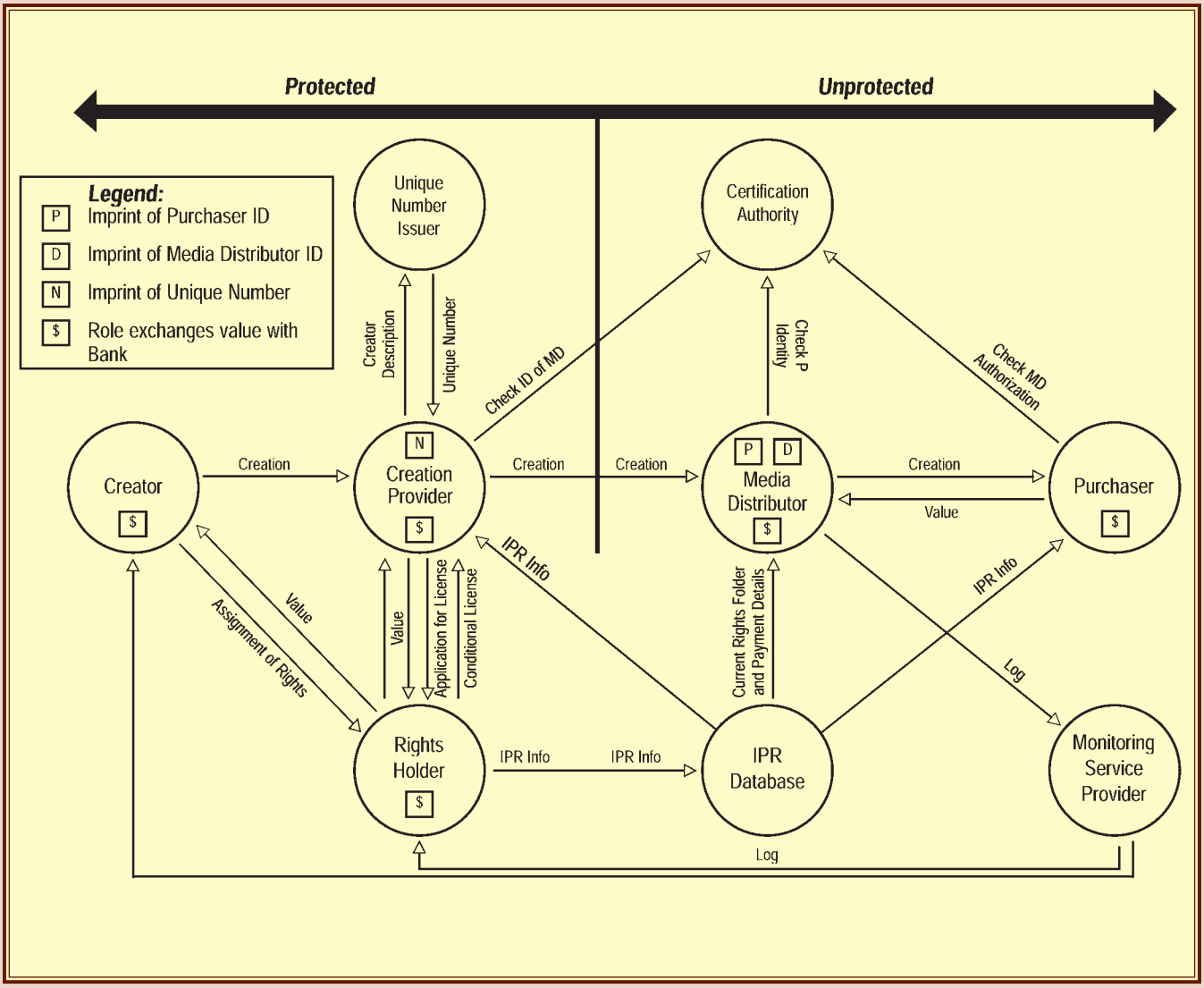

Fig. 1. The Imprimatur business model has become widely recognized for its usefulness in communicating the generic principles of electronic network-based commerce. The work of the Imprimatur Project is frequently referenced in the output of international standards bodies. The latest version of the business model is available for download from www.imprimatur.net.

eration of the Phonographic Industry (IFPI) became the international registration authority for the International Standard Recording Code (ISRC) and with the responsibility for appointing National ISRC Agencies. For the first time a structured approach to the management of identification was introduced within the music industry. The benefits from such a system are considerable. It can be used as a tool for the purpose of rights administration to automatically identify the current rights holders associated with a sound recording. But, more important, it can be used to monitor and track the usage of copyright music that has been electronically distributed. However, record companies were slow to introduce ISRC, both in terms of its allocation to specific sound recordings and for its integration within their own proprietary numbering systems. In many cases record companies did not maintain effective information management systems to enable the documentation of ISRC numbers (as required by the ISRC standard) even when the numbers had been allocated.

More recently record companies have been applying significant resources in an effort to rectify this deficiency. They have established computerized databases of information about their sound recordings, either through the purchase of data from third parties or by preparing and entering data from historical, paper label copy documents. However, as the population of ISRC numbers has increased, so has the recognition that there is a need for a global repository of ISRCs and their associated metadata—such as recording title, artist, and record company—for the purpose of establishing unique identification. Sound recording rights societies in the U.K. and U.S. have taken the initiative to develop database repositories on behalf of their members to store information about sound recordings. Phonographic Performance Limited (PPL) initiated the CatCo Project, which has resulted in an archive of sound recording releases populated by information provided by many U.K. record companies. Likewise the Recording Industry Association of America (RIAA) has developed a sound recording database (SRDB) to provide a similar source of information on behalf of its member

companies. No doubt in the future similar repositories of sound recording release information will emerge in other countries. Their ultimate usefulness, however, will depend on the ability of the record industry to agree to a strategy for creating a global information network that will ultimately allow the user to locate information about sound recordings no matter where in the world they have been released.

The music rights societies have faced similar challenges managing information about musical works. In 1994 the Confédération Internationale des Sociétés d'Auteurs et Compositeurs (CISAC) initiated a collaborative information management project called the Common Information System Plan. CISAC is the umbrella organization for societies responsible for the administration of rights in a range of intellectual property including musical works. This project developed the International Standard Musical Work Code (ISWC). CISAC is currently in the process of establishing an information repository of ISWCs and their metadata to support the adoption and use of the standard.

The availability of a system containing authoritative metadata for the unique identification of sound recordings will become an important tool to support electronic copyright management transactions. Such a tool will be used to provide an organized and structured approach to monitoring, tracking, and identifying current rights holders. This will provide critical support for the fast, high-volume transaction environment induced by electronic commerce. It will also become an essential tool for exercising antipiracy measures against the fraudulent use of copyrighted audio material.

Historically the music industry, more than all the other creative industries, has generally led the way, embracing change introduced by new technologies such as digital reproduction and new distribution formats. The advent of markets for the electronic distribution of music is similarly just as likely to set new precedents for high-volume transactions of copyrighted material. The industry must therefore prepare itself by creating an information infrastructure to manage its exposure to this new business model to effectively manage and protect its assets.

Should Numbers be Dumb or intelligent?

The process of numbering to achieve unique identification is a principle building block in establishing an information infrastructure for the music industry. This raises interesting questions about the nature of the number itself, as well as the way it functions as an identifier. An analysis of the emergence of numbering systems during the last 10 years shows a trend away from applying intelligent numbers to dumb numbers. Intelligent numbers generated meaningful data within the number string. Dumb numbers, favored more today, are strings of meaningless characters that serve as unique identifiers. The choice between intelligent and dumb numbers is not always an easy one. The decision depends on both the needs of the community the numbering system is designed to serve and the nature of what needs to be identified. Problems encountered with either approach will usually only become apparent in hindsight.

To demonstrate these two contrasting approaches we can compare two numbering systems, ISRC and ISWC. Each has been implemented to serve the needs of two different but related communities within the music industry. The ISRC was introduced to serve the needs of the record producers to uniquely identify sound recordings. This 12-digit alpha-numeric number is structured in four parts to incorporate intelligent data. It identifies the country (2 characters), the first owner (3 characters), the year in which the recording was made (2 characters), and a recording code (5 characters) that uniquely identifies each track. The intelligence in the ISRC number should allow the user to uniquely identify a specific recording and locate its current copyright owner. In 2001 the record industry revised the ISRC standard (ISO 3901) to account for some shortcomings that have come to light. For example, the first-owner code has been replaced and is now used to identify the copyright registrant of a recording at the time an ISRC was allocated. Other shortcomings are more problematic. For example, the year-of-recording code is limited to only two digits and thus only 99 years of use. However, there is reluctance to increase the overall length of the identifier from 12 to 14 characters, because compact discs have been provided with storage space for only 12 characters.

It is likely, and indeed intended, that within the databases of music rights societies and other music organizations ISRCs will be linked to ISWCs to establish the relationship between sound recordings and musical works. Unlike the ISRC, the structure of the ISWC is informal and makes no attempt to designate meaning, such as a date. The ISWC number format is comprised of the letter T followed by a nine-digit number between 000000001 and 999999999 and a final check digit (an example is T5938392801). The ISWC standard is based on the ISMN number for printed music, and a single character was required to ensure that the two were not confused within the same databases, where the prefix letters ISWC would not appear. ISMN begins with M for music, so T for tune was chosen for the ISWC. While the ISWC has been formally ratified as an ISO standard, it remains in an early stage of adoption. As such, it is too early to say whether it fully meets the requirements for which it was envisaged or any constraints which might emerge with its syntax and semantics.

DIGITAL RIGHTS MANAGEMENT OR DIGITAL MANAGEMENT OF RIGHTS?

Digital rights management (DRM) has become a widely used and well documented catch-all expression to encapsulate the function and operation of technologies for the management and protection of digital content. However, less well documented is the challenge of managing the complexity of administering rights in music and other media types when they are exploited in digital form on physical formats and network-based trading situations.

The music publishing industry offers probably one of the most complex scenarios for the expression of the rights associated with musical ➥

works. Composers and authors are entitled to exercise a collection of rights in every country that has appropriate legislation in place and for different types of usage, including public performance, mechanical reproduction, synchronization, and increasingly electronic distribution. The result has been the creation of a vast network of contractual relationships between creators, music publishers, agencies, and rights societies.

Many composers and authors assign their rights to music publishers who create complex assignments of rights to their catalog of works with subpublishers on a territorial basis; this can often result in a matrix of agreements between different publishers. But it is important to understand that they can only subpublish the rights that they themselves have been assigned by a composer and author, taking into account any territorial restrictions.

It is standard practice for composers and authors to assign their performing right to a music rights society as part of their membership agreement with the society administering the rights on their behalf. A similar practice exists for mechanical rights, although there are exceptions. For example, in the U.K. and U.S. composers and authors can appoint either the Mechanical-Copyright Protection Society or the Harry Fox Agency as their representing agents for licensing musical works and collecting royalties, without having to assign their mechanical right.

The nature of the rights that composers and publishers assign is frequently related to the manner in which musical works will be commercially exploited. Therefore rights may be assigned for a collection of ten musical works on a sound recording product, on the sound track of a film, or within the context of a library music catalog for dubbing as background music. In other cases, in return for an advance payment that can later be recouped by the publisher, they may choose to make an exclusive assignment of rights with a music publisher over a specified period of time for all their works, past, present, and future.

In the future global electronic commerce may reshape the nature of these assignments. However, there will always be a need, for as long as copyright is provided for by national legislation, to account for the many historical agreements concluded in times when public performance and physical distribution were the predominant mechanism for the expression of musical works. Rights management systems must therefore account for not only the new and possibly simpler requirements for rights clearance, but they must also be capable of managing and interpreting the complex historical matrix of rights assignments and licenses.

It is also relevant within the context of new multimedia packages to consider the implications for the rights for textual content. This is significant because in most areas of trade publishing authors only grant licenses to publishers, usually retaining all rights except volume and electronic text rights for verbatim reproduction. All other rights such as film, adaptation, and compilation rights are not licensed to the publisher.

It follows that it will be quite possible in the networked environment of the future that owners of rights will be interested in trading them independently of publishers, agents, societies, and other intermediaries. Therefore some mechanism for expressing these rights throughout the value chain is necessary. It is assumed that this rights information will be expressed in some kind of machine-readable language. In the next section we will examine how current technology standards have started to emerge to meet this challenge.

INFORMATION MANAGEMENT STANDARDS FOR THE MUSIC INDUSTRY

All rights management systems require well-formed metadata (data about data). INDECS (see www.indecs.com) specifies a well-formed metadata system to be multimedia, multifunctional, multilevel, multilingual, multinational, and multiplatform. The ability to accurately identify and describe content, rights, and relationships between rights holders is an essential requirement if network-based intellectual property trading is to become commercially viable. Therefore, with this objective in mind the music industry has become heavily preoccupied in the development of new identification and description standards.

MPEG-21 Multimedia Framework

The origins of the Moving Picture Experts Group (MPEG, or more formally, Working Group 11 of the Joint Technical Committee created between the International Organization for Standardization and the International Electrotechnical Committee) have traditionally been rooted in the development of audio and visual encoding standards for representing content. However, its area of focus over the years since its inception in 1988 has expanded to encompass the tools required to enable the search and retrieval of audiovisual content. This has recently resulted in the first version of the MPEG-7 standard for content description. But MPEG experts realized that achieving the ultimate goal of interoperability of content across all networks and devices would require a wider vision.

Probably one of the most significant standards activities to have emerged to facilitate this expansion in the last two years is the MPEG-21 multimedia framework standard. It is widely recognized that a framework is required to support new types of multimedia usage. The architects of such a framework must share a common vision to ensure that the systems delivering multimedia content are interoperable and that transactions are simplified and, if possible, automated. This applies to the infrastructure requirements for content delivery, security, identification, and description, and to rights management, secure payments, and the technologies enabling them. Experts from the music industry have become regular participants in the development of the MPEG-21 standard. Its specifications are likely to provide the foundation to many of the new rights management systems of the future. For more information on MPEG see http://mpeg.telecomitalialab.com.

Existing business models for trading physical goods are being overtaken by new models for distributing and trading digital content electronically. Indeed it is becoming increasingly difficult to separate the different

intellectual property rights that are associated with multimedia content from the content itself. For example, in the music industry the boundaries between the delivery of audio sound (music and spoken word), accompanying artwork (graphics), text (lyrics), video (visual), and synthetic (computer generated) spaces will become increasingly blurred. New solutions are required to manage the delivery process of these different content types in an integrated and harmonized way while keeping it entirely transparent to users of multimedia services.

A technical report—ISO/IEC TR 21000-1:2001(E) Part 1: Vision, Technologies and Strategy—describes the multimedia framework and its architectural elements together with the functional requirements for their specification. The title of the report describes its scope: define a vision for a multimedia framework to enable transparent and augmented use of multimedia resources across a wide range of networks and devices to meet the needs of all users; achieve the integration of components and standards to facilitate harmonization of technologies for the creation, management, transport, manipulation, distribution, and consumption of digital items; define a strategy for achieving a multimedia framework by the development of specifications and standards based on well-defined functional requirements through collaboration with other bodies. Based on the proposals and recommendations contained in the technical report, MPEG-21 has established a work plan for future standardization.

Introducing the MPEG-21 Digital Item

If the record industry is to extend its business into new network-based markets, it has to overcome a major challenge: devise an equivalent electronic-content package to existing trade units that have been successful for physical commerce, such as music cassettes, CDs, and DVDs. This same challenge faces any party that has a requirement to manage a collection of media and other assets within a single packaging construct suitable for trade or free distribution across networks that can be interpreted by terminal devices and software clients. For this purpose MPEG-21 has defined the digital item. Within MPEG-21 a digital item is defined as a structured digital object with a standard representation, identification, and description within the MPEG-21 framework. This entity is also the fundamental unit of distribution and transaction within this framework.

MPEG-21's first technical specification will soon finalize what is known as a digital item declaration. The declaration provides a format for representing digital items using a standard scheme expressed in XML. MPEG experts are also exploring the requirements for an MPEG-21 file format and understanding how this might differ from file formats specified in earlier MPEG standards.

Digital Item Identification

The scope of Part 3 of the MPEG-21 standard addresses Digital Item Identification. Digital Items will be identified in the future based on the Uniform Resource Identifier syntax [IETF RFC 2396, Uniform Resource Identifiers (URI): Generic syntax, 1988) as well as their component parts using existing identification systems, such as ISRC. Digital Item Identification also specifies how description schemes for Digital Items can be uniquely identified, either through an XML namespace identifier (W3C, XML Schema – Part 1 Structures, 2001) or, for nonXML-based description schemes, by a URI or other unique namespace identifier. The specification also proposes how a resolution service (such as the Domain Name System) can be used to link identifiers to related entities including metadata and other Digital Items.

A number of requirements related to identification within the scope of MPEG-21 fall outside of Part 3 and may themselves be candidates for future specification. One such example is the requirement to identify users, including value-chain participants. Users are defined as any entity that interacts in the MPEG-21 environment or makes use of a Digital Item. Such users include individuals, consumers, communities, organizations, corporations, consortia, governments, and other standards bodies and initiatives around the world. In order to effectively control how rights expressions are associated with content as it passes down the value chain, it will be necessary to identify the value-chain participants who are setting permissions. While there are many proprietary initiatives to develop identification systems for different communities of users, no international effort has as yet been initiated to address this requirement. It is appropriate to consider, within the scope of its specifications to support an integrated multimedia framework, whether this is an activity in which MPEG should take a lead.

Rights Data Dictionary and Rights Expression Language

The timing of the specification by MPEG of a Rights Data Dictionary (RDD) and a Rights Expression Language (REL)—Parts 6 and 5, respectively, of the MPEG-21 standard—has been opportune. Rights holders and their representatives have been struggling over the last few years to comprehend the impact from the electronic trading of intellectual property and how to construct an environment in which these rights can be traded in a secure environment. Many DRM products are being developed and marketed to rights holders as potential solutions to manage and protect content securely. In parallel with this MPEG has been developing standards to address what the users of content recognize to be the overriding requirement in this space, which is a single and interoperable solution for intellectual property management and protection.

A Rights Data Dictionary and Rights Expression Language are two of the fundamental tools that are necessary to support such an approach. The media industries require a set of common terms for describing rights, rights holders, and the relationships they construct with other parties for the assignment and licensing of rights. Without such common terms being easily interpreted by the rights-holder communities, interoperability will remain an unattainable goal and the benefits from the replacement of today's manual workflow processes with automated ➥

transaction processing will never be achieved.

MPEG has provided the necessary catalyst to engage the interest of rights holders across the creative communities. Earlier attempts to develop the platform for the construction of a Rights Data Dictionary and Rights Expression Language, in particular the framework proposed by Indecs (see "Interoperability of Data in E-Commerce Systems" at www.indecs.org), provide an important cornerstone on which future work can be based. Most important, it offers the developers of DRM systems an opportunity to understand that without codifying the rights that relate to any given piece of intellectual property at the point of creation it is impossible to accurately express the rules for its use to the parties involved downstream in the delivery chain.

Current DRM application developments generally take account of the expression of permissions from the point at which content is produced and packaged for distribution. While this is quite adequate where the ultimate rights holder is the vendor using the DRM system, it takes no account of a situation where the vendor does not hold all the rights. The MPEG RDD and REL specifications will enable permissions to be associated with intellectual property from the point of its creation as well as any subsequent constraints imposed by other parties in the value chain.

To enable DRM systems to become useful management tools for all participants in the rights and permissions chain, it is essential that they are designed to support what some people are now calling elaborate rights. This concept will enable the implementation of many different types of business models, including viral marketing and super distribution, by providing the tools to manage complex rights structures to ensure that upstream rights holders (creators, publishers, producers, performers, and various rights-holder representatives) are able to exert their control down the chain. Today this process can be seen to some extent in the way rights societies work. For instance users are able to obtain permission from one society to use content across a number of countries by relying on the bilateral agreements that it has agreed to with the rights societies in those countries. Rights holders are then compensated for the use of the content by virtue of the same cross-border bilateral agreements.

In the digital environment, however, the manual licensing processes that rights societies currently operate to grant permission for use within the boundaries of the rights that have been assigned will no longer be practical. DRM systems will therefore be required to support the management of automated rights clearance processes running on networks. In addition these processes will have to manage similar but enormously enhanced capabilities to support the current and future business models that are envisioned. For instance the processes will have to make it possible to know where rights holders are, how their contracts are formed, what those contracts say about how the content they control can be used, and how they can be remunerated. This will require a complex language equipped with a dictionary containing terms that can be constructed to express rights and contractual arrangements and still be understood by data-processing systems.

Persistent Association of Identification and Description with Content

An important requirement of the MPEG-21 multimedia framework is to enable the persistent association of identification and description with Digital Items and their component parts. This will help to achieve the critical link between pieces of information about the content, the environment which stores the related descriptive information, current rights holders, license conditions, and enforcement mechanisms to provide secure commerce transactions. The association of an identifier with digital content must be both persistent and resistant to attack and removal. Digital content can and will be modified, whether legitimately or not, and so the persistence of association between identifiers and content is a critical requirement.

MPEG issued a call for requirements at its 59th meeting in 2002 March, inviting the submission of requirements for the persistent association of identification and description with Digital Items. While MPEG has identified the need for such persistent association of identification and description, this call allows MPEG to consider further standardization requirements. Responses to the call are due to be processed prior to and during the 61st MPEG meeting in 2002 July.

The starting point for defining the requirements for the persistent association of identifiers requires an understanding of the law and the new legislation that is starting to be introduced to protect against the removal of rights management information. The signatories to the World Intellectual Property Organization (WIPO) Copyright Treaty of 1996 have accepted a framework for introducing national legislation to provide the owners and distributors of digital content with legal protection in a number of areas. As well as the provision of legal recourse in circumstances where identifiers and other rights management information are removed or altered without authority, WIPO prescribes against the circumvention of content protection technologies. The effectiveness of these provisions, however, will depend entirely on how these principles can be harmonized with the legislation to be introduced by different national governments. Following a period of consultation the European Parliament published Directive 2001/29/EC to ensure that harmonization can at least be achieved between EC member states. Each member state is subsequently discussing how its national legislation will need to change in order to conform to the directive.

In view of these issues it is interesting to consider the technical implications that might be required of a standard such as MPEG-21 to uphold the principles of the WIPO Treaty and the European Parliament directive. Technology solutions to help prevent the removal of identifiers and other rights management information from digital content are under development, but their effectiveness is still largely unproven in widespread commercial applications. It is hoped and expected that MPEG-21's call for requirements will help to further our understanding

in this important area and result in technological advancement and standardization where it is appropriate.

Music Industry Integrated Identifiers Project

It may be possible in the future for automated message transactions to be generated between record companies, music rights societies, retailers, and other business partners to communicate and exchange key information about their business relationships. Such a world will need standardized information about releases, licenses, sound recordings, musical works, and the relationships between these entities.

The Recording Industry Association of America (RIAA) and the International Federation of the Phonographic Industry (IFPI) commissioned a project in 2000 September with the goal of developing an integrated approach to the identification systems deployed by the key stakeholders in the record industry. The objective was to develop a proposal for a new system to identify releases of sound recordings for electronic distribution. The music rights societies, represented by CISAC and BIEM (Bureau International des Sociétés Gérant les Droits d'enregistrement et de Reproduction Mécanique), joined the project in 2001 January, thus broadening the project to take account of their requirements for the identification of the licenses that will be associated with releases and the musical works to which those licenses refer. The project has also attempted to take into account the requirements of many other participants in the music industry including retailers, electronic-music distributors, the providers of digital rights management services, and information management specialists. A framework was therefore established for conducting a global music industry project. The project is ongoing, and results are not yet available for public dissemination.

The project is addressing several issues relating to the identification and description of music-related products in the online environment. Information will have to be exchanged electronically with a growing number of organizations; without some standardization this could result in the adoption of disparate and incompatible data formats. The current format and definition of the EAN/UPC number is unlikely to be sufficient as a product-identification system for electronic music delivery.

Throughout the music industry there is a considerable amount of duplication of nonstandard information-based processes, such as information management, metadata interpretation, cross-referencing of proprietary identifiers, resource discovery, and manual identification.

Current information sources are both fragmented and of variable quality with no coordinated governance and control. These incompatible systems, each with separate access methods and protocols, can hamper information exchange and encourage storage duplication.

The lack of a standardized means of classifying and describing the information required to support common business processes makes it difficult to develop an industry standard for electronic-data interchange.

Current identification schemes do not provide mechanisms for easily linking music products with their associated licenses, which are necessary to facilitate rights clearance and trade. The combined identification of release and license could be a very effective way of distinguishing between legitimate and illegitimate products in the online environment.

Aims of the Project

The primary aim of the Music Industry Integrated Identifiers Project is to develop a new system for the unique identification and description of releases (the record industry's "fundamental unit of transaction for trade") and licenses associated with the releases issued by music rights societies. These new identification systems must be capable of integrating with the existing and future identification systems employed by the music industry. This has been achieved in a number of ways. First by the development of a scheme that supports the description of a release, license, asset, and work. An asset is a digital representation of a sound recording, graphic image, or any other media form. A work is an abstraction such as a musical or textual work. The scheme allows for the application of existing identification standards such as EAN/UPC, ISRC, and ISWC.

Second, it accommodates a host of proprietary identification schemes that are used by different organizations in different countries for the identification of physical products, the parties associated with those products, and the identifiers of different business partners. Third, it demonstrates how the principle message-transaction formats in use across the music industry can be interoperable with the description scheme produced by the project. Fourth, the ability to declare the use of different metadata namespaces within the dictionary allows for the introduction of terms already widely used by many communities where additional granularity of description is required.

The requirements of the music rights societies are crucial, as the new system must enable them to determine all the musical works and licenses associated with a release. The requirement to identify the component assets contained in a release also extends to the rights holders of other media types, such as text, images, video, and software, all of which are likely to be featured in future digital-music products.

The principle output from the first phase of the project is a functional design specification for an integrated identification and description system that can be used for EMD releases. This includes a set of recommendations for existing technology and information systems that can be incorporated as part of a future implementation phase.

The main components of the system design are: a specification for the release identifier syntax and the rules for its assignment and presentation; a specification for the license identifier syntax and the rules for its assignment and presentation; and a specification for a modular description scheme, which relates to the release identifier and license identifier.

This scheme will be designed to interoperate with other identification and information management systems that are already in use including the International Standard Recording Code (ISRC) and the International Standard Musical Work Code (ISWC). The ➥

goal is for the scheme to become the basis for standardizing description across the music industry to support message transactions between record companies, music rights societies, and their business partners.

The second phase of the project, which started in March, concentrates on the governance and operation of the design specification and preparation leading to its full implementation.

Identification and Description Requirements

The Indecs framework recognizes four guiding principles for the development of robust identification and description systems to support electronic commerce. Two of these have particular relevance to the creation of an information infrastructure, such as that under development in the Music Industry Integrated Identifiers Project, so it is appropriate to present them in this context.

The first principle is that every entity should be uniquely identified within an identified namespace. In the multimedia online environment the need for unique identification of a range of entities becomes increasingly important as does the need for interoperability between identifiers. For interoperability the most important properties of an identifier are uniqueness within a domain; stability (identifiers should never be changed or transferred); security, whether through protection by watermarking or encryption or by internal consistency through the use of check digit algorithms; and the availability somewhere of some basic descriptive metadata for the entity identified, without which the identifier has only limited use.

Within the music industry two such identification standards exist that are fundamental to the information infrastructure the industry needs to increasingly automate its content and rights management processes. The International Standard Recording Code (ISO 3901) provides the recording industry with a unique identifier for sound recordings that can be applied to appear on record-industry documentation, including label copy and licensing contracts, to support sound-recording rights administration (including electronic rights management), be encoded into digital-sound carriers that can be readable by consumer electronics hardware equipment, and automate the reporting of music usage by broadcasters.

The International Standard Musical Work Code (ISO 15707) provides the music rights societies with a key component of the information architecture being developed as part of their Common Information System plan, coordinated by CISAC. The standard specifies a minimum set of metadata that must be registered with an ISWC. This includes information about the title of a musical work and its creators (composers and authors) who must be identified using their applicable CAE/IPI number. This number is derived from the Interested Party Information System (formally the CAE file). This is an international register containing all the names of rights holders (natural and legal persons) of copyright protected works and public domain works, registered with the IPI Centre. The data it contains serves the documentation, distribution, and accounting work of the societies linked to the IPI System, which is administered by the Swiss copyright society SUISA.

It is likely, and indeed intended, that within the databases of music organizations ISRC numbers will be linked to an ISWC to establish the relationship between sound recordings of musical works.

Access to Information

Given the multitude of transaction relationships that exist within the music industry, another of the Indecs framework principles is also relevant. This states that for interoperability of information systems it is important that everyone requires access to the metadata on which they depend and privacy and confidentiality for their own metadata from those who are not dependent on it. In the increasingly distributed rights management environment that the Internet presents to the music industry, metadata has to be accessible where it is needed. The industry will need to agree on the amount of information that it is appropriate to make available to individuals and organizations in a given context in order to carry out their business. This is indeed a highly complex matter that is most likely to be addressed and resolved between concerned parties by negotiation at both an individual and industry level.

Opportunities for Creating an Authoritative Association Between Information Entities

The music rights societies and the record companies depend upon their ability to accurately identify musical works and sound recordings for license and release. Both parties incur significant costs from the business processes associated with the task of uniquely identifying a musical work and a sound recording whenever music is "used." Within the databases of many music-industry organizations, sound-recording information is linked to musical-work information to enable identification. However, accurate identification is frequently not achieved due to the lack of standard identification systems and inconsistent descriptive metadata. In the future it is expected that this will progressively be improved by release identifiers being linked to license identifiers and ISRCs being linked to ISWCs to establish the relationship between sound recordings and musical works.

A major benefit for record companies and societies that can be derived through the implementation of the design specification produced by the Music Industry Integrated Identifiers Project would be to formalize music-industry practices for creating authoritative associations between releases and licenses and sound recordings and musical works. The term authoritative is used here to emphasize the importance of the association between these information entities being made as close to the source as possible by the individuals and organizations that have the authority to decide which recordings are related to which works.

PUTTING IT ALL TOGETHER

This article has examined a number of developments that each have direct relevance to the music industry to ensure the continued viability of music-related commerce. Much of this is focused toward electronic network-based commerce that is widely regarded as becoming the major trading environment in the future for the provision of con-

sumer-oriented media entertainment services. Separately, each of the developments described here for providing new information management standards seems very reasonable and worth supporting. The question remains, however, how will they interrelate with each other to provide a homogenous framework on which commerce can be conducted?

Information management standards alone cannot be responsible for the development of new markets. They can, however, enable new models for trade from which new markets can develop. This is particularly true if you imagine a situation where the acquisition of the right to consume content across a network is separated from the delivery of the content itself. A greater dependency on integrated identification systems and the resolution of identifiers to descriptive metadata about content and the environment in which content will be used, value-chain participants, usage permissions, and the content itself could result in a far more efficient and satisfactory consumer experience. While peer-to-peer trading models are hardly a new concept, the lack of core information management standards to provide the foundation for such a commerce model has prevented its growth and development.

The predicted future increase in the volume of transactions to be conducted electronically by consumers combined with frequency of use, ease of digital reproduction, and low cost, demands greater efficiency in the management of rights. Tools to enable the persistent association of identifiers with content will become essential in order to facilitate automated procedures for monitoring and tracking both legal and fraudulent usage.

CONCLUSION

The intent here has been to place music copyright in the context of the digital environment, identify the requirements for change to effectively manage and protect the interests of rights holders, and where possible suggest how this change might be implemented. Many of the issues raised are not new and by and large are becoming widely recognized. The Secure Digital Music Initiative, while deliberately not discussed in this article, is an example of the high priority given to the collective efforts of content rights holders and consumer-electronic and software-technology companies to devise new and effective solutions to meet consumer expectations while respecting rights.

The many possibilities for marketing music in a digital form have made it a primary commodity in the evolution of Internet trade. At a time when so much investment is being made in land-based, mobile, and satellite communication methods, music is also a relatively easy option for content solutions. Music can be used in many different ways and in the long term the question must be asked whether, as a consequence of the ubiquity of networks, is the communication method relevant at all? Surely it is just the means of exploitation that is all-important. Analysis of new business models and potential revenue streams is an area of major importance to rights holders as they continue to resolve the conundrum of consumer demand, commercial reward, and effective rights management and protection.

The Author

Keith Hill has over 16 years experience in the field of intellectual property information management. He worked for U.K. music rights societies MCPS and PRS where he developed an extensive knowledge of the identification and registration processes of musical works, writers, publishers, and their contractual relationships. He has extensive experience as a business systems analyst developing information management systems to support the workflow processes of rights holders.

Mr. Hill has contributed to the major standards activities related to management and protection of intellectual property. He chaired the requirements working group within the Secure Digital Music Initiative, and has been a long-standing contributor to the development of identification systems for rights holders. He currently chairs the U.K. national standards committee that votes on the adoption of identification standards produced by ISO-TC46-SC9.

He was a primary contributor to the launch of MPEG-21 in 1999 and continues to play a leading role to define standards that enable the secure delivery of content within a multimedia framework. In 2000 January he became a founding partner in Rightscom, a strategy consultancy for digital content.