

Negotiation of copyright in e-commerce of multimedia publishing material

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Abstract. Intellectual Property Rights (IPR) management in e-publishing is becoming a key issue for its full deployment. There is a real and urgent need to solve the problems associated with multimedia content copyright control that the spreading of the Internet and the WWW has created. Although many technical solutions to the problems already exist, there is still a lack of an efficient and agreed business model for e-commerce of e-publishing. Apart from introducing copyright information in the content to sell, there are other new specific needs related to IPR management in e-publishing. One of them is the possibility of negotiating the copyright conditions when buying multimedia material. This material could be directly bought by end-users, or, more interesting, by other publishers. An example of this situation could be the negotiation between an intellectual rights holder and a prospective publisher. In the paper, we present a specific approach to this IPR need, which is based on the use of metadata for representing IPR features, and on the specification of a protocol for negotiation of copyright at the purchase moment. Furthermore, the paper introduces the issues associated to IPR negotiation in a multi-broker environment.

0. Introduction

The paper is about the issue of Intellectual Property Rights (IPR), its representation, its negotiation and its use in e-business in the area of e-publishing. We concentrate on selling and distributing multimedia publishing material (mainly video information) using an intermediary or broker.

Apart from introducing copyright information in the content to sell, and from encrypting the content when considered necessary, there are other new specific needs related to IPR management in e-publishing. One of them, also related to the business models to follow, is the possibility of negotiating the copyright conditions when buying multimedia material. An example of this situation could be the negotiation between an intellectual rights holder and a prospective publisher.

In the paper, we present a specific approach to this IPR need. Our approach is based, first, on the use of metadata for representing IPR features, and, second, on the specification of a protocol for negotiation of copyright at the purchase moment.

It should be also noted that we assume that the multimedia material to be managed has some watermarking that helps to identify it. We do not worry about how this is generated, verified and extracted, and we also assume that is strong enough to be kept during manipulation, as it is normally the case. So our focus is on the two previous points.

Although our model is based, as introduced in section 3, on the existence of a broker to which users make requests, and that negotiates IPR conditions on behalf of a content provider, the final part of the paper introduces the issues associated to the extension of our single-broker model to a multi-broker one.

1. Intellectual Property Rights (IPR)

Intellectual Property Rights (IPR) are legal instruments that provide a limited monopolistic right to the owner of things such as patents, trademarks or copyrighted works. They provide an incentive for the creation of and investment in new works (music, films, print media, software, performances, broadcasts, etc.) and their exploitation, thereby contributing to improved competitiveness, employment and innovation.

This description is based on the Berne Convention [1] and the WIPO Copyright Treaty [2]. It is, as the sources state, broad enough to ensure international applicability. There are local initiatives to implement these recommendations, as the EC Directive on Copyright [3] or the US Digital Millennium Copyright Act [4].

In the context of copyrighted works, IPR includes author's rights, which will be referred to later, *sui generis* rights (applicable for databases) and neighbouring rights (especially concerning artist-interpreters).

1.1 Author's rights (copyright)

All these rights are automatically given to originators of works (creators) by the simple fact of their authorship. They include:

- **Moral rights**

Independent of the author's economic rights, and even after their transfer, the author has the following rights:

- Dissemination Right: Exclusive right to disclose the work.
- Paternity Right: Exclusive right to claim authorship of the work.
- Respect Right: Exclusive right to object to any modification to the work prejudicial to his reputation.
- Withdrawal Right: Exclusive right to withdraw the work.

- **Exploitation rights (economic rights)**

Oriented to guarantee financial profit to originators of works. They include:

- Reproduction Right: Exclusive right to authorise the reproduction, direct and indirect, permanent or temporary, in any manner or form.
- Communication to the Public Right: Exclusive right for the authorization of any communication to the public of their works. These includes that members of the public may access them from a place and at a time individually chosen by them. Examples are: public performance, broadcasting, interactive on-demand transmission, etc.
- Distribution Right: Exclusive right to authorize the making available to the public of the original or copies of the work by sale or other transfer of ownership. Relevant only to tangible objects.

2. Business Models

The Intellectual Property Rights (IPR) management in e-publishing is becoming a key issue for the full deployment of publishing in electronic commerce. The issue includes both copyright protection and the so-called Electronic Copyright Management Systems (ECMS).

Although in text-based creations things are not going so fast, the work in this area is strongly increasing when the published material has any multimedia-based content. This is because there is a real and urgent need to solve the problems of multimedia content copyright control that the spreading of the Internet and the WWW has created. There are different European projects related to IPR management like IMPRIMATUR [5], INDECS [6], COPEARMS [7], FILIGRANE [8], etc. that are good starting points.

Although many technical solutions to the problems already exist, there is still a lack of an efficient and agreed business model for e-commerce of e-publishing. Several solutions are being deployed, mainly in the area of music distribution, such as Soundwrap [9], DMDsecure [10], or DX3 [11], but none of them has succeeded as a model to follow.

Concerning selling of publishing material (books or e-books) on the Web, there are some initiatives that have IPR again as a key issue.

E-books are mainly sold from e-publishers and bookseller sites (a special case is selling directly by the author, like Stephen King's experience [12]). Some downloadable e-books are sold with specific viewing software, others use rather standard software. Sometimes, the term e-book refers only to those that are stored and read in specific hardware, not in standard computers.

With respect to copyright protection, publishers need to ensure that once an e-book has been purchased, it is not possible to be copied again. One simple schema is to encrypt each e-book so it can only be decrypted by the reader for which it was purchased.

There are different initiatives to digital rights management in e-books, such as EBX [13] and OEBF [14], and some XML based ones, such as XrML [15].

2.1 A model for IPR information representation

In order to deal with IPR, we have first to select a model in which to base IPR representation and negotiation. We have selected the IMPRIMATUR Business Model [5], which identifies a series of entities that may take different roles, such as Creator, Provider, Rights Holder, Distributor, IPR Data Base, or Watermarking & Fingerprint marking.

We are applying this model to an environment that consists on the use of a Broker (with the role of Distributor) in charge of being an intermediary between providers of multimedia publishing material (content providers) and the customers interested in buying that material and the corresponding rights for use and/or commercial exploitation. From a functional point of view, these copyrighted multimedia material providers may also assume the roles of Creator and Rights Holders in the same entity.

Furthermore, the broker stores and keeps up to date (with the help of content providers) the information about the multimedia material for sale in the system (from all content providers associated to the broker), and about the terms and conditions in which commercial electronic transactions are done, with the help of the IPR Database. Figure 1 illustrates this broker-based IPR model.

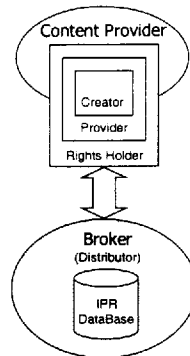


Figure 1. Broker based IPR Model

3. Use of metadata for IPR information representation

For managing IPR information, we need to represent it in some way. We have chosen a solution based on the use of metadata. A lot of work is going on in the area of metadata, from the widely used Dublin Core [16] to the MPEG7 standard [17] for audiovisual material. Our work is based on the alignment efforts we started in the context of an European CEN/ISSS Workshop [18], and on the work going on in the INDECS project [6], that focuses on metadata for IPR. We are currently implementing this solution in different projects, from brokerage of audiovisual material (in the HYPERMEDIA Project [19]), to broadband multimedia applications (the MARS Project [20]).

Basically, we use two kinds of metadata: general and IPR. General metadata, on the one hand, includes title, author(s), kind of publishing material, size, and other management attributes; and technical information, such as resolution, colour or shape. On the other hand, IPR metadata includes mark/no-mark, kind of mark, information associated to the mark (for further verification), rights owner, kind of rights, rights status and limits, etc.

This model just introduced has been implemented with RDF [21], extending the fundamental modelling concepts provided by the “RDF model and syntax” [22] and the “RDF schema” [23]. The schema utilisation policy of this framework allows the creation of a very flexible representation, not tied to any concrete initiative of metadata creation.

As said before, our system is based on a broker agent that is trusted by the content providers and the buyers (normally business users). It includes a database with references to the publishing material to sell. Since our implementation is focussing on video material, the multimedia metadata (information about the content to sell) stored in the broker can be divided in two types according to its use. First, there are video descriptive attributes (descriptive metadata) used to facilitate that the user locates the audio-visual material he’s interested in. The second type encloses the part of the model concerned with intellectual property rights representation (IPR metadata). This information is structured following a metadata model that we have developed based on existing ones.

To start developing from a solid basis, the model has been constructed over INDECS basic model. This provides the general concepts that allow non-traumatic extensibility and a great adaptability to concrete and changing environments.

The descriptive metadata subset includes all those audio-visual material properties that permit the easy and rapid localisation of the audio-visual material needed. These properties can be packaged inside RDF schemes. A more detailed description of our metadata approach is given in [24].

The graphic representation of the kernel sub-phase of this IPR negotiation protocol is given in Figure 2. More technical details are given in [26].

Accepting the offer is to accept a proposed clause of a contract (to add this entity to the list of entities who agree with this clause), making a counter-proposal is to add a new clause to the contract and rejecting the proposal is to remove the clause from the contract.

This “game” of proposals and counter-proposals could be extended under some rules (Negotiation Protocol). The negotiation is done through the broker, who has the unique legal copy of the contract. When the contract negotiation is finished, the broker generates the legal copy of the contract (Signed contract) and sends a copy of the contract to the entities involved.

Finally, although the rights negotiation protocol concludes when a proposal is eventually accepted or rejected, the IPR-related protocols continue in the context of the e-commerce “Post-Agreement” phase [25], that includes one step called “Post-negotiation”, where the contract is executed and the fulfilment of the agreements in the contract is verified, following some workflow rules. It is in this “Post-negotiation” phase where the agent technology, which we are using for the implementation of the negotiation protocol, plays an important role (see [24]).

4.1 IPR contracts

Initially, the creator (writer, composer, actor, software programmer, etc.) of a work is holder of all the rights over it. Authors may not have the economic power to exploit their creations in an effective way. In such cases some or all exploitation rights can be transferred to publishers/producers specialized on this task.

This can be formalised in **author’s contracts**. By them, publisher/producer becomes the exploitation rights holder of the work (Rights Holder). As a counterpart, the originator will receive royalties for the benefits derived from the exploitation of the work or/and initial fix revenue.

Publishers/producers do not usually have direct contact with end-users. They commercialise works to distributors (bookshops, libraries, Internet site providers, broadcasting companies, etc.), entities specialized in acquiring part of the rights of copyrighted works that allow them to satisfy final users demand of these works. Distributors may also encapsulate works with some services that facilitate this consumption, the added value they provide to the creations. Formalization of these agreements is made through **distribution contracts**, that may transfer some constrained exploitation rights or be mere licenses allowing the required actions to complete the commercialisation to end-users.

Finally, through distributors, copyrighted works arrive to their consumers. End-users acquire the right to access and use them by **purchase contracts**. These use rights may operate within the framework established in the distribution contract with the publisher/producer. The income distributor receives derived from these purchases will be also distributed, in a cascade manner accordingly to the royalties established in the different contracts so far, to publishers/producers and originators implied in the elaboration of the final product acquired by the consumer.

To ensure that fair economic returns arrive to authors and publishers/producers they can become members of collecting societies. These control the exercise of representation and reproduction rights of some types of intellectual works to enforce proper remuneration to their members.

4.2 An electronic IPR contract

Independently from the kind of contract agreed by means of the negotiation protocol already described, once an agreement is reached, there is a need to produce a contract to formalise the agreement. In the following paragraphs, we describe how to specify an electronic contract for this formalisation.

As already introduced, by IPR negotiation we mean the process in which, at purchase time, the buyer of some multimedia content and the rights owner (or his representative) negotiate the conditions (concerning rights) in which that material is sold. This process, run through a protocol with some interchange of information, is equivalent to creating an electronic contract. It could also be seen as a joint editing of a structured document (the contract), following pre-specified alternative rules.

The electronic contract, that should be electronically signed, has two parts:

- **Mandatory part:** It contains the minimum information necessary to formalise an electronic contract.
- **Optional part:** It contains optional information related to any kind of contract.

The mandatory part includes the following information:

- **Type:** To identify the kind of contract
- **ContractSerialNumber:** Contract unique identifier
- **SignatureInformation:** Information related to the signature of the contract
- **NegotiationList:** List of entities who participate in the negotiation of the contract
- **Broker:** Identification of the broker who has the TTP role
- **Validity:** Validity range of the contract

The optional part is a sequence of contract clauses. Every contract clause includes the following information:

- **IdentifierContractClause:** Clause unique identification
- **Material:** Multimedia material affected by this clause
- **Right:** Kind of right affected by this clause (right transfer, etc.)
- **AgreeList:** List of entities who agree with this clause
- **Obligations&FallsList:** List of obligations and associated punish actions
- **PaymentInformation:** Payment information involved with this clause
- **ClauseDescription:** Text description of the clause

5. A Multi-Broker Model

The second step of our work consists on the extension of the single-broker model to a multi-broker environment. In this case, it is necessary to add a protocol between brokers (broker-broker) able to allow a broker to sell publishing material that is managed by a different broker. Remember that our broker model is based on the fact that content providers give metadata information to brokers (while keeping the multimedia content in the provider's database) allowing them to sell their material to broker's customers.

Thus, apart from handling the broker-broker communication for selling purposes, this new broker-broker protocol also needs to be able to handle all copyright related issues, when IPR is associated to the multimedia material. *Figure 3* represents this new model.

Basically, what we have to do is to add extra functionality to the system with an operation able to update IPR information included in the broker's database. With this, it is possible for one broker to sell material managed by another broker. Then, the IPR information should normally be stored and updated in the responsible broker, not in the broker that is selling the content. Hence the need for this new functionality.

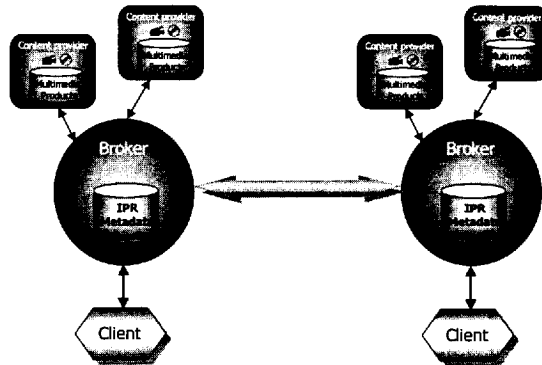


Figure 3. Multi-Broker Model

We are implementing this new feature with agents technology [27]. In this way, we can keep the information always in the system responsible for the publishing content and we can be sure that the information is always updated.

While the negotiation and contract preparation steps belong to the agreement phase in an e-commerce environment [25], this IPR information updating through a broker-broker protocol clearly belongs to a post-agreement phase [25].

In the multi-broker model we have two kinds of contracts: client-broker and broker-broker. The negotiation between brokers takes place when a broker is not able to provide publishing material requested by one of its customers, and has to look for the content in other places (we do not enter in the issue of how to find this external information, but the mechanism could be as simple as having the broker acting as a customer of another broker). In this case, the original client's broker has to negotiate with the content-owner's broker and produce a broker-broker contract to be able to sell the material to its customer, then producing a second contract, in this case a client-broker one. Figure 4 illustrates this combined negotiation and contract production.

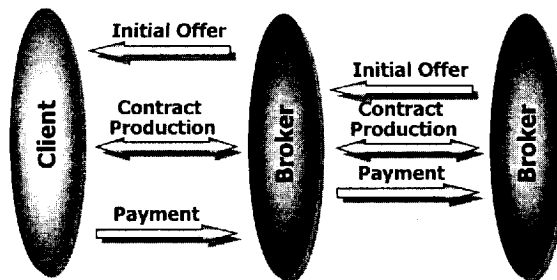


Figure 4. IPR Negotiation in a Multi-Broker Model

6. Conclusions

A business model for e-commerce of e-publishing where IPR is handled is still missing. Apart from introducing copyright information in the content to sell, there are other specific needs related to IPR management in e-publishing. One of them is the possibility of negotiating the copyright conditions when buying multimedia material.

In the paper, after introducing general issues about copyright and current business models, we have presented a specific approach for the representation and negotiation of

IPR. The representation is based on the use of metadata, by defining a structured set of attributes and an interface based on XML and RDF. This has been implemented in the MARS project, an application for e-commerce of audiovisual publishing material.

Concerning the negotiation of IPR, it is based on the specification of a protocol for the negotiation of copyright at the purchase moment. This is being implemented using agent technology. An electronic contract is also specified to formalise the agreements reached during negotiation.

Finally, the paper introduces the issues associated to IPR negotiation in a multi-broker environment. A new model with several brokers is introduced, and the needed operations, such as the update of copyright information, are identified.

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