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► **To cite this version:**

Melanie Dulong de Rosnay. An Action-Based Legal Model for Dynamic Digital Rights Expression. Dec 2006, pp. 157-162. halshs-00120011

HAL Id: halshs-00120011

<https://shs.hal.science/halshs-00120011>

Submitted on 12 Dec 2006

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An Action-Based Legal Model for Dynamic Digital Rights Expression

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Abstract. At the crossroad of law and computer science, the notion of Digital Rights Management renews the research on Lex Electronica. Rights Expression Languages provide the legal semantic and syntax to be implemented by Digital Rights Management Systems. Rights Expressions are legal metadata that define the actions led on a digital text or multimedia file. This article presents some legal resources and requirements to express rights and transactions pertaining to digital documents and data, ie legally or contractually allowed usages or actions. The proposed model associates terminological resources from technology, usages, exclusive rights and public domain. Research around this article takes place in Medialex, an interdisciplinary project aiming at building a transaction ontology to license, access and reuse.

Keywords. Digital Rights Management system (DRM), Rights Expression Language (REL), copyright, legal ontologies, Creative Commons metadata.

1. Introduction

This article is a legal contribution to Rights Expression Languages (RELs) requirements [2]. We showed in [4] that legal expression related to works sharing shall enable bi-directional communication [6]. We state that the transaction ontology to be developed should express legal constraints and rights in a dynamic manner, coping with the need to update and define a rights expression at each action led on a digital document. Indeed, actions led on a digital document or data imply either a transaction or a modification. Besides, rights expression shall be built according to copyright law granting exclusive rights to rights holders and prerogatives or fair use to end-users [4], and also to contractual users' requirements, while also matching contract law requirements. Finally, rights expression shall not be only a machine-readable formal language and a lawyer-readable contract, but also human-readable plain text, so that works users (licensors and licensees) can understand and negotiate [4] transactions licensing terms. The model presented hereafter describes the development of several terminological resources types to model actions in and on contracts, and the results from their mapping. These

resources are plural and associate concepts from DRM technologies (existing RELs categories), law (exclusive rights as positive law, public domain as implicit law) and usages (contracts standard clauses and a use case). We will demonstrate why using these specific resources provides an added value compared to other RELs methodologies, and in which extend they differ from other ontological resources of the domain in terms of accessibility, scope and legal accuracy and logic.

2. What is Digital Rights Management?

2.1. DRM systems and RELs: Technical and Architectural Norms

Digital Rights Management systems (DRMs) are software technologies aiming at restricting access or usage of digital data, or technologies embedded in hardware players for similar control purposes. DRMs are composed of several bricks including a REL. In order to support semantic interoperability between operating systems, players and other DRM tools, RELs have been standardized [9, 10] and provide syntax and semantic to express restrictions and licenses to be conveyed to the end-user through a technical information measure or implemented by a technical protection measure.

2.2. Market norms: Digital Business Management

We claim that the term « Rights » used in common language and within « DRM » can be misleading. Indeed, not legal « rights » (reproduction, distribution...) are digitally represented, but technological acts or usages (send, print...) allowed by business models. This information can be considered as an electronic contract offer. This private ordering may be unable to deal with fair use situations and suitable only to express access, copy and reuse and associated time or fee restrictions. In order to balance the influence of the market (DRM technology, data and documents transaction contracts standard clauses), we studied public interest requirements related to access to copyrighted works.

2.3. Legal and Social Norms: Open Access Usages and Creative Commons Metadata

Creative Commons [7] proposes rights information measures allowing the licensor to grant to the public additional freedoms (legal prerogatives, or grants) to traditional copyright law and usages in order to reflect public interest. The licensor may choose her licensing conditions through a cognitive user interface generating a license under three formats:

1. a license in legal language,

2. a human-readable version summarizing the conditions of usages granted by the licensor, each optional condition (Non Commercial Use, No Modification, ShareAlike or Copyleft...) is represented by a standardized semiotics,
3. legal metadata in RDF standard to tag works website or data files, this machine readable code can be further integrated in search engines, tracking, information retrieval or aggregating software applications.

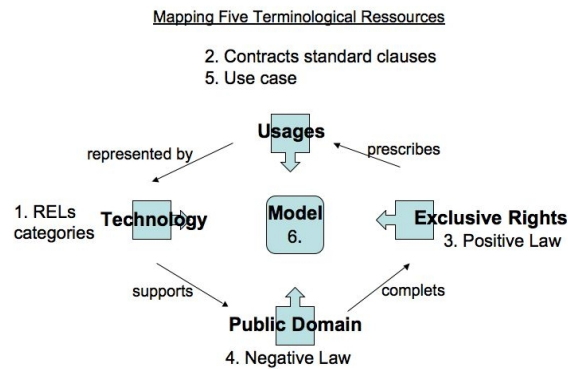
3. Terminological Material and Requirements Toward an Ontology

3.1. Action-Based Dynamic Rights Expression

We claim that attaching usage conditions to a document at the time of its creation by embedding metadata to a file format is not satisfying. Indeed, access and usage rights are defined for a given moment and a given user. Some usage conditions can be expressed by the original creator and/or the right holder at the time of the work's online divulgation; nevertheless, such a usage condition should be updated and adapted for each single situation, defined at the crossroad of an Action, a User, a Document and Conditions. Rights expressions are to be built all along the life-cycle of the digital data embedded in a document and re-configured at each action (transaction, modification...). An accurate rights expression is determined dynamically by the place and time of actions occurring on documents resulting from prior creations, modifications and transactions. RELs shall not preclude unspecified usages express access conditions to works in a descriptive ontology of technical actions.

3.2. A Network of Five Terminological Resources

Developing several ontological resources is a necessary step to qualify digital documents usages within an open access scheme, a commercial or private transaction, or a compulsory license mechanism. Five terminological pre-ontological resources have been identified as a prerequisite material to build an ontological model to express online transaction contracts on digital documents and data. The resulting model is close to a meta-ontology as its high-level classes are generic and could potentially be mapped to upper-level ontologies (such as Dolce and LRI Core). The figure below shows the intrication of the five resources of our model, described in the following sections.



3.2.1. Rights Expression Languages State of the Art (resource 1)

Instead of starting from scratch, we reused some existing RELs concepts. Indeed, some of their classes and categories reflect the implementation of license grants by a computer system (right of reproduction -> action of printing). We gathered material from several RELs, mostly MPEG-21 REL [9] and ODRL [10]. These RELs commercial transaction terms are overrepresented and were synthesized toward a clearer model, where legal and unregulated usages factors have been taken into account.

3.2.2. Core Fields in Contracts for Documents and Data Usage (resource 2)

It is important to deal with practical usages coming from both social and market norms. Identifying core fields usually represented in both paper and electronic contracts has been achieved by compiling manually a selected corpus of various contracts from different backgrounds (scientific publishing, music industry...), legal systems (civil and common law) and legal complexity (multimedia works). Clauses categorization answers requirements for copyright contracts legal validity in French legislation (“rights” extend and destination, contract grant location and duration).

3.2.3. Legal Categories for the Use of Protected Documents and Data (resource 3)

Legal texts (legislation and doctrine) have been studied to understand copyright decision-making process. Privacy and secret data are managed through simpler but similar authorization patterns. IPRonto [8] is an ontology of the REL domain which already includes positive law (WIPO international convention) and is build on actions [3, 5]. However, implicit law has not been included in this ontology.

3.2.4. Legal Categories for the Use of Unprotected Documents and Data (resource 4)

Unlike to the previous resource, ungoverned cases where no authorization is needed are left out by positive law analysis. The definition of a broad public domain (protection time expiration ie traditional public domain, document form and nature legal requirements to reach copyright protection, fair use or exceptions to exclusive rights user and usage factors, open access licenses) have been kept separated from the previous resources for two reasons:

- Legal reasons: this notion of public domain is not founded with a specific statute in positive law, but can be deduced from the absence of protection by exclusive rights and is designated as “negative” or “implicit” law (as in a photography negative);
- Architectural reasons: the statute of public domain implies that permission is already granted, there is no need to request an explicit authorization. Therefore, such situations do not require the implementation of a negotiation interface or a technical protection measure. Distinction between permission and authorization was studied in [1] and applied to normative multi-agent communities. Following this model where permission is an exception to obligation, public domain works, fair use and exceptions to exclusive rights are permissions by nature of the work, user, usage. Open Access licenses could be handled as authorizations if one considers they add an autonomous normative layer, but we think they are also permissions for multiple reasons. They are integrated in the legal system in addition of the law, and do not apply in an autonomous community only. They are applicable a priori by avoiding request before the transaction happens, and they express that the sanction foreseen in the legal system will not occur.

3.2.5. Legal Categories in National Legislations

It matters to include legal categories and requirements in RELs design so that management may respect the law and use all its combination possibilities, and not only the bricks provided by commercial business models. Beyond national implementation differences, national legislations are using similar top- level categories and rules. However, we think our model shall not be based on national legislations texts linguistic parsing results, for both legal and ontology- building reasons:

- Legal argumentation: common law fair use criteria are more difficult to be represented in information systems than civil law exceptions factors. On the one hand, DRM systems can be considered as contractual private agreements which do not have to respect all copyright fair uses, but only public order provisions. On the other hand, DRM systems have the same liberty to grant more generous provisions to the licensee than the minimal requirement provided by national exceptions. In the case

of Open Access licenses, public interest principles are implemented on a voluntary basis, even if they do not have a status of public order.

- Ontology-building argumentation: manual vs automatic ontology building methodology. We are considering the hypothesis that automatic retrieval of legislative text through language processing analysis is more adequate for information retrieval on large corpus than for decision-making application building from small corpus.

3.2.6. Modeling Actions on and (with)in Contracts (model 6)

These four (1, 2, 3, 4) resources provide the terminological material to build a synthetic model of the top-level concepts, attributes (into brackets) and basic relations needed to host most, if not all, possible Rights Expressions combinations. Assembling these bricks provides legal metadata top-level concepts and connectors, basis of electronic contracts embedded in DRMs: the contract (below 2.b) will be constituted of detailed elements belonging to one of the four other classes:

1. Actors (legal and contractual qualification)
 - a. Licensor
 - b. Licensee
2. Objects
 - a. Documents (legal, contractual and bibliographical qualification)
 - i. Works (collective, derivative...)
 - ii. Data (private, public...)
 - b. Contracts
 - i. Transfer (of "rights")
 - ii. Grant (of "rights")
 - iii. Mandate, compulsory license
 - c. Conditions
 - i. Unit (location, time, times, fee)
 - ii. Usage and targeted User
3. Actions: rules expressed by combining contract elements
 - a. Actions on the contract
 - i. Request
 - ii. Grant
 - iii. Get
 - iv. End
 - b. Actions in the contract
 - i. Permission (no need to request a contract)
 - ii. Authorization (after contract has been granted)
 - iii. Prohibition
 - iv. Requirement
 - c. Actions on the document/Usages/"Rights"
 - i. Read/Execute
 - ii. Copy/Transfer
 - iii. Modify/Manipulate

Further detailed metadata instances, to be contained in these four core classes makes it possible to express actions and, with simple relational and conditional connectors (if... then, and , or...), to build contracts which are dynamically updatable after each action:

<If the requested document is a private data (confidential information), then the licensee identity must be requested>; <If the requested action on the work is a legal exception to exclusive rights, then it is permitted according to usage and user conditions>

3.2.7. Rules Expressions and Relations Based on Logic

Automating Rights Expressions update at each action, the next step after category description, requires logical consistency. Creative Commons icons and licenses titles do not respect formal logic. Expressed conditions are based on the understanding of a core prerogative¹ (which is neither expressed in the icons nor in the license title: a royalty-free non-exclusive permission to reproduce and distribute the work), and not on a direct addendum to basic copyright grant (all rights reserved). No explicit option reflects positive grants. An extension of the human-readable system to the management of broader scope of usages (commercial usages) could hardly be logically supported. RDF Creative Commons machine-readable code presents a correct logic structure, such as the ODRL/Creative Commons profile [11] in XML, toward an ontology reflecting our model requirements and terminological plural components. Positively granted actions, which are not expressed in the licenses icons and titles but implicitly asserted, are represented with the ODRL Permission/Prohibition/Requirement model [10].

4. Conclusion: a Use-Case Methodology

The fifth resource of our model is a use case scenario (resource 5). We developed a dozen of actions in order to compile and combine a wide range of technical, usage and legal possibilities to create and interact with multimedia documents: teaching, commerce, advertising, collective management... This use case is useful to check the proposed model consistency and completeness and to convey technology, usage and legal possibilities to a non-lawyer colleague², as a basis for further test to compare ontologies on a single complete example.

5. References

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¹ Some Creative Commons licenses which are out of the 6 licenses core suite and not available through the license generator interface (Developing Nations, Public Domain and Sampling licenses) grant less prerogative and may deserve a re-design of the options suite for the system's coherency sake.

² Acknowledgments to Nadia Nadah for stimulating discussions on previous version of this model.

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