

Federico Costantini

#Folksonomies and #Law

Theoretical issues on «search for meaning» and legal ontologies

This paper explores some foundational issues on the deployment of folksonomies in legal information management. It is analysed whether and how these information technologies could be suitable to represent the connection among the «Cur jus?» (the meaning of law for the individual), the «Quid jus?» (the concept of law considered as the structure of social ties), and the «Quid juris?» (the purpose of the law, namely to solve disputes among people) within a legal ontology underpinned on a theoretical perspective which claims to be realistical, and that, for this reason, it is somewhat unusual in Legal Informatics.

Category: Scientific Articles

Region: Italy

Field of law: Legal Information & Search Technologies

Citation: Federico Costantini, #Folksonomies and #Law, in: Jusletter IT 24 September 2015

Contents

1. Legal ontology and Legal Informatics between the «map» and the «territory»
2. Some preliminary remarks on a realistical perspective of legal ontology
 - 2.1. The connection among «Cur jus?», «Quid jus?» and «Quid juris?»
 - 2.2. Legal ontology and social ontology as decentralized networks
 - 2.3. Key concepts of a realistical legal ontology
3. Folksonomies and the «search of meaning» in law
 - 3.1. Tagging as a tool for offline and online «search of meaning»
 - 3.2. Folksonomies and their features
 - 3.3. Short discussion on technical issues and remedies
 - 3.4. Key concepts of folksonomies
 - 3.5. Final remarks
4. The use of folksonomies in legal «search for meaning»
 - 4.1. Complications and practical remedies in daily legal information management
 - 4.2. An example of legal folksonomy
 - 4.3. The contribute of folksonomies to law
5. Concluding remarks: folksonomies and legal realism

1. Legal ontology and Legal Informatics between the «map» and the «territory»

[Rz 1] If philosophy in ancient times was said to rise from the wonder of mankind in front of Nature,¹ in contemporary thought it rather expresses the «search for meaning» in human existence.² We could call «Semantics», in a very generic sense, the fact that we give meaning to things around us and to our own life or, even better, the way we perceive, feel and realize our experience in order to deepen our self-understanding, pursue our interests and share our perspective with others.

[Rz 2] On this subject it has been suggestively written that «the map is not the territory».³ This metaphor warns us to take into account the difference between reality and its representation; yet, it does not deny the usefulness of the latter, but underlines its natural limits and the necessary bond between Thought and Being that traditionally defines the concept of Truth.

[Rz 3] The metaphor «map» / «territory» also applies to the way law is represented. Modern legal science has never been interested so much in the «territory» as in the «map». In other words, the goal was not to understand the essence of law, but to build a system as consistent as possible.⁴ Contemporary legal theories have gone a step further, considering solely the «map», as if there was no «territory» at all. For example, according to HANS KELSEN legal rules are nothing more than intellectual abstractions produced by any individual who undergoes a command;⁵ following OLIVECRONA, on the contrary, law is just a set of empirical facts stated through a symbolic

¹ PLATO, Teeteto 155d; ARISTOTLES, Metaphysics I, 982b.

² VIKTOR EMIL FRANKL, Man's search for meaning. An introduction to logotherapy, Hodder & Stoughton, London (1946).

³ ALFRED KORZYBSKI, Science and sanity. An introduction to non-Aristotelian systems and general semantics, International Non-Aristotelian Library Pub. Co. The Science Press Print. Co., distributors, Lancaster, Pa; New York City (1933).

⁴ HUIG DE GROOT, De iure belli ac pacis libri tres, in quibus ius naturae et gentium, item iuris publici praecipua explicantur, apud Nicolaum Buon, Parisiis (1625).

⁵ HANS KELSEN, Reine Rechtslehre. Einleitung in die rechtswissenschaftliche Problematik, Deuticke, Leipzig und Wien (1934).

system.⁶ In the first perspective law gains a metaphysical dimension which is radically refused in the empiristical vision of the second. Although the two theories appear radically opposed, there is a common element – the modern concept of system – hence the denial of the «existentialistic» Semantics depicted above, and moreover the refusal of a substantial notion of Truth: for the first, as a redundant idea, for the second, as a mere superstition.

[Rz 4] According to what stated so far, we can argue the significance of the problem of the definition of legal ontology. Different perspectives can be outlined depending on whether we appreciate the concept of law in substantial terms (we called it «territory») or in a formalistic way (we identified it as «map»). In the first sense – we can address it as «realistic» – the meaning of law relies in Nature, since it is expression of the universal order connected to the physical world.⁷ In the second sense – we can name it «naturalistic» – the result is an abstract domain⁸ detached from life's experience, where «meaning» is separated from «sense».⁹ In the latter perspective, it should be stressed that the «map» loses the «territory» or, better, it becomes itself the «territory».

[Rz 5] Of the two just described, the second approach is the one mainly adopted by Legal Informatics since its origins. It is implicit, for example, not only in the assumption that jurisprudence can be measured (this is explicit in the word «jurimetrics» used by LOEVINGER¹⁰), but also in the best studies on sources of law,¹¹ and in the efforts that have been made to apply artificial intelligence to law.¹²

[Rz 6] In recent years there has been a significant evolution in information technology that – remaining in the metaphor – has allowed to draw a more reliable «map» of the «territory». Indeed, in the Semantic Web,¹³ which was built on a knowledge representation language such as the

⁶ KARL OLIVECRONA, *Law as fact*, Stevens & Sons, London (1971).

⁷ AGOSTINO DA IPPONA, *L'ordine*. In: Gentili, D. (Hrsg.), *Opere di Sant'Agostino. Testo latino dell'edizione maurina confrontato con il Corpus Scriptorum Ecclesiasticorum Latinorum Città Nuova, Roma (1982)*, TOMMASO D'AQUINO, *Summa Theologiae. Prima secundae*. In: Busa, R. (Hrsg.), *S. Thomae Aquinatis Opera Omnia F. Frommann Verlag (Gunther Holzboog), Stuttgart (1980)*. In this paper, we do not address the analysis or explanation of cognitive processes, logical operations and rhetorical arguments concerning the relationship between the jurist and the law. What matters for the purpose of this study is that the law requires an intellectual activity by man, but is not limited to it. The distinction between «map» and «territory» is provided here in order to express some underlying issues: (for the «territory») if law is neither an abstract rule nor an empirical fact, then what is? (for the «map») if law cannot be seen as a system, then how could it be known, understood, communicated, applied? In short, how can we move without losing the right direction, if the «map» is not reliable? How can we act or judge the behavior of others if we remain without criteria (or «values»)? We can observe that if there is something that gives meaning to law, it is the connection between «map» and «territory», that is, between representation and reality, or finally between Thought and Being.

⁸ GIOVANNI SARTOR, *The Nature of Legal Concepts: Inferential Nodes or Ontological Categories?* In: *Artificial intelligence and law*, Heft 17, pp. 217–251 (2009).

⁹ GOTTLÖB FREGE, *Über Sinn und Bedeutung*. In: *Zeitschrift für Philosophie und philosophische Kritik*, Heft 100, pp. 25–50 (1892).

¹⁰ LEE LOEVINGER, *Jurimetrics: The Next Step Forward*. In: *Minnesota Law Review*, Heft 33, pp. 455–493 (1949).

¹¹ «The *ontology* as it is usually understood in Knowledge Engineering has a more specific meaning: it is the product resulting from the systematic inventory by knowledge engineers of relevant aspects of a certain knowledge domain» ALEXANDER BOER, *Legal Theory, Sources of Law and the Semantic Web Frontiers in artificial intelligence and applications*, 195, IOS Press, Amsterdam (2009), s. 32.

¹² TREVOR BENCH-CAPON/MICHAL ARASZKIEWICZ/KEVIN ASHLEY/KATIE ATKINSON/FLORES BEX/FILIPPE BORGES/DANIELE BOURCIER/PAUL BOURGINE/JACK G. CONRAD/ENRICO FRANCESCONI/THOMAS F. GORDON/GUIDO GOVERNATORI/JOCHEN L. LEIDNER/DAVID D. LEWIS/RONALD P. LOUI/THORNE L. MCCARTY/HENRY PRAKKEN/FRANK SCHILDER/ERICH SCHWEIGHOFER/PAUL THOMPSON/ALEX TYRRELL/BART VERHEIJ/DOUGLAS N. WALTON/ADAM Z. WYNER, *A history of AI and Law in 50 papers: 25 years of the international conference on AI and Law*. In: *Artificial intelligence and law*, Heft 20, pp. 215–319 (2012).

¹³ TIM BERNERS-LEE/JAMES HENDLER/ORA LASSILA, *The Semantic Web*. In: *Scientific American*, Heft

Resource Description Framework (RDF),¹⁴ the description of resources has two notable features: (1) it can also refer to objects that do not belong to the domain of the Web, including things that pertain to practical experience;¹⁵ (2) it is shared by the community of users, thus representing their search for «meaning», which can be conceived in the sense devised at the beginning of this paragraph. For this reason it has been written that the Web 2.0 is not just an «information space»¹⁶ but also a «social space»¹⁷.

[Rz 7] In this paper, I will analyse whether these technologies could be useful in the Legal Informatics, if not for bridging, at least for reducing the gap between the «map» and the «territory» that remains in a naturalistic vision of legal ontology. More precisely, I intend to explore if the Semantic Web, applied to law in accordance with a realistic ontology, could suggest new perspectives of research considering, on one hand, the «existentialistic» importance in the human «search for meaning» and, on the other hand, the connection between legal ontology and social experience.

[Rz 8] To pursue this goal, I will proceed as follows: (1) at the outset, I will provide some clarification on the features of the law within a realistical ontology, just sketching – for the sake of synthesis – some foundational issues; (2) I will introduce the main subject recognizing in folksonomies the technologies having features similar to those identified above, describing how they work as far as needed to proceed; (3) afterwards, I will explain the main implications of the findings, emphasizing their potentials in theoretical terms and providing few examples. At the end, I will give some concluding remarks and draw possible paths for further studies.

2. Some preliminary remarks on a realistical perspective of legal ontology

[Rz 9] In this section, I give some preliminary explanations on the theoretical perspective here argued. To do so, it seems appropriate to clarify three aspects ordered as follows: (1) the philosophical foundations, of which will be provided a very short explanation; (2) the main features of law, as they rise from an ontological approach; (3) the key items of the realistical vision I intend to suggest.

2.1. The connection among «Cur jus?», «Quid jus?» and «Quid juris?»

[Rz 10] Law is commonly appreciated just as an external criterion for qualifying social behaviour, and this issue is often designated as «*Quid juris?*». Less attention rises the very notion of law, the

CCLXXXIV, pp. 28–37 (2001).

¹⁴ GRAHAM KLYNE/JEREMY J. CARROLL/BRIAN MCBRIDE, Resource description framework (RDF): Concepts and abstract syntax. In: W3C recommendation, Heft 10 (2004). It must be outlined that RDF has been updated with OWL 2 Web Ontology Language, <http://www.w3.org/TR/owl2-overview/>.

¹⁵ HARRY HALPIN, Social semantics. The search for meaning on the Web, Semantic Web and Beyond, 13, Springer, New York (2013).

¹⁶ TIM BERNERS-LEE/TIM BRAY/DAN CONNOLLY/PAUL COTTON/ROY FIELDING/MARIO JECKLE/CHRIS LILLEY/NOAH MENDELSON/DAVID ORCHARD/NORMAN WALSH, Architecture of the World Wide Web. W3C (2004).

¹⁷ JAMES HENDLER/JENNIFER GOLBECK, Metcalfe's law, Web 2.0, and the Semantic Web. In: Web Semantics: Science, Services and Agents on the World Wide Web, Heft 6, pp. 14–20 (2008).

«*Quid jus?*»,¹⁸ and even less importance is given to the problem of the meaning that law has for each of us. To this last aspect here corresponds, for the reader's convenience, the question «*Cur jus?*».

[Rz 11] According to what has been argued above, it is crucial to reverse the order of the issues, as it is the «*Cur jus?*» that has to be considered as part of the «search for meaning» underpinning every aspect of human existence. Therefore, it can be said that, by its very essence, law is a primary subject of the problem of Truth, and this different perspective involves the notion and the purpose of law, too. In other words, law not only participates in the Truth, but it is also the instrument suitable to connect society within the order of the Being. In this sense, the «*Quid jus?*», namely the concept of law, becomes the substantial criterion for solving legal disputes, that is the «*Quid juris?*».

[Rz 12] In support of the vision that depicts law as deeply inscribed in human nature – or at least in legal practice – it may be recalled that it has been handed down from the Roman tradition for over a thousand years,¹⁹ although it is documented that this perspective dates back to about four thousand years ago.²⁰ Instead, we have been conceiving law as «legal system» just for about five centuries, and this perspective has been always disputed.

2.2. Legal ontology and social ontology as decentralized networks

[Rz 13] It can be argued that legal ontology has the same conceptual framework of social ontology, as expressed in the famous latin motto: «*ubi jus, ibi societas*», and in its antonym «*ubi societas, ibi jus*».

[Rz 14] The assertion that the human being has a «sociable nature» often occurs in the history of philosophy, although with different connotations. For example, in Aristotle this notion is based on the reality of things, and thus law fits in a rational order that transcends perceptive experience.²¹ In modern thought, conversely, this claim constitutes a precise conventional assumption, as is the «*imbecillitas*» – the weakness of the individual hence the need of others – in Grotius.²² Finally, there are more recent opinions that explicitly adhere to a naturalistic approach, such as those of TUOMELA.²³

[Rz 15] The most recent studies have shown that human beings are placed necessarily within a framework of interpersonal relationships and that these connections can be represented as a

¹⁸ IMMANUEL KANT explains very clearly the difference between «*quid juris*» and «*quid jus*». IMMANUEL KANT, *Die Metaphysik der Sitten*, F. Nicolovius, Königsberg (1798).

¹⁹ For example: «

²⁰ « [...] let the oppressed, who has a case at law, come and stand before this my image as king of righteousness; let him read the inscription, and understand my precious words: the inscription will explain his case to him; he will find out what is just, and his heart will be glad [...]» Code Hammurabi (eighteenth century B.C.), translated by L. W. King <http://avalon.law.yale.edu/ancient/hamframe.asp>.

²¹ ARISTOTLES, *Politics* I, 1253a, 7, ARISTOTLES, *Nichomachean Ethics* IX, 1169b, 18.

²² «*etiamsi daremus, quod sine summo scelere dari nequit, non esse Deum, aut non curari ab eo negotia humana*» HUIJ DE GROOT, *De iure belli ac pacis libri tres, in quibus ius naturae et gentium, item iuris publici praecipua explicantur*, Prolegomeni, §. 11. This vision is opposed to the empirical and individualistic perspective – also hypothetical – of HOBBS, according to whom «*life is but a motion of Limbs*» THOMAS HOBBS, *Leviathan or The Matter, Forme and Power of a Common Wealth Ecclesiasticall and Civil*, Printed for Andrew Crooke, London (1651), p. 1.

²³ The claim is quite explicit in RAIMO TUOMELA, *Social ontology: collective intentionality and group agents*, Oxford University Press, New York-Oxford (2013), p. 4.

decentralized network. In this sense, the results of the pioneering studies of the sociology of communication carried out five decades ago²⁴ have been confirmed by the latest discoveries made by computational anthropologists²⁵.

[Rz 16] If law belongs to human nature, and if human nature, as mentioned above, involves sociability, then also legal ontology can be represented with the same lattice structure of social ontology. Indeed, some of the latest researches in Legal Informatics concern the use of network analysis for the study of the legal system, or to find patterns in the distribution of judicial decisions, or to describe the overtime evolution in institutional – or even criminal – organizations, or – finally – to visualize the connections among rules in a specific field.²⁶

2.3. Key concepts of a realistical legal ontology

[Rz 17] In the vision that here I intend to outline there are three relevant aspects: (1) the existentialistic perspective, consistent with the «search for meaning» of humankind; (2) the pattern of legal rules, shaped according social ties; (3) the realistic approach, which is opposed to the more common naturalistic view. Hereinafter I briefly discuss these profiles.

1. Regarding the first issue, it should be remembered that, in the tradition of modern legal science, the State is the only true subject of the legal system, since law flows from the Sovereign, as the instrument of its power. Here instead it is suggested to consider as subject the individual in flesh and bones or, better, the jurist conceived as a person, as a human being involved in a «search of meaning». In other words, the vision here proposed could be defined as «client-oriented», rather than the modern one, which can be seen as «server-oriented».
2. Moving to the second aspect, it may be said that the claim for the individualistic perspective should not be considered conclusive. In fact, it can also be found in the theories that apply hermeneutics to the law.²⁷ Here, instead, I claim that the «search for meaning» does not produce an artificial context – an ideal sphere of Being – closed around the single interpreter, but aims to recognize the reality of social ties and the connection of law with the nature of the human being.
3. With regard to the third profile, it may be pointed out that in legal thought a naturalistic approach has been attained in continental codifications, although in two different ways: for example, the «legal domain» in French Civil Code has been built to shield the sources of law,²⁸ while in the German Civil Code has been configured in order to constrain the interpreter²⁹. In

²⁴ STANLEY MILGRAM/LEO MANN/SUSAN HARTER, The Lost-Letter Technique: A Tool of Social Research. In: The Public Opinion Quarterly, Heft XXIX, pp. 437–438 (1965), STANLEY MILGRAM, The Small-World Problem. In: Psychology Today, Heft I, pp. 61–67 (1967).

²⁵ LUCA MARIA AIELLO/ROSSANO SCHIFANELLA/BOGDAN STATE, Reading the source code of social ties. 2014 ACM Conference on Web Science ACM, Bloomington, Indiana, USA, pp. 139–148 (2014).

²⁶ On these matters, here can be mentioned two workshops in «Network analysis in Law»: the first in 2013, in conjunction with ICAIL 2013: XIV International Conference on AI and Law (Rome, Italy); the second in 2014, in conjunction with JURIX 2014: 27th International Conference on Legal Knowledge and Information Systems (Krakow, Poland).

²⁷ EMILIO BETTI *Teoria generale della interpretazione*, Giuffrè, Milano (1955), HANS-GEORG GADAMER, *Wahrheit und Methode. Grundzüge einer philosophischen Hermeneutik*, Mohr, Tübingen (1960).

²⁸ The «Code Napoleon» was declared the exclusive source of law with Article 7, Loi 30 Ventôse XII (21st March, 1804). Famous is the sentence of Jean Bugnet reported by Julien Bonnet: «*Je ne pas le connais Droit civil; que je n'enseigne the Code Napoléon*».

²⁹ The BGB (*Bürgerliches Gesetzbuch*), which entered into force on 1st January 1900, contains a general part,

fact, it can be argued that the crisis of contemporary codification is the result not so much of historical and external causes (for example, the globalization of commerce), but of an innate weakness: the theoretical difficulties affecting naturalism. I claim that, in this perspective, law can not be «codified» because reality in itself can not be reduced to a system.

[Rz 18] In conclusion, the basic idea of this perspective is that law belongs to the natural «search for meaning» performed individually by humans and shared with others through social relations.

3. Folksonomies and the «search of meaning» in law

[Rz 19] In this section, I will introduce some insights on the Semantic Web and its technologies in order to verify if their employment in the legal field could be consistent with the vision previously exposed. Specifically, I will: (1) explain the reasons why focus on collective tagging systems among the «Web 2.0» technologies; (2) define folksonomies and briefly analyse their features; (3) describe the issues arising from these technologies and the most trusted remedies; (4) identify the key elements in order to prosecute the discussion. At the end, I provide some concluding remarks.

3.1. Tagging as a tool for offline and online «search of meaning»

[Rz 20] If it really can be said that the «search for meaning» belongs to human nature, it is also true that labels are amongst the tools used by people to organize their own environment. Labelling things, in this sense, is a natural activity. Each of us organizes in this way his life at home (we have jars with «salt» or «pepper» written on the caps) and at work (we use folders with «invoices» or «bank account» printed on the cover). The relevance of this simple action is even more obvious if we consider using it together with other people: indeed, it allows us to establish and share a common information framework, with either material objects (books, such as Worldcat or Bibsonomy, or public and private bibliographic catalogues), or intangible items (links, such as Delicious, or images, such as Flickr or Instagram, or short messages, such as Twitter and Facebook). For reasons of convenience, tags have been included in electronic documents (also in this essay), in most of the software applications we use (e-mail, calendars), and in many online services.

[Rz 21] On the Web even those users who don't have technical skills can publish content, and the most effective solutions for cataloguing unstructured information quickly and easily are tagging tools, which consist in provide the URI with metadata that describe the resources according to users preferences. By tagging an object every user can: (1) describe its contents, (2) label the item freely, without having to follow a preset taxonomy, (3) use any lexical expression, even belonging to natural language or even to a jargon, (4) allocate many tags to an object or assign the same tag to different objects, and (5) share or recommend choices and preferences.

[Rz 22] Basically, collective tagging systems allow people to replicate on the Internet an activity performed in their daily routine.³⁰

Allgemeiner Teil, placed before the sections in which are included the provisions for each subject (*Recht der Schuldverhältnisse, Sachenrecht, Familienrecht, Erbrecht*).

³⁰ SCOTT A. GOLDBER/BERNARDO A. HUBERMAN, The Structure of Collaborative Tagging Systems. In: *Journal of Information Science*, Heft 32, pp. 198–208 (2006).

3.2. Folksonomies and their features

[Rz 23] Collective tagging systems consist of three elements: (1) the users of the system (people who actually do the tagging), (2) the tags themselves, and (3) the resources being tagged. Sets of categories resulting from the use of tags in the description of resources are commonly defined as «folksonomies»³¹.

[Rz 24] Consequently, let us define «folksonomy» a tuple as follows:³² $F := U, T, R, Y, \prec$ where

- $U, T,$ and R are finite sets, whose elements are users, tags and resources, respectively,
- Y is a ternary relation between them, i.e., $Y \subseteq UxTxR$, called tag assignments (TAS for short),
- \prec is a user-specific subtag/supertag-relation, i.e., $\prec \subseteq UxTxT$, called subtag/supertag relation.

[Rz 25] The personomy P_u of a given user $u \in U$ is the restriction of F to u , i.e., $P_u := T_u, R_u, I_u, \prec_u$ with $I_u := \{(t, r) \in TxR \mid (u, t, r) \in Y\}$, $T_u := \pi_1(I_u)$, $R_u := \pi_2(I_u)$, and $\prec_u := \{(t_1, t_2) \in TxT \mid (u, t_1, t_2) \in \prec\}$, where π_i denotes the projection on the i th dimension.³³

[Rz 26] Let us assume that the tags that best describe a resource are those that are most frequently assigned to it, and that users can always add new tags to the existing ones. The main feature of folksonomies is that they tend to stabilize into a pattern that can be represented as a power law distribution,³⁴ which represents few tags labelling most resources and most tags labelling just a few resources.

[Rz 27] Folksonomies can be counted among «human computation systems», which can be defined as «*intelligent systems that organize humans to carry out the process of computation*».³⁵ The very simple activity of tagging is carried out spontaneously by the users, as in «crowdsourcing»,³⁶ «collective intelligence»,³⁷ and «social computing»,³⁸ but in this case the human effort is led by

³¹ FEFIE DOTSIKA, Semantic APIs: Scaling up towards the Semantic Web. In: International Journal of Information Management, Heft 30, pp. 335–342 (2010), THOMAS VANDER WAL, Folksonomy Coinage and Definition. <http://www.vanderwal.net/folksonomy> (all Internet sources last visited on 3 August 2015) (2007). The word «folksonomy» is a blend of the words «taxonomy» and «folk», and stands for conceptual structures created by people. It is important to point out that, to obtain folksonomies, it is necessary that the semantics of the tags should be made explicit.

³² HOTHOTH, ANDREAS/JÄSCHKE, ROBERT/SCHMITZ, CHRISTOPH/STUMME, GERD, Information retrieval in folksonomies: Search and ranking. In: Sure, Y. and Domingue, J. (Hrsg.), The semantic web: research and applications, 4011, Springer, Berlin Heidelberg, pp. 411–426 (2006), p. 414, MIKA, PETER, Ontologies are us: A unified model of social networks and semantics. In: Web Semantics: Science, Services and Agents on the World Wide Web, Heft 5, pp. 5–15 (2007), JÄSCHKE, ROBERT/HOTHOTH, ANDREAS/SCHMITZ, CHRISTOPH/GANTER, BERNHARD/STUMME, GERD, Discovering shared conceptualizations in folksonomies. Ibid., Heft 6, pp. 38–53 (2008).

³³ We should distinguish between «narrow» and «broad» folksonomies In the first, only the owner of the resource can tag it, in the second anyone can tag anything. It is obvious that this different conceptual framework has important implications in the description of the content. VANDER WAL, THOMAS, Explaining and showing broad and narrow folksonomies. <http://www.vanderwal.net/random/entrysel.php?blog=1635> (2005).

³⁴ $\gamma = \alpha \cdot \chi^\beta$.

³⁵ EDITH LAW/LUIS VON AHN, Human Computation, Brachmann, R.J./Cohen, W.W. and Dietterich, T., Synthesis Lectures on Artificial Intelligence and Machine Learning, 13, Morgan & Claypool Publishers, San Rafael (2011), p. 4.

³⁶ «The act of outsourcing tasks, traditionally performed by an employee or contractor, to an undefined, large group of people or community (a crowd) through an open call» *ibid.*

³⁷ «A shared or group intelligence that emerges from the collaboration and competition of many individuals and appears in consensus decision making in bacteria, animals, humans and computer networks» *ibid.*

³⁸ «Technology for supporting any sort of social behavior in or through computational systems, eg, blogs, email, instant messaging, social network services, wikis and social bookmarking. Technology for supporting computations that are the carried out by groups of people, eg, collaborative filtering, online auctions, prediction markets, reputation systems, computational social choice, tagging, and verification games» *ibid.*

a pattern: the operation is assigned by the system and accomplished by the user, which returns the result to the system in order for it to be processed again. A well-known example in this regard is given by the reCAPTCHA.³⁹

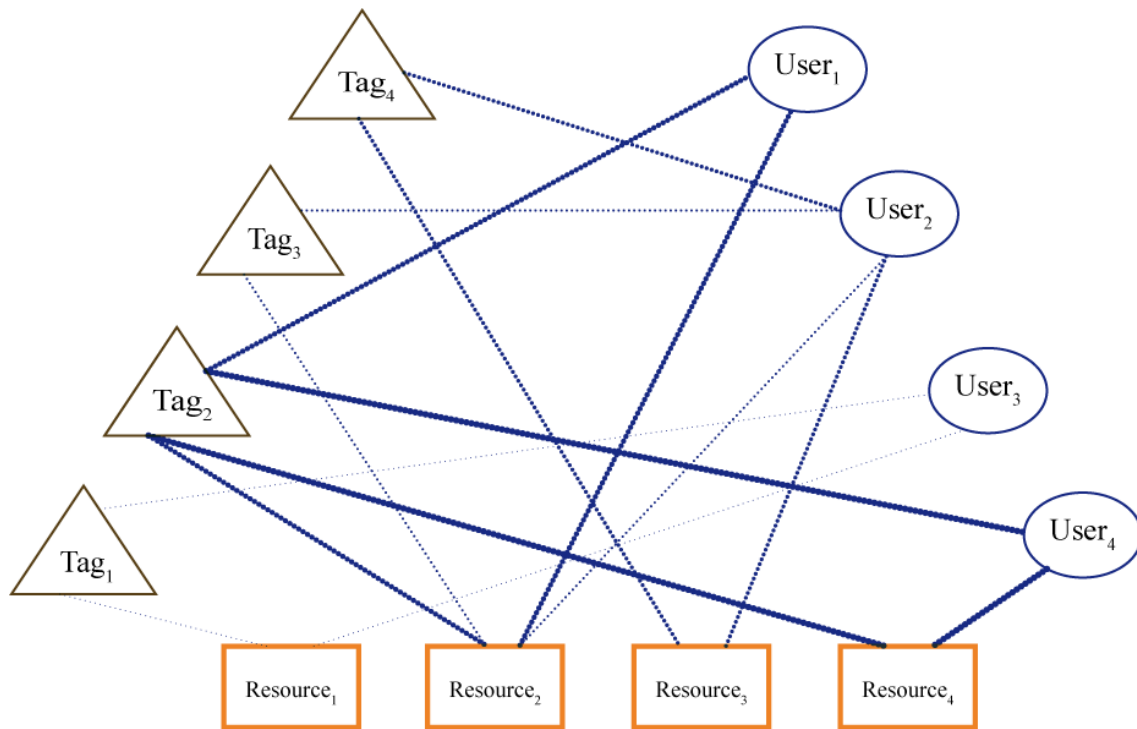


FIGURE 1: a simple example of folksonomy where User1 assigns Tag2 to Resource2, User2 tags Resource 2 with Tag3 and Resource3 with Tag4, User 3 tags Resource1 with Tag1 and User 4 tags Resource4 with Tag2.

3.3. Short discussion on technical issues and remedies

[Rz 28] The most discussed problem of folksonomies⁴⁰ is whether and how it is possible to build a semantic representation of the data collected through the analysis of tags. Precisely, the question is whether an implicit agreement arising among users in the choice of bookmarks can constitute a stable and consistent core of meaning, and if this «nucleus» may be suitable as a classification scheme for the relevant resource. On this issue we can identify two major opinions, thus some

³⁹ LUIS VON AHN/BENJAMIN MAURER/COLIN McMILLEN/DAVID ABRAHAM/MANUEL BLUM, reCAPTCHA: Human-Based Character Recognition via Web Security Measures. In: Science, Heft 321, pp. 1465–1468 (2008). Moreover, it must be underlined that collective tagging systems are different from traditional search engines, which rely commonly on previous searches, whereas tagging relies on human knowledge. In a Web search engine, user enters a number of keywords into an automatic algorithm, which exploiting them retrieves the relevant resources to displays to the users. In collaborative tagging systems, instead, users find resources and add manually one or more tags, which are stored in their personal connection or shared by the system among users.

⁴⁰ MATTHIAS LUX/MICHAEL GRANITZER/ROMAN KERN, Aspects of Broad Folksonomies. Proc. Of The 18th International Workshop on Database and Expert Systems Applications (DEXA '07), Regensburg, pp. 283–287 (2007).

consider folksonomies a kind of ontology, and others disagree.

[Rz 29] As for the first position, based on the fact that folksonomies tend effectively to stabilize into power law distribution, we have to recognize that recently scholars have taken more careful positions. Some agree that folksonomies can be considered as a sort of ontology, but take it to be lightweight, dynamic and limited in scope.⁴¹ Others clarify that folksonomies work almost perfectly when users share specific interests («object-centered» social networks, e.g. Flickr), but they are more fallible in simple collections of individual profiles based on personal relationships («ego-centered» social networks, e.g. Facebook)⁴².

[Rz 30] Critics, on the other hand, point out that in «Web 2.0» users jointly catalogue information depending on their personal attitudes, preferences, interests or qualities, and argue that this affects the reliability of the patterns that are built on the selection of tags. As confirmed by some studies, users with more knowledge, skills and understandings create folksonomies of higher value, because «experts» users classify objects more accurately than «novices» do. For this reason some scholars doubt that, at least in fields that require specific expertise, folksonomies could get interesting results.⁴³ Others researchers believe that folksonomies could certainly complement, but not replace, traditional ontological classifications, such as in bibliographic catalogues.⁴⁴

[Rz 31] Several methods for improving folksonomies have been proposed. Some studies focus on amending the many fallacies of tagging,⁴⁵ others on retrieving and ranking data in order to filter them.⁴⁶ Many algorithms have been developed in order to automatically suggest tags to users,⁴⁷ or to enrich existing tags with others whose use is statistically correlated,⁴⁸ or to cluster tags within ontologies, such as WorldNet.⁴⁹ Recently, a self-adapted method has been proposed⁵⁰ and the use of weak signal detection theories has been suggested as a means to foresee incoming changes

-
- ⁴¹ PETER MIKA, *Ontologies are us: A unified model of social networks and semantics*. In: *Web Semantics: Science, Services and Agents on the World Wide Web*, Heft 5, pp. 5–15 (2007).
- ⁴² HAK-LAE KIM/JOHN G. BRESLIN/HAN-CHIEH CHAO/LEI SHU, *Evolution of social networks based on tagging practices*. In: *IEEE Transactions on Services Computing*, Heft 6, pp. 252–261 (2013).
- ⁴³ SONJA ŠPIRANEC/TOMISLAV IVANJKO, *Experts vs. Novices Tagging Behavior: An Exploratory Analysis*. In: *Procedia – Social and Behavioral Sciences*, Heft 73, pp. 456–459 (2013).
- ⁴⁴ PETER J. ROLLA, *User tags versus subject headings*. In: *Library Resources & Technical Services*, Heft 53, pp. 174–184 (2009).
- ⁴⁵ CÉLINE VAN DAMME/MARTIN HEPP/KATHARINA SIORPAES, *FolksOntology: An Integrated Approach for Turning Folksonomies into Ontologies*. *Proc. Of The Bridging the Gap between Semantic Web and Web 2.0 – 4th European Semantic Web Conference 2007*, Innsbruck, Springer, pp. 57–70 (2007). Indeed, words can be misspelled, nouns can be singular or plural, and verbs can be conjugated.
- ⁴⁶ NICOLÁS TOURNÉ/DANIELA GODOY, *Evaluating tag filtering techniques for web resource classification in folksonomies*. In: *Expert Systems with Applications*, Heft 39, pp. 9723–9729 (2012), HEUNG-NAM KIM/MAJDI RAWASHDEH/ABDULLAH ALGHAMDI/ABDULMOTALEB EL SADDIK, *Folksonomy-based personalized search and ranking in social media services*. In: *Information Systems*, Heft 37, pp. 61–76 (2012).
- ⁴⁷ I. CHING HSU, *Integrating ontology technology with folksonomies for personalized social tag recommendation*. In: *Applied Soft Computing*, Heft 13, pp. 3745–3750 (2013).
- ⁴⁸ GIOVANNI QUATTRONE/LICIA CAPRA/PASQUALE DE MEO/EMILIO FERRARA/DOMENICO URSINO, *Effective retrieval of resources in folksonomies using a new tag similarity measure*. *Proc. Of The Proceedings of the 20th ACM international conference on Information and knowledge management*, Glasgow, Scotland, UK, ACM, 2063657, pp. 545–550 DOI= <http://dx.doi.org/10.1145/2063576.2063657> (2011).
- ⁴⁹ GIOVANNI SEMERARO/PASQUALE LOPS/MARCO DE GEMMIS/CATALDO MUSTO/FEDELUCIO NARDUCCI, *A folksonomy-based recommender system for personalized access to digital artworks*. In: *Journal on Computing and Cultural Heritage*, Heft 5, pp. 1–22 (2012), MOHAMMED NAZIM UDDIN /TRONG HAI DUONG/NGOC THANH NGUYEN/XIN-MIN QI/GEUN SIK JO, *Semantic similarity measures for enhancing information retrieval in folksonomies*. In: *Expert Systems with Applications*, Heft 40, pp. 1645–1653 (2013).
- ⁵⁰ ALBERTO CÓRDOBA/JOSÉ JAVIER ASTRAIN/JESÚS VILLADANGOS/FRANCISCO ECHARTE *A self-adapted method for the categorization of social resources*. *Ibid.*, pp. 3696–3714.

through the variation of tag distribution.⁵¹

3.4. Key concepts of folksonomies

[Rz 32] Research on folksonomies promises further developments that open up fascinating horizons. Developments concern also law, as we shall see. Before, we turn to that, though, it is worth pointing out that, on the base of what I have said above, there are some key elements, which have to be taken into consideration while discussing the relevance of folksonomies to law.

1. *Immediacy*. We can observe that, in perspective, the relevance of this feature tends to increase with the growth of the mean-device interaction through voice commands (e.g. SIRI, CORTANA).
2. *Spontaneity*. Thousands of people publish and tag content every single second without being forced. Of course, users share information and metadata for different personal reasons, but we should admit that the main aggregating factor is a common underlying interest, which is ultimately the personal need to manage legal information on order to solve a legal issue.
3. *Realism*. The task of organizing information is performed by inserting lexical terms in the system and through the association of their meaning with the tagged object. So, tagging could be considered a kind of language-game concerning the description of reality.⁵²
4. *«Lattice» structure*. From the analysis of the relations between tags we can obtain – besides descriptions of resources and their meanings – also details about the structure of the links between users, and hence elements which might be useful for describing their social ties.

3.5. Final remarks

[Rz 33] To conclude, it can be argued that folksonomies could be suitable to express a realistical ontology for three main reasons, which can be designated respectively as epistemological, social and individual.

1. *Epistemological*. From the epistemological point of view, it is important that the description contained in the tags may concern how any given resource interacts (1) with other resources within the domain; (2) with external resources; (3) with the observer. These categories can be seen also as different levels of complexity which enrich the legal domain.
2. *Social*. With regard to the second aspect, it is relevant that folksonomies are shared among users. It must be stressed that such sharing is shaped as a decentralized network, which reproduces the topography of the relational structure among people.
3. *Individual*. Regarding the third issue, is it relevant that metadata are assigned to resources according to the interest they have for users. Therefore, it is confirmed that a tag is a tool to organize resources depending on the «search for meaning» that each user performs individually.

⁵¹ OLIVIER GLASSEY, *Folksonomies: Spontaneous crowd sourcing with online early detection potential?* In: *Futures*, Heft 44, pp. 257–264 (2012).

⁵² LUDWIG WITTGENSTEIN, *Philosophical investigations*, Blackwell, Oxford (1953).

4. The use of folksonomies in legal «search for meaning»

[Rz 34] In this section, I intend to address the issues raised by the application of the theoretical perspective highlighted in the second paragraph to the information technologies described in the third. To do so, I intend to: (1) describe the main practical problems that emerge from the «client-oriented» perspective of law and present briefly some remedies currently under scrutiny, (2) provide a simple example of a hypothetical folksonomy of legal resources, and (3) explain the possible contribute of folksonomies to law.

4.1. Complications and practical remedies in daily legal information management

[Rz 35] Nowadays jurists face daily several complications in solving legal problems due to the heterogeneity of the material to be used. These difficulties can be merely practical – since information can be contained on various media (analog or digital) and formats (audio tracks, video footage, images, pictures) – but also strictly theoretical. Indeed, this latter issues depend by different factors, such as (for example): the type of source of law (constitutional, legislative or administrative), the issuing institutions (legislative, administrative or judicial bodies, but also international institutions, independent authorities, arbitration panels, chambers of commerce), the kind of document (piece of legislation, court sentence, legal study), the languages used (official, unofficial or lacking translation), the unofficial sources examined (academic journals, conference presentations or personal blogs). The reason why many lawyers tend to print most of the available files is that it is the easiest way to manage them in order to solve their case.

[Rz 36] We must recognize that information technologies provide a very effective support to the jurist. Herein may be mentioned only a few of the most recent and interesting tools for drafting laws (RuleML)⁵³, searching and visualization jurisprudence (RavelLaw)⁵⁴, recommendation systems based on content or ontological classification,⁵⁵ tools for interaction with court's offices.⁵⁶

[Rz 37] It is both desirable and inevitable that such tools will be improved, and it is likely that they will be integrated each other in the near future. Herein, I want not just to provide technical solutions to be taken, but to stress the fact that the efforts made so far could lead to better results if directed towards the realistical legal ontology that I called «client-oriented» since it is focused on the «search for meaning» of the individual and on sharing with others of that «semantic» activity.

⁵³ <http://wiki.ruleml.org>.

⁵⁴ <https://www.ravellaw.com>.

⁵⁵ RADBOUD WINKELS/ALEXANDER BOER/BART VREDEBREGT/ALEXANDER VAN SOMEREN, Towards a Legal Recommender System. Proc. Of The JURIX 2014. Proceedings of the Twenty-seventh Annual Conference, Krakow, Ios Press, Amsterdam, pp. 169–178 (2014).

⁵⁶ <https://e-justice.europa.eu>.

4.2. An example of legal folksonomy

[Rz 38] In order to explain how a legal folksonomy could be represented, I extract from Eur-Lex⁵⁷ the distribution of ten EuroVoc terms⁵⁸ linked to some judgments of the European Court of Justice⁵⁹, as follows:

CELEX number of the judgment considered	advertising	competition	cosmetic product	Cyprus	Defamation	electronic commerce
62008CA0236	X					
62008CN0236	X					
62008CN0237	X					
62008CN0238	X					
62009CN0323		X				X
62009CN0324	X		X			
62013CN0291				X	X	

[Rz 39] Let us assume that a platform CTS is implemented in Eur-Lex, and that three users have assigned their tags in the same way in which it has been done through EuroVoc thesaurus. The result could be represented in the following table:

⁵⁷ <http://eur-lex.europa.eu>.

⁵⁸ EuroVoc is a thesaurus. In this contribution I use it for the suitability of its terms in describing the content of legal documents.

⁵⁹ The judgments are linked to Art. 14 of Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market («Directive on electronic commerce»), in OJ L 178, 17 July 2000, pp. 1–16.

CELEX number of the judgment considered	advertising	competition	cosmetic product	Cyprus	Defamation	electronic commerce
62008CA0236	User1					
62008CN0236	User2					
62008CN0237	User3					
62008CN0238	User1					
62009CN0323		User2				User3
62009CN0324	User1		User2			
62013CN0291				User3	User1	

[Rz 40] We can observe, for example, that «advertising» is the used five times while all other terms are used just once. The links among Users, Tags and Documents can be shown as follows:

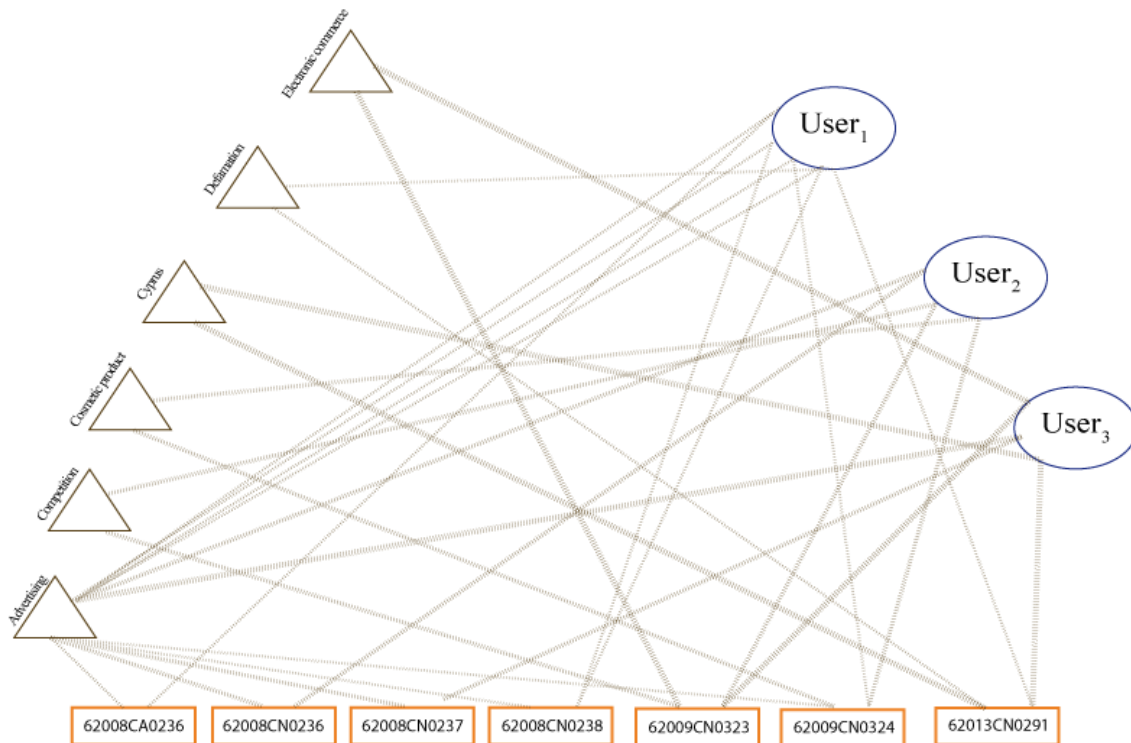


FIGURE 2: the scheme of a simplified folksonomy built using ten EuroVoc terms assigned to seven judgments applying art. 14 Directive 2000/31/EC.

4.3. The contribute of folksonomies to law

[Rz 41] From what emerged hitherto, I argue that folksonomies are suitable of being applied to law. Indeed, I can detect three theoretical reasons, which correspond to the foundational aspects mentioned in the realistical perspective of legal ontology: «*Quid juris?*», «*Quid jus?*» and «*Cur jus?*».

1. The answer «*Quid juris?*» could be seen as the «purpose» of law, and thus as the interest suitable to aggregate vast communities of users from different cultures, backgrounds, skills and occupation⁶⁰ in order to shape a folksonomy. Besides, all parties involved in this process – universities, professionals, publishers, scholars – tend today to become communities and promote themselves as such. Indeed, within each of them – on institutional websites, specialized blogs, and Facebook’s pages – we can find dialogue, sharing, exchange and discussion on law, its application and its interpretation.
2. The issue «*Quid jus?*» concerns the «concept» of law. In this respect, folksonomies could potentially allow to overcome the theoretical limits of existing legal ontologies, enriching their semantics and shaping them in a «lattice» structure. Law has a taxonomy that is understood or that can be learned in its broad lines by all users without special endeavour,⁶¹ so that the heterogeneity and the huge amount of legal documents does not exclude the possibility of their understanding by of a community of users motivated by a shared aim. Furthermore, it should be added that the description of legal documents by users can be made more efficient and effective with available technologies, such as integration with legal ontologies⁶² or by applying «narrow» folksonomies.⁶³
3. The question «*Cur jus?*» is related to the «sentiment» of the law. The inner attitude with which the jurist – as a human being – tackles legal questions emerges indirectly from the way he uses tags to organize his personal «search for meaning» through folksonomies. In this respect, the application of such technologies in the field of the law can bring a great theoretical contribution, since so far this field was largely unexplored.

5. Concluding remarks: folksonomies and legal realism

[Rz 42] Maybe today – after ten years – folksonomies can be considered as a mature technology. Its implementation to the realm of law has been discussed in academia,⁶⁴ and recently its use was

⁶⁰ BERNARD HIBBITTS, *From Law Reviews to Knowledge Networks: Legal Scholarship in the Age of Cyberspace*. In: *Serials Review*, Heft 25 (1999).

⁶¹ The essential difference between «experts» and «novices» nowadays seems to fade, especially if we consider the ongoing process of specialization sustained by the legal professions.

⁶² MERITXELL FERNÁNDEZ-BARRERA/GIOVANNI SARTOR, *Classifications and the Law: Doctrinal Classifications vs. Computational Ontologies*. Working Papers of the Law Department of the EUI, European University Institute (2010).

⁶³ SERENA MANZOLI, *Taxonomies make the law. Will folksonomies change it?* <http://blog.law.cornell.edu/voxpath/2013/04/29/taxonomies-make-the-law-will-folksonomies-change-it/> (2013). For more technical information on the applicability of collective tagging system to the law, it may be helpful to read the report of the meeting «Annotating the law», held on 13 and 14 August 2013 at Harvard University and organized by the Berkman Center for Internet and Society and Hypothes.is.

⁶⁴ FEDERICO COSTANTINI, *Folksonomies & Law – Background issues and theoretical perspectives*. <http://blog.law.cornell.edu/voxpath/2014/11/27/folksonomies-law-background-issues-and-theoretical-perspectives/> (2014).

required by Italian law⁶⁵ and experimented by an Italian municipality.⁶⁶ It can be argued that folksonomies could be used to draw a representation of the law, which resembles quite precisely the way in which jurists effectively perform their activity, and which is closer to what law really is.

[Rz 43] Before concluding, it is useful to provide a brief summary of the observations made above.

[Rz 44] The underlying theme concerns the meaning of human existence in the present age, so pervaded by technology. The question is whether technology could support this pursuit, or it constitutes an obstacle. In other words, is technology helping us to understand reality – and especially, who we really are – or is it hiding the nature of things?

[Rz 45] That question, of course, also reflects the way of thinking about the law. We saw the contrast among different visions of the law, especially the realistic and naturalistic, emphasizing that basically Legal Informatics falls within the latter.

[Rz 46] With reference to the technologies of the Semantic Web, it was noted that folksonomies allow to replicate on the Internet the same cognitive processes that belong to everyday life, developing different levels of complexity in information management and sharing.

[Rz 47] We have seen that the characteristics of folksonomies are particularly interesting for the legal thinking, both from a theoretical and a practical profile. In fact, their application in the field of law, on the one hand, confirms that the modern conception of law as a system can be overcome and, on the other hand, allows to consider aspects that previously were completely neglected, namely the value given by citizens to the legal rules.

[Rz 48] In light of all this, I can draw three paths for further research – which respectively recall the three aspects mentioned above: the «*Quid juris?*», the «*Quid jus?*» and the «*Cur jus?*» – that can be performed following a realistic perspective of law.

1. «*Cur jus?*». Through the study of folksonomies in law it could be analysed the way jurists deal with legal issues, both in cognitive and emotional terms.
2. «*Quid jus?*». A further search path may concern the relationship between the legal ontology and social ontology, or rather, between law and interpersonal relationships, to determine if and on what terms it could be compatible with a realistic conception of law.
3. «*Quid juris?*». Lastly, it could be envisaged a further profile of investigation that concerns the possibility to find a network isonomy among legal documents, legal concepts and people, in order to find if folksonomies could be really useful as a tool in legal information management.

Avv. Dott. FEDERICO COSTANTINI, Dipartimento di Scienze giuridiche, Università degli Studi di Udine (Italy); federico.costantini@uniud.it.

⁶⁵ Cfr. «Guidelines for websites of public administrations» of 29 July 2011, page 20. Rules enacted pursuant to art. 4 of Directive 26th November 2009 n. 8, of the «Minister for Public Administration and Innovation», according to the Legislative Decree of 7 March 2005, n. 82, «Digital Administration Code» (O.J. n. 112 of 16th May 2005, S.O. n. 93).

⁶⁶ The city of Turin has recently set up «TaggaTO», a system of «social bookmarking» <http://www.comune.torino.it/taggato/>.