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#Folksonomies: the next step forward to transparency?

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In this paper, I offer a theoretical perspective on the application of collective tagging system to the field of legal information management. I discuss the hypothesis that folksonomies could be a useful tool to increase the transparency of the legal system. The essay can be divided in three main parts. In the first section, I introduce the issue of transparency in the context of the legal system through an overview of different opinions outlined by contemporary legal philosophy, thereby confirming the overall formalistic perspective. In the second part, I show how transparency may correspond to the concept of "data sharing" that is achieved in the «many to many» communication through the Internet. In the third part, I analyse the collective tagging system after identifying the key element of Web 2.0 in the sharing of metadata, providing the definition of folksonomies and describing some features of its possible application to legal information management. In conclusion, I suggest that folksonomies could improve legal information management through Internet.

Inhaltsverzeichnis

1. Introduction

[Rz 1] The current notion of transparency can be considered as an ultimate synthesis of an opposition that can be analysed under different profiles: (1) ontology, between «order» and «system», (2) epistemology, between «experience» and «knowledge», (3) philosophy of law, between «sources of law» and «legal reasoning», namely «legal domain» and «legal ontology», and (4) legal informatics, between «legal information retrieval» and «legal artificial reasoning». In this paper, I aim to assert that: (1) transparency is not an attribute of the «system» as such, (2) to support the transparency of the legal system means to adhere to a formalistic conception of law, (3) in legal informatics, transparency is a feature of the «lattice» structure of law; (4) in legal information management, transparency can be regarded as the synthesis of «legal information retrieval» and «artificial legal reasoning, and (5) in Semantic Web, transparency can be found in folksonomies, of which here is provided a definition, a short functional description, and a brief assessment of possible applications to legal documents.

2. The transparency of the legal system

[Rz 2] In this section, I provide some preliminary remarks on transparency about the legal system. For this purpose, I outline the following issues: (1) theoretical observation on «opacity» and transparency, (2) considerations on the «opacity» of the legal system having regard to the idea of «code» in modern legal thought, and (3) definition of current meaning of transparency as a process of «codification», focusing on its main implications.

[Rz 3] *First*. The «system» [1] is the typical pattern of the modern thought, which has been adopted by the scientific method in opposition to the concept of «order» [2], establishing – or rather replacing – its own veracity. In this sense, the «system» should be defined as «opaque» since the light of knowledge cannot pass through it and reach the constituent structures of the «being». It is for this reason that, for instance, in Hegel the Spirit converts «system» into reality, and reality into «system» [3]. Since the «system» is «opaque» in itself [4], we can argue that the attribution of transparency is an attempt to overcome the theoretical difficulties of «opacity» and the raise of «scepticism» and «scientism». On first side, we find «perspectivism». According to this approach, in the contemporary age would take place the «*erosion of the «reality principle*» [5], and therefore would have vanished both the trust on the existence of a universal and absolute «order» and the confidence in the ability of reason to build perfect systems. In the postmodernity paradigm [6], indeed, men choose their temporary truth, thus creating individual worlds as projections of their own personal beliefs. In this sense, the will pretends to transcend the limits of reality and subjectivity. On the second side, we can note the recent development of the «philosophy of

information»[7]. Following this view, we could stipulate a transcendental dimension that joins the «order», the system and the observer. Nature and mind would combine in a unified vision[8], so that information would become the synthesis of reality and knowledge. In this sense, «being» and «existence» merge themselves in the «*infosphere*»[9]. We can say that transparency refers to a transcendental dimension in which the truth of the metaphysical «order» and the certainty of the modern «system» are not admitted, since there are only semantic fluctuations that can be represented as algebraic functions[10].

[Rz 4] *Second*. The opposition between «order» and «system» affects the modern legal thought. This seems clear considering how the *ordo juris* of the classic tradition has been replaced by modern «legal system»[11]. We can argue that also in modern legal thought the «system» is conceived as «opaque»[12]. This could be explained recalling briefly the historical experience of continental codifications, and particularly the two versions of it – the French and the German –, reconnecting each of them to one of the issues mentioned above: the French code to the definition of boundaries of the experience which has to be represented, the German code to the internal consistency of the model that has to be built[13]. On one hand, the French doctrine resumed the Roman tradition of civil law as the material of the «Code Napoleon», whose enactment was simultaneous with the elimination of all other sources of law[14]. On the other hand, the Pandectists in Germany used the *jus commune* to organize the existing legislation into a conceptual model[15]. Both in the sources of law and in legal reasoning we can still find a conceptual framework isolated from reality, locked in its artificial perfection, insensitive to social changes. Thus, with respect to the sources, law can be seen an entity in its own right and can be properly named as «legal domain»; having regard to the legal reasoning, conversely, law qualifies a «legal ontology» imprinted in our mind, actions and language[16].

[Rz 5] *Third*. The most recent studies are attempting to overcome the limitations of «opacity» combining the «theory of the sources of law» with the «theory of legal reasoning». It can be said that nowadays the «code» is not embodied in a legal text, as in the modern tradition, nor in a conceptual framework (regardless of whether it is logical or linguistic), as in contemporary thought, but should be identified in the process that continuously produces the law. In this sense, the legal system becomes both resource and result of the relentless activity of coding and recoding behavioural patterns by means of interaction with social environment. This notion of «codification» matches the meaning of transparency identified in the previous section[17]. In this sense, two issues emerge outwards and inwards: (1) the «system» requires opening itself to the changing influences of its context[18], and (2) the «system» needs to articulate in an adaptive organization[19].

3. Transparency as the key issue in legal informatics

[Rz 6] In this section, I claim that the legal informatics can be properly defined as the study to represent the legal system in terms of transparency. In support of this statement, I provide the following arguments: (1) few preliminary remarks on transparency in legal informatics, (2) a brief insight into legal information management, and (3) a focus on the resulting meaning of the «lattice» model commonly used in recent studies.

[Rz 7] *First*. At the level of legal informatics, transparency is the goal of maximum efficiency and effectiveness of information's processes. It denotes the perfect situation in which there are no barriers to the exchanges since structures are constantly adapting to their changing environment, and functions feedback to each other. Applying this notion, we can imagine a continuous exchange of information among legal system, society and individuals. However, we should point out that if institutions change their pattern according to the needs of the social context, and rules continuously aggregate and shape social relations, then ethical values are nothing more than symbols that we, human beings, need to be driven to respect social rules[20].

[Rz 8] *Second*. At this point, we could broadly define the legal information management as the study of automatic elaboration of the law. The two major research directions are the legal information retrieval and legal artificial reasoning: the first approach, which can be defined as inferential or «bottom-up», from legal texts aims to build legal concepts and formulate legal rules[21]; the second, which is called deductive or «top-down», intends to classify legal documents using criteria derived from a pre-established conceptual representation[22]. What is interesting here is that these perspectives feature the same problems mentioned above. Regarding the «legal domain», the issue is the «openness» of the system, namely the identification of the limits of the represented experience and the definition of criteria for data mining. Concerning the «legal ontology», the difficulty is in the construction of knowledge, namely the need to adapt the existing categories to information collected further. The central point is that the most recent studies attempt to combine these two methodologies, on one hand by improving the selection and analysis of data, on the other hand by increasing the change in taxonomies[23]. This synthesis precisely confirms the importance of transparency in the «legal informatics»: the artificial representation of the experience and knowledge – «legal domain» and «legal ontology» – appears as a whole information process.

[Rz 9] *Third*. After observing that the researches concerning legal informatics achieve their natural completion in the paradigm of transparency, it is useful to dwell on how it is expressed. In this regard, it is interesting to note that the most recent studies use the conceptual tool of the «lattice» structure. It is not simply a suggestive trope or a widespread *topos*, but it has a precise meaning. The decentralized network, indeed, is the conceptual pattern that best describes

also two huge phenomena: (1) the structure of social relations[24], (2) the backbone of computer networks[25]. There is no denying that today «*many-many communication*» – which is the hallmark of the Internet[26] – is the most efficient technique to share resources on a global level. Therefore, we can say that transparency needs a distributed «lattice» structure to perform the processes of resources» sharing.

4. Semantic web, folksonomies and transparency

[Rz 10] In this section, I argue that the folksonomies are today the most advanced tool to achieve transparency on the Internet and that they can be fruitfully used in legal information management. To support this assumption I wish to: (1) provide some preliminary notions to define folksonomies; (2) describe their main features, (3) explain broadly their meaning relying on what reported in the previous paragraphs, and (4) evaluate their potential applications to legal information management.

[Rz 11] *First*. As we know, in the last twenty years the Web[27] has evolved in the Semantic Web[28]. Today users may publish content and spread it worldwide, even if they do not have technical skills. The fast growth of unstructured data has required tools for cataloguing information quickly and easily. The most effective solutions are tagging tools, which consist in provide the URI (Uniform Resource Identifier) with metadata that describe the resources according to users preferences. By tagging we can: (1) describe the contents of an object, (2) label the item freely, without having to follow a pre-set taxonomy, (3) use any lexical expression, even belonging to natural language, (4) allocate many tags to an object or assign the same tag to different objects, and (5) share or recommend our choices and preferences. Semantic patterns resulting from the use of tags are commonly defined as «folksonomies»[29] and consist of sets of associations among three elements: (1) the users (people who actually place the tagging), (2) the tags themselves, and (3) the resources being tagged[30].

[Rz 12] *Second*. Scholars observed that in folksonomies an implicit agreement typically arises among users in the choice of tags, thus creating a stable and consistent core of meaning which may be suitable as a classification scheme for the resource. In other words, through the analysis of tags it is possible to build a semantic representation of the data collected. Without commenting technical details[31], we can detect some exciting features. *First*, immediacy. We can observe that, looking to the future, this aspect would likely increase with the growth of the mean-device interaction through voice commands (e.g. SIRI). *Second*, spontaneity. Nobody forces a user to publish content and to tag items, yet thousands of people do it every single second. Of course, users share information and metadata for different personal reasons, but we can say that the main aggregating factor is a common underlying interest. We have to admit that it works. *Third*, language. The task of organizing information is done by

inserting lexical terms in the system and through the association of their meaning with the tagged object. We can argue that tagging could be considered a kind of language-game concerning the description of reality[32]. *Fourth*, «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 the social structure.

[Rz 13] *Third*. I consider appropriate to face the theoretical aspects of folksonomies resuming the order of the issues previously addressed. Thus, I begin with engaging in epistemological question, I continue with those related to the philosophy of law, and I conclude with some remarks from the point of view of legal informatics. Regarding the first issue, I can argue that folksonomies express the synthesis between «perspectivism» and «philosophy of information». According to «perspectivism», the activity of tagging could confirm that the individual is naturally led to ascribe meaning to its context in a way that escapes his full control, since the truth is believed not to be exclusively rational. In this sense, users shape the resources in order to build their own reality just matching their needs, which besides can be wrong, misunderstood or provisional. It does not matter since simply the «domain» created by user is the synthesis of what previously we called «order» and «system». With regard to the «philosophy of information», we observed that tags automatically organize resources spontaneously, continuously and collectively. The fact that these processes are the result of the synergy of individual autonomous choices could lead one to consider that there are links underlying raw data, and so to believe that there should be an overall and unifying vision that could always explain the apparent chaos of our experience of life. I'd say this is quite a mystic point of view. With regard to the philosophy of law, it can be argued that folksonomies fits perfectly into the flow of information that surrounds people, things and institutions, and which is produced by the continuous process of «codification» of social relations. Within such a deterministic context, in which the events are caused – directly or indirectly – by interactions among operators, even law must adapt passively to this ever-changing context. Furthermore, I may suggest that also human existence, till in its inner dimension, becomes nothing more than a semantic process, which cannot be nothing but provisional, unceasing and fast: the individual conscience is guided by slogans, icons and keywords, rather than by deep convictions, which require an awareness that the individual is not supposed to have or improve. As for the legal informatics, we should note that labelling belongs to our common experience. In folksonomies, resources are described with metadata by humans and not by computers[33]. On this basis, we can make two observations regarding: (1) the structure of the communication, (2) the effects of folksonomies from the cognitive point of view. With regard to the first aspect, it is true, indeed, that through tag's distribution users create a set of semantic relations among the resources, but it is also true that the connections replicate the structure of relationships among the same users. Essentially, what enhances and reinforces the sharing of resources is precisely

the «lattice» conceptual pattern of the connections built by folksonomies. Considering the second issue, scholars claim that the association of tags – and thus the increase of the metadata – influences the way users select the resources and browse the Web, since tags facilitate the semantic associations between resources, using the same model that allows the human mind to form a chain of connection among memories[34].

[Rz 14] *Fourth*. With particular regard to the legal information management, attention must be focused on three features of folksonomies: (1) the possible combinations of tags is virtually infinite, (2) metadata may refer not only to the resources, but also to the way they interact with their environment, and (3) the descriptions may refer to the individual attitude towards the resources. As regards the first aspect, the practical disadvantages given by the lexical and linguistic extreme variety – thus difficult to manage by computers – can be reduced by technical measures, as seen above. On the second point, it is important to outline that the legal documents can be described in all their aspects, both extrinsic (for instance, in a legislative text: the issuing authority, serial number, date of publication, date of appeal) and intrinsic (for example, in a decision: specific rhetoric figures, arguments for appealing). As for the third profile, users can annotate their reaction about the legal document (for example, impressions, feelings or comments). In this latter issue can be appreciated the major difference compared to the «top-down» and «bottom-up» approaches – or to their combinations – in legal information management. Hence, we can identify four implications: (1) regarding the «top-down» approach, ontologies could become more resilient to the «lattice» structure of social relations, (2) on the «bottom-up» approach, there could be combined documents that do not belong strictly to the theory of the sources of law (mainly: literature, judicial sentences and administrative rulings), thus allowing to widen the «legal domain» however minimizing the risk of inserting irrelevant data, selected manually by users, (3) with regard to the feedback on the laws, it should be possible to disclose the «sentiment»[35] of citizens, thus providing an additional tool in the hands of the lawmakers[36], and (4) with respect to individuals, self-organizing legal documents could help navigate within a legal system increasingly complicated.

5. Conclusion

[Rz 15] Transparency suffers from fundamental difficulties: (1) the «order» is not a «system» and the «system» is not an «order», so a «system» cannot be, as such, «transparent», (2) experience cannot be detached from «being» and knowledge is, after all, a mere representation of the experience, (3) there is no collective intelligence[37] in the proper sense, and there is no supposed «*wisdom of crowds*»[38], nor could they be the result of the automatic computation, and (4) to conceive the law as «transparent» means to break the link between the juridical experience and the meaning of human existence, and prevent it from giving a substance to legal values.

[Rz 16] More than sixty years ago, the legal informatics was developed as the «next step forward» of jurisprudence[39]. Today, perhaps we might ask ourselves whether folksonomies might be a «next step» in the legal informatics. Of course, it is necessary to overcome the theoretical difficulties concerning the notion of transparency, especially if – as was shown in the previous sections – the legal informatics can be considered as a study of the transparency of the legal system. Yet, folksonomies can be placed within this paradigm, and may be particularly useful in the field of legal information management. Perhaps a more thorough study, possibly deepening also the topology of social connections and the cognitive sciences, could help to overcome at least some of the difficulties mentioned above and maybe reconnect – without replacing – the «system» to «order».

6. References

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1 In fact, the third paragraph of the chapter *Transzendentale Methodenlehre* is entitled «*Die Architectonic der reiner Vernunft*» KANT, IMMANUEL, Kritik der reinen Vernunft. 2. Auflage, J.F. Hartknock, Riga, S. 538 (1787). In Kant's system can be identified three key components: (1)

a plurality of elements empirically considered, (2) a set of relations, which may be appreciated as functions of the system itself, and (3) a unitary vision that imposes the system as the one and only rational understanding of the elements. According to Christian Wolff – who inspired Kant – we can say that the system is the horizon in which knowledge can be considered as a legitimate representation of the experience.

2 The «order» belongs to the dimension of the «being» and may include equally things that can be hidden or not, knowable or unknowable. Likewise, there are visible and invisible aspects inside each of us; some parts are well known, while others may remain mysterious to our own understanding. Since the «order» is the formal structure of all that «is», as human beings, we participate in it and there we find the meaning of everything. The system, instead, is a representation of a certain experience, and therefore includes only what we can empirically perceive, or what we stipulate to consider as such. In this sense, while the «order» is real, the system is always an intellectual construction. FABRO, CORNELIO, The Transcendentality of Ens-Esse and the Ground of Metaphysics. In: International Philosophical Quarterly, Heft 6, S. 389–427 (1966).

3 «*Was vernünftig ist, das ist Wirklich; und was wirklich ist, das ist vernünftig*» HEGEL, GEORG WILHELM FRIEDRICH, Grundlinien der Philosophie des Rechts oder Naturrecht und Staatswissenschaft im Grundrisse. Nicolaische Buchhandlung, Berlin, S. 19–20 (1821).

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7 FLORIDI, LUCIANO, The philosophy of information. Oxford University Press, Oxford (2013).

8 BATESON, GREGORY, Mind and nature: a necessary unity. Dutton, New York (1979).

9 This term was inspired by the theological concept of «noosphere» which is connected to a gnostic spiritual belief, TEILHARD DE CHARDIN, PIERRE, L'avenir de l'homme. Oeuvres de Pierre Teilhard de Chardin, 5, Éditions du Seuil, Paris (1959).

10 In this perspective, to understand our experience and its meaning we should rely only on the concept of information. Through it, we can just measure: (1) the likelihood that an event will occur in a given context (ontological aspect), (2) the perception of the empirical effects of the phenomenon (epistemic aspect), (3) the understanding of the input received and the formulation of a response (cognitive aspect), (4) the impulse of the reply to the stimulus (operational aspect), (5) the effects of the response within the context (reactive aspect), and (6) the modification of the behaviour depending on the response obtained (retroactive aspect).

11 From a theoretical perspective, *jus naturale* was conceived as a rational pattern emerging from the nature of things; in practical terms, it was an instrument for the pursuit of justice in the human experience «*[…] ut eleganter Celsus definit, ius est ars boni et aequi*» ULPIANUS, ENEUS DOMITIUS, Liber Primum Institutionum, D. 1, 1, 1. Gradually, it was overtaken by the «natural law», a concept swinging between materialism and rationalism: in the first, rules are defined by a system determined exclusively by physical causes, HOBBES, THOMAS, Leviathan or The Matter, Forme and Power of a Common Wealth Ecclesiasticall and Civil. Printed for Andrew Crooke, London (1651). In the latter, norms are classified in logically consistent set of axioms, DE GROOT, HUIG, De jure belli ac pacis. Apud Nicolaum Buon, Paris (1625). At the end, the sources of law divorce from their metaphysical roots and legitimacy struggles against legality.

12 Certainly, in the modern perspective law does not ground its legitimacy into natural order, but in sovereign's decrees or in social behaviours pragmatically detected.

13 In fact, codification embodies the unilateral imposition – a «top-down» process – of the system, which may relate to the sources of law as well as to the legal reasoning.

14 Article 7, Loi 30 Ventôse XII (21st March, 1804). Famous is the sentence of Jean Bugnet reported by Julien Bonnecase: «*Je ne pas le connais Droit civil; que je n'enseigne the Code Napoléon*».

15 Sartor and Fernandéz-Barrera find a similarity between the Pandectists and the Analytical Jurisprudence of Austin in the common effort to build a conceptual system,FERNÁNDEZ-

BARRERA, MERITXELL/SARTOR, GIOVANNI, Classifications and the Law: Doctrinal Classifications vs. Computational Ontologies. Working Papers of the Law Department of the EUI, European University Institute, S. 12 (2010). As we know, also this effort produced a *corpus legis*, which is also structurally different from the French Code precisely because of the different theoretical approach adopted. The BGB (Bürgerliches Gesetzbuch), which entered into force on 1 st January 1900 contains a general part, *Allgemeiner Teil*, placed before the sections in which are included the provisions for each subject (*Recht der Schuldverhältnisse*, *Sachenrecht*, *Familienrecht*, *Erbrecht*).

16 Although its use has spread for its practical convenience, in contemporary legal philosophy the coincidence of «code» and system has become obsolete. Concerning the sources of law, the legal system is based, according to John Austin, Hans Kelsen, Herbert Lionel Adolphus Hart, Joseph Raz, respectively on the sovereign power, on the *Grundnorm*, on the rules of recognition, on the recognition by the primary organs. With regard to the legal reasoning, several authors reformulate the legal language with the aim of shaping a logical system; in this sense, some scholars deepen modal logic (Stephen Toulmin), others adopt a practical approach to argumentation (Aulis Aarnio, Robert Alexy, Aleksander Peczenik), and others devote themselves to the deontic logic (Wesley Newcomb Hohfeld, Carlos E. Alchourrón and Eugenio Bulygin).

17 The term «coding» is used here differently from LUHMANN, NIKLAS, Das Recht der Gesellschaft. Suhrkamp, Frankfurt am Main (1993).

18 It is believed that the «openness» of the legal system can be achieved throuh the increase in the number and variety of sources of law. For example, through the recognition of local autonomies or judicial precedents, or even with the establishment of independent authorities, LUHMANN, NIKLAS, Soziale Systeme: Grundriss einer allgemeinen Theorie. Suhrkamp, Frankfurt am Main (1984).

19 It is assumed that the mutual integration of different systems can qualify the overall system as a self-observing entity. In other words, the system is no longer just a representation, as it can produce a self-referential semantics. In this sense, the existence of the system itself becomes a foundational principle, ZAGREBELSKY, GUSTAVO, Il diritto mite: legge, diritti, giustizia. Einaudi Contemporanea, 14, Einaudi, Torino (1992). Since legality is not simply opposed to legitimacy, but it is its foundation, in a «transparent» legal system, therefore, the law itself, the legal methodology and hermeneutics eventually merge in the synthesis of experience and knowledge.

20 This perspective is not very far from what depicted inROSS, ALF, Tû-tû. In: Harvard Law Review, Heft 70, S. 812-825 (1957). What matters most, from this perspective, is that social rules actually exist, that they are recognizable, rationally representable, practically executable, and it is likely that infringements are remedied. Since those that we commonly define as «principles» only aim to preserve the existing configuration of the processes, then they do not have an actual substance or at least a persistent meaning. In radical terms, it can be argued that within a transparent legal system, there are no values for which it is worth living or dying. The sharing of resources is expressed in the distribution of rights to individuals, but does not depend on the recognition of a real – or better, natural – utility to them, but rather serve efficiency and effectiveness of information exchange, LUHMANN, NIKLAS, Vertrauen: ein Mechanismus der Reduktion sozialer Komplexitaet. Soziologische Gegenwartsfragen, N. F., 28, F. Enke, Stuttgart (1968).

21 «A system of legal concepts or legal conceptual system is a network in which each node corresponds to a legal concept and each line in the network corresponds to a link between legal concepts»Fernández-Barrera, Meritxell/Sartor, Giovanni, Classifications and the Law: Doctrinal Classifications vs. Computational Ontologies. Working Papers of the Law Department of the EUI, European University Institute, S. 11 (2010).

22 An «ontology» is defined as: «the product resulting from the systematic inventory by knowledge engineers of relevant aspects of a certain knowledge domain» Boer, Alexander, Legal Theory, Sources of Law and the Semantic Web Frontiers in artificial intelligence and applications, 195, IOS Press, Amsterdam, S. 32 (2009). In other words, it's «*a specification of one's conceptualization of a knowledge domain*» ibid.

23 To sum up, I can say that recent efforts are focused on the attempt to develop frameworks composed of multilayer architecture that integrates language and concepts, and so «top-down» and «bottom-up» theories. The purpose is to enable the representation of legal

domains in ontologies in order to articulate multiple conceptual contextualisation of lexical terms. This allows firstly to separate the legal concept from its linguistic expression, secondly to distinguish between synonyms, and finally to handle polysemous expressions, PALMIRANI, MONICA/OGNIBENE, TOMMASO/CERVONE, LUCA, Legal rules, text, and ontologies over time. Proc. Of The RuleML2012@ECAI Challenge, at the 6th International Symposium on Rules, Montpellier, (August 27–29, 2012), CEUR-WS, S. 61–78 (2012).

24 MILGRAM, STANLEY/MANN, LEON/HARTER, SUSAN, The Lost-Letter Technique: A Tool of Social Research. In: The Public Opinion Quarterly, Heft 29, S. 437–438 (1965).

25 BARAN, PAUL, On Distributed Communications Networks. RAND Corporation papers, P-2626, RAND (1962).

26 «*The Internet is therefore a unique and wholly new medium of worldwide human communication*» American Civil Liberties Union v. Reno, decision of the Court for the Eastern District of Pennsylvania, 11th June 1996, in 929 F. Supp. 824, 830-849 (ED Pa. 1996), (1996); American Civil Liberties Union v. Reno, decision of the Supreme Court of the United State No. 96–511, 19th March 1997–26th June 1997, in 521 U. S. 844 (1997), 850, (1997).

27 BERNERS-LEE, TIM/CAILLIAU, ROBERT/LUOTONEN, ARI/NIELSEN, HENRIK FRYSTYK/SECRET, ARTHUR, The World-Wide Web. In: Communications of the ACM, Heft 37, S. 76–82 (1994). The Web is defined by W3C as «*an information space in which the items of interest, referred to as resources, are identified by global identifiers called Uniform Resource Identifiers (URI)*» BERNERS-LEE, TIM/BRAY, TIM/CONNOLLY, DAN/COTTON, PAUL/FIELDING, ROY/JECKLE, MARIO/LILLEY, CHRIS/MENDELSOHN, NOAH/ORCHARD, DAVID/WALSH, NORMAN, Architecture of the World Wide Web. W3C (2004).

28 As stated by Berners-Lee, the Semantic Web «*is not a separate Web but an extension of the current one, in which information is given well-defined meaning, better enabling computers and people to work in cooperation*» BERNERS-LEE, TIM/HENDLER, JAMES/LASSILA, ORA, The Semantic Web. In: Scientific American, Heft 284, S. 28–37 (2001). The Semantic Web can be defined as an «information space», namely a network «where nodes are resources and arcs are links» HALPIN, HARRY, Social semantics. The search for meaning on the Web. Semantic Web and Beyond, 13, Springer, New York, S. 56 (2013).

29 The word «folksonomy» is a blend of the words «folk» (which means «people» in German language) and «taxonomy» (a conceptual grid strictly classified). This expression was used for the first time in 2004 in VANDER WAL, THOMAS, You down with folksonomy. http://www.vanderwal.net/random/entrysel.php?blog=1529 angerufen 3/1/2014 (2004). 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, VANDER WAL, THOMAS, Explaining and showing broad and narrow folksonomies. http://www.vanderwal.net/random/entrysel.php?blog=1635 angerufen 3/1/2014 (2005).

30 HALPIN, HARRY, Social semantics. The search for meaning on the Web. Semantic Web and Beyond, 13, Springer, New York, S. 111 (2013). Precisely, let us define «folksonomy» a tuple as follows: $F:=U, T, R, Y, <$ 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., $Y \subseteq U \times T \times R$, called tag assignments (TAS for short), $<$ is a user-specific subtag/supertag-relation, i.e., $< \subseteq U \times T \times T$, called subtag/supertag relation. The personomy Pu of a given user $u \in U$ is the restriction of F to u, i.e. $Pu:=Tu,Ru,Iu, <u$ with $Iu:=\{t,r \in T \times Ru \mid t,r \in Y\}$, $Tu:=\pi 1 Iu$, $Ru:=\pi 2 Iu$, and $<u:=\{t1,t2 \in T \times Tu \mid t1, t2 \in <\}$, where πi denotes the projection on the i^{th} dimension. HOTHO, ANDREAS/JÄSCHKE, ROBERT/SCHMITZ, CHRISTOPH/STUMME, GERD, Information retrieval in folksonomies: Search and ranking. In: Sure Y, Domingue J (Hrsg.), The semantic web: research and applications, 4011, Springer, Berlin Heidelberg, S. 411–426 (2006).

31 There are several methods to integrate «bottom-up population» with «top-down standardization»: folksontologies, explicit semantics, enriched semantics, flexonomies, network of terms, semantic layer, DOTSIKA, FEFIE, Uniting formal and informal descriptive power. Reconciling ontologies with folksonomies. In: International Journal of Information Management, Heft 29, S. 407–415 (2009).

32 WITTGENSTEIN, LUDWIG, Philosophical investigations. Blackwell, Oxford (1953).

33 Folksonomies indeed can be counted among «human computation systems», defined as «*intelligent systems that organize humans to carry out the process of computation*» LAW, EDITH/ VON AHN, LUIS, Human Computation. Brachmann RJ, Cohen WW, Dietterich T,

Synthesis Lectures on Artificial Intelligence and Machine Learning, 13, Morgan & Claypool Publishers, San Rafael, S. 4 (2011). It should 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. In «human computation systems» each 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, *v*ON AHN, LUIS/MAURER, BENJAMIN/MCMILLEN, COLIN/ABRAHAM, DAVID/BLUM, MANUEL, reCAPTCHA: Human-Based Character Recognition via Web Security Measures. In: Science, Heft 321, S. 1465–1468 (2008).

34 CRESS, ULRIKE/HELD, CHRISTOPH/KIMMERLE, JOACHIM, The collective knowledge of social tags: Direct and indirect influences on navigation, learning, and information processing. In: Computers & Education, Heft 60, S. 59–73 (2013).

35 Similar analysis are performed in marketing,UNNAMALAI, K., Sentiment Analysis of Products Using Web. In: Procedia Engineering, Heft 38, S. 2257–2262 (2012).

36 Folksonomies can make explicit how legal documents are received by the addressees, so to evaluate aspects that can be broadly defined as «emotional», «ideological» or «ethical» – individual feelings and beliefs, collective principles, values – and to which the current legal information management tools cannot attribute any relevance. Nevertheless, we know that these items are of great importance in our society, as they can be manipulated by those who control the mass media. In this aspect, folksonomies fully exploits the ambiguity of transparency.

37 ENGELBART, DOUGLAS C., Augmenting Human Intellect: a conceptual framework. Stanford Research Institute (1962); LÉVY, PIERRE, L'intelligence collective: pour une anthropologie du cyberspace. La Découverte, Paris (1994).

38 SUROWIECKI, JAMES, The Wisdom of crowds: Why the many are smarter than the few and how collective wisdom shapes business, economies, societies and nations. Random House, New York (2004).

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

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