

# The Ontomedia Project: ODR, Relational Justice, Multimedia

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**Abstract.** More than ever, the Web is a space of social interaction. Recent trends reveal that Internet users spend more time interacting within online communities than in checking and replying to e-mail. Online communities and institutions create new spaces for interaction, but also open new avenues for the emergence of grievances, claims, and disputes. Consequently, online dispute resolution (ODR) procedures are core to these new online worlds. But can ODR mechanisms provide sufficient levels of reputation, trust, and enforceability so as to become mainstream? This contribution introduces the new approaches to ODR with an emphasis on the Ontomedia Project, which is currently developing a web-based platform to facilitate online mediation in different domains

**Keywords:** Semantic Web, Online Dispute Resolution, ODR, Web 3.0, Web Services, Web-based platforms

## 1. Introduction: Relational Justice and ODR

Technology both fosters and participates actively in the process of transformation of law. Drafting, contracting, sentencing and administrative management have been enlarged with all the Online Dispute Resolution (ODR) initiatives and new forms of self-regulation and access to justice. Besides, the web fosters personalization. Citizens require a greater participation and faster and more effective ways of facing their legal activities. We will refer to these legal forms as *relational justice*.

In a broad sense, relational justice (RJ) may be defined first as the justice produced through cooperative behavior, agreement, negotiation, or dialogue among natural or artificial actors. The RJ field includes Alternative Dispute Resolution (ADR) and ODR, all forms of mediation (in commerce, labor, family, juvenile and adults' crimes, victim-offender ...), restorative justice, transitional justice, community justice, family conferencing, and peace processes (Casanovas and Poblet, 2008).

From a technological point of view, RJ may be defined as well as the substantive and formal structure that allows users (citizens, consumers,

customers, clients, managers, and officials) to participate in the making of their own regulation and legal outcomes through all the mixed and plural strategies of the Semantic Web framework. This implies the coexistence of legal and social norms, rights and duties to be shared by subjects (artificial or natural agents) in a flexible and dynamic structured environment (Casanovas, 2009).

There are rights to be protected and duties to be put in place. But these rights and duties belong to a new regulatory framework, because the networked information environment has definitively transformed the marketplace. The Internet is evolving towards a network of things (contents), and not only of linked websites. Cooperation, mobile use, crowdsourcing and services orientation constitute the next step for the World Wide Web.

This has been recently referred as to “the Metropolis model” (Kazman and Chei, 2009): “businesses are shifting from a ‘goods-dominant’ view, in which tangible output and discrete transactions are central, to a service dominant view, in which intangibility, exchange processes, and relationships are central”. In the Metropolis model, service-dominant logic views customers not as passive but as proactive agents, “as co-creators of value”.

The new regulatory landscape constitute the natural environment of the relational justice field, where scenarios and contexts are shaped from a hybrid use of different technologies by a multitude of different users (citizens, customers, officers, agents or MAS, Multi-Agent Systems). In the following sections, we will situate broadly the Ontomedia Project among the ODR developments.

## **2. Recent trends in Web 2.0**

In the very spirit of its present developments, the notion of “Web 2.0” has a half-baked, conversational, and collaborative genealogy. Quoting Scott Dietzen, Eric Knorr welcomed Web 2.0 in December 2003 as a “universal, standards-based integration platform” (Knorr, 2003). Shortly after, the term popped up in a brainstorming session between Dale Dougherty (co-founder of O’Reilly Media) and Craig Cline, and reached larger audiences after the O’Reilly Media Web 2.0 conference in late 2004. The notion would then spread rapidly to become one of the most successful paradigms of the recent Internet era.

Perhaps as the clue of its nearly immediate success, there was neither clear consensus on what Web 2.0 was nor where the precise boundaries lied across. Again, and following discussions with other commenters, O’Reilly posted in a forum a compact definition of Web 2.0 which included as a

chief rule for success “to build applications that harness network effects to get better the more people use them” (O’Reilly, 2006). And, indeed, as people started using them, the focus gradually shifted towards the social component of Web 2.0, to the point that Web 2.0 became equivalent to “the Social Web”. Today’s Social Web breeds an ever-growing number of online communities that share all types of contents (documents, images, videos, music, etc.), knowledge, and expertise in a number of areas. Some recent figures by Nielsen Online may give an idea of the impressive growth rate of online social communities: (i) from a time spent perspective, member communities surpassed e-mail for the first time in February 2009; (ii) previously, video audiences had already surpassed e-mail audiences in November 2007 (roughly 100 million users at the end of that year); (iii) “new moms” (younger, one child), are much more likely to visit social networking sites and publish or own a blog than most other online users”. For instance, new moms “are 85% more likely to spend time with Facebook compared to the average online consumer” (Nielsen, 2009). To Nielsen analysts, “becoming a mother is a dramatic inflection point and drives women to the Web in search of advice and a desire to connect with others in her shoes”.

To what extent are these trends relevant for online dispute resolution (ODR)? Is ODR to become the default justice system of the Social Web in the next future? Furthermore, can ODR mechanisms provide sufficient levels of reputation, trust, and enforceability so as to become main stream? Clearly, online communities and electronic institutions create new spaces for interaction, but also open new avenues for the emergence of grievances, claims, and disputes. In the pages that follow we will try to offer some answers by providing some recent examples and describing our particular contribution to the field, the Ontomedia project.

### **3. ODR 2.0**

Ricoh Online Dispute Resolution (ODR) is an umbrella domain that covers a full range of processes (i.e. negotiation, early neutral evaluation, conciliation, mediation, and arbitration) to handle disputes online. While it was sometimes viewed as the online equivalent of ADR (Alternative Dispute Resolution) processes, there is a growing consensus in specialized literature that considers ODR more than just the delivery of alternative dispute resolution (ADR) services through the Internet, especially since Ethan Katsh (2001) first suggested giving technology the role of a “four party”.

In this line, the emergence of a vast range of both new terminologies and typologies to systematize current ODR practices proves that the

domain is becoming a branch of dispute resolution in its own right. Especially when the judicial system alternative is perceived too costly or inappropriate for a number of reasons (nature and/or value of the dispute, physical location of the parties, etc.) ODR has the potential to become an efficient default system. This is precisely the case for online communities such as e-Bay, whose dispute resolution services deal with roughly 40 million cases each year (Rule, 2008). Overall, in recent research on ODR services we have identified up to twenty major service providers, most of them working on private schemes (Poblet et al., 2009a) (Fig. 1). Even though they differ significantly on case figures, procedures, or business models, they all tend to deal with small value claims and procedural costs can be kept relatively low. In contrast, and with some exception (Gabarró, 2009) little is known on users' satisfaction towards ODR services.

In 2006, Colin Rule welcomed 2.0 technologies and forecasted that "ODR will be one of the biggest beneficiaries of these new technologies, because they are squarely aimed at ODR's core functionality areas: communication, collaboration, and interactivity" (Rule, 2006). However, he also warned that "too many ODR providers rely on outdated platforms and technology because they are reluctant to make the investments in time and resources needed to bring their platforms up to Web 2.0 standards" (Hattotuwa, 2008a). Sanjanah Hattotuwa (2008b) went a step further anticipating unwanted consequences of ODR lagging behind the curve of Web 2.0,

"[T]he most obvious being that ODR itself may cease to exist. With the ubiquity of broadband wired and wireless connectivity, the ability to roll-out dispute resolution service online is possibly going to be seen as a normal service provision of ADR service providers, just like automated online tech support is now part and parcel of customer support mechanisms of many large software companies."

Generally, the current platforms that populate the ODR market have in common some basic features: proprietary software, stable versions, PC-based, and predetermined roles (i.e. the services provider, the mediator, the parties, etc.). Beyond these common traits, ODR services differ in scope (either addressed to specific domains or open to any type of dispute), techniques offered (assisted negotiation, mediation, conciliation, recommendation, arbitration, etc.), degree of sophistication (from facilitating online forms and procedures to case management, assignment of online mediators, or professional training), communication channels (synchronic, asynchronic, or both) and business models. Recently, some fifteen ODR service providers have been reviewed by the CEN in order to facilitate interoperability schemes (CEN 2009) Table 1 below summarizes basic features of twenty ODR providers.

Table 1. Basic features of ODR service providers. Source: CWBM, Poblet et al. (2009a)

Producto	Address	BBB	Over Settle	DisputeM	ECODR	Electronic Courtbook	Over-Confianza Online	Juripax	MARS	Mediateur du net	Mediation Room	National Arbitration Forum	Net Neutrals	ODRWorld	PayPal	Ricchi Online	Smart Settle	Square Trade
Owner	Council of Better Business Bureaus	USA	CyberSettle	DisputeM Singapore Arbitration Center	European Commission	Electronic Courtbook	AUTOCENTRAL Concepts for Courts, Red as	Juripax	MARS	Le Forum des Mediation Internet	National Mediation Room	National Arbitration Forum	DeHans & Ass.	ODRWorld	PayPal	Milano Chamber of Commerce	ICM Systems	Square Trade
Country	USA	USA	USA	Singapur	Europe	USA	Spain, Andorre	Holland	USA	France	UK	USA	USA	UK, India	US	Italy	USA	USA
Domain	e-T	e-T	G	e-T, dh	e-T	G	e-T, dh, far	G	e-T	e-T, dh, far	G	G	T	G	e-T	e-T	G	Gal
Negotiation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mediation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Arbitration	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Complaints	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Conciliation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Recommendation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mediators' roast	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trustmark	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Training	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Other services	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Control of flows	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Registry of cases	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Structured forms	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Messages to parties	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Asynchronous communication	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Synchronous communication (chat, videoconference)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Confidential registries	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Optimization algorithm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cross-offers algorithm	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Web provider	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ODR simplified	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Softcrated ODR	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Licenses selling	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

G generic domains e-T electronic Transactions (B2C, B2B, C2C) far Internet related rights (privacy, access, copyright) T eBay specific transactions Gof Electric appliances guarantees

Other services 1. Standards 2. Premediation 3.Psychometric profiling 4. Express mediation and arbitration

ODR services do not only provide the framework, the tools, and the procedures to deal with disputes, but also create their own “soft law”, precedents, and even enforcement mechanisms: in eBay, buyers and sellers may submit their dispute to the Paypal Resolution Center, which will be able to block the money transfers until a consensual decision is reached or the Center delivers a final decision; in the Wikipedia, where mediation is normally used for disputes about article content and arbitration mostly applies to disputes about user conduct, editors can temporarily or indefinitely be blocked depending on the seriousness of the case.

New horizons and opportunities for ODR have incredibly expanded over the last three years with the emergence of new web tools and services focusing on conflict prevention, conflict tracking, debate, or negotiation. For the sake of clarity, we will distinguish here two different sets of tools: (i) open source platforms and (ii) mashups. Even though different in nature and purpose, they all have in common featured aspects of state-of-the-art Web 2.0: open source software, free access, multiplatform facilities, and crowdsourced data.

## 2.1. OPEN SOURCE PLATFORMS

- **Ushahidi** —“testimony” in Swahili— is a free, open source platform that allows its users to gather distributed data via SMS, email or web and visualize it on a map or timeline.<sup>1</sup> Through Ushahidi people report real time information of events such as political disruption or natural disasters and the platform aggregates this incoming information for use in a crisis response. The website was created at the beginning of 2008 as a simple mashup, using user-generated reports and Google Maps to map reports of violence in Kenya after the post-election fallout. Ushahidi has recently released the open Beta version of its platform and has been used in different projects in India, Congo, and South Africa.
- **Swift** is a free and open source toolset for crowdsourced situational awareness.<sup>2</sup> The first use of Swift has been as a complement to Ushahidi to monitor the Indian 2009 Elections. Swift embraces Semantic Web open standards such as FOAF, iCal, Dublin Core, as well as open publishing endpoints such as Freebase to add structure to crisis data and make them shareable.
- **RapidSMS** is an open source web-based platform for data collection, logistics coordination, and communication developed by the Innovations and Development team of UNICEF.<sup>3</sup> With the RapidSMS web interface,

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<sup>1</sup> <http://www.ushahidi.com/>

<sup>2</sup> <http://swiftapp.org/>

<sup>3</sup> <http://www.unicefinnovation.org/mobile-and-sms.php>

multiple users can simultaneously access the system to view incoming data as it arrives, export new data-sets, and send text messages to users.

## 2.2. MASHUPS

- *Vikalpa* is a Sri Lanka citizen journalism initiative that in May 2008 launched a micro-site on Twitter with short reports on election related violence and malpractices. Reports were generated by the citizen journalist network in the Eastern Province of the country.<sup>4</sup> The micro-blogging initiative was complemented with a Google Maps based solution for the Centre for Monitoring Election Violence (CMEV) to locate election related incidents on a map (Hattotuwa, 2008b).
- *WarViews*: Visualizing and Animating Geographic Data on Conflict. WarViews is a project of The Swiss Federal Institute of Technology that has developed an interface for the exploration of GIS data on conflict. WarViews is offered in two different versions: a static version that runs in a web browser and allows the user to switch between different data sets, and a dynamic version based on Google Earth that can time-animate geographic data such that the development over time can be monitored (Weidmann et al., 2009). WarViews targets both researchers and practitioners in the conflict management and resolution domains.
- *WikiCrimes* is an initiative at the University of Fortaleza (Brazil) that allows posting and accessing criminal occurrences in a Google map.

## 4. The Ontomedia Project

People in need for help and assistance —as the new mums example shows— look for help in social communities and specialized web sites. This is where Ontomedia aims at contributing. From the Ontomedia standpoint, both Web 2.0 and Web 3.0 technologies can make significant advances into the ODR field, helping professionals to gather resources relevant to the mediation services they are providing, and helping users to share and contribute to harness the connective intelligence about ODR that can be found on the Web.

The main objective of Ontomedia is to allow users and professionals to meet in a community-driven Web portal where contents are provided by users. Nevertheless, our focus is on mediation users (mediators and parties) rather than on content itself. Thus, and following a consumer-first approach (Gabarró, 2009) we expect mediation users to create the contents and the

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<sup>4</sup> <http://www.vikalpa.org/archives/category/languages/english/>

semantics that reflect how present their cases, how they interact with the mediators and the other parties, and how they experience the mediation process. While Ontomedia works with a Core Mediation Ontology (CMO) (Poblet, 2009b) that models the main concepts and relationships in mediation, we intend not to anticipate the needs of the users and impose formal semantic structures in advance. Rather, our aim is let the users define their needs and then elaborate semantic models that evolve as a by-product of the mediation processes.

We have described elsewhere the core-ontology (Poblet et al. 2009b) and the functionalities of Ontomedia (information, repository, training, communication, management) (Poblet et al. 2010). Fig. 1 shows a fragment of the ontology (phases of mediation):

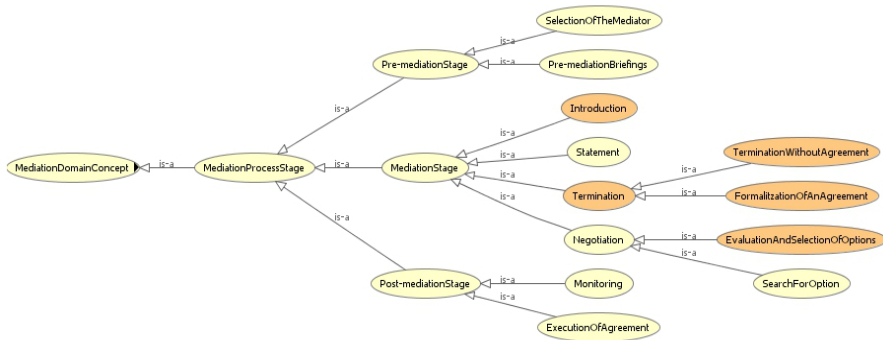


Figure 1: Fragment of the Ontomedia ontology in successive stages

Ontomedia assists mediation users and professionals assistance at different levels:

- **Information retrieval on previous cases.** Users and mediators will be able to consult previous cases, duly anonymized to ensure privacy and compliance with current legislation. Retrieval will be enhanced by one or more ontologies.
- **Definition of a case.** To control the mediation process, the Core Mediation Ontology (CMO) models the basic concepts and relationships in mediation and creates templates to guide users and mediators throughout the process.
- **Mediation.** Ontomedia will have videoconferencing facilities including different tools to provide mediators with information on the mood of the users (analyzing their voice, their movements, and their reactions).
- **Annotation.** The system will be able to annotate the contents of the multimedia objects, being those texts, video, audio objects. These



annotations will be further used to categorized and increase the case corpus. The annotations will be automatically realized against a set of ontologies on mediation and about the specific sub-domains.

- **Tagging.** Ontomedia needs its users to enhance the contents. Every piece of information is susceptible of being tagged, creating thus mediation folksonomies that can be later used also in the information retrieval stage. Users will be able to tag, comment and suggest, creating online communities around their cases and their problems.

Fig. 2 shows the overall Ontomedia cycle:

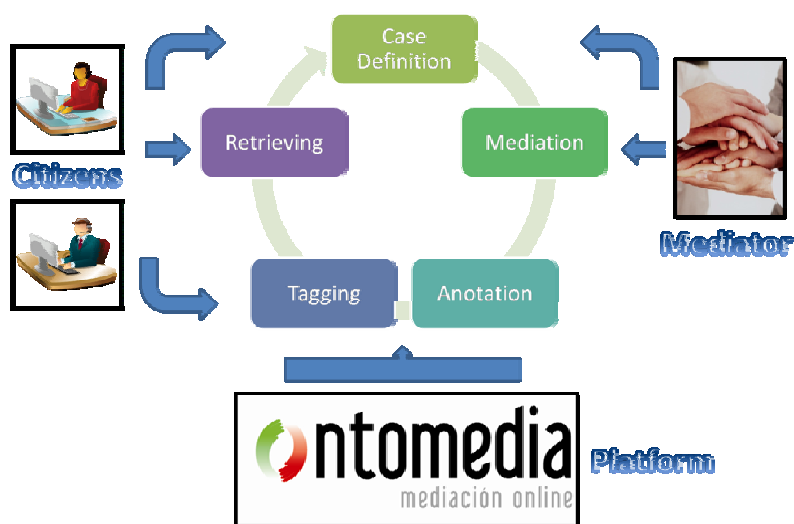


Figure 2. Ontomedia case lifecycle

## 5. Web Oriented Architecture, enhanced interaction and Multimedia

Mediation users and professionals can use any kind of devices to access the portal (computers, mobiles), and in any format suitable to their purposes (text, speech, video, pictures). Users will therefore be able to participate in online mediation services as they do in a face-to-face basis, but with the advantages of distributed and even remote access.

In Ontomedia we also foresee the application of mediation services as tasks within a mediation process that will be formally described by means of both process ontologies and mediation ontologies. These services will be

described, stored and made accessible through a service bus that will ensure end to end communication between consumers and providers, as well as a semantic execution engine that takes care of the execution of semantically enhanced mediation processes.

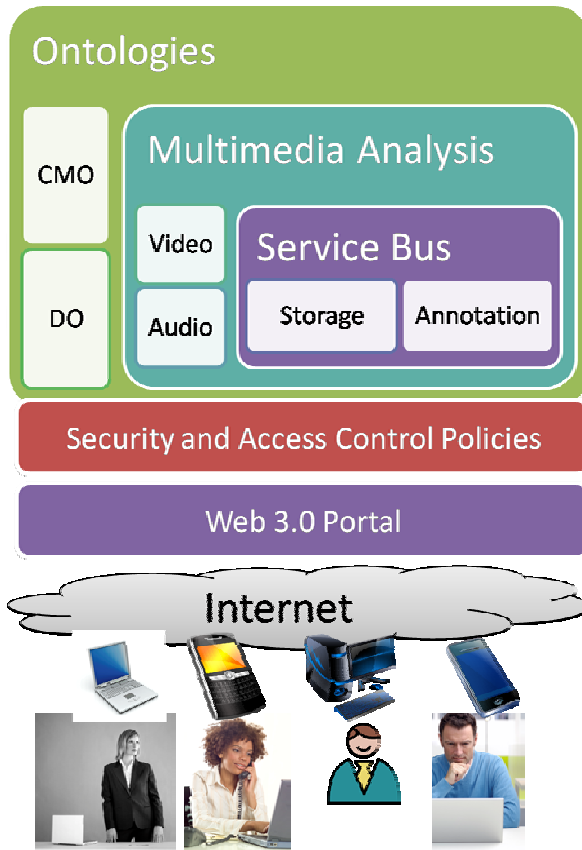


Figure 3: Ontomedia layered architecture

Ontologies will be used to annotate and analyze any type of content. The multimedia analysis aims at enhancing the information a mediator receives during a mediation session, capturing mood changes of the parties and any other psychological information inputs. All types of metadata will be automatically extracted and stored to be further used within the mediation process.

Ontomedia will also develop tools to invite users to exploit the advantages of sharing information and experiences with others. In this way, users will be able to tag and store content that are useful or interesting to them, and to find similar cases. In doing so, they will be able to create social communities of people with common interests. And, related to those utilities, Ontomedia will provide a mashable suite of features that will allow users to locate similar cases to theirs. The semantic geographical location of those cases and its representation in a map is a trivial feature.

What seems more interesting from a user perspective is the possibility to have tag clouds of concepts related with each case and a timeline of concepts against a case. The set of Web 3.0 features that will be enabled and accessible to users of the ONTOMEDIA platform can be summarized here:

1. *Annotation of all types of contents.* With this feature, a user can easily know if another case has some conceptual similarity with hers. Given a case, a useful visualization feature is the representation of those concepts more relevant in a case as a tag cloud. Just clicking in one concept or other in the tag cloud will show you a set of cases that also are related to that concept.

2. Jointly with the annotation, *some metadata extraction is automatically conducted*, including geographical position of cases, time location and named entity recognition: (i) geo-location allows users to track similar cases, given the set of concepts related to the issues. The tag cloud will always show the concepts that are relevant to cases appearing in the map. Categorization and segmentation will be possible by means of several icons and with just a glimpse the user of the platform will have a tool for visualization and conceptual identification; (ii) with time location, users will have a timeline. Timelines can show the location of cases against time with respect a particular concept (the apparition of a case related to a concept in a particular time). With this feature, users will be able to see the evolution of the frequency of cases where a concept is concerned; (iii) where NER (Named Entity Recognition) is concerned, the platform will be able to detect where well-known entities are mentioned.

3. In Ontomedia, well-known entities are *concepts that transcend domain ontologies* like person names, organizations, dates, places, figures and some others. The power behind this feature is that doing so, we will be able to connect well-know entities with well-know facts as those defined with the LOD (Linked Open Data) principles (Berners-Lee, 2006). Where the name of a person is mentioned, if it exists, we will retrieve her FOAF<sup>5</sup>

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<sup>5</sup> FOAF. Friend of a Friend. <http://www.foaf-project.org/>

profile. Where a place is mentioned, we will extract the GeoName<sup>6</sup> information available, and so on. This information can be used within Ontomedia to add formal restrictions and reason over it. Each concept, each piece of information, each resource is susceptible to have a comment from any user. Users are encouraged to participate within the platform and to build it jointly with other users, as professional mediators are as well. From this second point of view, multimedia content and management constitute an important issue.

Let's go this last issue. Managing mediation is far from easy. Empathy, emotions, culture and professional practice shape the interactions and the communicative flow. It has been much discussed recently whether emotions alter face-to-face interactions when they are computer-mediated. We recently established the state of the art (Poblet and Casanovas, 2007). Several studies have shown that emotional content situates and intensifies the strength of cognitive and expressive skills (Ben Ze'ev, 2004). Thus, linguistic rationality is not the single kernel of the argumentation process. Rational arguments go through what the ancient rhetoric knew as *stasis* and *ekphrasis*, based on the perceptual and visual behavior among participants (Casanovas, 2010).

What we are building up in Ontomedia, then, are some devices to visualize emotions through facial reading, and some ways to reconstruct the visual abduction of narratives (Gracia et al. 2010a, 2010b). As the reader will see in the next papers in this same volume, we are following two different strategies: (i) diarization, and (ii) semantic annotation (González-Conejero, 2010). In this way, the mediator may have some additional non-intuitive information about the distance of the agreement and the feelings of the participants.

Still, empowering professional mediators' skills is not an easy task, and we have no evidence yet about whether or not these tools will be useful and used. Moreover, this attempt is not free of ethical issues and concerns about privacy, neutrality and impartiality. However, even in this exploratory stage, we think that this is the kind of knowledge that is needed to enhance relational justice through the web.

## 6. Conclusions

Despite the conceptual vagueness of the definitions, both Web 2.0 and Web 3.0 developments offer new forms to interact with the Web that are most relevant to ODR. To be sure, some of their critical features—openness, standardization, free access, connectedness, crowdsourcing

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<sup>6</sup> Geonames. <http://www.geonames.org/about.html>

effects, etc.— make it possible to enrich ODR services in a wider perspective. The Ontomedia project attempts to learn from these innovations so as to provide an easy-to-use web platform for both mediation domain experts and end-users. A distinctive aspect of Ontomedia, nevertheless, is the application of Semantic Web technologies to enhance online mediation processes. On the one hand, Ontomedia will use basic ontologies to annotate any kind of content (either textual or multimedia) to facilitate users to participate in the process and search any useful information on related cases. On the other, a semantic execution engine will take care of the execution of the semantically enhanced mediation processes.

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