Expanding the Horizons of ODR

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Sponsors of the 5th International Workshop on Online Dispute Resolution

Foreword

Welcome to the Fifth International Workshop on Online Dispute Resolution. This time we are honored to be hosted by the Institute of Legal Information Theory and Techniques (ITTIG-CNR) in Firenze. We also thank the other Workshop sponsors (The European University Institute, the UAB Institute of Law and Technology, and the University of Bologna) for their support with the organization of this 5th edition of the ODR Workshop.

As in the previous four editions of the Workshop, the 5th International ODR Workshop'08 aims at offering a forum for the exchange of ideas and projects between people with different backgrounds, such as providers of ODR services, researchers in the field of ADR/ODR, law, argumentation, negotiation, and Artificial Intelligence & Law, practitioners, justice experts, etc. For an overview of the previous ODR Workshops, see http://odrworkshop.info.

In less than a decade, Online Dispute Resolution (ODR) is on its way to achieve a stage of maturity. The provision of a vast array of ODR services and the number of disputes resolved through ODR in different domains (i.e. e-commerce, domain name disputes, court-annexed ODR, insurance claims, peace-building processes, etc.) suggest that the taxonomy of disputes suitable for ODR may expand in the next future. Nevertheless, the development and application of ODR also poses a number of issues for researchers, practitioners, service providers, and final users (individuals, organizations, governments, etc.). These issues are related to aspects such as accessibility, interoperability, usability, efficiency, confidentiality, or enforceability.

This year we accepted 8 papers covering many aspects of ODR, for which we divided the Workshop in three sessions: ODR in institutions and organizations, decision and negotiation support systems in ODR, and use cases and techniques for ODR. In addition, we had two invited speakers, Arno R. Lodder and Graham Ross, who presented two different initiatives in the ODR field: the work done by the CEN /ISSS Workshop on Standardization of Online Dispute Resolution Tools (WS/Stand-ODR), and the pioneer ODR platform "The Mediation Room" respectively.

On behalf of the program committee, I would like to express my appreciation to the authors for their submissions and the invited speakers for their talks. I also thank the members of the ODR Workshop'08 program committee for providing their expertise and giving timely elaborate feedback. My warm thanks also to Arno R. Lodder and John Zeleznikow for sharing with me their expertise in the organization of previous editions of the ODR Workshop. Particular thanks to Pompeu Casanovas, Director of the UAB Institute of Law and Technology. Last but not least, we would like to thank Enrico Francesconi, Giovanni Sartor, and Daniela Tiscornia, the members of the organizing committee of the JURIX 2008 conference for their efficient help with all the Workshop details.

December 2008   Marta Poblet
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Introduction: Bringing a New Vision to Online Dispute Resolution

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Abstract. This article offers a brief overview of the state-of-the-art ODR domain by presenting the contributions to the field made by the participants in this volume. It also examines some of the challenges that ODR face at present with regard to interoperability and the new evolutions of the Web 2.0. Finally, it also considers the need for a new vision of ODR that, while keeping pace with the technological developments of the Web, situates the users the center of the paradigm.

Keywords. Online Dispute Resolution, ODR, Decision Support Systems, Negotiation Support Systems, Web 2.0, Semantic Web, relational justice

1. ODR in Brief

For some years now, Online Dispute Resolution (ODR) developments have been the object of close attention in a number of research domains: negotiation studies, law, economics, computer sciences, artificial intelligence, information systems, etc. Broadly defined, ODR encompasses those services, processes, methods, and techniques using ICT technologies to facilitate the resolution of disputes erupted both in online and off-line environments. While ODR is often seen as the online equivalent of alternative dispute resolution methods (ADR) that fall outside the judicial domain, there are some reasons to refrain from an exact correspondence between the two. On the one hand, ODR procedures might not necessarily satisfy the "alternative" aspect of ADR, since they may form part of the judicial process (i.e. online mediation to assist divorcing couples in drafting divorce agreements). On the other hand, the technical aspects of ODR pave the way to specific procedures that vary from those applicable in ADR (namely, automated, blind-bidding negotiation). Thus, a basic typology of ODR processes may be summarized as follows:

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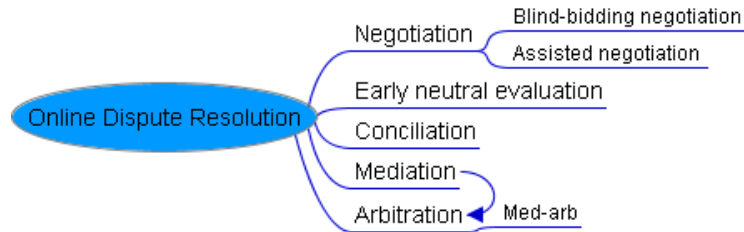
Figure 1. ODR basic typology

The experimental projects started by the mid nineties (the Virtual Magistrate at the Villanova University and the Online Ombuds Office at the University of Massachusetts) already bore the promise of making the resolution of online disputes more efficient, speedier and inexpensive, especially if compared to judicial procedures. By 2001, commercial sites offering ODR services had reached its peak in the US (SquareTrade, Cybersettle, SmartSettle, etc.) while experimental initiatives started to walk in Europe (ECODIR, Médiateur du Net, etc.). The commercial development of ODR services, nevertheless, was early impacted by the collapse of the dot.com bubble that lead to a decline in service providers and the subsequent restructuring of the incipient ODR market.

Notwithstanding these temporary backwards, a decade after the inception of ODR commercial services through the Internet the largest online trading platform eBay handles more than 40 million disputes a year, in more than 16 different languages [1]. Albeit this is by far the most impressive figure by a single ODR service provider, the types of disputes dealt by ODR services cover an ever-growing spectrum, ranging from early domain name disputes to intellectual property, insurance, personal injury, or privacy cases [2].

Nevertheless, and despite its successful results in the e-commerce, insurance or domain name disputes, the social impact of ODR remains limited. Orna Rabinovich-Einy mindfully reflects in this volume on the present situation of ODR by analyzing the Israeli example. These circumscribed impingements of ODR may obey to different reasons: (i) lack of sufficient advertisement and/or public awareness about the advantages of ODR; (ii) existence of multiple, heterogeneous procedures displayed by public and private ODR initiatives and services that may create confusion among potential users; (iii) lack of basic standards at the European and international level (iv) issues such as trust, confidentiality, privacy, or security that may deter people and organizations from using ODR services.

How daunting these challenges can be for ODR to reach full maturity? What is needed to make ODR the default for Internet disputes and, whenever suitable, for offline disputes? To some extent, most of these issues have already been addressed at multiple levels. At the legislative level, the European Parliament and the Council of the EU have recently adopted the Directive 2008/52/EC of 21 May 2008 on certain aspects of mediation in civil and commercial matters, which prompts the establishment of basic principles as "an essential step towards enabling the appropriate development and operation of extrajudicial procedures for the settlement of disputes in civil and commercial matters so as to simplify and improve access to justice." Furthermore, the

Directive encourages the Member States "by any means which they consider appropriate, the availability to the general public, in particular on the Internet, of information on how to contact mediators and organizations providing mediation services." [3]

Among the contributions to this volume, Arno R. Lodder presents the tasks done so far by the CEN/ISSS Workshop on Standardization of Online Dispute Resolution Tools (WS/Stand-ODR), set in October 2007 with the goal to specify the guidelines to facilitate a clearer and easier use of ODR resources to the potential users. Jelle van Veenen and Roberta Regazzoni offer an overview of Rechwijzer and RisolviOnline, two newly started ODR tools from the Dutch Council for Legal Aid and the Milan Chamber of Commerce, respectively. What these tools have in common, precisely, is to make already existing services for dealing with disputes available online by means of friendly, easily accessible user interfaces. From another point of view, John Zeleznikow also suggests principles for the development of Negotiation Support Systems that encourage fairness, transparency, and efficient bargaining. No doubt, these are significant steps towards the gradual adoption of robust, reliable, and user-centered ODR systems able to satisfy the needs of individuals and organizations as regards the management and resolution of their conflicts.

2. Decision and Negotiation Support Systems in ODR

Since the late 1970s, Decision and Negotiation Support Systems (DSS, NSS) have been developed to aid decision makers and also support complex negotiation tasks. In a comprehensive historical overview, Kersten and Lai examine the field of negotiation and e-negotiation systems through the discussion of their types, architectures, and software applications [4]. Kersten and Lai propose to distinguish between two generations of negotiation systems: (1) NSSs designed for a stand-alone computer or a local-area network (typically before mid 1990s); and (2) ENSs systems which use Internet technologies and are deployed on the Web [4]. The long-standing use of NSS has also resulted in well-grounded empirical research on typologies of bargaining steps [5], models of scenarios of human negotiations [6], users' assessment of NSS [7], or attitudes towards online mediation [8].

The contribution of both DSS and NSS to the development of ODR is unquestionable but, conversely, the principles, requirements and goals of ODR services also provide the development of new DSS and NSS with a practical, use-centered agenda. This is clear for business issues and e-commerce [9] but also a reality in other domains such as family law and insurance. In this volume, Abrahams and Zeleznikow offer an overview of recent work on development of multi-agent architectures to improve both DSS and NSS as part of integrated ODR environments dealing with Australian family law. Muecke, Stranieri and Miller present Re-Consider, an Australian family law ODR system that models judicial decisions with Bayesian belief networks to provide disputants with decision support in their disputes.

Ultimately, among the major challenges for DSS and NSS are how to address the needs of ever-growing Internet communities using the Web as default environment to negotiate, manage and resolve their conflicting issues. To quote Kersten and Lai:

> In order to have a more systematic and productive progress of ENS usage, which can result in positive impacts on negotiation activities in the Internet age, it is

necessary to build a research framework which can serve as a foundation for studying and comparing various ENSs, comparing different experimental results and conducting comparative studies in market mechanisms and the use of negotiation models in conflict management [4].

3. ODR and the Web 2.0

As Hendler *et al*. have recently put it "the Web is part of a wider system of human interaction; it has profoundly affected society, with each emerging wave creating new challenges and opportunities in making information more available to wider sectors of the population than ever before." [10]. At present, Web 2.0 is riding the crest of the wave. According to Tim O'Reilly, who first coined the notion, one of the chief rules of Web 2.0 is to "build applications that harness network effects to get better the more people use them" [11].

 As regards ODR applications, there is still an enormous territory to explore. Yet, some experts have warned either 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" [12] or that Web 2.0 may face unwanted consequences,

> [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. [13]

 Nevertheless, the same experts warning about ODR lagging behind the curve of Web 2.0 technological development already suggest possible paths to follow. In this line, Rule also predicts 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" [12]. Hattotuwa, having used maps to plot election violence and the existence of high security zones that contravene international law in Sri Lanka, considers "the use of free, web based map mash-ups for ODR, particularly for land/territorial disputes and those that are based on natural resources, demography and ethnic composition" [13].

 But Web 2.0 is also known as "the social Web" insofar it breeds an ever-growing number of online communities that share all types of contents (documents, images, videos, music, etc.). And, in addition to contents, the social Web already offers examples of communities that share knowledge and expertise in a number of areas: business (InnoCentive), science (Rosetta@home) journalism (Spot.Us), politics (MoveOn), education (WikIEducator), health (CureTogether), etc. Similarly, forums and social networks store numerous records of "How-Tos" and "question-answer" pairs that may be conceptualized and interpreted as problems linked to proposed solutions. How ODR can benefit from collective, distributed, bottom-up knowledge on how to manage and resolve different types of disputes? Most likely, to answer this question we

will need to go a step further an consider the technological developments of the new Web generation, the Semantic Web.

4. ODR and the Semantic Web

In a visionary article, Berners Lee *et al*. envisaged an extension of the Web "in which information is given well-defined meaning, better enabling computers and people to work in cooperation" [14]. While we are still some way from achieving this vision, in the last recent years Semantic Web technologies have come to the fore bringing an extended research agenda. As the World Wide Web Consortium (W3C) puts it:

> Semantic Web technologies can be used in a variety of application areas; for example: in data integration, whereby data in various locations and various formats can be integrated in one, seamless application; in resource discovery and classification to provide better, domain specific search engine capabilities; in cataloging for describing the content and content relationships available at a particular Web site, page, or digital library; by intelligent software agents to facilitate knowledge sharing and exchange; in content rating; in describing collections of pages that represent a single logical "document"; for describing intellectual property rights of Web pages (see, e.g., the Creative Commons), and in many others [15].

The variety of applications makes the current Semantic Web "a set of semantic islands" that will only be bridged if people share ontologies and facilitates scalable mappings between them [16]. Ontologies and ontology mappings, nevertheless, are not the only ways to achieve the objectives of the Semantic Web. Recent trends in Semantic Web research propose that the top-down approach based on formal ontologies can be enriched with a bottom-up, semantic structuring of Web contents based on folksonomies [17, 18]. As it is well-known, folksonomies arise when different communities of users assign keywords or tags to webs, blogs, wikis, articles, stories, pictures, videos or other ever-growing information sources. To borrow Tom Gruber's words, "tags introduce distributed human intelligence into the system" [17]. Folksonomies can therefore be seen as metadata applied to unstructured people's experiences scattered in the Web. To some extent, they can also be approached as lightweight shallow ontologies emerging in specific communities of practice where users "tag" some content objects [18]. In this line, the analysis of folksonomies by using different Web mining processes over Web communities (ranging from open forums to specialized services such as Questions-Answers websites) can be applied to harvest and organize knowledge from a bottom-up perspective.

Again, ODR may unlock its full potential by adopting state-of-the art Semantic Web technologies. On the one hand, top-down ontologies would allow ODR service providers to create broader infrastructures and platforms to enable the ODR field to interoperate in an ecosystem of information and data sources, services and agents (individuals, communities, organizations, institutions, etc.). In this volume, Stolarski *et al*. use ontology alignment formalisms to come up with a formal description of legal interpretations in the domain of risk management.

On the other hand, the analysis of folksonomies by using different Web mining methodologies targeting different Web communities (which may range from open forums to blogs, wikis, or specialized services such as Questions-Answers or How-Tos websites) can be applied to harvest and organize both information and knowledge on different typologies of conflicts and disputes from a complementary, bottom-up perspective.

Eventually, in what this new vision of ODR may consist of? Much empirical research is needed to provide an accurate, more detailed account. Nevertheless, it seems reasonable at this point to state that keeping pace with the technological innovations that are so utterly transforming the Web will also bring to a new ODR paradigm in which the center will be neither the online component nor the disputes to be resolved, but the individual people, communities, organizations, and institutions that have to deal with disputes and conflicts and will use the Web to manage and get them resolved in a more effective, efficient, and inexpensive way. This will bring to a new vision on how disputes may be managed and resolved in the information society. This is a vision that not only transforms the field of ODR, but also the very essence of justice and law by making them more horizontal. In sum, a paradigm of relational justice and law [19, 20].

Acknowledgments

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Towards Standardisation of Online Dispute Resolution Tools

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Abstract. This contribution summarizes the main goals, objectives, and tasks done
so far in the framework of the the CEN/ISSS Workshop on Standardization of
Online Dispute Resolution Tools (WS/Stand-ODR), started on 17 December at the
CEN Management Centre in Brussels (Belgium).

Keywords. Online Dispute Resolution, ODR, standards, interoperability,
ontologies.

1. The CEN Workshop on ODR Standards

Many different Online Dispute Resolution (ODR) services have been developed all
over Europe in order to allow consumers and businesses to exploit Alternative Dispute
Resolution (ADR) resources.

We are developing a CEN Workshop Agreement (CWA) that specifies the
guidelines to facilitate a clearer and easier use and exploitation of ADR resources to the
potential users. The focus will be on Online Dispute Resolution (ODR). Whilst
recognising that the technical requirements of ODR may necessitate the introduction of
specific processes that vary from those applicable in ADR, it is an objective of this
CWA to maintain the processes of ODR and ADR in as close a synergy as may be
practicable and to encourage and facilitate their future evolution in parallel to the
maximum practicable extent.

The project team started in February 2008, and will deliver the final results in early
2009. In our final project report we provide a survey of ODR models and providers, an
analysis of ODR processes, background information on technical aspects of ODR as
well on regulatory and legal aspects. The main aim of the project is to deliver a
taxonomy of ODR processes that is used as the basis of an ontology. This ontology is
implemented in Protégé, and used to automatically generate XML schemes. One of the
underlying goals is to create interoperability within ODR.

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Many ODR providers exist today and ODR systems offer different user interfaces, adopt different languages and are unable to exchange information each other, preventing potential users from using their features within multi-language and cross-country business and legal environments**.** This diversity contributes to the lack of visibility of ODR systems and undermines the take off of this service in the market.

2. Interoperability

Interoperability is a property referring to the ability of diverse systems and organizations to work together (inter-operate). The term is often used in a technical systems engineering sense, or alternatively in a broad sense, taking into account social, political, and organizational factors that impact system to system performance.

With respect to software, the term interoperability is used to describe the capability of different programs to exchange data via a common set of exchange formats, to read and write the same file formats, and to use the same protocols. (The ability to execute the same binary code on different processor platforms is 'not' contemplated by the definition of interoperability.) The lack of interoperability can be a consequence of a lack of attention to standardization during the design of a program. Indeed, interoperability is not taken for granted in the non-standards-based portion of the computing world.

According to ISO/IEC 2382-01, Information Technology Vocabulary, Fundamental Terms, interoperability is defined as follows: *"The capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units".*

Lack of interoperability can have important economic consequences. If competitors' products are not interoperable (owing to causes such as patents, trade secrets or coordination failures), the result may well be monopoly or market failure. For this reason, it may be prudent for user communities or governments to take steps to encourage interoperability in various situations.

Our goals in ODR interoperability are:

- To define a clear and simple European level ODR framework, based on common taxonomy and resolution models
- To make this available in different European countries

These main objectives raise the following issues, amongst others:

Open Questions

- What if a dispute owner wishes to move his dispute resolution process from an ODR provider to another ODR provider (competitor) saving his position and all the documentation? It is apparent that as yet there is little demand for such transfer – is this to do with the nature of the processes or are there barriers (technological, semantic, legal or regulatory) preventing such transfer?

- What can be done to reduce time spent and costs in the processes?
- What scope is there for scalability (from automated negotiation to assisted negotiation, to mediation or arbitration); and should this be optional or mandatory?
- What is the state of interoperability between ODR and pre-dispute systems (customer complaints mechanisms, e-sales and e-contracting systems, etc) and post-dispute systems (enforcement and appeal mechanisms)?
- What is the state of interoperability between ODR and of line ADR procedures?

Interoperability is connected with process. The ODR process can be interoperable with external process, such as pre-dispute systems (typically provided by private companies), following defined best practices.

Also, as described in the "Typical Information Flow" above, the ODR process can provide internal progression between Automated Negotiation, Assisted Negotiation, Online Mediation, but not normally with Online Arbitration; if at the end of the single step there is no settlement between the parties, they can escalate to another process.

The ODR process can be interoperable with external processes, such as post-dispute systems (enforcement and appeal mechanisms). All of these progressions between different steps of the process could be provided by different providers.

If the dispute owner moves to another ODR provider he should approve the integrity of information that he is migrating to the new system.
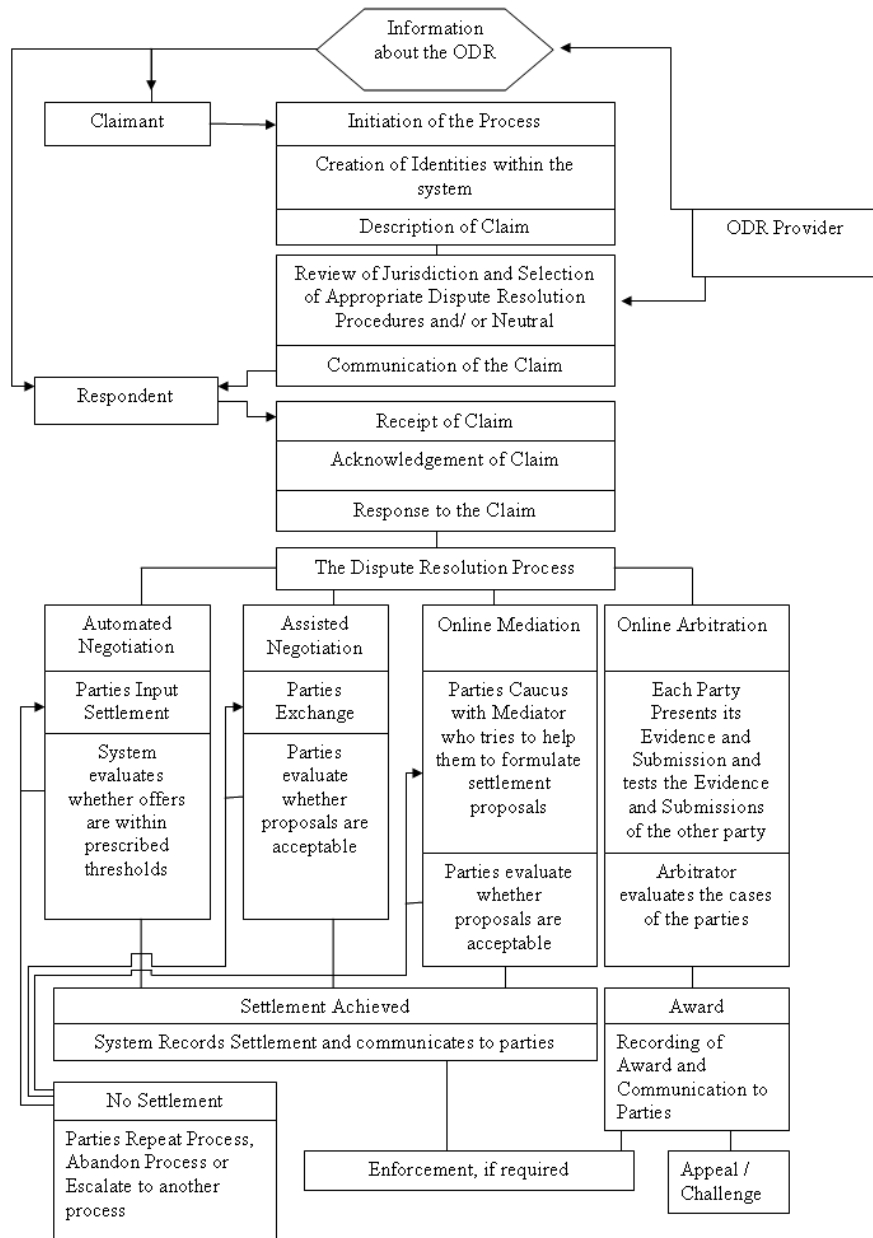
Figure 1. ODR Typical Information Flow

3. Ontology

The main concepts of the ontology will be presented during the ODR workshop in Florence on December 13, 2008. The ontology defines the concepts, terminology and semantics of ODR in both business and technical terms, in order to:

- Create a foundation for further work in domain-specific areas,
- Enable communications between business and technical people,
- Enhance the understanding of ODR concepts in the business and technical communities,
- Provide a means to state problems and opportunities clearly and unambiguously, and
- To promote mutual understanding. And on the other hand it potentially contributes to model-driven ODR implementation.

Reflecting on ODR: The Israeli Example

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Abstract. The state of ODR in Israel provides an instructive illustration of the developments and achievements in the field as well as the significant challenges that it still faces. The general picture is one in which there are very few ODR projects on the ground, hardly no theoretical study of these systems and little, if any, general public awareness of the phenomenon. This picture is not very different from the state of ODR globally. With the exception of a handful of extremely successful ODR systems, after over a decade of existence, this avenue for dispute resolution and conflict transformation has yet to be fully discovered. The article explores these themes through the description of those ODR projects that have developed in Israel – *The New Generation Court System* (NGCS), *Benoam* online arbitration system, *Emun Hatzibur* ODR scheme for the resolution of consumer complaints, and several others. This handful of case studies suffice to challenge some of our limiting conceptions about ODR – its scope, definition and impact – and to defy our expectations. At the same time, the Israeli experience also provides a good demonstration of the strong barriers – financial, cultural, institutional and professional – that still stand in the way of expansion of the field.

Keywords. Alternative Dispute Resolution, Technology, Online Dispute Resolution, ODR, ADR, Virtual Courts, Israel, Conflict Resolution

Introduction

The state of ODR in Israel provides an instructive illustration of the developments and achievements in the field as well as the significant challenges that it still faces. In the last decade, an ambitious court digitization project was developed and just recently launched, a successful online arbitration scheme was introduced in the insurance industry and incipient ODR initiatives are emerging in the consumer protection arena as well as some other more general schemes for the spread of ODR tools. Most of these efforts have developed without grounding in the ODR field. In fact, in some cases, the developers of ODR systems were unaware of the existence of such a field and drew their inspiration from the literature and experiences of the area of alternative dispute resolution (ADR) or the domain of law and technology. While these two distinct fields – ADR on the one hand and law and technology on the other – have received widespread acknowledgement in Israeli practice and in the academe, ODR has received only limited attention. This is quite surprising, considering the fact that both the need for ODR and the know-how for its development exist in the country.

With an overburdened and expensive legal system that is struggling to deal with new types of conflicts that arise in the internet society, the prospect of accessible tailored processes for addressing disputes would seem particularly appealing.

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Nevertheless, the general picture is one in which there are very few ODR projects on the ground, hardly no theoretical study of these systems and little, if any, general public awareness of the phenomenon. This picture is not very different from the state of ODR globally. With the exception of a handful of extremely successful ODR systems, after over a decade of existence, this avenue for dispute resolution and conflict transformation has yet to be fully discovered.

In the following sections, this article will briefly describe those ODR projects that have developed in Israel – *The New Generation Court System* (NGCS), *Benoam* online arbitration system, *Emun Hatzibur* ODR scheme for the resolution of consumer complaints, and several others - highlighting both their achievements and limitations, with a view to drawing some more general conclusions on the current state of ODR and the potential for the expansion of the field in the future.

1. The New Generation Court System[2]

The NGCS, represents an ambitious, and in many respects unprecedented, effort to design a court system suitable for the internet age. The NGCS is an advanced system for online document filing and case management, which is being introduced into Israeli civil courts. Former Judge and architect of the project, Boaz Okon, described the NGCS as including the following five basic features: electronic file, work space, calendar, e-filing and task assignment. As evidenced from the description below, it is the combination of these characteristics that make this system so impressive, in particular the task assignment feature, made possible by the BPM engine.

The electronic file feature refers to the idea that aside from trial hearings, the entire trial process is managed digitally. This means that the court case is reduced to a link on the computer screen and all of its components can be searched and viewed online. Once the system is in place in all courthouses in Israel, the electronic court case will be fully accessible to the presiding judge, the secretariat, certain court administrators and the attorneys on the case by use of a smart card and password. For all involved, access to an electronic, rather than a paper court case obviously presents a significantly more efficient way of performing their work with remote access and more sophisticated informational search tools.

In term of the judge's workspace, the new system enhances efficiency by concentrating all of a judge's outstanding assignments, allowing access to the electronic court case and a variety of legal databases, and creating a work scheme according to which a judge's assignments are to be organized (for example, the system can be instructed to schedule all administrative appeals on Monday mornings, between specific hours) thereby enabling automatic case allocation.

The calendar feature refers to system wide automatic case scheduling based on predetermined criteria. Such scheduling is efficient on two levels. First, the assignment can be performed by the system without the need for human intervention. Second, the work allocation scheme maximizes efficiency because the work is assigned according to areas of expertise (and the judges themselves schedule the work in a way that allows them to work more effectively).

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[2] For a full description and analysis of the NGCS, see Orna Rabinovich-Einy, *Beyond Efficiency: The Transformation of Courts through Technology*, 12 UCLA J. of L. & Tech. 1, 16-32 (2008). [9]

A major improvement in terms of efficiency is realized through the NGCS' e-filing feature. The system allows for remote filing and online service of process of all court documents, twenty-four hours and seven days a week, through the internet. Since access to the system is, as a rule, restricted to those with a smart card, communication is secure.

Finally, one of the most remarkable features of the NGCS is the task assignment element. In the design of the system, an arduous process of mapping the various types of proceedings involved was performed in order to identify, step-by-step, the different stages that each of these processes is comprised of. For example, civil proceedings were divided into sub-categories such as standard civil proceedings, fast track, small claims, etc. The same was done for all other types of court cases—criminal, administrative and employment-related actions. Next, each particular type of proceeding was further analyzed, resulting in a detailed scheme of the steps associated with such procedure. Each step was named a "task" and each task was associated with a person or entity in charge of performing such assignment (plaintiff, defendant, judge, a particular person within the secretariat). The mapping of procedures was necessary to allow the BPM engine to substitute for the manual administration of a court case. Instead of having the parties or court employees initiate action, the system designates task performers for each ensuing action and is either capable of performing a necessary function automatically or prompts the task performer for action. The system periodically examines whether a task was performed and, if not, there are pre-programmed consequences that escalate over time.

The task assignment feature is significant in several respects. An obvious advantage is the added efficiency afforded through increased automation. The system can easily substitute manual assignment of court cases to particular judges or the manual scheduling of hearings post-assignment to judges, with automated processes. Similarly, the onus for filing such motions as a motion to strike out a claim for inaction will no longer be on the defendant; the system will be able to automatically detect and handle such matters.

A more subtle, but no less important, benefit has to do with the fact that this impressive project of mapping the various court proceedings, serves to enhance accountability in the system. By linking the tasks with a person in charge for their execution, the system clarifies what the duties and areas of responsibility of the various actors in the system are. Therefore, presumably, there should be no tasks that fall between the cracks, assignments should be handled more quickly and proceedings in general more efficiently. Most importantly, in those cases in which tasks are not executed at all or carried out poorly, responsibility can be assigned.

Finally, the fine-grained mapping of procedures allows for improvement and learning on a system-wide level. Reports per-case type can be produced, allowing in depth analysis of, and comparison among: different types of proceedings; the manner in which they are handled; the allocation of judicial time to their resolution; and the need for further development and refinement of the system. For example, a study of how judges perform specific functions (conduct pre-trials, conduct hearings, write decisions) could underscore areas in which further training is needed (running a courtroom, ascertaining under what circumstances and in what ways to encourage settlement, developing writing skills, etc.). The architects and implementers of the system, despite realizing its learning potential have had a limited view of learning, one that is focused on efficiency. Therefore, they have tended to view the mapping of procedures as a tool for detecting pockets of inefficiencies in the system (such as

scheduling of cases) but have overlooked the potential for broader learning advancing values other than efficiency.

As can be seen from the above description, the NGCS is an important component in the development of ODR, but also presents some of the limitations of current understandings of the scope of ODR. Initially, ODR was understood as the delivery of the familiar ADR processes – negotiation, mediation, arbitration – through the internet. Under this narrow understanding, the NGCS is obviously not an ODR scheme. However, the understanding of ODR has expanded significantly over the last decade and is now understood to include a broad range of uses of technology in the dispute resolution or conflict transformation domain. [3] This definition now includes the incorporation of technology in the courtroom and the related impact on legal actors, institutions and procedures. [4]

Despite its many achievements evident from the above description, a close scrutiny of the NGCS from an ODR perspective reveals some limits and drawbacks. For one, the most striking lacuna is the lack of ODR processes in the traditional sense. One would expect an advanced system for online filing and case administration to allow for online referral of parties to both off- and online alternatives. Nevertheless, the system designers neglected to do so.

Moreover, the design choices made reveal a limited understanding of the area of dispute system design ([9] Rabinovich-Einy, 2008). The design process seemed to be top down with little room for user input leading to a product that places an emphasis on efficiency while neglecting other important procedural values, such as fairness, which could also be promoted through the design and application of the technology and are essential for generating trust in the system. This is perhaps not surprising in light of the fact that procedure has often been understood as a means for promoting efficiency and dispute resolution processes with both ADR systems and courts measured according to case closure statistics. Therefore, the introduction of technology to procedural systems has been reduced to a means of further enhancing efficiency, overlooking its broader potential contribution. Similarly, ODR systems typically focus on efficiency and access as their major selling point neglecting other unique features, such as maximizing pareto optimal resolutions or the access to a wider pool of third parties.

The NGCS also provides a good demonstration of some of the other, perhaps more mundane, barriers that ODR systems face. One such difficulty is the issue of cost and the question of payment for dispute resolution services. The development of the NGCS came at exorbitant costs of the NGCS (in the hundreds of millions of shekels) that are not to be funded through court fees. This obviously presents a significant burden for an already under-budgeted, under-staffed court system. At the same time, this seems like a natural choice for a public system that chose to introduce technology as a means of enhancing access. This choice was further strengthened through the decision to allow access to the system to clinics and to permit general access for certain types of cases in which pro se litigants typically participate.

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[3] This can be seen in the range of topics that were discussed in the last few ODR forums. *See* http://odr.info/. [13]

[4] In fact, these developments were foreseen by Ethan Katsh in two of his earlier books. *See* ETHAN KATSH, THE ELECTRONIC MEDIA AND THE TRANSFORMATION OF LAW (OXFORD UNIVERSITY PRESS, 1991) [2]; ETHAN KATSH, LAW IN A DIGITAL WORLD (OXFORD UNIVERSITY PRESS, 1995) [3].

In other ODR systems as well, the issue of costs and access fees is central. We see that the ability to develop accessible, well-designed systems is tied to the availability of funds on the one hand and the responsiveness to the needs of users of the system on the other. eBay's ODR schemes are a good demonstration of well designed systems that are sponsored by the company and offered at no or low cost to members ([10] Rabinovich-Einy, 2006). This is a choice that a successful company like eBay was wise enough to make and could afford to, but the question remains to what extent non-profit organizations and other, perhaps less successful businesses, can follow suit.

Another significant barrier is a cultural one ([9] Rabinovich-Einy, 2008). On the most immediate level, a significant number of Israeli judges, certainly in the District and Supreme Court, are uncomfortable with computers and resent the planned changes. A less conspicuous challenge, which may prove more significant, has to do with the threat to the privacy and autonomy of judges presented by the NGCS. The NGCS limits judges' control over scheduling, and makes their calendars visible to court administrators and, to a certain extent, attorneys. Again, these difficulties are not unique to the court setting or even the legal arena. The technical know how presents a barrier to many mediators and arbitrators as well and the prospect of broad documentation of the actions of third parties, can be daunting, despite its potential for enhancing accountability.

2. Benoam

Benoam is an online arbitration system developed specifically for the insurance industry. The system is designed to address subrogation claims between and among insurance companies for property damages arising from car accidents. In practice, all of the insurance companies in the Israeli market but one have signed on to the system and are committed to referring all such claims exclusively to it ([12] Tzur, 2007).

Benoam grew out of the need to find an effective substitute for the court option. The prospect of conducting expensive litigation before an overloaded court system over disputes of low financial value provided a real incentive for the insurance companies to agree on an alternative system ([12] Tzur, 2007). The dispute resolution mechanism was designed by a local law firm headed by Adv. Yehuda Tunik, after realizing that this area was in desperate need of an ADR-based solution. The thought was to conduct the entire process online – initiation of claims, submission of documents, testimony, and the delivery of the award, while allowing for supplementary in-person sessions on rare occasions ([12] Tzur, 2007). Since efficiency and trust were of utmost importance, the online feature was a good fit ([12] Tzur, 2007). Aside from low costs, convenience and swift communication, the documentation that comes with online interaction not only enhances access to information and efficient handling of claims, but also heightens transparency on two realms: between Benoam and its users, and internally - inside each of the insurance agencies ([12] Tzur, 2007).

Unaware of the existence of an ODR field, Tunik's team developed Benoam based on observations and extensive conversations held with industry representatives ([12] Tzur, 2007). The online arbitration process they created is conducted through an accessible and secure online platform. The choice of arbitration seemed natural to them in light of the need for an efficient process that would enhance predictability and consistency. This process seemed particularly fitting for the resolution of small scale financial disputes arising among a sophisticated group of repeat players that possess

similar bargaining power ([12] Tzur, 2007). Detailed rules of procedures were developed and agreed to by the participants. Alongside these rules, the system maintained pockets of flexibility which allow it to function and develop in a manner that is simultaneously efficient and fair, predictable and just ([12] Tzur, 2007). The arbitrators used by the system are all experienced professionals, whose awards must be reasoned and are subject to an appeal before an extended panel – all means for ensuring trust in the system and enhancing its legitimacy ([12] Tzur, 2007). In addition, the effectiveness of the system was ensured by making Benoam a clearing office able to automatically enforce its arbitral awards ([12] Tzur, 2007).

The Benoam example is instructive in several respects. First and foremost – it is a success story. For several years now, the insurance companies have repeatedly signed on to Benoam's services and report a high level of satisfaction with the system. The key to Benoam's success lies in the ability of its founders to identify a need for a tailor-made dispute resolution system for this environment ([12] Tzur, 2007). This is perhaps counter-intuitive. Typically, we think of ODR systems as fitting for the global arena, when parties are distant and face to face encounters present a major barrier ([4] Katsh & Rifkin, 2001; [11] Rule, 2002). However, as the Benoam system clearly illustrates, the potential for the development of ODR extends beyond the international realm and there are plenty of opportunities for devising local ODR schemes that improve the accessibility to dispute resolution services as well as the quality of such services ([4] Katsh & Rifkin, 2001).

Furthermore, Benoam's choice of a design process that involved the stakeholders both in the initial design stages and later on seems key to Benoam's appeal ([5] Lipsky et al., 2003). In a way, this is similar to the eBay approach, which has continuously remained connected to the needs of its users, from the early SquareTrade days through the more recent PayPal dispute resolution systems ([10] Rabinovich-Einy, 2006).

In addition to its effectiveness in addressing subrogation claims, the system proved valuable in other important respects. Because of the centralized, accessible and effective channel it provided for addressing the claims, the insurance companies were able to improve their effectiveness more generally in terms of preserving and accessing data, handling complaints internally instead of relying on external legal services and restructuring complaint handling within the agencies from a geographically based arrangement to a centralized one ([12] Tzur, 2007). In addition, the intensive, online communication among the agencies through the system actually produced more informal dialogue that has benefitted the agencies and improved work relations among them ([12] Tzur, 2007).

The Benoam system also provides a good demonstration of the complex relations that exist between formal dispute resolution mechanisms and their alternatives. If we used to think of ADR processes as operating "in the shadow of the law" ([7] Mnookin & Kornhauser, 1979), more and more, it seems that these bodies are actually producing and enforcing their own set of norms ([6] Milman-Sivan & Rabinovich-Einy, 2008). In the case of Benoam, the vast majority of subrogation claims over property disputes never reach the courts and the system is becoming the authority charged with addressing lacunae through the generation of new norms, which, as mentioned above, it also effectively enforces ([12] Tzur, 2007). However, as Benoam became a formal lawmaker, informal negotiations (even mediations run by the Benoam team) have surfaced in its shadow ([12] Tzur, 2007). The question of norm generation and enforcement by alternatives is of course not unique to the ODR arena, but may become

even more acute in the global setting where ODR processes' contribution is exceptional ([8] Rabinovich-Einy, 2004).

Finally, the story of Benoam also tells the tale of the fall of old intermediaries and the rise of new ones in the internet age ([2] Katsh, 1991; [8] Rabinovich-Einy, 2004). While the proliferation of ODR processes has contributed to the threat on the legal profession's monopoly over legal services, it has also served to facilitate lawyers' professional work through remote access to digital records and databases. While lawyers have lost some of their strength, new players such as ODR providers have gained an important role through their control over the design of the dispute resolution process and their control over the information exchanged in such processes. The digital format in which such information is stored and preserved, makes the position of ODR providers substantially different than that of traditional ADR providers ([10] Rabinovich-Einy, 2006).

3. Emun Hatzibur

The leading Israeli consumer organization, Emun Hatzibur is in the process of developing an online arbitration tool for addressing consumer complaints, currently handled through traditional arbitration ([1] Bracha, 2008). The offline arbitration process addresses both consumer complaints and the removal of Emun Hatzibur trustmarks from businesses that were found to repeatedly breach the required standards. The arbitration is offered at a nominal cost of 250 NIS to the consumer and 350 NIS to the business (and in the case of a justified complaint the arbitrator may award costs to the consumer) ([1] Bracha, 2008). The proceedings are subject to the rules of procedure posted on the website and are conducted by attorneys who are specialists in consumer law. Despite its accessibility, only a handful of complaints reached the traditional arbitration system and Emun Hatzibur is now looking into developing a complementary online arbitration tool as part of an attempt to revamp the system ([1] Bracha, 2008).

Interestingly, Emun Hatzibur's online complaint management system,[5] perceived by the organization merely as a tool used to track complaints for the purpose of aggregating information on businesses, has actually proved to be a sophisticated ODR system. Any consumer can file a complaint online against any business (not restricted to those who have Emun Hatzibur trustmarks, but the latter are required to meet Emun Hatzibur's standards in replying to such complaints). The system tracks complaints and documents their treatment by the business and Emun Hatzibur's involvement has proven central in inducing the businesses to cooperate by both addressing the individual complaint and remedying the systemic problem. Emun Hatzibur uses the system to compile detailed reports on complaint patterns to businesses that received its trustmark. It seems only natural to incorporate the online arbitration feature into the complaint filing system.

It is obviously too early to judge whether the Emun Hatzibur online arbitration initiative will prosper, but there is reason to believe that it will. For one, ODR seems like an excellent choice for addressing consumer disputes even where distances are not great and the disputes arise locally. Consumer complaints are typically over low sums and therefore suing, or, in some cases, even devoting one or two face-to-face

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[5] www.emun.org/ptrust/html/web/eich_poel.htm (last visited on September 24, 2008). [14]

encounters do not pass a cost-benefit analysis ([4] Katsh & Rifkin, 2001; [8] Rabinovich-Einy, 2004).

The businesses, on their end, have an obvious incentive to satisfy their clients, in particular when these are savvy, online consumers. For one, companies have learned over the last decade or so that dissatisfied consumers can cause substantial harm to a company's reputation in the internet age. Where in the not so distant past, consumers were helpless against wrongdoing by corporations; consumers are now empowered by the ability to spread word of mouth on the internet instantaneously, at little or no cost, to vast audiences across the globe. Likewise, consumer organizations have gained power through their ability to use information on the performance of organizations to encourage fair practices through the introduction of trustmarks on the one hand, and the publication of problematic corporate conduct on the other ([8] Rabinovich-Einy, 2004).

Therefore, it is not surprising that the proliferation of e-commerce was one of the leading forces that drove the evolution of ODR systems, with companies like SquareTrade and eBay investing substantial funds and efforts in the development and refinement of a wide array of processes delivered online based, to a large extent, on user feedback and input ([10] Rabinovich-Einy, 2006; [11] Rule, 2002).

4. Other ODR Initiatives

Other ODR mechanisms are also evident in the Israeli setting, but are still in their early stages. Two leading online negotiation tools – Smartsettle and Cybersettle – have entered into agreements with Israeli affiliates. In addition, the Israeli Institute of Commercial Arbitration together with Dr. Yuval Karniel and Adv. Naomi Asia are in the process of developing an online arbitration tool for the resolution of disputes that arose in the course of online activity. The idea is to offer these services to websites whose terms of use will include an online arbitration clause through the Institute. At this point in time, however, the scheme is still in its early development stages. While the local e-commerce arena has yet to develop ODR tools, at the other end of the ODR spectrum – certain ODR tools are already in use in peace and conflict transformation efforts.[6] Israeli and Palestinian politicians and activists have made use of the internet in the last few years to advance general communication,[7] peace education,[8] and specific peace initiatives.[9] The war in Lebanon two years ago provided a mirror image of the challenges for conducting a centralized war in the internet age while maintaining confidentiality of sensitive information and winning on the global PR front. At the same time, even in those difficult times, some promise for reconciliation was gained

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[6] Sanjana Hattotuwa, *Daring To Dream: CSCW for Peacebuilding. Available at*: sanjanah.googlepages.com/DaringtoDream-CSCWandPeacebuilding.doc. [15]

[7] *For Example*: www.mepeace.org [16], www.mideastweb.org/index.html. [17]

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[9] http://www.geneva-accord.org/HomePage.aspx?FolderID=11&lang=en. [19]

through such means as reading the "enemy's" blogs or communicating with one another on social networks.[10]

5. Achievements, Barriers and Future Challenges

The state of ODR in Israel depicts a complex picture that is both promising and disappointing and, in this respect, is indeed representative of the state of ODR worldwide. The existence of several ODR ventures that show promise underscores the potential of ODR in the digital age. This handful of case studies suffice to challenge some of our limiting conceptions about ODR – its scope, definition and impact – and to defy our expectations. At the same time, the Israeli experience also provides a good demonstration of the strong barriers – financial, cultural, institutional and professional – that still stand in the way of expansion of the field. Indeed, the future growth of the field seems to be the main challenge that lies ahead. One principal challenge is to transform the field from a niche area to one that is relevant to two other, emerging domains which have over the years remained close, but separate from ODR – the traditional alternative dispute resolution field and the cyberlaw area.

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[15] sanjanah.googlepages.com/DaringtoDream-CSCWandPeacebuilding.doc
[16] www.mepeace.org
[17] www.mideastweb.org/index.htmlKj

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[10] One example is the "Lebanese Bloggers Forum", which became an arena in which Israelis and Lebanese could discuss the Second Lebanon War in real time and in an unmediated manner. *Available at:*

http://lebanesebloggers.blogspot.com/2006/07/day-6-more-attacks.html [20]

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Online integrative negotiation tools for the Dutch Council for Legal Aid

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Abstract. This paper describes the background, theoretic model, implementation and use of the *Rechtwijzer*. The *Rechtwijzer* ("conflict resolution guide") is the online application of the Dutch Council for Legal Aid. The aim of the application is to help people with a dispute to find a conflict resolution professional that can help, but also to get users to think about their conflict and learn more about their situation. The advice that the application offers is based on integrative negotiation, and should help users to obtain an integrative outcome where possible.

Keywords. Online dispute resolution, integrative negotiation

1. Introduction

The *Rechtwijzer*[2] ("conflict resolution guide") is the internet application through which Dutch citizens seek advice on legal help. The application is the front end of the website of the Dutch council for legal aid, the organization that is responsible for all legal aid in the Netherlands. As a part of this task, the organization offers citizens advice on what steps to take and which legal professionals to contact when they are confronted with a conflict. The council does not offer its users direct legal advice, since that is the responsibility of another organization.

The council was looking for a way to make their services more accessible through the internet, and approached researchers from Tilburg University[3] to develop an application to this aim. Some important guidelines for the development were:

- the application should help laymen to find the dispute resolution professional that can best help them to solve their conflict;
- the application is based upon the conflict resolution principles of integrative negotiation;
- the application lets users think about their conflict;
- the application does not offer legal advice

The *Rechtwijzer* was first launched in September 2007 and since then several new functions have been added. In this paper, I describe the functionality at the time of

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[2] www.rechtwijzer.nl
[3] The development of the Rechtwijzer was funded and commissioned by the Dutch Council for Legal Aid (raad voor rechtsbijstand, www.rvr.org), Rechtwijzer was developed jointly by the Council, the Tilburg Institute for Interdisciplinary Studies of Civil Law and Conflict Resolution Systems (TISCO), and the Tilburg Institute for Law, Technology, and Society (TILT), both departments of Tilburg University (www.uvt.nl).

writing (November 2007), and I look forward to the extensions that are currently being developed and that are planned for the near future.

2. Model of Dispute Resolution

One of the main ideas behind the *Rechtwijzer* is that every conflict situation is different. A conflict can be caused by all kinds of problems in the interaction between people. The *conflict resolution needs* of people can be defined as the need to solve the problem (or problems) that lie at the core of the conflict. The aim of the *Rechtwijzer* is to help people find the conflict resolution professional that can best fulfill their conflict resolution needs.

Apart from offering advice, the *Rechtwijzer* also has several less visible functions. The first is that, when working on the *Rechtwijzer*, users let some time pass before they act. This allows them to cool down, and prevents over-emotional users from taking actions that they might regret later on. Secondly, users of the *Rechtwijzer* are urged to think about the various aspects of their situation. The application helps them to organize their thoughts about the situation and what they need to do. Users who have completed the *Rechtwijzer* will have a better picture of their situation, their own part in it, and what needs to be done to resolve it. As a result, users may decide to contact, for instance, a mediator, but they may also decide not to contact professional help, and to take further actions by themselves.

The *Rechtwijzer* is based upon the principles of integrative negotiation;[4] the idea being that most conflicts can be solved if parties "separate the people from the problem", "talk about interests, not positions", "identify options for mutual gain", and use objective criteria and the BATNA to evaluate options [1]. Based on these principles, a number of actions were defined that can be performed to further the dispute resolution process.

- *Improve communication* - when parties do not communicate well or do not communicate at all.
- *Investigate interests* - when the user is not clear on what she wants and needs
- *Identify creative options* - when the user has given little thought to possible solutions for the situation
- *Identify the BATNA* - when the user doe not have a clear idea of what will happen if she cannot work something out with the opponent
- *Find objective criteria* - if the users cannot agree on an outcome, objective criteria can help them to reach a decision.

Each of these actions can be performed by a professional who offers such a service; a mediator might help parties to improve communication, for instance, while a lawyer may help with identifying objective criteria.

Of course, there are also numerous situations where these negotiation techniques are of limited use. In some cases, the conflict requires a binding decision by a third party, or fact finding by an independent expert. Below, all such interventions are listed. Some of the interventions on this list were added specifically to deal with urgent situations: in the case of aggression and in cases were quick action is required, people are immediately referred to a professional.

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[4] Described in "Getting to yes" [1]. See also the Harvard Project on Negotiation: www.pon.harvard.edu

- *Establish facts* - when the parties disagree on the circumstances
- *Non-binding advice* - when the parties need independent advice, but also need to maintain some control over the outcome
- *Binding decision* - when the situation is such that parties will not reach an agreement by themselves
- *Ensure compliance* - when there already is an agreement or a binding decision that one of the parties is ignoring
- *Record agreements* - when parties have reached an agreement but need help to get it recorded officially
- *Stop aggression, intimidation, discrimination* - urgent referral is needed in cases where there is aggression, intimidation, or discrimination
- *Urgent referral* - when time limits or possibly serious consequences require that the user contacts a professional immediately

3. The Application

The *Rechtwijzer* consists of a number of components. In this section I will describe the components that are currently fully functional and that are available to the public. Since the launch of the *Rechtwijzer* in September 2007, we have been improving the application, both on a substantial and on a functional level. In section 5, I will outline the components that are currently being developed.

3.1.   A citizens' guide to legal assistance

The aim of the *Rechtwijzer* is to offer citizens advice on what legal professional may be of help in a conflict situation. The advice includes a wide array of legal professionals, ranging from lawyers to mediators and ombudsmen. In order to select the help that is best suited, the application analyses two factors: *what is the conflict about* and *what is the nature of the conflict.*

1.   *What is the conflict about?* The first step is to determine the domain of the conflict, so that professionals not active in this field can be filtered out. The *Rechtwijzer* uses a database with a large number of professionals, but the selection mechanism allows it to give users advice very specific to their situation. In order to determine the situation, the user navigates through a model of the domain by making a series of choices. Each choice further refines the domain definition, until a level is reached where further choices would not result in more specific advice.

   The *Rechtwijzer* currently helps people with a problem on one of five different domains: housing, family, consumer issues, work, and government. For each of these domains, there are several additional levels, which allow the application to determine whether the user has a housing problem concerning an unexpected raise of the rent, or a consumer issue concerning some electric appliance. At this level, we can determine which specific professionals may be of help (dispute resolution committee electric appliances or the rental committee), and also which all-round professionals could be contacted (lawyer or mediator).

Rechtzoekende

Rechtsbijstand

Rechtwijzer

Mediation

Nieuws

Veelgestelde vragen

Downloads

Vind snel een...

Rechtwijzer

Stap **1**

kies een onderwerp

Wonen

Een flat, rijtjeshuis of vrijstaande woning. In een drukke stadswijk, in een ... Lees verder...

Familie

Conflicten binnen de familie of de relatie zijn altijd vervelend. Deze ... Lees verder...

Consumentenzaken

U koopt producten en maakt gebruik van diensten: boodschappen doen, een ... Lees verder...

Werk

Of u nu een vaste baan heeft, parttime werkt of vrijwilligerswerk doet, soms ... Lees verder...

Overheid

Iedereen heeft wel eens met de overheid te maken: u krijgt een huurtoeslag, u ... Lees verder...

Figure 1: A screenshot from the *Rechtwijzer.* Here, the application identifies the conflict domain. The user chooses between *housing, family, consumer issues, work,* and *government.* Each domain is further refined in a number of steps.

2. *What is going wrong?* The second stage in finding suitable help is an analysis of the conflict situation. The application asks the user a number of questions to determine what actions (from the conflict resolution model above) are needed.

    The figure below shows a question that is used to determine whether help with improving the communication is needed. The question is: *"How is the communication with the other?"* If the user answers *- there is good interaction and we understand each other-* or *- Normal, there is reasonable interaction-* , it is concluded that the action *improve communication* is not required in this conflict. If the user answers that *-interaction is difficult-* or *-there is no interaction-,* it will probably be useful to improve the communication, and so the action *improve communication* is added to the advice.

Figure 2: A screenshot from the *Rechtwijzer*. Here, the user is asked about the interaction with the other party: *How is the communication with the other? - There is good interaction and we understand each other - Normal, there is reasonable interaction - interaction is difficult - there is no interaction*

The figure below shows some advice from the *Rechtwijzer*. The column on the left lists the actions that are needed in this case, and the top row lists the conflict resolution professionals that may perform (some of) these actions. Both the actions and the professionals are 'clickable'. When a user clicks on an action, he or she gets a further explanation about the action. Clicking a professional results in an overview of the practical information such as the working methods, price, options for legal aid, costs, and contact information.

The *Rechtwijzer* does not offer the user advice on what single professional to contact. Rather, it offers the users an overview of the things that need to be done, who may do this, and what this may cost. With this information the user herself can choose which of the professionals is best suited for her own (personal, financial) situation.

Figure 3: The result of the Rechtwijzer. The table displays which actions are needed to solve a conflict (at the top), and which professionals would be able to deliver such services (to the left). The top line reads: Mediator / Lawyer / Ombudsman / Consumer organization/ Dispute resolution commission electronics / Free help or advice. The column to the left reads: What happens when the conflict is not resolved? / Look for a fair way to divide money or goods / Make a list of issues and worries / Identify creative options.

3.2.   Communicate needs and wishes to the other party

Bad communication can get in the way of resolution, and it may even be at the root of a conflict. If a customer is unclear in her description of the problem that she experiences, it will be hard for the customer service to come up with a solution. Someone who starts of with threats where she should be explaining why the situation is such a problem will probably reduce her chances of finding a good solution. Because bad communication is at the source of so many conflicts, a tool was developed for the *Rechtwijzer* with which users can communicate the most important information to the other party. With this tool users write a letter to the other party which they can send via email or regular mail. This letter serves several purposes: it helps the user to reflect upon the situation, and it helps her to make a clear and effective statement to the other party. The letter should also urge the other party to take her seriously.

The content of the letter is based on the integrative dispute resolution model. Apart from some practical parts, most of the elements of the letter fulfill a function in the integrative negotiation process. The letter includes the following elements:

- *There is a problem* - The user makes it clear that she is experiencing a problem.
- *Product details* - Description of the product or service.
- *Complaint* - What is wrong with the product or service according to the user
- *Consequences* - here, the user describes the effects that the problem has on her life. When the interests are known, parties can look for a creative solution.
- *So far* - The user describes what both parties have done so far to solve the situation. She also describes how the interaction has been, and how helpful the other has been.
- *What's next* - The user sets a date by which she will contact the other, or when she expects the other to contact her. She also makes clear what actions she will take if the dispute is not solved in this way. With this information (from the advice module) she affects the opponent's BATNA, making it clear that serious alternatives are available.

The techniques used for generating the letter are simple; basically, the users' answers are pasted into the letter. While this has some disadvantages (the phrasing of the letter can be a bit awkward, for example), the benefits are great, especially when considering the simplicity of the tool. After working on the letter, users will have a much clearer and organized perception of their situation. The other party will also better understand the users' problems and wishes, and knows that the user is aware of methods for solving the dispute. Research on the effects of the letter on the way that people solve their conflict is being planned, and until now we only have some anecdotal evidence of the effects that it has.

3.3.   Used techniques

The *Rechtwijzer* is a relatively simple application. For a large part, the concepts of the *Rechtwijzer* could be implemented directly in a commercially available knowledge-based system (KBS). Some of the core elements fitted well within the architecture this KBS.

- *Establishing the domain* To determine what the conflict is about, users navigate a simple tree.

- *Diagnosis* The diagnosis of the conflict is based around an evaluation of the need for various actions. This could be implemented straightforward in the knowledge system's logic based reasoning systems. Basically, the answers to the various questions were used as conditions that include or exclude certain actions.

Several parts of the Rechtwijzer however required additional specific features that were not available in the KBS. These features were developed and integrated by the KBS supplier.

- *Advice* - The *Rechtwijzer* offers advice on the basis of a database of conflict resolution professionals. For each type of professional, the area of expertise (housing, consumer goods) as well as the services that they can deliver (binding decision, establishing alternatives) are listed. When the domain and the conflict diagnosis are established, the proper professionals can be selected from the database and presented to the user.
- *Database of professionals* - The *Rechtwijzer* depends on a complete and up-to-date database of dispute resolution professionals, the price of their services, available legal aid, and contact information. Because such information requires careful and regular maintenance, an interface was developed for editing the database.
- *Letter* - development of the letter also required special development. The implementation of the letter is quite basic. Users answer a number of questions, and the answers are pasted into a standard letter. The letter is formatted and made available for download in the rtf format. This allows the users to edit the letter themselves. This way, users remain some control over the end result. It also takes away the need for users to enter their personal information on the website.

4. Focus on the user

The aim of the *Rechtwijzer* is to help users with a conflict. A lot of care and attention was given to the way that people use the application, and user experiences were gathered to improve both the content and the user interface.

4.1. User experience

Extensive use was made of focus groups. At various stages of development, the application was tested by a group of of people representing the target population. These people were given example cases and were instructed to use the *Rechtwijzer* to decide on their next action. During this they were to think aloud and comment on their experience. This gave the researchers an excellent insight into their experience.

The focus groups proved to be important throughout the development process. One issue that was identified early on regarded the length of the texts. The developers had taken great care to explain all the important steps throughout the application, and to get every question as clear as possible. Focus group research pointed out that the users would simply ignore texts beyond a certain length. In order to cope with this, all text s were (repeatedly) rewritten, and great care was given to the development of the graphical components of the interface.

Focus group results showed an increase in users' appreciation; the application is currently rated at a 7.2 by the users. Each month, about 7.500 people open the front page of the website of the Legal Aid Council. Of these people, some 277 complete the entire *Rechtwijzer* application, and leave with an advice. More research is needed into when and why people leave the application before they finish. Research into the effects that the *Rechtwijzer* has on the quality of the conflict resolution process of the users is currently being planned.

5. Future developments

Several extensions to the Rechtwijzer are planned or underway. One particular example that is currently under development (and will probably be operational at the time of the ODR workshop) is a module for identifying objective criteria.

5.1.   *Module for objective criteria*

Objective criteria are a powerful negotiation tool. They offer conflict parties a way to resolve their conflict on the basis of external criteria, which allows them to accept an outcome without risking to lose face. Objective criteria also provide decision makers with a powerful anchor to which they can compare potential outcomes. Realistic criteria increase the likelihood that users accept a realistic outcome.

The *Rechtwijzer* will be extended with a module for objective criteria. This module will offer information in several forms, depending on the relevant norms. Some criteria may be presented in the form of a calculation tool, where the user only needs to enter the relevant numbers to get an outcome. In other situations, such a clear norm will not be available, and there the *Rechtwijzer* will offer a description of a reasonable outcome.

The module is currently being developed. This includes development of a method for gathering objective criteria, development of interface components and presentation methods for objective criteria, and empirical research into the effects that objective criteria have on users.

5.2.   *Plan of action for divorce*

Over the next year the *Rechtwijzer* will be extended with a module for handling divorce cases. The module offers a *plan of action* similar to the PICE system [2]. The plan of action describes all the important issues that the divorcees have to address, and it offers them a set of tools to help them with this process. The plan of action functions as a process management system which guides the user through the divorce process, but it also functions as a communication platform and as a documentation system. Users can communicate through the system, and all agreements are documented there. Users can also access the objective criteria module with specialized knowledge about divorce cases.

Ideally, users would discuss all the issues around their divorce using the plan of action. The may find that they agree on a number of issues, and cannot work out a solution to some others. For those issues they can then consult a professional (which they can find with the advice module). This way costs are reduced, parties remain a greater level of control over the outcome, and the adversarial part of the process is reduced.

We do recognize that a system such as the plan of action will not be suitable for all divorce cases. A test is being developed for assessing the suitability cases.

Furthermore, the plan of action will be tested in a pilot project under close professional supervision, before it becomes available to the public.

5.3.   *Measuring the effects of the Rechtwijzer*

Future plans for the Rechtwijzer also include a study of the effects of the application. Important questions include "are the users happy with the advice they get", "are the users happy with the solution they get after using the Rechtwijzer", and "what is the quality of the solutions that people get when they use the Rechtwijzer". For this end, the instrument developed within the *Measuring the Cost and Quality of Access to Justice* research project[5] will be used. This instrument measures the quality of *paths to justice* on dimensions such as procedural justice and interpersonal justice.

6.   Conclusion

In this paper, I have introduced the *Rechtwijzer* application and the ideas that underlie it. Noticeable features of the *Rechtwijzer* are: 1) the focus is on procedure rather than on knowledge, 2) the model of dispute resolution is based on integrative negotiation and the application advises the user to take actions that help her to reach an integrative outcome, and 3) the *Rechtwijzer* lets the user think about the conflict situation and organize her thoughts about the problem and possible solutions. The technical implementation of the *Rechtwijzer* is relatively simple but its use in practice shows that it fulfills a need. The precise effects of the application remain a subject of future study at this point, but stories from users as well as the results of regular testing with focus groups leave us optimistic in this respect.

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[5] http://www.tilburguniversity.nl/faculties/law/research/tisco/research/projects/access/ - see also [3]

RisolviOnline: Online Mediation from a Very Practical Point of View

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RisolviOnline

Abstract. This paper consists of a summary of the lessons learned from seven years of experience in online mediation and set future trends.

Keywords. Online Dispute Resolution, ODR, mediation, practice

1. How it all started

RisolviOnline.com appeared on the web site of the Chamber of Arbitration of Milan at the very end of 2001. The Chamber of Arbitration of Milan is a branch of the Milan Chamber of Commerce, founded in 1985, specialised in providing alternative dispute resolution (arbitration and mediation) for commercial matters involving businesses and consumers.

At that time the excitement for a new environment (online) was at the top. E-commerce was spreading all over the world mostly in a wild way and pre-existing rules of law and remedies were useless. In such a scenario the Chamber of Commerce of Milan (the institutional point of reference for business as well as for consumers) started to try to set a pattern for the phenomenon, by exerting one of its most traditional activities, that is, analysing as much contractual terms published online as possible in order to monitor the custom as arising out of online transactions and abusive clauses in online contracts. At the same time, the Chamber of Arbitration of Milan, which was already providing Alternative Dispute Resolution services for the traditional market such as arbitration and mediation, began to design the first Italian ADR service to be provided ONLINE.

RisolviOnline comes out from the attempt to translate the experience and the model of the Chamber's face-to-face mediation in an online system.

In 2002 we managed 38 commercial cases; unfortunately in the same year the same number of online mediation requests could not be handled by the service because related to non-commercial matters. In the following years the number of submissions noticeably decreased until 2007 when, on the contrary, it reared up to 117 requests for online mediation.

2. RisolviOnline up to May 2008

From 2001 to May 2008, the system consisted in a bi-lingual online request form linked to a database and a text-based chat-room. Though we built for the users a very simple, "google-style" chat, users asked us, right from the start, to mediate via e-mail.

We guess that this favour for e-mail communication is partly related to the costs of the Internet connection (an online meeting in chat could last for hours) and the higher familiarity in handling e-mail instead of chat; but we also think that there might be an important conclusion to be drawn: in online negotiations (assisted or not) people do prefer to take their time in order to think better about the proposals' exchange**.**

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A-synchronous[2] better than synchronous? Since the online environment lacks of important reassuring clues (such as the "look" of the opposing party or the tone of voice, etc.), it pushes the disputing parties to "move on" very carefully in a negotiation.

The process in itself was very straightforward:

1. An online mediation request is sent via form on the web site;
2. The Secretariat handles the request and contacts the opposing party inviting he/her to participate in an online mediation process (by filling in an online form);
3. If the opposing party agrees in participating, a mediator is appointed for the case;
4. The mediator contacts the parties through e-mail and guide the discussion;
5. If an agreement is reached, the mediator put it into writing and circulates the draft among the parties to the dispute. The last version of the agreement is printed by the parties, signed, and sent to the Secretariat, which will cross the agreement signed by one party to the other and viceversa.

In 2001 we decided to keep the system as simple as possible, so the users were not required to use the e-signature to sign the agreement. In 2008 we still think that asking the parties to sign electronically the agreement would be an obstacle in the choice for online mediation.

At a national level the e-signature is having a very slow uptake. In order to spread the use of e-signature the businesses have been compelled by the law to deposit their financial balance to their Chamber of commerce using e-signature, but as far as the author know, this produced a misuse of the smart card that lies in the safe of the company accountant waiting for the next deposit. In Italy professionals and private citizens seem to suffer from some sort of allergy to e-signature and ICT in general. This is maybe one of the reasons of the slow uptake of online mediation too (together with a poor promotion of the tool).

From January 2002 to December 2006 we managed 136 requests, 13 online mediation processes and closed (positively) out-of-mediation 29 cases. Out-of-mediation means that the simple contact of the other party by the Secretariat generated a re-start in the (private) negotiations between the disputing parties who reached a positive result. Here are two more important clues:

*   Businesses hardly agree to enter in our online mediation process but in general they do not know/trust Alternative Dispute Resolution in general and all the more so they do not trust online ADR;
*   The Secretariat alone resolved a large amount of cases without entering in a mediation procedure, simply contacting the opposing party.

The great majority of our online mediators belong to the legal profession. Until 2008 we had a panel of 11 mediators: half of them were trained (in different ways and level) in traditional mediation techniques, the other half was not specifically trained in mediation. We wanted to know if and how the training in traditional mediation techniques would have affected the management of an online mediation.

We noticed that in general the trained mediators had fewer difficulties in impasse phases and their online meetings ended with creative agreements but we also found out that not necessarily a good traditional mediator fits the online text-based environment. We also discovered "natural born online mediators" in the non-trained half of our list. All of them put into effect a wide range of strategies in order to carry out their task in the best way, and faced new challenges. Clue number 4:

*   A specific training on mediation helps, but it's not enough.

2007 appeared to be a sort of turning point for RisolviOnline. The Secretariat managed 117 online mediation requests, 8 opposing parties accepted to enter the online procedure and 37 cases were

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[2] A-synchronous: the communication between the parties is not occurring in real time (e.g. e-mail exchange, discussion forum): synchronous: the communication between the parties is in real time (e.g. chat)

positively closed by the sole intervention of the Secretariat. And more: one of the parties was non Italian in 61 cases out of 117. We therefore tried to ride the wave and take the risk.

3. RisolviOnline European Network

In early 2008 we decided consequently to improve the service considered the number of international cases we managed in 2007 and in the perspective of the possible spin-off of the new directive "*on certain aspects of mediation in civil and commercial matters*"[3] .

Basics still are that RisolviOnline is a public and institutional service provided for businesses and consumers and it deals with commercial disputes only worldwide regardless of the economic value of the dispute. It is text-based and it origins on the traditional concept/notion of mediation that is: it's voluntary, the mediator is impartial and neutral, the mediator assists the parties in reaching an agreement. The agreement, once signed, has a contractual nature. The whole process is confidential.

The mediator is a professional. The officer of the service does not act as a mediator and he cannot provide legal advice to the parties who eventually ask for it (and it happens very often). In a word, the officer must keep a neutral and independent position towards the parties to a dispute.

To this "traditional core" we added to the rules of the service the possibility, if all the parties involved agree so, to ask the mediator for one or more settlement's proposals, which are not binding for anyone so to comply with the pillars of mediation.

We decided to create a stand-alone web site, containing the crucial information about the service (how does it work, rules, fees, code of conduct for the online mediator) translated in 23 languages. We have an official list of Italian online mediators and a pilot list of online mediators coming from all over Europe.

Figure 1. RisolviOnline homepage

The official list of RisolviOnline includes a very well trained panel of mediators partially matching with the one used by the offline Mediation Service. The mediators attended advanced training courses and practiced in the field of commercial mediation. To be part of our offline panel they passed a

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[3] Directive 2008/52/EC at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:136:0003:0008:EN:PDF> see 8th «Whereas»: The provisions of this Directive should apply only to mediation in cross-border disputes…» and Whereas no. 9 «This Directive should not in any way prevent the use of modern communication technologies in the mediation process.»

structured selection consisting in written and oral tests on mediation and role plays. This is the first selection procedure for mediators in Italy. It has been conceived by the Chamber of Arbitration of Milan which needed an effective way to select skilled mediators for its panel.

Besides the official panel, RisolviOnline has a pilot list of skilled mediators coming from all over Europe because one of the main goals of the project is to foster a multilingual approach to online mediation. We gathered issues related to international cases/disputes and one of the most sensitive problem was the language of the negotiation. Certainly, it is not only a matter of language only, but of culture in general. We hope that relationship between our mediators coming from different countries may enrich the mediation culture of all the participants in the project.

For this reason the Chamber of Arbitration of Milan is going to schedule at least one meeting a year in order to facilitate the team spirit, the cultural exchange and to provide some specific online mediation training to our online mediators.

We organised two workshops in the last 3 years exclusively dedicated to our online mediators. We asked Dr. Susan Summers Raines,[4] Associate Professor in conflict management at Kennesaw State University (Georgia – USA) and mediator (offline and online), to create specific training for our mediators.

From a technical point of view we replaced the e-mail exchange with another asynchronous communication tool, in order to protect the confidentiality of the discussion which can be at risk using e-mails: the discussion forum.

Another important point is the development of specific online mediation techniques. We strongly believe that the development of such techniques and the training of the online mediators is the crucial point of online mediation (as conceived by the Chamber of Arbitration of Milan). Systems and platforms play a strong role in facilitating the activity of the third neutral or even a greater role in automated negotiation but as far as our ODR scheme is concerned, the leading role in the proceedings is played by the online mediator (as well as the parties). This is the reason why the Chamber is thinking of developing a project focused on online mediation techniques involving different academic departments (law, psychology, sociology, communications, etc.) in order to find out and develop such techniques and train our mediators.

4. ODR and the Italian Chambers of Commerce

After RisolviOnline, a number of other online mediation services have been created by the Italian Chambers and their technical partners such as Concilia-online[5] (used by a number of Chambers such as the Chambers of Tuscany and Piedmont and many others), WebCuria[6] (Treviso) and others. Systems are often modular (they offer various levels of complexity to its users, starting from a simple chat until a web conference). We have direct notice for the Chambers of Piedmont and Treviso which do not report any case of online mediation, while we do not have any figures by the other online services.

5. Conclusions

In seven years of activity, it seems that the main points/findings for an online dispute resolution service shaped on traditional mediation are:

- Businesses are reluctant to take part in a mediation proceedings, and they are far more reluctant to enter an online mediation (but the Directive: 52/2008 might improve their attitude towards ADR);
- Parties of an online mediation proceedings privilege a-synchronous communication tools;
- The Secretariat has a crucial role in processing the online mediation requests and also in helping the parties in re-opening private negotiations;

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[4] See Dr. Raines' CV at <http://www.kennesaw.edu/pols/mscm/raines_cv.pdf>
[5] www.conciliaonline.net
[6] www.curiamercatorum.com

- The training on mediation techniques may be the starting point but it's not enough to handle the cases in the proper way, therefore it is vital to find out and develop specific online mediation techniques;
- It is important to develop multilingual systems because though it may be quite easy and common to conclude online transactions in English, it could be much more difficult to take part in an online negotiation if the party is not an English native speaker.

The author is perfectly aware that these points are more "suggestions" since they are poorly supported by statistics,[7] but the Chamber of Arbitration of Milan is still going ahead with the project thinking that there will be a positive change in the situation soon. We think that the international vocation of the service will be appreciated especially when Directive 52/2008 will be enforced by each Member State.

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[7] Only in 31 cases (out of a total number of 380 online mediation requests) there have been a real online mediation proceedings (5 are still going on, in 16 cases the mediation has been successful, in 10 it failed), 83 cases were solved by the intervention of the Secretariat. Statistics in detail at www.risolvionline.com

Beyond Interest Based Bargaining - Incorporating Interests and Fairness in the Development of Negotiation Support Systems

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Abstract: One of the major concerns raised by people using negotiation processes is about the fairness of the process. Individuals undertake negotiation to derive better outcomes than could be obtained from conflict and litigation. Thus they often engage in interest based negotiation.

But interest based negotiation focuses upon the interests of disputants rather than upon objective measures of fairness. For example in family law, parents might focus upon their own desires rather than the needs of the children. In employment law, individual bargaining between employers and employees might lead to basic needs (such as recreation leave and sick leave) being whittled away.

It is thus vital to develop measures, or at the very least principles, for the development of *fair* negotiation support systems. In this paper, we suggest principles which when applied, will encourage fairness in the development of negotiation support systems. Such principles include transparency, bargaining in the shadow of the law and the need for discovery. We also illustrate the pitfalls of using such principles.

We indicate how some of these principles can be applied in Australian Family Law.

Keywords: Negotiation Support Systems, Fairness, Bargaining in the Shadow of the Law, BATNAs

1. Introduction

It is a common mantra, often accepted by courts and government, that negotiation is preferable to litigation in almost all circumstances. However, knowing when to negotiate and when to refuse to negotiate is vital (Mnookin 2003). For example, on September 30 1938, Neville Chamberlain, the prime minister of the United Kingdom, returned from Munich saying '*we have peace for our time*'. Within twelve months, Kristallnacht had occurred, the Molotov-Ribbentrop pact was signed and World War Two had commenced.

Even now supporters of Chamberlain rationalise that he was correct, and that his actions in Munich won the United Kingdom vital time to prosecute the war. So how

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can we measure when to negotiate and when to conduct conflicts, especially when knowledge is not transparent? Or should we just try to manage rather than resolve conflicts?

Blum (2007) argues that protracted armed rivalries are often better managed rather than solved, because the act of seeking full settlement can invite endless frustration and danger, whilst missing opportunities for more limited but stabilising agreements. In analysing enduring rivalries between India and Pakistan, Greece and Turkey and Israel and Lebanon, Blum notes that in each of these conflicts, neither party is willing to resolve the core contested issues but both may be willing to carve out specific areas of the relationship to be regulated – what she calls *islands of agreement*.

Similarly, rather than resolve a family dispute, should we just manage it so that minimal conflict or disruption occurs? Eventually, the dispute might be more easily resolved or due to the progress of time, the dispute may no longer exist – such as when dependant children become adults.

In this paper, we wish to develop certain processes for ensuring the negotiation support systems we are developing, can in some way be considered to be *fair*. This is a mammoth task, and our results are clearly preliminary. Further, the detailed literature survey required in such a project, cannot be presented in a mere conference or workshop article. A lengthy journal article on this topic is currently being finalized.

A primary motivation for our interest in the fairness of negotiation processes, arose when we examined bargaining about charges and pleas in the domain of criminal sentencing. In this domain, the two parties often have very different resources, a well supported prosecution versus an impoverished defence[2]. Further, the consequences of an unfair negotiation can be dire – the incarceration of an innocent defendant, can not easily be reversed.

In criminal law jurisdictions, a defendant can appeal a decision if they believe the judicial process was flawed. However, when negotiating about pleas – known as plea bargaining, a participant cannot challenge the decision. The reason for this situation is that unlike in a trial, the defendant has pleaded guilty and thus admitted that he committed the crime. This situation becomes problematic in the admittedly few cases where a person accepts a plea bargain even though they did not commit the crime. The defendant may plead guilty because he was offered a heavily reduced sentence (e.g. no jail time) and he felt the probability that he would be found guilty is reasonably high. Thus, it is very difficult to undo an '*unfair plea negotiation*'. But it is also essential that it be possible to reverse unfair decisions.

Because of the different proof requirements in civil and criminal law and the fact that criminal law cases involve the state prosecuting an individual, we shall restrict ourselves to discussing civil law, and primarily family law, in this paper.

Alexander (1997) has argued that in Australian Family Law, women tend to be more reluctant than men to continue conflict and are more likely to wave their legal rights in a mediation session. McEwen et al (1995) believe family mediators focus upon procedural fairness rather than outcome fairness. Phegan (1995) argues that differences in power between men and women lead to negotiated results that favour men. Bargaining imbalances can thus produce *unfair results* unless mediators overcome them

But what are fair results? Take for example a marriage in Australia where the couple have been married for fifteen years and have three children, one of whom has special

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[2] The trial of O. J. Simpson for the murder of Nicole Simpson and Ronald Goldman involved a very affluent defendant, who had the ability to present a very strong defence.

needs. Suppose the husband works full-time, whilst the wife is not employed outside the house and is a full-time carer for the husband and children. If this is a low income and low asset marriage, the wife might be expected to receive 70% of the common pool. The husband would also need to pay Child Support. In many circumstances, the fact that the husband has a low income and is paying substantial child support, may mean that he cannot afford to pay rent. He might thus be forced to return to living with his parents. Men's groups have vigorously protested at what they perceive as injustices.

Are such results fair or just? The answer depends on how we measure fairness. If we measure fairness by meeting the interests or needs of both parents equally, then the answer is clearly no. In Australia, our notion of justice focuses upon meeting the paramount interests of the children. Hence the solution suggested above, is eminently fair according to Australian Law.

It is vital that we develop '*fair*' and '*just*' negotiation support systems. Indeed, one of the barriers to the uptake of Online Dispute Resolution (ODR) relates to users' concerns about the fairness and consistency of outcomes achieved by any ODR approach. But how can we measure what is '*fair*' and '*just*' negotiation support? Pierani (2005), in discussing Online Dispute Resolution in Italy, argues that as with ADR models, ODR systems need to be impartial, transparent, effective and fair.

Family Law is one domain where interest-based notions of mediation conflict with notions of justice. In such domains, the use of negotiation support systems that attempt to equally satisfy both parties is limited. Nevertheless, we believe that our ODR environment may still play a positive role in the family-law setting. One safeguard for use of ODR in fields such as family law may be required certification of the result by a legal professional.

2. Fairness Principle 1 - Bargaining in the Shadow of the Law

Traditional Negotiation Support Systems have focused upon providing users with decision support on how they might best achieve their goals (Raiffa, 1982). A fundamental issue arises whenever anyone builds a negotiation support system for use in legal domains: is the system being developed concerned with supporting mediation or providing justice? When issues of justice are not reflected in the outcome of the mediation process, bargaining theory has its limitations. Bargaining imbalances can thus produce *unfair results* unless mediators overcome them.

Because most legal dispute resolution occurs outside the court-room, there are fewer opportunities to ensure fair decision-making. In support of this argument, Galanter (2004) claims:

> *In the federal courts, the percentage of civil cases reaching trial has fallen from 11% in 1962 to 1.8% in 2002. In spite of a five-fold increase in case terminations, the absolute number of civil trials was 20% lower in 2002 than it was 40 years earlier.*

In writing about the Vanishing American Trial, Galanter argues that whilst litigation in the United States is increasing, the number of trials decided by US judges has declined drastically. This is because litigants are using alternative forms of Dispute Resolution.

Most negotiations in law are often conducted in the shadow of the Law i.e. bargaining in legal domains mimics the probable outcome of litigation. Mnookin and Kornhauser (1979) introduced the bargaining in the shadow of the trial concept. By examining the case of divorce law, they contended that the legal rights of each party could be understood as bargaining chips that can affect settlement outcomes.

Bibas (2004) argues that:

> *the conventional wisdom is that litigants bargain towards settlement in the shadow of expected trial outcomes. In this model, rational parties forecast the expected trial outcome and strike bargains that leave both sides better off by splitting the saved costs of trial. ... This shadow of trial model now dominates the literature on civil settlements.*

Walton and Mckersie (1965) propose that negotiation processes can be classified as distributive or integrative. In distributive approaches, the problems are seen as "zero sum" and resources are imagined as fixed: *divide the pie*. In integrative approaches, problems are seen as having more potential solutions than are immediately obvious and the goal is to *expand the pie* before dividing it. Parties attempt to accommodate as many interests of each of the parties as possible, leading to the so-called *win-win* or *all gain* approach. As (Kersten 2001) notes although Walton and McKersie did not suggest one type of negotiation being superior to the other, over the years, it has become conventional wisdom that the integrative type allows for better compromises, win-win solutions, value creation and expanding the pie

Traditional negotiation decision support has focused upon providing users with decision support on how they might best obtain their goals. Such advice is often based on Nash's principles of optimal negotiation or bargaining (Nash 1953). Game theory, as opposed to behavioural and descriptive studies, provides formal and normative approaches to model bargaining.

Most negotiation outside the legal domain law focuses upon interest-based negotiation. Expanding on the notion of integrative or interest-based negotiation, principled negotiation promotes deciding issues on their merits rather than through a haggling process focused on what each side says it will and will not do (Fisher and Ury 1981). Amongst the features of principled negotiation are: separating the people from the problem; focusing upon interests rather than positions; insisting upon objective criteria and knowing your *BATNA* (*B*est *A*lternative *T*o a *N*egotiated *A*greement).

The reason you negotiate with someone is to produce better results than would otherwise occur. If you are unaware of what results you could obtain if the negotiations are unsuccessful, you run the risk of:

1) Entering into an agreement that you would be better off rejecting; or
2) Rejecting an agreement you would be better off entering into.

For example, when a person wishes to buy a used car, they will usually refer to a commonly accepted set of approximate automotive prices. Using this initial figure and considering other variables such as new components, the distance travelled by the car and its current condition, the buyer then decides the value they wish to place on a car. If the seller is not willing to sell the car at this price, then you can argue the merits of your valuation, in an attempt to persuade the seller to accept your BATNA.

As an important starting point in a negotiation, BATNAs can be used to form a basis from which fair agreements can be obtained. Mnookin (2003) claimed that having an accurate BATNA is part of the armory one should use to evaluate whether or not to agree to enter a negotiation. Comparing the possible (range of) outcomes with alternative options encourages parties to accept methods that are in the interests of disputants and enables them to identify those that are not. It is likely that most parties, to some extent, test the values of their BATNAs when assessing whether or not to opt for a certain dispute resolution method.

3. Fairness Principle 2 - BATNAS

In their development of a three step model for ODR, (Lodder and Zeleznikow 2005) evaluated the order in which online disputes are best resolved. They suggested the following sequencing:

1. First, the negotiation support tool should provide feedback on the likely outcome(s) of the dispute if the negotiation were to fail – i.e. the BATNA.
2. Second, the tool should attempt to resolve any existing conflicts using dialogue techniques.
3. Third, for those issues not resolved in step two, the tool should employ compensation/trade-off strategies in order to facilitate resolution of the dispute.
4. Finally, if the result from step three is not acceptable to the parties, the tool should allow the parties to return to step two and repeat the process recursively until either the dispute is resolved or a stalemate occurs.

If a stalemate occurs, arbitration, conciliation, conferencing or litigation (or indeed any other ADR technique) can be used to reach a resolution on a reduced set of factors. This action can narrow the number of issues in dispute, reducing the costs involved and the time taken to resolve the dispute.

Lodder and Zeleznikow's model, in suggesting providing advice about BATNAs, facilitating dialogue and suggesting trade-offs, focuses upon E-Commerce applications. They claimed that their research assumes that disputants focus upon interests. But as we shall discuss in section four, the notions of Bargaining in the Shadow of the Law and BATNAs have important implications for developing just negotiation support systems.

Whilst this paper primarily focuses upon negotiation theory, we now examine the fairness of some negotiation support systems that we have constructed in Australian Family Law.

3.1. Enhancing Interest Based Negotiation: The Family Winner and AssetBuilder Systems

Bellucci and Zeleznikow (2006) supported interest based negotiation in their Family Winner system. They observed that an important way in which family mediators encourage disputants to resolve their conflicts is through the use of compromise and trade-offs. Once the trade-offs have been identified, other decision-making

mechanisms must be employed to resolve the dispute. They noted that while it appears counterintuitive:

- The more issues and sub-issues in dispute, the easier it is to form trade-offs and hence reach a negotiated agreement, and
- They choose as the first issue to resolve the one on which the disputants are furthest apart – one party wants it greatly, the other considerably less so.

In assisting the resolution of a dispute, Family_Winner (Belluci and Zeleznikow 2006) asked the disputants to list the items in dispute and to attach importance values to indicate how significant it is that the disputants be awarded each of the items. The system uses this information to form trade-off rules. The trade-off rules are then used to allocate issues according to a '*logrolling*' strategy[3].

The trade-offs pertaining to a disputant are graphically displayed through a series of trade-off maps (Zeleznikow and Bellucci 2003). Their incorporation into the system enables disputants to visually understand trade-off opportunities relevant to their side of the dispute. A trade-off is formed after the system conducts a comparison between the ratings of two issues. The value of a trade-off relationship is determined by analyzing the differences between the parties.

The system implements compensation by either increasing or decreasing a party's rating. It is then expected that changes made to a rating will influence the decision of a future allocation. The amount of any compensation resulting from the triggering of a trade-off has been empirically determined from an analysis of data. Even though Bellucci and Zeleznikow (2006) have tried to explicitly define utility functions, they are indeed developed implicitly and are only approximations.

Our interest about fairness in family mediation was raised when Bellucci and Zeleznikow first evaluated the performance of the Family_Winner system. They met with a number of family law solicitors at Victoria Legal Aid. Whilst the solicitors were very impressed with how Family_Winner suggested trade-offs and compromises, they had one major concern – that Family_Winner in focusing upon mediation had ignored issues of justice. They claimed that Bellucci and Zeleznikow had focussed upon the interests of the parents rather than the needs of the children.

Relationships Australia (Queensland Branch)[4] wants to use a modified version of Family_Winner to provide decision support for their clients. The application domain concerns agreements about the distribution of marital property. Instead of Family_Winner attempting to meet both parents' interests to basically the same degree, mediators at Relationships Australia determine what percentage of the common pool property the wife should receive (e.g. 60%).

The new system, Family_Mediator (Zeleznikow and Bellucci 2006) helps resolve the issue by:

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[3] Logrolling is a process in which participants look collectively at multiple issues to find issues that one party considers more important than does the opposing party. Logrolling is successful if the parties concede issues to which they give low importance values. See Pruitt (1981).

[4]   See   http://www.relationships.com.au/who-we-are/state-and-territory-organisations/qld last accessed 30 October 2008

1. The mediator involved in helping resolve the dispute makes decisions about the relative points the husband and wife should each receive[5]. Say the wife receives X% and Husband (100 – X) %
2. The mediator decides on the value of each item in dispute.
3. Both the Husband and Wife give points to each of the items in dispute[6].
4. The Family_Mediator system then suggests trade-offs and compensations so that the wife receives T*(50 + X) points and the husband receives T*(150 - X) points where T is the number of points each party would receive under the original Family_Winner system.

Unlike the Family_Winner system, the AssetDivider system (Bellucci 2008) allows users to input negative values. This development is necessary because family mediation clients often have debts (such as credit card debts and mortgages) which are as much items in the negotiation as assets.

Further, to ensure that AssetDivider system proposes an acceptable solution, it might be necessary to include as a universal issue in all disputes, a cash variable payment item. For example, where the wife has identified that her highest preference is to retain the family home, an outcome might provide for her to keep the matrimonial home and the mortgage. In order to reach an acceptable settlement, the wife might need to make a cash payment to the husband. Hence the requirement that a variable appear in the output is stipulated.

A further limitation of the AssetDivider system is the need for users to enter numerical values. Whilst disputants can probably linearly order the significance to them of all items in dispute, it is unrealistic to expect them to give a numerical value to each item. But it is not unreasonable for the users to assign a linguistic variable to each item. A seven point Likert scale which can then be converted into points is suggested:

Suppose the parties enter the following terms for the issues in dispute in the example given in section 3.4 of Zeleznikow et al (2007).

Item	H description and thus unscaled points		W description and thus unscaled points	
Residency	Little Significance	10	Essential	60
Visitation Rights	Very Important	50	Irrelevant	0
Shares	Important	40	Little Significance	10
Superannuation	Little Significance	10	Moderate	30
Child Support	Moderate	30	Irrelevant	0
Matrimonial Home	Irrelevant	0	Important	40
Investment Unit	Marginal	20	Irrelevant	0
Holiday House	Irrelevant	0	Marginal	20
Mitsubishi Car	Marginal	20	Irrelevant	0
Holden Car	Irrelevant	0	Moderate	30
Boat	Marginal	20	Irrelevant	0

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[5] Essentially evaluative mediation – where the mediator assists the parties in reaching resolution by pointing out the weaknesses of their cases and predicting what a judge is likely to do. This prediction tries to encourage the negotiation to be fair and just.

[6] As in the entering of the points into the Family_Winner system, the points are normalized to 100.

The husband's total score is 200. Thus to scale his scores each number is multiplied by 100/200 = 0.5. The wife's total score is 190. Thus to scale her scores each number is multiplied by 100/190 = 0.53. This leads to a points table:

Table 2. Points table

Item	H Points	W points
Residency	5	32
Visitation Rights	25	0
Shares	20	5
Superannuation	5	16
Child Support	15	0
Matrimonial Home	0	21
Investment Unit	10	0
Holiday House	0	11
Mitsubishi Car	10	0
Holden Car	0	16
Boat	10	0

These points are then utilised by the original Family_Mediator algorithm. The development of Family_Mediator and AssetDivider allows the concept of interest-based negotiation as developed in Family_Winner to be integrated with notions of justice. The advice about principles of justice can be provided by decision support systems that advise about BATNAs or human mediators.

But how can we develop reasonable BATNAs?

3.2. Developing BATNAs: The Split Up System

In the Split-Up project, Stranieri *et al* (1999) wished to model how Australian Family Court judges exercise discretion in distributing marital property following divorce The resulting system uses rules and neural networks to determines which assets will be paramount in property considerations and then determines a percentage of the property to be awarded to each party.

Whilst the Split—Up system was not originally designed to support legal negotiation, it can be directly used to proffer advice in determining one's BATNA. Suppose the disputants' goals are entered into the Split—Up system to determine the asset distributions for both W & H. Split—Up first shows both W and H what they would be expected to be awarded by a court if their relative claims were accepted. The litigants are able to have dialogues with the Split—Up system about hypothetical situations which would support their negotiation.

Bellucci and Zeleznikow (2001) give an example of a divorcing couple who had been married twenty-years and had three children. The husband worked eighty hours per week whilst the wife did not engage in employment outside the home. They entered three scenarios into the Split—Up system. The system provided the following answers as to the percentages of the distributable assets received by each partner.

Resolution	H%	W%
Given one accepts W's beliefs	35	65
Given one accepts H's beliefs	58	42
Given one accepts H's beliefs but gives W custody of children	40	60

Clearly, custody of the children is very significant in determining the husband's property distribution. If he were unlikely to win custody of the children, the husband would be well advised to accept 40% of the common pool (otherwise he would also risk paying large legal fees and having ongoing conflict).

Hence, while Split-Up is a *decision* support system rather than a *negotiation* support system, it does provide disputants with their respective BATNAs and hence provides an important starting point for negotiations. This problem can arise where a fully automated ODR environment is used in which resolution is based on consensus.

4. Principles for Developing Fair Negotiation Support Systems

Having examined interest based and principled negotiation and bargaining in the shadow of the law as well as family mediation and bargaining about charges and pleas, we now wish to develop a framework for developing fair and just negotiation support systems.

4.1. Transparency

As we have seen from a discussion of negotiating about pleas and charges, it is essential to be able to understand and if necessary replicate the process in which decisions were made. In this way unfair negotiated decisions can be examined, and if necessary, be altered. The same is true in family mediation.

The November 2001 declaration of the Fourth Ministerial Conference of the World Trade Organisation , held in Doha, Qatar, developed guidelines for the organization and management of their free trade negotiations. One of their principles (number 49) says:

> *The negotiations shall be conducted in a transparent manner among participants, in order to facilitate the effective participation of all. They shall be conducted with a view to ensuring benefits to all participants and to achieving an overall balance in the outcome of the negotiations.*

Bjurulf and Elgstrom (2004) discuss the importance of transparency in negotiations re the European Union directives on public access to European documents. They argue that the development of norms helps facilitate fair negotiations.

We can in fact also consider two distinct forms of transparency: transparency about the process and transparency of the data in a particular negotiation.

4.1.1. Transparency in Negotiation Processes

There is wide spread support for the development of transparent processes in dispute resolution. For example, at the commencement of all mediation conferences, Relationships Australia (Queensland) clearly indicate to the disputants, how the process will be managed. They follow the model discussed in Sourdin (2008): *Opening, Parties' Statements*, *Reflection and Summary*, *Agenda setting*, *Exploration of Topics* , *Private Sessions*, *Joint negotiation sessions and Agreement/Closure*

To emphasize the importance of transparency in charge negotiations, Wright and Miller (2003) believe that pervasive harm stems from charge bargains due to their special lack of transparency. Charge bargains, even more than sentencing concessions, make it difficult after the fact, to sort out good bargains from bad, in an accurate or systematic way.

To improve the dilemma of plea bargaining, Wright and Miller (2002) introduce the notion of *prosecutorial screening*. The prosecutorial system they envisage has four interrelated features: early assessment, reasoned selection, barriers to bargains and enforcement.

4.1.2. Transparency and Discovery

Even when the negotiation process is transparent, it can still be flawed if there is a failure to disclose vital information. Such knowledge might greatly alter the outcome of a negotiation.

Take for example the case of a husband who declares his assets to his ex-wife and offers her eighty per cent of what he claims is the common pool. But he has hidden from his ex-wife, ninety per cent of his assets. Thus, in reality, he has only offered her eight per cent of the common pool.

Cooter and Rubinfield (1994) and Shavell (2003) point out, in litigation, the courts may require that a litigant disclose certain information to the other side; that is, one litigant may enjoy the legal right of *discovery* of information held by the other side. Shavell claims that the right of discovery significantly increases the likelihood of settlement because it reduces differences in parties' information. This benefit is often lost in a negotiation.

The failure to conduct adequate discovery can be a major flaw in ensuring that negotiations are fair. But how can we conduct sufficient discovery without losing the benefits of negotiation – speed, lower cost and flexibility?
Requiring specified aspects of disclosure in a negotiation might help enhance the fairness of a negotiation process.

4.1.3. Using Bargaining in the Shadow of the Law in Negotiation

As discussed in section 2, most negotiations in law are conducted in the shadow of the law. The probable outcomes of litigation provide beacons or norms for the commencement of any negotiations (in effect BATNAs). Bargaining in the Shadow of the Law provides standards for adhering to *legally just* and *fair* norms.

By providing disputants with advice about BATNAs and Bargaining in the Shadow of the Law and incorporating such advice in negotiation support systems, we can help support fairness in such systems.

For example, in the Family_Mediator system, interest based negotiation is constrained by incorporating the paramount interests of the child. By using Bargaining in the Shadow of the Law, we can use evaluative mediation (as in Family Mediator) to ensure that the mediation is fair.

The Split_Up system provides BATNAs for commencing fair negotiations. Such BATNA advice is now being provided on the internet. The BEST-project (*B*ATNA *E*stablishment using *S*emantic web *T*echnology), based at the Free University of

Amsterdam aims to explore the intelligent disclosure of Dutch case law using semantic web technology[7]. It uses ontology-based search.

4.2. The negatives in using Transparency and Bargaining in the Shadow of the Law for Negotiation Support

In section 4.1, we outlined the benefits of promoting transparency and bargaining in the shadow of the law to support fair negotiation. There is however a certain danger in promoting transparency and Bargaining in the Shadow of the Law for negotiation support.

a) **In such situations, disputants might be reluctant to be frank** – one of the benefits of negotiation (as opposed to litigation) is that outcomes are often kept secret. Thus the resulting negotiation does not act as a precedent for future litigation. If this benefit is lost then parties might be more reluctant to negotiate.

b) **Mediators might be seen to be biased** (such as in evaluative mediation) – if mediators need to offer advice about transparency and bargaining in the shadow of the law, then both the disputants and other interested parties might be reluctant to engage in the negotiation.

c) **The difficult and dangers of incorporating discovery into negotiation support systems** – discovering appropriate information is complex, costly and time consuming.

d) **The inability to realise the repercussions of a negotiation** – often disputants focus upon resolving the dispute at hand. They fail to realise that the resolution they advocate may have larger scale repercussions. In 2005, the Australian Competition and Consumer Commission (ACCC) convened a number of examinations of VISY executives (whose chairman is Richard Pratt) over allegations that VISY entered illegal price-fixing and market-sharing arrangements with arch-rival Amcor. Initially VISY denied any wrongdoing. In October 2007, Pratt secured an early negotiated settlement with the ACCC, avoiding months of potentially damaging publicity for Mr. Pratt and Amcor. But this changed evidence has led, in June 2008, to the ACCC beginning criminal proceedings in the Federal Court against Mr Pratt for allegedly providing false or misleading evidence in the course of an investigation[8]. Despite expensive legal advice, Mr. Pratt did not realise that his negotiated civil plea negotiation with the ACCC could lead to later criminal proceedings against him.

Thus, our proposed principles for developing fair negotiation support systems also have some drawbacks.

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[7] See www.best-project.nl/description.sthml Last accessed August 4 2008

[8] See www.accc.gov.au/content/index.phtml/itemid/832393 last accessed August 6 2008.

5. Current Work and Conclusion

A further extension of the move towards ADR, is the notion *if negotiation is good, then compulsory negotiation is even better*. In Australia, mediation – generally facilitative mediation – has been used to handle disputes in the family arena for about twenty years. Initially it was considered essential that the couple enter mediation voluntarily. However, this is not the situation in Australia today: at least one meeting with a family mediator is mandatory before lodging an application for a parenting order in the Family Court. Often parties who have no intention of settling their conflict without adjudication are forced into mediation before they can continue to court. In a joint project with Relationships Australia, we are investigating the benefits and pitfalls of compulsory mediation.

In conjunction with Victoria Body Corporate Services[9], we have developed model dispute resolution rules for condominium owners. These rules are used to promote constructive mediation following the resolution of disputes. Techniques used involve conciliation and arbitration (both with the same mediator and arbitrator and a different person undertaking the respective roles) and a sealed arbitration followed by mediation.

We are also hoping to build an ODR environment to house negotiation support systems to support both housing and family disputes.

We have seen that one of the major concerns from disputants using Alternative Dispute Resolution is about the fairness of the process. Without negotiation procedures being seen as fair and just, there will always remain legitimate criticisms of the process. But how can we measure the fairness of Alternative Dispute Resolution procedures?

Through an examination of the relevant literature in a variety of domains – including international conflicts, family law and sentencing and plea bargaining – and an in depth discussion of negotiation support tools in Australian Family Law, we have developed a set of important factors that should be incorporated into 'fair' negotiation support processes and tools. These factors include:

* Transparency;
* Bargaining in the Shadow of the Law and BATNAs; and
* Limited Discovery.

Incorporating these factors, does however have some drawbacks for the development of negotiation support systems.

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A Multi-Agent Architecture for Online Dispute Resolution Services

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Abstract: Argumentation theory is often used in multi agent-systems to facilitate autonomous agent reasoning and multi-agent interaction. The technology can also be used to develop online negotiation and mediation services by providing argument structures that assist parties involved in a dispute to resolve outstanding issues or avoid future disputes. While Alternative Dispute Resolution (ADR) represents a move from a fixed and formal process to a more flexible one, Online Dispute Resolution (ODR) moves ADR from a physical to a virtual place. The research aims to capitalise on the recent trend towards ODR by creating a JADE based multi-agent ODR environment. The utility functions and argument structures of two existing ODR applications are being re-deployed as Web based intelligent agents capable of intuitively coordinating during a negotiation. One agent uses expert knowledge of the Australian Family Law domain to recommend a percentage property split, while another uses heuristics and game theory and combines this split with a significance rating of items provided by each party, to allocate issues and advise upon possible trade-offs. The ultimate aim is to provide disputants with an integrated ODR environment offering a range of services to assist them in achieving fairer outcomes.

Keywords: Alternative dispute resolution, Bayesian reasoning, Argumentation theory, JADE, Multi-agent systems, Online Dispute Resolution.

1. Introduction

Recently, argumentation theory has become an increasingly popular method of specifying autonomous agent reasoning and facilitating multi-agent interaction. The theory can be used by agents, for example, for belief revision and decision-making under uncertainty and non-standard preference policies, and provides tools for designing, implementing and analysing sophisticated forms of interaction among rational agents as described by [1]. The technology can also facilitate online negotiation and mediation services by providing argument structures that assist parties involved in a dispute to resolve outstanding issues or avoid future disputes.

The Laboratory of Decision Support and Dispute Management at Victoria University in Melbourne Australia, has successfully developed decision support

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systems in Australian Family Law. The project team has further used domain expertise to construct a variety of Family Law negotiation support systems.

The Split-Up project [2] used Toulmin's theory of argumentation [3] to model how Australian Family Court judges exercise discretion in distributing marital property following divorce. The prototype used machine learning to model how judges perform a percentage distribution of assets. Whilst the Split-Up system was not originally designed to support legal negotiation, it is capable of doing so. Split-Up can be directly used to proffer advice in determining a 'Best Alternative to a Negotiated Agreement' (BATNA). This point is illustrated by [4].

Family Winner [4] is an application that uses a variety of artificial intelligence and game theoretic techniques to advise upon structuring the mediation process and advising disputants upon possible trade-offs. Heuristic utility functions were developed from cases supplied by the Australian Institute of Family Studies. Family Winner operates best when it is possible to allocate points to issues, and creative decision-making is not required.

Having successfully overseen the development of these applications, the research laboratory is now focussing on the development of a new multi-agent online dispute resolution (ODR) environment. The aim is to re-deploy the utility functions and argument structures of Split-Up and Family Winner as Web based intelligent agents that can intuitively coordinate during a negotiation to assist parties involved in disputes to achieve fairer outcomes. A BATNA agent uses expert knowledge of the Australian Family law domain, combined with Toulmin's argumentation theory and Bayesian reasoning[2], to recommend a percentage property split. An Asset Divider agent uses heuristics and game theory and combine this percentage split with a significance rating of items provided by each party, to allocate issues and advise upon possible trade-offs.

The paper commences with some background information about ODR and briefly describes its place in the field of Alternative Dispute Resolution (ADR). A proposed framework for a multi-agent ODR environment is then presented and multi-agent interaction is described in detail, as well as the utility functions and behaviour of individual agents. Finally, the paper outlines the project team's ultimate vision, which is to deploy the architecture as an integrated ODR environment, offering disputants a range of negotiation and mediation services.

2. Online Dispute Resolution

Alternative dispute resolution (ADR) is generally defined as processes that are 'alternative' to traditional court proceedings (litigation). The ADR movement has progressively played an increasingly important role in the move away from authoritarian and top down social and institutional structures to more open, accountable and inclusive arrangements [5]. Online dispute resolution extends this trend even further. While ADR represents a move from a fixed and formal process to a more flexible one, ODR (by designating cyberspace as a location for dispute resolution) moves ADR from a physical to a virtual place.

Although ODR sites have primarily been used for Internet-related disputes, ODR can also facilitate resolution of disputes that have not originated online. For instance, many blind-bidding sites that exist can be used to solve financial disputes, such as insurance claims, that are not necessarily related to e-commerce. In addition,

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[2] http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=76835

considering the ease with which the younger generation uses online tools, it seems reasonable to suggest that within the next decade, ODR will become a central method of dispute resolution.

SmartSettle [3] assists parties in overcoming the challenges of conventional negotiation through a range of analytical tools. It is designed to clarify interests, identify trade-offs, recognise party satisfaction, and generate optimal solutions. The aim is to better prepare parties for negotiation and support them during the negotiation process. Applications such as Smartsettle are becoming popular alternatives to litigation. This is possibly because many people are starting to believe that for most conflicts, ODR is a better dispute resolution mechanism due to its convenience, low cost and speed. The benefits of ODR are described in detail by [6].

Other interesting and related research includes work presently being undertaken by [7] who use a multi-agent approach to simulate negotiation and decision making in the Rungis wholesale fruit and vegetable market[4] in France, and the work of [8] who are developing an integrated software framework for the rapid construction of a Web-based negotiation support systems.

3. A Multi-agent Online Dispute Resolution Architecture

The project team believes that there are a number of advantages in using a multi-agent approach to develop ODR systems. Firstly, the loosely coupled nature of multi-agent systems can reduce the complexity of adding additional services. Services can be added somewhat independently by creating new domain agents, thus eliminating the need for major modification of existing programming code. Another advantage is that by using a dedicated agent development environment such as JADE[5], communication protocols are readily available. External agents can also access services offered via the interface agent using the JADEGateway class. Communication protocols in JADE are defined by the ACL language specified by FIPA[6]

The JADE main container also provides two special agents; 1) an Agent Management System (AMS) that ensures that each agent has a unique name, and allows agents on external containers to be terminated; and 2) a Directory Facilitator (DF) that lists services offered by agents so that other agents can find them. These two special agents are very useful for managing independent services. JADE can also run in any J2EE compliant container and with most of the popular database management systems[7]. The system is configured to run on a Tomcat server using MySQL and JDBC for database connectivity. The system architecture is presented in Figure 1.

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[3] http://www.smartsettle.com
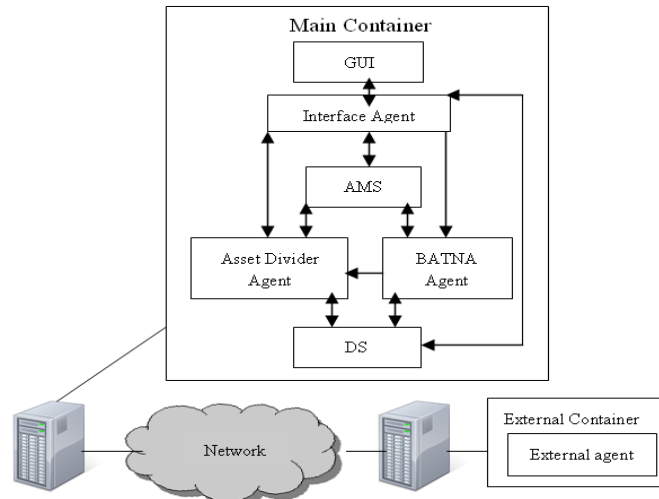
[4] http://www.rungisinternational.com/pages/gb/presentation/mar_hist.asp

[5] JADE version 3.6 available for download at: http://jade.tilab.com

[6] http://www.fipa.org

[7] http://www.theserverside.com/news/thread.tss?thread_id=14185

Figure 1. Multi-Agent Architecture

3.1. Interface Agent

The interface was designed as the system's gateway to external resources. Supported by a JSP graphical user interface (GUI) to accept user input, it also provides access to services for agents on external containers through the JADEgateway class. In the case of a marital property dispute, the user is presented with a series of screens similar to Split-Up prompting them to enter facts about a marriage and the party's financial contributions to it. This data is received by the Interface agent from the GUI in the form of XML. It is then transformed into the ACL format to be passed to the BATNA agent.

Another series of screens accepts the same user input as Family Winner about items in dispute, including an associated importance value that indicates the significance of each item to the disputants. Once again, the data is received by the Interface agent in the form of XML, transformed into the ACL format and passed to the Asset Divider agent.

3.2. BATNA Agent

Toulmin argument structures provide a mechanism for decomposing a task into sub-tasks. In Split-Up, ninety four arguments were identified during expert/engineer interactions for the determination of an appropriate percentage split of assets of a marriage. That is, the task of determining a percentage split was decomposed into ninety four sub-tasks. Many of these arguments produced claims which were in turn used as data for other arguments. All arguments ultimately contributed to three culminating arguments which were then fed into a final top level argument named the Percentage Split argument, the claim of which presented a solution to the problem. The claims for arguments in Split-Up were mainly inferred from data values with the use of

a neural network. The inputs into the network were the data items for the argument. The network's output represented the claim of the argument.

The BATNA agent uses the same Toulmin argument structures that were implemented in Split-Up. Bayesian reasoning, however, is used instead of a neural network to infer argument claims. With Split-Up it was later found during a controlled experiment that 16 variables actually produced a more accurate prediction of judgements than when 94 variables were used. A possible explanation offered by [4] was that judges rarely used many of the other 78 variables when distributing property. It was therefore decided that the BATNA agent would only use 16 variables to formulate argument claims.

3.2.1. BATNA Agent Process Flow

At runtime, the BATNA agent makes a JDBC connection to a legal database and extracts data about previous cases. The agent receives user input from the Interface Agent. The agent uses its business logic (described in 3.2.2) to formulate argument claims and determine a percentage property split. This percentage split is then sent to the Asset Divider agent.

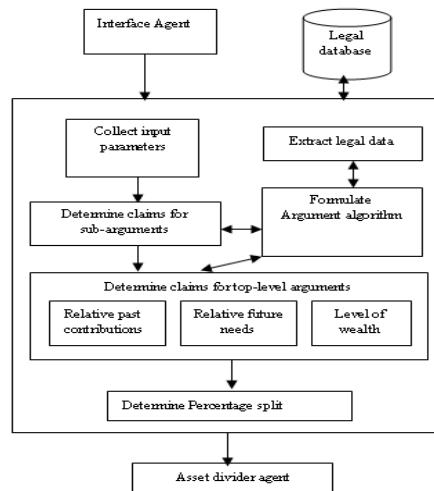**Figure 2**. BATNA Agent Process Flow

3.2.2. BATNA Agent Utility Function

Bayesian reasoning is a statistical approach to uncertainty management in expert systems that propagates uncertainties based on the Bayesian rule of evidence [9]. Eq.(1) is known as the Bayesian rule. The concept considers that event A is dependent upon event B.

$$p(A/B) = \frac{p(B/A) \times p(A)}{p(B)} \qquad (1)$$

$p(A/B)$ is the conditional probability that event A occurs given that event B has occurred; P(A) is the probability of event A occurring;

Bayes' theorem can be transformed to the following equation:

$$p(C_1|A_1A_2...A_n) = \frac{p(A_1|C_i) \times p(A_2|C_i) \times ... \times p(A_n|C_i) \times p(C_i)}{\sum_{K=1}^{m} p(A_1|C_k) \times p(A_2|C_k) \times ... \times p(A_n|C_k) \times p(C_k)}$$

(2)

In expert systems, an expert determines the prior probabilities for possible hypothesis $p(H)$, as well as the conditional probabilities for observing evidence E if hypothesis H is true $p(E/H)$ [10]. In the architecture presented here, the BATNA agent itself fills the role of the expert by using statistical analysis of previous cases to determine prior probabilities and conditional probabilities of $p(H)$ and $p(E|H)$.

Example 1

Let us say that in a hypothetical property dispute Eq. (2) has been applied to determine the claims of all sub-arguments in the BATNA argument tree, leaving only the following three top level arguments to be processed before a final percentage split is inferred:

A1	The wealth of the couple can be considered average
A2	The wife in future will need more
A3	The wife in the past has contributed more

Table 1: Top Level Arguments

Three possible outcomes[8] (claims) are now compared:

C1	70% of property awarded to wife
C2	60% of property awarded to husband
C3	50% split

Table 2: Possible Outcomes (Claims)

The BATNA agent has calculated the following conditional probabilities of observing each argument for the three claims:

	Hypothesis		
	i = 1	i = 2	i = 3
$p(C_i)$	0.45	0.35	0.20
$p(A1|C_i)$	0.25	0.60	0.55
$p(A2/C_i)$	0.80	0.40	0.65
$p(A3/C_i)$	0.70	0.00	0.80

Table 3: Conditional Probabilities for Argument Claims

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[8] In reality there would be many possible outcomes. To keep the explanation simple only the likelihood of three are compared here.

Thus, by applying Eq. (2):

$$p(C_1|A_1A_2\ldots A_n) = \frac{0.25 \text{ x } 0.8 \text{ x } 0.7 \text{ x } 0.45}{0.25 \text{ x } 0.8 \text{ x } 0.7 \text{ x } 0.45 + 0.6 \text{ x } 0.4 \text{ x } 0.0 \text{ x } 0.35 + 0.55 \text{ x } 0.65 \text{ x } 0.8 \text{ x } 0.2}$$
$$= 0.52$$

$$p(C_2|A_1A_2\ldots A_n) = \frac{0.6 \text{ x } 0.4 \text{ x } 0.0 \text{ x } 0.35}{0.25 \text{ x } 0.8 \text{ x } 0.7 \text{ x } 0.45 + 0.6 \text{ x } 0.4 \text{ x } 0.0 \text{ x } 0.35 + 0.55 \text{ x } 0.65 \text{ x } 0.8 \text{ x } 0.2}$$
$$= 0$$

$$p(C_3|A_1A_2\ldots A_n) = \frac{0.55 \text{ x } 0.65 \text{ x } 0.8 \text{ x } 0.2}{0.25 \text{ x } 0.8 \text{ x } 0.7 \text{ x } 0.45 + 0.6 \text{ x } 0.4 \text{ x } 0.0 \text{ x } 0.35 + 0.55 \text{ x } 0.65 \text{ x } 0.8 \text{ x } 0.2}$$
$$= 0.48$$

C_1 is now considered the most likely outcome based on the Bayesian forecast. The BATNA agent has predicted that out of three possibilities, the most likely outcome is that a judge would award 70% of marital property to the wife. This percentage split is passed to the Asset Divider agent.

It should be noted that the Bayesian reasoning forecast method used here assumes conditional independence of evidence. To ensure validity of outcomes, results need to be thoroughly tested and compared to outcomes of the Split-Up application.

3.3. Asset Divider Agent

This section describes the process flow and utility function of the Asset Divider agent.

3.3.1. Asset Divider Agent Process flow

The Asset Divider agent receives a property percentage split from the BATNA agent, and collects user input about issues in dispute and their significance rating via the Interface agent. It applies game theory and heuristics to form trade-off rules based on this input. Issues are decomposed into sub-issues and allocated to each party in accordance with a logrolling[9] strategy. Trade-off maps are then produced and sent back to the Interface agent to assist parties in evaluating possible trade-offs between issues. Figure 3 shows the process flow of the Asset Divider agent.
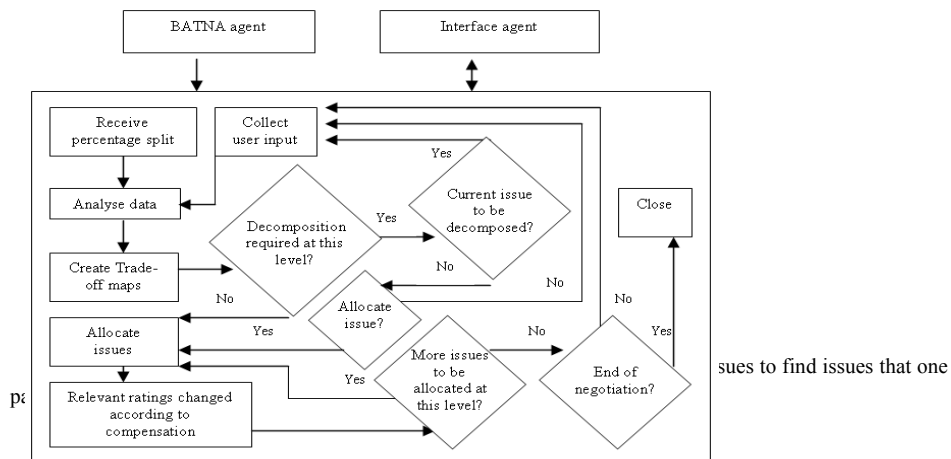

Figure 3. Asset Divider Agent Process Flow

3.3.2. Asset Divider Agent Utility Function

3.3.2.1. Defining the problem

The set of issues in dispute is: $D = X \cup Y$ where $X = \{X_1, X_2, \ldots, X_n\}$ is the set of issues that H sees as in dispute and $Y = \{Y_1, Y_2, \ldots, Y_n\}$ is the set of issues that W sees as in dispute. H and W give a significance value (rating) to each of the issues in $D = \{D_1, D_2, \ldots, D_k\}$ where $m, n \leq k \leq m+n$. These significance values (or ratings) are denoted $x_D = \{x_{D1}, x_{D2}, \ldots, x_{Dk}\}$ and $y_D = \{y_{D1}, y_{D2}, \ldots, y_{Dk}\}$ respectively. Eq. (3) normalises each party's significance values, so that they both initially sum to one hundred and are then adjusted to incorporate the 70/30 percentage split received from the BATNA agent.

> $NEW(x_{Di}) = ((x_{Di} \times 100) \times (200 \times 0.3))/\sum x_{Di}$ and $NEW(y_{Di}) = ((y_{Di} \times 100) \times (200 \times 0.7))/\sum y_{Di}$ where $i \varepsilon \{1, 2, \ldots, k\}$

$$(3)$$

Each issue can be decomposed into sub-issues $D_i = \{D_{i,1}, \ldots, D_{di,g(i)}\}$, where $g(i)$ is the number of sub-issues for issue D_i.

The rating of an issue refers to the value of an issue to a party. The rating of a parent issue is its numerical rating provided by disputants while the rating of a sub-issue is represented by a percentage of the parent issue's rating. The value of sub-issues, with respect to the rating of their parent issues is calculated next and is defined as a P-rating.

So the initial issue (such as child welfare) is now deleted from the list of issues to be considered and replaced by the sub-issues. The p-ratings take into account the ratings of both issues and sub-issues. P-ratings incorporate the influence of a parent issue to form the rating of a sub-issue. P-ratings are calculated according to the following equation:

If sub-issue D_i is given ratings $\{x_{Di,1}, \ldots, x_{Di,g(i)}\}$ where $\sum x_{Di,j} = 100$; and $\{y_{Di,1}, \ldots, y_{Di,g(i)}\}$ where $\_y_{Di,1} = 100$; then the p-rating for $X_{di,j}$ is $x_{di} \times x_{di,j}/100$ and the p-rating for $Y_{di,j}$ is $y_{di} \times y_{di,j}/100$

$$(4)$$

It should be noted that only the ratings of the initial issues and sub-issues are normalised. So after the initial normalisation, there is no reason why ratings or sub-ratings should sum to 100.

Example: Suppose, Party H gives issue 1 a rating of 60, and issue 2 a rating of 40. Suppose further that issue 1 has sub-issues 11 and 12 and that party H gives them ratings of 10 and 90 respectively. Then Issue 11 has a p-rating of 6 (10% of 60 = 6), and Issue 12 has a p-rating of 54 (90% of 60 = 54).

3.3.2.2. Choosing the order of allocation

The order in which issues are considered for allocation is then calculated. Specifically, the function described in (5), choose (*i*) calculates the numerical difference between the ratings set by both parties towards the same issues.

Let set $D = \{d_1, d_2, \ldots, d_k\}$ be the set of differences between the ratings of the issues in dispute, where $d_i = |x_{Di} - y_{Di}|$ with $i \, \varepsilon \, \{1, 2, \ldots, k\}$. The issue with the highest d_i value will be presented first.

choose$(1) = \max \, \{d_i : 1 <= i <= k\}$
The choose function, choose (i), for $i > 1$, operates on revised ratings. So choose(2) will be the maximum of the differences in revised ratings with: (a) The first issue allocated is removed from the list of revised ratings; (b) The revised ratings following the allocation of the first issue are used. The function is defined recursively.

$$(5)$$

The disputants can choose to either decompose the issue into sub-issues or directly allocate it. Example: Suppose Party H has issue1 with value of 60, issue 2 with value of 40 and issue 3 with a value of 0. Party W has issue1 with a value of 50, issue 2 with a value of 30 and issue 3 with a value of 20. The difference calculation for issue1 is 10, while the corresponding calculation for issue2 is 10 and the corresponding calculation for issue 3 is 20. Therefore D is the set $\{10,10,20\}$. Since issue 3 has the highest value of 20 in set D, the system will suggest to the disputants that they negotiate over issue 3 first.

3.3.2.3. Allocating Issues

Once a decision on which issue to distribute has been made, the issues need to be distributed. Issues need to be distributed by taking into account each parties significance factors. For example, if D_1 is distributed first. H had a rating of 0 for D_1 whilst W gave it a rating 20. Thus W is awarded D_1. H needs to be compensated because W is awarded issue 3. Thus at any step, a function is required to keep a record of how many points each disputant has received at time t. Let us call this function GAIN(z,t). The eventual goal is to have GAIN(H,FINAL) fairly close to GAIN(W,FINAL).

In the example above, GAIN(H,1) = 0 and GAIN (W,1) =20.

$$(6)$$

3.3.2.4. The top level utility function

If an issue does not require decomposition or has been subdivided appropriately, the issue is allocated according to the issue's importance rating. The ratings of issues are hence compared. Essentially, the party whose rating is greatest is allocated the issue. If the ratings are of equal value, then the next issue to be considered for allocation is presented. Formally, this algorithm is presented as follows:

If $x_{Di} \geq y_{Di}$ then issue i is allocated to H, else issue i is allocated to W, where $i \, \varepsilon \, \{1, 2, \ldots, k\}$

$$(7)$$

3.3.2.5. Performing Trade-Offs

Once an issue (or issues) has been allocated, the remaining issues are affected to varying degrees, according to trade-offs executed as a result of the allocation. The extent to which the ratings of issues change is dependent on whether an issue is lost or gained, the ratings of issues forming trade-offs, and strength of the trade-off (represented by relationship figures). The values of these variables are combined to form a series of graphs, used to extract the amount of change affecting ratings. Once the issues and sub-issues have been allocated, trade-offs are needed to compensate the loser of the issue or sub-issue. To support the awarding of compensation, the Asset Divider agent develops Trade-off Maps. These diagrams are indicative of possible trade-offs between pairs of issues. A detailed discussion of trade-off maps can be found in [11].

4. Future Work

The research is being conducted in conjunction with industry partners the Queensland branch of Relationships Australia[10] and Victoria Body Corporate Services[11]. The first stage involved setting up a multi-agent architecture and establishing basic communication between a series of generic agents. The architecture is similar in design to one that was implemented in the AcontoWeb [12] system, which was built to facilitate the querying of travel and accommodation Web sites in a semantic Web environment.

The first agents to be deployed assist in resolving family disputes. The utility functions described in sections 3.2.2 and 3.3.2 are added to the generic agents to form two domain agents that can intuitively coordinate to assist parties during a marital property negotiation. The Split-Up project, from which the argument structure of the BATNA agent is based, is now somewhat dated. Split-Up used a neural network and machine learning to infer outcomes, whereas the BATNA agent uses a Bayesian reasoning approach. Once the BATNA agent is fully functional, a series of tests will be conducted to compare outcomes of Split-Up with the outcomes of the BATNA agent. If the outcomes are favourable, the BATNA agent will then be modified to include current case data and incorporate recent changes to Australian Family Law. If test results are non favourable in comparison to Split-Up, the BATNA agent's utility function and argument structure will need to be re-adjusted and refined. Other forecast methods such as certainly factor reasoning[12] may also be considered.

To satisfy the needs of both industry partners, agents are being developed to assist with body corporate disputes. Like the agents described in this paper, these agents will be expertly engineered, this time using domain knowledge of Victorian property law. Plans are also underway to develop a mediator agent that could guide disputants through a mediation process, using linguistic analysis to identify dispute agenda items, and automatic text summary to clarify the opening positions of parties. A range of linguistic tools such as these are now available for use in application development via the open source Java platform LingPipe[13].

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[10] http://www.relationships.com.au/who-we-are/state-and-territory-organisations/qld
[11] http://www.vbcs.com.au/
[12] http://www.cse.unsw.edu.au/~billw/cs9414/notes/kr/uncertainty/uncertainty.html
[13] LingPipe version 1 available for download from: http://alias-i.com/lingpipe/index.html

5. Conclusion

The paper has presented a multi-agent framework providing decision support for disputes that parties attempt to resolve in cyberspace. The approach taken is to merge techniques developed from argumentation, artificial intelligence, and game theory to provide decision support in a multi-agent online environment. Apart from merely resolving disputes, it is anticipated that developing a negotiation support system will enable the continuation of constructive relationships following disputes. The project wishes to combine integrative bargaining, bargaining in the shadow of the law and formulation to develop decision support systems that support mediation and negotiation. The system, which is being developed in conjunction with industry partners Victoria Body Corporate Services and Relationships Australia, will respect ethical and legal principles and rely upon processes that are not only fair but are perceived by the parties to be fair. The ultimate aim is to provide disputants with an integrated ODR environment offering a range of services to assist them in achieving fairer negotiated outcomes.

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Re-Consider: The Integration of Online Dispute Resolution and Decision Support Systems

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Abstract. Current approaches for the design of Online Dispute Resolution (ODR) systems involve the replication of Alternative Dispute Resolution practices such as mediation and negotiation. Though such systems have been found to be popular, there are concerns that these systems fail to take into account judicial practices. In this paper a system that supports disputants' decisions making when engaged in an online dispute is advanced. The system, Re-Consider, is an Australia Family Law ODR system, that is based on judicial reasoning modelled with Bayesian belief networks and provides disputants with decision support in the dispute. It is believed that this approach provides disputants with an online resolution process that will help them to reach outcomes that take judicial practices into account and presents a step toward more deliberative form of online dispute resolution.

Introduction

Alternative Dispute Resolution (ADR) and Artificial Intelligence forms the basis for most protocols used to resolve disputes by many Online Dispute Resolution (ODR) systems [20]. These approaches range from the use of e-mail to facilitate a text based negotiation or mediation to the use of more complex systems such as Family Winner, which uses artificial intelligence to allow users to negotiate by allocating marital assets, based on the users ranked preferences[3].

Gramberg [7] identifies three concerns with regards to the uses of ADR: Outcomes for both parties may not be similar to those achieved at court; a third party mediator or arbiter, if used, may not be as neutral or unbiased as a judge; and one party may feel pressured into accepting an agreement. In particular the neutrality of the third party is perhaps one of the most important concerns that critics of ADR express [7,15].

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In an analysis of three case studies on the use of ADR in the workplace Gramberg [7] found that one of the most prevalent complaints was that the third party did not act neutrally.

Others such as Alexander [2] feel that the use of dispute resolution techniques such as negotiation and mediation can lead to unfair outcomes if a power imbalance exists. For instance, in family law disputes it is not uncommon for the wife to concede to the demands of the husband, particularly in cases where spousal abuse has taken place. The practice of conceding to demands when it is not in the disputant's interests has also been observed when one or both of the disputants' is angered [6,11]. However Friedman et al [6] notes that anger is not always a negative factor because displaying anger can help to show that the issue is of particular importance.

These concerns about ADR/ODR that [7] raised are not necessarily the primary concerns of disputants, for whom litigation may not be practical or possible for geographical, jurisdictional, financial or other reasons [1,16]. For many disputants, ADR/ODR represents the only practical dispute resolution mechanism and the notion that the outcome may have been different, if the matter was litigated, is not pressing. However, the existence of different mechanisms for resolving disputes that generate different outcomes challenges a modern states expectation of procedural and distributive justice. Numerous authors including Ingleby [8] and Mack [10] have concerns about the impact that ADR and ODR have on the judicial system. This leads to the question; *Should disputants accept outcomes that are markedly different from judicial decisions just because litigation is not a feasible option?*

Arguably, the threat to principles of justice as a result of small scale eCommerce disputes resolved by ODR is minimal. However disputes in family law are increasingly resolved by ADR/ODR and often involve custodial arrangements for children and valuable property. The way a dispute is resolved and the decisions reached impact on the disputants and children for many years and, given the prevalence of divorce in many countries has the potential for undermining justice.

One way to mitigate against the possibility of injustices due to divergent outcomes between ODR and litigation is to design ODR systems that are guided by judicial reasoning. Zeleznikow et al [19] and Zondag & Lodder [20] have proposed different approaches to provide ODR systems that go beyond the typical implementation of ADR ideas. However few approaches are directly aimed at influencing disputants to arrive at outcomes in line with those a judge would reach.

The Re-Consider system is a hybrid ODR / Decision Support System (DSS) system that uses a model of judicial reasoning to structure how a percentage split of assets in a divorce dispute should be calculated. The Re-Consider system aims to realise the ADR practice of bargaining in the shadow of the law, whereby disputes are resolved using the most likely litigated outcome as a tool to guide and motivate the litigants during the dispute resolution process [19].

ReConsider differs from traditional ODR systems as it aims to focus the dispute on the issues that judges consider when hearing a case. The basis of the approach involves guiding disputants to discuss only those factors that a judge would consider in making a decision. This differs from other ODR approaches that are based on creating environments that facilitate negotiation or mediation. The result of this is that Re-Consider is not an online court, nor is it a negotiation or mediation system, as it does not directly provide users with the ability to barter and make trade-offs in order to resolve a dispute. Nor is Re-Consider an Arbitration system. Although the system does

make predictions of judicial findings these are used to advise and persuade users in their decision making, but it does not mandate that users abide by the recommendations. Instead, the system focuses more on deliberation as described by Walton & Krabbe [17], where users are encouraged to adopt deliberative stances toward mutually beneficial outcomes.

The ODR protocol described here has been designed with several themes in mind: To restrict the scope of the dispute to only factors that judges would consider; to make no distinctions based on gender or moral differences; and to create an environment where users are encouraged to think about their beliefs. The motivation is that if users are restricted in this way, they are prevented from introducing factors into the dispute that are not likely to be relevant or conducive to the resolution of the dispute consistent with a judicial decision. It is believed the benefit of restricting the scope of the argument to only judicial factors will reduce the potential for the argument to turn into what Walton & Krabbe [17] describe as an eristic argument motivated mainly by emotional needs. The potential for an argument to become eristic is increased when one or both disputants are provoked and become angered [6,11]. Friedman et al [6] found that in such situations there was a high risk that the dispute could stagnate, which in turn increased the likelihood that the dispute would not be resolved.

It is believed that by providing users with judicial predictions about what would likely occur, were the case to be heard in court, that this will encourage the disputants to consider their positions more carefully. The hypothesis is that the disputants will change their position to one that is more closely aligned with that of the judicial advice. In the next section a model of judicial reasoning embedded into Re-Consider is described. Following that the protocol deployed by the system to guide the discussion is presented before concluding remarks.

1   Model of Judicial Reasoning

Judicial reasoning aimed at determining a percentage split of assets between husband and wife was modelled with the assistance of an Australian Family Law expert, Andrew Combes, A hierarchy of factors called an argument tree following [13,18,14] was elicited. The argument tree extracts the claim and data items from a series of interconnected arguments, where each argument takes the form described in figure 1. Each level of the tree represents a sub-argument or factor of the higher level. The top of the tree is the root node, which represents the division of marital assets.
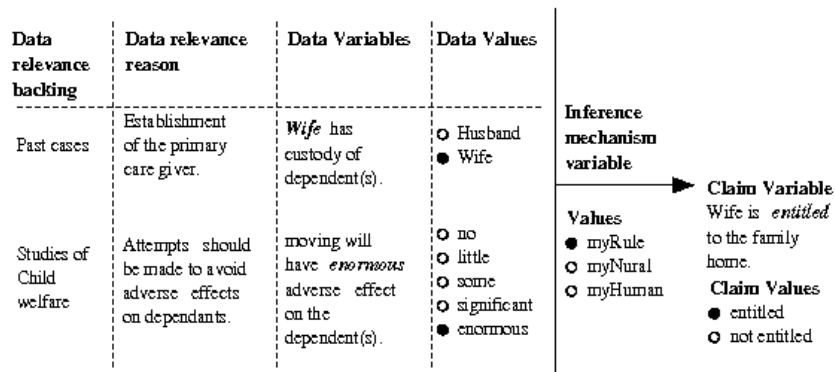
Data relevance backing	Data relevance reason	Data Variables	Data Values	
Past cases	Establishment of the primary care giver.	*Wife* has custody of dependent(s).	○ Husband ● Wife	**Inference mechanism variable** **Claim Variable** Wife is *entitled* to the family home. **Values** ● myRule ○ myNural ○ myHuman **Claim Values** ● entitled ○ not entitled
Studies of Child welfare	Attempts should be made to avoid adverse effects on dependants.	moving will have *enormous* adverse effect on the dependent(s).	○ no ○ little ○ some ○ significant ● enormous	

Figure 1. GAAM Family Law example

The three factors considered most important by the expert in determining the division of marital assets are children of the root node as illustrated in figure 2; contributions made to the marriage, the future needs of both parties and the level of wealth of the marriage. Below each of the three factors are the important sub-factors and so on. For instance, a judge determining the length of a marriage will consider the number of years of marriage, time apart during cohabitation and the number of years of cohabitation prior to marriage. A judge will combine these factors in order to reach what he or she believes to be a judgment about the length of a marriage. The way in which the factors are combined was modelled using a Bayesian Belief Network at each level of the tree as described in Section 3.

On commencement, the protocol presents users with child factors of the root argument (see Fig 2). They are not presented with the root argument to avoid focusing the user's attention on getting a particular result (i.e. a 60/40 split) rather than working towards finding a mutually beneficial solution. Disputants are not presented with any of the sub-factors of the displayed factors. This is because the sub arguments will be revealed as required in order to restrict the dispute to only those of the branches relevant to the current dispute.
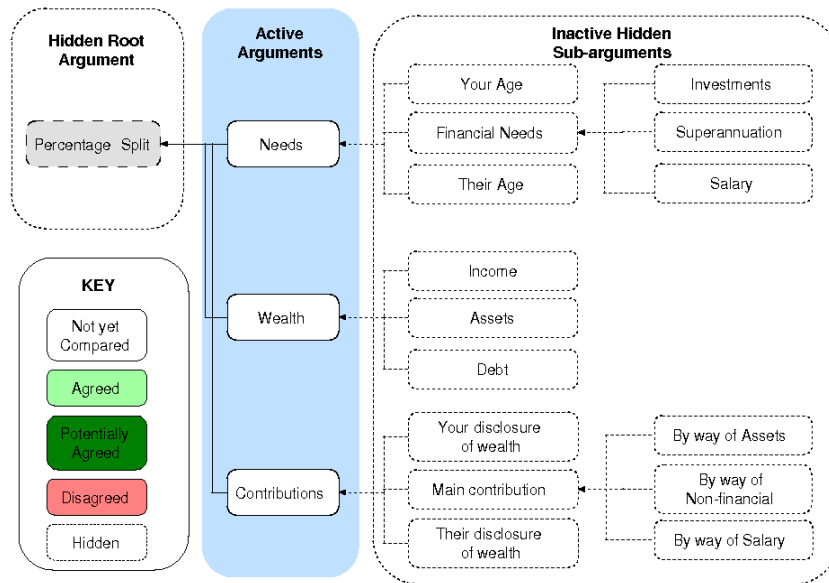
Figure 2. Illustration of active arguments

Users are required to assert their beliefs about each of the root arguments sub-arguments. Once they have both made their assertions, the system infers the parent argument using each disputant's assertions and then compares the outcomes. There are four possible outcomes of the comparison:

Agreed this is where assertions made by both users are the same. For example, both users agree that the marriage was not wealthy, their combined income was average, their assets were to the value of $9,000,000 and that their Debt was $7500000.

Potentially Agreed this is where the inferred argument is the same but assertions made on sub-factors used in order to make that inference are not all the same. For example, your spouse asserts that he/she contributed more to the marriage, and has similar needs, whereas you think he/she contributed equally but your needs are greater. In this case, the system inference made by the Bayesian network associated with the parent argument, percentage split of assets, infers the same percentage split regardless of whose claims are accepted as being true.

Disputed this is where the parties disagree on a factor and on the sub-factors and, unlike the Potentially Agreed, the Bayesian network infers a different conclusion at the parent factor. For example, your spouse asserts that he/she contributed more and you assert you have contributed much more. This results in a different outcome for the parent argument when applied to the Bayesian network so, they are both provided with the sub-arguments of the contributions argument.

Disagreed this is where neither user can find agreement on a given branch of the argument tree. This occurs when all sub-factors including leaf nodes have been explored and the users still do not reach agreement on a claim.
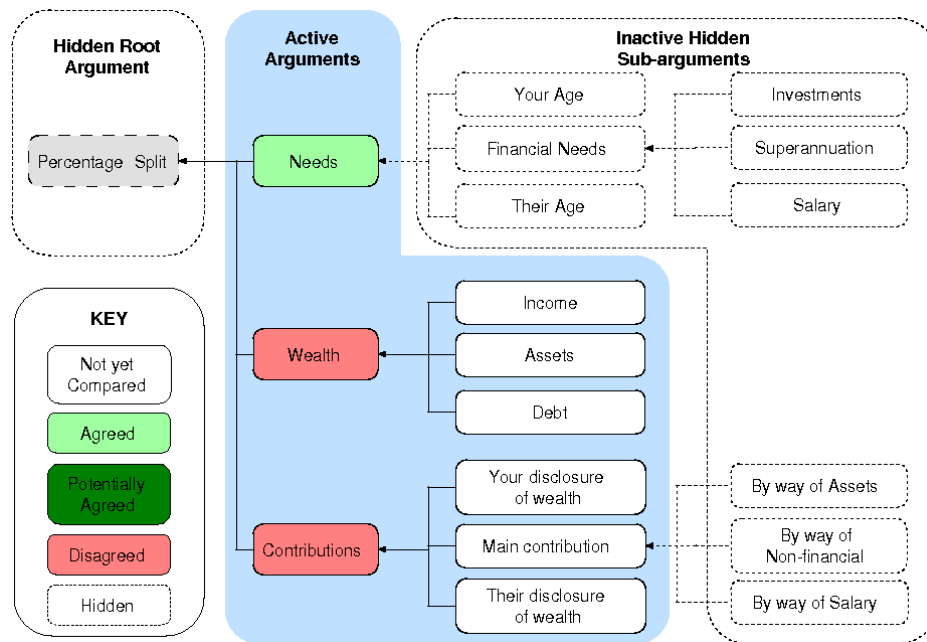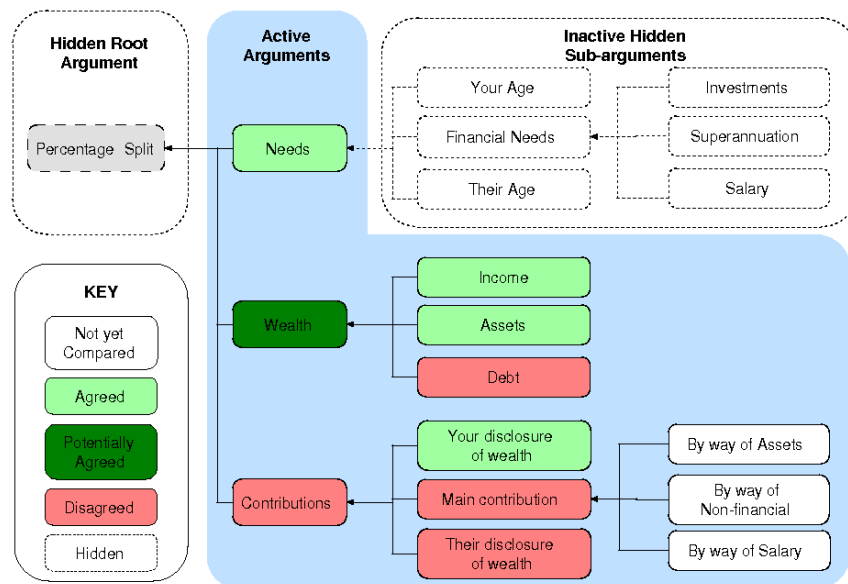

Figure 3. Illustration of active arguments with agreed and disagreed arguments highlighted

If the outcome of the inference from the initial arguments is that there is an agreement or potential agreement the protocol calls for the users to be informed that they have potentially resolved their dispute and are shown the outcome inferred by the Bayesian network. If the users both accept the recommended outcome of the dispute, then the dispute is considered to be resolved. However in the event that either user rejects the outcome or that the inference resulted in a dispute, then the user's assertions will be compared to each other. Where there is an argument in agreement, that branch of the argument will not be displayed and remains hidden from the users unless, one or both of the users decides to change their initial assertion. However where there is disagreement then the sub-arguments for the disputed argument will be revealed to the users and they are required to then make assertions on those sub-arguments (see figure 3).

Once the users have made assertions on the newly revealed arguments, then the process is repeated. The disputed argument's sub-arguments are used to infer the argument. If the argument is agreed or potentially agreed upon then there is no longer any need to explore that branch of the argument. If there is a dispute then the assertions are compared and for those sub-arguments that are disputed, those branches will be revealed for the users to make assertions.

This process of comparing the argument continues (see figure 4) until one of two things occur; either a leaf argument of the dispute is reached or all the arguments for

that branch of the dispute are agreed upon. If all the arguments are agreed upon then both users are able to infer forward to discover what a judge is likely to find given the agreed sub-arguments. For each of the possible claims that could be asserted for the inferred argument, a probability is assigned. These probabilities represent the likelihood that judges will find that claim to be correct, given that the sub-argument accepted as being true. In the event that the arguments used to make the inference were all agreed upon then the probability for both users would be the same.

Figure 4. Illustration of active arguments, with the sub arguments explored and agreed, disagreed and potentially agreed arguments highlighted

In the event that the leaf arguments are reached for a given part of the argument tree and both users disagree on the leaf assertions dispute, the system accepts both of their assertions. To do otherwise would be to have the system determine a finding of fact. Findings of fact are discussed below. Instead the protocol has the assertions inferred and compared to see if they make a difference in the result for the parent argument. If the inferred parent outcome is potentially agreed then the difference at the leaf nodes is ignored. If a potential agreement is not found then the users are required to Re-Consider their position, based on the probability that a judge will agree with their assertion and the argument will be flagged as disagreed. From this point the users are able to infer their way back down the tree to see if they can resolve their difference at a lower level. At each level users are prompted to compare their position to that of the other users and that of the judicial advice.

2   Findings of fact

There are two main tasks that a judge is required to perform; making decisions about what the facts of a case are, and to apply the law based on those facts. Although findings of fact are beyond automated systems, there are measures that can be taken to reduce the likelihood that one or both disputants will misrepresent the facts.

The simplest method that was considered for use with the Re-Consider system was to require the disputants, when making a claim on a leaf argument to state how strongly they believed a judge would agree with them. In this way, doubt could be introduced into the argument which is likely to have an impact when inferences are then made on the parent argument. As a result it may cause the disputants to reconsider their position. However, it was decided that the use of such an approach was not likely to have any significant impact on the outcomes of the dispute as any disputant that asserted a claim that they did not mostly or wholly believe in was also not likely to admit it.

An alternative to relying on the disputants to assert their belief on the leaf claim, but that still incorporated doubt to be considered in the inference of the parent argument was to ask the disputants to list what evidence they had to support their leaf assertions. The disputants would be provided with a list of options that covered a range of evidence types. Each type of evidence would, alone or combined, be used to calculate the level of belief that their claim was correct which would then be fed into the inference of the parent argument. Depending on the argument the different types of evidence would provide different levels of support for the claim with some potentially providing no support if they were not generally seen to support the claim. This approach is, however, susceptible to the well informed disputants who could potentially make misleading claims and support them with false claims of credible evidence. To prevent this, the system would then need to provide a method for the disputants to evaluate each others evidence. This in turn is open to the disputants unintentionally or deliberately not accepting the evidence presented to them. To counter this the system would then require a process whereby a neutral third party evaluates the evidence, which begs the question: *Why not just go to court?*

The end result is that any attempt to make a finding on fact is likely to either require the disputants to be honest or for a third party to intervene on behalf of the disputants. The Re-Consider system deals with divergent leaf assertions by testing to see if any differences that may exist in claims, results in having any impact on the outcome of the parent argument. When there is a significant difference the disputants' claims, the system uses both of their claims to generate the probabilities that a judge will agree with; their claim, the claim of the other parties, and the claim that the system believes a judge would likely find. The users are then provided with these probabilities to assist them in deciding how best to proceed.

3   Representing uncertainty in predictions

Bayesian Belief Networks (BBN) are used to model a judges reasoning to predict an outcome[4]. The use of BBNs over that of other methods of predictions is due to the BBNs ability to provide a level of certainty for every possible outcomes rather than solely predicting an outcome. For example, a decision tree on neural network that

predicts an outcome at the root argument of a 50:50 split, cannot present the likelihood of a 40:60 split.

An example of how the prediction of uncertainty is represented is illustrated in Table 1. This table shows the assertions made by the two disputants (Your's & Their's) as well as those made by the judge (judges). The table also shows the possible claims and the probability of a judge accepting each of the claims as determined by the Bayesian network. Looking at Table 1 it is apparent that a claim of Very long or Very short would not likely be believed by a judge and thus not a wise claim to assert. Their claim of Short has a low likelihood of being accepted, this should indicate to the disputants that it would be unwise to press this claim as both Your claim and the Judge's claim is more likely to be believed. Your Claim of Long is not a particularly strong claim, but is stronger than Their claim. Lastly the Judge's claim of Average is much stronger than any of the others, as a result it is believed that this will help motivate the disputants towards the system's findings.

Table 1. An example of predictions for Marriage Length argument

Assertions	Claims	Estimated Outcome
	Very Long	01.00%
Your's	Long	28.00%
Judge's	Average	55.00%
Their's	Short	15.90%
	Very Short	00.10%

Fisher & Ury's Best Alternative to A Negotiated Agreement (BATNA)[5] is used by disputants to determine whether to accept or reject an offer. A prediction of judges' determination on assertions that lead to an ultimate outcome does indirectly provides a BATNA. The likelihood a judge will agree with a disputant's assertions helps the user to advance claims about specific aspects of the dispute and ultimately, to engage in ODR using reasoning that is similar to that a judge would deploy.

A key element to the users' acceptance of the system is to what extent the disputants accept the advice given by the system, as it is vital that the participants trust the ODR system. Trust has been raised as one of the key factors that influence the success of ADR and ODR [12]. Korobkin [9] reports that most disputants don't trust ADR and fear unfair outcomes. It is likely that such misgivings are also shared about ODR. Tyler [16] also notes the need for trust in ODR systems for them to be successful. However she also reports that about 70% of people are prepared to use ODR systems.

4   Conclusion

This paper has described an approach to ODR that is unlike conventional approaches, in that the aim is to structure the dispute around factors that judges consider and to provide decision support to the disputants in the form of predictions of judicial decision making. It is hypothesised that this will promote an environment where the disputants are more receptive to changing their position to one more in line with legal practices.

The Re-Consider system has been described as an ODR system that implements an integrated DSS and ODR protocol. The Re-Consider system achieves this by integrating Bayesian Belief Networks into an argument tree model of legal reasoning. The resulting system allows disputants to navigate legal reasoning and provides estimations on the likely outcome of each level of the argument. Knowledge of the likelihood that disputants assertions will be accepted at Court may provide a real incentive to withdraw extreme claims and ultimately to deliberate on the issue to achieve outcomes more consistent with judicial decisions. However, Re-Consider is a prototype ODR system and cannot make findings of fact that are associated with judicial decision making. Instead the ODR protocol attempts to catch disagreement on leaf claims by examining the impact that the differences have on the ultimate outcome.

Acknowledgements

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A Description of Legal Interpretations in Risk Management with the Use of Ontology Alignment Formalisms

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Abstract. The paper has two goals: firstly, we explain how ontology mapping formalisms can be used to denote the many interpretations of a given legal concept; secondly, we provide a short case, justifying the potential need of using such formalisms in modern legal knowledge models. This approach may be especially useful for coding knowledge about specific legal cases.

Keywords. Risk management, legal concepts, semantic modeling, travel insurance, ontology alignment.

Introduction

The key challenge that we are undertaking in this research is to elaborate on how legal information systems become aware of different potential meanings of a legal concept instead of being only aware of the concept's existence.

In this work we meet two main goals. We deal with the problem of interpretation and facts categorization of legal concepts, which constitute agreement provisions. In order to illustrate the problem a specific case is given as an example. The case comes from the insurance industry but the generalized method should be applicable also elsewhere. Apart from the main goals we also insist that the modern legal knowledge models are powerful enough to bring vital information not only about concepts but their interpretations as well.

The context of concepts in the legal ontologies is given by the net of relations and other concepts connected to the one that is being discussed. The definition of such a concept is also supported by instances – if given. Yet such an environment of an entity in the ontology can only hold the knowledge about a single – predefined meaning of

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this entity. In real life the meaning (semantics) of an entity may differ, depending on circumstances.

The semantic differences are not only connected and reflecting the changes in the state of knowledge in time (like for instance the number of planets in the Solar system reduced after the 2006 meeting of the International Astronomical Union). The expected meaning of an ontological entity may also depend on other contexts – such as, for example, the subjective point of view of a person or their subjective awareness of the current state of affairs. Such a case is especially important in the legal domain, as the way the provisions are understood is a crucial factor for sustaining the order of law. On the other hand if there is a misunderstanding between parties, then the knowledge about the particular differences about the ways of different interpretations is also vital. This is extremely true in the field of disputes resolution, as we may assume that the starting point of any dispute is when the parties do not share the common semantics of earlier created provisions.

1. Negotiation and Risk Management

One of the principal goals of the law is to reduce risk through the avoidance of litigation. McBurney and Parsons [10] include an excellent coverage of risk assessment; however there is very little application of their work to the domain of law. Zeleznikow [23] provides a detailed discussion of law, negotiation and risk[2].

Whilst there has been extensive research on law and probability, there is a scarcity of reported research on law and risk. Nevertheless, most legal professionals regularly use risk analysis when preparing and indeed avoiding litigation.

Whilst probability and risk are commonly inter-related[3], they are used in quite different ways in the legal domain. Probability and risk have significant differences in how they are utilised in civil law and criminal law[4]. In criminal law, the onus of proof is beyond reasonable doubt. To quote Black [2], this means that the evidence must clearly, precisely and indutiably convict the accused. In criminal law, statistics has been used to analyse evidence (see for example Aitken [1] and Schum [15]). Areas investigated include DNA testing, Fingerprints, Footwear and Ballistics. Kadane and Schum [9] used probability and Wigmore's diagrams of evidence to analyse the trial of the American anarchists Sacco and Vanzetti[5].

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[2] Much of the discussion in this section is taken from Zeleznikow [23].

[3] As also is uncertainty.

[4] The findings in this book relate to both Civil Law and Common Law countries. It should be noted that the word 'civil' is used in two different contexts. Civil law may be defined as that legal tradition which has its origin in Roman law, as codified in the Corpus Juris Civilis of Justinian and as subsequently developed in Continental Europe and around the world. Civil law eventually divided into two streams: the codified Roman and uncodified Roman law. Civil law is highly systematised and structured and relies on declarations of broad, general principles, often ignoring the details. Civil law systems are closed, in the sense that every possible situation is governed by a limited number of general principles.

As opposed to criminal law, in which conflict is between the state and the defendant, civil law involves conflict that does not involve the state as a party to the conflict. It involves two equal status parties: the plaintiff and the defendant.

[5] Ferdinando Sacco and Bartolomeo Vanzetti were two Italian-born American laborers and anarchists, who were tried, convicted and executed on August 23, 1927 in Massachusetts for the 1920 armed robbery and murder of two pay-clerks in South Braintree (a Boston suburb), Massachusetts. Their trial attracted enormous international attention, with critics accusing the prosecution and presiding judge of improper conduct, and of allowing anti-Italian, anti-immigrant, and anti-anarchist sentiment to prejudice the jury. Prominent

Zeleznikow and Stranieri [24] stress the software can help with legal interpretation, but not make decisions about facts. They noted that that only a human can make decisions with regard to facts and that humans will disregard information they find inconceivable.

In building legal decision support systems, it is thus better to focus upon interpreting the law rather than making decisions upon facts. Because of the beyond reasonable doubt onus in criminal law, very few decision support systems have been built in criminal law. The exceptions are in the domain of sentencing (see Schild [13], Zeleznikow [22] and Schild and Zeleznikow [14] for a discussion of discretion and sentencing information systems). The burden of proof in civil law is on the balance of probabilities. Hence it easier to provide decision support systems in civil law domains.

Judicial decision-making first involves the determination of the facts of a case. The second step then involves applying the law to the given fact situation. Legal decision support systems have primarily been used in civil law domains to provide an interpretation of the law.

One of the major benefits of decision support systems that advise upon risk assessment is that they help avoid litigation. Ross [12] states the principal institution of the law is not trial; it is settlement out of court. To support this argument, Williams [21] notes that whilst the figures may vary in different jurisdictions, of all the cases listed before the courts only about 5% of the cases are ever heard by the court and only 1% of the cases result in judicial decision-making. He quotes the 1980 Annual Report of the Director- Administrative Office of the United States of America Courts, Washington, D.C. (1980) at pages A-28 and A-20 which states that the average percentage of cases reaching trial verdict is 6.5%. The average for districts varies from a low of 2.0% to a high of 16.1%. By circuits, the differences are less extreme, ranging from a low of 4.0% in the District of Columbia Circuit to a high of 8.4% in the Eighth Circuit.

Further, many disagreements are never even listed before courts. Ross [12] claims that a major study of personal injury/automobile insurance cases in the United States shows that of claimants represented by attorneys who obtained some compensation, 72% filed suit, 6.5% started trial and 2% reached a verdict[6]. Obviously these figures will vary depending on the jurisdiction and type of actions; however what does not vary is that negotiated settlements account for the vast majority of all legally binding decisions.

To avoid the risks of extra costs and an unfavorable outcome, disputants often prefer to negotiate rather than litigate. Whilst investigating how disputants evaluate the risks of litigation researchers are faced with a basic hurdle - outcomes are often, indeed

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Americans such as Felix Frankfurter and Upton Sinclair publicly sided with citizen-led Sacco and Vanzetti committees in an ultimately unsuccessful opposition to the verdict. Sacco's and Vanzetti's execution elicited mass-protests in New York, London, Amsterdam and Tokyo, worker walk-outs across South America, and riots in Paris, Geneva, Germany and Johannesburg. Sacco's and Vanzetti's actual guilt remains a source of controversy. Significant post-trial evidence cast doubt upon the verdict and the fairness of their murder trial. These include modern ballistics tests, revelations of mishandled evidence, a confession to the crime by convicted bank robber Celestino Medeiros, and statements by numerous participants in the case.

On August 23, 1977, Massachusetts Governor Michael Dukakis signed a proclamation declaring, "any stigma and disgrace should be forever removed from the names of Nicola Sacco and Bartolomeo Vanzetti." Dukakis said, "We are not here to say whether these men are guilty or innocent. We are here to say that the high standards of justice, which we in Massachusetts take such pride in, failed Sacco and Vanzetti." Taken from http://en.wikipedia.org/wiki/Sacco_and_Vanzetti last accessed September 6 2008.

[6] AUTOMOBILE PERSONAL INJURY CLAIMS, U.S. Department of Transportation, Automobile Insurance and Compensation Study, 1970.

usually, kept secret. If the case is litigated, it could be used as a precedent for future cases, which may be a disincentive for one or more of the litigants ([8]). Publicity of cases and the norms resulting from cases makes the public aware of the changing attitudes towards legal issues [7]. The adjudication decision not only leads to the resolution of the dispute between the parties, but it also provides norms for changing community standards ([6]). This latter facet is lost in negotiated settlements.

The secrecy behind negotiated settlements is one of the reasons for the paucity of published material on legal decision support systems dealing with risk. WIRE IQ (Wire Intelligent Quantum) is an Internet delivered decision support system which allows lawyers, insurers and re-insurers access to up-to-the minute quantitative analysis of current claims settlement values for a wide range of personal injuries ([5]). Douglas and Toulson [5] state that analysis and price discovery of tort in un-settled personal injury claims has been conducted using rule-based systems. In such systems, the details of the claim (injury type, claimant's age, sex, earnings, etc.) are entered into the system. The system then applies predefined rules to determine the settlement value of the claim.

WIRE IQ uses a database with thousands of records of settled claims and court wards for a range of personal injury claims. It then uses provides the following analysis services based on the data: trend analysis, comparative analysis, precedent search and forecasts. The forecasts are performed using neural networks.

Avoiding risk is a fundamental goal of insurance agencies. The Rand Corporation built numerous expert systems in the early 1980's [17, 18, 19, 11] to advise upon risk assessment.

One of their early systems, LDS, assisted legal experts in settling product liability cases. Another Rand Corporation decision support system, SAL [17] also dealt with claims settlement. SAL helped insurance claims adjusters evaluate claims related to asbestos exposure. SAL used knowledge about damages, defendant liability, plaintiff responsibility and case characteristics such as the type of litigants and skill of the opposing lawyers.

In this paper we investigate risk avoidance in the domain of travel insurance to demonstrate our approach for developing formalisms, methodologies for the task of interpreting legal knowledge about the insurance industry.

2. The Travel Insurance Case Model

2.1. Case Description

The described case is based on real events. Private details have been removed on account of anonymity sustaining.

The subject was approved by her employer to attend a conference in Portugal and work with a colleague at a university in another European country. Four day's prior to travel being due to commence, the subject's sister, died of breast cancer. Whilst the illness was terminal, at the time the ticket for travel was initially booked and paid for, the subject believed that her sister would survive for at least another year.

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[7] In common law countries, changing community values towards issues such as abortion, euthanasia and rape within marriage have been enacted in the legal system through landmark precedents, rather than parliamentary legislation.

At first, cancelling the trip was considered, but the organisers of the conference, where the subject was due to give an invited address, pleaded for her to participate in the conference and offered to reorganise the conference program.

To meet their request, as well as the needs of the subject's family; after much conflict with the airlines, the subject managed to reschedule the departing flight to until a week after her sister's demise. This resulted in her having to repurchase the London to Lisbon leg of her flight, incurring an additional cost of $US270.

The subject was initially confident that the employer's travel insurance would pay the extra cost. Yet, the claim for this amount for reimbursement was refused by the insurance agency.

2.2. Documents

Below we present experts from documents connected to the introduced case. The documents reflect the legal state of affairs.

The Policy:
SECTION 5 – LOSS OF DEPOSITS AND CANCELLATION CHARGES
EXTENT OF COVER
We will indemnify You and any Insured Person for loss of travel and accommodation expenses paid in advance by You or the Insured Person and for the loss of which You, he or she is legally liable and which are not recoverable from any other source, consequent upon the cancellation of travel occurring between the date of payment of those expenses and the date of commencement of the Insured Travel caused only by:

1. The Unexpected Death, Injury or Sickness, compulsory quarantine or jury service of an Insured Person or any person with whom the Insured Person intended to travel;
RELATIVE means […]
SERIOUS INJURY OR SICKNESS is a […]
UNEXPECTED DEATH means death which occurs fortuitously and does not include the death of a terminally ill person unless the death is caused by any other reason.

EXCLUSIONS
We shall not be liable for loss of expenses caused by:
4. Death of relative with a known short life span as a consequence of a Sickness.

The Death Certificate:
The document certifying the death indicated that
"the claimant sister's condition was terminal and has been known for some time".

2.3. Conceptualization

The conceptual diagram of the case is contained in Figure 1. The diagram shows that we treat knowledge of the parties about the case as separate pieces of ontology. The conceptualization reflects information and categories gathered during the analysis of documents as presented above. The conceptualization phase is a fundamental element of ontology development process. We deal more with legal ontologies in other papers (i.e. [16]).

3. Legal Concepts Interpretations Modeling

In the process of interpretation there may be a divergence between different notions about the classification of certain events or facts into given categories. Such divergences typically become apparent at the time of classification rather at the time of creation or when negotiating definitions about the general meaning of symbols.

Theoretically the fuzzy nature of definitions is a matter of economy of information. The trade off between the cost of preparing sufficiently precise provisions and the cost of potential dispute marks the nearly optimal point of precision of agreements' resolutions.

In terms of ontologically modelling such cases, the mentioned economy of information is represented by the richness of additional properties, attributes and axioms specifying given concepts. The more such entities exist, the less is the risk that parties will misclassify instances in the processes of categorization.

On the other hand the definitions may be demonstrated by the examples. For instance, an event concept may be introduced by any potential real-life event that by the agreement of parties should be recognized as the kind of event. In reality this is not possible to realize, so only approximate approaches are used.

If the concept definition is well-tailored and there is still place for disagreement between parties then three situations are possible:

- The definition does not cover all the relevant facts known about the object of classification.
- Parties interpret some parts of the definition in different ways.
- Parties share the meaning of a concept but have different knowledge about the facts at a given moment.

In the first case only the clear-cutting post ante redefinition is possible. Another two possibilities are – in contrast – a quite interesting matter for modelling.

We propose a way of modelling such situations by assuming that in fact there exists more than one ontology, each of which is in effect at the same time. If this is true, than we further expect that concepts from such parallel ontologies may be aligned to picture the relations between different understandings of the concepts of different parties. For the ontology alignments, the developed formalisms may be used.

3.1. Ontology Alignments

A comprehensive proposition of how an ontology alignment should be defined is given in [3]. The definition provides an information structure that allows representing alignment in such a way that it can be (re)used in many contexts and situations.

Assuming that two ontologies: O1 and O2 are given, each containing entities of certain meta-types (classes, instances, relations, formulas, axioms, etc.), alignment is a set of correspondences between pairs of such entities <e1, e2> where e1 belongs to O1 and e2 to O2. The entities may be either simple instances of meta-types or complex structures made of simple entities[8].

Such correspondences may be viewed as quadruple:

$$<e1, e2, R, n>$$

where:

---

[8] Definition is based on [4].

- e1 and e2 are the entities between which a relation is asserted by the correspondence;
- R is the relation, between e1 and e2, asserted by the correspondence. For instance, this relation can be a simple set-theoretic relation (applied to entities seen as sets or their interpretation seen as sets), a fuzzy relation, a probabilistic distribution over a complete set of relations, a similarity measure, etc.
- n is a degree of confidence in that correspondence (this degree does not refer to the relation R, it is rather a measure of the trust in the fact that the correspondence is appropriate – "I trust n% the fact that the correspondence is correct/ reliable/…").

The degree of trust represented by n may be computed in many ways (for instance: users' feedback or log analysis). The alignment description should be made up of at least the below given items:

- a level used for characterizing the type of correspondence;
- a set of correspondences which express the relation holding between entities of the first ontology and entities of the second ontology.;
- an arity (default 1:1) Usual notations are 1:1, 1:m, n:1 or n:m. We prefer to note if the mapping is injective, subjective and total or partial on both side.

More advanced way of alignment descriptions are possible, but they are out of scope of the paper.

The relation holding between the two entities is by default equivalence. Nevertheless, it is not restricted to this type of relation, but can be more sophisticated - e.g., subsumption or incompatibility [7]. Even some fuzzy relations are possible. The strength denotes the confidence held in this correspondence. Since many alignment methods compute the strength of the relationship between entities, this strength can be provided as a normalised measure. The measure should belong to an ordered set M with maximum and minimum elements. Currently, this value is normally restricted to be a float value between 0 and 1.
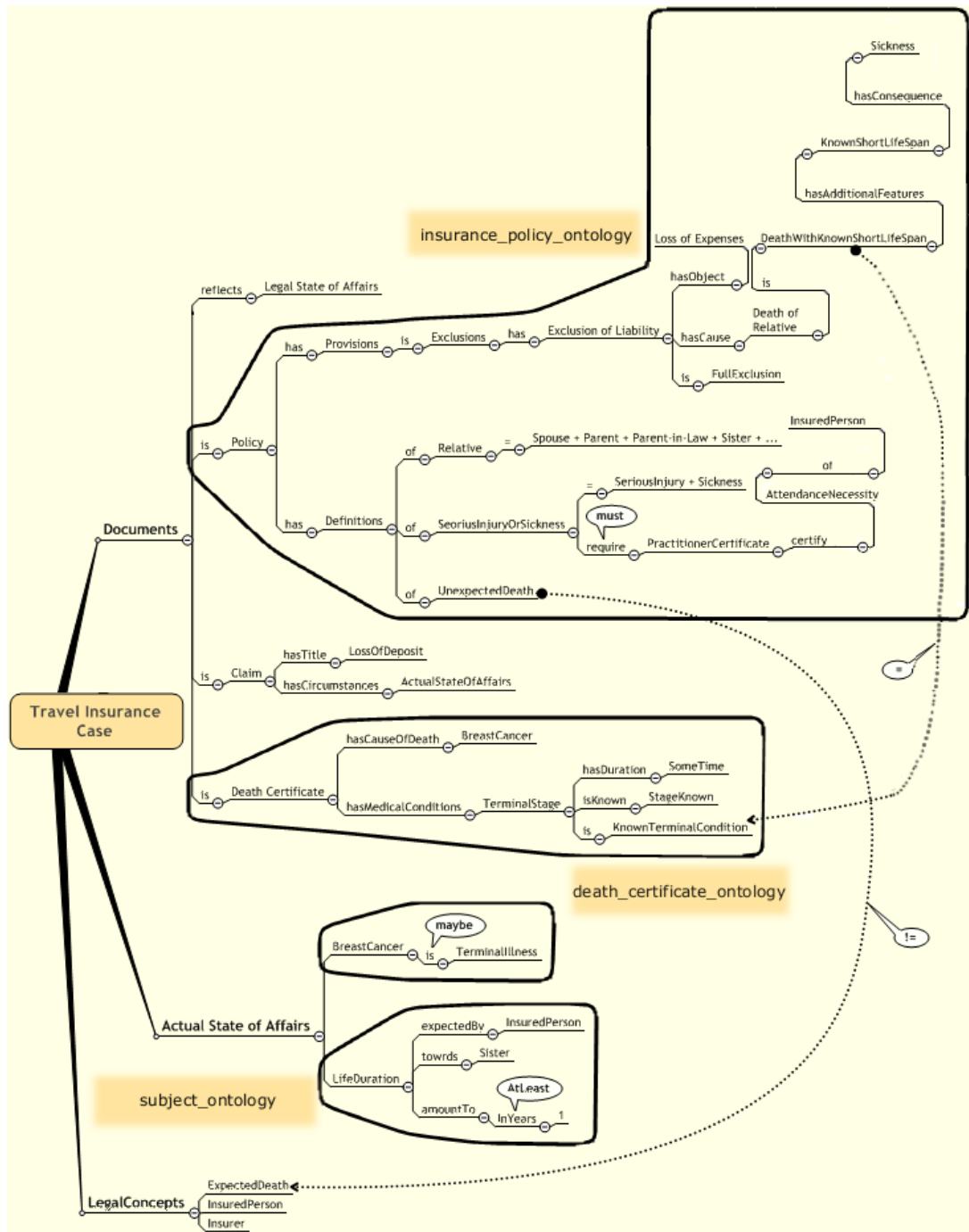
Figure 1. The case model

```
    <rdf:RDF
xmlns="'http:"//knowledgeweb.semanticweb.org/heterogeneity/alignment'
    xmlns:rdf='http://www.w3.org/1999/02/22-rdf-syntax-ns#'
    xmlns:xsd='http://www.w3.org/2001/XMLSchema#'>
    <Alignment>
     <xml>yes</xml>
     <level>0</level>
     <type>**</type>
     <onto1>http://www.example.org/subject_expectations_ontology</onto1>
     <onto2>http://www.example.org/insurance_policy_ontology</onto2>
     <onto3>http://www.example.org/death_certificate_ontology</onto3>
     <map>
      <Cell>
       <entity1 rdf:resource="'http:"//www.example.org/
death_certificate_ontology#KnownTerminalCondition'/>
       <entity2 rdf:resource="'http:"//www.example.org/ insurance_policy_ontology#
DeathWithKnownShortLifeSpan'/>
       <measure rdf:datatype="'"&xsd;float'>0.75</measure>
       <relation>equal</relation>
      </Cell>
      <Cell>
       <entity1 rdf:resource="'http:"//www.example.org/ #SisterHealthStateAxiom'/>
       <entity2
rdf:resource="'http:"//www.example.org/insurance_policy_ontology#ClaimantRelative
ConditionAxiom'/>
       <measure rdf:datatype="'"&xsd;float'>1.0</measure>
       <relation>notEqual</relation>
      </Cell>
     </map>
    </Alignment>
    </rdf:RDF>
```

Figure 2. Example of the use of the formalism.

The xml code given in Figure 2 presents two alignments. The first one of concepts: KnownTerminalCondition from the ontology representing the death certificate with DeathWithKnownShortLifeSpan (taken from the insurance policy ontology). The concepts are recognized the same with the strength weight of 0.75. The second alignment match two axioms: SisterHealthStateAxiom and ClaimantRelativeConditionAxiom form the claimant's and insurer's ontologies respectively. As can be seen, the two axioms do not match and are considered unequal with the highest degree of certainty (1.0).

4. Case Generalization

The presented approach is in our view independent of any contextual details. This means that the very similar method of model creation should possibly be deployed in other domains (not only in cases connected to travel insurance or even the insurance

sector) where disagreement modelling using overlapped ontologies can be useful as a starting point in resolving disputes.

Such models may also be helpful in remembering knowledge about past cases or legal precedents. It also creates space for more robust search techniques in knowledge bases. Such search may also be used in order to project provisions of agreement by approaching a merged version of resolutions from initial differentiated ideas on legal qualifications.

5. Conclusion

This paper deals with modeling risk in the domain of travel insurance.. The risk of insurance companies may manifest in many forms. One of the forms is the legal risk and risks associated with it. In order to avoid (or reduce) such a risk the companies of the sector should preclude the possibilities of misunderstanding between policy parties as the shared comprehension of provisions is generally always of mutual interest when it comes to legal agreements (disregarding the cases of bad will). The presented approach sketch a method of represerating disputes taking its root from different interpretation of legal concepts or facts. The representation assumes that parties' subjective knowledge may be modelled by overlapping ontologies. The ontology alignment formalisms can be used to indicate similarities and differences in those ontologies.

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I Want the Opposite of What You Want: Summary of a Study on the Reduction of Fixed-Pie Perceptions in Online Negotiations

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Abstract. Negotiating is a complex task in which negotiators typically try to maximize their own interests without realizing that most conflict situations contain potential for solutions that benefit both parties involved in the dispute. It seems that negotiators typically refrain from exchanging and processing information about their own and the opponent's interests which results in the erroneous belief that their interests are diametrically opposed. These fixed-pie perceptions often impede integrative agreements. According to the negotiation literature, several techniques improve negotiations. In order to test whether these negotiation strategies actually contribute to a reduction in fixed-pie perceptions and hence result in more effective conflict resolution, two experiments have been conducted. The results demonstrate that people reduce their fixed-pie perceptions over the course of a negotiation. This effect seems to be the result of the negotiation itself rather than the negotiation techniques. However, providing negotiators with a negotiation technique was found to lead to an increase in the likelihood of achieving an agreement. The implementation of negotiation techniques in an online environment, the most important findings of the two studies as well as their implications are summarized in the present paper.

Keywords. Online dispute resolution, fixed-pie perception, integrative agreement, negotiation techniques

Introduction

Online dispute resolution (ODR) is an alternative to traditional dispute resolution procedures. It involves two or more parties negotiating by electronic means in order to reach an agreement online. The main advantage of ODR is simplicity as it saves both temporal and monetary costs. People who resolve their disputes online do not have to travel or attend meetings, but can simply negotiate from their computers at home. Sceptics of ODR argue that it is less powerful than face-to-face negotiations since the absence of non-verbal cues interferes with an understanding of the other party's interests which in turn decreases the likelihood of obtaining an integrative agreement [1]. Another problem inherent in both online and offline negotiations refers to the fact

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that negotiation situations are complex and negotiators have limited information-processing capacities which often results in a failure to obtain an optimal outcome. One of these cognitive limitations concerns negotiators' limited perception of potential solutions for a conflict. Negotiators typically seem to believe that the interests of the opposing party are diametrically opposed to their own. These fixed-pie perceptions were identified as a major cause of ineffective conflict resolution and seem to be relatively resistant to change [1, 2, 3, 4, 5]. In contrast to what negotiators typically seem to believe, most conflict situations contain potential for solutions that benefit both parties involved in the conflict instead of favouring one party at the expense of the other. Integrative agreements can be reached by taking the different patterns of priorities of opposing negotiators into account in order to obtain an outcome that is beneficial to both parties. It has been suggested that a reduction in fixed-pie perception increases the likelihood of achieving an integrative agreement [3, 4, 5, 6, 7].

Key to integrative negotiation is to identify the interests of the other party thereby realizing that they may not be opposed to one's own interests. Several negotiation techniques have been proposed in the negotiation literature that are believed to aid bargainers in decreasing their fixed-pie perceptions and achieving an integrative agreement. These strategies include "expanding the pie", "logrolling", "non-specific compensation", "cost cutting", and "bridging"[2] [6, 7, 10]. While these techniques have the common goal of generating integrative agreements, the manner in which they achieve this differs. The "expanding the pie" technique includes resources being added in such a way that there are more possible solutions and both parties can achieve their objectives. The "logrolling" strategy refers to both parties exchanging information about their preferences on the resources to be divided. It is thereby assumed to increase willingness to concede on those issues that are of less priority. "Non-specific compensation" means that incentives are given independent from the resources that have to be divided in order to allow one party to obtain his objectives and pay off the other party for giving in. The fourth negotiation technique is "cost cutting", which includes one party achieving her objectives while the other party's costs to go along are reduced. Another technique that is not specifically discussed as a negotiation strategy, but that is nevertheless assumed to improve negotiations refers to knowing one's best alternative to the negotiated agreement (BATNA). Knowing one's BATNA may contribute to the acknowledgement that a disagreement may be disadvantageous. Research has demonstrated that people become more interested in finding a settlement than trying to maximise their own benefit when there is a credible threat of disagreement [8, 11]. While the BATNA does not by itself influence this perception, more effort may be put into finding a solution when a possible settlement is better than an individual's BATNA. With regard to ODR, some of these negotiation techniques are already used in order to facilitate online negotiations. For instance, logrolling is applied in the family_winner system [12] and in Smartsettle (www.smartsettle.com).

The theoretical assumptions that underlie these negotiation techniques are that they require both parties to engage in a meaningful exchange of information about their interests which is supposed to result in an improved understanding of each other's interests. It is assumed that this leads to more integrative agreements [6]. Hence, negotiators who are provided with a negotiation strategy subsequently understand their opponent's priorities which enables them to reduce their fixed-pie perceptions and

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[2] Since bridging turned out to be difficult to implement in an experimental context, it was not included as a negotiation strategy in the present study, and it is therefore not discussed in more detail in this paper.

obtain an integrative agreement. Research on information availability and information processing in negotiations has shown that fixed-pie perceptions can indeed be decreased by an increase in information exchange and information processing [3, 4, 5, 13]. Apparently, negotiators often fail to exchange and accurately process information about interests and preferences which consequently results in a fixed-pie perception and a decreased likelihood of obtaining an agreement. Since little effort has been put into empirically validating the effectiveness of the above described negotiation strategies, it is unknown whether negotiators benefit from receiving a negotiation strategy both in an online and offline environment. Therefore, the above described negotiation techniques have been implemented in an online negotiation environment in order to test their usefulness in terms of a reduction in fixed-pie perceptions and an increase in the likelihood of obtaining an agreement. The set-up of the two experiments that have been conducted, the most important results as well as the consequences and practical implications of these findings are discussed in the following sections.

2. Experiments

Two experiments, in which participants had to negotiate several issues in an online environment, were conducted in order to explore whether providing negotiators with a negotiation strategy contributes to a decrease in fixed-pie perceptions and an increase in the likelihood of obtaining an agreement.

2.1 Experiment 1

The first experiment was conducted to test whether people revise their fixed-pie perceptions when they receive one of the following negotiation strategies: (1) expanding the pie, (2) logrolling, (3) non-specific compensation, (4) cost cutting, or (5) knowing one's BATNA. A control group was included in order to measure whether negotiators who receive a negotiation strategy revise their fixed-pie perceptions to a greater extent than negotiators who do not receive any instructions. The main hypotheses were that (1) negotiators revise their fixed-pie perception during the course of a negotiation, and that (2) negotiators who receive a negotiation strategy are more likely to revise their fixed-pie perceptions than negotiators who do not receive a negotiation strategy. It was furthermore tested whether people reach more agreements when they receive a negotiation strategy.

The experiment took place in a room that was equipped with computers. 84 students of Tilburg University participated in the first experiment. They were randomly assigned to one of the conditions (control, expanding the pie, logrolling, non-specific compensation, cost cutting, knowing one's BATNA) and were told that they should imagine they wanted to purchase a computer and had to negotiate the price, warranty and delivery time of the computer with the seller (see table 1). The negotiation task that was used in the present experiment was similar to negotiation tasks used in prior research [2, 3, 5]. The negotiation took place via a computer. The participants' opponent, i.e. the seller of the computer, was not an actual person but his actions were dictated by a computer. Participants were told that they should use their payoff schedule in order to obtain an outcome that is most favourable to them in terms of points on the three issues to be negotiated. As can be seen in the payoff schedule presented in table 1, the best deal for the buyer is 9-9-9, for a total outcome of 1000

points, while the least favourable outcome is 1-1-1, for a total outcome of 0 points. Participants were only provided with their own payoff schedule and did not know the preferences of the other party. Participants were not allowed to communicate during the completion of the negotiation task and were informed that the negotiation would continue for seven rounds after which it would be terminated regardless of whether or not they had obtained an agreement. They were told that if they failed to reach an agreement with the other party, they would obtain no points. Additionally, subjects were informed that one iPod was allotted amongst all participants and two additional ones amongst those who reached the highest amount of points. Not obtaining an agreement would therefore decrease their chances of winning an iPod. This incentive was believed to assure that participants take the negotiation task seriously, try to maximise their points and try to reach an agreement. Participants were informed that the seller (i.e. the computer program) makes the first offer and that they had to either accept it or place a new offer. The negotiation continued until the buyer made an offer that equalled or exceeded the seller's offer or until the seventh negotiation round had been completed.

Table 1. Negotiator's payoff schedule for computer negotiation task (adopted from Van Kleef, De Dreu, & Manstead, 2004).

Level	Price of computer		Warranty period		Delivery time	
	Price	Payoff	Warranty	Payoff	Time	Payoff
1	1500	0	1 month	0	9 weeks	0
2	1450	65	2 months	40	8 weeks	20
3	1400	130	3 months	80	7 weeks	40
4	1350	195	4 months	120	6 weeks	60
5	1300	260	5 months	160	5 weeks	80
6	1250	325	6 months	200	4 weeks	100
7	1200	390	7 months	240	3 weeks	120
8	1150	455	8 months	280	2 weeks	140
9	1100	520	9 months	320	1 week	160

The different negotiation strategies were operationalised as follows; in the "expanding the pie" condition, a fourth issue was added in order to create more possible solutions. Participants assigned to the "logrolling" condition were provided with information about the seller's preferences during the course of the negotiation. In the "non-specific compensation" condition, negotiators were provided with distinct gadgets of varying value to both the buyer and the seller. Subjects assigned to the "cost cutting" condition were told that the seller would deliver and assist in the installation of the computer if the buyer accepts the long delivery time. In the "BATNA" condition, negotiators were told that not obtaining an agreement would have the consequence that the buyer cannot buy the computer at the special offer price but instead will have to return the next day which would result in an increase in price. These pieces of information were presented throughout the course of the negotiation in order to make sure that participants understand and use it. The efficiency of the distinct negotiation techniques was measured by assessing participants' fixed-pie perceptions before and after the negotiation as well as by their ability to reach an agreement. Joint outcomes were measured by summing the points of the buyer and the seller on all three issues. If

participants failed to reach an agreement, this automatically resulted in a score of 0 points.

Table 2. Negotiator's (buyer) and opponent's (seller) payoff schedule for computer negotiation task (adopted from Van Kleef, De Dreu, & Manstead, 2004).

Level	Price of computer		Warranty period		Delivery time		*Printer[3]*	
	Price	Payoff	Warranty	Payoff	Time	Payoff	*Type*	*Payoff*
				Buyer				
1	1500	0	1 month	0	9 weeks	0	*Type A*	*0*
2	1450	65	2 months	40	8 weeks	20	*Type B*	*15*
3	1400	130	3 months	80	7 weeks	40	*Type C*	*30*
4	1350	195	4 months	120	6 weeks	60	*Type D*	*45*
5	1300	260	5 months	160	5 weeks	80	*Type E*	*60*
6	1250	325	6 months	200	4 weeks	100	*Type F*	*75*
7	1200	390	7 months	240	3 weeks	120	*Type G*	*90*
8	1150	455	8 months	280	2 weeks	140	*Type H*	*105*
9	1100	520	9 months	320	1 week	160	*Type I*	*120*
				Seller				
1	1500	160	1 month	320	9 weeks	520	*Type A*	*120*
2	1450	140	2 months	280	8 weeks	455	*Type B*	*105*
3	1400	120	3 months	240	7 weeks	390	*Type C*	*90*
4	1350	100	4 months	200	6 weeks	325	*Type D*	*75*
5	1300	80	5 months	160	5 weeks	260	*Type E*	*60*
6	1250	60	6 months	120	4 weeks	195	*Type F*	*45*
7	1200	40	7 months	80	3 weeks	130	*Type G*	*30*
8	1150	20	8 months	40	2 weeks	65	*Type H*	*15*
9	1100	0	9 months	0	1 week	0	*Type I*	*0*

2.1.1 Results

Of the 84 participants, 27 (32.1%) had a fixed-pie perception before the negotiation as opposed to 57 (67.9%) who perceived integrative potential before the negotiation. The number of participants who had a fixed-pie perception after the negotiation decreased to 14 (16.7%), while the number of participants who perceived integrative potential after the negotiation increased to 70 (83.3%). More precisely, of the 84 participants, 19 (22.6%) had improved from having a fixed-pie perception before the negotiation to perceiving integrative potential after the negotiation, 6 (7.1%) had no fixed-pie perception before and had a fixed-pie perception after the negotiation, and the remaining 59 (70.2%) had not changed their perception. This finding indicates that during the negotiation people revised their fixed-pie perception and correctly perceived integrative potential. The results of the first experiment furthermore show that negotiators who received a negotiation strategy were not more likely to revise their fixed-pie perception than negotiators who did not receive a negotiation strategy.

53 (63.1%) subjects reached an agreement while the remaining 31 (36.9%) subjects failed to reach an agreement. In the majority of the cases where an agreement

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[3] Note that the fourth issue (printer) is only provided to participants assigned to the "expanding the pie" condition.

was obtained (60.4%), it was obtained in the last, i.e. seventh round. Participants who obtained an agreement were found to make higher concessions in the last round than in the preceding rounds which may indicate that knowing that the negotiation would be interrupted after the seventh round regardless of whether or not they had obtained an agreement had an influence on their negotiation behaviour. This is an interesting finding, since participants knew beforehand that the negotiation would not exceed seven rounds and that they could increase their chances of winning an iPod if they obtained an agreement. The finding that the majority of the participants who obtained an agreement did so in the last round strongly suggests that participants were highly motivated to obtain an agreement in the last round in order to increase their chances of winning an iPod rather than because of an increased perception of integrative potential. In a follow-up experiment, participants should therefore not be informed about the number of rounds in order to exclude this effect on their behaviour. Nevertheless, this finding leads to the inference that time pressure might induce more cooperative negotiation behaviour.

The results furthermore demonstrate that whether or not a negotiator received a negotiation strategy and if so which negotiation strategy he was provided with did not increase the likelihood of obtaining an agreement. Furthermore, participants who did not have a fixed-pie perception after the negotiation were not more likely to obtain an agreement than those who still had a fixed-pie perception after the negotiation. This finding suggests that obtaining an agreement does not depend on whether or not a person perceives integrative potential in this particular context. This finding is not in line with previous research findings and it might at least in part be due to both a small number of participants and some of the negotiation strategies not being very distinctive.

Taken together, the results demonstrate that negotiators more often perceived integrative potential after the negotiation, and are hence able to revise their fixed-pie perceptions in the course of a negotiation. Apparently, negotiators had improved their understanding of the seller's preferences after the negotiation. However, this was the result of the negotiation itself rather than the negotiation strategies. Moreover, the effect of negotiation strategy on fixed-pie perceptions and the likelihood of obtaining an agreement seems to be less strong than hypothesised. Since some of the findings were not in accordance with previous research findings, a second experiment with a larger sample and several changes in the experimental set-up was conducted.

2.2 Experiment 2

The second experiment was designed to test whether people revise their fixed-pie perceptions when they receive one of the following negotiation strategies: (1) adding resources, (2) logrolling, or (3) knowing one's BATNA. Based on the research findings of the first experiment, it was hypothesised that negotiators revise their fixed-pie perception during the course of a negotiation. Despite the results of the first experiment, it was again tested whether negotiators who receive a negotiation strategy were more likely to revise their fixed-pie perceptions than negotiators who did not receive a negotiation strategy. As in the first experiment, a control group was included in order to measure whether negotiators who receive a negotiation instruction revise their fixed-pie perceptions to a greater extent than negotiators who do not receive any instructions, the underlying assumption being that a decrease in fixed-pie perception results in an increase in the likelihood of obtaining an agreement.

The negotiation strategies used in the second experiment were operationalised as follows; in the "adding resources" condition, negotiators received incentives that were added to the initial issues. This condition equals the "non-specific compensation" condition in the first experiment. The "expanding the pie", the "non-specific compensation" and the "cost cutting" strategies are very similar to each other and it was therefore decided to group them together resulting in the "adding resources" condition. The "logrolling" condition of the second experiment was operationalised in the same way as in the first experiment, i.e. by providing subjects with information about the other party's interests. The "BATNA" condition of the second experiment differs from the "BATNA" condition that had been used in the first study. Participants assigned to the "BATNA" condition were told that the negotiation would have seven rounds after which it would be terminated. Their BATNA was therefore that not obtaining an agreement would result in no points which would mean that they would not take part in the lottery for an iPod. The BATNA used in the second experiment is therefore a real and not an imagined outcome. Given the findings of the first study it is assumed that the first two negotiation strategies influence the likelihood of obtaining an agreement by reducing people's fixed-pie perception whereas the BATNA strategy influences the likelihood of obtaining an agreement as a result of time pressure, i.e. an external motivation to obtain a valuable outcome. Moreover, knowing one's BATNA was believed to lead to more agreements than either no or one of the other strategies. This is in line with the findings of the first experiment as well as previous research findings on the influence of time pressure on negotiation behaviour [17].

In the second experiment, the exact same procedure was used as in the first experiment. Participants were randomly assigned to one of the conditions. The negotiation task was the same as the one used in the first experiment and was similar to negotiation tasks used in prior research [2, 3, 5]. Again, subjects had to negotiate the price, warranty and delivery time of a computer. Participants were told that they have the role of the person who wants to purchase the computer. The seller's actions were again dictated by a computer program using the same strategy as the one used in the first experiment. The payoff schedule used in this experiment is the same as the one that had been used in the first experiment (see table 1). It shows participants which outcomes are most favourable to them and does not provide any information about the preference structure of the other party. Participants were informed that the seller (i.e. the computer program) makes the first offer and that they will have to either accept it or place a new offer. The negotiation continued until the buyer made an offer that equalled or exceeded the seller's offer or until the seventh negotiation round had been completed. Before the negotiation, subjects were informed that a price would be awarded to the individual who reaches the highest amount of points in the negotiation task and that subjects who failed to reach an agreement would not take part in the lottery. Unlike in the first experiment, participants were not informed about the number of negotiation rounds. Only participants in the "BATNA" condition received this information.

The effectiveness of the distinct negotiation techniques was measured by assessing participants' fixed-pie perceptions before and after the negotiation, as well as by their ability to reach an agreement. Since the measure for fixed-pie perceptions used in the first experiment was found to be less accurate than assumed, two distinct measures were used to assess participants' fixed-pie perceptions in the second experiment. In addition to participants' fixed-pie perceptions before and after the negotiation, the

number of participants who obtained an agreement was measured. Joint outcomes were again measured by summing the points to the buyer and to the seller on all three issues.

2.2.1 Results

295 law students of Tilburg University participated in the study in exchange for course credit. 203 (68.8%) had a fixed-pie perception before the negotiation as measured with the new fixed-pie measure. This number is considerably higher than the number of participants who had a fixed-pie perception in the first experiment and is moreover similar to findings of other studies concerning the proportion of people who enter a negotiation with a fixed-pie perception [2, 4] which strongly suggests that this is a more accurate measure of people's fixed-pie perceptions in this context. Only 75 (25.4%) participants had a fixed-pie perception after the negotiation. Like in the first experiment, this finding indicates that during the negotiation people revised their fixed-pie perception and correctly perceived integrative potential. There was again no difference across the conditions in terms of perceiving integrative potential after the negotiation. This finding is in line with the results of the first experiment suggesting that negotiators who receive a negotiation strategy are not more likely to revise their fixed-pie perception than negotiators who do not receive a negotiation strategy.

109 (36.9%) subjects reached an agreement while the remaining 186 (63.1%) subjects failed to reach an agreement. In 49.5% of the cases where an agreement was obtained it was obtained in the last, i.e. seventh round. This is lower than the proportion of negotiators who obtained an agreement in the last round in the first experiment. Furthermore, the proportion of participants who obtained an agreement in the second experiment is considerably lower than in the first experiment (63.1% vs. 36.9%). This is believed to be the result of the fact that in the second experiment, negotiators were not informed about the number of negotiation rounds. The results of the second experiment therefore suggest that knowing the number of negotiation rounds, i.e. being exposed to time pressure, had a positive effect on the likelihood of obtaining an agreement. This finding is in accordance with the integration-before-differentiation hypothesis stating that negotiators' behaviour often becomes more cooperative if they fear that they might fail to obtain an agreement [8]. Being aware of the fact that the time to obtain an agreement is limited seems to have increased negotiators' awareness that obtaining an agreement is more favourable than failing to, which in term seems to have led to a change in negotiation behaviour from more distributive to more problem-solving behaviour.

Subjects who received a negotiation strategy obtained an agreement more often than subjects who were not provided with a negotiation technique. Hence, receiving a negotiation technique improves negotiations in terms of leading to more agreements. In the first experiment this effect was not found which is most likely due to both a small number of participants and the finding that some of the negotiation strategies were not very distinctive. As expected, negotiators who knew their BATNA more often achieved an agreement than negotiators who received either no or one of the other two negotiation strategies. As previously mentioned, it seems that time pressure improves negotiations by increasing the likelihood of achieving an agreement. Interestingly, there was again no significant relation between whether or not someone obtained an agreement and fixed-pie perception after the negotiation. This finding is consistent with the results of the first experiment and suggests that obtaining an agreement does not necessarily depend on whether or not a person perceives integrative potential. In order

to further explore the relation between fixed-pie perception and agreement, the differences between the experimental groups were analysed in more detail. When considering all participants assigned to the experimental conditions, there was no significant difference in fixed-pie perceptions after the negotiation across the three groups. Hence, all the three negotiation techniques had an equal effect on the reduction of fixed-pie perceptions. In contrast, the effect differed for the three strategies when only participants who obtained an agreement were considered. Of those negotiators who obtained an agreement, more participants in the "BATNA" condition still had a fixed-pie perception after the negotiation than participants in the "adding resources" and the "logrolling" conditions.

Taken together, the results show that there is some overlap between the findings of the first and the second experiment. In accordance with the first experiment, one of the most important results of the second experiment refers to the fact that participants reduced their fixed-pie perceptions over the course of the negotiation. In contrast to what had been expected, this effect was again found to be due to the negotiation itself rather than the negotiation techniques. The effectiveness of the negotiation techniques in terms of reducing negotiators' fixed-pie perception therefore seems to be limited. Since fixed-pie perceptions decreased across all conditions, it seems that the negotiation itself had at least some effect on negotiators' understanding of their opponent's interests. A possible explanation for this finding is that while both the negotiation itself and the strategies might have contributed to some awareness of the opponent's interests, the strategies might not have motivated negotiators to process this information more systematically. As previously mentioned, more thorough information processing is a prerequisite for integrative negotiation [4, 5, 8]. Nevertheless, the results of the second study demonstrate that negotiation techniques are effective in leading to more agreements. The finding that negotiators who received a strategy were more likely to obtain an agreement shows that they have some potential in making negotiators aware of the fact that obtaining an agreement is typically more favourable than failing to reach an agreement. Apparently, a thorough understanding of the opponent's preferences is not necessary in order to achieve an agreement. The findings of the second experiment therefore suggest that the effectiveness of negotiation strategies lies in their potential of motivating negotiators to realize that obtaining an agreement is desirable rather than in motivating them to engage in more information exchange and processing.

3. Discussion and Conclusion

An exploration of the effectiveness of integrative negotiation techniques that have been proposed in the literature, on fixed-pie perceptions and the likelihood of achieving an agreement has largely been ignored. The present paper summarizes the most important findings of two experiments that studied the implementation of negotiation techniques that are supposed to contribute to more integrative agreements to online negotiations in order to explore their usefulness. The findings demonstrate that while negotiators are able to revise their fixed-pie perceptions over the course of a negotiation, whether or not they are provided with a negotiation strategy had no effect on perceiving integrative potential. It may therefore be concluded that in contrast to what has been proposed, these strategies do not sufficiently contribute to an improvement in information exchange and especially more effortful and systematic processing of information about

interests. Nevertheless, the findings demonstrate that the strategies had an effect on the likelihood of obtaining an agreement. Moreover, it seems that a decrease in fixed-pie perceptions is not necessary in order to enable negotiators to obtain an agreement. The potential of the negotiation techniques therefore seems to lie in an increase in negotiators' awareness of the importance and desirability of obtaining an agreement rather than in implying a better understanding of the opponent's interests. Furthermore, the findings of the present study support previous research findings on the importance of time pressure on negotiation behaviour in terms of leading to more agreements. Clearly, more research on the effects of various negotiation techniques on negotiation behaviour seems beneficial. In addition, a more detailed exploration of negotiation behaviour seems valuable in order to gain more insights into aspects that affect the likelihood of obtaining an agreement without necessarily increasing the negotiator's understanding of the opponent's interests. One of the aspects that deserves more attention refers to providing negotiators with their BATNA and exposing them to other forms of time pressure.

With regard to implications for online negotiations, the findings of the present studies imply that increasing negotiators' awareness of the desirability of achieving an agreement can enhance their tendency to engage in more problem-solving behaviour. Apparently, this can be achieved by different means, e.g. by providing negotiators with their BATNA. Clearly, ODR practice would benefit from more research on the potential benefits of time pressure, in terms of nearness to a deadline, on negotiation behaviour in an online environment. While providing negotiators with incentives independent from the resources that have to be divided as well as providing them with information about the opponent's preferences led to more agreements in online negotiations, providing them with their BATNA was most effective. From a practical point of view, the findings of the present studies have important implications that may lead to more agreements in online negotiations.

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