

# Alternative Dispute Resolution Based on the Storytelling Technique

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**Abstract.** This paper describes a groupware prototype addressing the alternative resolution of legal conflicts. The groupware prototype integrates the storytelling and argumentation models with the legal process, accomplishing two major complementary objectives: eliciting spontaneous and informal explanations about the conflict, while contributing to the process with correct inferences and logic. The paper discusses in detail the integrated information model and provides a prototype implementation. These results were significantly enriched by a formative evaluation conducted by a dispute resolution professional. The contributions of this research to the state of the art are twofold: (1) the innovative integration of the storytelling and argumentation models; and (2) the support to self-help legal representation based on group technology.

## 1 Introduction

The major purpose of Alternative Dispute Resolution (ADR) is to resolve conflicts out of the court. ADR has been accepted by many companies seeking to resolve litigations in a more expedite and less expensive way, and many authorities trying to rationalize their legal systems.

ADR has also gained momentum with the popularity of e-commerce, considering that the world-wide market, new business opportunities and extended flexibility – as well as new threats, such as identity theft and lack of clear legal borders – brought by e-commerce should, at least, be accompanied with equally flexible mechanisms to resolve disputes. Online Dispute Resolution (ODR) is a kind of ADR providing fully-automated or assisted-automated mechanisms to resolve conflicts utilizing online technologies and in particular the Internet [1]. Examples are the Cybersettle, Settlementonline and Clicknsettle sites.

Electronic communication is one feature adopted by most ODR [2]. This feature is implemented in various ways, including email, chat and video conferencing. However, it is recognized that electronic communication introduces an impersonal factor reducing the effectiveness of ODR [3]. Very often, behind this problem, lie the difficulties participants have intervening in the most clear, convenient and efficient ways. This has been expressed in the research literature as worries about the quality of self representation from people who may not know in detail how to align their interven-

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tions with the requirements of the legal process, instead of relying on professional representation [4].

This research reports our efforts developing an ADR groupware prototype supporting self representation. The prototype relies upon the Issue Based Information System (IBIS) [5] argumentation model to facilitate the expression of arguments.

We nevertheless regard argumentation models – and IBIS in particular – as artefacts which are difficult to master, especially by untrained users [6]. In our perspective, some additional support is necessary to effectively integrate argumentation models in ADR/ODR technology.

To overcome this problem, we tested the applicability of the storytelling technique as a front-end for eliciting arguments in ADR. Storytelling is a narrative technique allowing to express complex information using a conceptual scheme that is well-known by the untrained user: telling stories [7]. Storytelling allows expressing unstructured and incomplete events using a narrative framework from where logical and temporal relationships may later emerge [8]. Storytelling is inherently a group activity, which has been found to improve knowledge recall, creating synergy and providing richer information about past events [9].

In this paper we argue that: (1) telling stories is a simple and adequate approach for expressing conflicting situations; (2) Storytelling may be combined with argumentation models with the purpose to derive arguments from stories; and (3) Storytelling and argumentation models may be combined with ADR.

Our prototype addresses the above assumptions. It allows gathering information about a dispute as a collection of stories. It also supports a mediator or arbitrator analyzing the story, deriving and organizing the facts relevant to the resolution process.

The paper is organized in the following way. We start with a review of the major concepts involved in the prototype: ADR/ODR, argumentation and storytelling. We propose a model integrating these concepts. We then address the model evaluation and finish the paper with a discussion of the obtained results and open issues.

## 2 Literature Review

**ADR and ODR.** ADR is an amicable and extrajudicial approach to reestablishing dialog among conflicting parties, sustaining healthy relationships, applying justice, and restoring social harmony whenever it has been damaged [10]. The major advantages of ADR rely on the possibility of resolving disputes based on the social and economic responsibilities and self-organization of the conflicting parties.

Although ADR is nowadays mostly focussed on resolving e-commerce disputes, its origins rest in family law, where it has been considered an absolute necessity [10]. Also, in many countries of the European Union, ADR is considered a mandatory preliminary procedure in labour law. These two fields of law, although very different, share one common defining characteristic of ADR: the interest in maintaining good communication and future relationships.

The ADR process helps two conflicting parties reaching an agreement with the assistance of one neutral third party. The ADR process falls into one of the following categories [11]: negotiation, mediation and arbitration. In negotiation, the third party

is responsible for assisting communication. In mediation, the third party has no decision power but tries to convince the other parties to reach an agreement. In arbitration, the third party hears the arguments from the other parties, gathers evidence and reaches a decision, although such decision may not be legally enforced.

Within the European Union, arbitration is not considered an ADR process, as it is considered part of the traditional court system [10]. In Portugal, only mediation and arbitration are currently accepted as legal ADR processes. An ADR should provide the following guarantees [10]:

- Impartiality of the third party – The third party must not have any interest in the conflict, and may not represent or defend any one of the other parties.
- Transparency – The parties must have access to the necessary information during the whole ADR process.
- Effectiveness – The ADR should be accessible and cost efficient relative to the normal dispute resolution processes.
- Fairness – Both parties should be treated equally.
- Confidentiality – The information in the process should be confidential.

ODR provides the online technology necessary to efficiently implement the ADR process. This comprises simplified procedures for initiating, litigating and resolving disputes, and communication mechanisms necessary for self-help/unassisted participation [4]. Although the use of the Internet is not mandatory, ODR is in general considered an Internet-based service [3].

ODR is in general dependent on the different purposes of negotiation, mediation and arbitration [2]. The supplied services are differentiated according to these categories, and have most impact on the support to the third party. Considering negotiation, these services are focused on avoiding the human negotiator. In this context, litigants must assume bidding roles, while the ODR supports communication and optionally highlights potential satisfactory settlements. ODR support to mediation is mostly focused on the human mediator. This functionality is comparable to meeting facilitation [12], as it supports facilitative interventions aimed at maintaining communication, avoiding conflicting behaviors and clarifying issues. On the other hand, ODR support to arbitration is mostly centered on empowering the arbitrator's reasoning about the conflict, such as identifying facts or establishing causality through information models.

Lodder and Zeleznikow [13] analyzed various ODR systems and identified three critical success factors: (1) ODR should provide feedback on the likely outcomes of the dispute if the negotiation fails; (2) ODR should attempt to resolve conflicts using dialogue techniques; and (3) ODR should employ trade-off strategies to facilitate conflict resolution. Our goals are fundamentally aligned with the second critical factor, improving dialogue techniques with argumentation support.

**Argumentation Support.** Argumentation is a social activity aiming at producing correct inferences from given premises through thinking, speaking and writing [14]. Argumentation is founded on the persuasion of others about the strengths of one explanation of a conflicting situation. Argumentation provides logic structure to dialogue, mentioned above as one critical success factor. Argumentation also affords constructing rational-legal authority [15], which is fundamental to resolve conflicts.

Toulmin [16] proposed a model integrating these two facets of argumentations: rationality and persuasion. The model identifies six constructs: the *claim*; the *grounds* offered by who asserts the claim; the *warrant* implicitly linking the grounds to the claim; the additional justifications *backing* warrants; *qualifiers*, expressing the degree of force attached to the claim; and *rebuttals*, expressing the limitations of the argument. In the context of ADR/ODR, this model facilitates the expression of coherent arguments supporting the facts of the legal process.

IBIS [5] is another well-know argumentation model. It defines an argumentation system using three elements: *issue*, i.e. a conflict, misunderstanding or question; *position*, identifying a conflicting view over the issue; and *argument*, in support of or detriment of a position. The major advantage of IBIS in our context resides on the importance attributed to the issues, as they support the identification of conflicting views departing from a neutral situation: issues are neutral, only positions reveal the nature of conflicts. Contrasting the Toulmin's model with IBIS, we observe that IBIS is more adequate to dispute resolution, because it affords iterating the construction of arguments, including those that may not be accepted as facts, while the Toulmin's model is restricted to the final argumentation supporting the facts of the legal process.

A review of other argumentation models used in dispute resolution is given by Reed and Grasso [17]. These models have been used in ADR/ODR and Negotiation Support Systems (NSS), which are more broader in scope (see e.g. Yuan and Head [18]). Split-Up [19] is one ODR using the Toulmin's model. Zeno [20] and HERMES [21] are two ODR systems utilizing IBIS to organize arguments. gIBIS [22] is a NSS using the IBIS model and focused on visual representation. Research has shown that these models are useful for representing and summarizing argumentation [17]. However, several researchers have also pointed out that the adoption of these models is also problematic:

- They provide a narrow view of argument structure [17].
- They provide a coercive negotiation environment, in the sense that argument structures impose rules to the participants [23].
- Users find it difficult to participate in such a regulated way [20].
- Users classify and utilize the information structures in the wrong way [24].
- They pose inclusion problems, related with the need to master the technology and information structures [23].

We emphasize the perspective that argumentation models may restrict the interactions to formal structures not understandable and adhered by users. The consequence is that many of the benefits presented by argumentation models (e.g. logic structure, search capabilities) may be undermined. In fact, storytelling constitutes an information structuring technique more close to the participants' intentions and behaviors.

**Storytelling.** Telling stories is considered a simple and universal way to communicate and organize knowledge [25]. Humans are natural story tellers and unconsciously apply their inventiveness to convey their narrative intentions [26]. Stories evoke visual images and emotions, pulling the listener/reader into the scene [27]. Several studies show that information is more quickly remembered, persuasive and believable when presented as stories [27, 28]. In the context of ADR/ODR, storytelling could serve several purposes: (1) Offer a spontaneous, informal and stimulating way to

convey past events related with the conflicting situation; (2) Trigger visual memories of past events; (3) Turn arguments more meaningful; (4) Strengthen understanding of the points made. Good stories, although having an informal nature, also present an underlying structure [27] which is well aligned with the purpose of ADR:

- Setting the scene – Time, place, players and context of the events.
- Build-up – The sequence of events leading to a troubling situation.
- Crisis or climax – The high point of the troubling situation.
- Learning – The retrospective inferences about what happened.
- Awareness – The understanding of what occurred after the troubling situation.

Groupware supports storytelling in various forms. Considering our focus on dispute resolution, we will especially address the support to knowledge recall, i.e. the reconstruction and articulation of past events through storytelling. The Group Storytelling technique utilizes storytelling performed by a group of people with the purpose to reconstruct events [9, 29]. The group context assumes an important role in this process because the complete knowledge of past events may be scattered among various persons and only the group allows fillings the gaps. Preliminary research results indicate that the Group Storytelling technique facilitates knowledge recall [9].

Although the links established here between storytelling and dispute resolution identify a compelling research line, we were unable to find any ADR or even ODR system supporting the storytelling technique. Storytelling has been conceptually associated to mediation and studied in the context of ADR, in what has been designated narrative mediation [30], thus stressing the important role of the mediator getting and reviewing alternative stories about a conflict. However, the focus is on the process, not the technology. Rainey discusses storytelling and ODR [31], but storytelling is again regarded a mediation process, which may be supported by a general-purpose ODR. Choi [32] points out that ODR, in an attempt to replicate face-to-face disputes, should support storytelling when the parties engage in such behavior, but also remarks there are new possibilities offered by virtual media that go beyond replicating face-to-face behavior.

In summary, there is evidence on the important role of storytelling in ADR/ODR, but technological support to storytelling in dispute resolution has not yet emerged. Our research aims to develop such support and combining it with the advantages offered by argumentation support.

### **3 Integration of Storytelling and Argumentation in ADR**

Our goal is to develop groupware supporting dispute resolution. This preoccupation with technology naturally emphasizes the central role of the information model. In this section we will describe our model, integrating the generic objectives of ADR with argumentation and storytelling.

The context of this research was the Portuguese legal system, which does not consider negotiation within the scope of ADR [33]. Therefore, only mediation and arbitration are considered. Furthermore, we combine the mediation and arbitration perspectives into one single information model. The differences have natural impact on the final decision, which respectively belongs to the parties or the arbitrator. But in

both cases the model facilitates the production of arguments and reasoning about those arguments, thus blending together the behaviors of the mediator and arbitrator.

Assuming an information systems perspective, the elements of the legal process have the structure illustrated in Figure 1 (the elements were drawn from the case 1 described in section 5). The elements are organized in dates, facts and evidences, where the facts necessarily have a date and follow a chronological order. Dates are central to the logic of the legal process. Facts are elements (events or documents) that should be supported with evidence, i.e. supporting documents.

Date	Fact	Evidence
02/01/06	Client phoned about the cancellation	Phone contact
01/04/06	Client was told to cancel by e-mail	E-mail
	Client was informed incorrectly	
	Client assumed the service cancelled	
02/04/06	Client cancelled the service by fax	Fax

Fig. 1. Elements of the legal process

In our model, the information associated with the legal process is produced by the third party without direct intervention from the other parties. The claimant and defendant are responsible for producing their own stories about the conflicting situation. Observe in Figure 2 how storytelling is organized. The claimant and defendant tell their own stories, each one designated *story-conflict*. A story-conflict is composed by a list of events organized according to the order of occurrence.

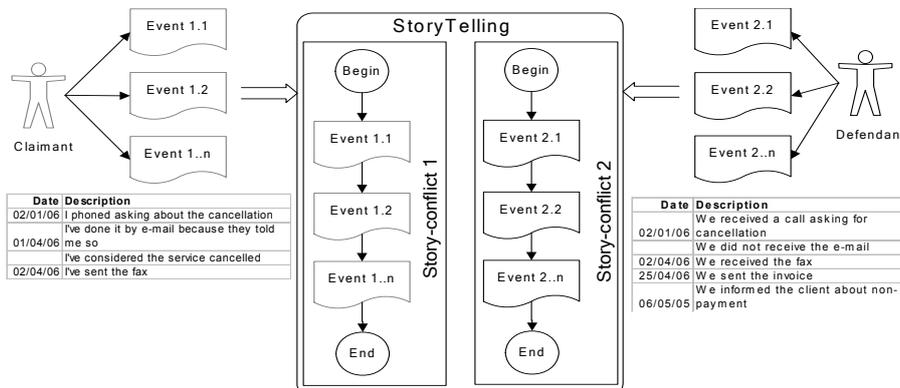


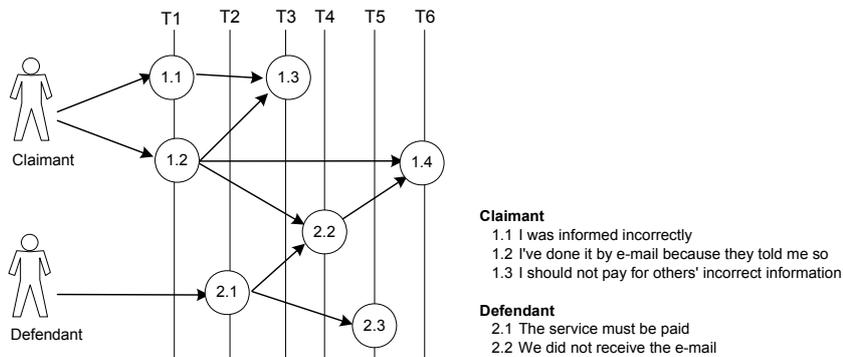
Fig. 2. Specification of story-conflicts by the claimant and defendant

We will now consider the integration of the IBIS argumentation model with storytelling. The adoption of IBIS is based on several arguments previously mentioned:

- IBIS departs from a neutral element to organize the argumentation process. Issues are neutral because they only identify what issue is in dispute, independently of the parties and their disagreements. We believe the opportunity to start from a neutral context facilitates the work from the third party and offers a positive environment for the argumentation process.
- IBIS integrates all arguments produced during the ADR process, including those that may not lead to facts. We believe this contributes to the impartiality, fairness and transparency of the ADR process.

- The IBIS process is inherently iterative and supports all parties working in parallel, sharing their positions and arguments.
- IBIS affords a hypertext visual representation.

The integration of IBIS and storytelling is done in the following way. The claimant and defendant create events in a story-conflict according to their temporal order. Each event is also a candidate issue, and for each candidate issue there is implicitly a position in favor from the person who specified the event. If there is a doubt or a disagreement with that event, e.g. because it conflicts with an event produced by the other party, the situation is explicitly expressed with an argument, and is implicitly associated with a position against. When there is a position against a candidate issue, it becomes an issue. The relationship between storytelling and argumentation is thus established by specifying arguments, which turn events into issues and automatically associate positions against the issues. According to the IBIS model, new arguments may be associated to previous arguments. In Figure 3 we illustrate how this argumentation process evolves through time.



**Fig. 3.** Illustration of the argumentation process

Note that storytelling and argumentation may be intertwined. Also, we do not explicitly specify if the arguments are generated by the claimant and defendant without assistance from the third party, by any participant, or solely by the third party. We assume that these restrictions depend on many contextual variables, e.g. type of conduct from the third party or the capability of the claimant and defendant to construct their arguments. The proposed model is therefore independent from such contextual variables. We classify the arguments in the following categories:

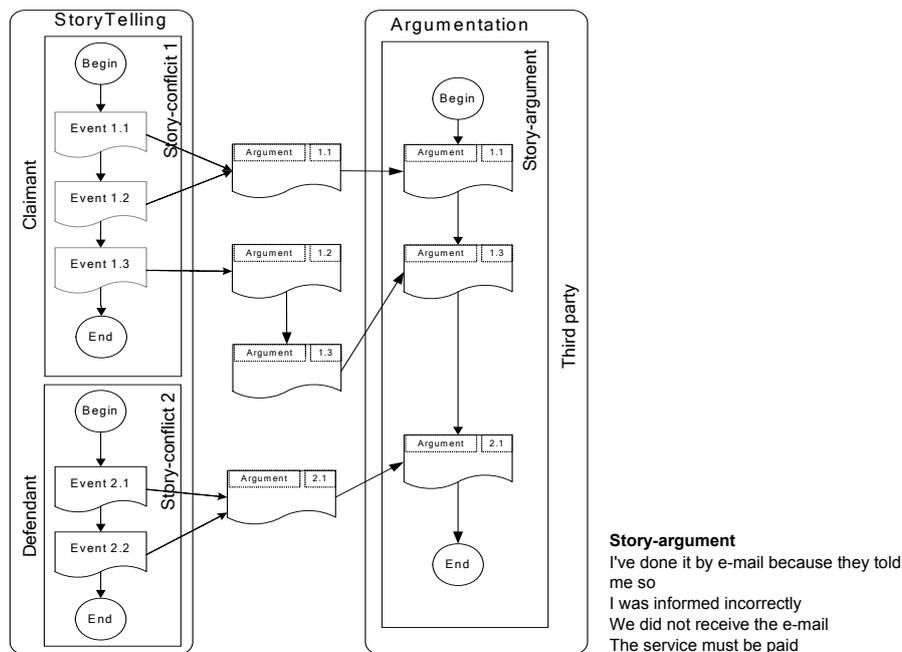
- Initial arguments – Derived from positions against events in the story-conflict (e.g. 1.1, 1.2 and 2.1).
- Reinforcement arguments – Based on arguments previously expressed by a party, they persist or sustain a line of argumentation (e.g. 1.3).
- Composition arguments – Use any previous arguments to derive a new argument (e.g. 2.2 and 1.4).
- Decomposition arguments – They adopt part of a previous argument to define a new argument (e.g. 2.3).

Having established the links between storytelling (the story-conflicts) and argumentation (arguments and their implicit positions), we must now establish the links

between the argumentation and the legal process. As mentioned previously, the third party is responsible for defining the legal process, an activity that is based on the evaluation of the available arguments. This is accomplished in two steps.

The first step concerns the definition of the *story-argument*, as shown in Figure 4. Recall that the claimant and defendant compose their story-conflicts by specifying events. Those events may then originate various types of arguments. Then, the third party selects which arguments are relevant to the legal process. The selected arguments set up then what is designated story-argument.

The fundamental purpose of the story-argument is twofold: (1) identify what arguments are elected to the legal process; and (2) define the logical sequence of the arguments. Note that although the arguments are related with events belonging to the story-conflicts, which have a temporal order, many times these arguments reflect conflicting views exactly about the timing of events. Consequently, we cannot specify any strict relationship between the order of events and the order of arguments in the story-argument. Only the third party, naturally with the help from the other participants, may determine such relationships.



**Fig. 4.** Story-argument specification and its relationship with the story-conflicts

The second step in the construction of the legal process concerns the definition of what we designate the *story-legal*, illustrated in Figure 5. Through the definition of the story-argument, the third party determines what arguments seem to be relevant to the legal process. Then, it is time to deduce facts about the situation. The deduction of facts is accomplished in two steps. The first step concerns the definition of candidate facts. These are shown in the middle of Figure 5. Basically, a candidate fact identifies the arguments used in the deduction process, the date of occurrence and any evidence

(external documentation) supporting the fact. The second step concerns selecting and organizing the facts in a temporal order, thus forming the story-legal.

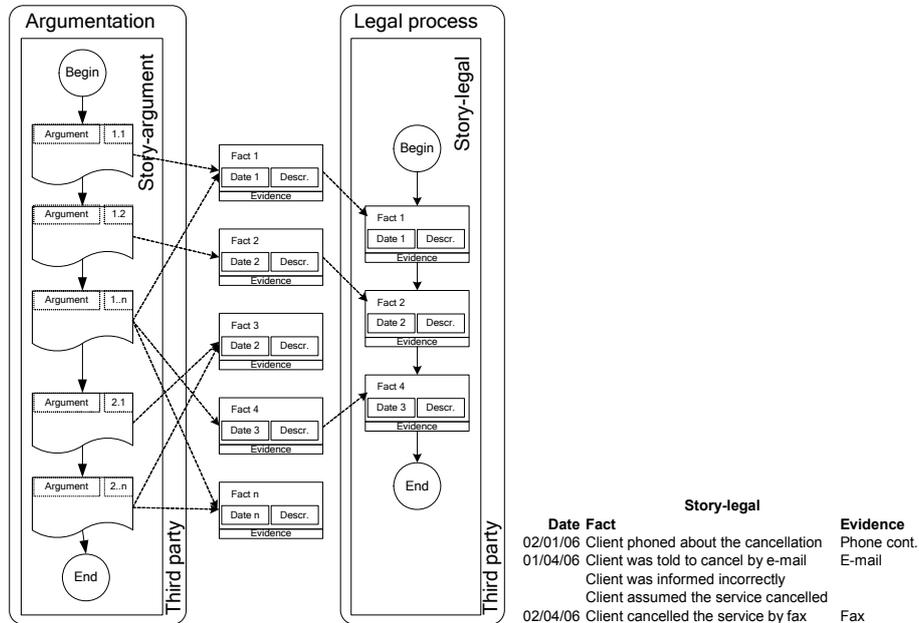


Fig. 5. Specification of the story-legal and its relationship with the story-argument

Finally, we would like to emphasize that the construction of these information elements is iterative and concurrent. The definition of the story-legal is not a logical consequence of the successive construction of the story-conflicts and story-argument. Instead, as the story-conflicts are being interactively constructed by the parties, and issues emerge, there is the responsibility of the third party electing arguments and deducing facts. Furthermore, since the story-conflicts, story-argument and story-legal are permanently available to all parties, all this information necessarily evolves with time: events and arguments may appear, disappear and be redefined; while arguments and facts are included and removed from the story-argument and story-legal.

## 4 Prototype

The model described in this paper was implemented in a software prototype. Our major concern developing the prototype was to validate the model, through the study of several ADR cases, rather than evaluating in detail any specific functionality or user-interface features. For legal reasons, it was not possible to evaluate the prototype in a real situation. The prototype was developed in Visual C# and uses a Web browser and an SQL database. The functionality is provided by several forms:

- Third party management – Supports defining personal data about the claimant and defendant, and the elements of the legal process, including process number, type of process (mediation or arbitration), starting and finishing dates.
- Story-conflict – Definition of the story-conflict by the claimant and defendant. The events in the story-conflict contain text and must have a date (Figure 6).
- Visualization of story-conflicts – Allows the participants to visualize the story-conflicts side-by-side.
- Argumentation – Specification of arguments by the parties. The arguments are either linked to events or other arguments. The classification of arguments (initial, reinforcement, composition or decomposition) is done implicitly. Different colours are used to identify the type of argument. There is no explicit use of positions, since they are implicit in the arguments.
- Story-argument – Selection of arguments by the third party (Figure 7). The arguments must be ordered. These arguments may be edited by the third party.
- Story-legal – Definition of candidate facts by the third party and selection of facts belonging to the story-legal (Figure 8). Each fact must have text and date, and can be accompanied with evidence (references to external documents). The facts in the story-legal must be ordered.

The screenshot shows a window titled "Events - Claimant" with a sub-header "Claimant A". It contains a table with the following data:

Nº	Date	Description
1	02-01-2006	We received a phone call asking about the cancelling process
2	01-04-2006	We received a phone call complaining about a cancelling request never activate
3		We did not received an e-mail
4		Cancel request must be done by fax ou letter
5	02-04-2006	We received a fax
6	02-04-2006	Mr.XX will not pay the services after the mail he says he as sent
7	29-04-2006	A notification was sent for him to pay

Below the table are buttons for "Add", "Remove", "Save", and "Cancel".

Fig. 6. Specification of a story-conflict by the claimant

The screenshot shows a window titled "Argumentation Process" with three panels:

- Claimant:** A table with 7 rows of arguments. Row 7 is highlighted in yellow and has a date of 02-04-2006. The description is "I've send the fax".
- Argumentation Process:** A central table with 3 rows. Row 2 is highlighted in yellow and has a date of 01-01-2006. The description is "Cancel Request must be done by fax ou letter".
- Defendant:** A table with 11 rows of arguments. Row 11 is highlighted in yellow and has a date of 06-05-2006. The description is "we informed Mr. XX about a le".

Buttons at the bottom include "Add Claimant Argument", "Remove", "Add Defendat Argument", "Add", "Remove", and "Story - Legal".

Fig. 7. Specification of the story-argument by the third party

Arguments		
	Date	Description
1	02-01-2006	E-mail sent with confirmation
2		Cancel request must be done by fax or letter

Incomplete Facts		
N°	Date	Description
1		Clear was not well informed

Facts		
N°	Date	Description
1	02-01-2006	E-mail sent requesting services cancelling
2	02-01-2007	phone record confirming information request for cancelling services
3	28-04-2006	fax cancelling services sent

**Fig. 8.** Specification of incomplete facts and story-legal by the third party

Although our implementation is open to various types of strategies adopted by the third party, the following description illustrates the common prototype usage. After initialization by the third party, the claimant and defendant start writing their stories, introducing events and identifying when they occurred. Omissions and incorrectly specified events (e.g. arguments expressed as events) are expected. We also assume that at the beginning of the process the claimant and defendant will be focussed on their own stories.

After some time, the participants will start analyzing both stories. Whenever a conflicting view occurs, the participant may associate an argument with the conflicting event. During this period, the third party may edit the arguments generated by the claimant and defendant, seeking to clarify information and also to structure and elaborate arguments. New arguments may be drawn from previous arguments. The claimant and defendant may also come back to their stories, recalling new events and modifying or deleting events if necessary.

Meanwhile, the third party may start promoting arguments to the story-argument. This is a decision process that gives some indication to the parties about the direction where the legal process is leading, although this may still be influenced by the future actions taken by the parties.

Based on the available stories and consolidated list of arguments, the third party may then define incomplete facts. When, the stories and arguments appear to stabilize, the incomplete facts may be promoted to facts, thus defining a clear description of the conflicting situation. Finally, the parties may reach an agreement that no further information is relevant to the legal process.

Contrasting this functionality with the common ADR process, we would like to emphasize two positive issues. The first one is that the prototype has a strong focus on visually confronting the stories defined by the claimant and defendant, facilitating the perception of conflicts. Another positive issue is that the prototype provides a mechanism to document and understand the reasoning behind the conflict, avoiding information losses while leading the participants from the story to the facts.

In Figure 9 we present the structure of the database developed for the prototype.

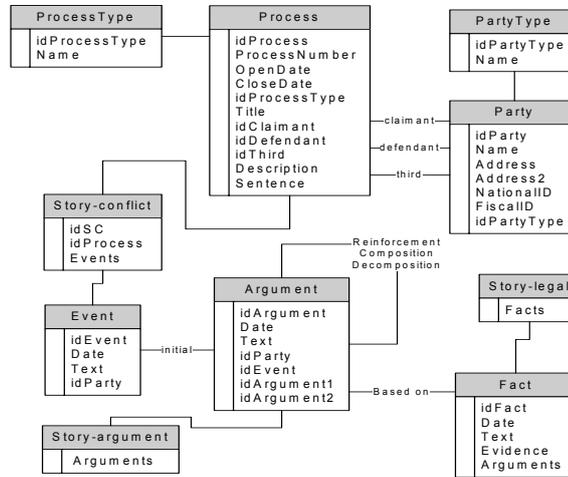


Fig. 9. ODR information structure

## 5 Formative Evaluation

Our model was subject to a formative evaluation, which was conducted side-by-side by one of the authors and a lawyer accredited as third party and experienced with ADR. In some way, the adopted approach resembles the pair-programming idea adopted by the agile software development movement [34]. The evaluation consisted of two major steps:

- Analysis and discussion of various ADR cases previously conducted by the lawyer. Two of them were selected as representative of mediation and arbitration processes. This was followed by a detailed deconstruction of the selected cases, with the identification of all their events and arguments.
- Reconstruction of the cases using the prototype. This was accomplished side-by-side, with the two participants playing the roles of claimant, defendant and third party, while defining the story-conflicts, story-argument and story-legal.

In both steps the comments and ideas discussed by the participants were documented for later analysis. In the spirit of formative evaluation, these comments and ideas were incorporated in the redesigned model presented in this paper. The selected ADR cases are briefly summarized below.

**Case 1.** This case concerned a complaint from a client over a service charged to him after he requested its cancellation. The client contacted the provider by telephone and was informed that he could request the cancellation by email. To his surprise, after several months, he found out that the service was not cancelled. Furthermore, he was informed that the email message was not received and thus the service was active and should be paid. After several other steps, which included a second request for cancellation sent by fax, the client was notified by a layer representing the company that a legal case would be initiated. The client decided to request an arbitration process, which was accepted by the other party.

**Case 2.** A client bought a new vehicle from a major car maker. Several times, during regular maintenance, she complained the car had a strange noise, which was undetected. Every time the vehicle was subject to maintenance, the issue was registered in the respective repair form. After the legal guarantee period, one component supporting the motor broke up and the car was immobilized. The maintenance company charged for the repair, but the client refused payment and submitted a complaint directly to the car maker. The client and maintenance company decided to submit the case to a mediation process.

Complete transcripts from the above cases were available during the evaluation, with proper authorization from the parties involved. Their use beyond the evaluation was denied and anonymity was also enforced. No contact with the claimant and defendant was established. The major outcomes from the formative evaluation were:

- Dates (of events) play a major role in the system. All events, arguments and facts are closely related with dates. Dates are fundamental to the logic and structure of the ADR process.
- The construction of the story-conflicts is mostly done individually, without immediate refutation from the other party. This allows initially eliciting the issues perceived as most important by each party, even though they may appear disorganized and incomplete. The analysis of the other party's story-conflict is done afterwards and allows consolidating the events in a more structured way.
- The creation of the story-conflicts was initially perceived as time consuming, considering that its value is only perceived later on, when building arguments.
- Regarding the creation of arguments, the separation between the argumentation process and the recollection of past events was positively regarded, giving more fluidity to the whole conflict resolution process.
- The creation of arguments was also perceived as time consuming.
- By insistence of the lawyer participating in the evaluation, the arguments were ordered according to the dates of the events they were related with, instead of the order of their creation. This person mentioned that the adopted order provided a more clear visual and mental organization of the case, and in fact lead to the definition of facts more early than expected.
- Facts were mostly created by cutting and pasting information contained in arguments, something that was very well regarded by the participants. It was observed that the way facts are constructed influenced the argumentation process, since arguments were defined with the purpose to become facts.
- The participants also perceived a strong relationship between facts and the events belonging to the story-conflicts, highlighting the requirement to make them visible during the creation of candidate facts and story-legal.

## **6 Discussion, Open Issues and Conclusions**

The first issue we would like to discuss in more detail is related with validation. In this respect we should consider two important limitations in our research. In the one hand, the prototype was evaluated in artificial conditions; and, in the other hand, it involved one single stakeholder. We made attempts to experiment the prototype in

real situations. However, this objective failed because the participants did not consent to participate and, in fact, there is no legal framework to support such an experiment, thus making its use in those conditions highly risky. One alternative that could have been considered would involve testing the prototype with real cases but false participants playing the roles of claimant and defendant. From our point of view, this could be beneficial to evaluate specific aspects of the prototype, e.g. the user interface, but not the information model. Since our intentions were doing a feasibility study centred on the model, we believe the adopted formative approach was more adequate.

Although one single stakeholder participated in the evaluation, she was highly experienced conducting mediation and arbitration processes. The deep knowledge of the alternative dispute resolution processes and the level of involvement in the definition of the information model gave us very insightful and invaluable information. These insights were codified in the solution described in this paper and provide good indications for future research. To cite Gray and Mandiwalla [35]: “we have reached the point where we need to expand what we can do with group support systems ... to do so we need to invent, invent, invent rather than test, test, test what exists.”

Although the formative evaluation was very insightful, we could not find concrete answers to several issues that remain open. Perhaps the most important one is related with argumentation and, more specifically, identifying who may produce and organize arguments. The model and prototype allow three distinct types of functionality: (1) only the claimant and defendant generate arguments; (2) every participant may generate arguments; and (3) only the third party produces arguments. We may identify several scenarios where some of these approaches could be more feasible or adequate than others. The third party participating in this research perceived the prototype as most beneficial to her own work, thus minimizing the roles attributed to the other parties, but we cannot generalize from this observation. More research is necessary to study which operation mode is most adequate to alternative dispute resolution.

Somewhat related with this issue are the difficulties users typically have interacting with argumentation models. We tried to reduce the impact of the argumentation model with two complementary approaches. The first one was avoiding using the model to control the participants' interactions, i.e. the model is used to organize information but not to define what the participants must do next. The second approach consisted in simplifying the use of issues and positions, considering that the former are inferred from events in the story-conflicts and the later are automatically derived by the system. Nevertheless, this issue is mostly related with usability and thus a different type of evaluation is necessary to come to conclusions about its effects.

We should also emphasize here that the proposed approach requires the participation of a human acting as third party. Unlike other approaches, which automate this role, mostly often because they are limited to exchanging information between the claimant and defendant, we rely on the human third party to accomplish a much more complex endeavour: organizing arguments, eliciting candidate facts and organizing the facts of the legal process. This focus on the third party naturally has advantages and disadvantages. One important disadvantage to consider is that the system may be more difficult to use in the ODR context. On the contrary, the human third party is beneficial in situations where the problem is very complex or delicate, e.g. family law. We should also note that we have not tested our prototype in the ODR context.

Besides all these open issues raised above, our research has come to some positive results that we would like to summarize. The first one to consider is the positive indication that storytelling and argumentation models may be integrated with the legal process in a groupware system. This unique combination facilitates arranging the legal process in two different levels. At the forefront, we find support to the elicitation of the events related with the conflicting situation in a simple way, which is adequate to the presumed non-legal/technical abilities of the claimant and defendant. At the backside, we find the support to the logical structure of the legal process, with facts and evidence, which is centred on the more legal/technical proficient third party. In this scenario, the argumentation model basically serves to intermediate the information flows between the two levels, and provides another very important functionality: support to self-help legal representation in the litigation process.

Further research will proceed in two different fronts: performing experiments in the ODR context, using the system through the Internet with different levels of intervention from the third party; and more formalized and detailed evaluation actions based on role playing real legal cases.

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