

Enhancing the decision making process through relevant legal information in consumer law disputes - a case study in air transport passenger rights

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Abstract. This paper aims to describe an initial stage of research related to the introduction of a new completion to the online dispute resolution landscape in consumer law domain. The aim is to include a legal layer into the life cycle of dispute resolution schemes that has not been yet considered. This is part of an intended support-system that aims to provide both consumers and companies with meaningful and relevant domain-specific legal information and awareness about their rights, in order to enhance the decision-making process, to determine the consumer's legal position at an early stage of dispute, avoiding escalation and legal action conflicts. The approach is illustrated by means of a case study based in the area of air transport passenger rights.

Keywords. legal ontologies, information, air transport passenger rights, incidents, complaint, consumer law, online dispute resolution.

1. Research Motivation

This paper contributes to the ongoing discussion of delivering information to foster dispute resolution. We will substantiate the need to provide to the disputant parties relevant legal information regarding their rights in a consumer conflict. Consumer disputes have impacted interest and are often categorized by time-consumption, cost-disproportionality and are convoluted into complex procedures. They comprise acrimonious, since prolonged, legal wrangling which epitomizes long-term damage. Stakeholders (ombudsman, regulators, ADR/ODR providers, consumer associations, among others) assume more palatably that the lack of legal information (the concerned rights) related to the case is linked to the root-cause of disputes [1].

Information disclosure to consumers, as the conventional regulatory tool² to protect consumers and solve disputes, appears to be a classical overregulated domain, deserving much attention by legal drafters, policy and decision makers, and actors in the consumer realm. The classical paradigm sustains a pro-consumer disclosure of

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² The four consumer protection techniques commonly employed in European contract law are (1) mandatory pro-consumer arrangements, which must be part of every consumer contract; (2) mandated disclosure; (3) regulation of entry to and withdrawal from contracts; and (4) pro-consumer default rules and contract interpretation [5].

information which creates obligations upon suppliers to provide relevant information about the rights at stake, in order to make aware and better autonomous choices (as the prototypal autonomy enhancing technique), memorize the “imperfect rationality problem” of consumers, their asymmetric information, their vulnerability (hypo-sufficient laymen), and their biased conceptualization of popular law [2][3].

The theory of behavioral economics embedded in consumer policy³ has been demonstrating that disclosure of information is not sufficient to avoid consumer disputes. It asserts that mandate disclosures are neither read nor used (“non-readership” phenomenon⁴), and they are beyond most people’s interest or understanding, notwithstanding the fact that consumers are bestowed with substantive contractual rights, remedies, disclosures, benefits and cumulative interpretations (that stems from case law, doctrine and European communications, as we will see in our study). A new approach is being considered. Effective, “information-user-specific design” (individual-use information) and “targeted” information disclosure tools are a new reconceptualized approach. It recalls the principle of relevance: contextualized, situational data, which accounts the informee’s interest [6].

It is a fact that consumers need to have the sophistication to know and access their rights and insist on compliance (empowerment or readiness of consumers, their “smartening”, dispute acculturation or “self-litigation conduct”) but at the same time is required a technological and operational management of the complaint system from ODR providers and/or from the companies themselves who provide services and goods.

This proposal investigates how can a legal layer (in the air passenger rights domain - APR) be designed and incorporated into a decision-support system (into the technological and operational business field)⁵ that may enhance the decision-making process of the disputants. We conceive that such a design may portray a new completion to ODR: a customizing legal knowledge-based support-system that applies and permeates the market - the *locus* where disputes occur and thus, enhance better settlements, redress and replace the balance between consumers⁶ and the company.

³ Behavioural economics shows that people are often altruistic, not fully rational and not independent but tend to reproduce their peers’ choices [4].

⁴ People do not pay attention to standard forms, neither long nor short, in plain language or in legalese, written or oral, separately signed or unified into one document, handed out in advance or *ex post*, See

⁵ In-House Customer Care or Internal Complaint Systems may incorporate this legal cover also in their mass customization strategy. For the purpose of this paper we will only be concerned with the provision of the legal cover; undoubtedly, principles such as impartiality and independence are allocated, but we won’t pursue these matters at this stage. It is a plausible deduction that such a legal incorporation may neutralize and calibrate the pronouncement offered by the internal business policies, which in turn, might improve the market behaviour and will maintain the legal compliance for every stakeholder. This leads us to the consideration that the envisioned legal information system can also reward the economic operators, such as reputable and competitive businesses that render consumer services and goods. As effective consumer policy, recharged with this legal cover, supports the proper functioning of the single market and drives out rogue operators, due to clear legal rules and better coordinated enforcement addressed by the companies. We assert that the market aims good practices to held the consumers allegiance, decrease the number of complaints (reputation and operational costs), which enables systemic accuracy. We contend that this configuration (customer centricity) can be seen as a quick response to the sectorial market problems which can incorporate preventive measures.

⁶ It is foreseen to be a way to support the dispute and its resolution: consumers can determine their legal position (to go ahead with the claim or perceive that there is no case at all) at an early stage of dispute (which can discourage unmeritorious complaints). As such, we assume that consumers may feel entrusted (digital trust in e-society) and aware if the trader is acting in good-faith when filling a complaining and taking decision. Hence, we posit that this approach can avoid escalatory *versus* de-escalatory cycles if not solved in the earlier stage (and foster ulterior phases of mediation) and potentiates the continuation of relationship with the trader. Ultimately we can anticipate that providing the legal cover to the consumer as an early

The paper is structured as follows. We firstly analyze the APR problems and define the research questions. After reviewing previous work in the field, we enunciate the proposed research methodology. In section 6 we provide a description of the legal framework model, then we proceed with its expression as a set of ontologies and in section 7 we conclude.

2. Case-study: Analysis of the Air Passenger Rights Domain

Air transport passenger triggers the top of the consumer complaints ranking in the EU, even after the entry into force of the EU's Air Passenger Rights Regulation 261/2004⁷ (hereinafter Regulation (EC)) that establishes minimum levels of assistance and compensation for passengers subject to denied boarding or affected by long delays or cancellations. This status is affirmed in significant sources. Concerning complaint handling in 2012⁸, a total of 56,478 complaints were received by the National Enforcement Bodies (hereinafter NEBs)⁹ of the EU member-states. In a more comprehensive overview, 38% of complaints are attributed to delays and 38% to cancellations¹⁰. According to the 2011 report disclosed by the European Parliament, the ECC-Net 2011 Air Passenger Rights Report¹¹, the ECC-Net 2012 Annual Report¹², and ECC-Net 2012 Alternative Dispute Resolution in the Air Passenger Rights Sector Report¹³, air passenger transport typifies the industry with the highest rate of disputes, worst reputation and with low resolution rate outside court (airlines are not obliged to

intervention[17] to the conflict, will provide earlier results on impacts on mediation; foster fewer impasses, produce more concessions leading to agreements (more willingness to compromise). These essentials portray other estimable prospects: it may avoid overlapping jurisdictions between different ADR bodies (according to the EU Regulation of ODR) and the burden of proof from the rogue operator is mitigated.

⁷ Regulation (EC) No 261/2004 of the European Parliament and of the Council of 11 February 2004 establishing common rules on compensation and assistance to passengers in the event of denied boarding and of cancellation or long delay of flights, and repealing Regulation (EEC) No 295/91, JO L46/1 of 17-2-2004. All Articles without special notice refer to the Regulation (EC) No. 261/2004

⁸ SWD (2014) 156 final, Commission Staff Working Document, Document on Complaint handling and enforcement by Member States of the Air Passenger Rights Regulations. The present document reflects the period from 2010 to 2012 (by comparing data, where possible, with the previous reporting period (2007-2009). It thus reflects quantitative complaint handling data provided by the national enforcement bodies (NEBs) for the period from 2010 to 2012, p. 19.

⁹ The Regulation (EC) 261/2004, according to its Article 16, obliges Member States to designate "national enforcement bodies", a body responsible for the enforcement of this Regulation as regards flights from airports situated on its territory and flights from a third country to such airports. Where appropriate, this body shall take the measures necessary to ensure that the rights of passengers are respected. Passengers who believe they have not been treated correctly should contact the body in the country where the incident took place.

¹⁰ The percentage of cases where NEBs launched sanctioning procedures has doubled (2%) since 2011. The top 3 countries receiving most complaints remain unchanged: Spain (15 733) where a great proportion of complaints relates to Spanair ceasing operations, Portugal (6 165) and Germany (5 105), in SWD (2014) 156 final, Commission Staff Working Document, p.19.

¹¹ Available in http://ec.europa.eu/consumers/ecc/docs/ecc_net_air_passenger_report_2011.pdf

¹² It is worth to illustrate that "(...) air transport was at the origin of more than 20% of all complaints (of which luggage issues represented only a minor proportion compared to other issues linked to the denial of passenger rights or unfair commercial practices (...)", p.12, available online in http://ec.europa.eu/consumers/ecc/docs/report_ecc-net_2012_en.pdf

¹³ Alternative Dispute Resolution in the Air Passenger Rights Sector, 2012, by the the European Consumer Centers' Network (ECC-Net), p.2, available online in http://www.ecc.lt/index.php?id=602#.U80gl_mSywd

adhere to alternative dispute resolution schemes due to the fact that they are based on voluntary bases and thus do not provide binding decisions¹⁴).

The ensuing analysis of the air passenger rights settings portrays some of the causes of consumer detriment in the air transport sector. We are cognizant of the reasons¹⁵ underlying this malpractice and failure to provide passengers their rights regarding incidents covered by the Regulation (EC). They stem from: i) existent legal grey areas; ii) unawareness of passengers' rights; iii) complex complaint handling procedures; iv) sanctioning; v) disproportionate financial costs. Concretely:

i) *existent legal grey areas*: lacking definitions, unclear provisions and varying biased interpretations of the text of the Regulation (EC) by the airline industry leave grey zones and loopholes in the passengers' rights, which entail legal inconsistencies and loose standards in the application of the law, leading to the consequent case-law produced to date¹⁶. Most passengers feel that they lack the knowledge and experience to properly enforce their claim, regarding the incidents of cancellation or delay, especially when airlines reject their claim requests or raise a defence of "extraordinary circumstances-excuse"¹⁷ (under those circumstances air companies are released from the obligation to pay compensation) or "reasonable measures" (consists of open textured concepts that require further interpretation in a case-by-case assessment). Generally, passengers cannot verify the accuracy of these kinds of counter-arguments. Often airlines abuse from the excuse of "technical failures" to exclude their liability and it tends to be "accepted" by the passenger. Despite of a proposed legislative revision¹⁸ adopted in 2013 addressing legal uncertainty, only incipient enforcement of air passenger rights in adapting in light of the judgments of the European Court of Justice was perceived¹⁹.

¹⁴ Article 2 of the Directive 2013/11/EU of the European Parliament and of the Council of 21 May 2013 on alternative dispute resolution for consumer disputes.

¹⁵ Air Passenger Rights Revision - Frequently Asked Questions Air passenger rights – summary European Commission - MEMO/13/203 13/03/2013, available online in http://europa.eu/rapid/press-release_MEMO-13-203_en.htm

¹⁶ The most recognized cases brought before the Court of Justice of the European Union (CJEU): case C-549/07 (Wallentin-Hermann), Case C-22/11 (Finnair), C-402/07 and C-432/07 (Sturgeon and Böck) of 19 November 2009, C-581/10 and C-629/10 (Nelson and others vs IATA, KLM, British airways) of 23 October 2012, C-11/11 (Air France vs Folkerts) of 26 February 2013, whose rulings need to be codified by the forthcoming legislation.

¹⁷ Events that are beyond the airline's control, such as political instability, meteorological conditions incompatible with the operation of the flight, security risks, unexpected flight safety shortcomings, strikes affecting the operation of an operating air carrier, natural disasters; Draft list of extraordinary circumstances following the National Enforcement Bodies (NEB) meeting held on 12 April 2013, available online in <http://ec.europa.eu/transport/themes/passengers/air/doc/neb-extraordinary-circumstances-list.pdf>.

¹⁸ In 2013, the Commission tabled a proposal to amend Regulations 261/2004 to improve enforcement by clarifying key principles and passenger rights that have given rise to disputes between airlines and passengers. The text defines the term "extraordinary circumstances" as events which are beyond the actual control of the air carrier and provides non-exhaustive lists of both extraordinary and nonextraordinary circumstances, Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EC) No 261/2004 establishing common rules on compensation and assistance to passengers in the event of denied boarding and of cancellation or long delay of flights and Regulation (EC) No 2027/97 on air carrier liability in respect of the carriage of passengers and their baggage by air, COM/2013/0130 final - 2013/0072, available online in <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52013PC0130:EN:NOT>

¹⁹ BEUC position paper on Air Passengers' Rights, Revision of Regulation 261/04 on the rights of air passengers in the event of denied boarding, cancellation and long delays, p.2. Available online in <http://www.beuc.org/consumer-rights-and-enforcement/air-passenger-rights>. The European Consumer Organisation (BEUC, stands for French "Bureau Européen des Unions de Consommateurs") is an umbrella

ii) unawareness of passengers' rights: within this industrial realm, the Eurobarometer survey²⁰ discloses that almost six out of ten Europeans (59%) are unaware of their contractual rights and obligations when buying a ticket from an air transport company; but not only the consumers, both airlines, insurance companies and travel agencies are often not sure about the details as well. Besides the existent legal patchwork in APR sector, information requirements, brochures on air passengers' rights are distributed at every major airport of the Community in all official languages and further information is given on official homepages and in mobile applications²¹. Nevertheless, it seems from the number of complaints that many of these requirements or information disclosures are not having their desired effect.

iii) complex complaint handling procedure: it has been observed that passengers encounter difficulties in enforcing their rights as airlines' complaint-handling procedures are ill-defined, contingent and time-consuming, often featured as ping-pong pattern queued cases, which ultimately dissuade consumers from lodging a complaint regarding air travel incidents, or because there is no complaint handling body to turn to in case of irresponsiveness of the air carrier. The parameterized workflow of the complaint diverges according to the air carrier: some contend that only the web-form (their own tailor-made complaint forms) conforms the acceptable and valid complaint; others embrace a more wider perspective of a complaint, such as the ones submitted by fax, email or by letter; most of them require adding of proof documents, eg. invoices, ticket receipt, photos, inventory forms, amongst other documents often demanded, many of those, laymen can not comply with due to lack of on-the-spot information.

iv) sanctioning: the NEB's responsibility for the application and enforcement of passenger rights are only of limited help; they cannot manage individual complaints; they apply different sanctioning policies²² and differently interpret various parts of the Regulation. Inconsistent or insufficiently enforcement and non-effective sanctioning policies by national authorities do not give sufficient incentives for the industry compliance. In this regard, it should be recalled that the sanctioning process is time consuming and can take several years before sanctions are collected (notably in case of appeals);

Conversely, we posit that acknowledging this problems may configure a pre-condition to offer more specific and situated information regarding the guidelines prompted by the emergent consumer policy and the new information design. Hence, the

consumers' group. It brings together 41 European consumer organisations from 31 countries (EU, EEA and applicant countries).

²⁰This research also asserts there is a clear correlation between the passenger's level of awareness of his/her rights and the satisfaction with the services received when travelling by air. The data indicates that the higher the degree of awareness, the higher the quality of services received, see Special Eurobarometer 319 on Air Passengers' rights 2009, Conducted by TNS Opinion & Social at the request of Directorate General Energy and Transport Survey co-ordinated by Directorate General Communication, p. 10.

²¹Information requirements of Article 14 of the Regulation depicts it is the duty of the airlines to provide information in two ways: first there must be a legible notice at the check-in counter where to find the text of the rights in case of a long delay, cancellation or denied boarding; second, in case such inconvenience occurs, the air carriers must provide a notice containing the rights to compensation and assistance to the passengers. In addition, the European Commission distributes leaflets concerning air passenger rights at every airport within the Community, alongside its mobile application for free to check their rights immediately and on the spot <http://ec.europa.eu/transport/passenger-rights/en/mobile.html>

²²Which may include may include inspections, audits, warnings, media contacts, monitoring of websites, meetings with airlines and stakeholders, consultations, pecuniary sanctions, continuing information process, monitoring of the ground handling procedures, amongst others), SWD (2014) 156 final, Commission Staff Working Document, Document on Complaint handling and enforcement by Member States of the Air Passenger Rights Regulations.

relevant and meaningful legal information will focus not only on the rights (if they have grounds to lodge a complaint), but also how to address it and to whom in order to have redress.

3. Research Questions

If ultimately, the stage and the enforcement of the claims regarding the disputes still depends on each companies' regulation policies and their willingness for settlement (as ADR/ODR are dispute resolution schemes are based on voluntary bases and thus do not provide binding decisions) a way to leverage the dispute status could be by endowing busyness with a legal layer. This assertion substantiates the research questions of the current study:

- How can the decision-making process of the users be enhanced?
- How to build a framework design for a decision-support system legally embedded?
- Within a human-computer interaction, how can the design of the decision-support system be user-friendly?
- To which extent the formal constraints imposed by ontological structures imply limitations on the complete and reliable representation and structure of legal knowledge, considering also the legal domain features, such as *i*) accessibility: technicality of legal language; specialization of the law; multi-level jurisdictions; subsidiary laws; legislative updates; *ii*) interpretation of the “terms of art”, polysemy, ambiguity of the open texture concepts, vagueness; *iii*) information retrieval: the fact of cross-referencing of legislation.

4. State of the Art

In current online disputes resolution systems (the so-called “fourth party” referred to the technology component in the dispute management), even though the existence of technological innovation and maturity by the prominent players²³, there are no dispute resolution services (e-government services nor private), nor methods (standard typology encompasses automated negotiation, computer assisted negotiation, online mediation and online arbitration) that provides legal information on the content of the legal rule that applies to a conflict. According to research, ODR experiences show some difficulties [7]. ODR services have not been so widely developed as envisioned, mostly due to lack of funding; lack of enforceability of the achieved agreements and the correlated reluctance from the parties to participate in ODR processes [8], amongst other factors. Moreover, the ODR Regulation 524/2013 primarily continues to rely on procedural rules (the coordination between the ADR entities) without approaching to the substantial content of the dispute, and both their theory and practice are saturated with the inferences of contact and communications theories paradigm. It proposes *i*) a complex procedure: only the complaint is submitted electronically and then it has a three-phase re-routing system not carried out online, but only through traditional ADR methods); *ii*) it is time-consuming: establishes a deadline from 3 up to 6 months for the

²³ Only main industrial experiences are predominant and use dispute resolution technologies. It is recurrently referred as example Colin Rule's assertion about the 60 million cases solved by e-Bay in a single year. Nevertheless, outside big marketplaces there are few business models for sustainable ODR systems .

possible settlement; iii) remains difficult to get an agreement: if parties don't agree with the ADR body/mediator, the process ends; iv) if the dispute is not solved within the offers and counteroffers, there is a "time-out period" due to a dislogical performative structure workflow. Hereby we affirm that ODR is theoretically incomplete and currently related to procedural aspects. We argue that ODR has been developing without its own cogent theoretical base [9] which resides in promoting access to justice and endow consumer protection (empowerment) and redress [10].

Therefore settling agreements "in the shadow of the law"[11], or "in the shadow of procedure" should not be delegated to self-regulation; a pre-emptive step in addressing disputes and complaints would be within the law itself.

According to our best knowledge, there is no ontological representation applied to the APR sector that can describe air transport passenger incidents and endow to the conflictive parties legal information regarding their dispute. Nevertheless, this is not the first initiative in this field. From the point of view of this paper's objective, Flightright's service²⁴ is particularly interesting; it calculates the potential compensation that a passenger might be entitled to in case of cancellation, denied boarding or long flight delay. The procedure of operation of the Flightright is as follows. If there is a positive estimation from the compensation calculator (software module based on an automatic logic), they will manually evaluate the chances of a successful claim collection. If the prospects are promising, thereby they bring the claim forward against the airline, tracking its status. It follows that when every airline does not respond to the demand for payment or declines to pay, Flightright recommends each user to engage the commissioned lawyers with no further costs.

Analyzing the existent initiatives and their clustered boundaries, we foresee how to go beyond and improve our rights-based architecture. In fact, Flightright and other existing companies in the APR domain do not manage baggage incidents (delayed, missing and damaged baggage) and its corresponding rights - as we intend to use in the forthcoming future - neither incidents related to service claims (such as irresponsiveness by the airline; bad quality service; misinformation) which unleashes also disputes and legitimate grounds of redress.

Also, it should be noted that the contextualized information regarding the procedures to claim and involved institutional entities are out of the spectrum of the provision of these services, information which we assume a priori welfare-enhancing self-litigation and empowering of the decision-making process.

They do not comprehend the whole legal framework (case law, national legislation prescribing the rights), nor links to official sources that could confirm, e.g., the alleged weather conditions, strikes, security risks or political crises which entail extraordinary circumstances.

It is worthwhile to mention that the (EC) Regulation establishes *minimum* levels of assistance and compensation for passengers affected by denied boarding or by long delays or cancellations. It states a *minimum standard* of compensation regardless of the fact of an actual damage. Therefore, "further compensation" allows passengers to be compensated for the entirety of the material and non-material damage they suffered due to the failure of the air carrier to fulfill its contractual obligations. Hence, passengers shall retain the right for further claims beyond this minimum standard, through legal proceedings in court. In this regard, Article 12 stipulates that passengers are not hindered from further claims, if the damage occurred exceeds the compensation awards

²⁴ <http://www.flightright.com/>

as under Art. 7. By offering information inasmuch as these service providers are interested, encompassing a monetary estimation may seem reductant.

4) These services are again of limited help. Their course of action (stage of the process, enforcement of the claim) still depends on each airline's regulation policies and their willingness for settlement: only when air carriers are willing to settle with these service provider, the consumer succeeds.

Considering the complexity of the arguments outlined by this powerful industry, the range of extraordinary circumstances, the plethora of initiatives on the legislative agenda on air transport passenger law by the policy-makers (binding or non-binding legal information resources), we may infer that the calculus of the eventual compensation fits only the company's interests.

5. Planned Research Methodology and Future Steps

The research methodology to be followed will consist of: *i*) analysis of the legal framework concerning APR sector, doctrine and case-law; *ii*) conceptual analysis (structuring of the main concepts, from hard and soft law, to build the ontology; *iii*) knowledge acquisition - case analysis and natural language processing on complaints and consumers' requests; *iv*) definition and selection of the decision-making scenarios regarding the typologies of the most known used-cases, according to the previous step; *v*) ontology building; *vi*) end users' tests.

Regarding *the present stage of research*, in order to formalize as ontologies (within an bottom-up approach) the relevant information in the APR domain, different procedures were followed combining analytical and experimental work always considering the end users needs. To this end, hand knowledge acquisition process is described. We gathered information from the ten's largest airlines. To assemble a comprehensive representation of the ten's largest companies, we followed a criteria related to the number of passengers carried, revenue, number of passenger-kilometers flown²⁵. We analysed their current general terms and conditions of carriage (passenger and baggage), their procedures, workflow and their required web-forms alike.

We considered the legal framework related to the air transport passenger domain. We pondered the relevant legislation, including the Regulation (EC) and supporting legislation²⁶; consulting²⁷ and auxiliary²⁸ official documents were accounted for this further analysis, as well as official reports²⁹. Significant case-law from the European

²⁵ American Airlines, Air France, Delta Airlines, Lufthansa, Ryan Air, Air China, amongst others, in http://en.wikipedia.org/wiki/World's_largest_airlines

²⁶ Such as the Communication from the Commission from to the European Parliament and the Council on the application of the Regulation, COM(2011) 174 final; Commission staff working paper accompanying document to the Communication; Communication from the Commission from to the European Parliament and the Council pursuant to Article 17 of the Regulation (EC) on the operation and the results of this Regulation, COM(2007) 168 final; Communication from the Commission from to the European Parliament and the Council: A European vision for Passengers: Communication on Passenger Rights in all transport modes, COM/2011/0898 final.

²⁷ The Commission staff working document: Complaint handling and enforcement by Member States of the Air Passenger Rights Regulations [SWD(2014) 156] and the Public Consultation for the Proposal of revision of the Regulation (EC) (19/12/2011 - 11/03/2012).

²⁸ Auxiliary official documents were also accounted, like the passenger rights EU complaint form and the National competent authorities' document.

²⁹ The following reports: the Special Eurobarometer on Air Passengers' Rights and the European Consumer Centres Network Reports.

Union Court of Justice was regarded to frame the legal framework in APR sector³⁰. From the surveyed data we had access to structured and substantial information pertaining to this sector, statistics of air transport cases and their details, development comparisons concerning previous years, (un)solved cases within ADR schemes, recommendations and conclusions. The manually retrieved information was used to model the scenarios and to populate the ontologies' concepts and their dependency relationships.

Concerning the *steps ahead*, we will continuously describe the processes and the decision-making scenarios in which end users are getting involved, concretely, new typologies of incidents regarding baggage's and service and the correspondent rights, relying in a legal and empirical research (such as a database of complaints). Also as future work, it is aimed to connect the information offered and retrieved from pre-established and structured cases using natural language processing³¹. The obtained domain knowledge will be modeled, refined and represented formally in Protégé via the OWL editor, adding further complexity to the of Air Transport Passenger Incidents and Rights model (ATPIR), as classes, object properties, axioms, and the incoming ontology population.

We will also reuse terms of related legal ontologies, and will link to legal sources and official documents and websites (list of the correspondent NEBS, airline contact list, airline T&Cs, complaint form, list of banned/restricted airlines, official web pages). Legal expert validation (researchers, academics and professionals) will be regarded, as well. In order to combine the plausible information, the support system will express a model with a set of rules (possibly Legal Rule ML) which are in the process of being defined. As a complement, an initial framework implementation follows (as proof of concept tool). A simple application is envisioned that might retrieve from the knowledge base, the specific rights, according to typologies of the most used-cases in APR domain.

6. Formalization

The ATPIR model is created from scratch by eliciting practical knowledge from normative sources and complaints and it is iteratively evolving, describing actual incidents and its circumstances, tackling the complaint processing workflow and is acquainted with the applicable rights.

These pieces of information are unrelated and their analysis was split into three different domains, leading to the definition of three related OWL ontologies. The permanent, resolvable IRI of these ontologies is shown in **Erro! Fonte de referência não encontrada**.and the online documentation expresses the description of the classes, properties and . The ontologies reuses concepts defined in other related vocabularies such as the provenance ontology (PROV-O)³², the LKIF core ontology [12] and Geonames³³.

³⁰ For instance, one right consolidated in jurisprudence (and not in the (EC) Regulation) states that passengers may be entitled to compensation for flights where delay in arrival in 3 hours or more and when the delay is not due to extraordinary circumstances.

³¹ The technical implementation is going to be prompt by InfoCor, a collaborative project held between IDT-UAB and CogniCor, which works within agreement technologies, <http://www.cognicor.com/>

³² <http://www.w3.org/TR/prov-o/>

³³ <http://www.geonames.org/ontology/>

Table 1. Ontologies and their IRIs

Ontology	prefix	IRI
Flight Incident	atpir-fi	http://purl.org/NET/atpir-fi
Complaint Workflow	atpir-cw	http://purl.org/NET/atpir-cw
Flight Incident Legal Framework	atpir-filf	http://purl.org/NET/atpir-filf

i) Complaint Workflow Ontology defines the workflow upon which a consumer might bring a complaint in a valid and complete way when a dispute arises against an airline. It comprises the iterative steps, such as *a)* submitting the complaint to the airline and also to the NEB, avoiding this way irresponsiveness of the airline; and *b)* adding proof documents (and which) to sustain the redress request; it specifies the acceptable standard complaint format and also it identifies the parties involved in the management of a complaint. The defined complaint workflow seems to conform with the general procedure of the ten's largest companies. In this way we may tackle complex and tailor-made complaint handling procedures, evading difficulties encountered by passengers in enforcing their rights due to ill-defined, contingent and burdensome complaint-handling procedures that lack on-the-spot.

ii) Flight Incident Ontology expresses the main flight disruptions that frame the air transport dispute market, such as *a)* baggage incidents (delayed, damaged and missing baggage); *b)* flight incidents (delayed, cancelled, denied flights); and *c)* service incidents (unfair commercial practises, bad quality service and irresponsiveness). These categories seem to encompass the foremost of the complaints as highlighted in the main reports, surveys and case-law. Identifying the main incidents may reveal if the consumer has a case and thus if is eligible for redress (discouraging unmeritorious complaints).

iii) Flight Incident Legal Framework Ontology models the policies and the legal sources that establishes the passenger rights. Even though we modeled rights (as our perspective is user-centric), other deontic modalities are envisioned in the near future, such as sanctions, obligations, prohibitions and permissions. *PassengerRights* group encloses the entitled rights related to the cancelled, denied and delayed incidents, as defined both in the EC Regulation and in case-law (*Information, Assistance, Rerouting, Compensation, Reimbursement and Return*) and defines when and how the rights are applied, depending on a context. Subclasses of *Sources* will refer to the policies of the companies, combined with the existent legal framework (EU Air Transport Law), which is compounded of the EU Regulation, Communications and the case-law from the Court of Justice of the EU. We assume this rights-based approach may attempt to enhance the awareness of passenger's rights and to mitigate the information asymmetry.

7. Conclusion

We consider that applying a technology-assisted dispute resolution support system to this field may constitute a promising approach. The goal of the design of this intended legal support system is the delivery of relevant legal information according to the user's needs (within a social-legal perspective [13]). mainly air transport passengers, airlines, but also other stakeholders, such as NEBs, Regulators, business from the travel sector, consumer centers (like the ECC-Net), in order for them to decide by themselves to lodge a complaint to the airline, to abandon the actual claim or to adjudicate their

case in court. The use-scenarios can be deployed in a mobile application, before lodging a complaint or to lodge a complaint. To achieve this goal, structured normative sources have been demarcated and modeled in ontologies that support existing domain-specific real-world standards.

We presented the preliminary steps towards the intended system and the forthcoming work, which is in its groundstage with the limitations of an early stage proposal, but it is a footstep in the direction of the semantic web applied in the air transport passengers domain.

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