



# A Model of Air Transport Passenger Incidents and Rights



**JURIX**

The Foundation for Legal Knowledge Based Systems

Víctor Rodríguez Doncel<sup>1</sup>, Cristiana Santos<sup>2</sup>, Pompeu Casanovas<sup>23</sup>

<sup>1</sup>Ontology Engineering Group, Universidad Politécnica de Madrid

<sup>2</sup>Autonomous University of Barcelona-Institute of Law and Technology

<sup>3</sup>Royal Melbourne Institute of Technology-Centre for Applied Social Sciences

11th December 2014

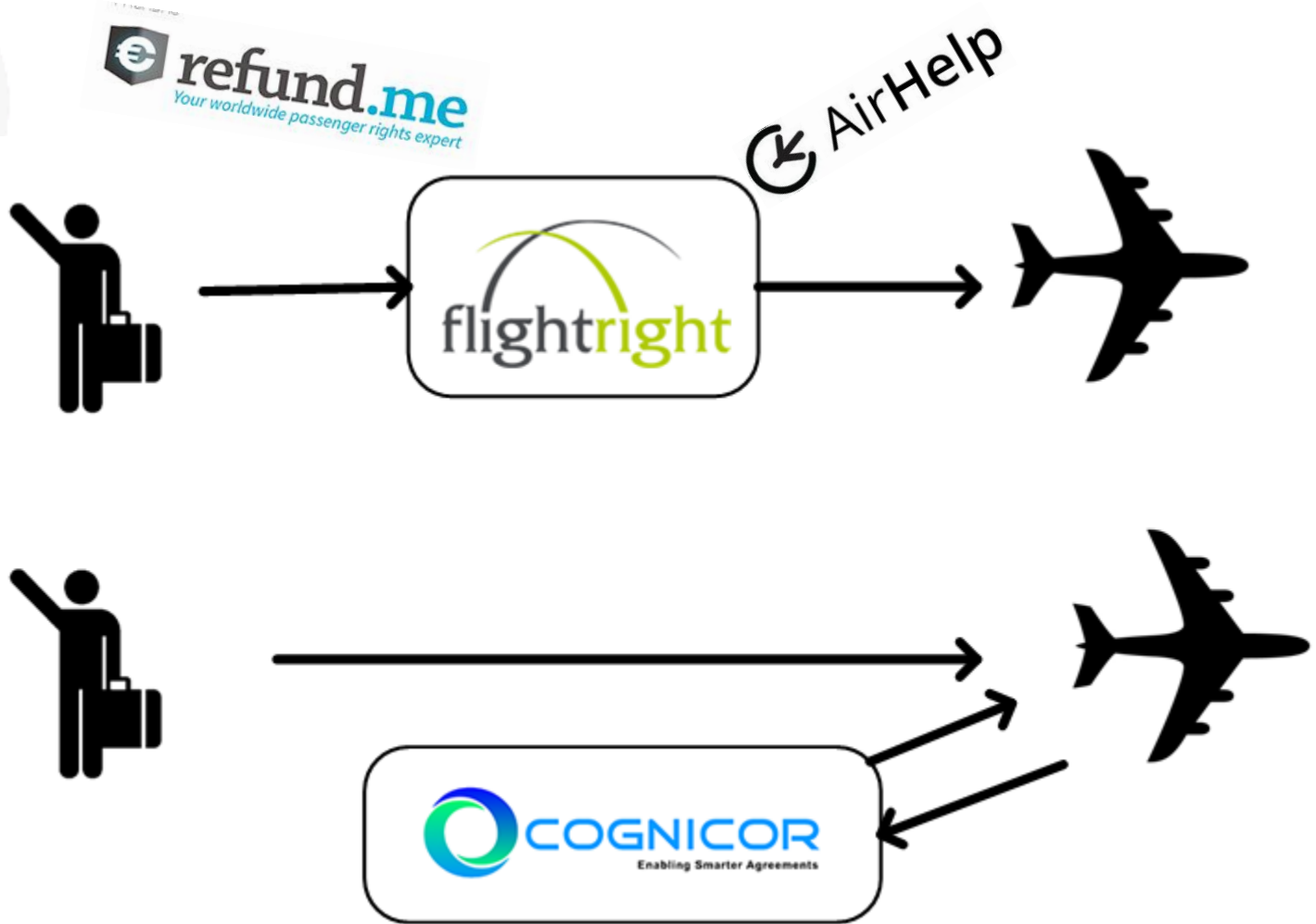


# Complaints in the Air Transport Passenger Domain

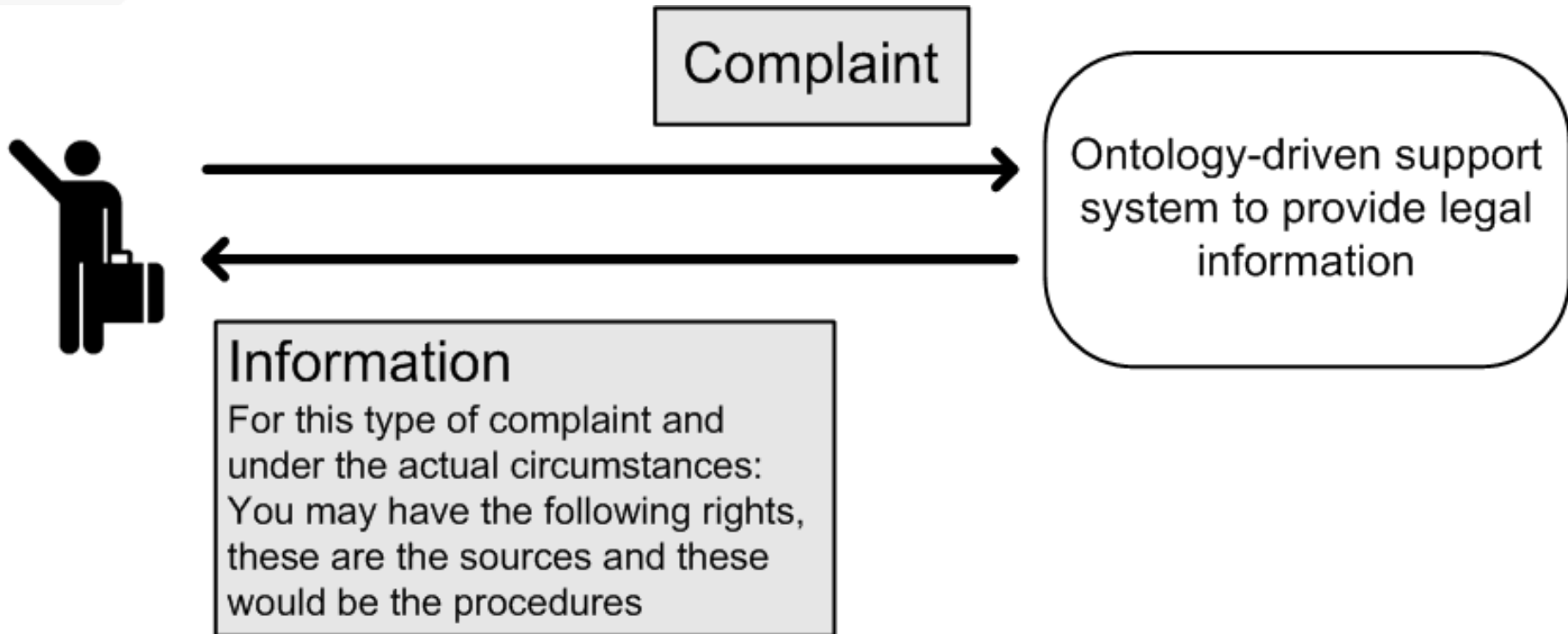


- ~ 800M passengers transported in the EU per year
- ~100k complaints received in the NEBs per year

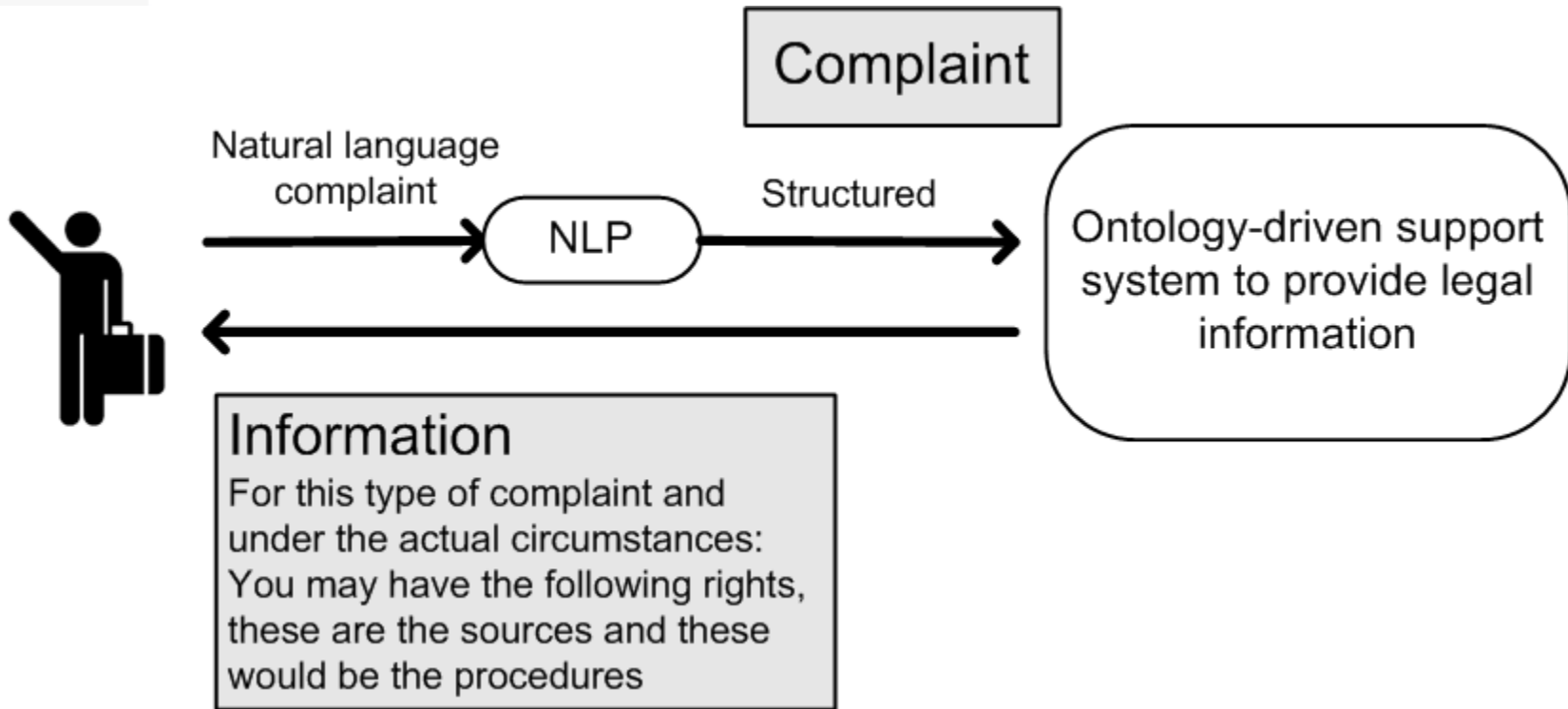
# Dispute Resolution Services vs Cognicor



# Ontology-Driven Legal Support System



# Ontology-Driven Legal Support System



Metric	Score
Refund calculation accuracy over a sample size of 60000 complaints	80%
Reduction in time spent by agent in processing complaints	60%
Reduction in time spent by a consumer with an unresolved complaint	70%
Percentage of repeat complaints processed automatically	60%
Percentage of variations of repeat complaints processed with assisted resolutions	25%

**Thesis: Ontology-driven support systems may assist in the evaluation and decision-making process. Advantages:**

- Neutrality: provide neutral information
- Transparency: the rules can become public
- Ease of update: ontologies easier to maintain than dedicated source code
- Reusability: favour the development of automated applications
- Interoperability: formalized format to represent complaints

- **Methodology:** Methontology, iterative process for the ontology design
- **Sources:**
  - **ATP legal framework:** Legislation (EU Regulation and Montreal CV); Communications from the Commission; European official surveys and annual reports; Case-law from European Court of Justice
  - **Complaint analysis** (new typologies of incidents from complex complaints and correspondent rights)
  - **Terms and Conditions** of the ten largest air carriers
- PURLs, foreseeing natively handling Enterprise Linked Data
- Rule-based system to select the information to present

- *Complaint Workflow Ontology* represents the integrative workflow upon which a passenger might bring a complaint when a dispute arises
- *Flight Incident Ontology* represents the flight disruptions that frame the air transport dispute market:
- *Flight Incident Legal Framework Ontology* models the rights-based approach. *PassengerRights* group encloses the entitled rights related to cancelled, denied and delayed incidents, as defined both in the EC Regulation and in case-law

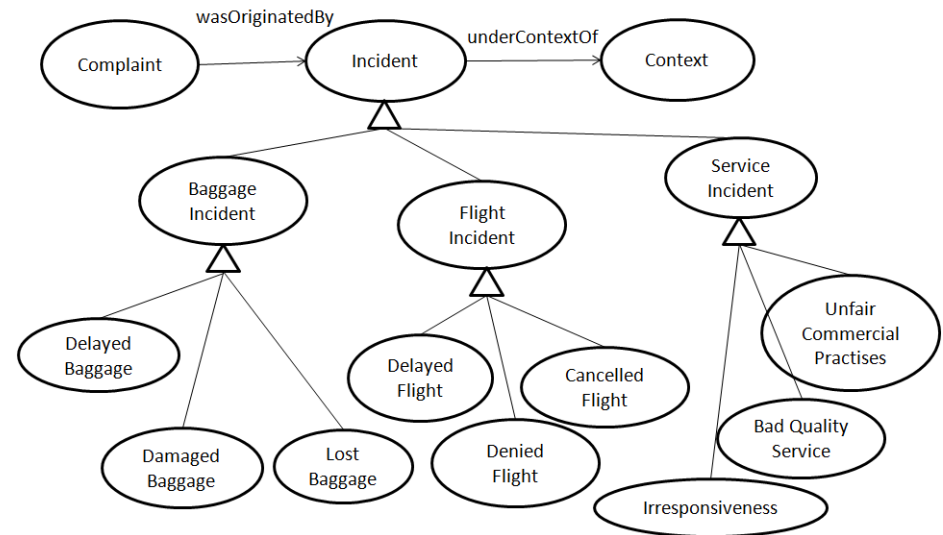
<http://purl.org/NET/atpir> ([link](#))

Ontology	prefix	IRI
Flight Incident	atpir-fi	<a href="http://purl.org/NET/atpir-fi">http://purl.org/NET/atpir-fi</a>
Complaint Workflow	atpir-cw	<a href="http://purl.org/NET/atpir-cw">http://purl.org/NET/atpir-cw</a>
Flight Incident Legal Framework	atpir-filf	<a href="http://purl.org/NET/atpir-filf">http://purl.org/NET/atpir-filf</a>

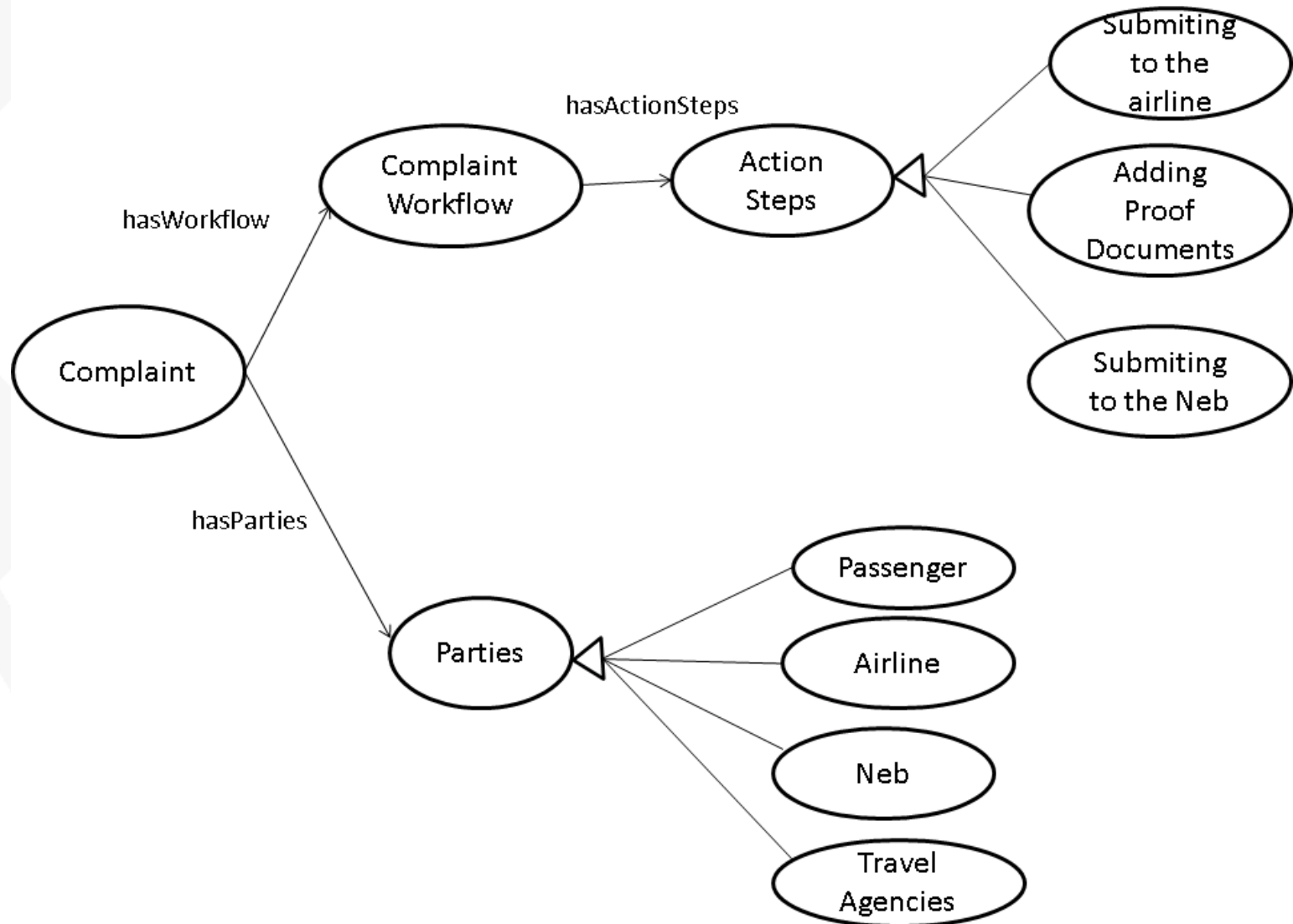


## Typology of incidents

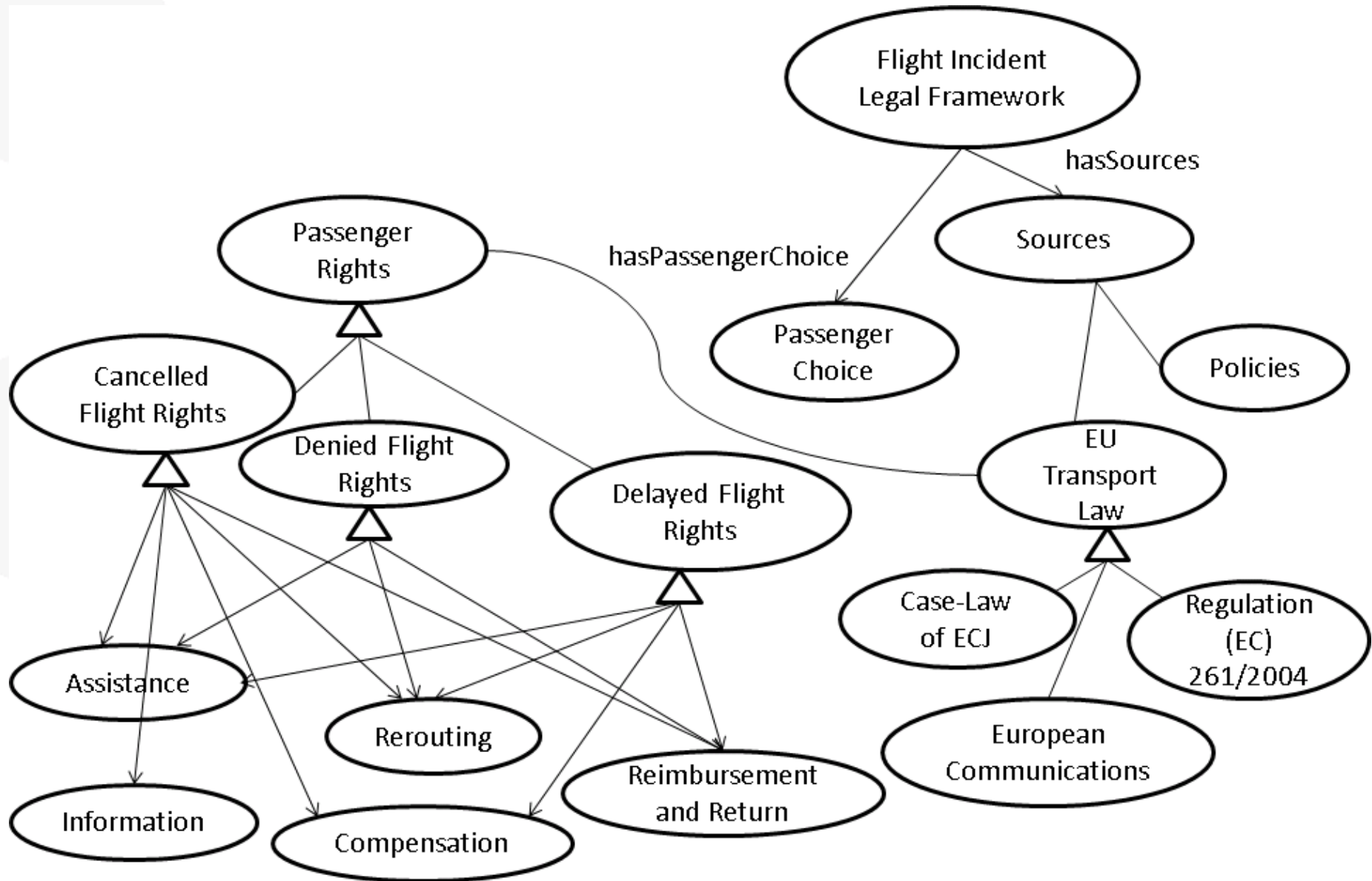
- Cancelled flights
- Delayed flights
- Denied boarding
- Baggage (delayed, damaged, lost...)
- Service incidents (transparency, quality)



# Complaint Workflow



# Flight Incident Legal Framework



*It consists in a **cancellation of a flight** regarding the air carrier xxxair, with the flight number 7473, from Eindhoven, departure time at 10.50h a.m. to Porto, with the estimated arrival time at 12.25h p.m., on the 25th of March of 2012. The passenger received an **email** on the same day, at 9.45h a.m., from the air carrier, stating that the flight was cancelled due to **extraordinary circumstances**, due to adverse weather conditions. In this email was declared the possibility to **rebook free of charge** a flight to the same destination, subject to availability. The provided flight occurred in the next day and departed from Maastricht. The consumer argues about the **transport costs, accommodation and meals**.*

```
Incident(?i) ^ hasFlight(?i, ?f) ^ IntraCommunityFlight(?f) ^
hasParty(?i, ?p) ^ CancelledFlight(?f) ^
reasonForCancellation(?x, atpir-fi:extraordinaryCircumstances)
=>rightTo(?p, :assistance) ^ rightTo(?p, :information) ^
rightTo(?p, ;refundOrRerouting)
```

## **Problems of dispute resolution services (flightright...)**

- Do not handle baggage claims, nor service complaints
- Look for their own interest, disregarding some cases
- Do not provide link to the legal sources
- Do not go beyond the minimum compensation
- Do not consider case law
- Do not consider best practices and recommendations
- Depend on the willingness of the air carrier to recognize the claimed rights

## **Problems of automatic complaint processing (Cognicor...)**

- Only consider the company's policies devoided of legal basis
- Inherently biased towards the air carrier

## Conclusions

- An ontology-driven support system brings neutrality and gathers a sparse knowledge
- We propose a **semi-automated** process because:
  - NLP and document classification tasks are fallible by nature
  - Automated reasoning is fallible due to incomplete information
- A simple approach based on definite clauses may suffice, even without the intervention of defeasible but possibly including temporal reasoning

## Future Work

- Deep linking to legal sources
- Ontology population with individuals (air carriers, etc.) and complete the list of rules
- Ontology validation from different perspectives
- More detailed handling of exceptional circumstances
- Extraordinary circumstances may be further described and related to external events whenever it is possible (list of 30 extraordinary circumstances listed)



# A Model of Air Transport Passenger Incidents and Rights



**JURIX**

The Foundation for Legal Knowledge Based Systems

Víctor Rodríguez Doncel<sup>1</sup>, Cristiana Santos<sup>2</sup>, Pompeu Casanovas<sup>23</sup>

<sup>1</sup>Ontology Engineering Group, Universidad Politécnica de Madrid

<sup>2</sup>Autonomous University of Barcelona-Institute of Law and Technology

<sup>3</sup>Royal Melbourne Institute of Technology-Centre for Applied Social Sciences

11th December 2014