Demo Version of the Pilot Tool

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2. Contributors

Partner	Name	Role	Contribution
UNIBO	Marco Billi, Giulia Grundler, Paolo Torroni	WP Participant	Automated JPOL extraction, customised detection module
UNITO	Ivan Spada, Rachele Mignone, Luigi di Caro, Davide Audrito	WP Participant	Identification of references, network analysis, automated JPOL extraction and association of JPOLs with the ontology
ORU	Magnus Kristoffersson, Eleonor Kristoffersson, Kevin Aiderfors	WP Participant	Validation of automatic extraction and JPOLs association to the ontology

Disclaimer: On behalf of APIS EUROPE, the present deliverable has been drafted by Hristo Konstantinov, Dilyana Bozhanova, Lilia Kachoreva, Boicho Georgiev, and Vasil Oreshenski.

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5. List of Acronyms

AI	Artificial Intelligence
CJEU	Court of Justice of the European Union
JPOL(s)	Judicial Principle(s) of Law
ML	Machine Learning
NLP	Natural Language Processing
OG	Official Gazette
SFS	Svensk Författningssamling (Swedish Code of Statutes)
SG	State Gazette
VAT	Value Added Tax
WP	Work package

6. Executive Summary

This deliverable illustrates the demo version of the POLINE Pilot Tool. The aim of this early version is to allow POLINE partners to present the provisional functionalities of the platform at the upcoming online test events with legal professionals in Italy, Bulgaria and Sweden, and gain feedback on its features. The received opinions and recommendations from the target users will facilitate and favour the development of the fully functional final version of the tool.

The demo version of the Pilot Tool includes three modules, which features are described in separate sections of the present deliverable. Section 8 outlines the scope of the legal content and the functionality of Legal Database Module. Section 9 presents the Link Visualisation Module and its features to provide visual representation of textual and semantic similarity between judicial principles and networks of references between decisions. Finally, Section 10 demonstrates a mock-up of the Customised Detection Module, which in its fully functional version will support users in identifying and assessing judicial principles of law on VAT in a specific decision or tax audit act.

7. Introduction

POLINE Pilot Tool is an AI-powered online service for the retrieval and analysis of judicial principles of law (JPOLs) in the case law of the CJEU and the supreme courts of Italy, Sweden and Bulgaria in VAT domain. The online service provides a multilingual user interface in four EU languages: English, Italian, Swedish and Bulgarian.

Although not yet fully developed application, the demo version of the Pilot Tool offers a clear insight into the core functionalities of the three system modules and the advantages they bring to the project's professional audience:

1) The *Legal Database Module* provides access to a multilingual database and a search engine for the retrieval of judicial principles of law extracted from the case law of the CJEU and the supreme courts of Bulgaria, Italy and Sweden in the VAT field.
2) The *Link Visualisation Module* allows a user-friendly visualisation of similar principles of law both within the same legal system and between different legal systems, and networks of decisions relevant to the judicial principle concerned based on the identification of explicit references or textual and semantic similarity.

3) The *Customised Detection Module* supports legal practitioners in identifying and assessing JPOLs in a specific VAT case by allowing users to upload a court decision and receive a customised legal assessment on the relevant JPOLs in the document at hand. In the demo version of the Pilot Tool this functionality is presented as a mock-up only.

The demo version of the Pilot Tool is freely available at https://poline-tool.eu. In the following sections, we briefly describe the content and the end-user functionality of the three modules as available at the current stage of POLINE project implementation.

8. Legal Database Module

8.1. Legal Content

The Legal Database Module of POLINE Pilot Tool provides access to a database of JPOLs extracted from decisions of the supreme courts of Bulgaria, Italy and Sweden as well as from judgments of CJEU. The JPOL collection is focused on two subdomains of VAT law – "Exemptions" and "Taxable Amount". In addition, the module provides access to the full texts of the court decisions from which the JPOLs were extracted, as well as the key legislative instruments in the field of VAT law at the EU level and in the three member states mentioned above. In the following subsections, we will briefly outline the scope of the provided legal content.

8.1.1. Judicial Principles of Law

The demo version of the Legal Database Module contains a total of 1394 JPOLs distributed among the four project jurisdictions as follows:

- European Union – 533
- Bulgaria – 445
- Italy – 222
- Sweden – 194.

Most of these JPOLs (874) are automatically extracted (annotated) from the texts of the court decisions. The JPOLs identified and annotated by legal experts of the project teams are 520 in total. These expert annotations were used for training of the ML models for automated JPOL extraction and subsequent evaluation of the results.

8.1.2. Case Law of the CJEU and the National Supreme Courts

The Legal Database Module provides indirect access to texts of the VAT-related judgments of the CJEU and the decisions of the national supreme courts of Bulgaria, Italy and Sweden. Each JPOL in the database contains a link to full text of the decision from which it was extracted. This way, the user has the opportunity to refer to the context of the JPOL and to consult the relevant facts or judicial argumentation that lead to the JPOL statement.

8.1.3. EU and National VAT Legislation

The Legal Database Module includes the most important instruments of EU and national legislations in the VAT domain. Access to these acts is ensured in section "Legislation" of the pilot tool (Figure 1).

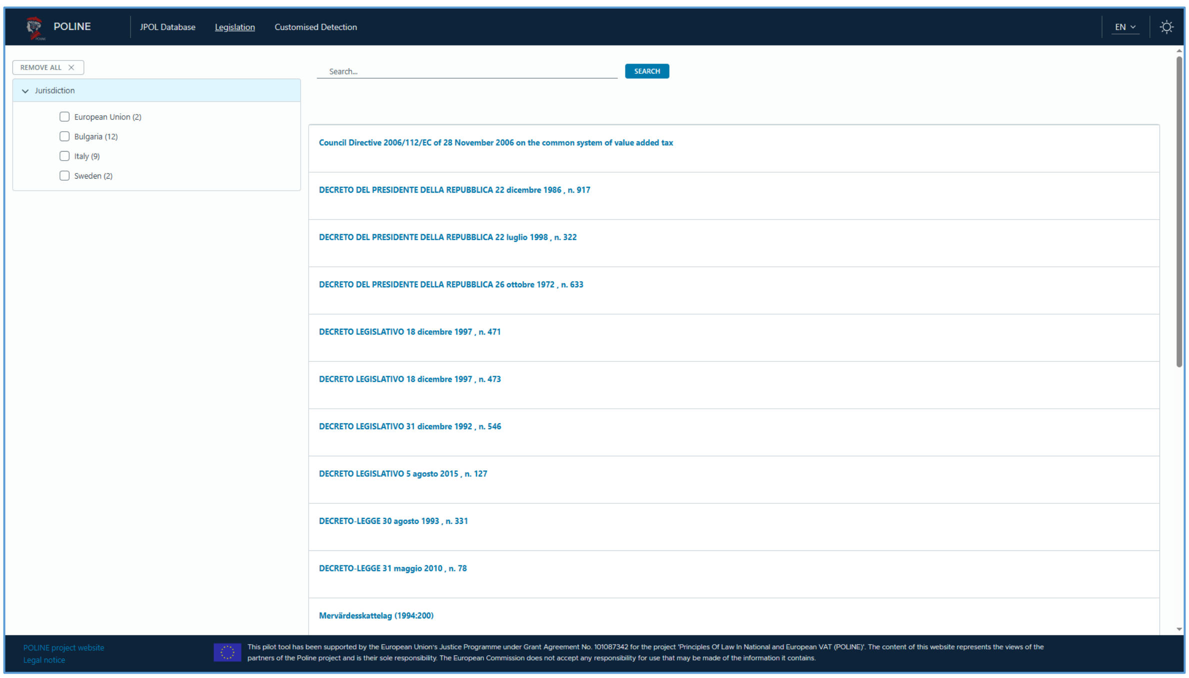

Figure 1. *View of "Legislation" section of the Pilot Tool*

The main instrument of EU legislation is the **VAT Directive** (2006/112/EC). However, a significant part of the judicial principles in the field of VAT law have already been derived from the case law of the CJEU on the application of the repealed Sixth VAT Directive (Sixth Council Directive 77/388/EEC). Accordingly, the system grants access to the provisions of the repealed directive as well.

The main legal instrument governing VAT taxation in Italy is Decree No. 633 of the President of the Republic as of 26 October 1972 (OG n. 292 of 11-11-1972 - Ordinary Suppl. 1), with all subsequent amendments, addendums and appendixes. In addition, the Legal Database Module contains also the consolidated texts of eight other instruments of Italian VAT law.

In Bulgaria, the main pieces of legislation in the area of VAT taxation are the Value Added Tax Act (promulgated, SG No. 63/4.08.2006, effective 1.01.2007) and the Regulations for Application of the Value Added Tax Act (promulgated, SG No. 76/15.09.2006, effective 01.01.2007). Users can find in the database ten other instruments of Bulgarian law among which the Tax and Social Insurance Procedure Code that sets out the proceedings rules for the ascertainment of obligations for taxes and compulsory social-insurance contributions, as well as for securing and collecting public claims, assigned to the revenue authorities and public enforcement agents.

In Sweden, the main legal instrument in the VAT field is the new Value Added Tax Act (SFS No 2023:200, promulgated on 27.04.2023). Since the case law on the repealed Value Added Tax Act (SFS 1994:200, promulgated on 30.03.1994; repealed on 01.07.2023) plays still an important role, the consolidated text of the repealed instrument will be also included in the database.

8.2. End-user Functionality and Features

The Legal Database Module serves as the entry point to the POLINE Pilot Tool, as its home page also functions as the module's home screen.

Unlike traditional legal databases that focus on providing access to the full texts of legal documents (e.g., bills, statutes, court decisions), the Legal Database Module offers users a range of useful features for exploring essential excerpts from jurisprudence (JPOLs) which are extracted from CJEU and national case law in the field of VAT. At the same time, users still may consult the full text of the court decisions and cited instruments of EU and national legislations.

The following subsections provide a brief overview of the main features of the Legal Database Module and their role in facilitating information retrieval for legal professionals.

8.2.1. Home Page

The **home page** of the Legal Database Module consist of three panels (see Figure 2):

- **Command panel** at the top of the screen with a ***command menu, buttons and a***

search box – it allows users to access the three modules of the pilot tool plus section "Legislation" from the menu commands, to select the interface language and to switch the colour scheme from light to dark, to perform searches by keywords and/or ontology concepts.

- **Filter panel** on the left side of the screen – it enables users to narrow down search results by ***filtering*** the list of displayed JPOLs by specific pre-defined criteria (filters).
- **Document list panel** on the right side of the screen – upon launching the pilot tool, this panel displays a list of all JPOLs in the database. After performing a search and/or applying filters, it presents the JPOLs that match the specified criteria.

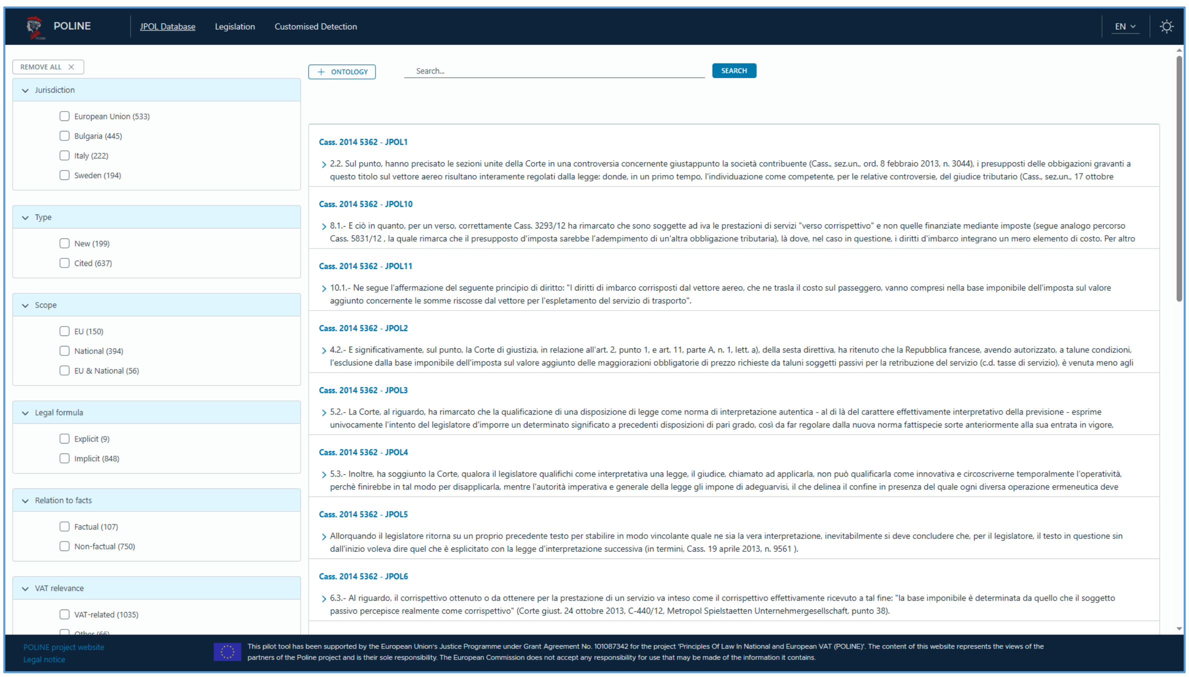

Figure 2. *Home page of the Pilot Tool and its Legal Database Module*

8.2.2. Searching and Filtering

The module allows users to enter a search query, and then filter the search results by multiple criteria (filters). The search results are displayed in a list of JPOLs on the right side of the screen below the search box. The list displays the first two lines of JPOL text, but users can easily consult the full text by clicking the stretch arrow button on the left to expand the text component (see Figure 3).

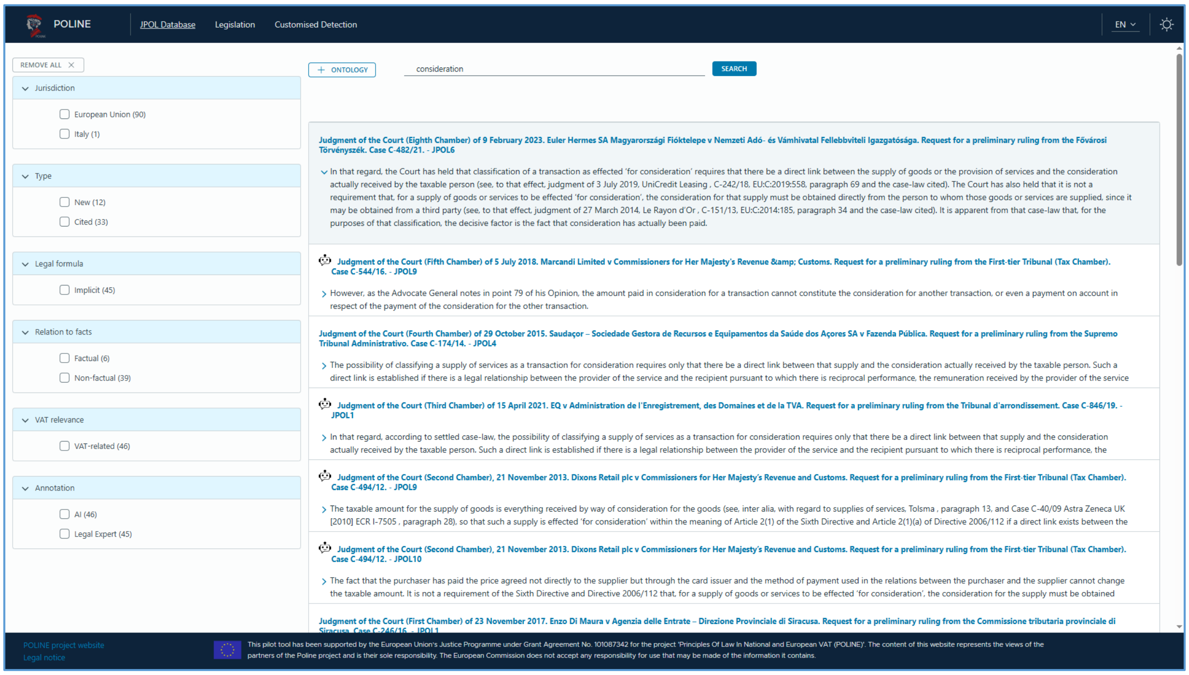

Figure 3. Stretching the text of a JPOL in a list with search results

The list of all JPOLs on the home page and the list of JPOLs generated after searching can be filtered by selecting one or more of the criteria designated as attributes in the Pilot Tool:

- *Jurisdiction* – European Union / Bulgaria / Italy / Sweden
- *Type* – New / Cited

  A JPOL is new if there is no explicit citation of previous case law, whereas a cited JPOL is such that contains a reference to a previous judgement in which that JPOL was already mentioned.
- *Scope* – EU / National / EU & National

  This applies to cited JPOLs only. A cited JPOL is national when it refers to a previous national judgement, a European one, when it refers to a previous judgement of the CJEU, and both when the cited JPOL refers to both previous EU and national decisions.
- *Legal formula* – Explicit / Implicit

  An explicit JPOL is a JPOL, which is designated (identified) as such by the court itself. This issue primarily concerns the Italian Court of Cassation, which is required under Italian law to express the 'principio di diritto' (principle of law).

- *Relation to facts* – Factual / Non-factual

  In contrast to factual JPOLs, non-factual JPOLs interpret the law, the principles of law in abstract terms, without reference to specific facts.

- *VAT relevance* – VAT-related / Other

  A JPOL is classified as VAT-related when it pertains to VAT rules. It is categorised as 'Other' (i.e., non-VAT) when it addresses different legal topics. Non-VAT JPOLs are included in the database only when they relate to general principles of the legal system or to principles governing legal interpretation.

- *Annotation* – AI / Legal Expert

  The distinction is based on the source of the JPOL annotation – whether it was performed by a legal expert or generated automatically by an AI-powered tool. Annotations created by legal experts were used to train and develop a machine-learning model capable of automating the annotation process. A robot icon in front of the title is used to easily distinguish AI-annotated JPOLs.

Filtering can be applied also for a list of JPOLs generated after using the Ontology.

8.2.3. Ontology Classification

The multilingual ontology of VAT concepts provides an advanced classification scheme for navigating the legal content of the database and retrieving relevant JPOLs. In the course of project implementation, the well-structured knowledge base of the Ontology was integrated with the JPOL extraction tool. Thus, the multilingual dataset of JPOLs was classified by relevant VAT concepts in order to empower legal professionals to navigate the complexities of VAT law with greater confidence and understanding.

In the Pilot Tool's graphical interface, the ontology is presented through a hierarchical browsing component. Users can select one or multiple ontology concepts to retrieve the relevant JPOLs (see Figure 4). In addition, the Legal Database Module enables more sophisticated and fine-grained search capabilities by allowing users to combine free-text queries with ontology-based concept selection and subsequent filtering of results.

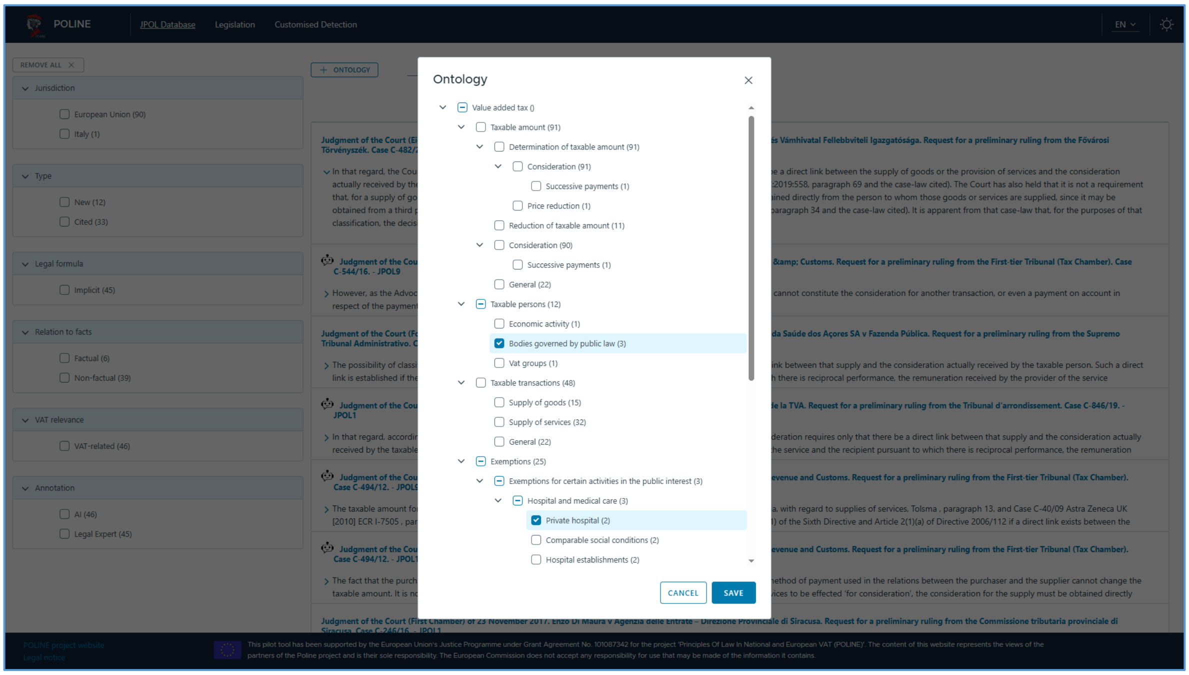

Figure 4. *View of the hierarchical ontology component with two selected concepts*

8.2.4. Exploring JPOLs and Decisions

"Judicial principle of law" (JPOL) is the main structural unit in the Pilot Tool and its Legal Database Module. It is understood as a portion of text from the argumentative part of a judicial decision providing for the interpretation of a rule or a legal principle or their application to a concrete case.

Each decision contains one or more JPOLs. Their identification was subject to manual or automated annotation activities performed within the framework of WP2 and WP3 tasks. The manual annotation was carried out by legal experts of the project partners. The results of their work and the annotation methodology are described in details in Deliverable 2.2 "First release of the corpus + draft annotation and validation guidelines". The automated JPOL extraction was performed using large language models (LLMs) whose annotation capabilities were iteratively fine-tuned by sophisticated prompt engineering techniques.

The user can access the JPOLs right from the home screen of the Legal Database Module, where they are presented as a list of elements. By selecting one or more options from the filters in the left panel, the user can filter the list, e.g. all JPOLs extracted from case law of the Italian Supreme Court of Cassation and the CJEU, which were manually annotated by a legal expert and are VAT-related. However, the primary method of searching the database for relevant JPOLs remains by executing a keyword search query and/or selecting one or more concepts from the ontology. The result from these searches can be further filtered.

The user can consult the text of each contained JPOL directly from the list. By default, the first two lines of the JPOL's text are displayed, but when it is longer, the user can see the full text using the stretch arrow button on the left.

Obviously, the full text could also be consulted by clicking the title of the JPOL and opening its text in a new window of the browser (see Figure 5).

Figure 5. *Example of a JPOL in a judgment of the Bulgarian Supreme Administrative Court*

The information about each JPOL consist of the following structural elements:

- **Title** – the JPOLs' titles are formed by the titles of the court decisions from which they were extracted and the sequential number of the respective JPOL in the text of the decision, i.e. they adhere to the following format: *[title of the decision]–[seq. number of the JPOL].*
- **Full text of the decision** – a link to the full text of the judicial decision from which the JPOL has been extracted.
- **Ontology** – one or more concepts of POLINE Ontology by which the JPOL has been classified. Each concept appears in the form of a link. Clicking the link opens a new

browser window containing a list of all JPOLs classified by that concept.

- **Text** – the full text of the JPOL as extracted from the text of the decision. The minimum length of the text of a JPOL is one sentence. Usually, the text of JPOLs consists of one or more whole paragraphs. When a paragraph is numbered, the number must be included in the JPOL's text.
- **Attributes** – these are metadata, which provide information about JPOL's assignment to the classification criteria listed in Section 8.2.2 above.
- **Cited Case-law** – a list of cited decisions of national courts and/or judgments of the CJEU.
- **Cited Legislation** – a list of cited provisions of national and/or EU legislative instruments.

The identified references to EU or national legislation and case law in the text of the JPOL and the metadata fields under the text appear in the form of clickable links leading to the cited document in the Legal Database Module (if available there) or to an external database (e.g. EUR-Lex). When pointing to the link with the mouse cursor, a hint is displayed with the text of the cited legal norm (when its text is available in the Legal Database Module) or with the exact URL to an external source.

JPOLs are closely linked to the decision from which they have been extracted. On top of JPOL's text just under the title there is a link to the "Full text of the decision". Clicking on this link opens the decision and positions the screen on the part of its text where the relevant principle of law is located. The text of the JPOL is highlighted in pale blue and surrounded by a red border. Thus, users can easily identify and explore the context of judicial arguments in which the court formulated the respective JPOL.

Quick links to all JPOLs contained in the decision text are available in the panel to the left as a table of contents. The currently selected JPOL appears in bold in the table of contents (see Figure 6).

Figure 6. *Example of a court decision with 5 identified JPOLs*

9. Link Visualisation Module

By its concept, the Link Visualisation Module has two basic functions:

- To allow users to consult and compare JPOLs that are similar to a particular judicial principle and explore textual and semantic similarities between them;
- To provide visualisation of networks of decisions relevant to the judicial principle concerned.

To achieve this goal in a user-friendly manner, the module's layout has been seamlessly integrated into the visual representation of JPOL's text and metadata page in the Legal Database Module. When a user opens a JPOL, the frame of the Link Visualisation Module appears just below the metadata fields as shown on Figure 7:

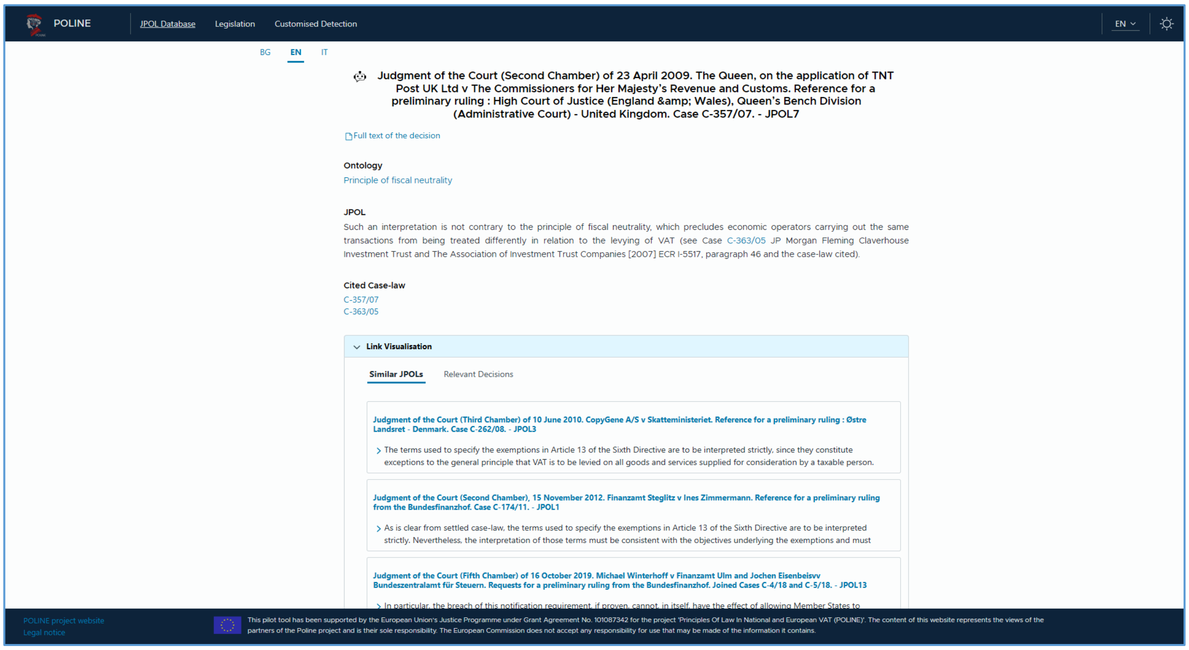

Figure 1. *The frame of the Link Visualisation Module with a list of similar JPOLs*

Firstly, the module provides a list of JPOLs that a similar to the currently viewed judicial principle. Decisions that a relevant to the JPOL at hand are displayed in a separate list within the frame of the Link Visualisation Module (Figure 8):

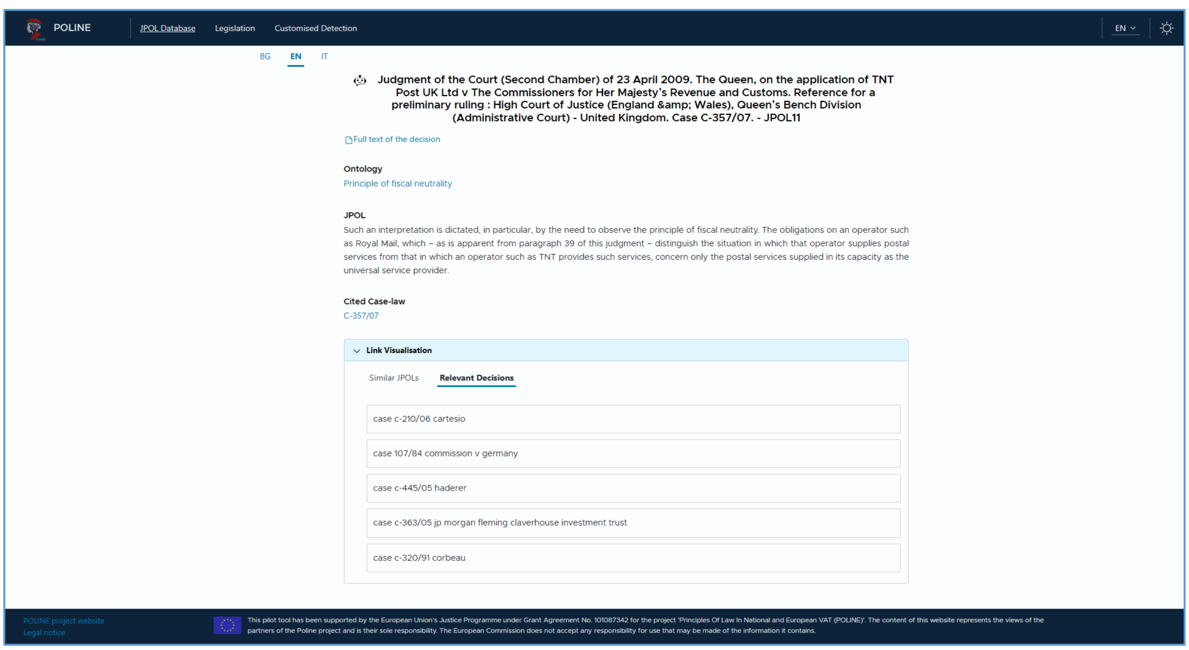

Figure 2. *A list of relevant decisions within the frame of the Link Visualisation Module*

Both lists are based on textual and semantic similarity and the identification of explicit references.

10. Customised Detection Module

The purpose of this interactive module is to provide support in identifying and assessing judicial principles of law on VAT in a specific decision uploaded by the user. In particular, the module will allow the user to upload a decision or a tax audit act and receive a customised legal assessment on the relevant JPOLs in the document at hand.

As this module is currently under intensive development, the demo version of the Pilot Tool offers only a mock-up to illustrate its future functionality. For this purpose, the text area component where the user is expected to paste the text of a particular decision or tax audit act contains by default a pre-selected sample text of a judgment of the CJEU, namely Case C-174/11 Finanzamt Steglitz v. Ines Zimmermann (Figure 9):

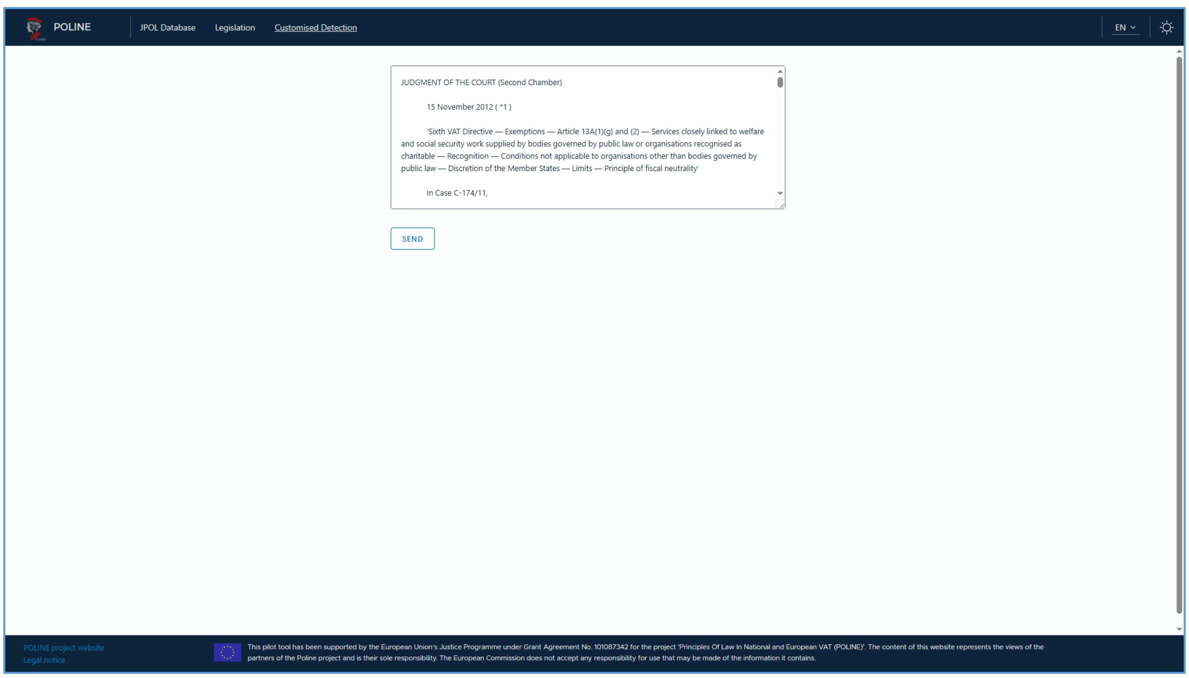

Figure 1. *Mock-up of the Customised Detection Module with a sample text of a CJEU judgment*

Upon clicking the "SEND" button, the mock-up simulates the text being sent to the ML model, the waiting period for its response, and the subsequent display of results below the judgment's text in the form of a list of extracted JPOLs (see Figure 10).

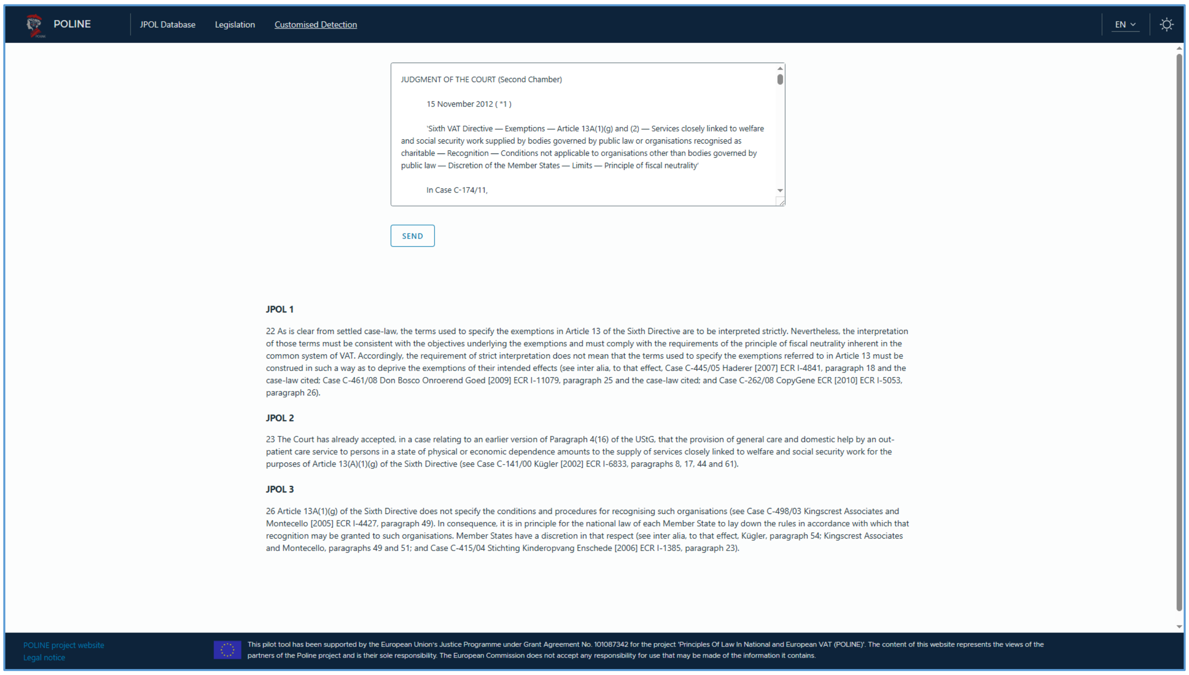

Figure 2. *A list of JPOLs extracted by the mock-up of the Customised Detection Module*

In its final implementation, the module will further allow the evaluation of the correspondence of the extracted principles with those existing at the national and EU levels, thus enabling the user to select more relevant or more recent principles.