

## D4.1

## Plugins to enable JATS XML based interoperability between OJS and Lodel

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<b>Abstract</b>	This deliverable consists of requirements analysis for interoperability and exchangeability between publishing software frameworks and implementation of extended metadata support for OJS OAI-PMH JATS-XML interface and a JATS-XML import module in Lodel. Similarly an OJS plugin was implemented to import and export TEI and JATS XML file formats bidirectionally. Implemented software solutions have been published in Github and documented for all users under free open licenses.

## Version and Revision History

Version	Date	Author/Reviewer/Contributors	Comments
0.1		Authors: Joao Martins (AMU), Ipula Ranasinghe (TIB), Jean-Christophe Souplet (AMU), Nicolas Vernot-Cortes, Dulip Withanage (TIB)	
0.2	2025.07.03	Reviewer: Antti-Jussi Nygård (TSV)	Review
0.3	2025.07.03	Reviewer: Marc Bria Ramírez (Universitat Autònoma de Barcelona)	Review
0.4	2025.07.07	Contributor: Theresa Waldmann (UGOE)	Final formal check
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## Disclaimer



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## List of Acronyms

AMU	Université d'Aix-Marseille
JATS	Journal Article Tag Suite
LTS	Long-Term Support
OJS	Open Journal Systems
TEI	Text Encoding Initiative
TIB	Technische Informationsbibliothek
XML	Extensible Markup Language
XSLT	Extensible Stylesheet Language Transformations

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# 1 EXECUTIVE SUMMARY

This document presents the results of Task T4.2, which focuses on improving interoperability between publishing platforms through the development of tools enabling seamless conversion between Journal Article Tag Suite (JATS) and Text Encoding Initiative (TEI) eXtensible Markup Language (XML) formats.

These requirements culminated in the creation of two primary tools: a plugin for Open Journal Systems (OJS) and a software bundle<sup>1</sup> for Lodel 2.0. Both implementations are designed to support bidirectional format conversion between JATS and TEI.

A broadly usable plugin for OJS was developed to streamline the conversion process between JATS 1.3<sup>2</sup> and TEI formats. This plugin has been publicly released and is compatible with OJS versions 3.3 and 3.4, providing robust, production-ready functionality. Notably, the plugin is supporting the long-term support (LTS) versions 3.3 and 3.5 ensuring sustained reliability for ongoing scholarly publishing workflows<sup>3</sup>.

On the Lodel side, OpenEdition (involved in CRAFT-OA as “AMU<sup>4</sup>”) developed the Data Interoperability Bundle, which supports both JATS to TEI and TEI to JATS conversions, tightly integrated into Lodel 2.0’s publishing processing pipeline. As the Lodel 2.0 source code is not yet publicly available, demonstration videos illustrate the functionalities.

The transformation between JATS and TEI is accomplished using Extensible Stylesheet Language Transformations (XSLT) stylesheets. These stylesheets were developed and maintained by the Métopes team, a valued partner in advancing standards-based text encoding and transformation workflows. More details about their expertise and contributions can be found on the website: <https://www.metopes.fr/>. Thanks to our requirements and work in CRAFT-OA, we were able to provide them with feedback that helped improve the conversion files.

The combination of these tools enables four new interoperability scenarios, facilitating bidirectional exchange of publication metadata and content between OJS and Lodel. These scenarios are color-coded for clarity and detailed in the report.

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<sup>1</sup> <https://symfony.com/doc/8.0/bundles.html> : A bundle, in the Symfony framework, is similar to a plugin in other software.

<sup>2</sup> <https://jats.nlm.nih.gov/archiving/>

<sup>3</sup> <https://pkp.sfu.ca/software/ojs/download/>

<sup>4</sup> <https://www.univ-amu.fr/en>



## 2 TASKS AND RESULTS

This section describes the technical outcomes of Task T4.2, starting with the tools developed for OJS (Open Journal Systems) and Lodel, followed by the four main scenarios that demonstrate how data can be exchanged between the two systems using these tools.

For data exchange, we use Journal Article Tag Suite (JATS) and Extensible Markup Language (XML) standards. JATS XML is an international and widely accepted standard for encoding the structure and metadata of scholarly journal articles using XML tags, enabling both human and machine readability. Still, JATS XML faces limitations on data interoperability between publishing systems due to inconsistent implementation across publishers using different versions or interpretations of the standard, complexity and missing support for reviewer metadata. The most recent version of JATS 1.4 (JATS Green) does not support reviewer metadata, which is a technical challenge in creating interoperable tools.

Text Encoding Initiative (TEI) is a more rich set of tags, but has a less strict validation scope. Compared to JATS XML, TEI is less used for publication workflows, making interoperability with publishing platforms and tools more challenging. Mainstream editors don't support TEI natively, and its rich markup can obscure content from search engines unless preprocessed. Multimedia and multilingual features also require extra customization for proper publication.

Under the following link you will find the conversion of TEI and JATS XML with our tools. We used the following stylesheets to convert the JATS XML to TEI.<sup>5</sup> and from TEI to JATS<sup>6</sup> This process is bidirectional and can be tested in OJS versions from 3.3 to 3.5. For JATS <https://github.com/withanage/xmlConverter/tree/stable-3.5.0/examples>

### 2.1 Tasks: plugin and bundle

#### 2.1.1 OJS plugin

Task	<b>T4.2 OJS JATS to TEI (Technische Informationsbibliothek (TIB))</b>
Subtask	OJS Plugin to convert JATS XML to TEI XML
Github issue	<a href="https://github.com/craft-oa/Interoperability/issues/1">https://github.com/craft-oa/Interoperability/issues/1</a>
Functionality	<a href="https://github.com/withanage/xmlConverter/?tab=readme-ov-file#demo">https://github.com/withanage/xmlConverter/?tab=readme-ov-file#demo</a>
Code	<a href="https://github.com/withanage/xmlConverter">https://github.com/withanage/xmlConverter</a>

<sup>5</sup> [https://github.com/withanage/xmlConverter/blob/stable-3.5.0/xslt/jatsToTei/jats\\_2\\_commons2.xsl](https://github.com/withanage/xmlConverter/blob/stable-3.5.0/xslt/jatsToTei/jats_2_commons2.xsl)

<sup>6</sup> [https://github.com/withanage/xmlConverter/blob/stable-3.5.0/xslt/teiToJats/TEI-Commons\\_to\\_JATS-Publishing.xsl](https://github.com/withanage/xmlConverter/blob/stable-3.5.0/xslt/teiToJats/TEI-Commons_to_JATS-Publishing.xsl)

Task	T4.2 OJS JATS to TEI (Technische Informationsbibliothek (TIB))
Code Review	Marc Bria
Release	<a href="https://github.com/withanage/xmlConverter/releases/tag/v1">https://github.com/withanage/xmlConverter/releases/tag/v1</a>
Status	Beta version: OJS 3.3 and OJS 3.4 Release can be used for production purposes in OJS Long-Term Support (LTS) 3.3
Installation	<a href="https://github.com/withanage/xmlConverter?tab=readme-ov-file#introduction">https://github.com/withanage/xmlConverter?tab=readme-ov-file#introduction</a>

Task	T4.2 OJS TEI to JATS (TIB)
Subtask	OJS Plugin to convert TEI XML to JATS XML
Github issue	<a href="https://github.com/craft-oa/Interoperability/issues/2">https://github.com/craft-oa/Interoperability/issues/2</a>
Functionality	<a href="https://github.com/withanage/xmlConverter/?tab=readme-ov-file#demo">https://github.com/withanage/xmlConverter/?tab=readme-ov-file#demo</a>
Code	<a href="https://github.com/withanage/xmlConverter">https://github.com/withanage/xmlConverter</a>
Release	<a href="https://github.com/withanage/xmlConverter/releases/tag/v1">https://github.com/withanage/xmlConverter/releases/tag/v1</a>
Code Review	Marc Bria
Status	Beta version: OJS 3.3 and OJS 3.4 Release can be used for production purposes in OJS LTS 3.3
Installation	<a href="https://github.com/withanage/xmlConverter?tab=readme-ov-file#introduction">https://github.com/withanage/xmlConverter?tab=readme-ov-file#introduction</a>



## 2.1.2 Lodel bundle

Task	T4.2 LODEL JATS to TEI (Université d'Aix-Marseille (AMU))
Subtask	Lodel Data Interoperability bundle to convert JATS XML to TEI XML
Github repository	<a href="https://github.com/operas-eu/lodel-data-interoperability-bundle">https://github.com/operas-eu/lodel-data-interoperability-bundle</a>
Video demonstration	<a href="https://api.nakala.fr/data/10.34847/nkl.616471b2/d8ce9ca6f4e585bf251e4103163ebe5f3a9d4166">https://api.nakala.fr/data/10.34847/nkl.616471b2/d8ce9ca6f4e585bf251e4103163ebe5f3a9d4166</a>
Code Review	Nicolas Vernot-Cortes (Lodel 2 Lead Developer)
Release	<a href="https://github.com/operas-eu/lodel-data-interoperability-bundle/releases/tag/v0.1.0">https://github.com/operas-eu/lodel-data-interoperability-bundle/releases/tag/v0.1.0</a>
Comments	Lodel 2 source code is not yet available. For this reason, the bundle cannot be tested externally to OpenEdition for the moment. That's why a demonstration video has been made.
Status	Released
Installation	<a href="https://lodel-data-interoperability-bundle.readthedocs.io/en/latest/installation.html">https://lodel-data-interoperability-bundle.readthedocs.io/en/latest/installation.html</a>

Task	T4.2 LODEL TEI to JATS (AMU)
Subtask	Lodel Data Interoperability bundle to convert TEI XML to JATS XML
Github repository	<a href="https://github.com/operas-eu/lodel-data-interoperability-bundle">https://github.com/operas-eu/lodel-data-interoperability-bundle</a>
Video demonstration	<a href="https://api.nakala.fr/data/10.34847/nkl.920amefh/667b9351964e485de87af80493931cc8a4b36292">https://api.nakala.fr/data/10.34847/nkl.920amefh/667b9351964e485de87af80493931cc8a4b36292</a>
Code Review	Nicolas Vernot-Cortes (Lodel 2 Lead Developer)
Release	<a href="https://github.com/operas-eu/lodel-data-interoperability-bundle/releases/tag/v0.2.0">https://github.com/operas-eu/lodel-data-interoperability-bundle/releases/tag/v0.2.0</a>

Comments	Lodel 2 source code is not yet available. For this reason, the bundle cannot be tested externally to OpenEdition for the moment. That's why a demonstration video has been made.
Status	Released
Installation	<a href="https://lodel-data-interoperability-bundle.readthedocs.io/en/latest/installation.html">https://lodel-data-interoperability-bundle.readthedocs.io/en/latest/installation.html</a>

## 2.2 Results: 4 new data conversion scenarios

Below is a schematic view of the four interoperability scenarios, each color-coded to distinguish the route and direction of data flow.

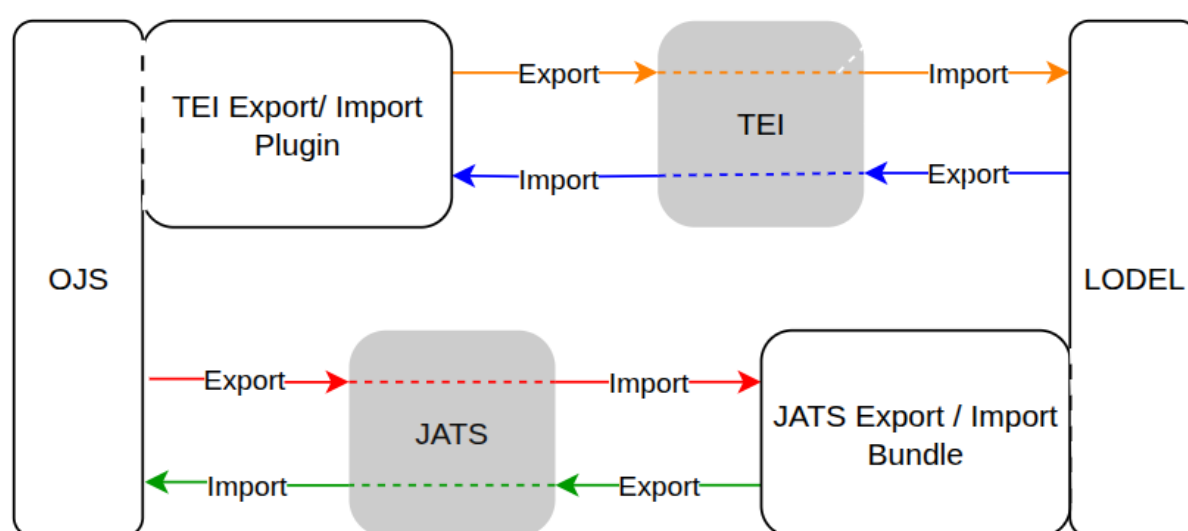


Figure 1: Schematic representation of the four interoperability scenarios between OJS and Lodel, based on JATS and TEI format

### 2.2.1 Orange (OJS plugin – TEI Export)

In the orange scenario, the TEI Export plugin within OJS is used to generate TEI-formatted files from JATS-formatted articles published in OJS. Once exported, these TEI files can be imported directly into Lodel without requiring any intermediate transformation.

### 2.2.2 Blue (OJS plugin – TEI Import)

The blue path goes in the opposite direction. It starts from Lodel, where articles are exported in TEI format. These TEI files are then handled by the TEI Import plugin in OJS, which automatically converts them into the JATS format expected by OJS. This allows content produced in Lodel to be brought into OJS and integrated seamlessly into its publishing workflow.

### 2.2.3 Red (Lodel bundle – JATS Export)

This red route begins in OJS as well, but this time it makes use of the JATS Export functionality that OJS provides by default. The resulting JATS files are then sent to Lodel, where a custom import bundle takes over. This bundle is responsible for converting the incoming JATS into well-formed TEI, suitable for Lodel's publishing environment. Once transformed, the files can be imported into Lodel.

### 2.2.4 Green (Lodel bundle – JATS Import)

Finally, the green path starts with Lodel content, which is first exported in TEI format. A custom export bundle within Lodel then transforms the TEI into JATS. The resulting JATS file can be directly imported into OJS, allowing the article body text to enter the OJS workflow without requiring additional plugin-based transformation.

## 2.3 Testing outcomes

To test the blue interoperability scenario (OJS plugin – TEI Import), a sample article was first prepared in Lodel and exported in TEI format. OJS instance with the XML Converter plugin was accessed in the article publication stage, and the TEI file was uploaded and imported using the plugin. The conversion process was closely observed as the plugin transformed the TEI into JATS XML, with attention paid to any errors or warnings.

After the conversion, the resulting JATS file was validated using a OJS JATS XML Editor<sup>7</sup> and a XML rendering viewer<sup>8</sup> to confirm structural integrity and compliance with OJS requirements. Once validated, the article was checked for correct appearance in OJS, ensuring all metadata, content, and structural elements were accurately rendered.

To ensure robustness, the process was repeated with TEI files containing complex structures such as tables and figures, and error handling was tested using malformed TEI files. The created JATS file was re-converted to TEI and compared against the original TEI file for conformity.

Further enrichments to the plugin can be later done to check the quality of the multimedia integration and the reviewer metadata.

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<sup>7</sup> <https://github.com/pkp/texture>

<sup>8</sup> <https://github.com/asmecher/lensGalley>

### 3 ACKNOWLEDGEMENTS

We would like to express our sincere gratitude to Edith Cannet and Dominique Roux from Metopes for their invaluable assistance and the fruitful exchange of information and the support regarding the XSLT files.



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- <https://pkp.sfu.ca/>
- <https://lodel.hypotheses.org/>
- <https://tei-commons-publishing.readthedocs.io/fr/latest/index.html>
- <https://jats.nlm.nih.gov/publishing/tag-library/1.3/>

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