OPERAS PLUS

On the road to sustainability: paving the way for OPERAS as an efficient open Social Sciences and Humanities scholarly communication Research Infrastructure

Design components architecture to support the translation platform

Deliverable 5.5

Delfim Leão / Bruno Silva / Nelson Ferreira
University of Coimbra | 2023.08.31

On the road to sustainability: paving the way for OPERAS as an efficient open Social Sciences and Humanities scholarly communication Research Infrastructure

Deliverable identifier	**D5.5**
Deliverable title	**Design components architecture to support the translation platform**

Grant Agreement number	:	101079608
Project acronym	:	OPERAS-PLUS
Project title	:	On the road to sustainability: paving the way for OPERAS as an efficient open Social Sciences and Humanities scholarly communication Research Infrastructure
Funding Scheme	:	HORIZON-INFRA-2021-DEV-02
Project's coordinator Organisation	:	Max Weber Stiftung – MWS
E-mail address	:	kaiser@maxweberstiftung.de
Website	:	https://www.operas-eu.org/projects/operas-plus/
WP and tasks contributing	:	WP5
WP leader	:	Sy Holsinger/OPERAS
Dissemination level	:	Public (PU)
Due date	:	2023/08/31

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

Delivery date : 2023/08/31

Authors : Delfim Leão, Bruno Silva, Nelson Ferreira/UC

Contributors : Jean-François Nominé/INIST, Janne Pölönen/Publication Forum at Federation of Finnish, Sy Holsinger/OPERAS

Digital Object Identifier (DOI) : 10.5281/zenodo.8289219

Document Log

Version	Date	Description	Name/Partner
ToC	2022-11-04	Table of Contents	Sy Holsinger/OPERAS
v0.1	2023-02-05	Initial Draft	Delfim Leão, Bruno Silva, Nelson Ferreira/UC
v0.2	2023-06-03	Feedback from Translations and Open Science project and Multilingualism SIG	Jean-François Nominé, Janne Polonen
v0.3	2023-06-16	Updated version from feedback; additional content for internal review	Delfim Leão, Bruno Silva, Nelson Ferreira/UC
v0.4	2023-07-20	Internal review complete, ready for external review	Sy Holsinger/OPERAS
v0.5	2023-08-11	External review	Alessia Smaniotto/OE, Susanna Fiorini/OPERAS
v0.6	2023-08-29	Updated and cleaned version from external review	Delfim Leão, Bruno Silva, Nelson Ferreira/UC, Sy Holsinger/OPERAS
V1.0	2023-08-31	Final version for submission	

This version has not yet been approved by the European project officer for OPERAS-PLUS.

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

Abstract

This deliverable serves as a design document that outlines the features and functionalities of a translation service platform for scholarly production, driven by the community. The platform aims to provide a collaborative environment for researchers and professionals to translate and edit scientific documents in multiple languages.

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

Contents

Document Log 3
Abstract 4
Executive summary 6
1. Introduction 7
2. Background 8
3. Value Proposition 11
4. Business Case Design 14
5. Service Design 17
5.1. Service Requirements 17
5.2. Service Architecture 19
5.3. Service Order Workflow 24
5.4. Service Acceptance Criteria 24
5.5. Service Options 26
5.6. Service Requests 26
5.7. Financial Structure 27
5.7.1. Costs 27
5.7.2. Pricing Scheme 27
5.7.3. Revenue Streams and/or Cost Recovery Measures 27
6. Service Transition Plan 28
7. Service Overview 29
7.1. Software architecture 29
7.2. Security and backups 32
7.3. Data protection 32
7.4. User interface 32
8. Conclusions 38

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

Executive summary

The following design document outlines the features and functionalities of a potential translation service platform for scholarly production, driven by the community and which pilot will be launched after this design study.

The platform aims to provide a collaborative environment for researchers and professionals to translate and edit scientific documents in multiple languages.

The platform offers user account management features such as registration, login, password reset, and profile management. It also allows users to upload documents in PDF, Microsoft Word, Open Document and translation-specific formats such as TMX, XLIFF, which can be translated into multiple languages using the platform's translation tools. Later on, the user can export the final translation into DOC, TMX and XLIFF.

The platform supports real-time collaboration between users and provides commenting and chat functionalities for efficient workflow and progress tracking. Additionally, the platform ensures that the original document is always accessible side-by-side to the translated version, and maintains version control to track changes and maintain consistency.

The platform prioritises high availability and seamless performance by ensuring robust backup and recovery plans and scalable infrastructure to accommodate a large number of users and documents. The platform also ensures data security and privacy compliance by providing authentication, authorisation, and data encryption features. To enhance usability, the platform offers an intuitive and user-friendly interface, supports multiple languages, and provides a search feature to find specific documents or collaborators easily.

Overall, this Translation Service platform provides a collaborative and secure environment for translation with a range of features to enhance usability and performance.

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

1. Introduction

The objective of this design study (D5.5) is to support the development of a future Translation Service that aims to provide a collaborative and efficient platform for translating scholarly production. This design study aims to design a "human collaborative workflow environment", which means a digital platform that is specifically designed to facilitate and support cooperation among individuals (humans) who are working together on a shared task or project. In this case, the task is collaborating on the translation of a document. The term also emphasises the interactive and cooperative nature of the platform, where users can engage, interact and collectively contribute to the translation document within a structured and organised framework. Another key objective of this study is to define strategies and methods to extract content from different types of digital documents, ensuring that the translation process is seamless and efficient. By achieving these objectives, the Translation Service will provide an intuitive and user-friendly interface that allows easy navigation and usage for all users, while ensuring high availability, scalability, and security.
The overall structure of the document follows the standardised template that OPERAS uses as part of its Service Portfolio Management (SPM) process, which was originally based on the FitSM standard template called "Service Design and Transition Package"[1]. Each of the individual OPERAS services will follow a similar structure, which will enable all content generated to be directly used within the OPERAS service management system (SMS).

Therefore, this document is structured as follows:

- Section 1: introduces the document and its structure.
- Section 2: describes the background of the service, previous funding and relevant development activities as an orientation to the service status at the start of OPERAS-PLUS and thus objectives within it.
- Section 3: outlines the value proposition including customer and user profiles.
- Section 4: presents the business case including demand assessment, assumptions, costs and risks, among others.
- Section 5: moves into the service design including service requirements, high level technical architecture, order workflows, acceptance criteria, among others.
- Section 6: briefly refers to the transition phase from a design study into a Pilot and later into the service in a live environment and the related activities and timing required.
- Section 7: provides the current status of the service along with visualisations.
- Section 8: concludes the overall document.

[1] https://www.fitsm.eu/downloads/#toggle-id-5

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

2. Background

The Design study for establishing a path to a collaborative translation service for communities of researchers, translators, publishers and students started with the conclusions from Balula, A., & Leão, D. (2021). Multilingualism within Scholarly Communication in SSH. A literature review. JLIS.It, 12(2), 88–98[2]. The identification of multilingualism as a source for potentiating access to a broader scientific community and for bringing a higher value for scientific production conducted to the idea that papers should be accessible in native languages, even when the interlocutor is not proficient in reading such languages. For that, translations by specialists on the languages of production and reception, together with proficiency in the scientific field are crucial.

However, compounding those three dimensions in just one individual is particularly hard. In that sense, collaborative translations that could have the intervention of authors/scientists, translators and the copyright owners (publishers) could favour a quite broad community.

SIG Multilingualism: in terms of theoretical background and practical approach, the work developed benefited as well greatly from the contribution given by the OPERAS Special Interest Group for Multilingualism, at two main levels:

1. Elaborate a specific Multilingualism White Paper (published in July 2021), which had a three-fold purpose:
    a. Synthesise evidence in the literature as to innovative dynamics of knowledge-sharing and scholarly communication within linguistically diverse scholarly contexts and research networks
    b. Have a better understanding of the role of multilingualism within bibliodiversity in scholarly communication, through the lens of publishers and translators/researchers
    c. Present preliminary insights into the conceptual design of a future OPERAS Translation Platform, aiming at supporting translation services at the scholarly communication level (involving publishers, translators, researchers).
2. Provide continuous feedback during the making of this Deliverable, as well as establishing links with external stakeholders that share a strategic interest in Multilingualism, and with other projects/initiatives outside the OPERAS community that are committed to promoting multilingualism in scholarly communication.

[2] https://doi.org/10.4403/jlis.it-12672

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

The design of the first pilot of the potential service is created by UC Framework. UC Framework is the technological arm of UC Next, a subsidiary of the University of Coimbra, specialising in the development of custom software solutions to support the university's digital transformation strategy. With a team of experts, UC Framework focuses on creating innovative and secure platforms tailored to the unique needs of the University of Coimbra. By developing proprietary technologies and centralising functionalities, UC Framework accelerates the development process and offers a comprehensive suite of digital solutions, including academic platforms for teachers and students, virtual communication tools and integrated management systems for various university operations. Through its commitment to technological autonomy and a holistic approach, UC Framework plays a crucial role in driving the digital evolution of the University of Coimbra.

The platform design is based on the structure of 'UC Teacher', an academic support platform for classes developed by UC Framework whose main purpose is to provide all teachers at the University of Coimbra with a tool that allows them to manage all their teaching activities. Based on its experience, UC Framework was charged with conducting a design study for a translation collaborative platform for potential OPERAS translation service.

This study considers OPERAS-P recommendations[3] and OPERAS Multilingualism White Paper[4] from July 2021, besides the inputs from two main groups, the SIG for multilingualism and the Translations and Open Science project[5]. At this exploratory stage, the corpus available for translation will be compounded by papers, books, and chapters in OA and provided by the publishers, who will be enrolled to benefit from discussions with the community for translation and improvement of all available documentation.

The GoTriple pathfinder will be used to cross objectives and be the main content provider and reference for the discovery process.

The timeline for the study includes the following main milestones:

- Starting the report with the service requirements and architecture in the week of 6 March 2023;
- Creating the initial UI mockup for the collaborative translation tool at the end of March 2023;
- Starting the development of the collaborative translation tool for the pilot in

[3] https://zenodo.org/record/5653084#.ZEbvNXbMKG6
[4] https://operas-eu.org/special-interest-group-living-book/operas-multilingualism-white-paper-june-2021/
[5] https://operas-eu.org/projects/translations-and-open-science/

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

April/May. The pilot will use already existing functionality in the UC Teacher platform to speed up the process of creating an MVP, whereas a tool to collaboratively edit and translate documents will be created from scratch. The pilot will apply all the information gathered in this design study and serve as a technical demonstration of a future OPERAS service.

This design study aims to outline a translation collaborative platform for academic communities and publishers and offers a variety of functionalities, including the possibility to create open specific communities in the platform, following topics and allowing the search for other open communities. By considering the OPERAS-P recommendations, the study will ensure that the translation platform is user-friendly and meets the needs of the scientific community.

A pilot system, integrated in University of Coimbra software ecosystem (UC Teacher), will be created after this design study and will allow users to collaboratively translate documents and provide a test basis for a future development of OPERAS collaborative translation service.

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

3. Value Proposition

User Profile	Description
(Potential) Customer of the service	Authors, professional translators and non-professional translators (community members), editors, publishers, general community members interested in following the progress of translations or in making short commentaries/contributions
(Potential) User of the service	Authors/researchers, translators, publishers and academic community members
User profile (pains/gains)	**As an Author:** I want to translate an original work into one or multiple other languages. With such a platform I'm able to share the work privately with professional translators or leverage the community to start the translation or find other translators. During the process, I'm able to comment and leave feedback on the translated document and chat with the translator or with a community that shares the same scientific interests. **As a Professional translator:** I want to provide my professional services and find new customers. I can use the community to find new projects and potentiate community awareness to my skills as a translator of academic papers on SSH. **As a Publisher:** I am looking for potential original works to publish or for opportunities to disseminate in a different language a work initially published by me.
Service Description	Translation collaborative platform within community groups is a simple online tool that brings together translators, proofreaders, and subject matter experts from around the world to work together on high-quality translations. The translation platform is designed to enable efficient collaboration and enhance the quality of translations by leveraging the collective knowledge and expertise of the community members. At the heart of the platform are communities of researchers, but also professional translators and language experts, who work together to deliver accurate, reliable translations in a wide range

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

	of languages and fields. The community members share their knowledge, experience, and insights to ensure that every translation is of the highest quality. Encourage simple specialist-to-specialist collaborations, starting from different native languages, while fostering reciprocal collaborative relationships without any commercial relationship.
Service Area	Multilingualism
Service tags	Translation, Collaborative writing/translation, Multilingualism, Academic community, Language experts, Professional translators, Language localisation, Subject matter experts, Proofreading, Language services, Open science
Value Proposition (pain relievers / gain creators)	**Pain Relievers:** • Reduce the time spent searching for suitable individual translators by facilitating the process of finding subject matter experts for translations of scientific works and through the networking generated by communities. • Manage multiple review or translation projects. • Avoid wasting time and money on poor quality translations that require additional proofreading and editing. • Prevent delays in translation projects due to lack of availability of translators. • Enhance attention to confidentiality and data security. **Gain Creators:** • Boost the collaboration with a community of professional translators and subject matter experts to deliver high-quality translations. • Stimulate access to a diverse range of language experts and translation resources to ensure accurate and reliable translations. • Faster turnaround times and ability to meet tight deadlines, ensuring timely delivery of translations. • Improved efficiency and productivity through streamlined project management and cloud-based tools.

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

	• Improved global communication and expanded outreach through multilingual translation service.
Tagline	Collaborate with the community of experts in certain scientific areas and with language experts to unlock global scientific output and communication through accurate translations and enhance multilingualism in the academic community as a value resource instead of a restrain.
Service Criticality	**Mission Critical:** In cases where the translation of scientific papers is essential for critical research, argumentation assessment, evaluation by funders or regulatory purposes, the service may be considered mission critical. e.g.: if a scientific organisation needs to translate research papers to get regulatory approval or for presenting their findings in a conference, the service becomes critical to their mission. Young researchers and small publishers with limited resources can also collaborate with each other in order to provide mutual services in the form of enhancing multilingualism from their native languages and the subjects they specialise in. **Value Add:** In cases where translation of scientific papers adds value to the research or academic work but is not essential for mission-critical or business-critical purposes, the service may be considered added value. e.g.: researchers may require translations of papers to gain insights into research in different regions or to support their own research work; on the other side, researchers may have access to critical research written in languages which he/she cannot read. **Other:** The criticality level of the service may also depend on the specific needs of the user. For example, students/researchers may require translations of scientific papers to improve their understanding of the subject matter, but the service may not be critical in this case.
EOSC Marketplace	After development of the service, i.e. once the pilot is tested by communities and transformed into a beta version.

Table 1: Value Proposition Design

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

4. Business Case Design

	Best Case	Average Case	Worst Case
Demand assessment	High demand from the scientific community, translators, disseminators and students for an accurate and collaborative translation platform, resulting in a significant increase in users and projects. (8k - 12k registered users, Extrapolation from ELIS 2022[6], considering 5% of 180,000 translators -> 8k - 12k.) For the pilot/test phase, we will make the service globally available for the UC community (ca. 25k students and teachers/researchers at the institution: ca. 1/3 of them are from the SSH areas)	Moderate demand from the scientific community, resulting in steady user growth and projects. (1k - 2k registered users), but a reasonable demand from translators communities' already enrolled in platforms or federations for dissemination of their works (c. 200-300 considering french and portuguese national contexts, extrapolation from registers in Société française des traducteurs (SFT)[7], in ATESS[8], in APT[9], and federations an communities in FIT[10]) that can work as beacons to	Low demand from the scientific community, resulting in minimal user growth and limited projects. (100 - 200 registered users). The worst-case scenario users would be 5% of UC community: 1,815 teachers, 311 researchers, 384 Researchers with fellowships = 2495 possible interested people - 5% -> 124 users -> 100 - 200

[6] https://fit-europe-rc.org/wp-content/uploads/2022/03/ELIS-2022_survey_results_final_report.pdf
[7] https://www.sft.fr/fr/trouver-votre-prestataire-linguistique?f%5B0%5D=domaine_activite%3A148
[8] https://www.atessfrance.org/membres
[9] https://www.apt.pt/
[10] https://en.fit-ift.org/

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

		publishers and other users	
Assumptions (about uptake)	High uptake due to positive user feedback and word-of-mouth recommendations, resulting in a significant increase in user engagement (5% increase users month-to-month)	Moderate uptake, with steady user engagement and moderate feedback. (2% increase users month-to-month)	Low uptake due to limited user engagement and negative feedback, resulting in a decrease in users. (1% increase users month-to-month)
Expected organisational impact	Increased organisational efficiency and productivity due to the collaborative nature of the translation platform, resulting in significant improvements in scientific communication and research	Moderate organisational impact, with steady improvements in scientific communication and research	Limited organisational impact due to limited user engagement and adoption
Expected Cost	Moderate initial development and implementation costs, with ongoing maintenance costs	Steady development and implementation costs, with ongoing maintenance costs	High initial development and implementation costs, with ongoing maintenance costs
Expected Revenue / Cost Recovery	Additional project funding will be required if the service is expected to be further developed from the Pilot stage. OPERAS central funding should also be explored.		

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

Risks	Controlled risks of service disruption due to high demand and uptake, resulting in minimal setbacks.	Moderate risks, including limited user engagement and adoption and increased competition.	High risks due to low demand and uptake, limited user engagement and adoption, and increased competition.
Supplier Evaluation	The success of the translation collaborative platform will rely heavily on the selection of high-quality suppliers and partners who have extensive experience in translation and collaboration services. The suppliers' expertise and support will be critical in the seamless development and implementation of the platform.		
Constraints / limiting factors	Various constraints and limiting factors may impact the platform's success, including limited resources and funding for development and implementation, technical difficulties in the platform development, and limited user adoption.		
Competitors and/or similar services	Competitors like Phrase[11] and Smartcat[12] offer similar services for translation and collaboration platforms. However, the platform's unique features and capabilities, such as the integration of chat and group communities, intuitive graphical interface, open documents that allow community members to give feedback and be part of the translation process, distinguishes it from the competition.		
Pricing and/or Access Policy	The pricing and access policies will play a critical role in determining the platform's sustainability and user adoption. Fair pricing and flexible access policies are likely to result in high user adoption and revenue. The service will consider a freemium version for those who want to use it more widely and a premium version that may grant access to special features. Access policy and pricing is dependent on development of the platform from pilot version into a platform.		

Table 2: Business Case Design

[11] https://phrase.com/
[12] https://www.smartcat.com/

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

5. Service Design

5.1. Service Requirements

Functional and technical	**User Account Management:** The service should allow users to create and manage their accounts, including registration, login, password reset, and profile management. **Document Upload:** Users should be able to upload the document they wish to translate and should be able to access the document for editing and translation. **Translation Tools:** The service should provide a way to create versions of the document in other languages. **Collaborative Editing:** Users should be able to collaborate on the same document in almost real-time, and changes made by one user should be visible to others. **Commenting:** Users should be able to comment on the document and provide feedback, suggestions, and corrections to improve the translation quality. A user must have editing permissions to be able to edit the text directly. If not, the user can only create/add notes (think that it will be similar to Google docs). **Chat:** Users of a community or group should be able to communicate with others through an integrated chat system. **Original Document Access:** The original document should always be accessible side by side to the translated version. **Version Control:** The service should maintain version history of the translated document to track changes and maintain consistency. Technical requirements: - VueJS, for the frontend development - FastAPI, with python for the backend

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

	- Containerisation with Docker for development and orchestration of the microservices architecture with Kubernetes - Load balancer to distribute load between microservices - Cache, like Redis, to speed up data reads - Postgres for database
Availability, continuity and performance-related	**Uptime:** The service should have high availability (95-98%) with minimum downtime and interruptions; **Scalability:** The service should be scalable to accommodate a large number of users and documents. By using a distributed architecture with microservices and a load balancer we can ensure high availability and scalability without any major setbacks. **Backup and Recovery:** The service should have a robust backup and recovery plan to avoid data loss and ensure continuity. **Performance:** The service should provide fast and responsive performance for seamless collaboration.
Security and data protection-related	**Authentication:** The service should authenticate users and ensure that only authorised users have access to the documents (using OPERAS ID). **Authorisation:** The service should provide different levels of access and authorisation to users based on their roles and responsibilities. **Data Encryption:** The service should encrypt data in transit and to ensure data protection. **Data Privacy:** The service should comply with data privacy regulations such as GDPR.
Usability-related	• Have an intuitive and user-friendly interface that allows easy navigation and usage for all users.

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

	• Support multiple languages to cater to a diverse user base and enable the translation of documents in different languages. • Allow users to upload, download, and edit documents. • Enable users to comment on specific sections of the document, highlighting the areas that need translation, correction or improvement. • Have a notification system that alerts users about new comments, translations, and document updates. • Offer a chat feature that allows real-time communication between collaborators for efficient workflow and progress tracking. • Provide a search feature that allows users to find specific documents or collaborators easily. • Provide document version control and revision history to ensure that collaborators are working on the latest version of the document.
Organisational	• Have a role-based access control system that allows different levels of access and permissions to the documents based on user roles. • Have a system for user authentication and authorisation to ensure the security and confidentiality of documents.
Data sources	The service should have a database of publishers and translators with whom users can collaborate for translation projects. The service should connect with goTriple API to: • Find and discover other researchers and projects across disciplinary, cultural and language boundaries; • Discover and reuse open scholarly SSH resources

Table 3: Service Requirements

5.2. Service Architecture

High-level service architecture	Type	Service Components	Description	Suppliers	TRL

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

	Enabling	OPERAS ID	Centralised identity management and single sign-on by OPERAS	OPERAS	9
	Enabling	Chat Service	Facilitates communication between collaborators. Provides real-time chat functionality.	TBD	1
	Enabling	Notifications Service	Sends e-mail and push notifications. i.e. a new post in a community the user follows or a comment in a document created by the user.	TBD	1
	Enabling	Communities Service	Creates and manages usage of communities and groups.	TBD	1
	Enabling	File Storage Service	Stores and saves all of the uploaded files (in a group, community or chat)	TBD	1
	Enabling	Comments Service	Allows a user to comment on any	TBD	1

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

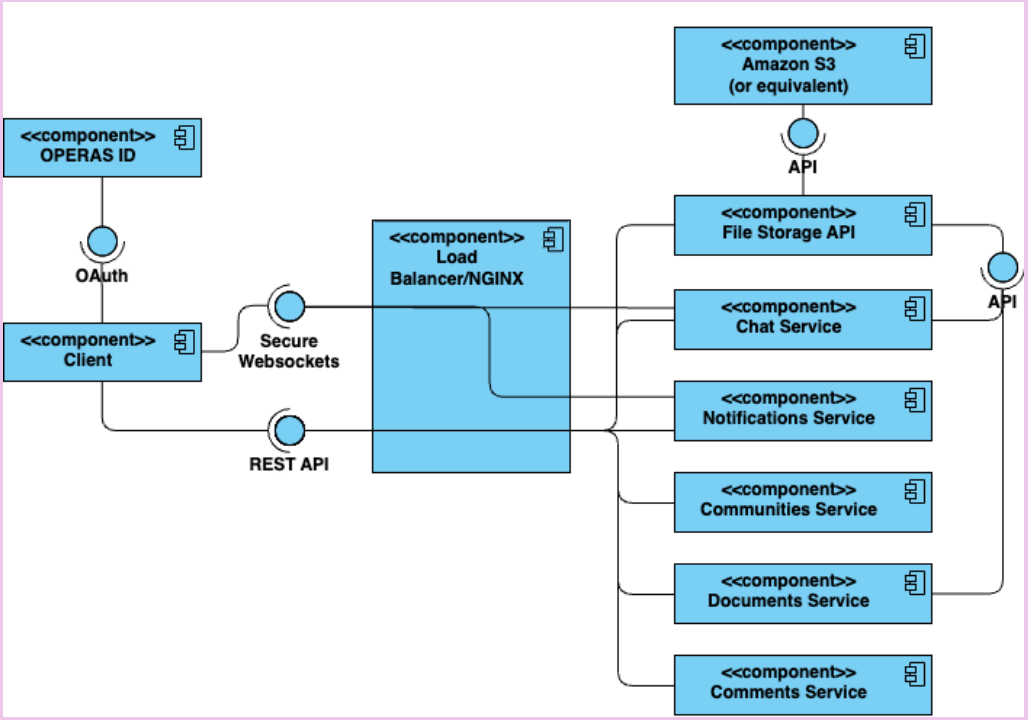
			document block or reply to any comment. Gives feedback by using reactions or other people's comments.		
	Enabling	Documents Service	Allows for collaborative editing of a document and to translate it into multiple languages. Version control and permission management for documents.	TBD	1
Technical service architecture					

Figure 1: Component diagram with the different microservices and external services used by the platform

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

	The use of microservices allow both vertical and horizontal scaling which can ensure a high availability and scalability as the user base grows. All microservices will have an active load balancer in front of them that will allow for quick reaction into pointing the users to an healthy node in case of failure and spread the load equally between machines. The notifications, the chat and documents editor services will use Websockets to broadcast changes to the client in real time to a user or group of users. SSL encryption will ensure security of the data in transit between the server and client.				
Service Dependencies	**Service**	**Description**	**Organisation**	**Component Criticality**	**TRL**
	OPERAS ID	Centralised identity management and single sign-on by OPERAS	OPERAS	High	9
	Cloud hosting provider	The deployment of our service should be done in a certified cloud hosting provider. It will ensure the continuous delivery of our service	Amazon AWS Google Cloud Digital Ocean	High	9
	CDN	A content delivery network will ensure the fast delivery of static content	Amazon CloudFront Cloudflare Akamai	Medium	9

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

	Static file storage	Uploaded files should be stored in a service that will persist them in time	Amazon S3 Cloudflare R2	High	9
	GoTriple	Platform to discover and reuse open scholarly SSH resources and find peers.	TRIPLE	Medium	9
Monitoring	For monitoring the usage and health of our service, we will be using Grafana with custom alerts. Grafana is a popular open-source platform that provides real-time visualisation and analysis of metrics and logs. It integrates with a variety of data sources and provides a customisable dashboard that allows us to monitor the performance of our service and detect any issues that may arise. Using Grafana, we will be able to monitor key metrics such as server response time, resource utilisation, and request throughput. We will also be able to track user activity, such as the number of active users, documents being translated, and comments being made. By monitoring these metrics, we will be able to identify any performance issues or bottlenecks that may impact the user experience. In addition to monitoring, we will set up custom alerts to notify us in real-time when any critical events or issues occur. These alerts will be based on pre-defined thresholds and triggers, such as a sudden spike in traffic or a drop in server availability. By setting up custom alerts, we will be able to respond to issues quickly and minimise any impact on our users.				

Table 4: Service Architecture

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

5.3. Service Order Workflow

Step	Role	Description
1	Author / copyright owner	Translates work into another language. Uploads work and shares the document link to a professional translator that will translate the work. At any point, can see the progress of the work, comment and guide it. Shares the same link to different translators to translate into different languages at the same time.
2	Translator	Uses the platform to translate the original work into another language Gets feedback and chats with the author.
3	Author / copyright owner	Uses the potential of the community to get help with the translation. Uploads original document and shares it with a specific community. The community is free to translate, comment or help with the progress of the translation.
4	Community member	Reads new scientific papers from the community and optionally helps with the translation and grants access to that knowledge in a different language.
5	Service Owner	Provides the platform for open collaboration in the translation of scientific papers.

Table 5: Service Order Workflow

5.4. Service Acceptance Criteria

Category	Acceptance Criteria	Critical	Achieved
Functional and technical acceptance	The platform should support multiple target languages and allow collaboration between translators. It should allow the users to communicate using private	Yes	–

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

	messages and leave comments on specific sections of the document.		
Service Level and Reporting	The platform should maintain an uptime of at least 99.5% during peak hours. A monitoring system should be in place to notify the support team of any disruption of the service.	Yes	–
Customer and supplier related	Easy-to-use interfaces	Yes	–
Capacity, availability, and performance-related	The platform should be able to handle a large number of simultaneous users and translations. It should support scaling during periods of high demand. The system should provide fast response times.	No	–
Security and data protection-related	The platform should adhere to industry-standard data protection and privacy regulations, like GDPR. It should have robust authentication and access management tools to prevent unauthorised access. Regular security audits should be conducted to identify and mitigate potential risks.	Yes	–
Support related	Support should be available in multiple languages to cater to the global user base.	No	–
Configuration, change and release related	Regular updates and feature releases should be planned and communicated to the community.	No	–
Usability related	The platform should have a user-friendly interface that is easily accessible and navigable for users of	No	–

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

	various backgrounds and experience levels.		
Organisational	Minimum level of personnel identified and allocated		–
Other	N/A	–	–

Table 6: Service Acceptance Criteria

5.5. Service Options

#	Name	Description
1	Free tier	Free of charge access to all main features of the collaborative platform and storage.
2	Premium subscription	Special features added to the regular service i.e. extra storage space, translation into more languages using integrated automatic translation tools and others to be defined.

Table 7: Service Options

5.6. Service Requests

#	Name	Description
1	Profile Registration	Request for registration and creation of a user profile.
2	Community Join/Create	Request for joining an existing community or creating a new translation community for a specific language or domain.
3	Projects Exploration	Request for viewing available documents and projects for translation within a community.
4	Member Messaging	Request for communication and discussion with other community members through private messages.
5	Technical Support	Request for technical support and troubleshooting issues related to the use of the platform, such as

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

		connection problems, user interface glitches, or software bugs.
6	Export & Archive	Request for exporting and archiving completed translation projects in various document formats.
7	Privacy & Compliance Inquiry	Request for information about the platform's data privacy, security safeguards, and compliance with relevant regulations and industry standards.

Table 8: Service Requests

5.7. Financial Structure

5.7.1. Costs

As this is a design study, the below costs estimate the development effort for implementing the service along with some moderate operational costs. Marketing and communication costs are not being considered.

Item	Cost (PM or €)
2024	€68,400 (1 FTE): 9 PMs (development) + 3 PMs (operations and maintenance (at an average PM rate of €5700)
2025	€34,200 (0.5 FTE): Less development required, but higher focus on outreach and support, together with marketing procedures.

Table 9: Service Costs

5.7.2. Pricing Scheme

Item	Price
Freemium	It is anticipated that the service would be offered free at point of delivery, however, a freemium model could be feasible for the service i.e. extra storage space, translation into more languages using integrated automatic translation tools and others to be defined.

Table 10: Pricing Scheme

5.7.3. Revenue Streams and/or Cost Recovery Measures

Revenue Source	Expected revenue (if applicable) Amount or a % of costs	Additional Info

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

EU funded projects	1 FTE	Identification of an EU funded project might be necessary for the realisation of the service to be developed.
OPERAS	TBD	Some funding from OPERAS central budget could also be explored
Community	In-kind	In-kind effort from the community, potentially via the OPERAS Innovation Lab could be explored.

Table 11: Revenue Streams and/or Cost Recovery Measures

6. Service Transition Plan

For the pilot testing phase: a collaboration is being considered with the section of Translation Studies from the Faculty of Arts and Humanities at Coimbra University (Master and PhD levels) in order to stimulate a more focussed users group, but the translation service is intended to be made globally available for a community of ca. 25k students and teachers/researchers at the institution, of which ca. 1/3 are from the SSH areas.

Future developments: The service should be scalable to accommodate a large number of users, documents, and to develop further functionalities, but this will depend on the results of the pilot testing phase and on the ability to attract additional project funding, combined with OPERAS central support.

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

7. Service Overview

In the following section, we describe the software architecture and user interface of the proposed platform.

7.1. Software architecture

In order to achieve availability and scalability of the system the proposed architecture follows a microservice pattern, where services are independent and responsible for a specific set of features:

- Authentication using OPERAS ID (external service)
- Chat service
- Notifications service
- Communities service
- File Storage service
- Comments service
- Documents service

Check Service Architecture section 5.2 for a detailed description of each microservice.

For each service we will have: an application & business logic layer developed using FastAPI framework and python and a database layer proposed as a relational database (for example Postgres). The database should be deployed in different machines in order to be accessible from different instances of the same service.

For the frontend we propose using a modern framework, like VueJS.

In the following diagram (Figure 2) is a generic view of a service with its different layers:

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

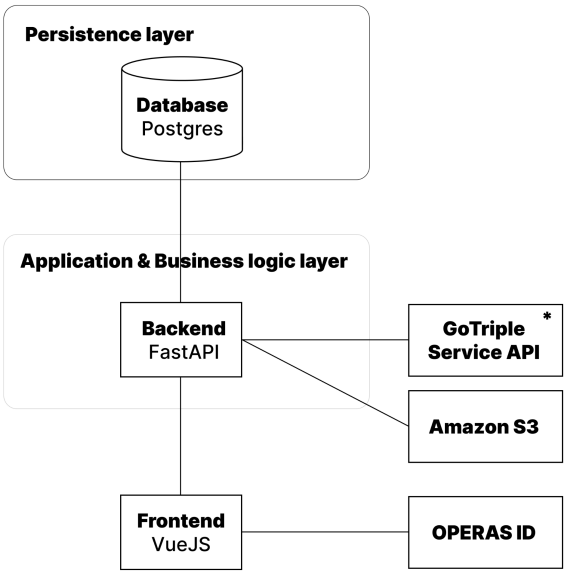


Figure 2: Service overview

*GoTiple will be used by the “Communities API” service to identify authors and publications.

In order to have a constant environment between developers during the development phase and in a later phase to be easily deployable, we suggest the use of Docker for containerisation.

Next is a proposal for the deployment diagram using containerisation which will allow horizontal scaling of services as needed. We suggest the use of Kubernetes for orchestration in conjunction with a cloud hosting provider, like Amazon AWS, Google Cloud, Digital Ocean or others.

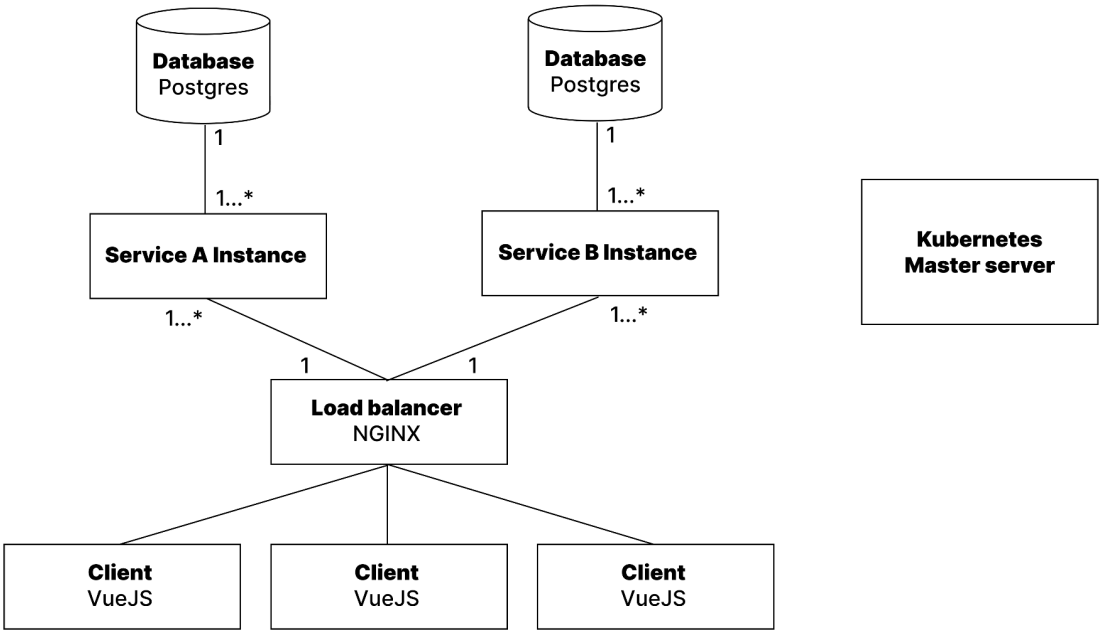


Figure 3: Deployment diagram with multiple instances of a service, shared database and load balancer between the backend and frontend

We will use an active-active load balancer (nginx) to check the health of each service and ensure that a user request is directed to a healthy machine that can provide the service. This tactic will ensure the high-availability and scalability of the service. Optionally, we might consider a second load-balancer to avoid having a single point of failure.

Each service should have at least one instance constantly running, being able to scale up horizontally when needed. The kubernetes master service is responsible for orchestrating new resources and checking the overall system health. This is also used by the devops team to manage or change configurations of the system. All services should run in a private network only accessible to the public by the load-balancer. For management and maintenance the devops team should use a VPN to have access to the kubernetes master server or any of the services or databases.

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

7.2. Security and backups

To achieve the security of data in transit, all communications between the clients and load-balancer will be encrypted with HTTPS/SSL connections. For live communications we will use WWS (WebSockets over SSL/TLS). As mentioned before, all microservices, databases and orchestration servers will run in a private network only publicly accessible from the load-balancers or using a VPN for administration processes.

In order to increase security and reduce the possible attack surface, all the accounts information will be managed and stored in OPERAS ID.

Backups should be done hourly for all databases of the system and saved in a remote location and different datacenter, so in case of a failure or ransomware attack they can be restored without much impact on the state of the platform. We also recommend creating a continuous backup using WAL Archiving to ensure minimal data loss. Amazon S3 backups should also happen every hour.

7.3. Data protection

We will ensure to respect the European General Data Protection Regulation by asking consent and describing the data required from a user. The information required to create an account will be the user name, e-mail and organisation, which do not require any special measures (such as health data or banking information).

For payment processing, if the stakeholders agree to charge for the service, it will be provided by an external entity (i.e. Stripe[13]), which follows and implements all the needed regulation. On our databases we will never store any credit cards or payments information, having only a reference to the payment method used.

7.4. User interface

Initial mockups for the collaborative translation editor that allows an user to translate a document into multiple languages can be seen in the following figures.

In Figure 4, the user can add blocks of content or a new page. To save, the user must press the green save button on the right top corner. The user has available multiple actions, such as: share document, approve current version or lock document edition (depending on the permissions) or delete the document.

[13] https://stripe.com/

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

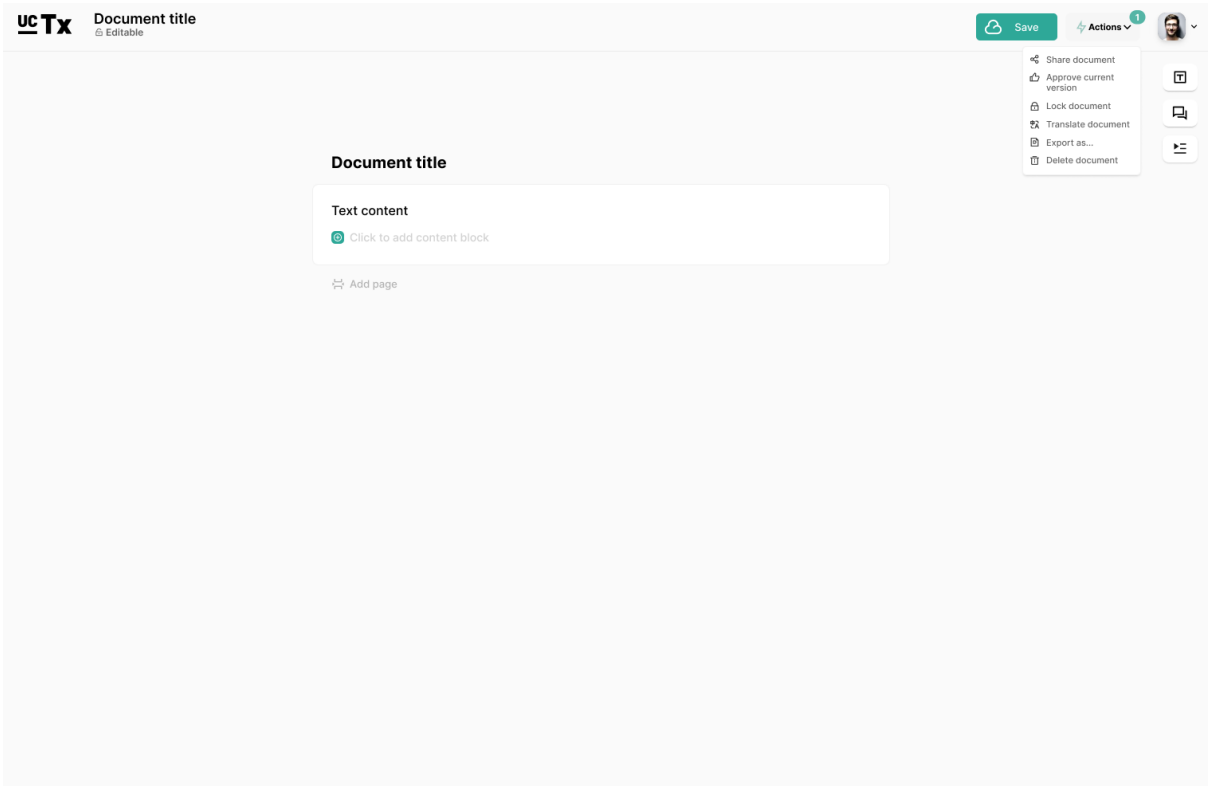


Figure 4: Initial view of the documents' editor

In Figure 5, we can see in more detail how a user can add new blocks of content to the document.

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

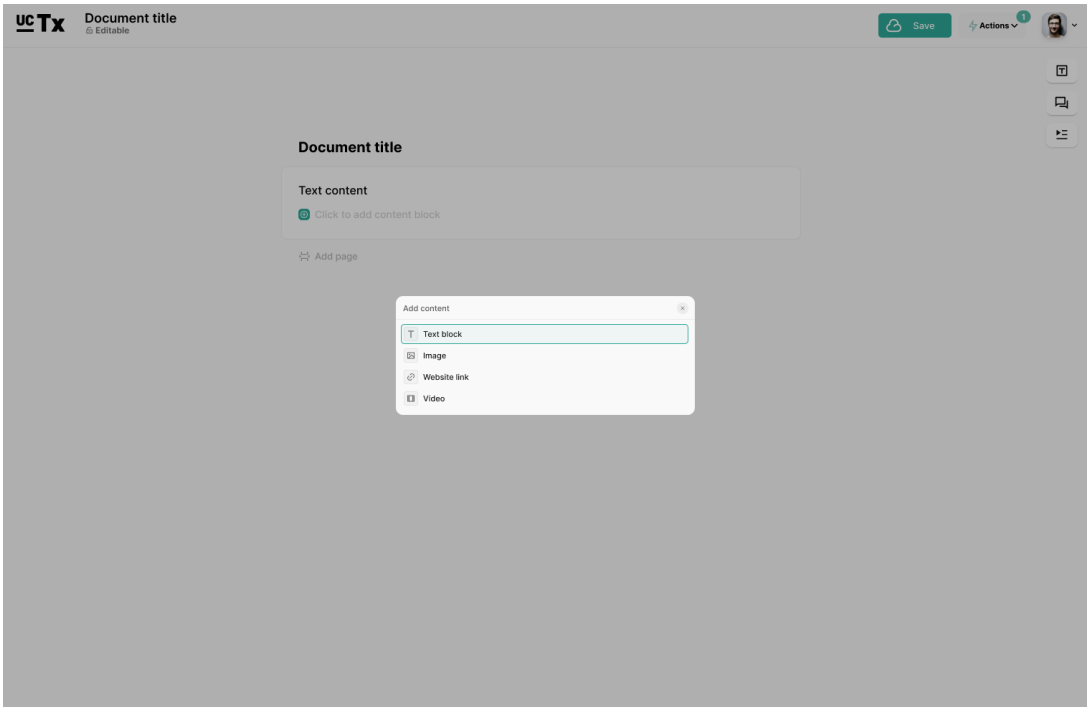


Figure 5: The user with writing access can add new blocks of content i.e. text, images and others

To help with collaboration, there is the possibility to leave comments next to each block of content. This feature depends on the level of permissions the user has in this document. If the author agrees, a document inside a community can be reviewed and commented on by their members, ensuring a continuous development and improvement of the original document or its translation.

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

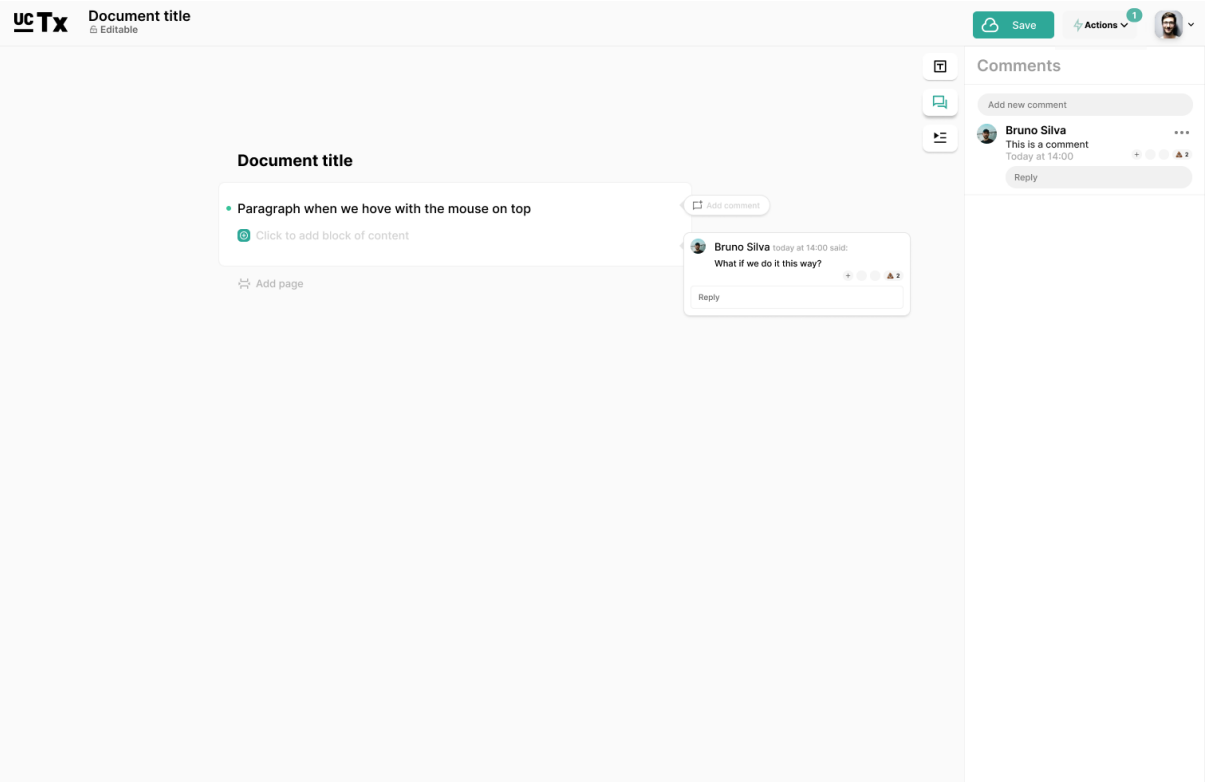


Figure 6: Any user with permission can add comments next to the content blocks. All the comments can be seen in the sidebar, in the comments section

The author of a document is able to create a new version of the document in any of the available languages. In the translation mode, the author or any user with editing permissions is able to work on the translation document at the same time they can see the original document side by side, as we can see in Figure 7 below.

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

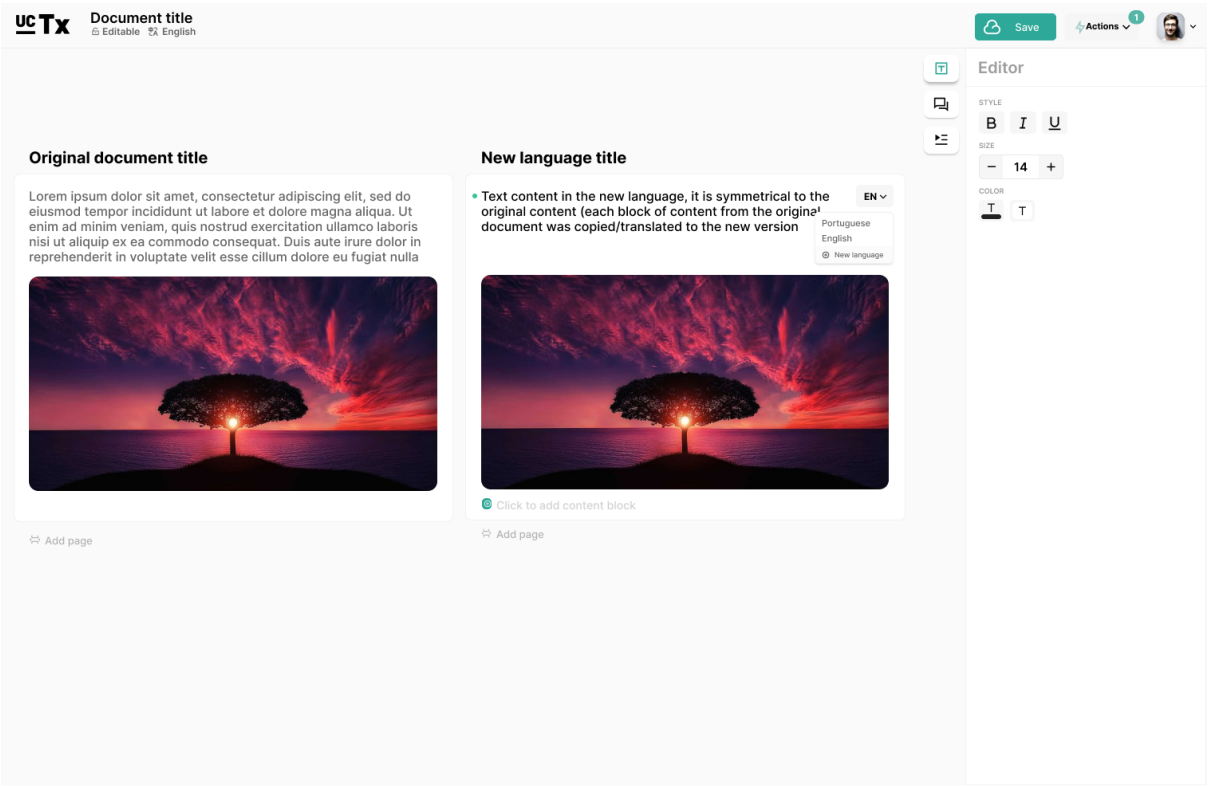


Figure 7: Side-by-side view of translation

A user with writing access can translate the document into any of the available languages and have access to the original document on the left. While in the editor mode, the user can use the sidebar to modify the current block of content. In the example, the user has text formatting options on the sidebar, when having a text block selected.

By default, a document has a version that can be editable and is constantly in draft. At any moment, the author or anyone with editing permissions is allowed to create a new version or snapshot of the document that will remain unchanged. Within a version of a document, anyone that is not the author can request approval of its version, which in turn can be approved by the author. This versioning system allows for the continuous development and improvement of a document or its translation.

Optionally, there will be an option to upload TMX or XLIFF files that will serve as a base to translate into other languages.

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

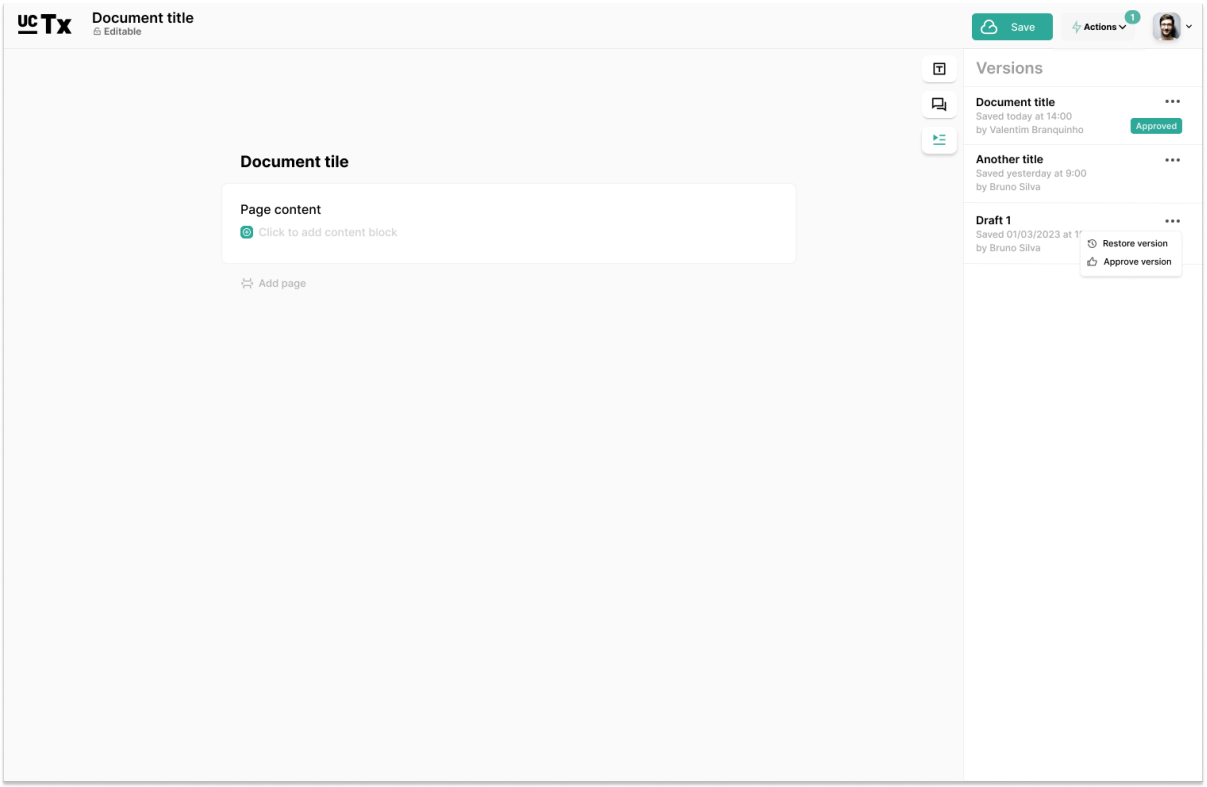


Figure 7: At any moment, anyone with editing permissions can create a new version that can be later approved and locked by the author

In the end, the user can download a TMX or XLIFF file with all the translated pairs from the original language to the target language. When downloading in these file formats, any media content will be ignored as these file formats only support text.

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains

8. Conclusions

In conclusion, the design of OPERAS translation services platform, intended for use by the scholarly community, has been carefully planned and detailed in this document. The platform aims to provide an intuitive and user-friendly interface that supports multiple languages, enables document upload and translation and allows for collaborative editing, commenting and chatting among users. The platform also emphasises security and data protection, with authentication systems, data encryption and compliance with data privacy regulations.

The platform's design also includes features to ensure high availability, scalability, backup and recovery, and fast and responsive performance. It leverages different microservices to manage translations, communication and connection with professional translators, but also with potential publishers and the research community at large.

Overall, the translation service platform involving communities is designed to meet the needs of users who require efficient and high-quality translation of scholarly work across different languages and disciplines, while providing a supportive community environment for collaboration and feedback. The platform's design has been conceived to address the functional, technical, usability-related, security and data protection-related and organisational requirements of the target audience.

This project has received funding under the Horizon Europe research and innovation programme under Grant Agreement No 101079608. The content of this deliverable reflects only the OPERAS's view and the Commission is not responsible for any use that may be made of the information it contains