

## TRIPLE project: building a discovery platform to enhance collaboration

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**Abstract.** Social Sciences and Humanities research is divided across a wide array of disciplines, sub-disciplines and languages. While this specialisation makes it possible to investigate the extensive variety of SSH topics, it also leads to a fragmentation that prevents SSH research from reaching its full potential. Use and reuse of research is suboptimal, interdisciplinary collaboration possibilities are often missed partially because of missing standards and referential keys between disciplines. Often, the reuse of data may paradoxically complicate a relevant sorting of data and a trust relationship between researchers. As a result, societal, economic and academic impacts are limited. Conceptually, there is a wealth of transdisciplinary collaborations, but in practice there is a need to help researchers and research institutions to connect them and support them, to prepare the research data for these overarching approaches and to make them findable and usable. The [TRIPLE](#) (Targeting Researchers through Innovative Practices and Linked Exploration) project is a practical answer to the above issues, as it aims at designing and developing the European discovery platform dedicated to Social Sciences and Humanities resources. Funded under the European Commission program INFRAEOSC-02-2019 “Prototyping new innovative services”, thanks to a consortium of 19 partners, TRIPLE will develop a full multilingual and multicultural solution for the discovery and the reuse of Social Sciences and Humanities resources. The project started in October 2019 for a duration of 42 months thanks to European funding of 5.6 million €.

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## 1 Introduction

SSH research is divided across a wide array of disciplines, sub-disciplines and languages. While this specialisation makes it possible to investigate the extensive variety of SSH topics, it also leads to a fragmentation that prevents SSH research from reaching its full potential. Use and reuse of SSH research is suboptimal, interdisciplinary collaboration possibilities are often missed partially because of missing standards and referential keys between disciplines. By the way the reuse of data may paradoxically complicate a relevant sorting of data and a trust relationship between researchers. As a result, societal, economic and academic impacts are limited. Conceptually, there is a wealth of transdisciplinary collaborations, but in practice there is a need to help SSH researchers and research institutions to connect them and support them, to prepare the research data for these overarching approaches and to make them findable and usable. The TRIPLE (Targeting Researchers through Innovative Practices and Linked Exploration) project is a practical answer to the above issues, as it aims at designing and developing the European discovery platform dedicated to SSH resources. Funded under the European Commission program INFRAEOSC-02-2019 “Prototyping new innovative services”, thanks to a consortium of 19 partners from 13 European countries, TRIPLE will develop a full multilingual and multicultural solution for the discovery and reuse of SSH resources.

## 2 Alignment with user requirements

In order to develop an effective and usable Social Science and Humanities discovery platform, the TRIPLE project aims to meet the needs of end users by working with the various different stakeholders from the very start of the project. A variety of methods, including co-design workshops and qualitative user interviews, will enable us to know what users (both academics and non-academics such as librarians, data analysts, enterprises, consultancies, media, service providers) would like to see in a new innovative platform.

To collect user requirements, we conducted a total of 26 interviews with researchers and academics in SSH over the period November 2019 - February 2020, and 11 with other stakeholders between January and March 2020. Interviews have been conducted both remotely (using conference-call software) and face-to-face, with a clear prevalence of interviews conducted via Skype. Several project partners were involved in supporting the identifications of participants for the interviews, and some also carried out interviews (especially where language support was necessary). Most of the interviews have been conducted in English, recorded and then transcribed before their analysis. The scripts of the interviews were developed in October-November 2019, with an initial draft provided by the task leader (University of Abertay) and with subsequent rounds of comments by other partners and re-drafting by the task leader, before reaching final agreed drafts. In terms of these research instruments, the main decision has been to structure the interviews for both target groups around the same areas, focusing on the following four macro areas for investigating the end-user needs:

- The Discoverability of Data/Information/Publications/Projects
- The Discoverability of People (in relation to networking and trusting others)
- The Discoverability of Researchers and Researchers' work by others
- Looking forward (focusing on the emerging trends in the respective fields)

The development of the platform is based on Interaction Design, which is a user-centered approach whose goal is to identify user needs, prototype and validate the design of digital objects assuming the user perspective [1]. Interaction design offers a solid and established approach towards understanding changing contextual situations from the user perspective and offers support to envisioning solutions to user problems. This perspective is built at first on the establishment of personas and scenarios.

### 2.1. Establishment of personas

Personas are “user archetypes” that help make decisions about design solutions that are informed by a user-driven perspective. According to the book *About face 3: The essentials of interaction design* [2], personas “are not actual people but are synthesized directly from observations of real people”. Personas are models and “precipitates” of real users that are entirely based on user research. In particular, the specific traits tend to be identified through the analysis of qualitative interview data. The interview transcriptions were uploaded to Nivo<sup>10</sup> and coded using Grounded Theory [3,] where a range of ‘themes’ emerge from the interview results.

A range of Personas (n=8) and Scenarios (n=8) have been produced from the analysis of the qualitative interviews to convey the user requirements to the technical partners, helping them to make design decisions. They also allow us to more easily discuss what the platform functionalities will be with stakeholders, and they are useful during co-design workshops. Since co-design will enable the stakeholders to have an input into the design and

<sup>10</sup> <https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home>

functionality of the platform, the process also increases ownership and engagement with the final product. An example of one of the non-academic Personas is shown in Figure 1. It highlights how the platform could facilitate interactions between academic research and industry and other SMEs.



Fig. 1. Example of a non-academic persona created from the results of the requirement analysis

## 2.2. Scenario Development

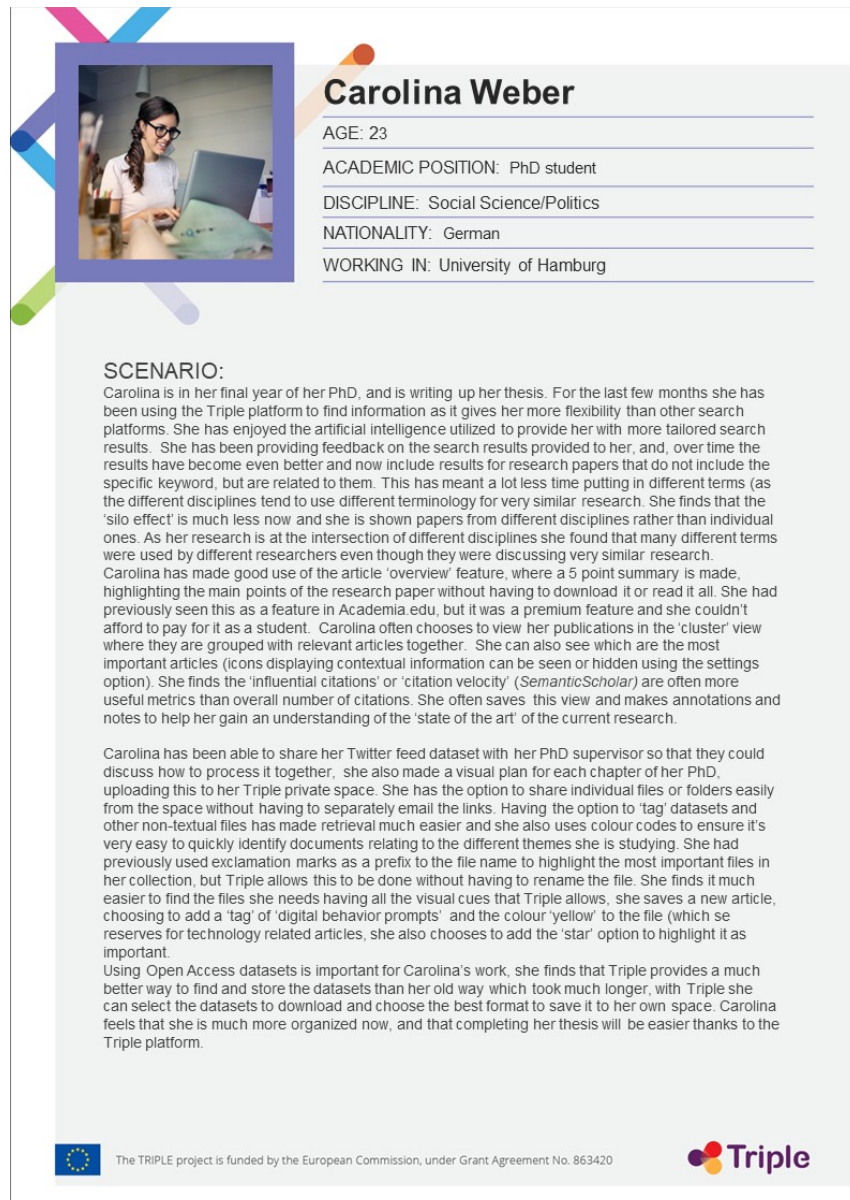
Scenarios are narratives of the personas interacting with the future product or service (i.e. for example the narrative of a Sociology researcher using the TRIPLE platform). Scenarios are fundamental for capturing the user perspective and current design research considers their relevance in a number of areas [4] : (a) scenarios are reflective tools for the design team to imagine plausible and feasible solutions to user needs; (b) scenarios present a narrative of concrete use, from the user perspective. However, different solutions can be explored in conjunction with the user because the narrative is flexible and open to interpretation; (c) scenarios support the design team from viewing high and low level design details from the perspective of the user; (d) scenarios help create an order flow in the design process; (e) scenarios help the design team to focus on the actual user activities in a real situation, rather than on abstract assumptions about the user behaviour.

User Needs/Requirements are then obtained via the transformation of scenarios in so-called scenarios steps. This entails transforming the scenarios in a list of activities that the user conducts within the scenario narrative. These steps lead then to a more formal definition of the user needs as a list which can constitute the basis for the

identification of functionalities and subsequent production of interface prototypes. Essentially the task is transforming the Scenarios narrative in a list of plausible steps that the user conducts in order to achieve a series of goals.

Scenario steps obtained from the Persona illustrated above (5 Carolina Weber) are:

- 5.1 The user shall be able to Obtain tailored (AI enhanced) search results (includes terms learnt that are connected)
- 5.2 The user shall be able to View 'Article Overview' for a publication
- 5.3 The user shall be able to share an individual file
- 5.4 The user shall be able to Share a folder
- 5.5 The user shall be able to Tag a dataset
- 5.6 The user shall be able to Colour-code a file/dataset
- 5.7 The user shall be able to Download a single publication



**Carolina Weber**

AGE: 23

ACADEMIC POSITION: PhD student

DISCIPLINE: Social Science/Politics

NATIONALITY: German

WORKING IN: University of Hamburg

**SCENARIO:**

Carolina is in her final year of her PhD, and is writing up her thesis. For the last few months she has been using the Triple platform to find information as it gives her more flexibility than other search platforms. She has enjoyed the artificial intelligence utilized to provide her with more tailored search results. She has been providing feedback on the search results provided to her, and, over time the results have become even better and now include results for research papers that do not include the specific keyword, but are related to them. This has meant a lot less time putting in different terms (as the different disciplines tend to use different terminology for very similar research. She finds that the 'silo effect' is much less now and she is shown papers from different disciplines rather than individual ones. As her research is at the intersection of different disciplines she found that many different terms were used by different researchers even though they were discussing very similar research. Carolina has made good use of the article 'overview' feature, where a 5 point summary is made, highlighting the main points of the research paper without having to download it or read it all. She had previously seen this as a feature in Academia.edu, but it was a premium feature and she couldn't afford to pay for it as a student. Carolina often chooses to view her publications in the 'cluster' view where they are grouped with relevant articles together. She can also see which are the most important articles (icons displaying contextual information can be seen or hidden using the settings option). She finds the 'influential citations' or 'citation velocity' (*SemanticScholar*) are often more useful metrics than overall number of citations. She often saves this view and makes annotations and notes to help her gain an understanding of the 'state of the art' of the current research.

Carolina has been able to share her Twitter feed dataset with her PhD supervisor so that they could discuss how to process it together, she also made a visual plan for each chapter of her PhD, uploading this to her Triple private space. She has the option to share individual files or folders easily from the space without having to separately email the links. Having the option to 'tag' datasets and other non-textual files has made retrieval much easier and she also uses colour codes to ensure it's very easy to quickly identify documents relating to the different themes she is studying. She had previously used exclamation marks as a prefix to the file name to highlight the most important files in her collection, but Triple allows this to be done without having to rename the file. She finds it much easier to find the files she needs having all the visual cues that Triple allows, she saves a new article, choosing to add a 'tag' of 'digital behavior prompts' and the colour 'yellow' to the file (which she reserves for technology related articles, she also chooses to add the 'star' option to highlight it as important.

Using Open Access datasets is important for Carolina's work, she finds that Triple provides a much better way to find and store the datasets than her old way which took much longer, with Triple she can select the datasets to download and choose the best format to save it to her own space. Carolina feels that she is much more organized now, and that completing her thesis will be easier thanks to the Triple platform.

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Fig. 2. Example of an academic scenario created from the results of the requirement analysis

The academic scenario in Figure 2 highlights specific questions such as: Which challenges do different SSH disciplines have to deal with if they want to make their data digitally available for research? Should the data be based on standards that are as far-reaching as possible, or should they above all reflect the specific methods, approaches and languages in the respective discipline? How do we deal with the variance of approaches in the social sciences and humanities to make data visible, and how great is the scope of such variance?



All these questions, as well as further questions raised thanks to other scenarios, will be the basis for a discussion about the necessary user needs and how to prioritize them for the building of the TRIPLE platform.

The identification of the priority needs will also underpin the work on the design of the TRIPLE User Interface. Moreover, the Personas and the Scenarios produced can be used for other purposes, for instance, they can be integrated into communication material or be used during the co-design process in conjunction with the interface prototypes.

### 3 Market and opportunity analysis

TRIPLE takes particular care to study the context in which the platform is developed - not only from the point of view of user requirements as mentioned above (in Section 1), but also from a competitive and environmental vantage point. Dedicated tasks are therefore focused on the study of existing platforms and various macro-environmental factors (PESTLE analysis) that will have an impact on the durability and sustainability of the platform.

#### 3.1 Competitor analysis

To get a broad overview of the competitive environment, 26 communication platforms have been evaluated through web-based research and documented in a provided template. The analysis documentations were transferred into a summary table and analyzed through qualitative content analysis. The analysis covers a comparison of offered features and functions, organizational insights, strengths and weaknesses as well as insights into usability and user experience. To complement the vantage points gained from the web-based competitor analysis, an interview study with general Open Science experts (3 participants) and executives from existing scholarly communication platforms (6 participants) was conducted. The qualitative interviews were designed as guideline-based expert interviews and evaluated through qualitative content analysis.

The analysis results can be summarized as follows: The main challengers have an established presence in the market, and the brands are well known. However, no successful platform targeting especially SSH community could be identified. Looking at the products and services provided by the competitors, we recognize that the planned feature-set for the TRIPLE platform (such as the conjunction of visualisation tool, annotation tool, trust building system, recommender system and crowdfunding service) represents unique features that will distinguish TRIPLE from the competition. Attention needs to be paid to a number of agile platforms which constantly release innovative (e.g. AI-powered) features. The interview results show that despite the many platforms and services available, there are still unoccupied market niches and underrepresented user groups that TRIPLE can target at.



Fig 3: Overview of analysed platforms including location information and launch year

### 3.2. PESTLE analysis

We use PESTLE, an analysis tool which helps to examine external events and influences with regards to their effect on an organisation's performance [5]. PESTLE is an acronym that stands for Political, Economic, Social, Technological, Environmental and Legal factors. We collected possible influencing factors in the respective category. After determining the factors, they were classified as positive or negative.

<p><b>POLITICAL</b></p> <ul style="list-style-type: none"> <li>+ EC committed to Open Science</li> <li>+ EC focus on pan-European research</li> <li>+ EC committed to support diversity</li> <li>- Diminishing research funding</li> <li>- Lack of recognition of SSH</li> </ul>	<p><b>ECONOMICAL</b></p> <ul style="list-style-type: none"> <li>+ Gross domestic spending on R&amp;D rising</li> <li>+ Education spending stable</li> <li>- Reduced public spending on tertiary education</li> <li>- Competition on established players in the search engine world</li> </ul>
<p><b>SOCIAL</b></p> <ul style="list-style-type: none"> <li>+ Population with tertiary education rising</li> <li>+ People employed in research rising</li> <li>+ Cultural trend sharing economy</li> <li>- Fake news and difficult verification of web content</li> </ul>	<p><b>TECHNOLOGICAL</b></p> <ul style="list-style-type: none"> <li>+ Artificial intelligence / Machine learning is on the rise</li> <li>+ Network bandwidth getting cheaper, more ubiquitous</li> <li>+ Cloud computing and container technologies making scaling up deployment on new sites easier</li> <li>+ Single sign-on solutions are becoming a commodity</li> <li>- Mobile (or tablet) as the dominant medium and speech recognition not addressed.</li> </ul>
<p><b>LEGAL</b></p> <ul style="list-style-type: none"> <li>+ Protection of personal data and transparency of its use build users' trust</li> <li>+ TRIPLE is a good advocate for future legislation on Open Science</li> <li>- Uncertainties regarding future governance and possible commercial activities</li> <li>- Eventual constraints in the building of the platform regarding GDPR and copyright regulations.</li> </ul>	<p><b>ENVIRONMENTAL</b></p> <ul style="list-style-type: none"> <li>+ Generational shift towards more responsibility for the environment</li> <li>- Large CO2 footprint of server-based online tools</li> </ul>

Fig. 4: Summary of PESTLE Factors

The political and economic aspects show a rather balanced relationship between positive and negative. From today's perspective, it is difficult to judge which of the positive or negative factors will have more significance in the future. The many positive ones in the field of technology should not obscure technical trends that can become relevant very quickly. For this reason, it is advisable to monitor technology trends closely. Since social factors tend to have a long-term effect, it is unlikely that they will have a rapid effect, either positive or negative. Nevertheless, the positive factors were found to outweigh the negative ones. With regard to legal factors, we are of course in the area of tension between national and EU legislation. Relevant for TRIPLE are mainly copyright and data protection regulations. If we consider that the platform will offer some commercial activities for specific end-users, it will be required to consider potential issues related to commercial and tax law (contract, procurement, liabilities, cross-border VAT issues, etc.). As the project develops, it is recommended to update and refine the analysis regularly (e.g. yearly). The results can be further processed in a SWOT (Strength, Weakness, Opportunity, Threat) analysis.

## 4 Produce, publish and share

From both the user research and the market and opportunity analysis, the consortium is able to specify the aim of TRIPLE platform and the relations between the different tools.

### 4.1 Adapting technology to usage

Open Data is an open window on the world, accessible to the greatest number of users. Retrieving information and knowledge comes with significant challenges when trying to avoid transforming this opportunity into a disorganized and indigestible mass of data through a scattergun approach. This is why, in parallel with the technological challenges, we are particularly attentive to the needs of users as varied as a scholar or scientist, company director, policy maker, student or simply a citizen who does research for his or her own pleasure. The aim of the TRIPLE platform is to make it much easier for scientists, citizens and business organisations to access scientific publications, data, data processing platforms and data processing services and therefore to benefit from Open Science.

Digital technology has changed the way research is conducted in all scientific disciplines: This is particularly true in the context of Open Science, which breaks the silos of knowledge and connects research with the needs of society. The TRIPLE platform will help people – from laypeople to experienced scholars and scientists – to find their way through millions of different types of interconnected SSH resources.

The TRIPLE platform will help to create, develop and strengthen communities of SSH researchers both in Europe and worldwide. The platform design and architecture will promote the “Community of Practice” [66] concept as the basis for conducting research. The concept will be harnessed to capture the idea that a group of people who have a common interest in a certain area can deliver better learning and improved results by working together and sharing expertise, which benefits the larger collective. Through its discovery tool, the TRIPLE platform will bring together members of the scientific community from different fields, languages, countries and communities in research projects and ensure that they collaboratively will be capable of offering improved solutions to research problems. Indeed, by identifying more easily the skills of researchers, the discovery platform will foster new collaborations and exchanges among members of the scientific community.

### 4.2 Reconnect culture and science

The TRIPLE platform is at the same time (1) a way to build and simplify collaborations between researchers, thanks to a personal interface, (2) a scientific platform to develop research through discoverability of SSH research data and publications, researcher profiles and projects and (3) a cultural platform to discover, understand and highlight European diversity in terms of societies, languages and practices. The discovery solution will offer a way for citizens to experience a great linguistic, cultural and disciplinary diversity through. Specialised on social sciences and humanities, TRIPLE deals mainly with cultural and social practices in the European societies and helps them to better understand their assets and challenges in terms of identity.

All users groups will have access to the same search and annotation tools. At the same time, we also pay attention by offering the research community a set of dedicated services to allow them to connect in a relevant way to their communities through networking tools based on trust and recommendation. To achieve this goal, our consortium is made up of research institutions, i.e. universities but also SMEs and research centers. This approach fosters cooperation and sharing of skills of communities who do not often meet: researchers and private actors.

### 4.3 Support scientific, industrial and societal applications

SSH research consists of many cross-cutting issues as it engages with diverse and multi-faceted challenges, relevant for modern, global societies. The challenge is, first, to enable multidisciplinary transfer of knowledge required to address these cross-cutting issues, and, second, to facilitate the transfer and uptake of SSH research relevant for the societal challenges. The TRIPLE solution will answer both needs by offering the possibility to develop networks and projects inside SSH fields and by opening up the community and the results of the research to a broader audience: the scientific community at large and other stakeholders involved in research and innovation matters. This objective will be achieved through three main aspects which are at the heart of the project:

- A Forum to gather the entire SSH community, either experienced researchers as well as younger ones, and establishing a balance between qualitative and quantitative content.
- Through APIs, the platform will index the content from several other platforms, mainly repositories, to reach a wider range of public as SMEs, administrations, media and citizens.
- A crowdfunding service integrated to the platform offers support of researchers for specific and smaller projects. Through this platform, we would like to propose new forms of interaction between research and

civil societies. This approach in terms of research funding is relevant to SSH research that directly addresses societal issues.

- The Recommender System<sup>11</sup> and Trust Building System [8] services are tools that guarantee a social architecture more conducive to trust [9].

## 5. A player on the European scene

Dedicated to researchers in the social sciences and humanities in the whole Europe, TRIPLE platform is developed in accordance with different European scientific initiatives. It tries to address different issues such as – among others - common interoperability between tools, linked open data, FAIRisation of data increasing societal impact of science.

### 5.1 Relation with the European Open Science Cloud (EOSC)

The European Open Science Cloud is one of five broad policy action lines of the European Open Science agenda endorsed also by the EC Communications on the Digital Single Market (DSM) strategy. In the early documents of the European Commission, the EOSC is described as a “vision for a federated, globally accessible, multidisciplinary environment where researchers, innovators, companies and citizens can publish, find, use and reuse each other's data, tools, publications and other outputs for research, innovation and educational purposes” [10].

As a vision, EOSC aims at being the implementation of Open Science in Europe, and started to be designed accordingly as an ecosystem of infrastructures, data, services and organizations, based on common architectural requirements, shared rules of participation, FAIR standards, and participatory governance.<sup>12</sup> As an implementation process, the EOSC construction is a multi-year undertaking which is being addressed in practice in several stages: the first phase until the EOSC launch (which started in 2016, and lasted until the Vienna Declaration of 2018), and the implementation for sustainability phase, which is currently on-going. The objective of the “INFRAEOSC-02-2019: Prototyping new innovative services” call, under which the TRIPLE project is funded, is to “develop an agile, fit-for-purpose and sustainable service offering accessible through the EOSC hub that can satisfy the evolving needs of the scientific community by stimulating the design and prototyping of novel innovative digital services”, with a specific attention on innovative collaboration models including incentive mechanisms for a user-oriented Open Science approach. TRIPLE is thus natively dependent on and connected with the EOSC implementation; that’s why the project work plan includes a Work Package fully dedicated to Open Science and EOSC integration.

Moreover, TRIPLE platform is conceived to be one of the services provided by OPERAS, the European Research Infrastructure<sup>13</sup> for the development of open scholarly communication in the social sciences and humanities. The OPERAS innovative services include: the OPERAS Discovery service (i.e. the TRIPLE discovery platform), the OPERAS certification service, the OPERAS Metrics service, the OPERAS Publishing Service Portal, OPERAS check-in, and the OPERAS XML toolbox. Thanks to the OPERAS-P project<sup>14</sup>, a protocol and a roadmap for the inclusion of the OPERAS Research Infrastructure services for SSH into the EOSC portal will be developed, both based on the EOSC Working Groups outputs, and the work in progress of the SSHOC project<sup>15</sup> (see above).

In particular, TRIPLE’s team is focusing on the following specific activities:

1. Defining the general interoperability requirements. The objective of this activity is to be able to define the basic rules to make possible the creation of Open Science workflows, to be shared both within the TRIPLE consortium and externally.
2. Producing, adapting, and reusing general and specific guidelines, in coordination with related projects such as SSHOC, and providing training and skills to the project members, in order to ensure they all have competencies on Open Science practices and workflows.
3. And lastly, integrating the TRIPLE platform into the EOSC. To reach this objective, three strategies are going to be implemented: a) The first integration will be made through the OPERAS portal, by adopting the OPERAS check-in service. This service is based on the EGI check-in service, which will be adopted as authentication and authorization service. By implementing a common Virtual Organization for OPERAS services and its users, the single sign-on service provides an identity and access management solution that facilitates the access

<sup>11</sup> <http://scar.know-center.tugraz.at>

<sup>12</sup> <https://ec.europa.eu/research/openscience/index.cfm?pg=open-science-cloud>

<sup>13</sup> <https://operas.hypotheses.org>

<sup>14</sup> <https://cordis.europa.eu/project/id/871069>

<sup>15</sup> <https://sshopencloud.eu/>



to services and resources using the federated authentication mechanisms. b) The second strategy consists in providing the TRIPLE service via the SSH Open Marketplace (see below). c) And the third one, and more obvious, is including the TRIPLE discovery service into the EOSC catalogue.

## 5.2 Interaction with the SSH Open Marketplace

To implement the second strategy mentioned above, a close collaboration has been set up between TRIPLE and the Social Sciences and Humanities Open Cloud (SSHOC) projects. Funded as one of the five ESFRI cluster projects under the INFRAEOSC 04-2018 call, the SSHOC project aims at connecting the SSH Research Infrastructures and communities to the EOSC and to support the integration of SSH infrastructural components to the EOSC offer. Both TRIPLE and SSHOC are working to develop the SSH components of the EOSC, and some partners of the TRIPLE project are also members of the SSHOC consortium, which strengthens the interactions.

The two projects are working towards the development of discovery layers/aggregators for SSH researchers in the EOSC context. While TRIPLE solution will allow SSH researchers to discover data and publications, people and projects, the SSHOC project is developing the SSH Open Marketplace, a “discovery portal which pools and harmonizes all the SSH tools (services and software), datasets, training materials and activities (workflows and scenarios) useful for SSH research communities, offering a high quality and contextualized answer at every step of the SSH research data life cycles”<sup>16</sup>. As discovery solutions for the SSH communities, TRIPLE platform and the SSH Open Marketplace aim to develop a complementary offer to their end-users and several lines are investigated to make this statement a reality. One of the hypotheses, mentioned in the SSH Open Marketplace System Specification<sup>17</sup>, could represent an interesting way to work on synergies between both portals relates to datasets. The SSH Open Marketplace will only showcase “chosen” datasets that can be connected and contextualized with the other resources in the portal, while the TRIPLE solution is developed based on a much larger and richer list of data catalogues. Based on this complementarity, different scenarios are currently being investigated to connect the two portals. Other synergies and integration could be discussed to improve the coherence of the SSH discovery solutions within the EOSC. To help identify them and work on their implementation, common events (e.g. hackathons between developers’ teams of both projects) are envisioned.

Beyond the interactions with the SSH Open Marketplace, a series of reports produced by the SSHOC project have been identified as relevant inputs for TRIPLE solution: the inventory of SSH citation practices<sup>18</sup>; the report on (meta)data interoperability problems<sup>19</sup> or the report about the certification for data repositories<sup>20</sup> to name a few of them. This mapping exercise was part of a wider effort of the TRIPLE project to identify relevant outputs coming from other EU initiatives (not only the SSHOC project, but also RDA outputs, FAIRsFAIR...) to work on the general interoperability requirements mentioned in the previous section.

These interactions with the SSH Open Marketplace, the SSHOC project and other relevant initiatives in the EOSC context contribute to widen the concept of “research data” to all types of digital research outputs linked to scholarly communication that are part of the research process in SSH, positioning OPERAS, as the service provider for TRIPLE, as a major player on the European scene.

## 6. Conclusion

TRIPLE’s main objective is to enable researchers to discover and reuse SSH data macro-typologies, related not only to publications, but also to people and projects. This implies to understand the needs of SSH researchers, to translate them in the right software tools and to take into account a global European scientific context. This great challenge is addressed through the process described above. This highlights that our contribution is to reconcile research and societies at two levels:

(1) making scientific output available to as many people as possible without popularising or simplifying the content.

(2) encouraging non-academic sections of society to take an active part in research projects.

The strength of the European science and technology system depends on its ability to harness all talents and ideas. This requires a fruitful, rich dialogue and active cooperation between science and society that should lead to more responsible science and enable the development of policies that are more relevant to citizens. Rapid advances in scientific research and innovation have led to an increase in important ethical, legal and social issues that influence the relationship between science and society. TRIPLE platform will enhance collaboration between

<sup>16</sup> <https://www.sshopencloud.eu/ssh-open-marketplace>

<sup>17</sup> <https://zenodo.org/record/3547649>

<sup>18</sup> <https://zenodo.org/record/3595965>

<sup>19</sup> <https://zenodo.org/record/3569868>

<sup>20</sup> <https://zenodo.org/record/3725868>

SSH researchers and various types of stakeholders (scientist or not) and will contribute to foster innovation for better societies. The TRIPLE project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement number 863420.

## References

1. K. Goodwin, *Designing for the digital age: How to create human-centered products and services*. Indianapolis, John Wiley and Sons (2011)
2. A. Cooper, R. Reimann, D. Cronin, *About face 3: The essentials of interaction design* (John Wiley and Sons, Indianapolis, 2007)
3. C. Charmaz, *Constructing Grounded Theory: A practical guide through qualitative analysis* (Sage Publications, 2006)
4. J.M. Carroll, *Making use: Scenario-based design of human-computer interactions* (Cambridge MA: MIT Press, 2000)
5. What is PESTLE Analysis? A Tool for Business Analysis. <https://pestleanalysis.com/what-is-pestle-analysis/>, retrieved 21/04/2020.
6. SWOT Analysis - How to Develop a Strategy For Success (2020, April 22). Retrieved from: [https://www.mindtools.com/pages/article/newTMC\\_05.htm](https://www.mindtools.com/pages/article/newTMC_05.htm), retrieved 22/04/2020
7. E. Wenger, *Communities of Practice: Learning, meaning, and identity* (Cambridge University Press, 1998)
8. G. Van Weyenbergh, B. Werner, *A social architecture to scale trust. Steps toward a social ecosystem*. Brussels: Meoh ASBL, <https://www.docdroid.net/n0I9jFw/a-social-architecture-to-scale-trust-v1-1-pdf>, (2018)
9. F. Ackermann, C. Eden, *Long Range Planning* **44**, 3 (2011)
10. Report on the governance and financial schemes for the European Open Science Cloud (Adopted by the Open Science Policy Platform- May 2017), [https://ec.europa.eu/research/openscience/pdf/ospp\\_euro\\_open\\_science\\_cloud\\_report-.pdf](https://ec.europa.eu/research/openscience/pdf/ospp_euro_open_science_cloud_report-.pdf)