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RIS Synergy - Creating a Common Language Across Institutions: Lessons Learned and Challenges

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Abstract

This paper analyses how a common language and a profound communication strategy enable the development of shared services in a digitisation project. In this paper, we discuss how RIS Synergy utilises international standards, such as persistent identifiers, to synergise CRIS systems across the Austrian research landscape. The project consortium consists of 17 diverse project partners with different requirements, processes, and vocabularies. Therefore, we share lessons learned and challenges, along with best practices for establishing a task force on public relations and communications for community-building and to raise awareness of the project and ensure its long-term nature.

1 Introduction

This paper analyses how RIS Synergy, a digitisation project aiming to synergise CRIS systems across the Austrian research landscape, handles a multitude of diverse project partners from the Austrian research landscape and how it leverages existing international standards to accommodate the wide range of partners involved. In addition to the technical standards, the project ist also concerned with establishing a task force for internal and external communication, which facilitates the exchange between project members and external cooperation partners.

RIS Synergy, led by TU Wien, was launched in March 2020 and is funded by the Federal Ministry of Education, Science and Research. The project consortium consisting of 17 project partners develops interfaces for the automatic exchange of research information between research institutions and funding organisations. RIS Synergy's goals are to optimise administrative support for research projects, increase data quality and transparency for research institutions, funding organisations and public bodies, and raise the international visibility of Austrian research.

RIS Synergy's outcomes also lay the groundwork for a national research portal in Austria, for which the project conducts a concept study defining the framework conditions, requirements and functionalities [1].

In the following, this paper covers the progress and lessons learned gained over the past three years. Emphasis is placed on the establishment of a common language and common processes among the institutions of the Austrian research landscape. Equally important is the discussion of the challenges we encounter as a nationwide digitisation project, especially with regard to the end of the project and the transition to regular operations.

2 Lessons Learned

2.1 From a common language to an inter-institutional meta-process model

A successful national process-oriented digitisation project requires a clear understanding of requirements and goals, alignment with international standards, collaboration and communication across institutional boundaries, and the establishment of a common language and processes. Taking a holistic approach and focusing on the bigger picture is crucial for optimising workflows. Adequate planning and resource allocation, along with continuous evaluation and improvement, are also key to the success of the project.

However, different project partners may have unique perspectives and motivations for contributing to this digitisation project, which can pose a challenge in finding a common ground. Particularly, as RIS Synergy partners include both research institutions from a variety of fields and funding organisations which cover different aspects of the research process. To address this challenge, the RIS Synergy project team employed a bottom-up approach by involving mid-level management departments who have a better understanding of the day-to-day operations of CRIS systems and repositories. The project partners analysed the locally existing RIS infrastructure, discussed common denominators and differences, and defined the data exchange that would benefit their institutions the most.

The project team also aimed to develop a common understanding of the project life cycle among all partner institutions and modelled a meta-process that depicts a research project's full workflow and use cases, reflecting the exchange of data between the CRIS systems of funding organisations and universities. The meta-process model outlines the project's life cycle starting with the dissemination of information regarding funding programs and calls provided by funding organisations. This is followed by the exchange of research proposals and project data between the funding organisations and research institutions. Finally, the meta-process depicts the exchange of financial reports and metadata on research output during the project phase and in the post-project phase.

To further promote a common understanding, RIS Synergy working groups have further developed use cases related to the exchange of data outlined in the meta-process model: funding programs, financial data, project data, project output, and organisational data.

While requirements are being defined, a project-wide glossary and vocabulary were set up to provide classification schemes and enhance a project-wide common understanding.

By bringing together diverse perspectives and establishing common processes across institutional boundaries, the project aims to ensure the success of the process-oriented digitisation project, while also connecting to international standards.

2.2 Building on international standards: CERIF, OpenAIRE Guidelines, and persistent identifiers

RIS Synergy is also working on a common language in terms of technical development: The 17 partners in the RIS Synergy consortium use different systems with various data models for the documentation of research information including vendor databases as well as in-house-built solutions. The project consortium therefore agreed to utilise international standards, namely the Common European Research Information Format (CERIF) [2] and the OpenAIRE Guidelines for CRIS Managers [3], as well as established persistent identifiers (PIDs) for the development and implementation of the data interfaces.

In an initial phase of analysis, each use case team collected relevant metadata fields required for data exchange. The teams each focused on a data exchange scenario described in the meta-process model: the exchange of call information, organisational data, project data, financial data, and publication data between funding organisations and research institutions. The collection of relevant metadata fields allowed the institutions to communicate their requirements and provided a comprehensive overview of the different use cases for data use.

The next step included comparing the metadata fields for each use case to the CERIF standard. Comparing the RIS Synergy metadata fields with the CERIF data model showed that it had to be extended according to the needs of RIS Synergy's objectives - but without affecting the basic structure of the standard. To this end, we have reached out to euroCRIS, the organisation responsible for maintaining CERIF, to communicate our suggestions for further development of the standard and to receive feedback regarding our challenges.

In addition to the CERIF data model, RIS Synergy follows the OpenAIRE Guidelines for CRIS Managers. This data exchange format (XML) is the basis for the API endpoints developed and provided by RIS Synergy. Again, an analysis of the guidelines showed that further development of the basic structure was necessary to cover all the data fields required by the project's participating institutions.

Although initially planned, not all of RIS Synergy's use cases support data exchange directly via decentralised data interfaces implemented at funding organisations and research institutions. Analysing possibilities for the exchange of publication data showed that a different solution is more practical in this case: the use of already existing OpenAIRE infrastructure as a data hub for metadata on publications [4].

Another use case, i.e. the exchange of data on programme and call information, required an additional solution for implementing decentralised interfaces. Not all funding organisations in the project have their own system for storing call information, and therefore cannot provide the data via interfaces. For this reason, RIS Synergy is developing a central platform for the manual entry and storage of programme and call information. Research institutions can retrieve the call data of all participating funding organisations from the central platform, regardless of whether the data was entered manually or retrieved via an interface.

From our work with CERIF and the OpenAIRE Guidelines for CRIS Managers, we have learned that the joint decision to use an established standard is the most critical decision in a development project with so many diverse project partners. At the same time, it was also necessary to extend the standard to meet the requirements - but without compromising the basic structure of the standard. CERIF as well as the OpenAIRE Guidelines for CRIS managers represent, on the one hand, a solution for leveraging the different databases in the project consortium. On the other hand, these standards are also the basis for the international compatibility of the products developed in RIS Synergy.

As RIS Synergy is a digitisation project concerned with research infrastructure, FAIR data management is a topic that fundamentally affects the development of the various data interfaces. A key element in FAIR data management is the use of persistent identifiers for the automatic data exchange of research information and, in this context, the establishment of PIDs in the systems and processes of the project partners [5].

As a first step, a working group was established within the project to examine the purpose of using persistent identifiers (PIDs). The working group explored existing persistent identifiers and, in the course of the analysis, identified these PIDs that are beneficial to the exchange of data via RIS Synergy interfaces: ORCID IDs [6] for researchers to exchange information about the principal investigators of funded research projects; ROR [7], Ringgold [8] and Crossref Funder IDs [9] for organisational data; DOIs [10] for research output in the form of publications; and Crossref Grant IDs [11] for funded research projects. The team also explored other identifiers such as RAiD [12]. Our comprehensive evaluation of PIDs is well-documented and remains a work in progress as we do not exclude future considerations of additional identifiers.

In addition to researching persistent identifiers in general, the working group also conducted a survey on PID use among the RIS Synergy project members. The survey revealed that persistent identifiers are not widely established in the systems, processes or policies of the partner institutions. The result of this (non-representative) study concerning the use and dissemination of organisational identifiers is in line with the findings of a comparable survey conducted in Germany in 2020 [13]. As the survey revealed, using existing organisational identifiers for RIS Synergy comes with its challenges. For instance, the metadata schemas of open PIDs, such as ROR and Crossref Funder ID, only allow the mapping of the top organisational unit. In contrast, Ringgold ID provides identifiers for all organisational units of an institution but is a commercial product that does not meet the RIS Synergy requirement of applying FAIR principles.

The findings of the working group led to two decisions in the RIS Synergy project:

First, the metadata schemas of the interface specifications explicitly consider persistent identifiers by providing metadata fields for as many PIDs as possible, allowing institutions to exchange them and thus deduplicate or enrich the data in their own systems. However, except for the Crossref Funder ID, none of the persistent identifier fields are mandatory and therefore not suitable as unique interface identifiers. For this reason, the RIS Synergy project develops its own unique and persistent RIS IDs to ensure automatic data exchange via interfaces.

Second, RIS Synergy aims to establish the use of persistent identifiers in the project consortium in a sustainable way and therefore cooperates with Austrian and international consortia and organisations in the context of PIDs.

While the adoption of persistent identifiers in the current RIS infrastructure leaves much room for improvement, RIS Synergy's data model already allows for a future implementation of the meta-process (described above) in the form of a PID graph [14].

2.3 Establishing a task force on public relations and communications

A project of this size has particular needs when it comes to communication. External but also internal communication, which is all too often overlooked, play a role in ensuring success.

Both of RIS Synergy’s subprojects, building APIs and conducting a concept study for a national research portal, have different communication requirements. Although they interconnect on a technical and conceptual level both subprojects have differing goals, target groups, and core messages. While the subproject concerning APIs needs a great deal of internal, institutional, and inter-institutional communication, the concept study requires much more external communication. Still, effective internal and inter-institutional communication is essential for the concept study as it takes the diverse perspectives of seventeen project partners and various external stakeholders into account. First and foremost, the project and the people behind it needed consistent wording to communicate the contents and objectives of the project. In several turns with different settings (on- and offline) and participants, the consortium created a brand statement, capturing the essence of the project, and core messages addressing all major target audiences of the project.

"RIS Synergy provides relief and increases visibility for science by standardising and digitising services, along with building expert networks." – RIS Synergy Brand Statement

The definition of communication goals and target groups for both subprojects built the basis for an internal task force on public relations and communications. The creation of this group signals the relevance of communication aspects to the project's internal and external stakeholders.

Goal 1: Creating awareness of the project.	**Goal 2: Ensuring the long-term nature of the project.**	**Goal 3: Community building.**
11/2021 Creation of core messages	01/2022 Project presentation for the Austrian Federal Ministry of Education, Science and Research	12/2021 Release of a screencast about national research portals
11/2021 Paper submission *VOEB*-Mitteilungen 74(2)	01/2022 Project presentation for the FWF (Austrian Science Fund)	04/2022 Introduction of quarterly factsheets for internal and inter-institutional communication
04/2022 FAIR Data Webinar hosted by RIS Synergy	10/2022 Project presentation for the FFG (The Austrian Research Promotion Agency)	05/2022 Release of the video "RIS Synergy: Outcome and Impact"
04/2022 Introduction of quarterly factsheets for internal and inter-institutional communication		05/2022 Workshop on a national research portal at the *Cluster Forschungsdaten* symposium
05/2022 Project presentation and paper submission at the euroCRIS conference 2022		02/2023 Kick-off RIS Synergy/euroCRIS Working Group on national and regional research portals
05/2022 Release of the video "RIS Synergy: Outcome and Impact"		

Table 1: RIS Synergy's communication goals and achievements

Since its launch one and a half years ago, this task force has already been able to recall several achievements. In part, this is thanks to the task force being equipped with sufficient workforce and leadership. Additionally, there is a high level of awareness among project staff about the importance of communications and PR for the project's outcome. Their willingness to work for the task force on top of their actual assignments in the project is particularly noteworthy considering that RIS Synergy has no financial resources dedicated to PR activities (a situation not unusual in scholarly research). The task force meets once per month and is responsible for strategic planning according to the overall communication goals. Subgroups, which usually consist of several consortial partners, realise the planned activities. Apart from papers, videos, workshops, and presentations, the group has accomplished the formation of an international working group on national and regional research portals within the euroCRIS network. Seventeen representatives of national or regional research portals have joined the working group at the time of its launch in February 2023. The discussions and outcomes of this working group will be incorporated into the concept study for an Austrian national research portal.

The activities of the communications task force are valuable for the project and receive appropriate internal and external feedback. In particular, the importance of inter-institutional communication cannot be overstated in a project with so many partners

2.3.1. Inter-institutional communication in a project with nation-wide partners

In a project with numerous partnering institutions from all over Austria, and with travel costs not being funded, online meetings will quickly fill the calendars of everyone involved. A silver lining of years of COVID-19 restrictions can be found in the fact that all project partners were appropriately and technically equipped for launching RIS Synergy online in March 2020. During the first two years of the project, digital meetings were common practice and allowed everyone to enhance their digital literacy. The project successfully completed its analysis phase with an online vote for which use cases to implement - all while Austria was still in a nationwide lockdown.

All benefits and successes of online communication notwithstanding, the first real-life project meetings quickly demonstrated that working together in person was much more fruitful than working digitally. Therefore, since COVID-19 restrictions have allowed it, regular core team meetings take place in what we call “RIS Office”, a monthly all-day event hosted by a different institution each time. These smaller versions of the yearly project meeting started without an agenda. However, it soon turned out that real-life RIS Office days are so valuable for collaboration that they soon started to serve as meeting points for making important decisions and showcasing API prototypes. More and more project members are using the RIS Office days to meet with the core team and become more deeply involved in the project. This setup might be a solution to a problem many projects of this size know: that it is usually the same few people who are usually involved in the work packages. Once per year, the project hosts a two-day on-site event for all partner institutions. The event is crucial for networking since the project still grows in partners because of its success. Delegates from all partners are involved in the annual meeting, using the opportunity to catch up with one another, contribute to workshops, and make joint decisions.

To provide a tool for internal communication within the institutions, the task force on public relations and communications started writing quarterly factsheets. These factsheets provide a short overview of updates concerning each API and project team. In addition, the factsheets contain information about upcoming events and how to become involved. The positive feedback from the consortium highlights that the factsheets are helpful in keeping track of things because the project’s online collaboration space is teeming with content after three years, whereas the factsheets provide a clear, streamlined overview of essential project news.

2.3.2. Networking with stakeholders

Ensuring that all levels of such a big consortium are on the same page and have the chance to voice their needs and demands is not easy. In addition to the quarterly factsheets, deeper conversations with decision makers of the partnering institutions are beneficial to the project. We believe that considering all levels will positively influence the project's output. In coordination with the project management, the task force identifies relevant stakeholders for personalised stakeholder presentations. Talks with the ministry and with internal stakeholders generate new ideas for the concept study that the project might have otherwise missed, such as ways to make a national portal more attractive to Austria’s economic sector. Preparing such conversations, taking into account the needs of the stakeholders, is as critical as the conversations themselves. Channelling the results of these stakeholder talks into the work of the project must receive the same amount of attention as the preparation and the talks itself, to justify the effort and obtain the best possible outcome.

3 Outlook and Challenges

While the project can report a number of successes and lessons learned after three years, there are still some challenges ahead. The advantages we have gained through large-scale, inter-institutional cooperation and by applying a bottom-up principle do not necessarily facilitate the long-term and sustainable operation of RIS Synergy's products. Therefore, two years before the end of the project, we are looking into the future of the project and its results in order to sustainably fulfil the goal of RIS Synergy: to generate synergies in the Austrian research landscape.

3.1.1. Challenge 1: Managing 17 diverse project partners and partners-to-be

The Austrian research community encompasses more than the 17 project partners involved in the RIS Synergy project, meaning not all Austrian higher education and research institutions are involved. However, the 17 partners effectively represent the diversity of the Austrian research landscape in their diverse composition, including universities and funding organisations of various sizes and specialisations, such as universities, technical universities, and art universities.

Since all institutions involved in the project agreed on a common language and on international, well-documented standards for developing the RIS interfaces, institutions not previously involved in the project will also be able to benefit from the publicly available project results in the end. In addition, we openly communicate interim project results, e.g. on the project website or at outreach events. The success of this approach is shown by the fact that even now, three years into the project, RIS Synergy can welcome new institutions to the consortium. This is particularly noteworthy given that there are currently available financial resources to distribute, yet the desire to participate persists. It remains to be seen how we will organise the laborious but indispensable communication measures and the (technical) onboarding process for future collaboration partners after the end of the project. The amount of information and documentation for implementing the RIS Synergy APIs is already enormous, and the project partners therefore need to develop a standardised workflow to facilitate the deployment of these products to all relevant institutions.

3.1.2. Challenge 2: Transition to regular operation – the end of the bottom-up approach

Another challenge we face is the question of how to ensure regular operation after the project ends. First and foremost, by abiding by the FAIR principles, the project results are to be made sustainably usable in the long term. To this end, it is necessary to develop an operating model with long-term usability in mind. Questions as to whether or not there will be financial and non-material support from the funding authority remain to be answered. Sufficient funding is certainly an indispensable prerequisite, but so are key decisions yet to be finalised: how to institutionalise regular operations, who will be given a mandate, and who will take the leading role in this operation. Once these decisions have been made, it will become clear whether it is possible to switch from a bottom-up to a top-down approach by establishing a responsible body that ensures sustainable operation in terms of expertise and infrastructure. To this end, we have joined with several project partners, also from other related projects, in submitting a proposal to a new call from the Federal Ministry of Education, Science and Research. In addition, we have identified best practices throughout Europe and have been in contact with representatives of other national or regional initiatives on research portals, such as SRCE [15], the University Computing Centre in Croatia; CSC [16], the IT Center for Science in Finland; CSUC [17], the Consortium of University Services of Catalonia; and SURF [18] in the Netherlands. These organisations serve as service providers for HEIs and develop joint solutions for the research

infrastructure of their countries/regions. They certainly show possibilities of how a sustainable solution could also be found in Austria, although in Austria we face a distinct legal situation in a research landscape different from the examples mentioned above.

4 Conclusion

In this paper, we set out to discuss RIS Synergy's goal to establish a common language and common processes across research institutions and funding organisations, enabling the development of collective solutions and shared services in the Austrian research landscape. After three years, RIS Synergy can report a number of lessons learned from working in a project consortium with 17 diverse project partners: We established an inter-institutional meta-process model and decided to apply international standards to create an equal framework for all organisations involved. Working with CERIF, the OpenAIRE Guidelines and various persistent identifiers has proven to be rewarding since they ensure the sustainability and international compatibility of RIS Synergy's products.

The RIS Synergy project has an enormous scope, both in terms of the consortium and in terms of goals: We not only digitise just one but many processes, which we also refine in multiple use cases. As this goes beyond the mere implementation of IT solutions, but fosters an integration of organisational practices, we devote a great deal of attention to internal and external communication in the project.

This paper demonstrated that RIS Synergy is well on its way to implementing the project's objectives, but we are equally dedicated to the challenges that lie ahead if we are to ensure that RIS Synergy's products continue to sustainably shape the Austrian research landscape.

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