

Advantages and challenges of gathering data into a regional CRIS: the case of FRIS

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Introduction

This contribution elaborates on the advantages and drawbacks of gathering data as an aggregator in a regional CRIS and puts forward some questions on how to make better use of the data and reduce the efforts to collect them.

In Flanders, information on publicly funded research is collected into a regional CRIS called FRIS (Flanders Research Information Space). The aim of FRIS is to capture all research performed in Flanders that is (at least partially) publicly funded. To be comprehensive, FRIS must connect to every research institute in Flanders and collect all relevant research information from each one.

Today most of the research organizations in Flanders are connected to FRIS. For a lot of them, the data collection is achieved through an automated connection with their institutional CRIS. For the ones that do not operate an institutional CRIS, they either use a multitenant CRIS provided by the Flemish government, upload data using a file or input the information manually via the admin UI of FRIS.

Goals, challenges and needs: FRIS @2026

Connecting all research organizations and ensuring they provide thorough, high-quality and up-to-date information to FRIS is a challenging and demanding process that requires significant effort from both the research organizations and the FRIS management team.

Therefore the reasons to invest in having a regional CRIS need to be very clear. From governments perspective, the advantages of gathering data from institutions in a regional CRIS are multiple:

- **Visibility & findability:** the visibility of Flemish research increases significantly by disclosing it through one regional portal. Portal users can find expertise, projects, publications... rather than navigating the websites of multiple research institutions separately.. This enables researchers to find collaborators more easily, helps companies identify solutions to their challenges, and allows innovation stakeholders to discover valuable technological opportunities in a far more efficient way.
- **Transparency:** It gives citizens and other stakeholders a transparent and detailed view on how public money is used for research.
- **Monitoring & reporting:** Gathering information from diverse research organizations in one single platform using one single data model and one single set of definitions results in a more consistent set of information. This is a great asset for monitoring & reporting purposes as it yields better comparability of the data and thus more qualitative analytic outcomes. This is useful for the government to track, amongst others, where the research budget is going to and what outcomes it has. It can also be useful for research organizations wanting to benchmark themselves in certain areas.
- **Single hub & reuse of data:** Having all the data on one single platform can significantly simplify integrations with external sources and exports towards third parties. Instead of having to have integrations built by every research organization separately, FRIS can deliver these functionalities for all interested organizations by building it once from/towards FRIS thus serving as a hub. Having all data in one database helps the reusability of data as there is one central source where data is collected and one source where data can be reused as often as possible, knowing that this data is kept up-to-date.

But, without any doubt, collecting data into a regional CRIS also represents some challenges. Here are a few:

- A research organization that wants to deliver information to the regional CRIS, needs to comply with the FRIS requirements:
 - **Scope:** the data offered for ingestion must have at least all the minimally required information. Depending on the span of information the organization already has and its maturity in data management processes, the data gathering may require a certain amount of effort. If information is not yet captured in the organization, then workflow and/or other processes have to be installed on the side of the research organization to do so. This

involves change management and/or IT-development and that typically takes quite some time and/or budget.

- Quality: the information must comply with the business rules and the definitions used by FRIS. Diverse research organizations often use a diversity of definitions and categories when collecting research information for their own purposes. To comply with the business rules of FRIS, some efforts may be needed to convert, map or redefine the data so that they match the requirements of FRIS. To reach the high quality standards of FRIS, it is of crucial importance that the research organization invests the necessary efforts needed to do so.
- Standardization: The organization that wants to build an integration with FRIS has to use the exchange model of FRIS (based on CERIF 1.5)
- The (team that manages the) regional CRIS, needs to invest in:
 - Building and managing the data infrastructure: team FRIS had/has to build and manage and maintain an information platform that is performant, flexible, reliable and secure at all times. The use of the regional CRIS as a hub in trans-organizational operational processes like reporting requires it to always work reliably without any failures. This requires permanent updates en monitoring of the infrastructure.
 - Data-quality: as the data is being used as a trusted source, it requires the data to be of premium quality. Team FRIS is putting a lot of effort in monitoring quality but does not curate the data as one of the guiding principles of FRIS is that research organizations always remain owner of the information and are themselves responsible for the data quality.

Part of the data quality checks done by FRIS are automatically done using a data quality engine. The other part of it is monitored ad hoc and periodically by analyzing the data gathered in FRIS using a business analytics tool. Nevertheless, no matter how much monitoring and controlling is done, FRIS can never claim to be 100% complete and correct, as it depends on the quality as delivered by the research organizations themselves. So, the quality of the information is as good as it is being delivered to FRIS.
- Creating added value: FRIS is also working hard to create added value on the FRIS data collection by enriching with information of external sources like Unpaywall, add SDG-labels, creating a managed journal master list, building golden record services, sending the information to OpenAIRE and EOSC etc.

- Stakeholder management: this is the trickiest part. As FRIS depends on the data delivered by the research organizations in Flanders, a lot of effort is put into managing the stakeholders. An organizational structure is put into place to interact with them consisting of a FRIS working group which acts as a steering committee, and several technical groups where discussions are being held on the data model, definitions, classifications, reporting requirements ... All proposals made in the technical groups are validated in the FRIS working group. FRIS always strives to reach a broad consensus with all of the stakeholders in order to obtain trust and support for the data delivery from the research organizations in Flanders. ECOOM Hasselt is assigned by the government to coordinate and mediate these discussions. Alongside these consultations, team FRIS is supporting individual organizations intensively to help them onboard FRIS and resolve technical issues. Collaboration is also incentivized by the Flemish government by making delivery to FRIS mandatory via the Science and Innovation Decree and management agreements.

The leap forward? Towards FRIS@2030

So where are we now? Over the last 20 years, FRIS has expanded to currently include almost all research organizations in Flanders delivering data and has also increased in the scope of the information that is collected to projects, publications, patents, datasets, infrastructure, researchers and research organizations. The data gathered in FRIS have been used in many use cases, a few examples of which are:

- The data are shared openly through the FRIS research-portal creating more visibility of public research performed in Flanders
- The data are shared openly through webservices used by third parties and shared with third parties like OpenAIRE, EOSC and the OECD
- The Flemish funder Research Foundation – Flanders (FWO) is using the research output data of FRIS to prefill the publication list in the project reports thus reducing the administrative burden of the researcher (<https://doi.org/10.1016/j.procs.2024.11.045>)
- The Flemish administration uses data in FRIS for financial reporting of their funds to universities and universities of applied sciences and arts (the Special Fund for Research (BOF) and the Industrial Research Fund (IOF)), for monitoring Open Science (<https://doi.org/10.1016/j.procs.2022.10.181>), for answering questions about spending on R&D by the Flemish parliament and for helping third parties to answer diverse questions related to science and science policy.

For the future, FRIS is looking for new use cases adding more value to innovation stakeholders and for innovative ways to make data collection less tedious for all parties concerned. The questions that arise are manifold: How can we further increase the visibility of research using new types of portals or dashboards? Which specific target groups (companies, citizens, policymakers...) would benefit from dedicated portals, and what functionalities do they need? One of the ideas would be to create a portal specific for companies where they can find collaboration opportunities and specific research equipment to help resolve their specific needs.

Which AI technologies could improve the searchability and smart discovery of information on the FRIS portal? How can we combine external data sources (e.g., Unpaywall, SDG labels, journal master lists, OpenAIRE, EOSC...) to create more added value? What new use cases could help innovation stakeholders make better decisions? How can we develop more automatic reporting for governments, funders, or organizations that currently request information manually?

How should we deal with the geopolitical changing world, information security, and cybersecurity as this effects the whole ecosystem of a CRIS?

How can research organizations more easily meet FRIS requirements related to scope and data quality? What do organizations need to increase their data-management maturity (processes, tools, training...)? How can API integrations between local CRIS systems and FRIS be made faster, simpler, or more standard? How can we further automate the data-quality tools and monitoring processes to reduce manual checks? Can we collect and share best practices from organizations with high data quality so others can onboard faster and with fewer errors?

Conclusion

In Flanders we are convinced that gathering data from different institutional CRIS's into one single regional platform yields substantial advantages in terms of increased visibility of research, better monitoring, and more efficient data exchange as demonstrated by several operational use cases. However we acknowledge that achieving this requires a significant and sustained effort from each of the stakeholders involved. Building an aggregated, consistent high quality dataset on research does not come effortless. We should keep on exploring innovative ways to reduce the effort that has to be invested and at the same time create more added value for all innovation stakeholders. The proof will be in the eating of the pudding as we take a leap forward with the future of FRIS.