

Fostering and assessing societal impact orientation in research - the SynSICRIS monitoring tool as an extension of DSpace-CRIS 7

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Abstract:

The SynSICRIS project (Synergies for Societal Impact in CRIS) developed a monitoring tool based on DSpace CRIS 7. The SynSICRIS tool supports project planning via an impact pathway and a working plan bar chart. This is combined with continuous, project-related monitoring of contributions to societal impact. Parts of proposals and reports can be replaced and different project stages can be compared through versioning. The monitoring data is available at an early stage, can be filtered as required for various purposes and is automatically processed in graphics. As part of an R&D project, the tool was developed and tested in a participatory process with researchers, major German funding agencies and experts. The contribution will give an insight into the data model, functions and further use of the development.

Introduction:

The aim of the public funded R&D-project was to enhance and assess the contribution of research to societal impact and build synergies with project planning, management and documentation obligations in research funding processes.

For the development of the datamodel, we take a perspective where research is one contributor to impact among others in complex innovation systems. Thus, the approach focuses on activities and reflections that support the development of impact in order to provide timely data for fair assessment. In addition, outcomes can be captured and expected impacts and negative side effects can be reflected.

The approach is tailored for use by funding agencies to create synergies with researchers' documentation obligations in funding processes - without additional effort - and to provide data for project management, programme monitoring and evaluation. The main idea is to replace text-based proposals and project reports, by gathering granular data in a CRIS system run by the funding agencies. The result is a complex monitoring tool to plan, manage and monitor impact-oriented projects. Based on the open source DSpace-CRIS, it is also adaptable for other purposes such as use in research institutions, evaluation service providers and transfer offices.

It was developed in a participatory process with major German funding agencies (e.g. PTJ, DLR-PT, VDI/VDE-IT, BLE), researchers and experts in transfer and evaluation. After several UX tests, the tool has been optimised and is now ready for wider pilot use, understood as an application accompanied by training and technical support. The contribution to CRIS 2024 will present the extended data model and the main features of the tool, and will discuss the further use of the development.

Extended Data model

We add several entities (*written in italic*) and metadata to quantitatively and qualitatively capture contributions to impact development. They are based on: Productive interactions (Spaapen and van Drooge 2011), transdisciplinary research (e.g. Lux et al. 2019; Newig et al. 2019; Knickel et al. 2019), responsible research and innovation (e.g. Bloch et al. 2018; Stilgoe et al. 2013), technology assessment (e.g. UNEP 2012), impact pathways (e.g. Barret et al. 2018; Blundo Canto et al. 2018; Joly et al. 2015), innovation systems (e.g. Dearing 2009; Hekkert et al. 2020; Koschatzky et al. 2016; Wanzenböck et al.

2020) and sustainable innovation (e.g. Diehl 2018). In addition, some entities have been added for use in funding contexts.

From the default data model of DSpace-CRIS we use *projects*, *funding*, *organisational units*, *publications*, *patents*, *products* (for research data), *events* and *persons* with some adaptations in the metadata. For use in funding contexts, we create a project-oriented data model to allow project-specific role management for research partners. We add *programmes* and *calls* (which are also relevant for the role management within the funding agencies) and *funding objectives* that can be related to the projects.

In addition to the *OrgUnits* that are involved as *project partners* or other *cooperating organisations*, we introduce *stakeholder groups*, to allow a more anonymous description of the *stakeholder groups* involved in transdisciplinary and participatory processes. All three entities have some common metadata to assess which disciplines or fields of action are involved in the project.

Participation and cooperation allow recording ongoing interaction and having relations to involved organisations and stakeholder groups (same in *events*). Furthermore, workpackages, milestones and tasks have also been added, to cover all activities of a *working plan*. *Research and development objectives* and *targets for interaction and transfer* support project and impact planning.

Reflection on the background of the project is introduced with *external conditions* that can support or hinder the development of impacts. According to RRI, *ethical* and *gender* considerations are reflected.

Publications cover all COAR types and provide added metadata for audience (science, practice, society). Additionally we introduce *objects/materials* (e.g. physical models, plant collections) to cover also these opportunities for re-use in research, teaching and transfer.

In terms of outcomes, we introduce several entities in addition to *patents*, *spin-offs* and *awards*. The core is the assessment of *possible solutions/changes/innovations*, where we merge OECD innovation types (OECD/Eurostat 2018) with societal-innovation types, including technology and solution readiness level and several reflections on applicability. In addition, *ideas for use of project results* and *work and cooperation after project end* are included. Finally, if there is a use case for the research, this is covered by the *application of a solution/change/innovation*.

Expected societal impacts and consideration of *possible negative side effects* allow for reflection, description and categorisation of sustainability aspects, magnitude and source of information.

Functions:

Several DSpace-CRIS 7 functions were also used in the SynSICRIS tool, such as import from publication databases, the European patent database and various altmetrics, as well as a link between filters and graphs [T4] (which were pre-configured in SynSICRIS for all entities).

The SynSICRIS tool boasts a crucial feature: the capability to organise items within an impact pathway, facilitating impact-oriented project planning (Wolf et al. 2021). It provides a working plan complete with a timeline, as well as an exploitation plan and an interim report template. All four components function like a versatile pinboard, allowing a single item to serve multiple purposes. This streamlined approach ensures a single point of truth about a project for funding agencies significantly reducing the documentation burden on researchers. Moreover, it replaces portions of proposals and reports, making it an invaluable tool in project management.

Versioning of individual items is part of DSpace-CRIS 7. This has been further developed to allow versioning of entire projects with all related items. It makes it possible to keep the status of information unchangeable (e.g. proposal version, interim report) and to grant read-only access to the funding agency (or the management level of the institutions). Version comparison with colour highlighting of new and deleted items is possible in the *impact pathway*, *working plan* and *exploitation plan*. A "comparison pop-up window" compares individual metadata of the versioned item. This feature is highly beneficial in reducing documentation and bureaucracy. It is also possible to export information on complete projects in PDF files structured according to the project description.

In addition, the search and filtering capabilities of DSpace-CRIS 7 have been enhanced: A two-step search allows limiting the search environment in advance (e.g. to projects of a certain programme) and then to perform the specific search (e.g. for innovations of a certain type). The search environment also provides the graphs and is linked to the CSV export.

The multi-language approach of DSpace-CRIS has been implemented for an English and German user interface, and several help boxes provide instructions on how to use the tool.

Conclusion:

SynSICRIS creates a new link between CRIS, project planning and impact-oriented monitoring. This may lead to new opportunities for the further development of CRIS. In any case, there are benefits for funding processes, research institutions, evaluation services and knowledge transfer:

1. **Impact orientation:** The structure of the impact pathway, specific attributes and reflective questions in the entities, as well as help boxes encourages the development, management and monitoring of impact-oriented projects.
2. **Efficient Project Management:** Researchers can create structured impact pathways, set working plans, and outline exploitation strategies - all within the same tool. This streamlines project execution and resource allocation.
3. **Transparency and Accountability:** By providing a single point of truth for funding agencies, the tool reduces documentation burden and ensures transparency. Researchers can focus on impactful work rather than paperwork.
4. **Collaboration and Alignment:** The versatile pinboard approach encourages collaboration. Researcher-teams and collaborators can collectively contribute, align efforts, and share insights.
5. **Timely provision of data:** The provision of contextual data with diagrams supports programme management, evaluation and knowledge transfer.

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