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The FAIRsFAIR journey introduced solutions for FAIR implementation across use cases, processes, needs and phases. While there is no one-fit-all solution, many use cases have drawn a possible way towards interoperability.

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In a FAIR research data world, data and metadata should flow and be reused freely according to regulation and need, unhampered by technical or semantic interoperability issues. **This is why several tasks in the FAIRsFAIR project during the last three years have been looking at technologies and solutions that could enable this. As FAIR is not a standard in itself, there are many practical decisions to make moving towards more machine and user-friendly FAIR services.**

During this journey it became clear that the **DCAT vocabulary** and its application profiles offer a good way forward in creating interoperability. However, DCAT needs to be completed with other shared languages, metadata standards and semantic artefacts. It is well suited for this but more work needs to be done to enable interoperable (meta)data. Important steps towards this have been taken and the work will surely continue beyond this project.

A minimal metadata set enabling discovery is rarely enough documentation for scientific reuse of any material. As designated communities have domain specific metadata and terminologies, forceful standardization or creating cross-walks can mean loss of specificity or make the scientific episteme/context or ontology unclear. Still, crossing and bridging disciplinary borders offer possibilities for new insight, maybe even serendipity and abductive reasoning. The tension between the accuracy and specificity needed for research and the requirements for discoverability is a challenge we can hardly evade in the near future. Different solutions and implementations are necessary for different use cases. Assessing the accuracy and quality of (meta)data is today beyond simple technical validation as the use cases vary and diversity is large in all aspects.

While many metadata and other mappings exist, they are not easy to find. **Furthermore, there is still a lack of incentives to produce and make available metadata with a FAIR Data Point or even using DCAT.** Repositories often have scarce resources and introducing these technologies seem costly in relation to the expected benefits and often unclear use cases from the individual service point of view. As few repositories offer DCAT and hardly no one harvests it, there is something of a chicken-or-egg problem regarding adoption of a shared vocabulary like this. Implementing DCAT can also be done in many ways, creating more or less interoperability. The quality of the (underlying) metadata is decisive for



the result. In the end our conclusion has been that the barriers or difficulties are often not on the purely technical side. In practice, other levels and dimensions of interoperability require the most effort.

Let's start back from service design

During FAIRsFAIR we have produced recommendations and guides together with many communities in order to help implement the FAIR principles. All infrastructure layers need to work together to make everything function as expected. But implementation can take more resources than are available in small services and if the community processes don't support FAIR by design, the cost and inertia can be considerable. **The way forward could be for funding agencies to invest more on service design, to specify drivers and needs of the user communities at the very first stage of service development. This should be done via relevant use cases and creating a supporting enterprise architecture to guide portfolio management on different levels to enable alignment around metadata and solutions for interoperability at the very beginning of every new process.**

Read more about the outputs and recommendations on the FAIRsFAIR website:

[FAIR Data Policies and Practices](#) | [FAIR Semantics, Interoperability, and Services](#)

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