The Importance of Demand and Environment for Defining and Establishing the Role of Data Stewards

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Abstract

Data stewardship is now a central part of FAIR research data management. Although various types of positions called data stewards have been created at academic institutions over the last years, no demand-oriented, formal model of data stewardship and the associated roles exist so far. This workshop report presents the outcomes of the panel discussion "The Importance of Demand and Environment for Defining Data Stewardship" held at the International FAIR Convergence Symposium 2020. It starts with the description of the situation at four structurally diverse research data management centers and their individual perspectives on the idea and role of data stewards. Despite efforts to define the profile of a data steward, the role is still new and the individual position profiles have not yet converged on a coherent job description, which is showing that local demand and environment are still more defining for specific positions than a generalized data steward role.

1. Introduction

With the growing importance of scientific data (Bryant, Lavoie & Malpas 2017), FAIR data stewardship (Wilkinson et al., 2016) and the idea and role of so called data stewards have become a crucial elements of the research data management (RDM) process. Recently, positions of data stewards have appeared in the research data management landscape. Depending on the institution, these data stewards are located at infrastructure providers, in research projects, and at RDM competence centers or support desks. Despite efforts to work out competences for data stewards (e.g. Herterich et al., 2019; Blask & Förster, 2019; Scholtens et al., 2019; Jetten et al., 2021), there is no final, demand-oriented, formal model of data stewards and the associated roles. In our session "The Importance of Demand and Environment for Defining Data Stewardship" at the International FAIR Convergence Symposium (27 November – 04 December 2020), we discussed how organizational structures and RDM requirements of

researchers influence the definition of data stewardship.[1] Therefore, we invited four speakers that presented different perspectives on how to implement and define the idea and role of data stewards within different organizational and structural contexts. These four perspectives address various aspects with regard to the term *data steward*, which depend on both the demands of their research community and the environments of their home institutions. This workshop report illustrates these four perspectives in detail and shows how a definition of the idea and role of data stewards is still missing. Moreover, it serves as a starting point for further discussions.

2. Four Perspectives on Defining and Establishing Data Stewards

Felix Rau

2.1 DCH – a research data competence center for the humanities

Research data management and data stewardship are issues that arise in different contexts and at different levels in an institution. Organizations are locating corresponding responsibilities at different levels inside the organization. In universities, requirements relating to RDM and data stewardship arise at the level of individual researchers, projects, departments, and faculties as well as on the university level. The differences in demands and in organizational embedding result in different types of requirements and emphasis at the various levels.
The Data Centre for the Humanities (DCH) is an institutional competence center for research data management in the humanities. It is a central institution of the Faculty of Arts and Humanities of the University of Cologne.[2] As part of the faculty's infrastructure, the DCH is permanently funded through the dean's budgetary funds and supplements RDM at the university with a profile tailored to the requirements of the humanities. By addressing the specific RDM requirements of researchers in the Humanities, the DCH is cooperating with the Cologne Competence Center for Research Data Management (C^3RDM) at the University of Cologne, which is a RDM support center for the whole university and is presented in the following section.

The DCH provides a wide range of services to researchers at the faculty (Blumtritt et al. 2018). In its activities, the center is guided by the FAIR (Wilkinson et al. 2016) and CARE principles (Carroll et al. 2020), RDM best practices (e.g. Corti et al. 2019), as well as discipline specific community standards (e.g. Seyfeddinipur & Rau 2020). It supports researchers through a structured consultation service (Helling, Blumtritt & Mathiak 2018), project application support, active data management, and training.[3] These activities all involve a high degree of subject-specific expertise and the center's staff has a background in the humanities. The center also assumes responsibility for the institutional securement, provision and long-term archiving of all digital resources entrusted to it. Accordingly, FAIR data stewardship is a central part of the responsibilities of the DCH.

The DCH has two permanently funded positions and a varying number of project funded employees and research or student assistants – at the time of writing six. Officially, all positions are categorized as either scientific employees or research assistants. In reality, we can identify five different position profiles at the center:

- Profile 1: consultation, networking, policies, training, management
- Profile 2: management assistance
- Profile 3: active RDM support
- Profile 4: data archiving
- Profile 5: software development

[1] International FAIR Convergence Symposium, 27 November – 04 December 2020. https://www.go-fair.org/events/international-fair-convergence-symposium/ [Last accessed 12 April 2022]; Session recording "The Importance of Demand and Environment for Defining Data Stewardship", https://vimeo.com/499270227 [Last accessed 12 April 2022].
[2] https://dch.phil-fak.uni-koeln.de/ [Last accessed 12 April 2022].
[3] https://dch.phil-fak.uni-koeln.de/fdm-services#c200501 [Last accessed 12 April 2022].

None of the positions seem to fit the various descriptions of academic data stewards as for example presented in the various contributions in Clare et al. (2019). Nonetheless, FAIR data stewardship following Wilkinson et al. (2016) is at the core of the center's work and in particular the positions profiles 1, 3, and 4. These five position types are the direct result of requirements of the faculty, the research projects, and the funding structure (e.g. Mathiak et al. 2019). The profile 1 positions are funded by the faculty and their profile is the result of the faculty's requirements. These employees focus on establishing the center and positioning it in the faculty as well as the wider RDM landscape, defining the policies, raising awareness and providing project application support for the whole faculty. The employees in profile 1 positions might also fulfil roles of profile 3 and 4 when necessary. Profile 2 is a student assistant with a supportive role in organizing the center. Profile 3 and 4 are employees or research assistants supporting projects through active RDM and data archiving. These roles are generally funded through the center's participation in research projects in various disciplines. Profile 5 positions can be funded through RDM and IT funding lines and answer infrastructure demands or more complex RDM requirements from specific disciplines. The profile of the DCH as a competence center and the position profiles are a direct consequence of the demands and the environment in which the center operates and facilitate a faculty- and discipline-specific RDM services.

Monika Linne and Jens Dierkes

2.2 Establishing a data steward concept at the University of Cologne by C^{3}RDM, NFDI4Health and GO UNITE!

RDM is a complex, dynamically developing field (Cox et al. 2016). On a university level, there are a number of players involved: researchers, infrastructure providers (libraries, computing centers), administration, and university leadership. Besides, there are research-community driven approaches to establish a data culture including RDM practices and support. Today you can find a large number of institutional initiatives, building up and establishing local RDM contact points, service or competence centers, etc.[4] These are predominantly driven by the central infrastructure providers. At the University of Cologne (UoC) we follow a similar approach, by establishing the Cologne Competence Center for Research Data Management (C^{3}RDM) that is constituted by the library, the computing center, and the research office.[5] The main goal is providing basic RDM support (consulting and training) and brokerage/networking across campus, as, e.g. with the Data Center for the Humanities (DCH, cf. Sec. 2.1) (Dierkes & Curdt, 2018; Linne et al. 2020).

In October 2020, the federally funded National Research Data Infrastructure (NFDI), which is target at building a research-communities-driven, federated data infrastructure in Germany has been launched.[6] The focus is on people, their skills, and RDM knowledge, not on hardware. NFDI4Health is the implementation of this concept for personal health data.[7] Its partner institutions cover clinical, epidemiological, as well as public health science sectors. However, the question remains, how can researchers on campus make use of the services and know how developed in such a consortium. The University and City Library (USB) Cologne, which is also partner in C^{3}RDM, is a member of NFDI4Health. The USB is exactly probing this interface between NFDI4Health and universities by exploring the role of a data steward being located at the library and providing RDM support for the researchers at the faculty of medicine. At the same time, the data steward is part of the C^{3}RDM team, which allows the data steward to build a value-added support portfolio and to build a local network of RDM players, enabling a bidirectional exchange of experiences and feedback between all parties.

Not only across Europe, but also globally, Universities and other scientific facilities face the challenge of establishing professional, institution-wide research data stewardship and to build its related and necessary infrastructure. So basically, RDM Competence Centers, RDM Infrastructures and institutions are all working on the same issues. But instead of building on existing and reusable good solutions the wheel is being reinvented all over again for too many times. Both the building and the establishment of university-wide RDM structures can be designed more effectively and efficiently if existing RDM institutions build networks, cooperate and exchange their experiences with best practices and standards.

[4] Cf. https://www.forschungsdaten.org/index.php/FDM-Kontakte [Last accessed 12 April 2022].
[5] https://fdm.uni-koeln.de/ [Last accessed 12 April 2022].
[6] https://www.nfdi.de/; https://www.dfg.de/en/research_funding/programmes/nfdi/index.html [Last accessed 12 April 2022].
[7] https://www.nfdi4health.de [Last accessed 12 April 2022].

As a result, in 2019 the German RDM community founded GO UNITE! as a national Chapter of the international Implementation Network Data Stewardship Competence Center (DSCC-IN) that is run by the International GO FAIR Initiative.[8] The DSCC-IN is composed mainly by individual national DSCC chapters that can reflect local setup needs and ensure a functioning network of DSCCs on national or regional levels. In GO UNITE!, German RDM experts come together to collaboratively work on topics of common interest. Currently the network focuses on three topics:

1. Connecting the network: Identification of RDM topics that require stronger networking between RDM initiatives.
2. Research data management description model: Development of a comprehensive description model of RDM demands and workflows.
3. Internalization: Enhancement of international collaboration between RDM players.

Our approach emphasizes the complex situation of multiple stakeholders and the attempt to foster a mutual understanding, which will hopefully allow for an optimized and more sustainable use of resources in (developing) RDM support.

Mijke Jetten

2.3 Professionalizing data stewardship: competences, training and communities

Over the past years, the Dutch Techcentre for Life Sciences (DTL) – a public-private partnership of over 50 life science organizations in the Netherlands – initiated essential international activities on professionalizing FAIR data stewardship. These initiatives serve as a framework and/or good example for local data stewardship developments, and help local research-performing organizations with FAIR data stewardship capacity and community building.[9]

A first example is the NPOS-F project (Jetten et al. 2021), on the national coordination of competences for data stewards and training in data stewardship. As part of the National Program Open Science (NPOS), the project report provides arguments for decisions and activities to ensure adequate data steward capacity, in order to realize the ambitions for Open Science. “How many data stewards do we need where in the organization and with what competences?” is a question each research-performing organization should ask. The report helps to build the foundation to answer them, by providing a landscape analysis, giving practical recommendations to multiple stakeholders, and by drawing attention to the need for nationally coordinated implementation. Recommendations include consolidation and implementation of defined data stewardship competences, formalizing job profile via national classification systems, training programs matching the required competences, and the building of a data steward skills tool as a single point of reference for up-to-date information. The NPOS-F project builds on the widely supported recommendations of two previous projects, the ZonMw data stewardship project (Scholtens et al. 2019) and the LCRDM data stewardship project (Verheul et al. 2019). The work also features as use case in the EOSC Strategic Research and Innovation Agenda and inspired the NPOS ELIXIR data steward competency framework.[10]

As a second example, facilitating the various communities in the Netherlands is an essential element of professionalizing data stewardship and FAIR data stewardship capacity building. These communities exchange experiences and good practices, and jointly tackle data challenges. For many years, DTL facilitates the domain-agnostic Data Stewards Interest Group (DSIG), with regular meetings and a vibrant (Slack) community for data stewards and like-minded in the Netherlands – even abroad – to share experiences and foster the implementation of data stewardship.[11] Another example is the Health RI Data Stewardship Community (DSC), a disciplinary community building initiative by DTL, which unites health care data stewards for fruitful national collaborations, so health data organizations don’t have to reinvent the wheel locally.[12]

[8] https://www.go-fair.org/implementation-networks/overview/dscc/ [Last accessed 12 April 2022].
[9] https://www.dtls.nl/about/ [Last accessed 12 April 2022].
[10] https://www.eosc.eu/eosc-sria-v10-15-february-2021 [Last accessed 12 April 2022]; https://competency.ebi.ac.uk/ [Last accessed 12 April 2022].
[11] https://www.dtls.nl/community/interest-groups/data-stewards-interest-group [Last accessed 12 April 2022].
[12] https://www.health-ri.nl/communities/data-stewardship-community [Last accessed 12 April 2022].

A third example is the recently established Research Data Alliance (RDA) Professionalizing Data Stewardship Interest Group (PDS IG), with DTL as one of the initiators and current co-chairs.[13] The group originates from two Birds of a Feather sessions at the RDA Plenary 14 and 15. Eight challenges were identified: a business case for data stewardship, terminology, models, job profiles, training, networking and knowledge exchange, and certification. The activities of the PDS IG help data stewards and their organizations, and align with the RDA mission to build bridges, exchange views, collaborate on relevant topics, and tackle current hurdles experienced by the international research data community.

As a last example, DTL co-created the RDA/LCRDM 23 project.[14] Inspired by the '23 Things: Libraries for Research Data resource' by the RDA Libraries for Research Data Interest Group, and as a joint effort of RDM stakeholders in the Netherlands, a 23 Things version for among others data stewards was created. Moreover, the static Zenodo versions (Jetten et al. 2020) were transformed into an interactive tool, in which users may select an audience (e.g. data stewards, students, researchers, IT staff) and theme (e.g. metadata, citing data, community of practice).[15]

Anna Wałek and Magdalena Szuflita-Żurawska

2.4 Gdańsk University of Technology approach to building up the research data services and infrastructure as well as a national network supporting data management

Even though the idea of "data stewardship" is evolving, there is still no coherent definition of the term. One possible explanation might be that "data stewardships" could be perceived differently by many stakeholders, such as the level of implementation by the national institutions. Even in Europe, the perception of involving data stewards in data management might be different in Germany and Poland. Below, we tried to present The Gdańsk University of Technology (Gdańsk Tech) case on building a competent service from scratch.

Gdańsk Tech, together with the Gdańsk Medical University and the University of Gdańsk, has been implementing the Bridge of Data project since 2018. The project's primary goal is to build the research data repository (MOST WIEDZY Open Research Data Catalogue – launched in April 2020) to collect, search, analyze, and share Open Research Data (ORD) from participating institutions. We were aware that building only technical infrastructure without sufficient support for the researchers would not be effective. That is why the projects essential element is substantive support provided by the Open Science Competence Center (OSCC). The Center was established in 2018. One of the centers main aims is to provide researchers, PhD students, librarians, and other stakeholders, with the necessary skills and broad competencies to perform Open Science effectively (Wałek & Szuflita-Żurawska 2020). In 2019, OSCC also became a GO-FAIR DSCC IN member, essential for developing services following the international community's standards.

Creating the OSCC has arisen from the global trend of data stewardship and experiences from the previous project dedicated to OA activities. We discovered that researchers' knowledge of Open Science has gaps, especially related to copyright and RDM issues. To resolve these practical difficulties researchers face, a support team that includes data specialists and librarians have been organized and managed at the Gdańsk Tech Library. Part of the team is recognized as data stewards. They are relatively new positions in the Polish academic landscape. A data steward is usually seen as a disciplinary expert with diverse knowledge and experience of RDM practices.

Another role played by OSCC members is that of a data support librarian. This role is called variously, but its essential characteristic is supporting researchers at multiple stages of the data lifecycle, both during the research process and during the curation process. Our significant challenges were setting up a team of professionals who can support the academic community for broad issues associated with Open Science, especially with ORD. At that time, there have been no specialists in this field in Poland. Scientific teams conducting research grants collected and managed data to the required extent but without institutional or structured coordination.

To create the first professional team of this type, we gathered librarians, IT specialists and scientists.

[13] https://www.rd-alliance.org/groups/professionalising-data-stewardship-ig [Last accessed 12 April 2022].
[14] https://www.lcrdm.nl/en/23things [Last accessed 12 April 2022].
[15] https://23things.sites.uu.nl/ [Last accessed 12 April 2022].

We offer different training types to scientific staff and students, such as tailored training concerning the scientific discipline, face-to-face consultations, or online webinars divided into thematic blocks.

Another challenge for the center was taking into account the differences between scientific disciplines and their different scholarly communication practices regarding sharing scientific output to provide complex support with RDM. Collaboration with scientists has resulted in developing a general metadata standard used by the Bridge of Data Repository and preparing tailored individual training for different scientific areas.

One of the teams most essential tasks is to support research teams and scientists applying for grants in creating DMPs. Our activities intensified in 2020, when the National Science Centre Poland (NSC) – the national founder, introduced the obligation to attach DMPs to grant applications.

In cooperation with the NSC, we conducted a series of training courses for librarians, university administration employees and researchers in February 2020, mainly in creating DMPs.

We trained several hundred people from all over Poland. We are currently creating a nationwide network that would be a platform for exchanging knowledge and experience from various academic centers. We will strive to ensure that as many initiatives of this type as possible appear in our national network and represent the best possible competences.

3. Report of the Discussion

The discussion of the four concrete perspectives in the session has illustrated how structural environments of RDM competence centers and domain- or community-specific demands have an impact on defining and establishing data stewards.

Although there is no consensus yet about the type and level of training for data stewards, the aforementioned DTL NPOS ELIXIR data steward competency framework formulates at least two essential needs for a job profile, and thus for training data stewards: experience with the handling of data and soft skills. Both are crucial to translate technical RDM aspects, functionalities and services to the daily practices of researchers. In addition, facilitating local and national data steward communities is essential for professionalizing data stewardship.

Considering more structural factors, the example of the Data Center for the Humanities (DCH) at the Faculty of Arts and Humanities at the University of Cologne highlighted the necessity for institutions to have a certain number of digital research projects which can motivate the presence of RDM support infrastructure and, consequently, consistent funding for personnel, e.g. data stewards. Accordingly, services and solutions need to be closely connected to such RDM demand structures. Especially within the context of the humanities, these can become extremely heterogeneous and require domain specific solutions and services.

The general influence and importance of domain- and community-specific demands on data stewardship is also a central aspect in the approach of the Gdańsk University of Technology. The goal here is to build up research data services and infrastructure as well as a national network supporting data management. Here, it is considered essential to cooperate with researchers at different institutions and faculties that have domain specific expertise in data management, while having a centralized data competence center with a coordinating role.

In addition, the development of the national research data infrastructure (NFDI) in Germany seems to have a potential for clustering solutions. Especially structures that consolidate services on a national level need to be made accessible. According to the Cologne Competence Center for Research Data Management (C^3RDM) as a generic RDM institution at the University of Cologne, this is a core challenge for data stewards. Following the approach of C^3RDM within the NFDI consortium NFDI4Health, the national research data infrastructure may be a suitable network environment for establishing data stewards and bringing together researchers and (domain-specific) solutions, services and training in an efficient way.

4. Conclusion

One of the goals of the session was to tangibly illustrate and discuss the variety of influencing factors that have an impact on defining the idea and role of data stewards: the plenum indeed recognized environment and RDM demands as the most relevant ones. However, the actual influence of individual environments and domain-specific RDM demands did not concretely emerge in the end. This may be due to the fact that the process of establishing RDM competence centers and data steward positions is still in its infancy. The session showed that a variety of aspects influence our description of data stewards, when it comes to environments and RDM demands. The process of building up and establishing these structures is still explorative and one still needs to draw conclusions from practice, while trying to reach a more abstract level. At this stage, exchange on different heterogeneous approaches is key to get closer to a comprehensive conceptualization of data stewards.

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