DCC NL Implementation Network

30 May 2020

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On 4 February 2020, a network meeting of the LCRDM was held in Wageningen, during which the writing team received feedback from a larger group of DCC stakeholders (120 participants). This input has been incorporated in the final version of this position paper. The feedback from the LCRDM advisory group on the various versions of the position paper has also been incorporated in this final version.

1. Introduction

In October 2019, NWO presented the implementation plan *Investeringen digitale onderzoeksinfrastructuur* [Investing in digital research infrastructure] to Minister of Education, Culture and Science Ingrid Van Engelshoven. This plan is an elaboration of the recommendations from the Apers committee *Integrale aanpak voor digitalisering in de wetenschap* [Integrated approach to digitisation in science] from March 2019. The recommendations concern the way in which the academic ICT infrastructure and associated expertise in the Netherlands can be strengthened, as well as how the investments for this laid down in the coalition agreement (20 million euros annually) can be achieved [1][2]. The implementation plan foresees a combined approach, with investment in ICT facilities (hardware) as well as investment in a federated system of local and thematic Digital Competence Centres (DCC) plus one interuniversity DCC. See Appendix 1 for a short explanation of the various levels of DCC.

In its *Positioning Paper 2019 en verder* [Positioning Paper for 2019 and Beyond], the National Coordination Point Research Data Management (LCRDM) [3] underlines the importance of good support for researchers with regard to the principles of Open Science (such as sharing FAIR Data). At present, this support within the universities and university medical centres (UMCs) is often fragmented and offered through a range of services (Library, IT, Legal, Data Stewards) and/or by the external thematic DCCs. Some research institutions in the Netherlands have already adopted a more integrated collaboration, in the form of a visible entity (such as the Leiden Centre for Digital Scholarship and Wageningen Data Competence Center), or as a virtual organisation accessible via the institutions' web portals offering RDM support (such as Groningen and Maastricht). The way in which this collaboration is arranged varies per institution and there are also large differences in the extent of development and implementation.

When NWO published its implementation plan, the LCRDM immediately saw the potential for knowledge sharing among the institutions through the establishment of the DCCs. For this reason, the LCRDM took the initiative to brainstorm about setting up a DCC NL Implementation Network aimed at supporting each other in DCC developments.[1] Such a network comprises delegations from the local and thematic DCCs, with participation by SURF, which has been assigned a supporting role in the implementation plan. The idea of a DCC NL Implementation Network that operates within the LCRDM means the initiative now lies with the institutions themselves. It is up to them (as long-term task group of the LCRDM) to jointly determine their position concerning the DCC concept. We feel there is much added value to be gained from a national collaboration of this kind between DCCs.

Although the NWO implementation plan does not mention DCCs within the Universities of Applied Sciences (HBO) and the hospitals in the Association of Tertiary Medical Teaching Hospitals (STZ), the LCRDM initiative is keen that they should join the Implementation Network

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[1] The platform and facilities for this brainstorm session were provided by GO FAIR. In the long term, joining with GO FAIR (also with regard to terminology) means expanding from national to international collaboration.

alongside the research universities and institutions and national RDM organisations. Many Universities of Applied Sciences and STZ hospitals are currently taking steps to organise support for Open Science and FAIR Data. This new development would benefit from a joint approach from the outset.[2]

The purpose of this position paper is to make clear that:
- RDM support is also already being structurally organised in many research institutions;
- the members of the LCRDM (over 200 RDM experts from more than 60 research institutions) are working in (a forerunner of) the DCC organisation in their institution;
- a DCC NL Implementation Network can be set up from the LCRDM.

2. D for Digital, or D(S) for Data (Stewardship)

The report by the LCRDM Data Stewardship task group [4] describes three levels of Data Stewardship: (1) operational in the research groups – embedded (2) advisory in a generic support entity – generic and (3) strategic at policy development level – policy. All three of these levels are found in Dutch institutions and sometimes all three levels are carried out by a single member of staff. The Data Stewardship tasks mentioned in the report largely correspond with the functions of a DCC as described by NWO. Although the DCCs are not solely focused on sharing advice and knowledge on FAIR data and software and the required infrastructure, the Data Stewardship tasks do form a key activity at their operation level.

The meaning of the D in the acronym was a recurring item in various brainstorming sessions. In discussions on Twitter (@wvanwezenbeek, @KarelLuyben, @barendmons, @GOFAIRofficial etc.) an argument was made for the D to continue to stand for Data. GO FAIR argues in favour of Data Stewardship (and in consequence a DSCC).

Although the description of the objectives of a DCC as formulated by NWO largely correspond with the Data Stewardship tasks as stated in the report by the LCRDM task group, our advice is to maintain the term as adopted by NWO – that is to say Digital Competence Centres. After all, the field is defined more broadly than the term 'Data' would imply. We would however like to add the observation that there is a risk that the term 'Digital' may be interpreted more broadly than intended in the defined tasks. Therefore it remains important to continue to monitor the delineation of the objectives of a DCC, based on defined tasks.

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[2] Following the national LCRDM networking day on 4 February, discussions have commenced between the NWO Executive Board Office and the Universities of Applied Sciences on a national DCC for the Universities of Applied Sciences.

3. Tasks of a DCC

Among other things, a DCC is tasked with:

■ fulfilling the duty of care for data management from the Netherlands Code of Conduct for Research Integrity from the Association of Universities in the Netherlands (VSNU) or the Code of Conduct from the Netherlands Federation of University Medical Centres (NFU), which include FAIR Data management;
■ arranging facilities that enable researchers to manage data in such a way that the FAIR principles of the Open Science ambitions are met.

These are structural activities:

1. Coordinating/organising Data Stewardship and IT Research:
   a. Facilitating the institution's Data Stewardship organisation
   b. Supplying RDM and IT services for research, including support and innovation (or referring to such)
2. Knowledge and advice centre for FAIR Data and software within the institution:
   a. Central point of contact for all questions related to FAIR Data within the local organisation, with sufficient awareness of the differences between disciplines
   b. Giving solicited and unsolicited advice to CISOs and the administrative tier of the institution on data policy and data guidelines and national and international developments
   c. Setting up and organising training courses for various stakeholders in FAIR Data processes
3. Hub in a federated network for data and expertise for the benefit of:
   a. Landing place for software and expertise developed in projects within the institution but also by third parties (GO FAIR, LCRDM, RDA, SURF)
   b. Exchanging knowledge related to FAIR Data developments and Data infrastructure within the national Implementation Network (DCC NL)
   c. Sharing successful strategies and developments that lead to behavioural changes in the transition to FAIR Data
4. Coordinating and stimulating cooperation in cross-domain data-driven research and teaching within the local institution:
   a. Promoting data-related collaboration between the various organisational units within the institution
   b. Point of contact for external parties who may want to collaborate with the institution in the area of data, and promoting this collaboration
   c. Point of contact for data (science) education in the ongoing learning pathways for Bachelor's, Master's and PhD programmes

4. Playing field

In this section, we briefly sketch the national and international playing field surrounding the DCCs.[3]

4.1. Research universities, UMCs, research institutions, Universities of Applied Sciences and STZ hospitals

Right now, every university in the Netherlands is setting up a local organisation to support researchers in working according to FAIR Data guidelines. The UMCs are establishing similar data desks for research support, or have already done so. In most research institutions (KNAW, NWO, TO2 etc.), universities of applied sciences and STZ hospitals in the Netherlands, this is just starting to get off the ground, but even in these institutions much attention is being paid to setting up support services for Open Science and good Data Stewardship for FAIR Data.

4.2. Joint national approach via the LCRDM

The LCRDM plays a pro-active coordinating role in facilitating data support collaboration with the local and national thematic groups, particularly with regard to furthering standardisation and knowledge-sharing and bringing together institutions with similar questions. This makes the LCRDM (with its 200+ RDM experts) the ideal platform in which the federated network described by NWO should be formed and operate.

4.3. Thematic DCCs in the DCC NL Implementation Network

The NWO advisory report also describes a development in thematic DCCs, although this form of DCC has not yet been thoroughly worked out in the recommendation. A number of examples of existing institutions are mentioned (CLARIAH, DANS, 4TU CfRD, Health RI, D4L, DTL etc.). The memorandum mentioned *Verkenning nationale datalandschap* [Exploration of the national data landscape] [5] includes a list of data repositories in the Netherlands.
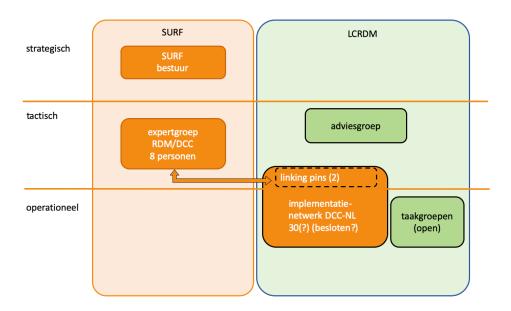
The DCC NL Implementation Network should also include participation by representatives from the thematic DCCs. Only in this way can the wishes of the researchers be translated into services provided by the thematic DCCs, and conversely the contact with the local DCCs can make it easier for the services and toolings from the thematic DCCs to be seen and used by the researchers.

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[3] At present, a core team lead by Melle de Vries of the Royal Netherlands Academy of Arts and Sciences (KNAW) is working on a 'survey of the national data landscape' as part of a National Platform Open Science (NPOS) project [5]. We look forward to seeing the results of this project.

4.4. SURF

Besides the thematic DCCs, the NWO advisory report names SURF as an umbrella organisation aimed at offering national support in joint infrastructure and computing power. SURF will be submitting a proposal to NWO concerning its interpretation of this role.

One or two of the participants in the DCC NL Implementation Network will be used to form the connection to SURF, the SURF RDM/DCC expert group and the technical pilots, whereby the coordination between the DC NL Implementation Network and SURF in a supporting role will be safeguarded.

4.5. Connection with research and education

Where the LCRDM is primarily a network of data supporters, we see that besides the ICT and RDM domain, Data Science is essential to make FAIR operational. Data Science can be used to obtain new insights intelligently.

Quoting Prof. M. Dumontier: Data Science is about "accelerating scientific discovery through the development of powerful Artificial Intelligence (AI) platforms coupled with FAIR Data and Services to systematically unlock knowledge about the world we live in".

For this reason, Wageningen has chosen a Data Competence Centre (WDCC) that not only incorporates Data Stewardship and Data Infrastructure programme lines, but also places a core focus on the programme lines Data Science, Data Science Education and Data Value Creation and uses the Stewardship and Infrastructure programme lines to support the core programme lines. The advantage of this approach, which is incidentally used in other institutions as well

(for example in Maastricht), is that Data Stewardship and Data Infrastructure are developed from the research programmes, while at the same time applications of existing and development of new solutions for facilitating FAIR Data are worked on from the coordinated approach. The blueprint of the WDCC could be used as one of the examples within the Implementation Network, in which each discipline can work out specific details on the basis of its own wishes.

4.6. International networks

At international level, the following networks (among others) play an important role for the DCC NL Implementation Network:

- Large-scale research infrastructures (for example ESFRIs and eIRG infrastructures)
- EOSC (European Open Science Cloud)
- GO-FAIR
- RDA (Research Data Alliance), WDS (World Data System)
- CODATA (Committee on Data of the International Science Council (ISC))

5. Aim of the DCC NL Implementation Network

"Good Data Stewardship" [4] is a recently mentioned focus and expertise area in science and a crucial part of Good Research Practice in scientific research and innovation. Good Data Stewardship is aimed at strengthening and professionalising all data-intensive steps in the research process, including FAIR implementation, and requires specialised expertise and capacity at three levels:

1. Local DCCs in all Dutch research organisations;
2. Thematic DCCs at national level (national data expertise and data initiatives);
3. SURF in a coordinating and supporting ICT role at national level.

This position paper represents a first step for giving the local and thematic DCCs a joint voice through the LCRDM to respond to and anticipate the DCC NL Implementation Network proposed by NWO. The LCRDM can also be used to strengthen the DCC NL Implementation Network. Locally embedded DCCs which are all still developing individually can learn from each other through exchanging experiences, good practices and solutions for common challenges. At the same time, the DCC NL Implementation Network can be used to optimise the contact and coordination between the local and thematic DCCs. Mutual contact and coordination prevents the formation of 'silos' that can hinder academic research. For this the local DCCs can work jointly to help formulate the principles for coordinating the thematic DCCs and the DCC at SURF.

It is within this LCRDM context that the DCC NL Implementation Network has summarised the following objectives:

1. Offering tips for establishing local DCCs, at the level of functions/roles within DCCs, in cohesion with local ICT and Data Science centres and aimed at strengthening the

possibilities for data exchange and collaboration between research teams from various different institutions;

2. Joint development and professionalisation of the local Data Stewardship process and expertise, including the necessary local software, infrastructure, research IT expertise and services;

3. Positioning the Implementation Network of local DCCs in the national data landscape (such as NPOS) via the LCRDM, including coordinating with the administrative level of institutions and umbrella organisations (such as VSNU, NFU, the Netherlands Association of Universities of Applied Sciences);

4. Connecting with international initiatives in Data Stewardship (such as GO FAIR, RDA, CODATA, EOSC, domain infrastructures).

6. Tasks of the DCC NL Implementation Network

Bearing the objectives in mind (Section 3, page 5), the DCC NL Implementation Network will be engaged in the following tasks:

1. Charting and promoting DCC best practices models, and updating them in line with latest insights;
2. Placing any bottlenecks in the implementation of DCCs on the agenda of the appropriate bodies;
3. Lobbying to boost DCCs in other sectors;
4. Making an analysis of the resources, people and capital needed to create optimally functioning DCCs in relation to the size and nature of the research institute. (Developing a Quickscan tool for analysing the status of RDM with the researcher and the institution, also making measurable the DCC and the topics in development and implementation);
5. Jointly developing competence profiles and training (in collaboration with existing LCRDM task groups);
6. Testing and giving feedback on FAIR tooling developed by third parties;
7. Reviewing each other's proposals for the NWO call;
8. Facilitating a pool of expert brigades to visit local DCCs.

The tasks ensuing from the DCC NL Implementation Network can be put out in the national LCRDM network through pitches and taken up by task groups, as is current practice in LCRDM.
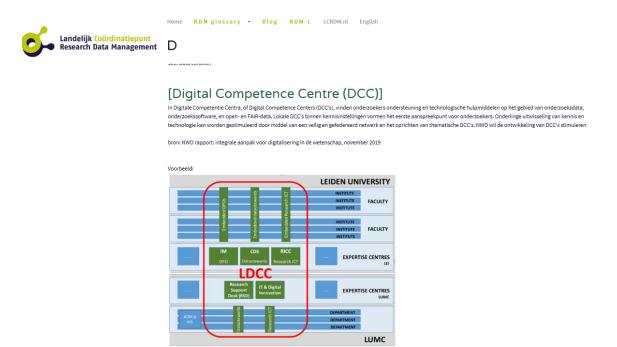
7. Recommendations

1. Set up a DCC NL Implementation Network within the LCRDM. The aims and tasks of such a network are described under 5 and 6.
2. Give the DCC NL Implementation Network a provisional working term of two years.
3. Recruit participants for the DCC NL Implementation Network (with representatives from DCCs from the various levels and institutions) from (among other places) the existing LCRDM network of experts, and position the DCC NL Implementation Network as a long-term LCRDM task group. The ideal size of the Implementation Network would be

around 30 participants (Universities, UMCs, KNAW, NWO-i, HBO, DTL, eScienceCenter, representative from the RIs).

4. Ask the DCC NL Implementation Network to develop a Roadmap for developing the Implementation Network, aimed particularly at the future joining of new participants (such as the data-driven business community).

8. Terminology

For terminology used, see the list from the LCRDM (https://www.lcrdm.nl/en/glossary) and the terminology list used in the Implementation Plan (Appendix 6). We give an example of a new term that has been added in response to the NWO advisory report *Integrale aanpak voor de digitalisering in de wetenschap* [Integrated approach to digitisation in science].

References

[1] *Rijksoverheid (March 2019) Berichtgeving mbt advies Integrale aanpak voor digitalisering in de wetenschap* [Central Government (March 2019) Notice on advisory report for integrated approach to digitisation in science] https://www.rijksoverheid.nl/documenten/rapporten/2019/03/04/integrale-aanpak-voor-digitalisering-in-wetenschap

[2] NWO, *Integrale aanpak voor digitalisering in de wetenschap. Uitvoeringsplan investeringen digitale onderzoeksinfrastructuur* (2019) [Integrated approach to digitisation in science. Implementation plan Investing in digital research infrastructure] https://www.tweedekamer.nl/kamerstukken/detail?id=2019D43212&did=2019D43212

[3] Verheul, Mordant, Ringersma, Sesink, Smeele, Boiten, … Dunning. (3 July 2019). *Landelijk Coördinatiepunt Research Data Management (LCRDM) – Positioning paper voor 2019 en verder (Version final)* [National Coordination Point Research Data Management (LCRDM) – Positioning Paper for 2019 and beyond (Final version). Zenodo. http://doi.org/10.5281/zenodo.3266833

[4] Verheul, Imming, Ringersma, Mordant, Ploeg, van der, & Pronk, (6 May 2019). Data Stewardship on the map: A study of tasks and roles in Dutch research institutes. Zenodo. http://doi.org/10.5281/zenodo.2669150

[5] Vries, de, Melle, *Notitie - Aanzet tot datalandschap (v.1.1)* [Memorandum – First step to a data landscape (v. 1.1)]
https://www.openscience.nl/projecten/project-e-verkenning-en-optimalisering-nationaal-datalandschap

Appendix 1: Various levels of DCCs

In a local Digital Competence Centre (DCC) positioned as a recognisable virtual unit in a university or UMC, expertise in data, software and computing is brought together in one place. The following functions are described for DCCs:

1. Landing place for RDM software developed centrally and locally;
2. Knowledge and advice centre for FAIR data, software, and the required IT infrastructure (workplace, computing power, storage and physical network);
3. Hub for the federated network of DCCs for the above points and expertise.

The thematic DCCs (which have not yet been worked out in detail in the NWO advisory report) will be formed by existing organisations such as DANS, 4TU.ResearchData, eScienceCenter, Health-RI and DTL.

In the NWO advisory report, SURF is designated as the interuniversity DCC, tasked with facilitating the technology and coordination of the secure, federated system that is to connect the DCCs to each other.