



# Royal Netherlands Academy of Arts and Sciences (KNAW) KONINKLIJKE NEDERLANDSE AKADEMIE VAN WETENSCHAPPEN

## DANS research programme 2018-2020

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# DANS Research Programme 2018-2020

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## 1 Background and History

DANS (Data Archiving and Networked Services) is the Netherlands Institute for Permanent Access to Digital Research Resources. DANS encourages researchers to make their digital research data and related outputs Findable, Accessible, Interoperable and Reusable (FAIR). It provides expert advice and certified services.

Its present orientation extends from its original domains (Humanities and Social Sciences) to cover adjacent domains and in principle all domains that have not enough critical mass to take care of their own data, targeting their so-called long-tail data.

The Research and Innovation group (R&I-G) has an investigative and supportive role concerning the overall DANS mission: research at DANS is practice oriented, applied research. In order for DANS to keep its services up-to-date and at the forefront of developments and to be proactive where new developments arise Research and Innovation activities are key.

As a member of the KNAW and NWO, DANS recognises that it has a societal role to play in the generation of knowledge. For this reason, the research programme takes into consideration the wider research agendas, such as the Dutch National Research Agenda, The Horizon2020 EU Research and Innovation Programme and the United Nations Sustainable Development Goals, in order to augment the consistency, efficiency and impact of research at all levels.

Acting as an external ambassador, the R&I-G aims to boost the societal relevance of DANS and strengthen links with the research community. This objective can be reached through ongoing participation in inter-institutional research projects and through the continued generation of synergies with the wider research agenda at national and international levels.

The R&I-G was established in 2011. Since then, many projects have been executed, among them two PhD projects – one ongoing. Research group members have contributed to DANS research output and activities (see [Pure KNAW](#), DANS research output). The spectrum of output covers peer-reviewed journal articles, special issues, books and book chapters, but also reports for European projects, datasets and tools.

At its start the group acted as a special ambassador for DANS, adding to the international visibility and acquiring research projects. Some of the early research projects were used to learn new methods (as Enhanced Publications [1], ACUMEN (metrics and interviews) [2], or ImpactEV (data mining and visualisation) [3]). Over the years, the research focus shifted, and the archive itself became an object of study. Examples are work on reference architecture across research infrastructures (in projects as DASISH, CESSDA SaW, Humanities at Scale) [e.g., 4], the DANS user study with C. Borgman [5], applying Linked Data approaches to collections (Dutch Historic Census) [6], and the visualisation experiments of NARCIS with K. Borner [7].

The research group remains project driven. At the beginning, those projects were rather isolated. Over time projects have been acquired more strategically, and research group members operate on projects across all competence groups (Fig. 2). This way, the research group contributes in practice to a flow of knowledge across different parts of the organisation. Today, the research group is a connector among projects, and influences them by adding a reflective, academic perspective.

It is important to note that research activities at DANS are not exclusively performed by the members of the R&I-G. The speed of technological progress in the information age, the emergence of new technological solutions covering all aspects of ICT concerns all competence groups in DANS: from the ICT support providing the technological backbone for both production and explorative services, to software development of DANS core services, to data stewardship executed in the archive group and the framing of scientific policies. Figure 1 presents an overview of the current R&I-G project portfolio.

Projects (with R&I staff)	Duration			Themes				Leading Competence Group
	2018	2019	2020	A	C	I	P	
Short name								
CESSDA				x	x		x	Policy
CLARIAH				x	x			Research
DARIAH-CIO					x		x	Research
TAP-Digging into the Knowledge Graph				x	x	x	x	Research
EHRI					x	x		Policy
EUDAT2020					x	x		Policy
EOSC-pilot					x	x		Policy
EOSC-hub					x	x	x	Policy
Freya					x		x	Policy
K-PLEX					x		x	Research
LinkSyr					x	x		Research
Re-Search					x	x		Research
KNAW VPP Smiraglia				x	x	x		Research

Funding source EC National International

FIGURE 1: R&I-G PROJECT PORTFOLIO

## 2 Research Themes

The central research question is:

**How do new insights affect the long-term archiving of complex digital research objects, and which community and infrastructure effects are needed to ensure this?**

R&I-G investigates this question along three dimensions: archives, communities, innovation and contributes to policy support at the intersection of those themes. (Fig 2.)

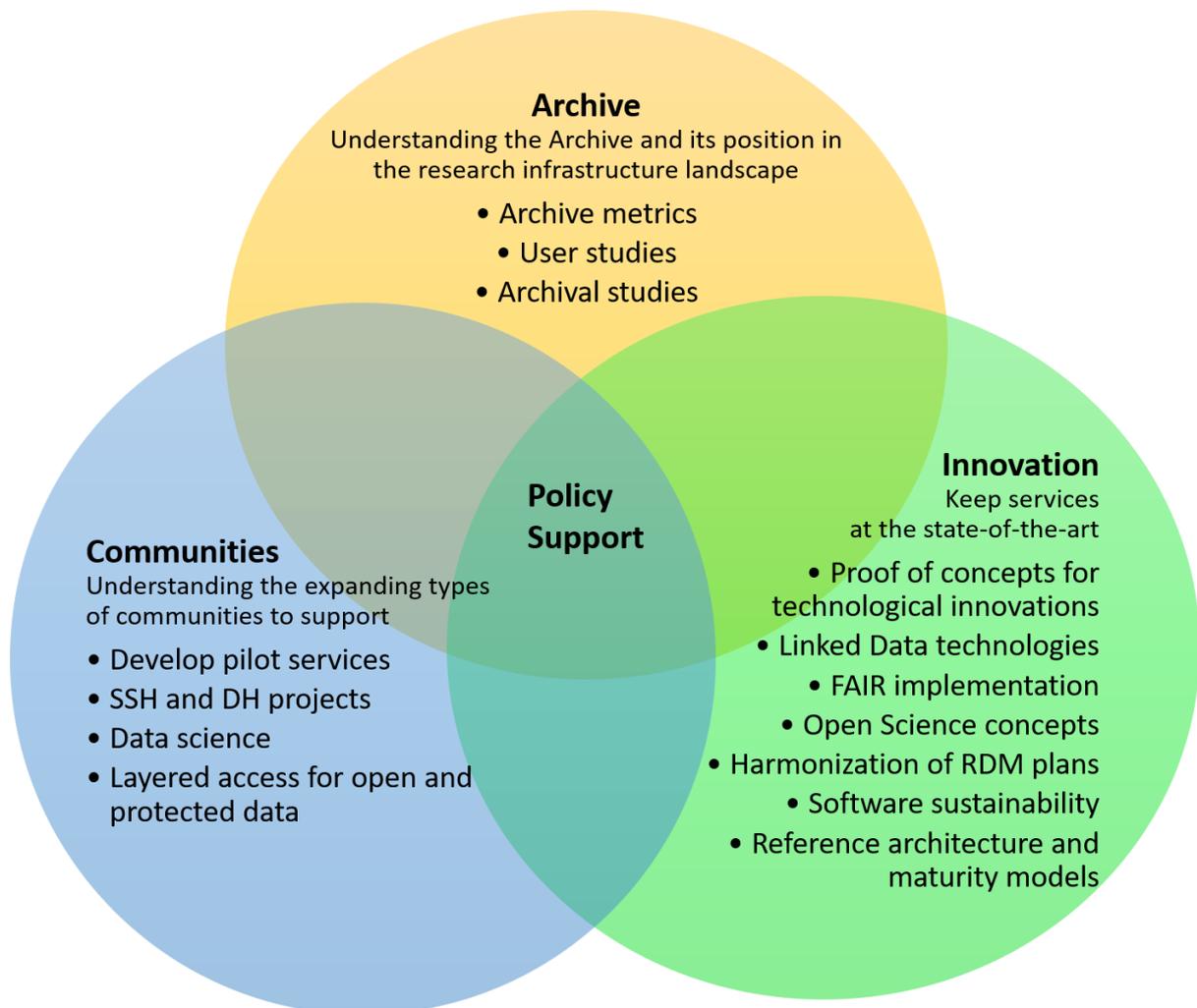


FIGURE 2: RESEARCH THEMES

### Archives

Archiving is in constant development. New technologies arise, new concepts develop and communities develop new demands and requirements. To better understand the DANS archiving services, their position in the research infrastructure landscape and the complex relationship between users of the archive and the emerging university data archives and RDM facilities, this topic requires continuous attention.

## Communities

The number of research communities beyond the original focus domains of DANS (Humanities and Social Sciences) that find DANS for their needs and support is growing significantly. To support the existing and emerging communities that use DANS archives and services deep understanding of their needs is required. Also, other service providers and research infrastructures (in the Social Sciences and Humanities and beyond) are communities to take into account and understand.

## Innovation

The R&I group develops new concepts and proof of concepts, for example for semantic web technologies, API's, cloud-based services, standards in data formats and metadata schemes, licenses and quality assessments. Temporary bottom-up emerging working groups like the DANS DataScience group, or the LinkedData group serve the development of new skills in-house.

## Policy support

The combination of knowledge and experiences and other findings by the R&I-G can be used to support continuous policy development, prioritisation of efforts and new planning. R&I-G will informally provide advise to the DANS Management Team. Examples are harmonising research data management planning [8], software sustainability [9], rewarding systems and metrics for open data, practical implementing matters regarding FAIR for data and for software [10].

As stated before, the R&I-G's activities are largely project-based, whereby the majority of the projects require applied research in infrastructures and communities. All projects can be classified under one or more of the research themes.

## 3 Research Agenda 2018-2020

The agenda contains a number of aspired research topics clustered around the research themes that were presented earlier. If projects which enable the research have already been acquired, they are mentioned between brackets in the list below.

### Archives

- Metrics/Scientometrics/Data metrics/Software metrics applied to content of DANS
- Developing of a new model for Data Retrieval (Re-Search)
- ERIC's as platforms for the co-evolution of research and infrastructures (DARIAH-CIO)

## Communities

- How to deal with sensitive and licensed data in Open Science? The construction of secure Virtual Research Environments and the European Open Science Cloud? (EOSC)
- How to build an own community around infrastructure? Explore different methods of user engagement, such as UX/User Centred Design.
- How to enable short-term usability of data sets and collections?
- Preparation of a possible model change, from a Product Development model to a Customer Development Methodology
- How to build research infrastructures which can serve communities (and archives) of different scale and of different digital maturity? Micro-services and modularity (e.g., Docker) (CESSDA)

## Innovation

- Management of provenance information and keeping it up-to-date (in particular in knowledge or data graphs formats), for instance, linking all derivative datasets to the originals (Digging into the Knowledge Graph)
- Archive for Linked Research Data (Digging into the Knowledge Graph)
- Archive for Endangered Knowledge Organisation Systems (controlled vocabularies) in the social sciences and humanities (Digging into the Knowledge Graph)
- Using Data Science to support research data management (for instance, apply Machine Learning and other AI algorithms to curate and enrich metadata and data)

## Policy support

- How (when and in which way) to long-term archive complex digital research objects and environments?
- Harmonisation of RDM-planning across organisations/levels (Parthenos)
- Software Sustainability

## 4 Composition and Modus Operandi of the R&I-G

Currently, 14 DANS employees belong to the R&I-G. Additionally, six DANS employees from other groups attend the research meetings on a regular basis. DANS invests about 2,5 FTE directly into R&I activities. Roughly 88 % of the effort of the group is funded through national and international projects.

The R&I-G organises two-weekly research meetings. The R&I-G members (obligatory) and interested members (voluntary) of other competence groups meet, with the purpose of exchanging information on on-going research and project activities.

The research meeting is accompanied by smaller group meetings around specific topics, for instance a new technological solution or methodologies relevant across projects.

The role of the group as knowledge exchange nexus, inside of DANS, national and international is visible in the organisation of DANS colloquia, work-lunches, workshops and the hosting of international guests (e.g., KNAW Visiting Professor Programme). Currently, the group runs the Chief Integration Office for DARIAH.EU, including CLARIAH.NL board functions.

The activities of the R&I-G are maintained and communicated through the DANS (external) website and the DANS Intranet for internal communications.

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This is the DANS Research Programme 2018-2020.  
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## Data Archiving and Networked Services (DANS)

DANS (Data Archiving and Networked Services) is the Netherlands Institute for permanent access to digital research resources. DANS encourages researchers to make their digital research data and related outputs Findable, Accessible, Interoperable and Reusable. We provide expert advice and certified services. Our core services are: DataverseNL for short-term data management, EASY for long-term archiving, and NARCIS, the national portal for research information. By participating in (inter)national projects, networks and research, DANS contributes to continued innovation of the global scientific data infrastructure. Open if possible, protected where necessary. DANS is an institute of the Dutch Academy KNAW and funding organisation NWO.

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*Driven by data*