

The Importance of User Involvement in the Development of the Norwegian Research Information Repository

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Abstract

This paper examines how systematic user involvement helped shaping the design and development of the Norwegian Research Information Repository (NVA), a national infrastructure for open access and research information, which was developed as a project using an iterative and agile approach. An expansion of the scope introduced a higher degree of complexity than anticipated. This introduced challenges related to functional diversity and institutional heterogeneity that the project underestimated. Additionally, large volumes of feedback from the user community proved difficult to handle by the people involved in the design and development process. To address this, a tighter collaboration with internal experts on CRIS was established, and different forms for user participation were introduced. This helped identify key functional requirements, improve the user interface, and align workflows with existing research administration practices. The examination of the user involvement process resulted in five distinct recommendations for similar national projects: secure early but structured user representation, anchor work at both operational and strategic levels, involve CRIS experts from the outset, phase and prioritise user involvement, and communicate clearly about development processes and how user feedback will be handled.

1 Introduction and background

In line with the EU Council conclusions on open access [1], the Norwegian Ministry of Education and Research appointed a working group in 2016 to develop national guidelines for open access to scholarly articles [2]. A key recommendation was to establish a national research information repository to streamline rights of clearance, reduce duplicated work, and improve national statistics and monitoring of open access. In 2019, UNIT published the white paper “Rapport fra utredning av

nasjonalt vitenarkiv” [3], which outlined the basis for establishing the Norwegian Research Information Repository (NVA).

At the time, Norway had a single national CRIS system (Cristin), along with several institutional repositories based on DSpace: the Brage service, which consisted of 78 different repositories, DUO at the University of Oslo (UiO), and Munin at the Arctic University of Norway (UiT). Several research institutions had no repository at all. This fragmented landscape led to duplicated registration, parallel rights clearance, quality assurance and meta-data enrichment processes for the same article, and uneven support for open access across sectors [3].

In its efforts to establish a national repository, the Norwegian Agency for Shared Services in Education and Research (Sikt) drew on the contemporary focus on user involvement in systems design [4] and developed a process that included institutions that would use proposed system [5].

This paper examines how systematic user involvement [6] helped shaping the design and development of the Norwegian Research Information Repository (Nasjonalt Vitenarkiv, NVA). First, we describe which user groups were involved and how they were engaged throughout the project. Next, we discuss the implications of said user involvement. Then, we identify key lessons learned and provide practical advice for others planning similar national-scale infrastructures. Finally, we outline our plans for future involvement of users.

2 User involvement in the design and development process

NVA was developed as a national repository and research information system aimed at nearly 200 institutions within the higher education, research, health, and museum sectors, respectively.

The project was developed in two phases [3]. In the first phase, the aim was to bring all the repositories together within a single technical infrastructure, and thus there was little need for direct user involvement. In the second phase, the scope changed to unify Cristin and NVA on a shared platform that operated on the same data. In this phase, user involvement took place primarily through cooperation with a reference group and working groups consisting of research administrators and librarians at universities, university colleges and research institutes, supplemented by a governance structure with a steering group representing institutional leadership, Universities Norway (UHR), and The Association of Norwegian Research Institutes (FFA).

Toward the final phase of the deliveries, a greater need emerged for more detailed user requirements and closer dialogue regarding acceptance of deliverables. Consequently, a test group was established, which largely consisted of and effectively replaced the initial reference group.

The project combined iterative, agile development with multiple user involvement mechanisms, i.e., reference groups, expert test groups, working groups, structured meetings, workshops, demonstrations, and user testing. In addition, we offered user support and user training through workshops, webinars, and “open office hours” sessions.

3 Timeline for user involvement in NVA

Development of NVA began in 2019. The first fully operational version of the institutional archive component of NVA was launched in the summer of 2021. Shortly thereafter, a selected group of smaller institutions in need of a repository solution, and not previously using Cristin, were onboarded.

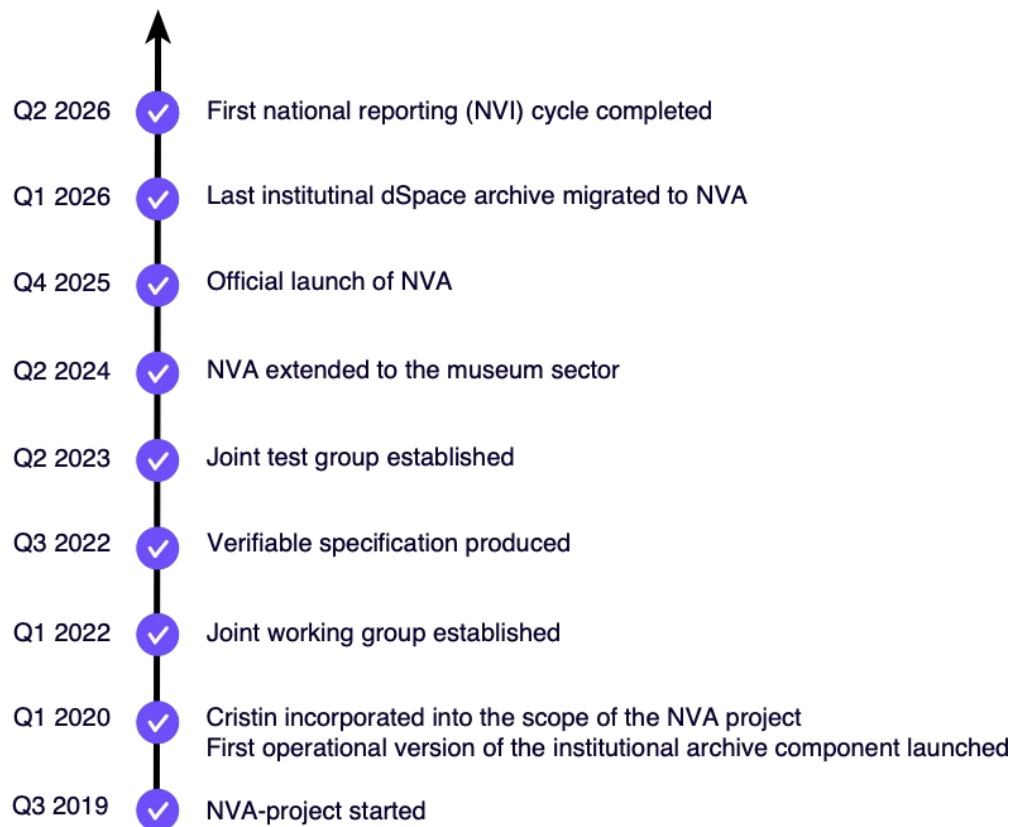


Figure 1: Timeline for some important milestones for the NVA project related to user involvement.

After Cristin was incorporated into the scope of the NVA project, expressions of concern were submitted by Universities Norway (UHR) and the Association of Norwegian Research Institutes (FFA) whether NVA would adequately meet the user needs of the different sectors. It was also discovered that the project had not sufficiently recognised and identified the complex requirements related to the publication of student theses stored in different repositories based on DSpace. In parallel, many users participated in early-stage product demonstrations and testing, which generated an overwhelming volume of feedback and users that claimed their input was not adequately followed up. In response, a joint working group with representatives from Norwegian universities and research institutions, facilitated by Sikt, was initiated in 2022. This resulted in a verifiable specification of the solution [5].

In continuation of the working group, a joint testing group was established in June 2023, to ensure broader, but more focused user involvement and to verify the solution. The testing group consisted mainly of research administrators from Norwegian universities, working together with representatives from Sikt, and met on a weekly basis. This initiated a more constructive process of user involvement.

In this period, more focus was put on user involvement and testing, on several levels. First, usability testing of selected parts of the solution was conducted in several rounds. Second, targeted acceptance testing for new functionality was carried out by real users, both internal experts on CRIS systems and by members of the test group. Third, the data quality in all repositories was thoroughly tested before the data was migrated to NVA. Fourth, a series of workshops, webinars and “open office hours” sessions were held with users to inform and support onboarding the solution.

In June 2024, the solution was extended to the museum sector, which used NVA as a repository in the period leading up to full production. After a gradual migration of the data in Cristin and institutional repositories in Brage, NVA was made available for full use for all Norwegian universities and research institutions from October 2025. The last institutional archive based on dSpace was migrated in February 2026, and the first national reporting cycle (NVI) was successfully conducted in NVA in April 2026.

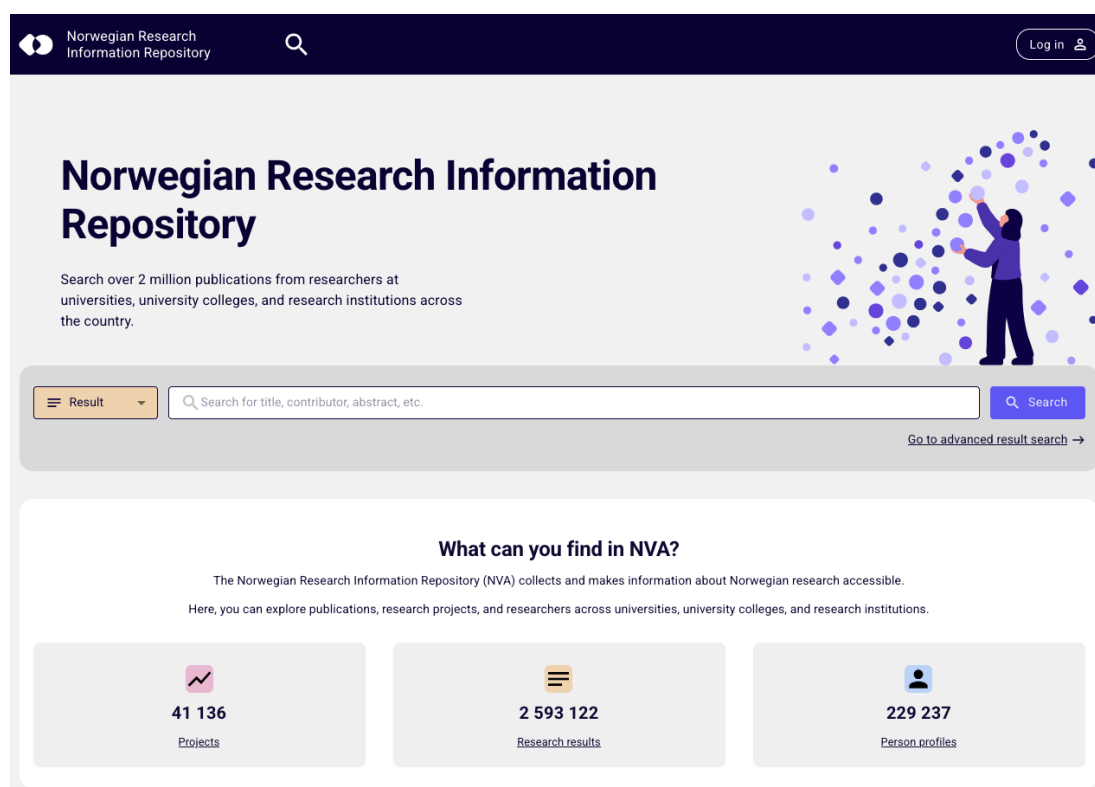


Figure 2: Screenshot from the NVA website

Work has begun to replace the external test group with working groups who will focus on refining, improving and expanding workflows in the NVA solution, e.g., research data registration, advanced search and administrative tasks. Two such groups, i.e., a working group for artistic development and a working group that focus on issues related to clinical trials are already operational.

4 Discussion

In retrospect, we see that after phase 1 of the NVA project, the scope changed more rapidly than the project could accommodate. This made it difficult to assess the functional diversity and institutional heterogeneity in the national research information system, which in turn contributed to user expectations that could not be fully met within available time and resources. The underlying problem lay in achieving timely and sufficiently deep understanding of, and communication with, the clients, particularly as the project scope changed and the timeline was extended.

After the scope changed, the project also underestimated the breadth and complexity of building a joint CRIS repository for almost 200 institutions. In this phase, user representation was initially narrow, but user response was overwhelming. This led to late discovery of important key requirements. At the same time, Sikt experienced some difficulties due to organizational changes combined with geographical separation, and cultural and technological differences between the Cristin team, the product team, and the project management. This led to communication challenges and inadequate involvement of key domain experts. This might have affected the quality and timing of user input negatively. Bringing CRIS experts into the project in a more constructive way to help identify and understand the implications of the changes to the scope could have led to clearer requirements and more robust design decisions.

We also found that inviting “everyone to everything” during demonstrations and testing created engagement but led to an unmanageable flow of suggestions. A more staged approach, where a smaller, clearly mandated expert group tests early prototypes and filters feedback [7], before broader user groups are involved, proved more sustainable.

Further, communicating the implications of an agile development methodology to users who had expectations of “finished” functionality proved demanding. The establishment of a smaller test group of experts with strong domain knowledge contributed to a more effective and targeted user involvement process. This helped the development team to focus on the requested functionality module by module, over a period of more than two years.

The project illustrates that agile development methodologies can be challenging to explain and operationalise in large, heterogeneous user communities. This particularly pertains to the setting of a public service provider, which faces other constraints and incentives than a private company in designing new solutions [8]. Without explicit communication about iteration, prioritisation and scope, external users may interpret changes and deferments as lack of responsiveness or instability, rather than as a normal part of the development process.

Strengthened focus on user involvement have had several positive effects: domain experts helped identify critical functional requirements and ensured that workflows reflected established research administration practices; user feedback led to changes in the user interface and how metadata registration and rights clearance were supported; smaller expert test groups filtered noise and focused development; and the governance structure created legitimacy and strategic anchoring at institutional leadership level. Thus, we claim that broad user involvement is essential when developing national research information infrastructures, but such involvement must be carefully planned and phased.

5 Lessons learned and recommendations

Based on our experience, we highlight five main lessons and key takeaways for similar projects:

1. **Ensure early and broad, but structured, user representation:** Broad user involvement is essential for national research infrastructures. Key user roles (e.g., research administrators and repository managers) need to be identified and involved from the start. Involvement must be carefully planned, phased, and communicated.
2. **Anchor the project at both operational and strategic levels:** Success requires strategic planning and good governance. A clear mandate that defines expectations, responsibilities, and who has decision-making authority is crucial. A steering group with institutional leadership and sector representatives is crucial for legitimacy, prioritisation and long-term sustainability.
3. **Involve domain experts and CRIS specialists early:** Invest in user mapping, domain experts, and process communication. Expert knowledge about existing CRIS systems and research administration is indispensable when designing workflows, metadata structures, and integration points.
4. **Phase and prioritise user involvement:** Combine wide engagement with focused expert groups to manage feedback from users. Start with a smaller expert testing group to refine prototypes and reduce noise in user response and suggestions. Expand gradually to larger user groups as the functionality matures.
5. **Don't underestimate the importance of frequent communication:** Explain how iterative development works, what users can expect at different stages, and how their feedback will be prioritised and followed up. This helps avoid frustration and builds trust.

6 Future plans for user involvement

Drawing from the lessons learned from the NVA project, we plan to involve users through several venues in future design and development phases. First, we will continue our current practice with direct user communication, support and training through workshops, webinars, open office hours, demonstrations and newsletters. Next, we plan to measure user activity and satisfaction through automatic tools, user testing, user observation and surveys. Further, we will keep the existing working groups within artistic development and clinical trials registration, redefine the current expert test group into two working groups for research administration and repositories, respectively, and establish a separate working group for researchers. In addition, we hope to establish regional networks where the more mature institutions can act as mentors for smaller and less experienced institutions. Finally, we will include suggestions collected from end-users through our web form, where relevant, and use artificial intelligence to organise and manage user input.

7 Conclusion

The development of NVA demonstrates both the necessity and the complexity of user involvement in building a national research information repository. Systematic engagement with users and institutions helped shape a solution that supports national goals for open access, reduces duplication, and enables better statistics and analysis. Our experience also underscores that user involvement at this scale requires strategic planning and a well-designed governance structure – and some stamina.

For others planning similar national infrastructures, we recommend investing early in user mapping, domain expert involvement and communication about development methodologies, and to combine broad engagement with focused expert groups that can translate diverse user needs into concrete, manageable requirements

8 References

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