



**National  
Coordination Point  
Research Data  
Management**

# Professionalizing the role of Research Software Engineers in the Netherlands

## **LCRDM**

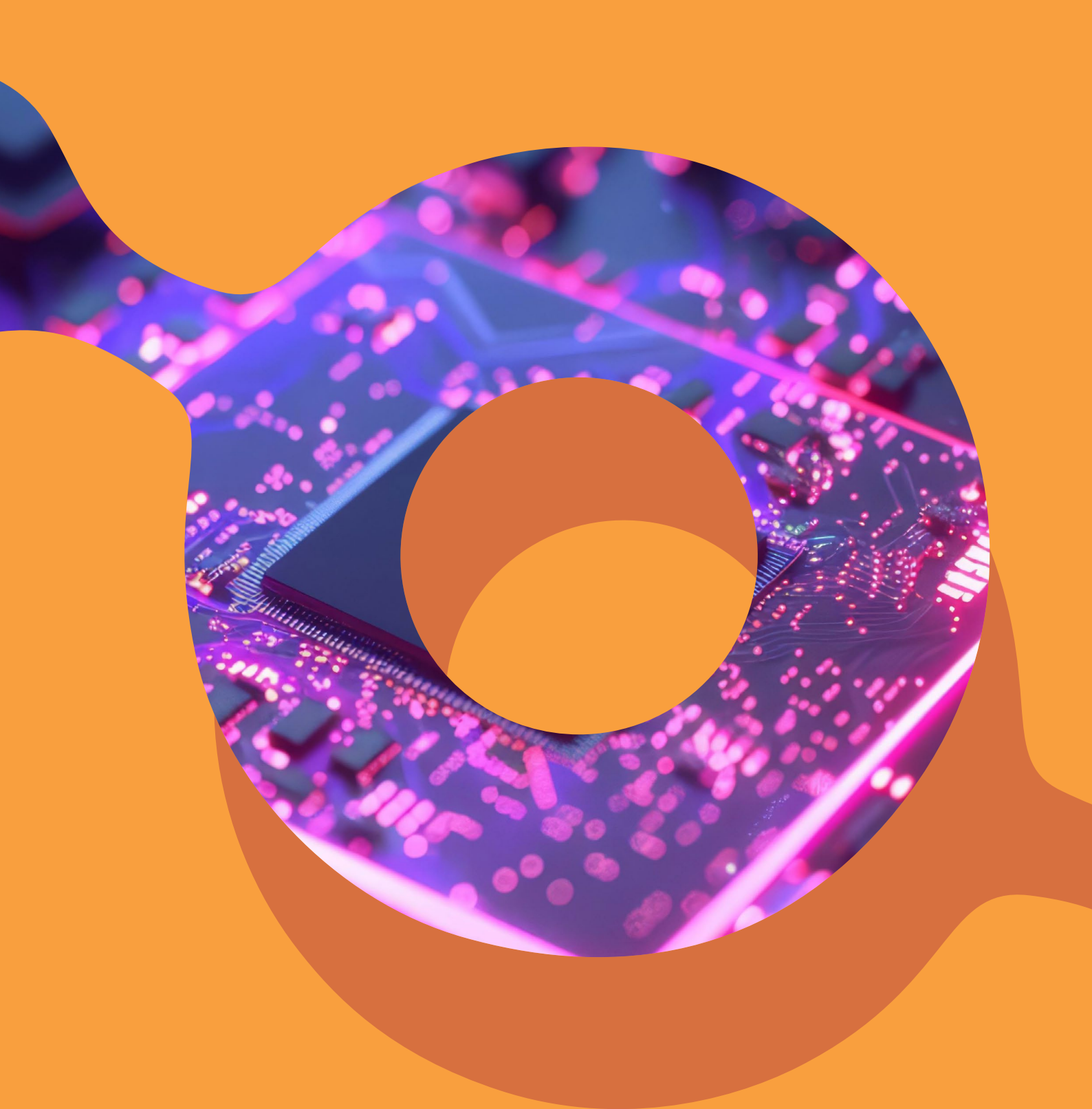
The National Coordination Point Research Data Management (LCRDM) is a national network of experts on research data management (RDM) in the Netherlands. The LCRDM connects policy and daily practice. Within the LCRDM experts work together to put RDM topics on the agenda that ask for mutual national cooperation.



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March 2025 | version 1.0  
Professionalizing the role of Research Software  
Engineers in the Netherlands






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# Executive summary



Research Software Engineers (RSEs) combine software development expertise with domain knowledge to create and maintain the specialized software that underpins modern research. While Dutch research-performing organizations have made significant progress in integrating RSEs - with several institutions now employing RSEs in permanent positions - there are clear opportunities to strengthen their position.

Investing in RSE capacity aligns naturally with institutions' strategic goals around digital transformation, Open Science, and research excellence. Strengthening RSE positions often requires rethinking existing structures rather than substantial new funding.

This report maps the landscape of Research Software Engineering in the Netherlands, highlighting both successful models and persistent barriers. It provides concrete recommendations for RSEs and their research organizations, funders, and policy makers to fully integrate RSEs into the academic ecosystem.



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# Introduction



**Without specifically developed software,  
modern research is not possible.**

Today's researchers work with complex computational methods, large volumes of data, and increasing computing power - all requiring specialized software developed by experts who combine software engineering skills and an understanding of the academic context. The quality of research and its output depends directly on this software<sup>1</sup>, and consequently on those who develop it: Research Software Engineers<sup>2</sup>.

Research Software Engineers (RSEs) have become an integral part of Dutch academia, with various research-performing organizations offering permanent positions and the Netherlands eScience Center alone employing more than 60 RSEs in 2024<sup>3,4</sup>. Building on these developments, there are opportunities to further enhance the integration of RSEs into the academic landscape. Better integration enables the Netherlands to optimize the use of digital technologies to stay at the forefront of modern academic research<sup>5-7</sup>.

Dutch institutions, including universities, University Medical Centers (UMCs), and Universities of Applied Sciences (Hogescholen), recognize this research transformation in their strategic plans<sup>8-11</sup>. They identify digital transformation and innovative research practices as key priorities. Increasingly, attention has focused on strengthening research support structure and professionalizing research support staff. While a recent report examining career paths for data stewards has highlighted similarities to RSEs<sup>12</sup>, research software development presents distinct challenges in maintenance, evolution, and reuse that differ from data management practices<sup>13,14</sup>. In addition, whereas most data stewards play an advisory role at specific points in the research cycle, RSEs often work on projects continuously together with researchers.

This report examines the role and professional standing of RSEs in Dutch academia, and explores ways to strengthen their structural embedding within organizations. It focuses on institutional positions, career paths, and offers recommendations for RSEs, research-performing organizations, funders, and policymakers.

This report draws on data collected during extensive community consultations during 2023-2024, including input from Dutch researchers, RSEs, Digital Competence Center staff, research support professionals, and institutional stakeholders such as RSE group leaders and HR personnel (see [Method and data](#)). This input was analyzed alongside vacancy listings and institutional strategy documents to understand RSE roles across Dutch academia. In addition, reports were reviewed that focus on RSE professionalization in the United Kingdom<sup>5</sup> and the United States<sup>15</sup>, where RSE career paths have also been a topic of discussion for several years. A draft version of the report was made available for community input.



### Definition of research software

Software developed for research is called research software. A comprehensive and commonly accepted definition of research software has been put forward by the international FAIR for Research Software working group:

*“Research Software includes source code files, algorithms, scripts, computational workflows and executables that were created during the research process or for a research purpose. Software Components (e.g., operating systems, libraries, dependencies, packages, scripts, etc.) that are used for research but were not created during or with a clear research intent should be considered software in research and not Research Software.”<sup>43</sup>*

Research software is not just important for research, it contains the research process: data is collected, read, preprocessed, analyzed, visualized and simulated using research software. High quality and open research software ensures the reproducibility of research results, and easy adaptation of existing methods to future research endeavors.



The background of the slide features abstract, overlapping curved shapes in shades of orange and yellow. A large, light yellow shape dominates the left side, while a darker orange shape is positioned below it. The right side of the slide is a solid, medium orange color.

# **The research software engineering landscape**



# The research software engineering landscape

This section explores the role and current professional standing of RSEs in the Netherlands. It details their competencies, gives an overview of existing institutional positions and career paths, and touches on the recognition of research software in Dutch academia.

## 2.1 RSE competencies

Those who develop research software are often referred to as Research Software Engineers (RSEs), a relatively new term used formally in some research institutions and informally by self-identifying individuals<sup>16</sup>. RSEs combine software engineering expertise with domain-specific knowledge and understanding of academic research. Their core competencies span technical skills (programming, software architecture, system design), research capabilities (methodology, data analysis, domain expertise), and professional skills (technical documentation, project management, collaboration)<sup>17</sup>.

### Maarten Hornikx

Professor Building Acoustics, Vice-Dean of the Department of the Built Environment, TU/e

*"Working with Research Software Engineers has boosted our academic work. RSEs don't just optimize code – they bridge the gap between complex computational needs and practical research tools. Through their expertise, we've seen our software become more accessible to researchers who may not have extensive programming backgrounds, while simultaneously pushing the boundaries of what's computationally possible."*

The role of RSEs varies across Dutch institutions and projects. Some are deeply embedded in research teams, developing new software and advising researchers on appropriate technologies and methodologies, (co-)authoring research papers, presenting at conferences, and contributing to funding applications. Others focus on support and training, guiding researchers on software best practices, including version control, testing, documentation, and FAIR principles. This variety in roles reflects the diverse ways institutions have implemented RSE positions, tailored to their local research needs<sup>18</sup>.

### Maria Cruz

Programme Leader Open Research Software, Open Science NL

*"Today's research environment is characterized by the pervasive use of research software. Recognising the pivotal role of high-quality research software in advancing science and scholarship, it becomes imperative to reward, support and incentivize the people who develop research software. In the Netherlands, we are doing so by investing in the sustainability of research software and by providing training for research personnel."*



## **Centre for Digital Humanities**

The CDH Research Software Lab at Utrecht University was established in 2014, and serves as a central RSE pool primarily dedicated to the Faculty of Humanities. The development team consists of 10 RSEs, all of whom hold permanent positions. They provide technical support to staff by developing custom software solutions for research and educational purposes. Additionally, the team offers guidance on (the adaptation of) ready-to-use (open source) tools.

## **Projects**

The expertise of the CDH RSLab spans a wide range of applications; however, the team most often focuses on building databases, visualizations, and text mining tools. Project durations range from a few weeks to several years, and for assignments exceeding 160 hours, funding is required. All RSEs have academic backgrounds in humanities sub-disciplines such as linguistics, history, musicology, and artificial intelligence, enabling them to optimally connect with researchers in the field.

## **Funding**

Approximately 65% of the lab's costs are covered by externally funded projects. Funding sources include research grants (e.g., NWO, ERC) and collaborations with external partners, such as media organizations and government agencies.

## **UFO Profiles**

ICT Developer



## 2.2 RSE positions and careers

RSEs are present in a range of research-performing organizations in the Netherlands. The Netherlands eScience Center is the national center for research software expertise. They house a large RSE group with broad expertise. Their RSEs collaborate with researchers of all disciplines at all research-performing organizations in the Netherlands to develop high-quality research software. They also train and mentor researchers, research supporters, and RSEs at research institutions. The eScience Center considers RSEs to be their main asset, and invests in the development and retention of talent. The eScience Center also formalized a comprehensive RSE career path<sup>19</sup>.

In other Dutch research-performing organizations, RSEs are embedded in various ways: within research teams, in centralized units such as Digital Competence Centers (DCCs), in or specialized decentralized RSE groups. Centralized models allow RSEs to provide broad support across various research domains, while decentralized approaches offer targeted expertise. Throughout this report, we highlight different RSE groups and their organizational contexts.

### Rodrigo Vargas Honorato

ICT developer, Computational Structural Biology Group / Bonvin Lab, Utrecht University

*"Since Research Software Engineer is a role somewhere in the middle between research and software development, it is usually not clear if the focus of our work should be in producing papers or writing high quality code. More often than not, these two tasks do not overlap, and it is up to the RSE to find a way (and time) to produce both a relevant academic paper and good software. An important step towards the professionalization of RSEs would be to have a better evaluation metric, one that goes beyond mere paper publications and software development, but takes into account both aspects of the work."*

RSEs are highly skilled professionals, yet many research-performing organizations lack the job security and clear career paths needed to attract and retain them. *Research Software Engineer* is not a recognized formalized job profile within the Dutch academic landscape. Instead, a range of professionals from diverse educational backgrounds who could be referred to as RSE often have different titles and are hired under different standardized job profiles (see [Glossary](#)). Job profiles applied to RSEs include *PhD candidate*, *(postdoctoral) researcher*, *(assistant/associate) professor*,

## software highlight

### Workflomics

Workflomics is a tool for life sciences researchers. It saves life sciences researchers time and when deciding what analysis tool to use for their data. This process is usually done by hand, and with the vast range of options out there, manual selection takes a lot of time. Workflomics does a systematic and automated analysis that results in the optimal workflow for life science researchers, not only saving time, but also enhancing the quality of the research. Workflomics was developed by Leiden University Medical Center, Utrecht University, Potsdam University with help from RSEs at the Netherlands eScience Center.



data steward, ICT developer, scientific programmer, and software engineer (see Group Highlights). Some of these profiles fall under the umbrella of support staff, others under academic staff (researchers). RSEs across different parts of the academic landscape have expressed the wish to create a dedicated RSE job profile<sup>20,21</sup>.

Many RSEs at universities are currently appointed under the ICT developer UFO profiles. As of January, a new UFO system applies, replacing outdated ICT profiles with more specialized ones. For RSEs on ICT profiles, this requires a remapping of responsibilities to the new profiles which will be implemented throughout 2025. While the impact of these changes is to be determined, the new profiles remain focused on traditional IT service roles, rather than recognizing research software development as an academic output. The new profiles, like their predecessors, do not reflect the hybrid nature of RSE roles. More specifically, common research focused RSE tasks (see section 2.1) are not included in the UFO profiles' activities and ranking criteria, and potentially go unrecognized in evaluations and promotions.

#### **Julie Beardsell**

Head of ICT Innovation Department, TU Delft

*"RSEs are making a direct contribution to the impact of scientific research. They support the development of research software in collaboration with research groups across the university. Researchers are not typically professionally trained software developers, but rather, specialists in their scientific domain. A professional RSE elevates the quality of the software produced by the research group and provides guidance on how to develop, distribute and use software, encouraging the use of FAIR principles and sharing best practices."*

Beyond job profiles, RSEs in the Dutch community reported that fixed-term contracts pose a challenge to both RSEs and their group leaders<sup>21</sup>. RSEs indicated, as a result of this, to experience a lack of clear career trajectories, job stability, and opportunities for advancement. This affects morale and motivation, and ultimately harms the long-term sustainability of project outputs and knowledge within the institution. RSE group leaders expressed that their inability to hire RSEs on permanent contracts leads to many leaving academia for higher-paid non-academic jobs. Lack of long-term prospects for RSE also complicates the maintenance of existing software, the ability to secure funding and long-term project planning for RSEs and group leaders. This insecurity undermines sustained contributions to research projects and ultimately the quality of research.

#### **Sreeparna Deb**

RSE, Research Engineering and Infrastructure Team, TU Delft

*"Departments that hire multiple RSEs can offer more stable and attractive career paths, reducing turnover and fostering a collaborative environment. Long-term contracts for RSEs encourage investment in large projects, securing additional funding and resources. Having this position makes me more employable both inside and outside of the academic context. This job is a great bridge between academia and the job market."*

### **2.3 Recognition of research software**

Research software is crucial for successful research, and a number of (inter) national initiatives emphasize a need for more recognition for research software as an output in the academic system<sup>23,24</sup>.

Despite efforts to establish software citation standards through initiatives like



## **Netherlands eScience Center**

The Netherlands eScience Center has had an RSE group in operation since the center's establishment in 2012.

The team currently consists of around 60 RSEs, who collaborate on projects with researchers across various academic disciplines throughout the Netherlands.

The RSE group is organized into four sections aligned with different research domains: Social Sciences and Humanities, Environment and Sustainability, Natural and Engineering Sciences, and Life Sciences.

The eScience Center operates as a national center of expertise. Beyond project work, RSEs provide training to the broader research community, helping to disseminate best practices in research software development. They also recognize community efforts through mentoring in the eScience Center fellowship programme, further fostering the growth of the RSE community in the Netherlands.

## **Projects**

RSEs at the eScience Center work on research projects with project partners across academic institutions.

Proposals for projects are typically submitted by Lead Applicants from Dutch research organizations through annual or bi-annual calls for proposals. Projects usually last between 18 months to 3 years.

## **Funding**

The eScience Center is funded by NWO and SURF. This funding is supplemented by external funding sources.

## **Job profiles**

The Center has developed its own job profile system tailored to RSEs, which includes levels such as Junior RSE, RSE and Senior RSE. While the eScience Center is not a university and does not use UFO profiles directly, their job profiles have been classified as fitting the Researcher UFO profile.



the FORCE11 Software Citation Principles<sup>25</sup> and the availability of DOIs for code releases, software is often inadequately cited or acknowledged in research papers, making it difficult to track its impact and give credit to RSEs.

Major Dutch research funders (NWO, ZonMw) and research-performing organizations (KNAW, universities, UMCs and HBOs) have demonstrated their commitment to reforming academic evaluation through the Declaration on Research Assessment (DORA)<sup>26,27</sup> and the Coalition for Advancing Research Assessment (CoARA)<sup>28,29</sup>. DORA established principles recognizing that journal-based metrics should carry less weight, and that research outputs should be assessed on their own merits. CoARA then provides the practical framework for implementing these changes. By signing these declarations, these organizations have not only endorsed the principles but also committed to developing concrete action plans to reform their research assessment practices. In addition, NWO and ZonMw have signed the Amsterdam Declaration On Funding Research Software Sustainability (ADORe)<sup>23,30,31</sup>. ADORe provides practical recommendations for funding bodies worldwide that promote research software sustainability.

Many of these commitments have yet to be fully translated into concrete changes in assessment and funding practices. Adhering to the recommendations in [section 4](#) of this report can help Dutch research-performing organizations achieve this.



## **KNAW Humanities Cluster**

The Digital Infrastructure (DI) department of the KNAW Humanities Cluster builds sustainable infrastructures for innovative humanities research for the Netherlands and abroad. In this way, DI supports the researchers of the Humanities Cluster. The infrastructure created in these projects is open source and available according to FAIR principles to all humanities researchers, RSEs, the education sector, and the heritage sector. Finally, the DI department sets national and international standards with its partners and plays a central role in the management of websites, tools and digital collections for the Humanities Cluster.

DI employs more than 30 people. Besides a director and a small staff for planning, consultancy and communication, most of the colleagues work in six areas of expertise: Infrastructure Services, Structured Data, Text Analysis, Computer Vision, Spatial Computing and Interface Design. One team focuses on managing the infrastructure, software and data. The other teams build software and therefore consist entirely of software engineers. Each engineer has a unique specialization in addition to extensive experience of working in humanities research.

## **Projects**

DI focuses on supporting the researchers of the Humanities Cluster. RSEs at the DI build generic infrastructure and specific research software. These projects have led to close partnerships with heritage institutions such as the National Library of the Netherlands, the National Archives, most Dutch universities, other academic organizations such as DANS and research institutes in Europe.

## **Funding**

Projects are mostly externally funded (mainly by NWO, but also increasingly by European funds).

## **UFO profiles**

ICT Developer



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**Towards research software  
professionals: opportunities  
and challenges**



# Towards research software professionals: opportunities and challenges

There are multiple examples of RSE teams demonstrating successful models for integrating these professionals into research-performing organizations, leading the professionalization of RSEs in the Netherlands. Despite these efforts, work remains to be done to fully recognize and structurally embed RSEs as a profession within the Dutch academic landscape. This section describes the potential opportunities and benefits this offers, and identifies the challenges faced.

## software highlight

### ESMValTool

The Earth System Model eValuation Tool helps climate researchers by automating the evaluation of Earth system models, which saves them a lot of time. It simplifies the complex tasks of preparing and analyzing data, making evaluations faster and more consistent across different models and datasets. This automation not only speeds up the process but also improves its reliability and consistency, which are important for making well-informed policy decisions. The Intergovernmental Panel on Climate Change (IPCC) uses ESMValTool in simulating and predicting future climate scenarios for their comprehensive climate assessment reports. ESMValTool (Earth System Model Evaluation Tool) is an open-source community software package with contributions from RSEs around the world.

### 3.1 Opportunities for the academic landscape

#### Enabling cutting-edge research

The majority of research relies on specialized software<sup>1,2</sup>, making RSEs essential to scientific and academic progress. Research software of high quality enables researchers to tackle complex research questions and make scientific discoveries<sup>32</sup>. The quality of research fundamentally depends on the quality of the software and the expertise of those who develop it.

#### Competitive advantage in grant proposals

A researcher's access to a trusted pool of RSEs strengthens their grant proposals. An established team of RSEs provides readily available expertise, avoiding the challenges and risks of hiring temporary software specialists. High-quality prototypes and demos developed by RSEs further enhance a proposal's credibility, showcasing the team's technical capabilities and research potential. Academics understand this competitive advantage and regard access to RSEs as beneficial to research environments.



## **Research Engineering and Infrastructure Team**

The Research Engineering and Infrastructure Team (REIT) at TU Delft has existed since January 2024. The team currently has 15 RSEs and HPC engineers, who collaborate on projects with researchers across the two computer science departments.

Seeing the high demand for advanced software and HPC/infrastructure expertise within computer science (CS), REIT is the result of multiple year bottom-up effort from CS academics. The team is led by two associate professors (one per CS department). While TU Delft also has a well-established central pool of RSEs as part of the DCC, REIT is a decentralized team, and directly embedded in the CS departments to provide highly specialized (domain) expertise. This allows REIT to be in constant dialogue with researchers and build close long-term relationships.

## **Projects**

Proposals for projects can be submitted by researchers at any point and are reviewed on a rolling basis, which allows REIT to flexibly and rapidly respond to demand. Projects vary in length from a few weeks to multiple years. For projects with duration of 3–6 months funding is preferred, for projects longer than 6 months funding is required.

## **Funding**

The majority of costs (>70%) are covered by funded projects. Funding comes from research grants (NWO, Horizon), co-funding consortia (e.g., Convergence), and industry.

## **UFO profiles**

ICT Developer, ICT Consultant, Researcher



#### Research efficiency and sustainability

RSEs improve research efficiency by developing specialized software tools that accelerate computational tasks and reduce manual workload. They create robust and scalable technical solutions that streamline complex research processes, and design reusable, extensible and maintainable software, avoiding costly redevelopment<sup>33</sup>.

Involving RSEs in research ensures that tasks are performed by those with the right skills. RSEs bring their own expertise to research projects, ensuring that the most suitable computational methods and technologies are used for a specific research question, allowing researchers to focus on generating insights and exploring new research avenues<sup>15</sup>.

RSEs support the entire lifecycle of development and maintenance of research software. Sustainable software persists beyond the end of a research project, potentially leading to further research<sup>6,17,34</sup>.

## software highlight

### Spoofax

Spoofax is a research vehicle for Programming Language researchers. It is both a workbench to define programming languages for research, and an environment in which new Programming Language research is incorporated. The Spoofax project stands at the basis of more than 100 published papers, and multiple (large) research grants. The combination of cutting edge research, and flashy demos garnered interest from multiple industrial research labs, resulting in multiple rounds of funding for both research and software engineering work on Spoofax. In the past software engineering work was mostly done by PhD students working under the Spoofax project umbrella, regularly causing delays in their PhD research. Nowadays, some of this work is covered by a research software engineer, who works on the project part-time and attracted renewed industry funding for further development package with contributions from RSEs around the world.

#### Open Science and impact

The shift towards Open Science requires sharing research outputs in accessible and reusable ways<sup>35</sup>, which can pose practical challenges to researchers<sup>36–38</sup>. RSEs play an important role in this transition by applying their expertise in FAIR software principles to give advice and hands-on support to prepare software for publishing<sup>34</sup>. Sharing research outputs, including software, leads to more impact within the research community and beyond, fosters collaboration, and makes the research process more transparent, inclusive and democratic<sup>39</sup>.



## **TU Delft Digital Competence Centre**

The TU Delft Digital Competence Centre was established in September 2020 to address the increasing need for hands-on support on data management and research software development at the TU Delft. Expanding on the network of Faculty Data Stewards that was established in 2017, the DCC was set up as a central support team, organized through the ICT department and the Library through initial funding from the TU Delft Open Science Program 2020-2024. Currently, the team comprises 8 RSEs and 4 Data Managers with diverse research backgrounds and expertise, supported by a coordinator and project manager.

## **Projects**

The DCC focuses on providing hands-on project support (3-12 months) to research groups to solve technical challenges, transfer knowledge, and promote FAIR principles and Open Science. RSEs actively collaborate with researchers to equip them with the skills to maintain and further develop the implemented solution. TU Delft researchers can apply for support through a yearly call with their data and/or software project. The DCC has now successfully completed over 70 projects across all TU Delft faculties.

In addition, the gained expertise and insights into the challenges researchers encounter inform the DCC's contributions to teaching, providing advice, and building a community. The members of the DCC are all certified instructors in the Carpentries and involved in developing new curricula. The combined approach of open office hours, shared guides and resources, teaching, mentoring, organizing community events, and providing hands-on support, allows the TU Delft DCC to offer the appropriate support for a variety of requests.

## **Funding**

Majority centrally funded through ICT and the Library with incidental (start-up) funding from NWO. Currently, hands-on support is offered in-kind, but additional funding options through research grants are explored to recover some of the costs.

## **UFO profiles**

ICT developer, Data Steward, Researcher



#### Institutional knowledge

RSEs bring a scarce yet essential skill set to modern research. They have expertise in state-of-the-art technology, collaborative practices, and project management<sup>17</sup>. It is common for RSEs to collaborate across research groups, departments, or even faculties. When employed long-term, the RSEs' knowledge and experience become institutional, and are transferred between different parts of the research-performing organization.

### 3.2 Challenges for Organizations who need Research Software Professionals

While the potential impact of research software professionals is clear, many research-performing organizations are not yet reaping the benefits described above. Creating an environment where RSEs become fully embedded and can professionally grow requires the academic landscape to address several challenges. Recommendations on how to address these challenges are listed in [section 4](#).

## software highlight

#### CropXR

The CropXR project, backed by the Netherlands Organization for Scientific Research (NWO), is a pioneering initiative in agriculture, set to revolutionize plant breeding to address global challenges. The initiative aims at enhancing the resilience of crops, enabling them to thrive under increasingly harsh and unpredictable environmental conditions such as drought or flooding. Research Engineers from REIT supported the project in its early phase by identifying and setting up the best suited and most cost-efficient data solution. This solution fits all requirements of the diverse CropXR user-base, originating from four different Dutch universities and 20 European companies, and enables the researchers to manage, share, and process large-scale biological data in the petabyte range.

#### Attracting, recruiting and retaining talent

Recruitment is typically the first hurdle that organizations encounter. Those responsible for hiring research software professionals may not have the necessary expertise to select the right candidates<sup>3,15</sup>. Organizations hiring RSEs find themselves competing in a limited talent pool not only with industry but also other research institutes, both nationally and internationally. To attract and retain talent, organizations must offer attractive working conditions, including job security, a stimulating academic environment, and clear paths for career progression.

#### Financial security

Offering secure employment conditions is not just a matter of willingness but ultimately depends on the financial capacity of the hiring organization. Hence, the long-term success of any RSE career path depends on the implementation of a viable and sustainable financial model.



Research-performing organizations often face a lack of financial security. With no or little structural funding being made available for RSE positions, many heavily rely on external funding sources. External funding is typically project-specific, often leading to fixed-term contracts (see section 2.3) and awarded on a competitive basis. Recently, initiatives like the LDCC funding from NWO<sup>24</sup> have represented crucial steps towards supporting the development and recognition of this role. However, this dedicated funding is also temporary, and, depending on the grant application, might only support a part-time position. The uncertain and temporary nature of project funding means that organizations are faced with financial risks when employing RSEs.

Moreover, relying too heavily on external project-based funding can also limit access to RSE expertise for less established researchers or those who are less successful in securing grants. This situation might lead to an inequality in access to crucial expertise within research institutions.

#### Limitations by funding agencies

The financial situation is further complicated by counterproductive grant rules from major funding sources. For most substantial grants, the “Approval of funding for scientific research”<sup>40</sup>, which was agreed on by NWO, UNL, ZonMw, NFU, KNAW and VFI/Sectie Gezondheidsfondsen, assumes staff will be hired for the duration of the research project, with salary scales capped at 11.2 (UNL/NFU). While this framework includes some employer costs through standard supplements, these standardized amounts and scale limitations often prove inadequate for specialized staff like RSEs, and do not account for the need for sustained professional expertise beyond traditional researcher roles<sup>41</sup>, making it difficult to sustainably fund and retain skilled RSEs.

#### Reliance on external funding

Organizations also face a delicate balancing act in determining the degree to which RSE teams are required to recover their costs. A financial model purely relying on external funding does not account for non-project activities that are essential for professional development and the wider academic community.

#### Visibility within research-performing organizations

Another common issue stated by RSEs and group leaders is that researchers struggle to find the digital expertise they need, even when it already exists within their organization. This invisibility can result in a suboptimal use of the RSE resources the institution has invested in.

#### Divide between academic and support staff

Most research-performing organizations separate their workforce into two distinct categories: academic staff (who do research and teaching) and support staff (who provide services). RSEs, despite contributing to research and often having PhD-level qualifications, are typically classified as support staff. This classification limits their ability to be a (co-)applicant for grants and receive appropriate recognition<sup>42</sup>.



## **Diagnostic Image Analysis Group**

The Research Software Engineering Team is part of the Diagnostic Image Analysis Group (DIAG) at Radboud University Medical Center in Nijmegen, The Netherlands. Since 2010, DIAG has consistently employed individual Scientific Programmers and RSEs, and in 2017, the DIAG established a dedicated RSE team. This is a domain-specific group specializing in Artificial Intelligence for Medical Imaging.

The team develops and operates Grand Challenge, a globally accessible open-science platform that provides a secure research environment for clinicians, medical data providers, and data scientists. This platform enables safe and efficient collaboration on the development and validation of AI methods, ensuring robust cloud capabilities while maintaining strict data safety and cost controls.

The team comprises five RSEs, a Product Manager, and a Team Lead, based within RadboudUMC's Imaging and Pathology departments. The DIAG recently expanded their presence to the University of Amsterdam, adding an RSE in the Department of Informatics.

## **Funding**

Over 70% of funding comes from public and private grants obtained by researchers at RadboudUMC and UvA. A further 20% comes from external universities and companies who also utilise the platform. All projects are developed in close collaboration with the team's Product Manager to ensure alignment with their roadmap.

## **Fuwavaz profiles (Radboudumc)**

Wetenschappelijk onderzoeker, Projectleider

## **UFO profiles (UvA)**

ICT developer



**Recommendations**



# Recommendations



While the following recommendations are neither exhaustive nor applicable to each organization, they provide a collection of practical tips that each stakeholder group can pick from while working to strengthen research software capabilities within their specific context. A list of relevant resources is compiled on the [NL-RSE website](#).

## For Research Software Engineers

Visibility	Make software visible by publishing it, demonstrating its research impact, and advocating for its value at conferences and events.
Relationship with researchers	Maintain close relationships with researchers through regular communication, feedback, and understanding their needs.
Open Science	Raise awareness of Open Science with project owners and provide guidance, support and education on this topic.
Community	Engage with the <a href="#">Dutch RSE community</a> by joining existing communication channels, participating in NL-RSE meet-ups, visiting other teams to learn and collaborate, and joining professional networking programs like the LCRDM buddy programme.
Awareness	Speak with leadership and researchers about increasing the sustainability of the RSE role to create awareness



## For (aspiring) Research Software Engineer managers

<h3>Strategy</h3>	
Partnership with support units	Partner with support units (Finance, HR, research support) for sustainable organizational and financial mechanisms.
Create guidelines and processes	Create clear guidelines and processes for collaborators and operations (e.g. RSE cost integration in grants, project acquisition and scope).
Local research context	Understand and document the local research context, trends, and software needs.
<h3>Team development</h3>	
Job profiles	Use eScience Center profiles as template for RSE positions. Work with institutional management and HR to determine (combinations of) appropriate job profiles and UFO profiles for RSEs, including clear compensation guidelines.
Career path	Create comprehensive career paths for RSEs by aligning with standardized job profiles and investing in training opportunities.
Personal development and growth	Stimulate personal development and professional growth through diverse responsibilities and opportunities for skill development (including training).
<h3>Visibility</h3>	
Team visibility strategy	Boost team visibility with a dedicated website, clear communication of RSE value, and guidelines for recognizing contributions.
Recognition of RSE contributions	Align with “Erkennen en Waarden” for recognition of RSE contributions.
Network	Participate in the Research Software Training Netherlands (RSTNL) network for coordinated training efforts.  Participate in the NL-RSE community.



# For institutional leadership

<h2>Strategy</h2>	
Align with strategic goals	Align investment in research software with the institute's strategic goals.
	Align hiring with institutional strategy and skills needed.
Pool of expertise	If possible, create a pool of experienced permanent RSEs, and ensure that researchers use the existing resources rather than hiring their own developers.
Offer attractive conditions	Offer competitive salaries and attractive working conditions, including budget dedicated to training and development.
<h2>Advocacy</h2>	
Demonstrate value	Communicate how investing in RSEs helps the institute achieve its long-term strategic goals.
	Demonstrate RSE value to stakeholders and skeptics.
Lobby for sustainable RSE positions	Include RSE capacity and expertise when promoting the institute's research strengths.
	Lobby funders/policymakers for sustainable RSE roles.
	Understand how RSE roles fit into grant-funded positions. Reevaluate the divide between academic and support staff.
Align with ADORE	Sign the <a href="#">ADORE declaration</a> .



# For policy makers and funders

Align with ADORE

Sign ADORE and align funding mechanisms with the ADORE declaration's recommendations.

For policy makers

RSE UFO profiles

Consider creating an RSE UFO profile so that RSEs become an integral part of the academic landscape.

For Dutch funders

Grant policies on permanent staff

Consider allowing grant funding for permanent staff salaries, either by granting exceptions for RSEs or changing the rule.

Salary caps

Consider removing grant salary caps to allow research-performing organizations to appoint staff at appropriate seniority levels within the total grant budget.

Grant eligibility

Consider making RSEs eligible to be (co-) applicants on grants relevant to research software.



## Glossary

The following entities and concepts are relevant in understanding challenges and opportunities facing RSEs in the Netherlands.

### **Universiteiten van Nederland / Vereniging Hogescholen**

Universiteiten van Nederland (UNL) is the association of Dutch research universities. Vereniging Hogescholen (VH) is the association of Dutch universities of applied sciences. UNL and VH act as a collective voice for the Dutch universities, advocating for their interests in discussions with the government, parliament, and other national and international organizations.

### **NL-RSE**

NL-RSE is a grassroots community formed by more than 200 RSEs across all Dutch universities, University Medical Centers, research institutes and other research related organizations. It brings together RSEs via meetups and online channels (mailing list, Slack) to share knowledge and to raise awareness for the recognition of RSEs and research software.

### **Open Science NL**

Open Science NL is the national programme to promote and accelerate the transition to Open Science practices in the Netherlands. It does so by providing targeted funding, strengthening communities and by building capacity and infrastructure. For RSEs, Open Science NL is relevant as it promotes developing open and reproducible research software.

### **Netherlands eScience Center**

The Netherlands eScience Center is a national expertise center in the Netherlands that focuses on developing and applying digital technology and software to advance academic research across all disciplines. Their RSEs collaborate with researchers to develop digital solutions and tools for complex research challenges, while also offering various programming and technology workshops each year. The eScience Center works on projects spanning various fields.

### **Local Digital Competence Center**

A Local Digital Competence Center (LDCC) is an institutional entity designed to enhance digital research capabilities within Dutch academic institutions. LDCCs provide expertise, training, and resources in areas such as data management, software development, and computational methods. RSEs working within or collaborating with LDCCs help and teach researchers about developing, maintaining, and optimizing research software.

### **NWO and ZonMw**

NWO (Nederlandse Organisatie voor Wetenschappelijk Onderzoek) and ZonMw are the primary public funding bodies for scientific research in the Netherlands. NWO is the Dutch Research Council, funding research across all scientific disciplines, while ZonMw focuses specifically on health research and healthcare innovation. Both organizations play a role in providing grants for projects, programs, and individual researchers.



### **Recognition & Rewards Programme**

The "Erkennen & Waarderen" (Recognition and Rewards) programme is a Dutch national initiative that aims to create more balance in the way researchers are recognised and rewarded. Launched in 2019 by UNL, NWO, ZonMw, NFI, and KNAW, the programme broadens the definition of academic excellence beyond traditional metrics like publication output and citation counts.

### **Amsterdam Declaration On Research Software (ADORE)**

The Amsterdam Declaration On Funding Research Software Sustainability (ADORE) is an international initiative launched in 2022 that focuses specifically on improving how research software is funded and sustained. ADORE addresses the crucial role of funding organizations in ensuring the long-term sustainability of research software. It emerged from the International Funders Workshop in Amsterdam and provides concrete principles for how funders can support not just the software itself, but also the essential human infrastructure needed to develop and maintain it.

### **Standardized job profiles**

Public research institutions in the Netherlands use standardized job classification profiles to define roles and job categories. The content of these job profiles are based on agreements made on a national level. The aim is to ensure consistency in job descriptions, responsibilities, and qualifications across similar institutions. This helps to determine fair and transparent salaries, such that employees in similar positions receive comparable pay. Depending on the type of research institution, different job classification systems apply, for example:

1. Universitair Functieordenen (UFO) is used at Dutch universities.
2. FUWAVAZ is used at Dutch university hospitals.
3. HAY is a more general job evaluation system used internationally. It is not specific to research institutions, but is applied at some Dutch research-performing organizations, such as universities of applied sciences.





**Method and data**



For this report, the following data were used:

1. A network meeting of Dutch RSEs in November 2023 was held to request input on career perspectives and recognition & rewards for RSEs.
2. Digital Competence Center (DCC) coordinators and RSEs from a range of organizations were contacted in 2024 to request information about the state of research software (support) in their organization.
3. Attendees of a Research Support onboarding day in June 2024 informed challenges perceived by DCC staff regarding research software (support).
4. Relevant stakeholders including researchers, RSE group leaders, departmental managers, financial manager and HR staff were contacted for information about challenges and opportunities they encountered.
5. Information about appreciation and career needs was taken from survey results from Dutch RSEs in 2023, and RSEs across the world in 2018
6. A range of vacancies published in 2024 at Dutch research institutes was selected to compare job profiles, salary scales and tasks and responsibilities.
7. Recent strategy documents from research-performing organizations informed the alignment between the report’s recommendations and the institutional policy.

This data was used to investigate how the role of RSEs is implemented in different places in the Dutch academic landscape, and to formulate challenges and requirements for the career perspectives of RSEs. Finally, recommendations were drawn up for different stakeholders based on the data: RSEs, (aspiring) managers of RSEs, institutional management, institutional operations, and funders. A more detailed description of the format of this data can be found in the appendix.

### Acknowledgements

We’d like to thank the following people for helping us improve the report: Azza Ahmed, Bjorn Bakker, Dani Bodor, Hugo Buddelmeijer, Ellen Carbo, Yan Grange, Vincent van Hees, Berit Janssen, Eduard Klapwijk, Carlos Martinez, Jolien Oomens, Thomas Pronk, Sietse Rispens, Lourens Veen and Linda Chen Zijlstra.

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