TU Delft Open Science Programme 2020-2024 Research and Education in the Open Era Evaluation 2022 & Work plan 2023

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Research and Education in the Open Era

TU Delft Open Science Programme 2020-2024

Evaluation 2022 & Work Plan 2023

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Contents

1. Introduction

The Open Science Programme 2020-2024, Research and Education in the Open Era, (OSP in short) addresses key areas of scholarly engagement where restrictions limit the flow of academic knowledge. It proposes innovative approaches to the process of research, education, and innovation, with a strong focus on academic rewarding and recognition, collaboration with third parties, and the development of skills.

The programme started in January 2020 with five interrelated projects: Open Education, Open Access, Open Publishing Platform, FAIR Data, and FAIR Software. The projects aim at creating and disseminating distinct types of resources for the benefit of TU Delft researchers, teachers, and students, as well as the broader public. They range from educational materials and software to a publishing platform. The outputs of the programme will be as open and FAIR as possible: findable, accessible, interoperable, and reusable. In 2021 two more projects were officially adopted by the Open Science Programme after a successful exploration phase: Citizen Science and Open Hardware.

Each project will address the following three preconditions for successful implementation: ensuring appropriate rewards and recognition, facilitating fruitful collaboration with third parties, and identifying the necessary skills. These are therefore incorporated in the programme as cross- cutting themes for all projects.

Portfolio holder of the TU Delft Open Science programme is VRM Rob Mudde. The programme is coordinated by a steering committee and will be managed by a programme team. Chair of the steering committee is Irene Haslinger, director of TU Delft Library. The other steering committee members are Jan Dirk Jansen, Dean of the Faculty of Civil Engineering and Geosciences (representing all faculties); Sacha Kroonenberg, director of Education and Student Affairs (ESA; representing all university services) and Frank van der Hoeven, who also chairs the programme team.

This report consists of three main parts:

- Looking towards 2023 and beyond: Open Science Next
- Evaluation: a reflection on the question if the goals/deliverables of 2022 were achieved;
- Workplan: an outline of actions and corresponding budget for 2023.

2. Open Science NEXT

The year 2023 will be the last of a four-year Open Science Programme. It raises the question of what we learned from the existing programme, whether we need a continuation to achieve the mission, and if we want to use the same setup or approach.

Strategic importance

The current OSP assumes that three cross-cutting themes provide the glue that binds the seven projects together. For the cross-cutting themes to be this binder, their funding is inadequate. Compared to the projects, the activities of the cross-cutting themes are modest in scope and size. Additionally, the projects have, in some cases, more substantial dependencies with activities and projects outside than inside the OSP.

That observation may call for a radically different setup and even question whether a follow-up OSP is the right approach. However, several national developments make such a follow-up perfect sense:

- establishing a council of Chiefs-of-Open-Science;
- transitioning from NPOS to NWO ‘regie-orgaan’;
- an increased prospect of government funding for open science and open education.

It is in the strategic interest of TU Delft to have a balanced, effective, and well-communicated set of activities that advance open science at its faculties. To emphasise that this is not a new effort, we suggest calling this programme Open Science NEXT.

Integration in the faculties

There is nothing wrong, of course, with investigating links between the various projects in the OSP. However, we can also find such links at each of our faculties. In their work, they need to apply the principles of open science in all dimensions of education and research.

In the last year of the Open Science Programme, we will investigate more than before how to reach out to local research and teaching programmes.

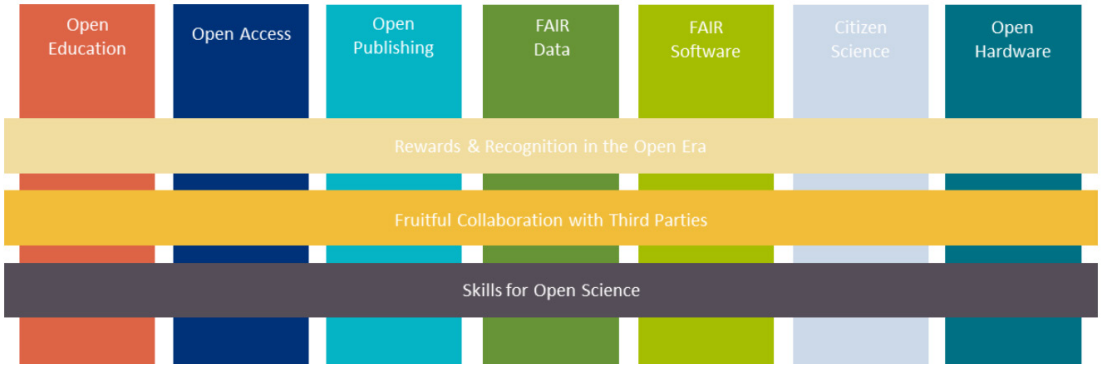
Clearing the road

The communication of the OSP is partly based on the idea that we still need to convince many of our colleagues that open science makes sense. After a decade of open access policies, that message is understood well. However, we learned that some of our most dedicated open science colleagues are slowed down in their best practices by the investments in infrastructure that TU Delft made in the past. For example, Coursebase, Brightspace (LMS) and Collegerama are all closed systems that prevent sharing and discovery. There may even be a need to rethink our CRIS: Pure. And to make matters worse, the open science efforts are not always recognised in TU Delft evaluation processes for hiring, tenure and promotion.

We advise the Executive Board:

- To emphasise explicitly that ‘open’ becomes the new ‘normal’;
- To acknowledge that there are internal obstacles that we need to resolve;
- To embrace a policy that all future investments and purchases of software and systems facilitate seamless open teaching and research practices;

We aim to present a Terms of Reference for Open Science NEXT to the CVB before summer 2023.



3. Evaluation 2022

To provide a concise overview we could divide the Open Science Programme in three clusters:

Steady

These projects run as expected with little or no deviation from the initial planning:

- Open Access
- Fair Data
- Fair Software
- Fruitful Collaboration with Third Parties
- Rewarding & Recognition

The only concern here is Rewarding & Recognition because the overall project is at its end and the employment of the (external) project leader is terminated.

Tailwind

Three projects show above expected dynamics:

- Open Education
- Open Hardware
- Citizen Science

Headwind

Three projects encountered unexpected obstacles that prevented them from delivering (some of) their deliverables.

- Open Publishing
- Skills for Open Science
- Ethics

In the case of Open Publishing, it became necessary to first deliver the scoping of the publishing activity at TU Delft. Skills suffered a setback when a vacancy did not bring (suitable) candidates. We suggested Ethics to explore the limits of open science. Given the current global events research safety became a more prominent issue.

In the next paragraphs an overview is provided of the 2022 highlights per project/cross-cutting theme. In this we discuss the work on deliverables in the OSP and additional activities that provide more context of what TU Delft has achieved in 2022 regarding Open Science.

Project Open Education

2022 has been a busy year for the Open Education team. The team itself has changed, with Michiel De Jong taking the lead in the project, and Marcell Várkonyi efficiently picking up the role of the Open Education Specialist in April. Although some delays associated with the multitude of stakeholders involved have significantly slowed down the progress of replacing commercial textbooks (deliverable 6) and service being absorbed by the library services rendering copyright & open licenses helpdesk irrelevant as a deliverable (1), work on other deliverables has exceeded expectations. Below is a detailed description of the results achieved by the team in 2022.

Planned deliverables for 2022:

1. Copyright & Open Licenses help desk
2. Teacher training (Open Education in UTQ)
3. Implementation of the Open Educational Resources (OER) Policy
4. Open Textbooks
5. Nanobiology OLMO
6. Replacing commercial textbooks
7. Grassroots pool
8. OCW curation

Detailed description of work on every deliverable:

D1: Copyright & open licenses helpdesk

- The helpdesk has been established as part of Library services and is currently handled by the Copyright team. The copyright team has indicated that they need no further funding from the Open Science Programme as of 2022. The funding that was budgeted for 2022 was, therefore, not utilized.

D2: Teacher training

- Preparations are under way to establish a dialogue with TLS (ESA) about incorporating open education in the UTQ. This will be further developed in 2023.
- A series of workshops have been established with the aim of raising awareness around open education, involving teachers more actively in open education, and enhancing their skills. The first workshop on Open Textbook Publishing was held on 17 October 2022. The frequency of workshops has been decided to be once every 6-8 weeks.

D3: Open Education Resources Policy

- The Open Education team has hired the Open Education Specialist (Marcell Várkonyi) to increase the capacity for implementing the OER policy. He is now working on open education at full capacity.
- The team has discussed the OER policy with all directors of education at the faculty in order to determine opportunities to implement the policy at the faculties.
- Initial conversations with the faculty of A&BE about bringing Marcell into the faculty to take inventory of educational processes and see where open education could be of value have been held. The faculty has expressed a positive attitude towards this, and

the team is currently working on initiating this in Q1 2023.

- The team is taking inventory of teachers' dispositions towards the use and development of open educational resources through an Open Educational Resources Survey. The survey is currently being prepared.
- With the help of the Library's Communication department, the team has begun establishing a communication vision and a strategic approach to raising awareness around open education. This vision will help with getting an overview of the way OE is perceived by teachers and students throughout the university.
- Conversations with HR regarding rewards and recognition for the production and reuse of OER, including teaching communities from the TPM faculty, have been initiated.

D4: Open Textbook publication

- Nine open textbooks have been published in 2022, five of which are new titles and four are new editions of an existing title.
- The on-demand textbook printing service was migrated from Webedu to Holland Ridderkerk, who facilitate worldwide distribution.

D5: Nanobiology OLMO

- The Nanobiology OLMO project has been successfully completed. It has resulted in a number of open educational resources becoming available for the program.
- In collaboration with the faculty of Applied Sciences, the team has started a pilot for publishing interactive open textbooks through the use of Jupyter Books. This is a follow-up of the Nanobiology OLMO project and is lead within the faculty by Timon Idema. ICT has created a central server for hosting the GitHub repositories and a domain for hosting the published textbooks.
- The team have funded an EUR 20,000 project to pilot the use of Jupyter Books, run by the faculty. The projected result will be a standard workflow with templates on how to publish an interactive textbook with Jupyter Books. The workflow will become available university- wide in September 2023.

D6: Replacing commercial textbooks

- The team has learned that replacing commercial textbooks with open alternatives also requires a shift in mindset within the faculties. The switch from commercial to open literature, besides publishing open textbooks, has, therefore, not been successful.
- In order to work on this systemic culture change, it will be necessary to continue the implementation of the OER Policy in the coming years, including after the end of the current Open Science Programme. To this end, the development of a long-term Open Education strategy and vision is under way.

D7: Grassroots Pool

- In September 2022, a Call for Proposals for the open education stimulation fund was put out with the aim of stimulating open education across TU Delft. Deadline for submissions is 1 December 2022.
- The rationale behind the Open Education Stimulation Fund is that, according to our observation, a variety of project ideas exist related to open education throughout the university. However, staff do not always have sufficient financial resources to realize

these project ideas.

- Total available funds are currently EUR 60,000. Maximum funding per project has been capped at EUR 20,000, with no minimum funding floor. The total number of funded projects therefore depends on the amounts requested by the selected proposals.

D8: OCW curation

- The technical issues with the OCW platform have been solved and the A&M team of the library is currently working on the backlog of courses that are uploaded to the OCW platform.
- A thorough stakeholder analysis of the requirements for a sustainable and future-proof solution for Open Courseware has been conducted with regards to online and on-campus education.

Project Open Access

Planned deliverables:

- Project Taverne
- Transformative publisher agreements

Detailed description of work on every deliverable:

D1: Project Taverne

The Taverne project, with its slogan “You share, we take care!” has been scaled up from a successful pilot to the realm of policy. Taverne is on the brink to becoming official TU Delft policy in early 2023. The basic principle is that researchers no longer have to sign a license to participate, but that there is an opt-out for those who do not want to use their legal rights. Taverne is administratively known as ‘scientific short work at TU Delft’.

D2: Transformative and Gold publishers’ agreements

So called ‘transformative agreements’ were signed with Trans Tech Publications, SPIE, Portland Press, EDP Sciences in 2022. Negotiations with American Inst. Physics as part of a national agreement were completed and took off in August 2022. All these negotiations are aimed at optimally facilitating OA publishing for researchers, at counteracting the separate APCs to publishers from the faculties and at efficiently purchasing scientific content.
Gold OA agreements are improved in terms of workflow, budget controlling and now completely incorporated in the budget as part of TU Delft Collections. With the publisher MDPI a financial cap is arranged in order to avoid overspending the Collections budget in 2022.

Additional results:

Plan S implementation

A specific webpage was set up for TU Delft researchers with all the necessary details on the implementation of Plan S. Several presentations about Plan S and its meaning for the scientists have been held for the contract managers of the Innovation and Impact Centre.

Growth of open access and monitoring

TU Delft’s ambition is to make open access publishing the default and ultimately to aim for 100% open access. To measure this goal, the number of peer-reviewed articles is measured annually. For publications in 2022, the percentage is 85% and has therefore grown again compared to previous years. The national average for 2022 is 81%.

As an extension of these activities, there are developments around a new way of monitoring at national level. A National working Group composed early 2022 a new national framework on Open Access monitoring. This framework is approved by UKB and the rectors as assembled in the SSPG. The framework is more inclusive and is better able to identify the different forms of open access by using a richer set of metadata coming from the CRIS-systems. In addition, as of 2023, we will do counts of conference papers, books and book chapters at a national level

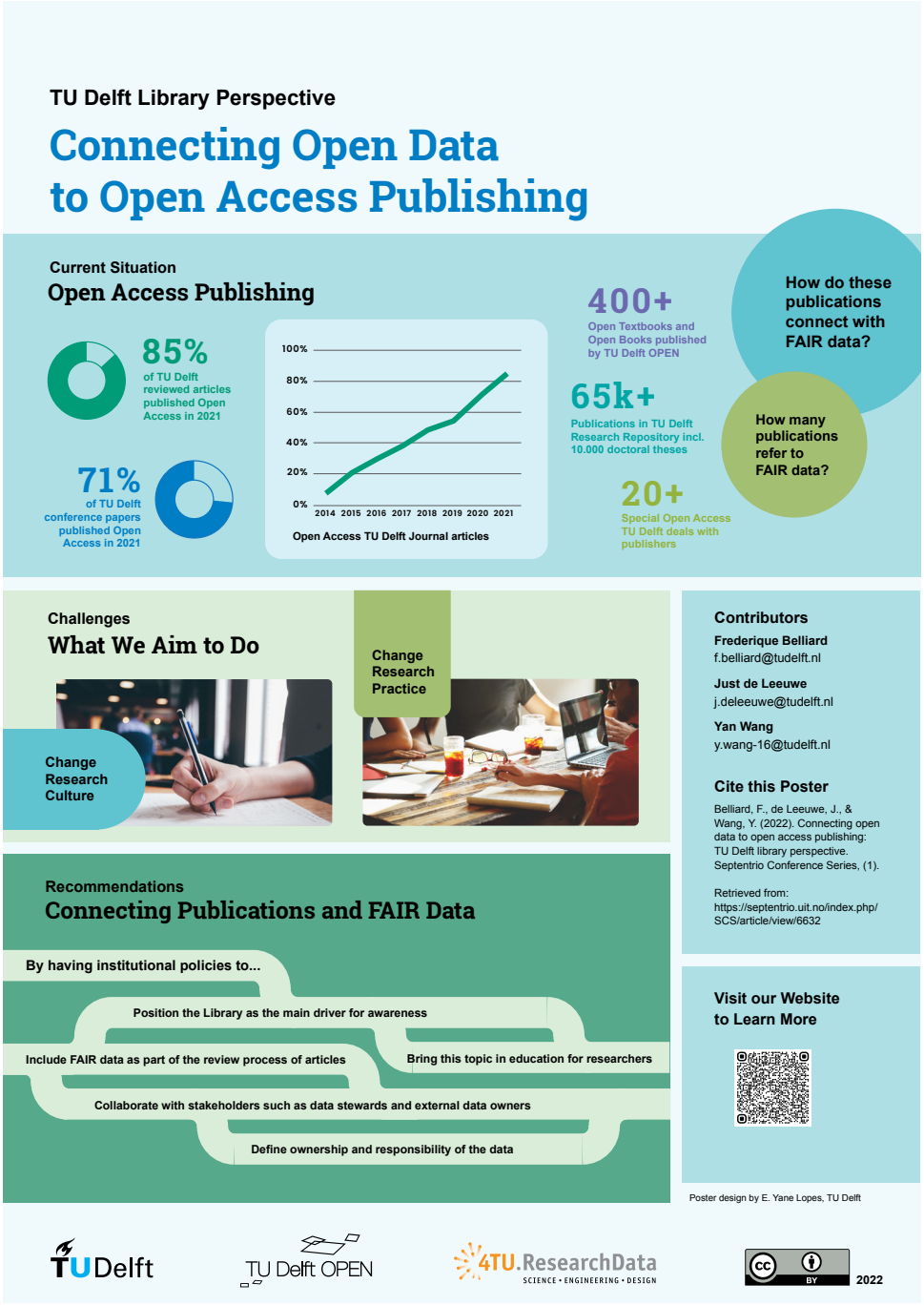
Infographics and poster Open Access

Various new infographics to help researchers understand how to publish Open Access research articles and the support available were designed and published.

Poster 'Connecting OA publications with FAIR data'

For the 17th Munin Conference on Scholarly Publishing a poster will be presented titled 'Connecting OA publications with FAIR data:

https://septentrio.uit.no/index.php/SCS/article/view/6632, DOI: 10.7557/5.6632



Project Open Publishing

In 2022 the Open Publishing project has undergone a scrutiny- and self-evaluation process. This resulted in a new, revised vision and strategic plan for the coming years and a tighter collaboration with Open Education. At the same time, it has slowed down the processes of the platform development and innovation as well as communication and engagement. The technical developments of the platform also suffered from serious scarcity of available capacity due to staff's prolonged sick leave.

Planned deliverables:

1. Platform - upgrade OJS, upgrade OMPs
2. Platform innovation and development
    - Open post-publication commentary, the implementation of recognition, and the integration of e-Pub all in The Evolving Scholar (ThES);
    - Partnership with other platforms (planned for 2023);
    - Enhanced/interactive publication format (planned for 2023).
3. Support
    - Editorial support for the platform;
    - Quality control of the published material;
    - Professionalizing journal covers, book covers, textbooks, and cover images.
4. Communication and Engagement withr esearchers and editors
    - Series of infographics;
    - Strategic Publication plan: 2022 prep, roll-out planned for 2023.

Detailed description of work on every deliverable:

D1 & D2: Platform upgrade, innovation and development

The platform software for journals, textbooks and BK-books (OJS and OMPs, respectively) have been prepared for the upgrade, including the test plans, but are yet to be implemented. The team indicated that no funding of an external PHP software engineer is required form the OSP.

The innovative and experimental Orvium platform that hosts the publications of the multidisciplinary journal The Evolving Scholar, developed some major new functionalities in an agile and flexible way beyond expectation. These developments include an integrated plagiarism check with iThenticate, integrated copy-editing functionality, and complete support for conference including an interactive programme, user's guides, videos, tutorials, help website, documentation. Together with the journal/ community of Ports and Waterways, the open peer-review and enhanced publications are being tested.

D3: Support

Editorial support was deployed to publish new content on the TU Delft OPEN platform with the support from the team. In 2022, TU Delft OPEN Publishing have also published with the publishers nai010, Boom (using imprint Eleven) DAP and IOS-press. More talks with other publishers are in progress. For the first time the concept of Conference books was discussed with editors and three conference bookshttps://books.open.tudelft.nl/home/catalog/category/conferencebooks were published in 2022. For this purpose, agreements between TU Delft

OPEN and editors were conducted.

Several journals have improved their branding through developing covers and template in co-creation with own university students.

A pilot with language- and copy-editing is continued and yet to be evaluated before a substantiated recommendation for an embedded service can be made.

Additional results:

- TU Delft OPEN Publishing re-anchored the Vision and Updated the Strategic Plan with focus on books (monographs and collated works), journals, and textbooks.
- TU Delft OPEN has submitted request for membership to The Association of European University Presses (AEUP) and has been approved in November 2022.
- TU Delft OPEN monographs are indexed in the Directory of Open Access Books (DOAB). More books that meet the criteria of the indexer are being added continuously.
- TU Delft OPEN joined the national working group of Netherlands University Presses (NUP). The working group is currently led by Radboud University Press.
- A series of Blogs were published, including four Authors Spotlight, Highlights 2021 and on Printing on demand.
- For the user – be it author, editor or reviewer, a series of TU Delft OPEN logos were published online and available to download, both as image and as vector.
- TU Delft OPEN Publishing signed a contract with printing specialist Hollandridderkerk, offering an online print service for all books and textbooks of the portfolio. Titles can be ordered directly from the TU Delft OPEN publishing website and are printed, invoiced and shipped globally to the customers.
- Outreach: Open Publishing team attended 2 conferences and a book launch in the field of architecture and a conference on connecting open data to open publishing.

Project FAIR Data and FAIR Software

Provision of support in the form of Digital Competence Center (DCC) and training has been the highlight for both, FAIR Data and FAIR Software projects in 2022. Establishment and proof of concept for DCC has proven a valuable contribution to research support and served as the grounds to bring together the two projects with their multitude of stakeholders to accomplish more together. Due to this close connection in implementation, the results of both projects are reported jointly in this section.

Planned deliverables for 2022:

1. Data Managers Pilot
2. Development of a course on managing personal research data
3. Supporting communities working with specific types of data
4. Limits of Open Data
5. Sustainability plan for the TU Delft Digital Competence Centre
6. Team building & training
7. Training: definition and the development of the digital skills frame work for researchers
8. Research Software Engineers Pilot

Detailed description of work on every deliverable:

D1: Data Managers pilot and D8: Research Software Engineers pilot

During 2022 two rounds of support calls were held.

The support call in January piloted different kinds of support that the DCC support team could provide. The team received 39 applications, resulting in 14 project reviews (comprehensively motivated rejection of application), 11 project consultations (advice on how to proceed on the topics addressed in the application, but no hands-on support), 3 mentoring tracks and 11 hands- on support projects. Time spent on these hands-on support projects ranged from 80 to 500+ hours.

The support call in September focussed on long-term hands-on support projects. This round resulted in 19 applications. 7 projects were selected, that start as of November 2022. The remaining applications were put in the back log, for future new DCC colleagues (2 vacancies for RSE are out now)

DCC Support team members were actively involved in improving the knowledge transfer of Carpentry trainings and Code refinery, developing and piloting some knowledge transfer improvements. In this, the focus is on why we teach these topics, not only teaching how to use the tools, based on the principles that are written down in the vision document (see D7)

D2: Development of a course on managing personal research data

In November 2021, a working group was established to develop the course ‘Personal Data & Human Subjects in Research’. The working group was formed by the Data Stewards Nicolas Dintzner and Santosh Ilamparuthi (Faculty TPM and EEMCS, respectively), Ingeborg Ahlers, member of the privacy team, the policy advisor for research integrity Cath Cotton, and Research Data Officer Paula Martinez from the RDS team in the library.

This course is aimed at PhD candidates, MSc students and researchers that collect personal data and work with human subjects within their research projects. The project had two parts:

- Design as self-paced and online course offered through Brightspace
- Design 1 face-to-face training sessions that future instructors and data stewards can use and be offered as a complementary as a hands-on session.

The self-paced online part of the course was finished at the end of September 2022. In October, the team opened the course for feedback from different members of the Open Science Programme, researchers and experts from other administrative offices. The launch of the course is planned for January 2023 after incorporating the feedback. The design of the face-to-face training session will finish in December 2022.

D3: Supporting communities working with specific types of data

TU Delft Library (including data stewards and DCC team members), 4TU.ResearchData and Frictionless Data joined forces to organise the workshop “FAIR and frictionless workflows for tabular data”. The workshop took place on 28 and 29 April 2022 in an online format. It was envisioned as a pilot to create training on reproducible and FAIR tools that researchers can use when working with tabular data, from creation to publication. Nineteen participants joined the workshop, that received quite positive feedback. Most of the participants’ expectations were fulfilled (79%) and they would recommend the workshop to other researchers (93%). Most of the participants felt that they can apply what they learned immediately and felt comfortable learning in the workshop.

TU Delft Library and DCC team members are currently involved in organizing and delivering several workshops in the geospatial and urbanism type of data:

On the initiative of the data champion and member of the Open Science Community, Claudiu Forgaci, the library and members of the DCC team helped in organizing, hosting and delivering the following workshops:

- ‘Reproducible and Automated Research with R for Urbanists’ (10th October 2022 – 18 participants)
- ‘Urbanism (14 October 2022 – 6 participants).

These workshops were planned within the framework of the researcher’s fellowship project ‘Rbanism -building digital competence for reproducible, automated and scalable research in the urbanism research community’ granted by the NL eScience center.

Claudiu Forgaci and his colleague Clémentine Cottineau from the Department of Urbanism at the Faculty ABE were also interested in testing the Geospatial Data curriculum of the Data Carpentries. To achieve this goal, a workshop, held on 18 and 21 November 2022, designed for PhD Candidates, Teachers, and MSc students from the department of urbanism. The idea of the workshop was to contribute to the enhancement of the skills of other researchers within the department, testing the relevance of the data carpentry curriculum, and engaging with potential future trainers and helpers to provide the workshop more often in the future. 16 participants attended the workshop, while 8 colleagues remained on the waiting list, signifying high intertest in the workshop across the department.

D4: Limits of Open Data

Details about this deliverable are reported under the cross-cutting theme “Fruitful collaboration with third parties”

D5: Sustainability plan for the Digital Competence Center

Sustainability scenarios were worked out and presented to the DCC Steering Committee in 2022. The hybrid model has been identified as the preferred option and will be further developed. In such hybrid model, a central DCC support team could exist, alongside members of the DCC dedicated to and funded by the faculties. The sustainability plans will be finalized by the end of 2022. Julie Beardsell, DCC coordinator, and other members of the DCC and data stewards, have been visiting the faculties to raise awareness about the work of the DCC and better understand requirements for the future. Discussions with HR, finance and NWO will be planned to execute the sustainability plan during 2023. The NWO understands that the start-up infrastructure funding used by many institutions for establishing the DCCs in the Netherlands is not sufficient (alone) for the sustainability of the DCCs and further investment is required. There are several research groups that have indicated they would be willing to pay for the DCC’s services. They will be asked to participate in the transition phase that will run in 2023 and that will move the DCC from a centralized service to a hybrid one.

The decision has been made to continue providing required services as a team formally embedded within the library and the ICT after the end of the current Open Science Programme. Additional services provided by the team would include support to the Open Hardware portfolio in 2023.

To meet the demand from the research community and to increase the capacity of the DCC team in the short-term, recruitment has started for two additional research software engineers to join the DCC (ICT Department) and the library has made a request to fund two additional data manager positions in 2023.

D6: DCC Team building and training

On 23 September 2022, the DCC enjoyed a team building session which included a couple of hours carrying out sheep herding exercises at a farm in Bleiswijk. After the exercise, the team walked along a scenic path following the river Rotte and had lunch at Restaurant Meerenbos The activity was appreciated by the team and proved valuable in creating more cohesion and further strengthening teamwork.

The following training courses have been successfully completed by the DCC staff members:

- Dutch language training (Aleks, Ashley, Niket, Jose).
- Carpentry Instructor Certification (Niket and Aleks).
- Erasmus University focused on strengthening communication skills (Ashley).
- Introduction to Functional Programming for Big Data Processing (Jose).
- Developing expertise in things that fill gaps for researchers in their projects (Linux, servers, docker, social coding) (Jose).
- High Performance Computing (Manuel).
- OOP with Python, Udemy course (Niket).

Picture 1: Eight members of the DCC team, four standing behind, four sitting in front with sticks for sheep herding.

D7: Training: definition and the development of the digital skills framework for researchers

A rubric with digital skills is created and a vision on how to develop these skills was written. Based on the design principles in this vision document, existing trainings (Software Carpentry and Code Refinery workshops are adjusted and an intermediate Git workshop is under development.

Project Citizen Science

The achievements of the Citizen Science project in 2022 revolved around three thematic directions: content platform development, training/knowledge-sharing activities, and supporting researchers in applying the Citizen Science methodology in their work. Through continuous discussions with researchers who use the Citizen Science methodology, it has become apparent that more training and structural support are needed to allow the researchers and the society to make the most of the multitude of benefits that it has to offer.

Planned deliverables for 2022:

1. Content platform/website
2. Training
3. Support researchers
4. Knowledge sharing activities

Detailed description of work on every deliverable:

D1: Content platform/website

The Citizen Science project team developed a first version of the TU Delft citizen science website www.tudelft.nl/citizenscience. The website currently serves as a platform that stores relevant existing content and guides researchers to find the support available for them in the field of Citizen Science at TU Delft. To create additional content, a ‘tips and tricks” document, a student was hired to conduct a set of interviews. The document will be published on the website.

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D2 and D4: Training and knowledge sharing activities

MOOC

Based on the identification and assessment of necessary skills conducted by the project, we developed and implemented a Citizen Science module for the TU Delft Open Science MOOC. While the pilot module has received been recognized as a great contribution among the international citizen science community, a modest number of participants took part in the pilot this year. It is likely that the low number is associated with not enough communication effort, something that will be addressed before the module goes again life in 2023. However, the smaller number of participants allowed the project team to receive more detailed feedback to address the existing gaps in the future iterations.

Citizen Science Community

The existing Citizen Science community has grown to include more members across multiple faculties and diversified the pool of participants to include researchers, data stewards,

communications and other support staff.

Citizen Science project updates

Delft Measures Rain, a citizen science project run by the Waterlab, successfully released a new edition: https://www.tudelft.nl/en/scd/waterlab/join-our-research/delft-measures-rain

International collaboration

Further collaboration with international Citizen Science experts was strengthened through contact with LIBER Citizen Science Working Group and European Citizen Science Association (ECSA).

D3: Support researchers Ethical and legal support

The aspect of ethical and legal support and guidelines for researchers involved in Citizen Science was further discussed with Legal, Privacy and HREC. It became apparent in these discussions that a clear workflow needs to be established to provide support for researchers. Further collaboration is planned to be established in 2023.

Climate Action

Initial steps to set up collaboration with the Climate Action Programme were taken through hosting a Citizen Science Basics workshop and extending the project's network with the Climate Action programme.

Picture 2: A table with an experimentation device (water station), water measuring cups, a water bottle and a handout.

Picture 3: Two tables with workshop participants and a trainer standing in front of a screen.

Publishing Citizen Science project outputs in open access

The project, in collaboration with the Open Publishing team, started developing a workflow for publishing citizen science projects' outputs open access in The Evolving Scholar and developing a comprehensible way to invite reviewers for open reviews. As a result, "Implementing Citizen Science within Open Science: Identifying Extra-Academic Skills, Collaborations, Rewards and Recognitions in the Context of a University", a concept paper based on experiences with Delft Measures Rain 2020, was submitted to the Evolving Scholar (OA).

Additional results:

An EU-funded 3-year Citizen Social Science project was acquired and started its implementation in April 2022. The Open Urban Sustainability Hubs (OPUSH) project aims to develop a knowledge hub in collaboration with the Delft City Library (DOK) and Delft municipality to create space and infrastructure to support citizen science projects. The project's scope is sustainable urban transformation. Project's relevance for the Open Science Programme is in piloting this approach and ensuring its sustainability to extend such support to researchers and citizens interested in other thematic directions after project completion.

Project Open Hardware

The highlight of the year for the Open Hardware project was the Open Hardware Academy, which was a tremendous success and brought many Open Hardware enthusiasts together, further extending the growing international community.

Planned deliverables for 2022:

1. Community Building Open Hardware
2. Training Open Hardware
3. Research Hardware Engineer

Detailed description of work on every deliverable:

D1: Community Building Open Hardware

Community meetings

Open Hardware community engagement cycle includes weekly lunch meetings on Fridays at 12:30, workshops and seminars where we address and discuss members' proposals and ideas. All of those were held by the project team in 2022.

Workshops

The project team delivered hybrid workshops to grow community and generated reusable documentation of the workshop lesson with CC license. The following are examples of such workshops.

- 3D printing workshop was developed and presented by community members. This in- person event at the library had wide participation from across the university which included students, researchers, employees and their families
- PCB making, a workshop developed and presented by Jerry de Vos (RHE), was designed to share basic knowledge in sought after skills within the community.
- Flow battery workshop, led by a guest speaker, Sanli Faez from Utrecht University, explored open-source flow batter project and the opportunities for the OpenNext guest speaker.

D2: Training Open Hardware

The team successfully ran the Open Hardware Academy, an open, project-based training and peer learning experience where the team members guided participants from 'zero to hero' in developing an open hardware project. The Academy is the most ambitious and engaging project from the Delft Open Hardware group in 2022. It consisted of a 10-week guided program to help researchers and students make their projects open source. All in all, it was a great success, with many new projects made open source.

The Academy delivered basic open hardware lessons as open educational resources archived in Zenodo that can be reused by other educators and trainers. The lessons can be found here: https://www.openhardware.academy/03_Lessons.html. Feedback was gathered from all participants to be taken into account when improving the next editions of the academy.

- Out of 23 applicants. 12 participants were actively engaged throughout the whole duration of the academy and 9 projects were presented on 14th October.

D3: Research Hardware Engineer

The team successfully ran the Research Hardware Engineer role pilot. The project team managed to retain Jerry de Vos (an active Open Hardware community member) who graduated from the IDE faculty with an award-winning open-source plastic scanner project in the new role of Research Hardware Engineer. The research hardware engineer role has been supporting the community with expertise and is currently working on strategic open hardware projects to showcase the relevance of working open at TU Delft. The pilot project has been expanded for another year while a permanent location for the RHE role is explored.

Additional results:

Communications

The team improved the communication channels and visibility with a new website hosted by TU Delft including promotional videos, projects, and events. All information is now available at tudelft.nl/open-hardware, including a video about the project.

Thesis support

The project team supported one open source hardware thesis at the IDE faculty for Joost Dommisse.

Collaborations

Engaged in open hardware collaborations and dissemination of open hardware in Academia through the following

- Participation in the RDA for FAIR research hardware .
- Talk Open Hardware Summit, about the origins of Delft open hardware and what we aim to do next
- Learned from Research Software communities teaching activities by engaging in software carpentries and code refineries which have been a source of inspiration for the open hardware academy.
- Promoted open hardware at TU Delft Maker Faire event at the sport and culture building, where participants got exposed to hands on.
- Made a public overview of great examples of open hardware.

Picture 4:Several people stanind around at TU Delft campus

Picture 5: Member of the Open Hardware team, Santosh Ilamparuthi, presenting in front of a screen. Several people sittting in from of the screen in a row looking at the presenter.

Cross cutting theme Rewards and Recognition in the open era

Planned deliverables:

1. New criteria for Valorisation (including Open Science aspects)
2. New Scientific Performance criteria (modernised with Open Science),
3. Additional deliverable: Research Intelligence Framework to support university's Rewards and Recognition (Results of the ARIA project (Advancing Research Intelligence Applications))

Detailed description of work on every deliverable:

D1: New criteria for Valorisation & D2: New Scientific Performance criteria

In Europe a coalition was started proposing an "Agreement on Reforming Research Assessment, 20 July 2022". TU Delft took part in the co-creation process towards the agreement. This agreement is signed by UNL. The core commitments of this agreement are:

- Recognise the diversity of contributions to, and careers in research according to the needs and the nature of the research
- Base research assessment primarily on qualitative evaluation for which peer-review is central, supported by responsible use of quantitative indicators
- Abandon inappropriate uses in research assessment of journal- and publication-based metrics, in particular inappropriate uses of Journal Impact Factor (JIF) and h-index
- Avoid the use of rankings of research organisations in research assessment

In 2022 the Programme Recognition & Rewards worked on a cultural change via the projects and deliverables as stated in the TU Delft Recognition & Rewards Perspective 2021-2024.

- The executive board made a preliminary decision on a new "Academic Career Track" policy to replace the current "Tenure Track Policy". The Academic Career Track will offer a development programme to support the development of new Assistant Professors in their development to become Associate Professor. The development programme will support them in the four key result areas: Education, Research, Impact & Innovation, Leadership & Organisation. Several members of the Open Science Programme are asked for input to help develop formal training within this programme.
- The executive board made a decision to abandon the use of the appraisal scores (I, II, III, IV) in the Result & Development Cycle and put more emphasis on the future dialogue.
- The Academic Position Criteria are being updated to include a wider diversity of contributions.
- In collaboration with the ARIA project we investigated needs for metrics. We also looked into the possibility for metrics for a wide diversity of contributions.

UNL works on an agreement between the universities on how to put the ambitions as set out in the position paper "Room for everyone's talent" into practice. The proposed decision regarding open science is that every university, university medical center and research institute makes it explicit how they will weigh or discuss activities in the realm of Open Science in the appraisal, appointment and promotion of staff and communicates about this transparently before the end of 2024.

D3: Research Intelligence Framework to support university's Rewards and Recognition

The project ARIA (Advancing Research Intelligence Applications) is a collaboration of TU Delft- EUR(MC)-CWTS, project lead for TU Delft is Alenka Princic. The project delivered, in collaboration with the Rewards and Recognition project, a draft research intelligence framework to support university's rewards and recognition practice. This research intelligence framework is focused on the infrastructural dimension of research intelligence. This requires a) registration and b) a strategic conversation about what needs to be registered and how. A draft research intelligence framework offers five principles about this registration: 1) No recognition without registration; 2) Register what matters, no need to register everything; 3) Allow for highly structured and less structured forms of registration; 4) Register efficiently, enable interoperability and reuse; 5) Whenever possible, integrate registration in the research process. With respect to the strategic conversation, the 'what' and 'how' of registration are further specified. The research intelligence framework will be published first on the ARIA project website and embedded in the conversations at the faculties on the future Rewards and Recognition policy.

Cross cutting theme Fruitful Collaboration with Third Parties

Planned deliverables:

1. IP MSc Repository
2. Guidelines for a fruitful collaboration with third parties
3. UNL working group “werkgeversauteursrecht”
4. Data Problems Analysis

Detailed description of work on every deliverable:

D1: IP MSc Repository

The working group has discussed several topics regarding this deliverable – such as copyrights of the student, procedures, GDPR issues, different policies within the university and objections of companies – in the internal working group as well as in meetings with 4TU colleagues. This has led to a memo which will be discussed with Rob mudde in December 2022.

D2: Guidelines for a fruitful collaboration with third parties

The Kerngroep Contracten is working on a policy/guidelines and on contract-clauses for all legal topics. Seeing the increasing (legal) importance of Open Science and to secure a coherent contracting-policy in TU Delft, this deliverable will be incorporated in this policy.

D3: UNL working group “werkgeversauteursrecht”

The UNL working group was very active in 2022. The working group has a meeting on a regular basis and decided to create a smaller working group who will work on a draft advice on this topic. Given the very varying opinions between the Dutch universities about the interpretation of Article 7 of the Dutch Copyright Act, the smaller working group is able to focus on the question from an objective perspective. When the UNL working group has a draft to share, the internal TU Delft working group (currently on-hold) will be asked to co-read and provide input. Derya from TU Delft is co-writer within this smaller working group of UNL.

D4: Data Problems Analysis

In 2022 there was created a smaller (more specialised) working group including 2 external counsels advising about the process for drafting a practical document/legal framework as to the status of data. There is a plan of action and based of that plan the working group had a first workshop for investigating the data problems within TU Delft from a legal perspective. The expectation is to have a first draft of the document in 2022 and to have the second session of the workshop in Februari 2023. In the meantime, the internal stakeholder will have the opportunity to review the draft and provide their input to the working group.

Cross cutting theme Skills

Planned deliverables:

1. Training Overview
2. Calendar
3. OS Personal Development Plan
4. Data Literacy
5. Skills Overview
6. Gap Identification
7. OS Skills Framework

Detailed description of work on every deliverable:

D4: Data Literacy

Project proposal for data-literacy for BSc and MSC programme approved. Unfortunately, the vacancy for a teacher/ course developer could not be filled.
On national level worked on a data literacy framework

Additional results:

4th run of the MOOC “sharing your research with the world”, including a new module about citizen science

Results exploration theme Ethics and Integrity

In December 2021, following specific suggestions from the Integrity Office on the OSP's 2022 work plan, it was agreed that, in the absence of budget for the suggested work, the Integrity Office and TUD Open Science Programme would conduct a preliminary exploration of Ethics and Integrity in Open Science. The goal would be to incorporate the proposals into the 2023 plan, and the work largely comprises three sub-topics:

1. Limits to openness
2. Openness and Knowledge Security
3. Open Science Impact and Implementation

Detailed description of work on every sub-topic:

T1: Limits to Open

The following actions have taken place in 2022 under this subtheme:

- Presentation to OSP
- Workshop on blindspots
- Recommendations to TUD OSP leadership

As an outcome, the following recommendation has been suggested:

There is room to broaden understanding of the impact of openness on different stakeholders and under different pieces of legislation. This issue might be best explicitly considered at the national and/or EU level.

T2: Openness and Knowledge Safety

The following actions have taken place in 2022 under this subtheme:

- Consultation to start Dec 2022
- Sci-hub discussion

Work on the TUD Knowledge Security programme has progressed over 2022. Sub-project 1 – Academic Values – plans to consult with various teams, including the OSP, starting from December 2022.

T3: Impact and implementation

The following actions have taken place in 2022 under this subtheme:

- Participation on DMS discussion on metrics

Additional results

Integrity "stress test"

- Comments on TUD OSP work plan 2022

- Comments on NPOS work plan 2022
- Overview to TUD OSP leadership

Publishing

- Queries on TUD COPE membership and retraction policy
- Input on presentation to PLOS

As a result of queries by the cross-cutting theme, COPE is considering Organisational membership from January 2023. There are indications towards beneficial changes in thinking on corrections and retractions elsewhere as well.

Open Science Community Delft (OSCD)

Coordinator: Tanya Yankelevich

Community growth

Although a coordinator of the community was absent for 5 months in 2022 due to staff change, the community continued to grow, signifying the interest and need among the Open Science advocates at TU Delft for collective action and knowledge exchange. Over 30 new members joined the community since January 2022, and more applications come in every month.

Networking and knowledge exchange

Various training events were organized by the community and its members in 2022, as well as the first in-person networking event, where community members were given a chance to present their project ideas and discuss topics of interest in an informal atmosphere. The response from the networking event has been overwhelmingly positive, and another in-person meeting is currently being planned for December 2022.

Mainstreaming Open Science Fund

For the first time in the history of the OSCD, funding was made available to support members' initiatives in advancing Open Science practices and/or supporting various Open Science community initiatives at TU Delft. Out of 15 applicants, 11 received funding under EUR 10.000 to implement such projects. Many other community members expressed interest in applying for similar funding in the future and appreciated the opportunity to share their ideas and attract potential partners for collaboration among the community.

Picture 6: A screen displaying information about the OSCD networking event, and people with stands on the background

4. Budget 2023

In budget of the library signed off on a OSP budget for 2023 of 1,345 million euros, based on the expected expenditure of 2022, taking underspending into account. So far, the OSP has displayed year after year significant underspending. To ensure that the budget is used we propose to fix the budget of the clusters on the amount that was included in the library budget: 1,5 million. The initial amount has been increased in connection with the collective labour agreement (CAO) salary increase. The requested budget exceeds slightly what is available. But with three years of underspending in a row this is unlikely to cause problems.

Project/theme Amounts in K€	**Budget 2023 project**	**Budget 2023 cluster**	**Explanation**
Open education	220	300	For all three projects this would be a significant step up compared to 2022.
Open Access	30		
Open publishing platform	100		
FAIR data	875	750	The FAIR projects with their Data managers and RSEs all in place are expected to show robust spending. Added is the IRODS pilot.
FAIR software			
Citizen Science	60	135	
Open Hardware	75		
Rewards & Recognition	-	150	
Fruitful collaboration	20		
Skills	110		
Ethics	30		
Programme costs	165	165	The programme team is fully in place with programme leader, community manager, communications officer.
TOTAL	**1685**	**1500**	A difference of 12% is well in line with expected underspending.

5. Work plan 2023

Open Education

Project Lead: Michiel de Jong

The project supports teachers in adopting and adapting teaching and learning methods through open education. It also helps to keep education accessible and affordable for students. The project builds on current practices such as OpenCourseware and MOOCs. Support includes training, advice, tools and infrastructures, for instance for sharing and reusing teaching materials.

The main goals for Open Education for 2023 are:

- Structural embedding of open education within all education processes of one of the faculties
- Research and development on infrastructure for publishing open textbooks and open educational resources
- Establishing a collaboration and workflow for open education with the various education related services of TU Delft, with the goal of incorporating the aspects of open education into the (already existing) skills development programs for TU Delft education staff.

Proposed project budget: 220.000 euro**.**

Deliverables 2023

Deliverable/objective	Description	Budget
Teacher training (OpenEducation in UTQ)	Explore ways to make this an extension of existing teachingpractices within UTQ (like organising courses and course materials), together with ESA. This budget would help us develop a course module should ESA agree to start up conversations on Open Education in the UTQ within the next year. The open education workshops will serve as a test environment for OE teacher training.	€ 10 K
Updated strategy and vision for Open Education beyond the OSP	In order to keep the momentum of open education adoption throughout TU Delft, it will be necessary to continue the implementation of the OER Policy after the current Open Science Programme ends. To this end, we will develop advice for a long-term Open Education strategy and vision.	-

Open Textbooks Innovation	Publishing open textbooks is now part of sustained library services. Budget for open textbooks innovation is required to further develop new services like Libretext and Jupyter Books to make them university-wide services, supported by the library.	€ 30 K
Curation of Brightspace course content	The initial tests of the TALIS and copyRIGHT tool have shown that we can systematically find resources within a faculty's Brightspace courses that are fit for publishing and use as OER. This budget will allow us to hire TA's who can do this for the Brightspace courses of two faculties (CEG and A&BE).	€ 40 K
Open Education Stimulation Fund	to the fund will be used to finance projects that showcase practical implementation of the OER policy. This funding will enable the team to start projects with faculties or programmes with a maximum budget of €20 K. Faculties may choose to supplement this. Due to the initial success of this call in 2022, we could scale this up to 100K for 2023. However, this does depend on the quality of the submitted proposals, which will be determined by the end of 2022.	€ 100 K
OCW 2.0 pilot	Transferring OCW to a new environment requires analysis, procurement and testing of new platforms. These costs will cover hiring an expert to look into potential platforms and also any procurement costs required to test platforms.	€ 40 K

Open Access: Going Forward with Open Access

Project Lead: Just de Leeuwe

In the coming years, the focus of Open Access will be extended from peer-reviewed scientific articles to books, conference proceedings, book chapters, reports, reviews and educational resources. The project supports this development by addressing both policy and infrastructure aspects that are crucial to the further development of Open Access practices.

The main goals for 2023: Successfully implementing the Taverne policy at TU Delft and streamlining Open Access at the faculty and library level.

Proposed project budget: 30.000 euro.

Deliverables 2023

Deliverable/objective	Description	Budget
Project Taverne	The decision on the implementation of Taverne approved by the Executive Board on 21 June 2022 stipulates the formation of the following bodies: 1. **The Operational Committee** 2. **Works Council (MR)** 3. **Local Consultation Body** (Labour Unions) **The following deliverables will serve to address Taverne implementation in 2023:** All short scientific works from publication year 2022 (articles, conference papers, book chapters) will be made open access, except for publications whose authors have chosen for the opt out possibility. It is expected that the percentage of TU Delft peer reviewed articles will become at least 90% for publications in year 2022. 4. After the introduction date of Taverne at TU Delft all short work in 2023 will be made open access- with an embargo of 6 months after the first online appearance of the work unless researchers choose for an 'opt-out'. Infrastructure in CRIS and a proper workflow will be designed with the OA team as well as an opt-out form, updated webpage, installing an administration etc.	-

Co-Creation of open access	We continue our aim to create open access books as partnership between TU Delft OPEN Publishing and external publishers. https://www.tudelft.nl/en/library/current-topics/open-publishing/about/sponsoring-and-co-creation Deliverables: 3 books published as part of co-creation in 2023	€ 30 K
APC's in the wild	As a result of our research, we know which publishers we can negotiate for Read&Publish deals with to relieve the faculties and prevent costly individual invoicing processes. IEEE is the sole major publisher without a Read & Publish agreement yet. About 3% of all TU Delft open access articles are paid by individual faculty members (faculties). It concerns ca. 125 articles per year on a total of 4.500 articles per year. The average APC fee is 1.880. In total the 'APC in the wild' costs per year are at least 235k The following deliverables will serve to address the identified areas of work in 2023: • In order to better identify APCs in the wild at the faculties, a cost category is created in the financial system of TU Delft. • Smaller publishers, often the publishing arm of societies, will be approached to see which open access conditions are possible in read&publish deals • Gold Open Access commercial publishers: a discussion with faculties will identify whether TU Delft Library should take Overo as a central hub for open access payments from TU Delft and what internal funding should be allocated for this.	-
Open Access Policy renewal	The current open access policy will be revised and improved in Q1 2023 by the project lead OA and presented to the Executive Board. The current policy (TU Delft Policy on Open Access Publishing) is in place since May 2016 and outdated. In the new version, the OA mandates of Funding Bodies (plan S) and Taverne will take an important place. The new OA policy document will be supervised by a group of designated reviewers from the OSCD.	-

Open Publishing Platform

Project Lead: Frederique Belliard

Open Publishing is a form of scholarly communication that offers not only free access to scientific publications, research data and educational materials, but also provides the infrastructure and processes for creating open content. Open publishing infrastructures use open-source software wherever possible, thus reducing the intrinsic costs of the publishing process. The project will deliver a publishing platform, together with services that will enable TU Delft researchers to adopt the open publishing principle.

The main goal for 2023:
An improved and sustainable platform infrastructure and accompanying user-friendly website with consistent and professional brand.

Proposed project budget: 100.000 euro.

Deliverables 2023:

Deliverable/objective	Description	Budget
Platform	The following activities will be conducted: • Evaluation of the current publishing platform software (OMP and OJS) and comparison with other systems to render improved technical and functional aspects of TU Delft OPEN. E.g., single-reader-facing search. alerts, feedback to authors, metrics, etc, based on the recommendations of the consultant the improvements will be implemented.	€ 10 K
Branding	• Upload mechanisms for Orvium platform / connection with OJS/ThES • Revamping the TU Delft OPEN Publishing website: improve the information pages of the website of its publishing operation to establish and maintain a sense of identity of a high-quality publisher; To be developed together with the communications team and an external consultant.	€ 5 K € 10 K
Pilot on peer-review of data and software	The following activities will be conducted: • Establish a collaboration with pioneering researchers who expressed the demand to offer peer review for data and software • Strengthen the collaboration between TU Delft, TU Delft OPEN and 4TU.ResearchData	€ 40 K

Support	Provide Editorial support for the publishing platform to: • facilitate the production of books • guide users (authors, reviewers, editors) • help journals managers	€ 25 K - hire 2 students 0,4 FTE
Communication and Engagement with researchers and editors	Engagement at one or two faculties (awareness, communication, events) to develop publishing strategy and publishing program.	
Rewards & Recognition in Open Publishing	Make **recognition** mechanisms for authors/reviewers as standard in The Evolving Scholar. • investigation and model proposal • technical implementation (POC)	€ 10 K

FAIR Data and FAIR Software: making research data and software FAIR

Project Leads: Marta Teperek (FAIR Data), Meta Keijzer-de Ruijter (FAIR Software), Julie Beardsell (DCC), Paula Martinez Lavanchy (Training), Yan Wang (Disciplinary practices)

The project creates a stronger bridge between the current policy, infrastructure and culture of data stewardship, sustainable software and scientific practice, for instance by exploring new roles like data manager or research software engineer, in order to fulfil the researchers' actual needs in managing their research data and software. A coherent approach to FAIR data and software helps make research more transparent and efficient.

Main goals for 2023: Improving FAIR Data and FAIR Software practices at TU Delft by developing training materials, discipline-specific guidelines and piloting a tool for active data management.

Proposed project budget: 875.000 euro.

Deliverables 2023

Deliverable/objective	Description	Budget
DCC (Data Managers and RSEs)	Final year of appointment of 2 data managers and 4 research software engineers	€ 450 K
Development of a self-paced course on RDM for the supervisors of PhD candidates at TU Delft	**Goals:** • Provide PhD supervisors with sufficient knowledge and skills to offer sufficient mentorship and support to PhD candidates with regards to research data management; • Improve FAIR Data practices across TU Delft. **People involved outside of the project team:** • Advisory: Supervisors, PhD candidates (consultations about the course content), Data Stewards, Graduate School, Skills project team within the OSP **Deliverables:** Course preparation - the appointment of an external education specialist consultant who will lead on the following tasks: • Design of learning objectives • Design of the concept and structure of the course • Design of the interactive and assessment activities • Content creation (e.g., animations and voice over, video recordings and edits, etc.) • Building the course in the selected learning platform • Piloting and testing • Incorporating feedback	€ 60 K

Development of disciplinary research data/software management guidelines	**Goals:** • Develop a methodology for creating disciplinary Open Science and data/software management practices; • Engage researchers in cross-faculty collaboration on common research themes to discuss disciplinary data software management workflows; • Promote Open Science and data/software management practices. **People involved outside of the project team:** • Researchers, Data Stewards and/ or DCC members: participate and contribute to disciplinary data / software guidance co-creation	€ 80 K (appointment of 1FTE project manager for 1 year, under the FAIR data umbrella)
Pilot a new solution for "active" data management based on an open source system called "iRODS" **(in collaboration with KU Leuven)**	**Background:** TU Delft offers researchers some solutions for storing research data (institutional network drives), as well as solutions for archiving and sharing research data fixed in a moment in time (4TU.ResearchData). However, there are currently no services which could help researchers effectively manage their research data during the 'active' phase of the research lifecycle. As such, this project tests a solution which could address a big gap in the current IT service provision at TU Delft. Joining forces with KU Leuven would help long-term sustainability of the endeavour. **Goals:** • Test an open-source tool which could help researchers manage their research data and metadata during the active phase of the research lifecycle (current gap in TU Delft support for research data management) and make research data more FAIR; • Improve research data management practices across the campus at TU Delft; • Make research data more FAIR; • Connect the different (currently disconnected) research data management processes; • If the pilot is successful, it could be turned into a service under the umbrella of the 'Research Hub.' **The project will involve multiple stakeholders from outside of the project team:** • Masha Rudneva (project coordination, ICT) • 3 different research groups testing the tool • DCC team, data stewards, Research Data Services team, ICT Innovation - advisory capacity, community connection	€ 285 K Funding for the appointment of: 1 Developer (1 FTE) – under the FAIR Software umbrella (ICT) 1 System Admin (1 FTE) – under the FAIR Software umbrella (ICT) 1 Data Manager (1 FTE) – under the FAIR Data umbrella (Library)

Citizen Science

Project Lead: Tanya Yankelevich

Citizen science is gaining more and more recognition as an open science research methodology that not only allows researchers access to large-scale collection of data, assists in identifying societally relevant areas of research, but also addresses the question of inclusion and bias in science. However, as a methodology it requires a lot of resource investment, not least of which are skills not typically associated with research cycle, time and the need for support services. The overall goal of the citizen science project within the Open Science Programme is, therefore, to improve support for TU Delft researchers in setting up and implementing citizen science projects.

Main goals for 2023: exploring the design for services for ethical, legal and privacy support; and providing capacity-building support to researchers who would like to/already use citizen science as their research methodology.

Proposed project budget: 60.000 euro.

Deliverables 2023

Deliverable/objective	Description	Budget
Ethical, legal and privacy support	Specific attention will be given to developing a structured roadmap on working with **ethical, legal and privacy** issues associated with citizen science projects. The project team will conduct a **mapping** of existing and missing **services** that could be helpful in setting up citizen science projects at TU Delft.	-
OPUSH implementation	The project will establish a **collaboration** with local administration, Delft public library and other stakeholders relevant for citizen science projects in the field of urban sustainable transformation. The project team will also create a **space for stakeholders**, including citizen scientists, to meet, discuss and work together on citizen science projects.	-
Content development and storage	The new Citizen Science **website** will be further developed to: • improve the flow based on the user experience tests • structure the tools and services to follow the logic of project development stages The website will be launched among the growing Citizen Science community of Practice within TU Delft.	€ 5 K

Training and community	**Monthly training sessions** will be organized for the Climate Action researchers who will be designing their citizen science projects (open to other researchers who would like to attend the sessions). These sessions will serve to provide guidance to researchers and feedback from the researchers to the project team to further map and develop support services. The citizen science module of the Open Science **MOOC** will be further supported when MOOC goes live. A **community of practice** plays a vital role in knowledge accumulation and its sustainable sharing. While a small community already exists, more efforts will be put into the inventorisation of existing citizen science projects at TU Delft to grow the community. Periodic meetings and training sessions will be organized to strengthen the community and channels of communication will be established to facilitate knowledge exchange. The Citizen Science team will work in close cooperation with the **Climate Action** programme thoughout the year to establish programme training needs and address knowledge gaps. The Climate Action programme will serve as a direct link to the TU Delft faculties and will, therefore, support embedding any services developed by the Citizen Science team in the faculties.	€ 55 K

Open Hardware

Project Lead: Santosh Ilamparuthi

Open hardware, or open-source hardware, is hardware whose design is made publicly available so that anyone can study, modify, distribute, make, and sell the design or hardware based on that design. This Open Hardware project aims to further embed open-source hardware into the Open Science movement at TU Delft. The project will accomplish this by continuing to support students and researchers in making their hardware projects open source and delivering training activities and learning materials to further the community goals.

Main goals for 2023:

1. Showcase and assess the relevance that open-source hardware brings to science, engineering and education;
2. Take steps towards embedding open source (hardware) collaborative best practices and values as part of the engineering curriculum at TU Delft;
3. Monitor and address evolving needs of faculties around usage, development, reward and recognition of open-source hardware related academic work;
4. Deliver recommendations on policies and measures that need to be considered to advance open hardware at TU Delft, including mainstreaming a research hardware engineer position;

Proposed project budget: 75.000 euro.

Deliverables 2023

Deliverable/objective	Description	Budget
Expanding the community of practice	The requested budget will be allocated for the following activities: • lunch meetings, 1 workshop per month and1 seminar/guest speaker per month; • 6 showcased projects per year by the community (from at least 4 different faculties); • Interuniversity collaboration (Utrecht, Berlin, Bath, MIT) and close collaborating with partner organizations (RDA, OSHWA, DIN SPEC); • A physical space to support projects; • Recruiting 5 professors as ambassadors of open hardware; • Support with Materials and prototyping makerspace	€ 22 K

Growing expertise in open research hardware	To address the existing skills gaps among open hardware enthusiasts and community members, the project team will: • Cater lessons and training activities based on knowledge and skill level (beginner, intermedium, expert); • Organize hardware replication workshops to assess, deploy and test open hardware that benefits science and engineering.	€ 41 K
Thesis support (5x)	With the requested budget, the project team will be able to support the material expenses for theses.	€ 5 K
Open Hardware academy	After a successful pilot of the Open Hardware Academy, the team plans to do the following in 2023: • Run the academy twice a year, grow the pool of technical lessons; • Reward participants of open hardware academy with ECTS and/or make an elective out of the open hardware academy.	€ 5 K
Promote open hardware	Open Hardware is a relatively new, but growing field within Open Science, which is why its promotion is especially important not make use of the momentum. The following will be done to achieve this goal: • Introduce competition calls for interdisciplinary teams of students developing open hardware projects. Award or competition with prize money to improve the amount of open hardware projects; • Engage in interuniversity collaboration (Utrecht, Berlin, Bath, MIT) and collaboration with partner organizations (RDA, OSHWA, DIN SPEC); • Establish a physical place to display open hardware projects (exhibition); • Maintaining the open hardware website.	€ 2 K
Deliver guidelines to onboard an RHE in the process of onboarding a second RHE	Having scoped the need for and added value of a research hardware engineer position, the project team will pilot the idea in 2023 and, based on the results of the pilot, provide guidelines for onboarding of such personnel at TU Delft faculties.	-

Recognition & Rewards in the Open Era

Contact: Evan van de Leur

The TU Delft Recognition & Rewards programme as a stand-alone programme will end in December 2022. The activities will continue in the Talent & Development team of HR as well as in the Teaching Academy. For Recognition in the Open Era, Evan van de Leur will be the contact. He'll work on the 'open' theme within the team development together with Meike Blokland under Selma de Ridder as their lead. The Steering Committee of the R&R Programme will stay in place and will be enlarged with a representative from the Open Science Programme/ Community. A bigger R&R event will be organised by team development in March 2023. Project leads from the OSP will be asked as guest speakers. A transition document will be hand over in December 2022, so the work continues, and the dialogue can be even enlarged.

Fruitful collaboration with third parties

Project Lead: Rianne van den Bogerd

This cross-cutting theme focuses on guidelines, policies and regulations that help to deal with any issues or opportunities that arise in (developing) collaborations with third parties, with regard to the outputs delivered by the projects in the Open Science programme. Collaborate (with eg: the Integrity Office and IIC) to explore the kinds of practical dilemmas arising between “as open as possible” and “as closed as necessary” with respect to (international) partnerships. To contribute to the Knowledge Safety and (International) Partnerships initiative (ToR in progress).

Deliverables 2023

Deliverable/objective	Description	Budget
IP MSc Repository	IP questions regarding the publication of MSc theses in the Repository The internal working group will discuss a memorandum (including a proposal for the further approach of this deliverable) with Rob Mudde in December 2022.	-
Guidelines for a fruitful collaboration with third parties	Guidelines for a fruitful collaboration with third parties This deliverable will be incorporated in the policy/guidelines/preferable TU Delft clauses which will be drafted by the “Kerngroep Contracten” (chair: mr. Sjoerd van Kesteren, Contractmanager 3ME). Derya and Rianne are also part of this working group.	-
UNL working group “werkgeversauteursrecht”	Participation in the “Landelijk werkgroep werkgeversauteursrecht” (UNL)”. The internal working group is temporarily hold on and will start again when there comes input from the UNL working group.	-
Data Problems Analysis	Practical document/legal framework for assessing data by internal stakeholders of TU Delft covering (inter alia) the following topics: I) legal status of data, suchas a) the (im)possibilities of ownership of/rights to data, b) possible IPR on data, c) how to deal with data following third party collaborations and ii) which department is in the lead when the internal stakeholder has questions about the legal status of data.	€ 20 K

Skills for Open Science

Project Lead: Nicole Will

Researchers, teachers, students and support staff will (further) develop certain skills in order to be able toapply the open science principles in their daily practices. This cross-cutting theme will create an overview of the skills needed, connect the existing training modules (and training still in development) in the projects, and coordinate the further development of courses in a comprehensive way. With a significant difference between training (courses), where participants learn and acquire skills, and knowledge and activities like roadshows and presentations aimed for creating awareness on certain topics, this project focuses exclusively on training.

Main goals for 2023: to identify skills relevant to all open science fields within the OSP and map existing training opportunities and gaps that address these skills.

Proposed project budget: 110.000 euro.

Deliverables 2023

Deliverable/Objective	Description	Budget
Skills Overview	A study that defines required skills and skills framework, build in collaboration with the OSP projects and cross-cutting themes, will be conducted The aim of this deliverable is to assess existing courses and training, to identify gaps and courses/trainings to be developed to fill the skills gaps for each of the OSP projects, and to guide researchers, teachers, and students in their personal skills development journey.	€ 25 K
Data Literacy	Defining skills for data literacy aimed at BSc and MSc students and developing a pilot for a corresponding course.	€ 75 K (Internal via secondment)
Training Overview	Inventory of training from projects and cross-cutting themes. Standardized course description; classified by audience, levels, topics.	€10 K

In addition to the above-mentioned projects and cross-cutting themes, an exploration of the following topic started in 2022:

Ethics and Integrity in open Science

Deliverable/Objective	Description	Budget
Openness and Knowledge security	• Contribute to KS consultation and evaluation meeting Dec 2022-April 2023 (capacity) • Develop TUD policy on Sci-hub including copyright and ICT security implications	-
Integrity "stress test"	• Programme-wide OSP integrity stress test to include in the OSP (2020-24) programme evaluation • External report on Governance in Open Science – TUD/NL/EU	€20 K
Limits to openness	• External report (10-20k) on Policy conflicts with Open Science (eg: GDPR, Knowledge Security, IP and Access to benefit-sharing) >> proposal to NL govnt/European Commission	€10 K
OS impact and implementation	• Internal evaluation (OSP 2020-24) to include: Outcomes, impact and metrics	-
Publishing	• Internal evaluation (2020-24) to include eexploring institutional membership for COPE • Development of TUD retraction policy and guide (capacity)	-

Annex 1.Team

The Open Science programme involves a growing team of experts with roots in various parts of TU Delft.

Portfolio Holder
Rob Mudde, VRM, executive board TUD

Steering Committee
Irene Haslinger, Director TUD Library, chair
Jan Dirk Jansen, Dean CEG, representative of TUD faculties
Sacha Kronenberg, Director E&SA, representative of TUD services
Frank van der Hoeven (Faculty BK), OSP Manager

Open Science Programme office
Frank van der Hoeven (Faculty BK), OSP Manager
Anke Versteeg (Lib), Executive Secretary
Tanya Yankelevich (Lib), Community Engagement Manager
Martha Otte (Faculty 3ME), Secretary support
Annet Zorge, Communication

Open Education
Michiel de Jong (Lib), Project-Lead
Marcell Varkony (Lib), Open Education specialist

Open Access
Just de Leeuwe (Lib), Project Lead

Open Publishing
Frederique Belliard (Lib), Project Lead

FAIR data and FAIR software
Marta Teperek (Lib/ 4TU.ResearchData), Project Lead
Meta Keijzer-de Ruijter (ICT), Project Lead
Aleksandra Wilczynska (Lib), Data Manager
Ashley Cryan (Lib), Data Manager
Jose Carlos Urra Llanusa (ICT), Research Software Engineer
Julie Beardsell (ICT), DCC Coordinator
Manuel Garcia Alvarez (ICT), Research Software Engineer
Maurits Kok (ICT), Research Software Engineer
Niket Agrawal (ICT), Research Software Engineer
Paula Martinez Lavanchy (Lib), Training Lead
Yan Wang (Lib), Disciplinary support for research data

Citizen Science
Tanya Yankelevich (Lib), Project Lead
Marit Bogert (Science Centre)
Nicoleta Nastase (Lib)

Open Hardware
Santosh Ilamparuthi (Faculty EEMCS), Project Lead
Jerry de Vos (Faculty EEMCS), Research Hardware Engineer Fruitful Collaboration
Rianne van den Bogerd (LS), Project Lead
Derya Ada (LS)

Rewarding and Recognition
Evan van der Leur (HR), contact person

Skills
Nicole Will (Lib), Project Lead

Liaison to EB/ SD, vacancy
Liaison to Innovation & Impact Center, Adriaan van Noord
Liaison to Integrity Office, Cath Cotton
Liaison to Communications, Annet Zorge

Open Education Advisory Board
Remon Rooij (Faculty ABE)
Joris Melkert (Faculty AE)
Willem van Valkenburg (Extension School)
Marcus Specht (Faculty EEMCS)
Annoesjka Cabo (Teaching Academy)