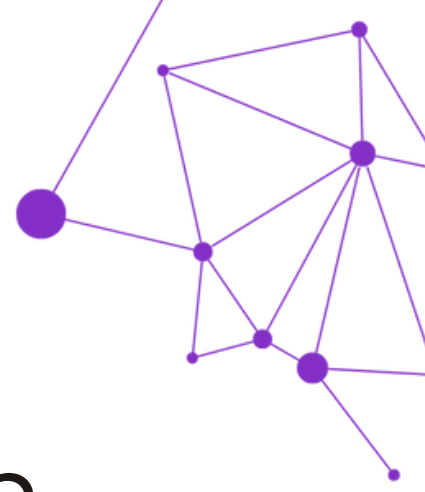May 11 2023 @Hal 5 in Leuven

Imagining the Future of Open Science in Flanders Together

Identifying Priorities in Open Science

Embracing Open Science: A Recap of an Inspiring Day

On May 11 2023, relevant stakeholders gathered in Leuven for the Open Science Network Day to discuss the **priorities of Open Science in Flanders**. Throughout the day, participants engaged themselves in introductory keynotes, interactive discovery sessions, and vibrant brainstorms. They delved into **ten key topics** in Open Science, examining the dreams, priorities, and potential actions surrounding Open Science priorities in Flanders. The outcomes of this day will be utilized as a starting point for a participatory path within the FRDN to formulate an **Open Science vision statement**, in anticipation of an upcoming policy period in Flanders. This booklet serves as a compilation of the highlights, offering a glimpse into the collective wisdom that emerged from our Network Day.

Index

Introduction Event

1. Bring better understanding of Open Science and inspire

2. Define priorities for future Open Science policy

3. Set stages for a strong community

4. Create ownership and advocacy

Contact info

Organizers

The **Flemish Research Data Network (FRDN)** is a network of 36 Flemish research performing organizations that collaborate on Open and FAIR data. This way, it supports individual institutions to implement the Open Science policy of the Flemish government, and to connect with international initiatives, such as the European Open Science Cloud (EOSC). Find more info about the participating institutions and our work on the FRDN [website](#).

Cocreation and collaboration are fundamental elements of the FRDN's vision statement, as evidenced by the involvement of volunteers from various research institutions who collaborated on the event.

We would like to express our sincere appreciation to all the participants, speakers, and organizers who played a vital role in making this event a success. Your contributions are greatly valued.

Introduction Event

Participants

The FRDN Network day reached its full capacity of 120 participants throughout the day. It was a diverse group of Open Science stakeholders from various profiles and affiliated institutes. Participants represented 36 different institutes, 29 of which were associated with the network. Nearly 7 out of 10 participants were actively engaged in Open Science as part of their daily work responsibilities, including roles such as data stewards, policy officers, university library and research coordination staff, research funders, and ICT personnel. Additionally, individuals involved in research, valorization, research funding, government services, and industry were also in attendance.

What is your Level of Expertise in Open Science

Currently, I work as...

- 43,60% OS Support Staff
- 22,80% Other
- 16,80% Researcher
- 16,80% OS Policy Support
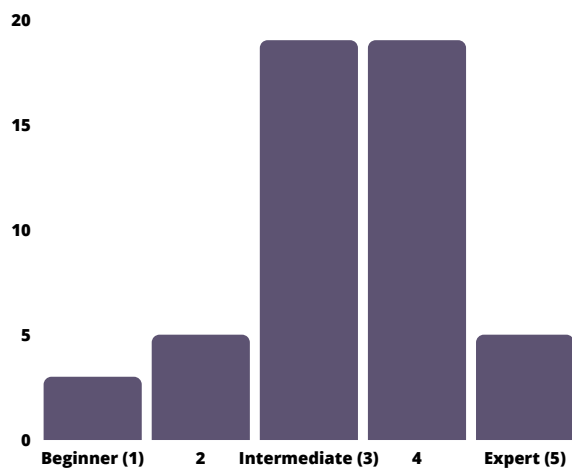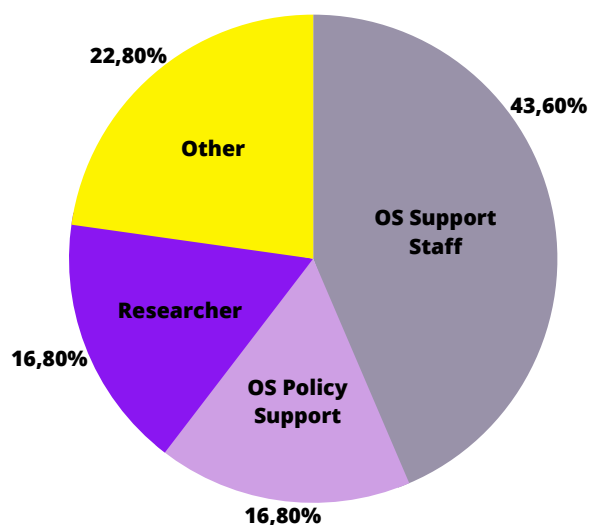
Aspirations of the Day

This booklet embodies the culmination of collective efforts and shared aspirations that unfolded during the Network Day. It represents the vision of our participants, which will be presented to the Flemish government to inform strategic decision-making.

Furthermore, nearly half of the attendees took the time to fill out our evaluation form, providing invaluable insights into how we fared in achieving our goals and how the day resonated with them. The evaluation results, as depicted here and interwoven throughout the booklet, resoundingly demonstrate that this event was not only successful in terms of experience and goal attainment but also in fostering a sense of collective ownership and collaboration, enabling us to build upon the vision of Open Science policy together.

Experience

Our goal was to create an engaging and inspiring experience for all participants. For the past four years, the FRDN has dedicated themselves to advancing the path towards Open and FAIR data. The evaluation form results from over half of the attendees (n=51) unequivocally demonstrated that we successfully fulfilled our overarching objective.

I Learned new things about Different Open Science Topics

5,88%	3,92%	25,49%	49,02%	15,69%

The Discovery Sessions Motivated me to Discuss Specific Topics

3,92%	13,73%	50,98%	31,37%

I engaged in fruiful Discussions about Open Science

9,80%	50,98%	39,22%

I had Networking Opportunities throughout the Day

	13,73%	43,14%	39.22%

1,96%

My vision and/or interest on certain aspects of Open Science changed

3,92%	15,69%	41,18%	29,41%	9,80%

My Overall Experience was Great

	49,02%	49,02%

1,96%

Legend:
- 🟥 Strongly Disagree
- 🟨 Disagree
- ⬜ Neutral
- 🟪 Agree
- 🟪 Strongly Agree

Introduction Event

Goals

We had four specific goals we aimed to accomplish during this event. In the remainder of the booklet, we want to show the reader why we think we accomplished our goals. Doing so, we will guide you through the main experiences and results of the day.

1

We aim to enhance the understanding of Open Science and inspire others.

2

Collectively, we define priorities for future Open Science policies & activities
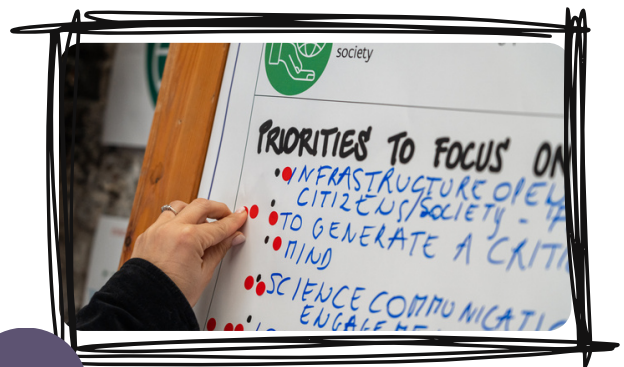
3

We set the stages for a strong network

4

We create ownership and advocacy

Introduction Event

Ten Key Topics

The common thread throughout the day were ten key topics in Open Science. These topics were thoughtfully selected in advance based on exploratory workshops conducted within the working groups of the FRDN. This approach allowed us to ensure that discovery and brainstorming sessions were focused on crucial aspects of Open Science.

1. Human Resources
All researchers are trained "open science" scientists and proper investments have been made in human resources and training
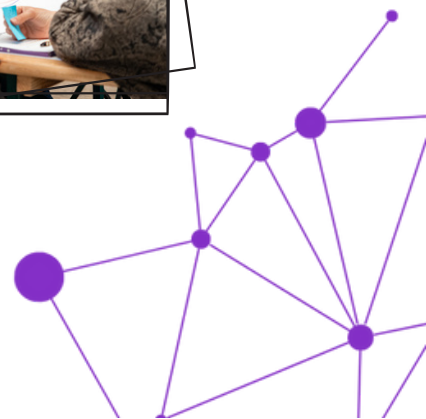
2. Rewards and Incentives
Open Science is recognized in the research reward and funding system

3. Legal Aspects
As open as possible, as closed as necessary is implemented and not only a principle.

4. Infrastructure
Researchers can rely on open and sustainable infrastructure to support Open Science

5. Reuse of Data
Reuse of data is a common practice and has led to scientific and societal innovations

6. Quality of Research
More reproducible and replicable research thanks to Open Science

7. Open Access for Publications
Academia has (re)taken control on the publishing and dissemination of research outputs

8. Societal Role
Open Science has closed the gap between research and society

9. Digital Technology
Digital technologies and Open Science have transformed scientific practices profoundly

10. Change of Mindset
A shared belief in the transformative potential of Open Science has been embraced

Bring Better Understanding of Open Science and inspire

A Place to Discover

Our primary objective of the Open Science Network Day was to bring a better understanding of Open Science and inspire. Following an engaging plenary session, attendees embarked on a personalized discovery journey, exploring five out of the ten presented topics. Each session was thoughtfully designed to provide diverse experiences, including quizzes, videos, and group exercises, aimed at stimulating ideas and encouraging discussions. The overwhelmingly positive feedback received (n=51, 75% agreement) on this segment of the day confirms the success of our endeavor to familiarize participants with the multifaceted nature of Open Science. This outcome reaffirms our commitment to providing an introductory experience that sparks inspiration and generates meaningful dialogue across the various dimensions of Open Science.

Participants Familiarized with the Multifaceted Nature of Open Science

- 5.9%
- 25.5%
- 19.6%
- 49%

Legend:
- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree
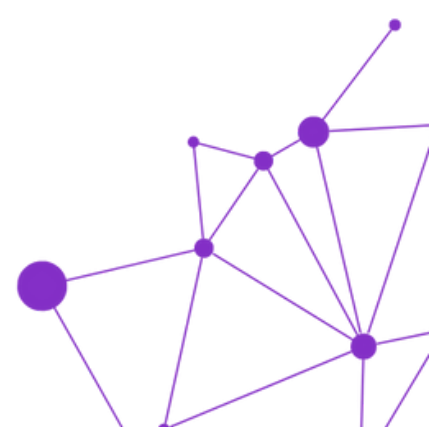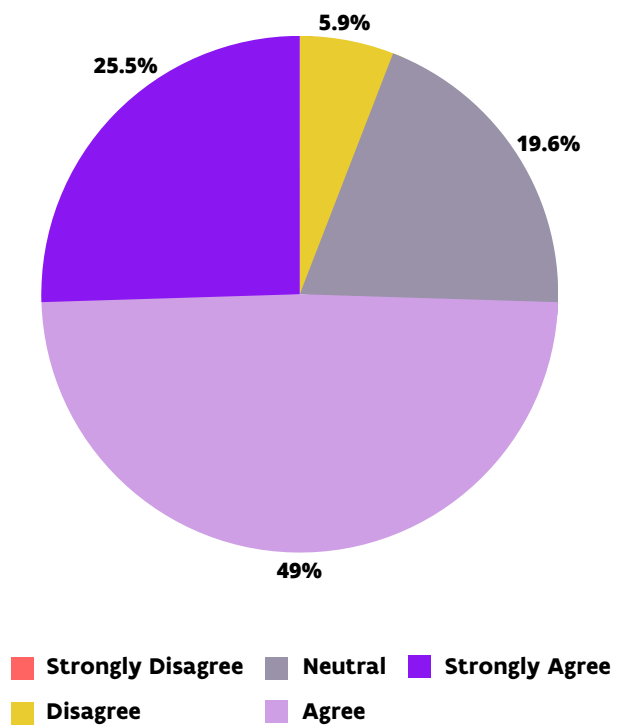
Bring better Understanding of Open Science and Inspire

Impressions

Transport yourself back to the discovery sessions or explore sessions you may have missed during the Network Day. Find the insights and quotes shared by the Discovery hosts as they guided participants through the topics. The materials are accessible on <u>Zenodo</u> via the provided links, and you are encouraged to re-use and share them in adherence to the CC-BY licenses, fostering a culture of knowledge exchange.

1. Human Resources

All skill areas are important for researchers, although some of them might be less relevant in certain disciplines. However, it cannot be expected that researchers become experts in all of these areas. Support, which does not always need to be in the form of training, needs to be available for researchers

2. Rewards and Incentives

To achieve responsible research assessment, we need to look beyond the metrics and need focus on the quality of research. Not by creating more Open Science requirements, but by guiding and rewarding researchers to professionalize themselves in Open Science.

zenodo

zenodo

3. Legal Aspects

The diversity of interpretations of the legal aspects was surprisingly large. Some cases lead to profound discussions, indicating that within the Open Science community there's an advanced understanding and interest in these matters, sometimes resulting from firsthand experience.

zenodo

4. Infrastructure

Choosing a suitable infrastructure for your data can be a (data) lifesaver!
Synergies will open the way to collaborative, durable solutions to find a good and secure home for your data. Through synergies, there will be awareness of the storage landscape and its correct purpose.

zenodo

5. Reuse of Data

Everyone is interested in the concept of data reuse but translating that to action is another matter. Data reuse differs from field to field with some fields unable to share/reuse due to valorization concerns and the full spectrum of data reuse activities and functions is often unknown to researchers. That's one of the reasons why data reuse is often not baked into a project from the get-go.

zenodo

6. Quality of Research

Researchers often feel pressured to oversell their work, which negatively affects reproducibility, replicability and the trust of the general public in science. To improve the quality of research, researchers should be awarded for the transparency of their protocols and accessibility of their data.

zenodo

7. Open Access for Publications

We cannot afford to accept the consequences of reinforcing unequal structures of privilege and power in the academic system by making scholarship accessible for free to readers but prohibitively expensive for writers.

zenodo

8. Societal Role

There still is a lot of untapped potential in connecting open science to citizen science and public engagement. This can open up the process of doing science to citizens and societal actors and increase active collaboration with societal actors and citizens to solve complex societal challenges.

zenodo

9. Digital Technology

Have you ever googled a question and it appears right before your eyes! No digging around the internet to get the answer to a simple pop culture question? What if we could have the same for scientific questions? Millions and millions of raw datasets are available on the World Wide Web. The new challenge emerging is Web-scale data search and discovery with digital technologies and open science can make this possible for scientists and society.

zenodo

10. Change of Mindset

Taking a step back and observing the timeline and evolution of different aspects of Open Science is a good exercise before designing the next step. Peripatetically thinking about the desired next milestone in Open Science worked miracles

zenodo
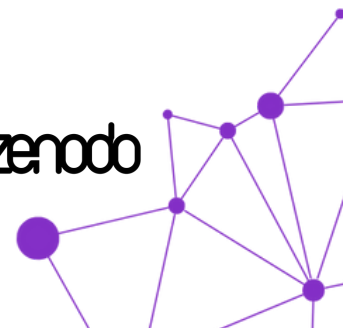
Define Priorities for Future Open Science
Policy

Designing the Future

Through a structured and participatory process of three brainstorm rounds, we have generated a collective output that encompasses essential ingredients, priorities, and actionable steps for ten key topics in Open Science. This comprehensive outcome will be presented to the government for careful consideration and potential implementation. The methodology used on this day effectively facilitated the seamless transition from ideation to practicality, ensuring that the valuable insights and recommendations shared by the participants reach the pertinent authorities for their consideration. These findings are also supported by our attendees.

Relevant Priorities for Open Science were defined

0% 5.9%

25.5%

19.6%

49%

- 🟥 Strongly Disagree
- 🟨 Disagree
- ⬜ Neutral
- 🟪 Agree
- 🟪 Strongly Agree
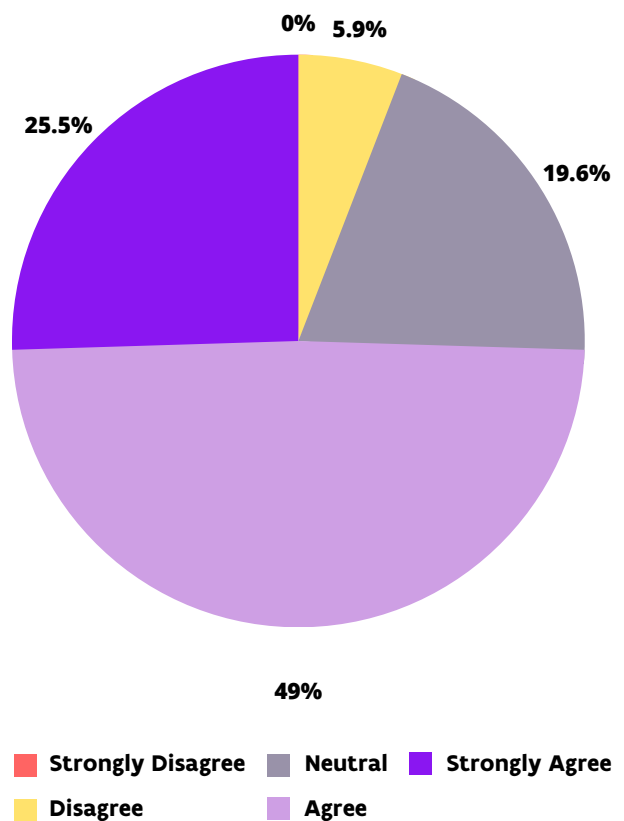
Define Priorities for Future Open Science Policy

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Methodology

</div>

Our methodology for Network Day 2023 consisted of three rounds: DREAM, DESIGN, and DELIVER, where participants were allocated to different topics based on their preferences. In the DREAM round, participants identified ingredients for the topic's future, based on the dream statement and word cloud, while the DESIGN round focused on setting priorities for the next policy period, with participants voting on the top three priorities. The DELIVER round involved parallel brainstorming to create tangible actions plans, and the outcomes were presented by the table hosts to all attendees for collective assessment. The consensus among participants regarding their shared vision was measured by a poll asking the attendees whether they would place a bet on this topic, with the percentage of 'Yes' responses displayed in the temperature measurement.
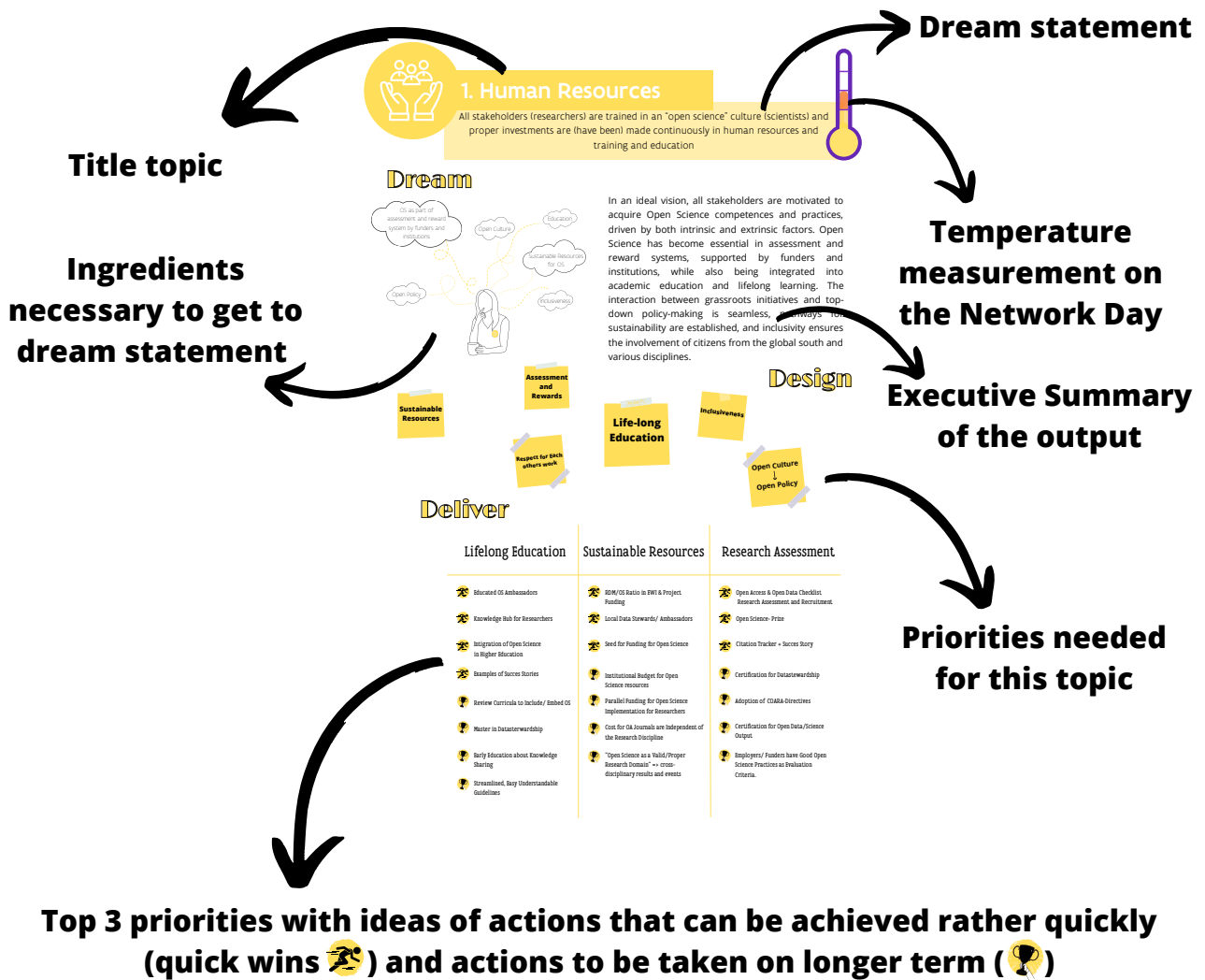
Dream statement

Title topic

Ingredients necessary to get to dream statement

Temperature measurement on the Network Day

Executive Summary of the output

Priorities needed for this topic

Top 3 priorities with ideas of actions that can be achieved rather quickly (quick wins 🏊) and actions to be taken on longer term (🏆)

1. Human Resources

All stakeholders (researchers) are trained in an "open science" culture (scientists) and proper investments are (have been) made continuously in human resources and training and education

79%

Impressions

The table envisions stakeholders who are highly convinced of the benefits of Open Science and are motivated to develop their skills and practices in this area. Researchers play an active role as ambassadors or participating in knowledge exchange communities, contributing to the development of knowledge in Open Science. A significant shift has occurred in the academic culture, integrating Open Science (including citizen science and science communication) into academic education and lifelong on-the-job- trainings for both researchers and research support staff. Certification of OS-related trainings is considered essential for career progression in both research and research support staff, which are both seen as essential parts of the scientific practice. Open Science has now become a crucial element of assessment and reward systems implemented by funding bodies and institutions. The use of Open Science (OS) and Research Data Management (RDM) checklists and follow-up metrics in funding practices serves as tangible evidence that these aspects are integral to the concept of research quality. Dedicated OS funding and OS prizes further incentivizes OS implementation. The collaboration between grassroots initiatives and top-down policy-making is seamless, establishing clear pathways for the sustainability of user-friendly Open Science resources, guidelines, and tools. Efforts have been made to ensure inclusivity by actively involving researchers from the global south and specific research domains in these endeavours.

Dream

OS in assessment and reward systems

Lifelong education

Sustainable resources and tools

Expertise-based policy

Inclusiveness
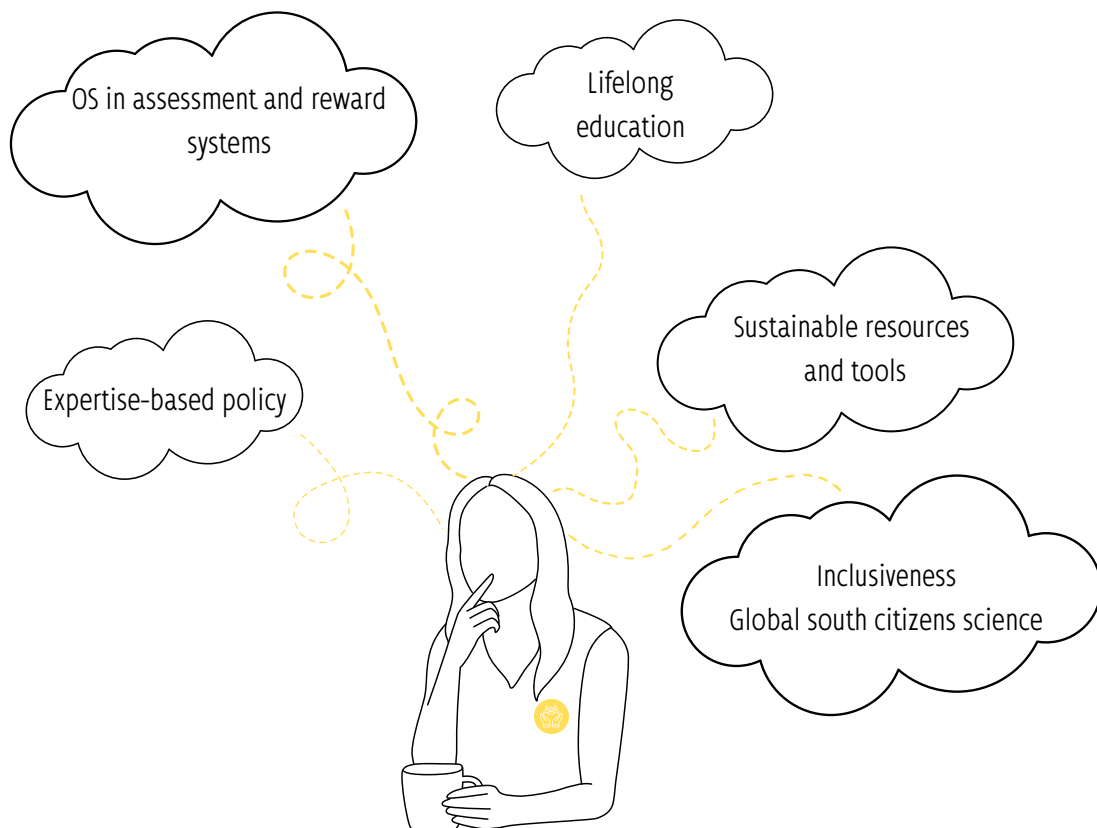Global south citizens science

1. Human Resources

All stakeholders (researchers) are trained in an "open science" culture (scientists) and proper investments are (have been) made continuously in human resources and training and education

Design

PRIORITY
Sustainable resources

Respect for each others work

PRIORITY
Assessment and rewards

PRIORITY
Lifelong Education

Inclusiveness

Open culture
↓
Open policy

Deliver

Lifelong Education	Sustainable Resources	Research Assessment
OS ambassadors from the scientific field	RDM/OS ratio in EWI & project funding	OA & Open Data checklists in research assessment and recruitment
OS community for researchers	Local data stewards/ ambassadors	Open Science- Prize
Integration of OS in higher education	Seed funding for Open Science	Citation tracker + success story
Examples of OS success stories	Institutional budget for Open science resources	Certification for datastewardship
Review academic curricula to embed OS	Parallel funding for OS Implementation for researchers	Adoption of COARA-directives
Master in data sterwardship	Cost for OA Journals to be independent of the Research Discipline	Good open science practices as a evaluation criteria
Benefits of sharing research outputs early in curricula	OS as a valid/proper research domain" => cross- disciplinary results and events	
Streamlined, easy understandable guidelines		

2. Rewards and incentives

Open Science is recognized in the research reward and funding system

67%

Impressions

To promote widespread adoption of Open Science, an incentivization framework must reward and recognize researchers accordingly. Recognizing Open Science involves acknowledging researchers' commitment to openness and FAIR principles. Funders play a crucial role in motivating researchers to embrace Open Science practices. For this, Open Science requirements should have legal foundations in order to be able to follow through upon funders' Open Science requirements. Evaluation schemes should incorporate elements such as "FAIRification," the quality and societal relevance of various research outputs, supported by responsible metrics. Moreover, the recognition of Open Science efforts can be further enhanced through the allocation of dedicated Open Science funds and the establishment of Open Science prizes. These initiatives contribute to elevating the prestige associated with researchers' endeavours in the realm of Open Science. Coaching and training programs can serve as valuable certifications for researchers' proficiency in Open Science, which can be considered during their assessment. It is important to establish clear and uniform competence matrices that form the foundation of this recognition system, ensuring inclusivity for researchers from diverse disciplines and research institutes. The revamped rewarding system must prioritize inclusivity, accommodating researchers from diverse backgrounds and disciplines. It is essential to provide researchers with both time and adequate resources to uphold research integrity, quality, and impact. Therefore, it is imperative to offer sufficient support to all research institutes, facilitating a smooth transition and ensuring equal participation for all researchers in embracing Open Science.

Dream

Qualitative OS requirements and dedicated funding

OS competences and skills

Impact of research output

Certified OS coaching

Responsible OS metrics

Inclusiveness of different types of researchers and research institutes

2. Rewards and incentives

Open Science is recognized in the research reward and funding system

Design

Better metrics

Focus on quality and impact for society `PRIORITY`

Grants specifically for working with reused data

OS requirements have consequences in funding

Participation of all institutions in policy making `PRIORITY`

Uniform competence matrix `PRIORITY`

Deliver

Focus on quality and impact for society	Participation of all institutions in policy making	Uniform competence matrix
Allow for narratives about research's impact in evaluation and value this in evaluation	OS prizes	Substantial funding for all research institutions
Development of quantitative indicators which take into account different forms of Impact (scientific and societal)	Give researcher time for OS	Dedicated funding for data reuse available for all research institutions
	Minimal OS training counts as a competence	Also include collections
	Start with simple competence matrix with existing competences (ORCID, DMP, Open metadata,...)	More collaboration- mutual learning between universities and other research institutions
	Assess long-term impact of research output	More stability in supporting personal and focus on collection
	uniform competence matrix in Flanders/EU/international	Acknowledge more institutions than universities to be able to contribute to OS
	OS protected by law	

3. Legal Aspects

As open as possible, as closed as necessary is implemented and not only a principle.

87%
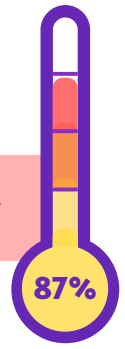
Impressions

The primary focus of attention at this table was the pressing need to simplify, harmonize, and clarify the disparate legislation associated with (Open) Science practices. Throughout the three rounds, participants collaboratively generated an impressive array of tools that could be made available to researchers. Facilitating information exchange among research institutes could prove highly effective. In an ideal future scenario, research institutes would successfully streamline back-office processes, leading to a significant reduction in the workload and stress experienced by researchers, potentially even allowing for automation of certain processes. Participants also highlighted the importance of robust infrastructure to comply with legislation. They prioritized the implementation of technologies that empower researchers to have control over their own data (participants expressed enthusiasm for the further implementation of SOLID), enabling improved data sovereignty and better follow-up of the adherence to legislative requirements in practice. Finally, a clear Flemish/Belgian stance should be developed not only to strengthen the own national legislation, but also to propagate the position at the European level for less contradictory and more concrete legislation. Challenges were described to be specifically related to 1) establishing a legal framework to support open science and information policies while ensuring compatibility with various business models, 2) a call for greater clarity in licensing, and 3) the development of a research-friendly version of GDPR (GDPR 2.0).

Dream
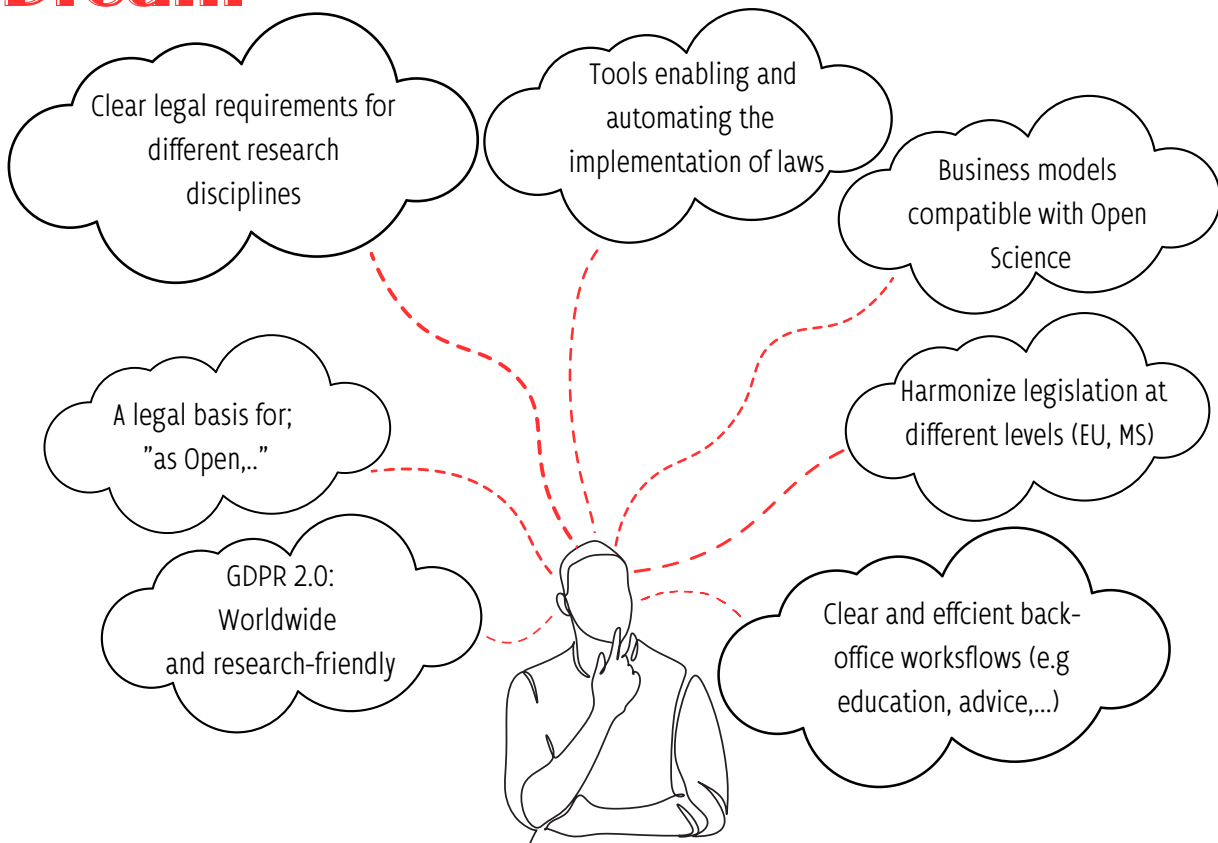
Clear legal requirements for different research disciplines

Tools enabling and automating the implementation of laws

Business models compatible with Open Science

A legal basis for; "as Open,.."

Harmonize legislation at different levels (EU, MS)

GDPR 2.0: Worldwide and research-friendly

Clear and effcient back-office worksflows (e.g education, advice,...)

3. Legal Aspects

As open as possible, as closed as necessary is implemented and not only a principle.

Design

Clear legal framework for public-private collaboration

Standardized forms & templates on legal procedures

Taskforce with mixed expertise /disciplines in Flemish governement

PRIORITY
Legal toolbox

PRIORITY
Solid-pods

Licence checker tool with compability analysis

PRIORITY
Harmonization EU / member states /BE / VL

Deliver

Legal toolbox	Harmonization EU/ memberstates/ BE/ VL	Researchers' personal data pod (solid)
Sharing institutional information at least at Flemish/ Belgian level	GDPR guidlines- help for researchers, take away the GDPR fear	Makin existing databases solid and Compatible
workflows on data storage/ data sharing	Comparison tool for legislation related to OS f.e. chose license organisation	Move data together with Researchers
Consensus statement about dataprocessing (f.e. in ICF)	Stronger regulation requirements for publicly funded research (top down)	Make rights-related metadata machine readable (including licences)
Clear and findable information on Licenses	Ready to use legislative OS package for EU member states	Align access to content based on the legal system (f.e. EU researcher in US wants Access)
Identifying trusted repositories for sensitive data		Define ways to legal rights
What is highly unique?- guidelines		
Benefits of sharing research outputs early in curricula		
Align assessments by ethic committees		

4. Infrastructure

Researchers can rely and actively use open interconnected, smart, easy, secure and sustainable infrastructure to support Open Science

87%

Impressions

To maximize seamless exchange of research outputs between researchers of diverse research institutions, future infrastructure should maximize user-friendly workflows, ensure interconnectedness, and enable FAIRness of the research outputs. The infrastructure should cater effortlessly to the needs of researchers and their institutions. Smart workflows should guide researchers throughout the research data life cycle. Participants highlight current challenges, particularly in developing secure and long-term preservation solutions. Flemish research institutions are actively pursuing international connectivity and readiness for the European Open Science Cloud (EOSC). To ensure optimal visibility for Flemish researchers, clear pathways for Flemish research data to integrate with EOSC and other domain-specific dataspaces should be established. Achieving true FAIRness of research data remains a significant undertaking that requires substantial international efforts. Participants prioritized efforts in findability and interoperability. There is a growing awareness of the necessity for (inter)national strategies regarding persistent identifiers and open standards, leading to increased participation in interoperability pilots and the establishment of ontologies and standards. Many participants acknowledge the potential of web standardization and automation technology, such as Linked Open Data, in accelerating the findability of research outputs. Researchers should receive adequate support in identifying sustainable, ethical and trustworthy data repositories. Smart business intelligence plays a pivotal role in demonstrating the value of the infrastructure. In exchange for long-term funding perspectives, research institutions can share knowledge and pool resources, fostering collaboration and ensuring the sustainability of the infrastructure.

Dream

Decentralisation - standardisation for Interoperability

Sustainable, long-term funding

Demonstrating the value of the infrastructure

User-friendly

Smart workflows

Training and knowledge exchange and collaboration

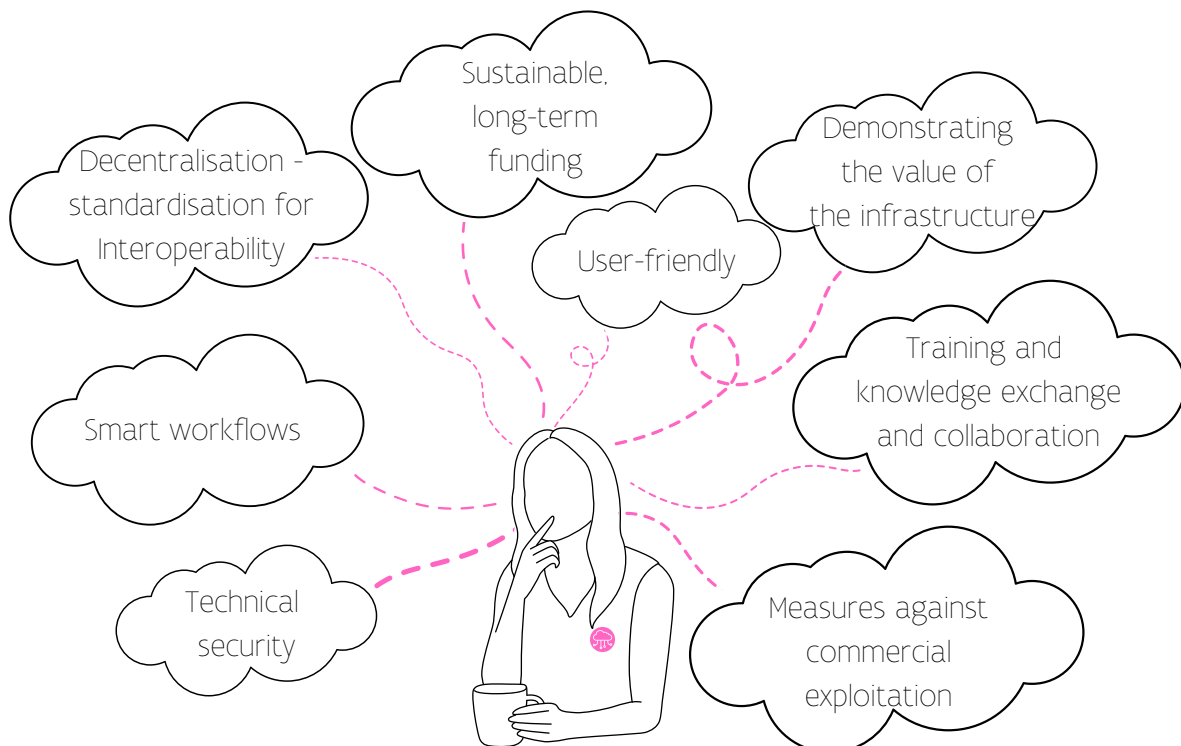Technical security

Measures against commercial exploitation

4. Infrastructure

Researchers can rely and actively use open interconnected, smart, easy, secure and sustainable infrastructure to support Open Science

Design

Technical components + long-term preservation

Security

PRIORITY
Vision on financial sustainability + demonstrable value

PRIORITY
Interconnected & interoperable

PRIORITY
Easy, user-friendly with smart workflows

FAIR, ethical, trustworthy
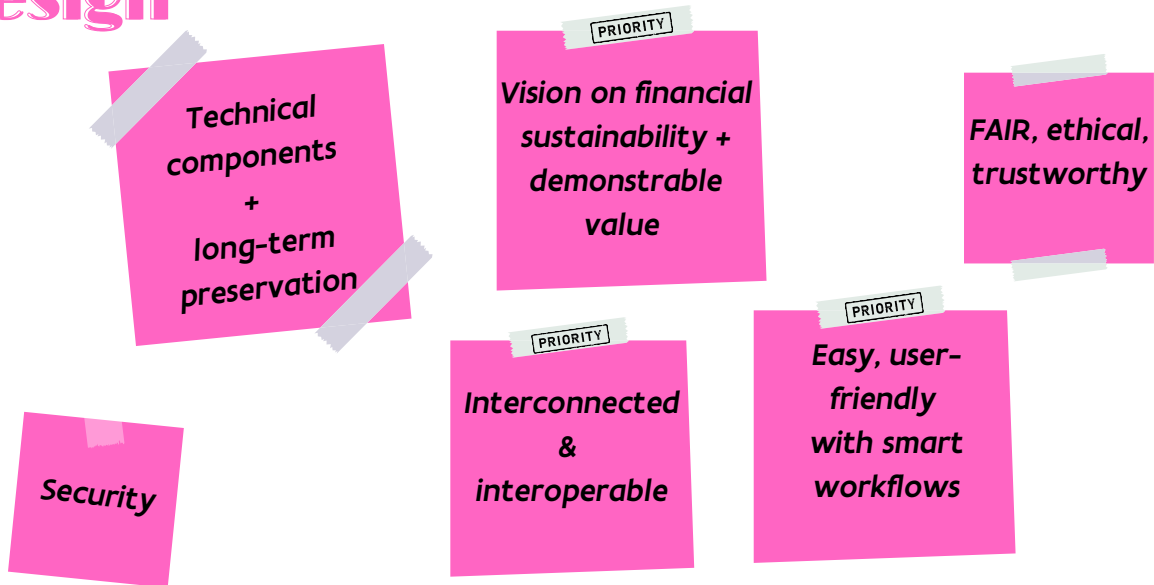
Deliver

Interconnected and Interoperable	Easy, user-friendly & smart workflows	Vision, financial sustainability & Value
Interoperability pilots	(Domain-specific) infrastructure guide throughout the research data lifecycle	Extend current finding
Persistent Identifier (PID) strategy	User-friendly workflows to ensure the discoverability of research outcomes	Collaboration between research institutions
Open standards for data storage	Linked open data for all research outcomes	Demonstrate the value of the infrastructure
Pathways to EOSC for Flemish Data		Structural funding for OS infrastructure

5. Reuse of Data

Reuse of digitized research output is a common practice and has increased the efficiency and productivity of science to produce scientific and societal innovations

64%
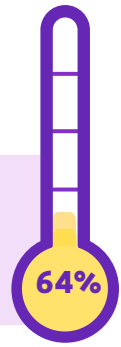
Impressions

Reuse of digitized research output has the potential to increase the reproducibility and efficiency of science substantially. However, achieving this requires a cultural shift wherein funding and recognition are provided for the provision and reuse of qualitative datasets in research careers. Dataset tracking devices and quality labels are necessary to enable the recognition of data-use. To facilitate this process, researchers should be supported by experts (data stewards, data curators,...) as well as trustworthy automated services to discover and prepare datasets. Additionally, training and awareness-raising for the advantages of RDM at early stages of the research as well as of the use of domain-specific databases, ontologies, and tools is crucial in advancing the reuse of data. Further investment in data stewards, data curators and RDM software developers with this expertise is crucial to provide adequate support for researchers. Research institutions should collaborate to train people in these relatively new fields of expertise. To propel the reuse of data into the realm of automated analytics and foster cross-disciplinary innovative insights, it is imperative to implement profound standardization, link research outputs, and provide structured read-me files for (automated) connections between datasets.

Dream

Linked Open Data - vocabularies and ontologies

Increased reproducability and efficiency of research

Incentives for reuse and provenance

Cultural shift

Computer-assisted data preparation & discovery of datasets

Trustworthy automated processes: only once

5. Reuse of Data

Reuse of digitized research output is a common practice and has increased the efficiency and productivity of science to produce scientific and societal innovations

Design

PRIORITY

Funding

Semantic frameworks (controlled vocabularies & ontologies) are globally recognised & used + easy accessible

PRIORITY

Support tools for researchers

Conventions on go-to infrastructure

PRIORITY

Measuring reuse

Data quality

Deliver

Support tools for researchers	Funding and incentives	Measuring reuse
Implement research data management course on a master level	Collaboration between research institutes instead of individual efforts	Define reuse
Standardized read-me file and guidlines	Fund initiatives to stimulate reuse-seperate funds for reuse.	Define use cases- who reuses what and why (academic versus non-academic)
Researchers should know why they document their data for reuse	Recognition for sharing/reusing data	Make datasets PIDs mandatory
Metadata-base for discoverability	Extra funding for datastewards and curators	Decide who registers data-(re)use
Competence center to support researchers-embedded in faculties	Quality check of reuse	Decide how to measure
Dedicated and domain specific training and guidelines on the use of controlled vocabularies, standard and documentation+ good examples		

Impressions

Transparency and FAIR research practices are vital for ensuring high-quality research. Making research output (data, protocols, codes,etc.) "FAIR" is crucial to ensure reproducibility. Furthermore, innovative platforms (e.g. with AI-driven search engines) can facilitate cross-disciplinary data integration and enhance scientific advancements. Data standards and data quality checks are needed for effective interlinking. Researchers should further invest in developing cross-disciplinary vocabularies and readable formats. It is imperative that "good research output management practices" become considered to be at the heart of quality in science. Research evaluation should incorporate these practices in its schemes. To support transparency and FAIRness of research, sustainable funding for infrastructure is needed, including supporting tools and staff. Shifting from individual or small-group research to mixed teams, with researchers focusing on their areas of expertise while being guided by RDM experts throughout the research life cycle, is worth considering.

Dream

Positive effects of transparent and FAIR research for society and science (f.e. reproducibility-)

User-friendly platforms and tools in combination with support staff to enable researches to reach high quality research

Good Data Management practices

Teamwork between researchers and support staff

Train evaluators on valuing transparency and FAIRness

Cross-Disciplinary and Innovative Platforms (AI search Engines for More representative datasets/studies

6. Quality of Data

Research is reproducible and replicable

Design

PRIORITY
Data quality check

Clear communication channels between support and researchers

Training & Advocacy

Research Assessment & giving enough time

PRIORITY
Mandating FAIR

PRIORITY
Sustainable funding for infrastructure

Joint co-designed infrastructure

Other forms of publishing conform transparency : publish null results, preregistration,...

Deliver

Mandating FAIR	Data quality check	Funding sustainable infrastructure
FAIR-compliant domain-specific repositories (create when necessary)	Incentives for publishing data papers	Sharing best practices (local, institutional,...) on infrastructure solutions
"Reproducibility box" for reviewers of papers to reproduce results	Simplify and incentivise the use of open data formats and data standards and educate researchers	More opportunities/attention for diversity of institutions (size, speciality,...) in OS infrastructural projects
"FAIR Lab" certification for research labs		Make datasets PIDs mandatory

7. Open Access for Publications

The research community should aim at universal accessibility to knowledge and reclaim control over open access publishing. Collective steps should be taken to guarantee fair pricing while fostering bibliodiversity and rewarding innovation in scholarly communication.

92%

Impressions

The research community should strive for universal accessibility to knowledge. Ideally, academia regains authority over the publishing process and promotes bibliodiversity by facilitating a broader range of publication types and platforms that endorse the idea of open research. To achieve this, various obstacles must be overcome. Financial sustainability of Open Access and the high cost of Article Processing Charges (APCs) are major concerns for the research community. It is important for the academic system, including funders, to exert pressure to ensure that APCs reflect the actual production costs (FAIR). Collective initiatives must guarantee Green and Diamond Open Access alternatives. Sustainable, community-led innovative open publication platforms deserve encouragement and support, a supply that must encompass all publishing forms, including monographs. The establishment of a resolute and unambiguous Belgian/Flemish stance is crucial in facilitating this transformative shift, accompanied by proactive endeavors to garner international backing. An essential element of this change entails the adoption of alternative evaluation criteria that minimize reliance on journal impact factors, but alternatively encourage reproducibility and foster debate through Open Peer Review. It is vital for funder requirements to be transparent, consistent, and conducive to the sustainability of the publication system. Furthermore, it is essential for the Belgian/Flemish stance to provide empowerment to researchers, strengthening their intellectual property rights in research output and promoting awareness of copyright retention. To accomplish these goals, expanding the scope of the Belgian Open Access legislation is instrumental, encompassing a broader array of research outputs and granting authors full rights over their accepted manuscripts. By extending the legislation's coverage, a more comprehensive and inclusive Open Access framework can be established, enabling researchers to freely and openly share their findings through various scholarly communication channels. These efforts should align with international initiatives aimed at harmonizing secondary publishing rights.

Dream

FAIR & Capped APC and clear rules for grants

FAIR Assessment - alternatives for impact factor

Innovative Publication Platforms f.e. open peer review

Bibliodiversity

Green route - full rights on accepted manuscripts

Researchers own the publication process

Together for Diamond Route
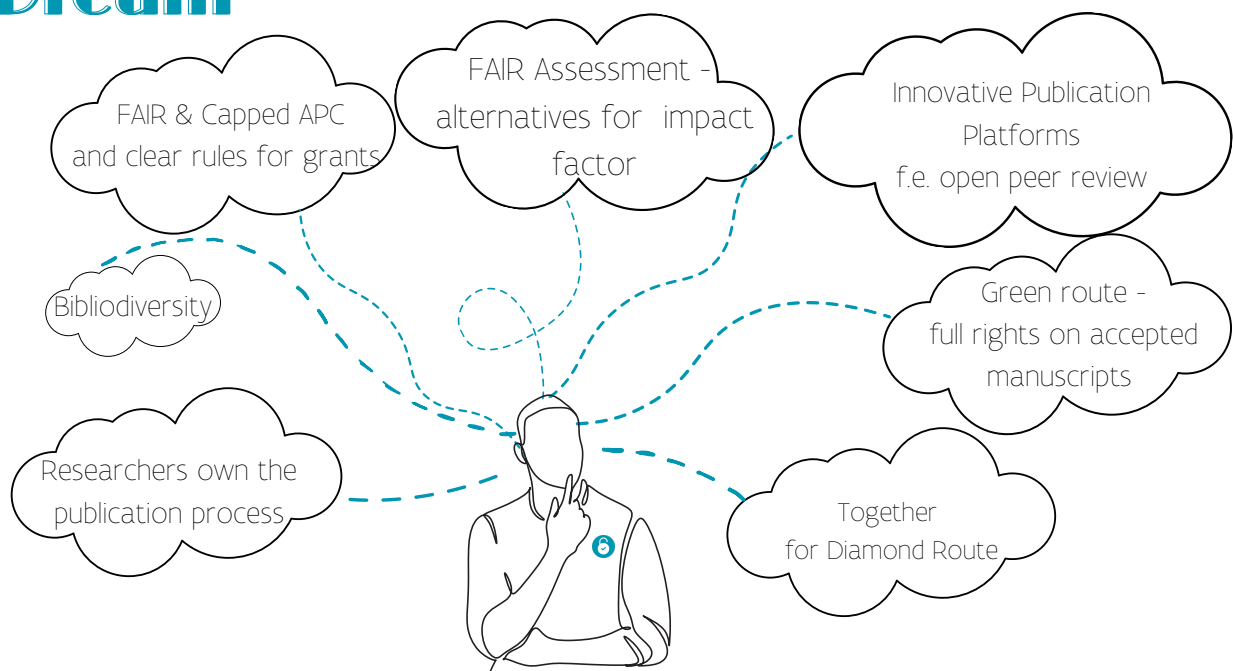
7. Open Access for Publications

The research community should aim at universal accessibility to knowledge and reclaim control over open access publishing. Collective steps should be taken to guarantee fair pricing while fostering bibliodiversity and rewarding innovation in scholarly communication.

Design

PRIORITY

Advance together for affordability 'FAIR' Open access

PRIORITY

Make research evaluation Open Access compatible

PRIORITY

Strenghten ownership of researchers output

Harmonize Open Access Policies

Open Infrastructure

Deliver

Strenghten ownership of researchers

- Promote copyright awareness to prevent researchers from transferring publishing rights
- suppoirt researchers in their negotiations with publishers
- Harmonization of the secondary publishing right (EU-level)
- Funds for new FAIR/non-profit journals/platforms
- Empower open community-led sustainable infrastructures through collaborative actions
- Broaden the scope of the Belgian OA law to ensure right retention on the authors' accepted manuscript.

Make research evaluation more compatible with OA

- Avoid improper use of impact factors-evaluate based on article-based metrics with attention for qualitative evaluation
- include social outreach and altmetrics
- Recognize publishing in sustainable innovative publication platforms endorsed by the research community
- Promote reproducibility, f.e. publishing negative results => important for reuse
- Fostering quality of research f.e. Incentivize debate by rewarding Open Peer review
- Foster bibliodiversity by recognizing publishing in diverse forms and languages.

Together towards FAIR OA

- Inform researchers on FAIR oa
- Criteria for FAIR journals in terms of APC, defined by funders and institutes
- Work at international level (European level)
- Collaborate to enhance Diamond and FAIR Open Access initiatives.

8. Societal Role

'Open Science' has closed the gap between Science/researchers and society/societal stakeholders

64%
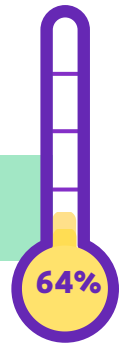
Impressions

In this ideal scenario, academia undergoes a profound paradigm shift, intensifying the uptake of its societal role. When effectively implemented, citizen participation in science, including co-creation with societal actors throughout the scientific process, is highly valued. Scientific methodology and critical thinking tools should be fundamental components of educational curricula from an early age. It is imperative for academia to prioritize the development of open educational materials that incorporate scientific evidence and actively engage in the daily teaching practices of schools. This uptake should extend beyond education to encompass societal debates and politics. Research findings and knowledge should be widely disseminated to diverse audiences, fostering cross-disciplinary discussions, evidence-based policymaking, and promoting scientific literacy and critical thinking in society. To facilitate this, infrastructure should be in place to ensure high-quality standards and to enable citizens to find and access scientific knowledge easily, get access to scientific data and apply analytical tools on it. Funding agencies should adapt to this intensified societal role of academia. They should incorporate the aforementioned aspects into the granting criteria and evaluation schemes of regular scientific programs, while also providing additional funding opportunities dedicated to achieving this objective. A critical element in assuming this societal role is for the scientific community to wholeheartedly embrace equity principles, guaranteeing access for all individuals regardless of their location, nationality, socio-economic circumstances, and other factors.

Dream

Involving citizens (incl co-creation) = common practice

Fund science communication adapted to diverse audiences

Datasharing, incl. Industrial Data

Public cross-disciplinary debates and evidence-based policy

Equity

Change of Mindset - Interaction with society

Critical thinking

FAIR data for citizens

'Open Science' has closed the gap between Science/researchers and society/societal stakeholders

Design

Data quality in Citizen Science

Visibility of Citizen Science

PRIORITY

Lower participation-barriers in science & Improve equity

PRIORITY

Generating a critical mind

PRIORITY

Infrastructure to open up knowledge to society

Science communication & engagement
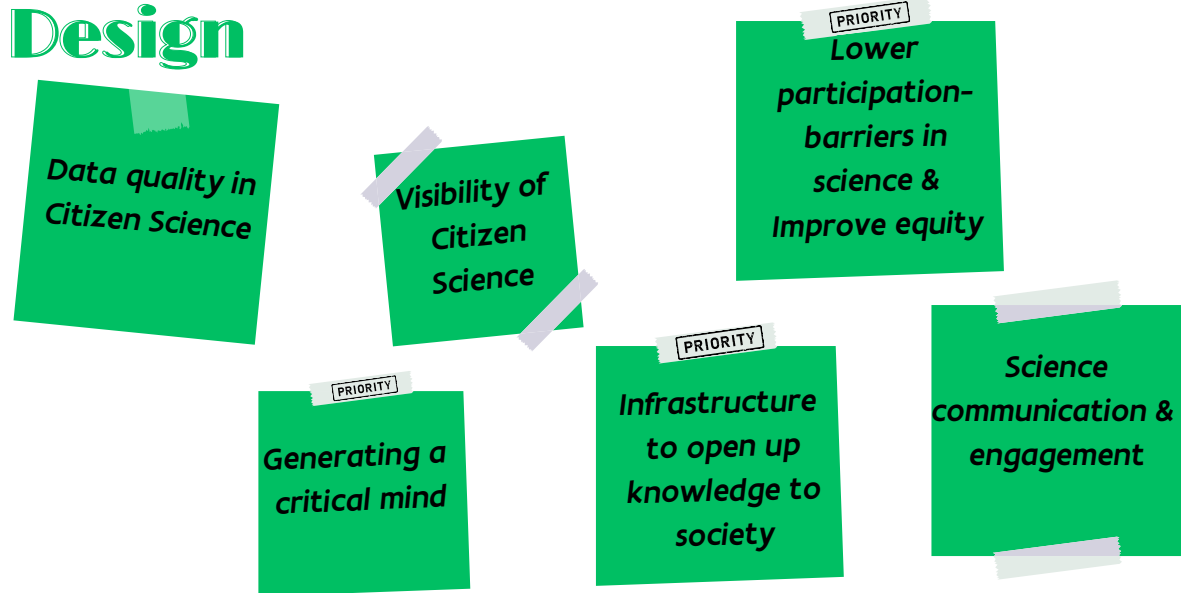
Deliver

Lower participation-barriers in science	Infrastucture open to society.	Generating a critical mind
Open educational resources about science, f.e. working with real research data, understanding scientific methodlogy, STEM	Flemish strategy-based data collection f.e mobility	Teach the hierarchy of evidence to everyone
Dedicated project calls for making this material	Integrated 1-stop shop for data publication and other deliverables encompassing all sources	Teach the people about political biases of media & make this structural (funding, information in app,...)
Civil society organisations as key partners	integrated metadata knowledge web.	Professionalize scientist appearing in media (attractiveness, protection for speaking out,..)
Gather material on a learning platform		Science communication that shows the process of doing science with failures too
Teach the scientific-skill "methodology" more broadly	Chat GPT bot only trained on scientific output, stemming from integrated metadata knowledge web	Integrate critical thinking and research methodology in seperate subjects in regular (early) education

Pub Data Person Orcid Code

61%

Impressions

The digital table underlines the importance of the original EOSC dream: a scientific world where the dream of full interoperability has been realized. A FAIR (de)centralized infrastructure enables trustworthy, qualitative and innovative searches on interconnected, transparent and reproducible research output. Centralized infrastructures complement this by fulfilling the archiving function for the actual research outcomes. For this dream to become reality, standardization of (meta)data has to become a reality, supported by an international ecosystem of Persistent Identifiers (PIDs) that automatically generates parts of the metadata for the researchers' convenience. Data is seamlessly connected through a sophisticated knowledge graph fueled by scientific ontologies. A trustworthy AI-supported search engine facilitates efficient retrieval of research output and knowledge. Moreover, an integrated system of interlinked services supports researchers throughout the research data lifecycle. Participants point at the biggest challenge for this system, to guarantee privacy and ownership for personal sensitive data without jeopardizing exchange and interoperability. Therefore, special attention should be given to innovative systems that securely handle this type of data in order to plug it in the web of interlinked data. To position Flanders as a leading player in the European EOSC dream, it has been proposed to establish an Open Science foundation (cfr. open source foundation) that acts as a legal entity capable of receiving international grants for Open Science development projects. In addition, the foundation would provide common goals and guidance to these projects in terms of implementation, governance, and outreach of their Open Science services. A community of interactive knowledge exchange is crucial and a platform for events, documentation, trustworthy (AI/UX,...) tools and the practical translation to scientific practice is still necessary. Different communities should grow based on level and area of expertise.

Dream

- Research data lifecycle workflow automation
- Linked integrated tool selection, build on good practices and based upon trusted and qualitative data
- Training and education => see the benefits of sharing
- Common goals are the drivers for collaboration
- Qualitative and trusted AI in data life cycle
- Smart use of existing op source software
- FAIR Linked data (Standardization, ontologies,....
- New User Interfaces (VR, smart search engines,...
- Infrastructure: ecosystems of centralized and decentralized systems

9. Digital Technologies

Digital technologies and Open Science have transformed scientific practices profoundly

Design

PRIORITY

Self-agile Governance

Standardisation

Automation of processes

PRIORITY

Community – Interactive Knowledge Exchange

PRIORITY

Research Insight Graph

Proof of Trust Provenance, Transparency and Tracability
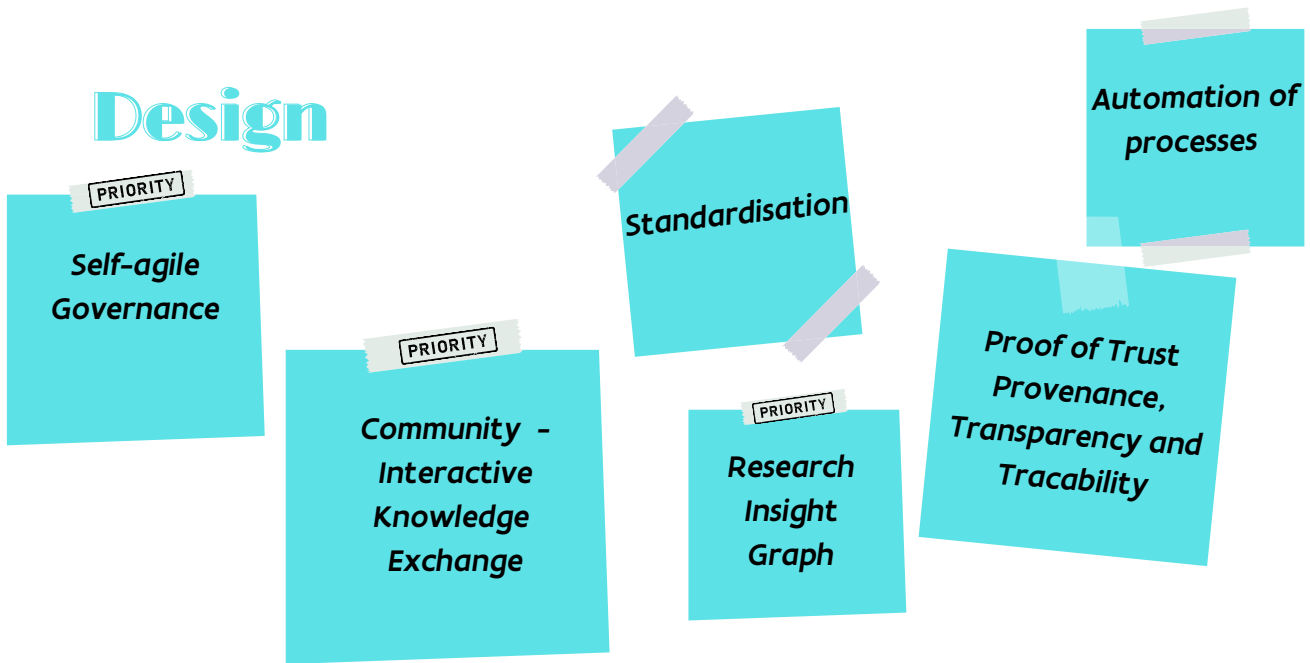
Deliver

Self-agile governance	Research Insight graph	Community Knowledge exchange
Overwiew governance models that are implementable for digital infrastructure (selection tool, use case examples, blue prints,...)	Every download generates a DOI or PID	Platform to announce OS knowledge exchange events participation on request
Open Science foundation, new user interfaces (VR, smart search engines,..): • Mother organisation for Open Science projects • Legal entity for projects • Guidance about governance and outreach/ community engagement • Customizable pre-designed process	PID strategy: use of ¨PIDS to complete and automise the link between researchers, funders, research institutes and projects	Documentation & Open Science communication/ practical translation to scientific practice
	Chat AI data provenance/ data downloadable	Differentiation in community of different "FRDN"- circles • Early/mid/expert level • Open Science expertise => growth path
		PID strategy: use of PIDS to complete and automise the link between researchers, funders, research institutes and projects

10. Change of Mindset

OS is the norm: a shared belief in the transformative potential of Open Science has been put in practice

82%

Impressions

In the ideal future, Open Science will be the norm in the scientific community, fostering a closer connection between science and society to raise trust in science. A shared belief in the transformative potential of Open Science has been put in practice.

A driving factor behind this shift is the significant changes in the reward systems employed by research institutions and funding agencies, using Open Science criteria to measure success and dedicating funding towards accelerating the development and adoption of open science practices.

The widespread acceptance of OS has been facilitated by aligning systems, procedures and infrastructure within institutions and, when necessary, across different institutions.

Comprehensive support, educational tracks and training building on good existing examples and knowledge make researchers and research support staff proficient in Open Science practices. OS expertise is valued and recognized among all actors and these ambassadors of open science complement top-down facilitators.

The Flemish government should continue investing in research-supporting infrastructure and training for researchers and support staff. Building on a robust Flemish metadata ecosystem and an onboarding strategy to the European Open Science Cloud (EOSC) is paramount. Further investments should be made in optimizing research management services with smart and automated workflows. These initiatives will further strengthen the Open Science landscape and contribute to the advancement of research in Flanders.

Dream
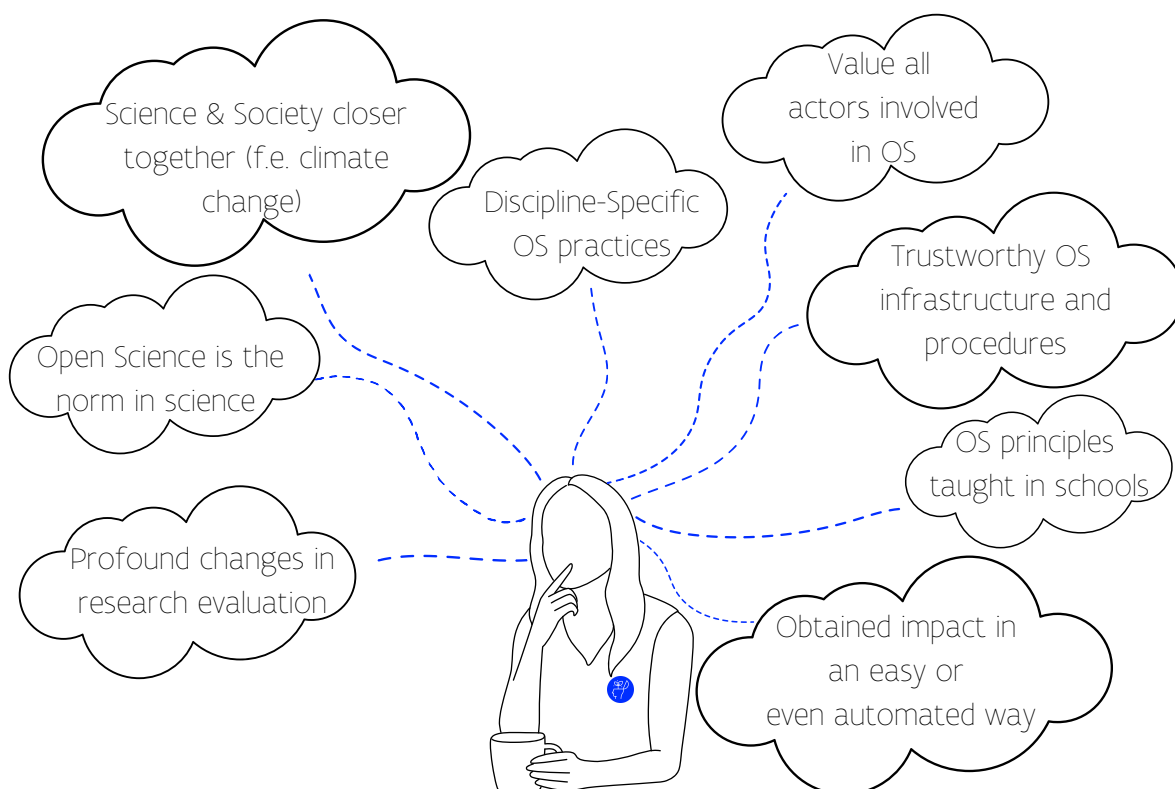
- Science & Society closer together (f.e. climate change)
- Value all actors involved in OS
- Discipline-Specific OS practices
- Open Science is the norm in science
- Trustworthy OS infrastructure and procedures
- OS principles taught in schools
- Profound changes in research evaluation
- Obtained impact in an easy or even automated way

10. Change of Mindset

OS is the norm: a shared belief in the transformative potential of Open Science has been put in practice

Design

PRIORITY
Aligned systems, procedures & infrastructure for OS

Long-term OS policies & Funding at organizational level

Involve citizens

PRIORITY
Sustained education, support and training

Bottom-up ambassadors

PRIORITY
Dedicated OS funding for projects & organisations

Learn and build from good examples

PRIORITY
Rewarding OS practices in Institutes, proposals,..

Deliver

Dedicated OS funding	Aligned Systems Procedures & Infrastructure	Sustain Support Education & Training	Rewarding OS Practices
Open Science accelerator grant	More governement investment in research supporting infrastructure	Incorporate OS practices and data management in courses of regular education	Gamification: visual rewards such as OS check boxes in applications and at the time of grant or a PhD submission
Budget to maintain the network	Further develop Flemish standards metadata (FRIS)	"Sharing is caring" mindset change	Annual OS price
Budget for train the trainer programs for bottom-up ambassadors	Onboarding in EOSC	Centralized platform to share knowledge and training resources	OS or FAIR data record as prerequiste for research funding
OS criteria in regular funding programs	Research management services unified & automated (beyond unified help desk)	Training events for researchers and trainers on the FAIR in OS	
OS is the default option in regular funding programs			
Budget for structural OS training programs supporting young researchers /doctoral & schools			

All quick wins also apply to senior researchers!

Fostering a Thriving Open Science Community

A Vibrant Convergence of Diverse Minds

On May 11, 2023, a diverse group of individuals with a shared passion for Open Science convened at the Open Science Network Day to discuss the priorities of Flanders. The event was marked by meaningful discussions, collaborations, and a collective commitment to the principles of Open Science. The day proved to be a successful gathering of like-minded individuals dedicated to advancing the field of Open Science

The Day was important to build an Open Science Community in Flanders

- 3,92%
- 47,02%
- 49,02%

- 🟥 Strongly Disagree
- ⬜ Neutral
- 🟪 Strongly Agree
- 🟨 Disagree
- 🟪 Agree
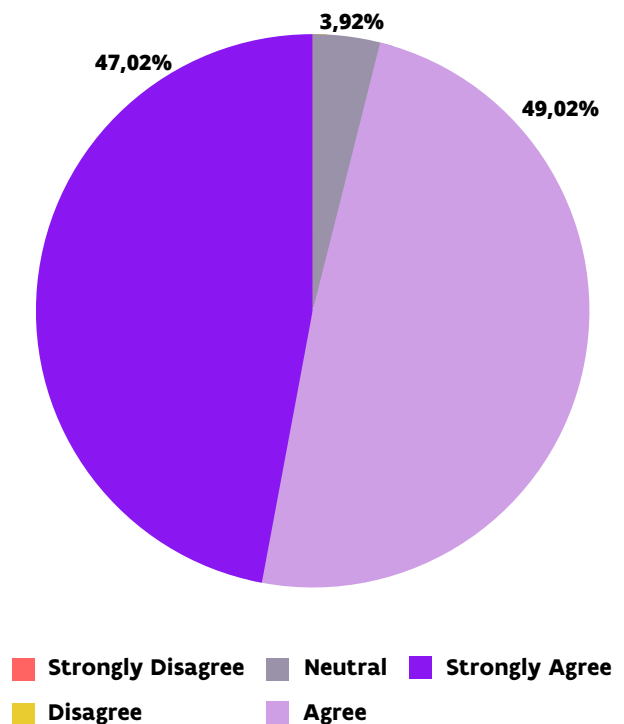
Open Science Network Day 2023

Set stages for a strong community

A Lasting Community for Open Science Enthusiasts

Beyond the successful event itself, our aim was to foster a vibrant community centered around Open Science. The Network Day served as a catalyst for forging connections, building relationships, and nurturing collaborations that extend far beyond a single day. We believe that creating a strong and supportive community is essential for driving lasting change in the realm of Open Science.

As we move forward, we are committed to nurturing this community and providing opportunities for continued engagement. We envision a network where individuals with a shared commitment to Open Science can exchange ideas and collaborate on projects that advance the principles of Open Science in Flanders.

Within our network, we have established working groups that tackle overarching themes, project groups that focus on specific and actionable aspects of Open Science, and a dedicated community for Research Data Management (RDM) support staff in Flanders. Through regular gatherings and interactive workshops, we strive to cultivate an environment where knowledge and expertise can flourish, and the collective impact of our community can be felt through tangible output.

We invite you to join us on this journey. Together, let us continue to build a community that promotes collaboration and shapes the future of Open Science in Flanders. By staying connected and sharing our experiences, we can create a lasting legacy of Open Science that drives meaningful change.

"It was eyeopening as a researcher to see the views of others such as the support staff, and how your priorities are different."

Open Science Network Day 2023

Create ownership and advocacy

Event as Catalyst

The Open Science Network Day was not just a one-time event, but rather a catalyst for advocacy and ownership. Through collaborative brainstorms and engaging discovery sessions with diverse partners, we aimed to ignite the spirit of ambassadorship within each individual.

> The thing I liked the most about the day was the deliver session, where I could come up with concrete actions to realize the priorities.

Active Contribution to a Shared Vision

We are proud to share that the format of the day resonated with our attendees, with a resounding 94% agreeing that it allowed them to actively contribute to a shared vision on Open Science. Now, the responsibility lies with each participant to be the change they want to see by carrying forward the discussions, ideas, and actions initiated during the event.

The Format allowed for Participants to Contribute to a Shared Vision on Open Science

5,88%
39,22%
54,90%

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

Sustaining Engagement

Furthermore, we acknowledge the desire of 91% of attendees to stay informed and connected. We commit to keeping them updated with relevant information, resources, and opportunities to actively engage in the Flemish Research Data Network (FRDN). Info about our projects can be found on our website and community driven output has a spot in our Zenodo Community.

Future Steps

Looking ahead, our next network day will celebrate the achievements within our network. It will be a platform to showcase the collaborative efforts of our partners, sharing good practices in Flanders and exploring how they compare in an international context.
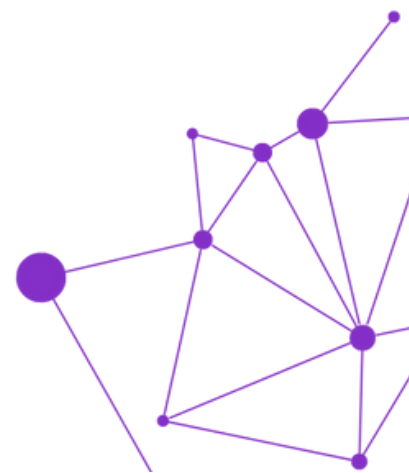
Open Science Network Day 2023

Future Predictions by participants

This figure showcases the results of the Change of Mindset discovery session, where participants shared their predictions for the future of Open Science. We organized these wild ideas based on our interpretation, and the feature quotes from the attendees as examples.

Some Predictions

2035

Coherence in Legal issues
- CC. 4.0 attribution becomes the new normal for virtual data
- Companies sharing their data
- Revision of GDPR
- Social license

Actual Change in Research Asessment
- Actual change in research assesment
- Change in policies at all Level
- More rewards for quality of eesearch
- A more Comprehensive Assessment of how Research is done and not just quantity of output

Regulation and Guidelines
- Open Science Regulations
- Geopolitics will have a negative impact on OS
- Worldwide Rules so Everybody can work in the same way.
- Nurenberg Code
- Open Source Code is Mandatory
- Clearer Landscape to share High Quality Research
- Information Crisis
- European Guidelines on Code Publishing and Preservation

Science Open to Citizens
- Citizen Science is a common practice
- Media Coverage of Open Science Sucesses
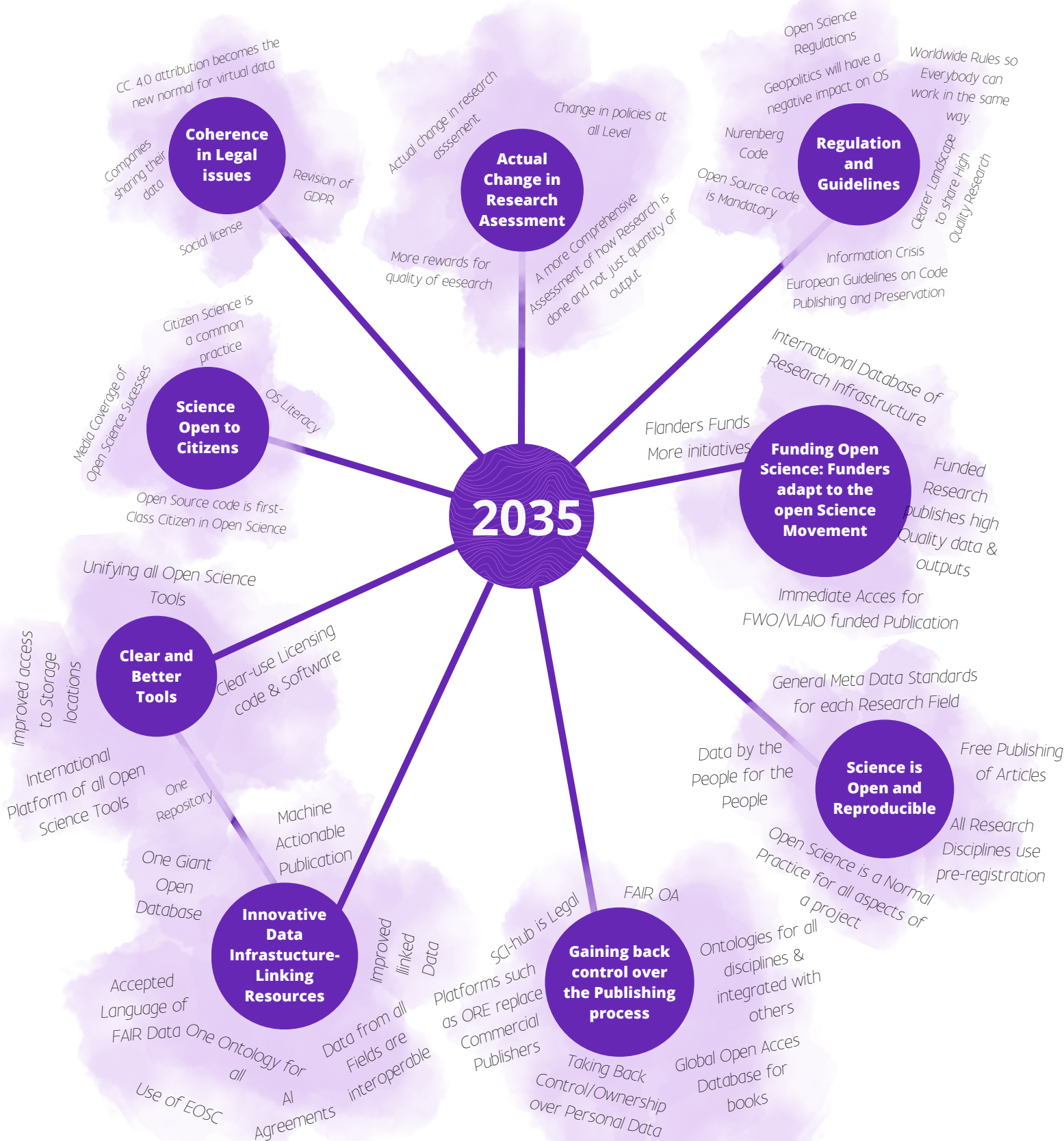- OS Literacy
- Open Source code is first-Class Citizen in Open Science

Funding Open Science: Funders adapt to the open Science Movement
- International Database of Research Infrastructure
- Flanders Funds More initiatives
- Funded Research publishes high Quality data & outputs
- Immediate Acces for FWO/VLAIO funded Publication

Clear and Better Tools
- Unifying all Open Science Tools
- Improved access to Storage locations
- Clear-use Licensing code & Software
- International Platform of all Open Science Tools
- One Repository

Innovative Data Infrastucture-Linking Resources
- One Giant Open Database
- Machine Actionable Publication
- Accepted Language of FAIR Data
- One Ontology for all AI Agreements
- Use of EOSC
- Improved linked Data
- Data from all Fields are interoperable

Gaining back control over the Publishing process
- FAIR OA
- SCI-hub iS Legal
- Platforms such as ORE replace Commercial Publishers
- Taking Back Control/Ownership over Personal Data
- Global Open Acces Database for books

Science is Open and Reproducible
- General Meta Data Standards for each Research Field
- Data by the People for the People
- Free Publishing of Articles
- Open Science is a Normal Practice for all aspects of a project
- All Research Disciplines use pre-registration
- Ontologies for all disciplines & integrated with others

FRDN
Open Science
Network Day 2023

1

FRDN | Vlaanderen is open wetenschap

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