

Change toolkit for digital building permit

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| Author | Organisation | Role | Date |
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| V0.2 | Review | 27/03/2023 | Marc Boonstra |
| V0.3 | Review / Author | 28/03/2023 | Jantien Stoter |
| V0.4 | Review | 28/03/2023 | Francesca Noardo |
| V1.0 | Final | 28/03/2023 | Jantien Stoter / Diana Keijzer |

Table of Contents

| | |
|----------------------------------------------------------------|---|
| 1. Executive Summary | 4 |
| 2. Introduction..... | 4 |
| 3. Lecture | 4 |
| 4. Attendance | 5 |
| 5. Resources | 7 |
| 6. Conclusion..... | 7 |
| 7. References | 8 |
| List of Figures | 8 |
| List of Tables | 8 |
| Annex I: Presentation slides of the Lecture Open Science | 9 |

1. Executive Summary

This deliverable documents the presentation on Open Science as given on March 23rd 2023 by Dr. ir. Bastiaan van Loenen and Tanya Yankelevich, both from TU Delft. In the presentation, the open science principles are explained with the project staff of CHEK's beneficiaries so that they can optimally adhere to these principles. Practicing Open Science is an important principle in the CHEK project in order to make best use of the project results during and after the project. The Open Science Lecture is based on the EU document '*Providing researchers with the skills and competencies they need to practice Open Science.*'¹ The open science practices of CHEK are in line with Section 1.2.13 of the Grant Agreement.

2. Introduction

The CHEK project is working on developing tools and methodologies to increase the automation and digital building permit processes with a consortium of nineteen partners across Europe. The use and the development of open standards and also practicing open science is important to maximize the use of the results during and after the project lifespan. Open Science assures that the (intermediate) results of the project are findable, accessible, interoperable and reusable by others. This is important for the scalability of the project results, the uptake of the results by a wide range of stakeholders and the maximization of the project's impact.

3. Lecture

The lecture was given by Dr. Bastiaan van Loenen and Tanya Yankelevich. **Dr. ir. Bastiaan van Loenen** (associate professor) holds a PhD from Delft University of Technology, and a M.Sc. from The University of Maine (Spatial Information Science and Engineering) and TU Delft (Geodetic Engineering). He is chairing the [Knowledge Center Open Data](#) at the Faculty of Architecture and The Built Environment. **Ms. Tanya Yankelevich (M.Sc MRes)** is TU Delft Open Science programme community engagement manager.

¹ European Commission, Directorate-General for Research and Innovation, O'Carroll, C., Hyllseth, B., Berg, R., et al., Providing researchers with the skills and competencies they need to practise Open Science, Publications Office, 2017, <https://data.europa.eu/doi/10.2777/121253>

The main topics of the lecture were:

- An introduction to Open Science and its (cultural) history
- Definitions of Open Data and their usage and relevance
- The European Union's Open Science Policy and the EU's Open Science Ambition for 2020-2024
- The FAIR principles
- Open Data: interfering interests
- The European Union's Open Data Directive
- Definitions and conditions of Research Data
- HVD (High Value Datasets) and the special regime they require
- Open Licences
- Further reading

4. Attendance

The consortium of CHEK was invited to join the lecture and the lecture was announced via the social media platforms of CHEK; LinkedIn and Facebook. In addition, the recording was published in the YouTube CHEK channel the next day.

In total 25 people attended the lecture. In addition, other 24 visualizations are documented in YouTube so far (4 days from the publication). The YouTube video is being further advertised through the CHEK website and social media as well.



Figure 1 Screenshot of the lecture

| No | Name | Beneficiary |
|----|----------------------------|-------------|
| 1 | Bastiaan van Loenen | 01.TUD |
| 2 | Tanya Yankelevich | 01.TUD |
| 3 | Diana Keijzer | 01.TUD |
| 4 | Marc Boonstra | 01.TUD |
| 5 | Danitsja van Heusden | 01.TUD |
| 6 | Jantien Stoter | 01.TUD |
| 7 | Amir Hakim | 01.TUD |
| 8 | Jasper van der Vaart | 01.TUD |
| 9 | Orjola Braholi | 02. FHI |
| 10 | Mariana Ataide | 02. FHI |
| 11 | Silvia Mastrolembo Ventura | 03. UBS |
| 12 | Kavita Raj | 03. UBS |
| 13 | Marika Puggioni | 03. UBS |
| 14 | Jose Granja | 04. UM |
| 15 | Ane Ferreira | 05. CYP |

| | | |
|----|------------------|---------|
| 16 | Elisa Schröter | 06. VCS |
| 17 | Hans de Kruijff | 07. XNP |
| 18 | Igor Skolov | 08. RDF |
| 19 | Peter Bonsma | 08. RDF |
| 20 | Trajche Stojanov | 09. ZWE |
| 21 | Lorenzo Muro | 10. SIA |
| 22 | Lucie Kovarikova | 14. IPR |
| 23 | Francesca Noardo | 16. OGC |
| 24 | Ana Baptista | 17. GIA |
| 25 | Jose Oliveira | 18. DIR |

Table 1 Attendance list

5. Resources

- Annex I of this deliverable contains the presentation slides of both Bastiaan van Loenen and Tanya Yankelevich
- The lecture is recorded and shared via CHEK's you tube channel: [Change toolkit for digital building permit - YouTube](#).

6. Conclusion

The main message of the lecture to publish data and software that will be delivered by the project is "As open as possible; As closed as necessary". The lecture was well received by the project beneficiaries. There was ample room for questions and answers, and this proved very useful to translate knowledge into the practice of the CHEK project. Moreover, since at TU Delft each faculty has a Data Steward to accompany individual researchers and consortium projects in their handling of Open Science principles, remaining or upcoming questions about open science principles can be asked to experts to be able to optimally implement them in CHEK. Another Horizon Europe project PUSH-IT (GA no. 101096566) has requested to also receive the lecture.

7. References

List of Figures

Figure 1 Screenshot of the lecture6

List of Tables

Table 1 Attendance list.....7

Open data: What is it and what does it really mean?

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<https://www.kc.opendata.eu>



ODECO

Towards a sustainable Open Data ECOSystem
<https://www.odeco-research.eu>

Open data

1. Data Must Be Complete
2. Data Must Be Primary
3. Data Must Be Timely
4. Data Must Be Accessible
5. Data Must Be Machine processable
6. Access Must Be Non-Discriminatory
7. Data Formats Must Be Non-Proprietary
8. Data Must Be License-free
9. Compliance must be reviewable
10. The work shall be available as a whole and at no more than a reasonable reproduction cost

<http://opendefinition.org/okd>

Updating the Open Definition to meet the challenges of today

Home / Featured / Updating the Open Definition to meet the challenges of today

March 16, 2023, by [Renata Ávila](#)



About Renata Ávila

CEO at Open Knowledge Foundation.

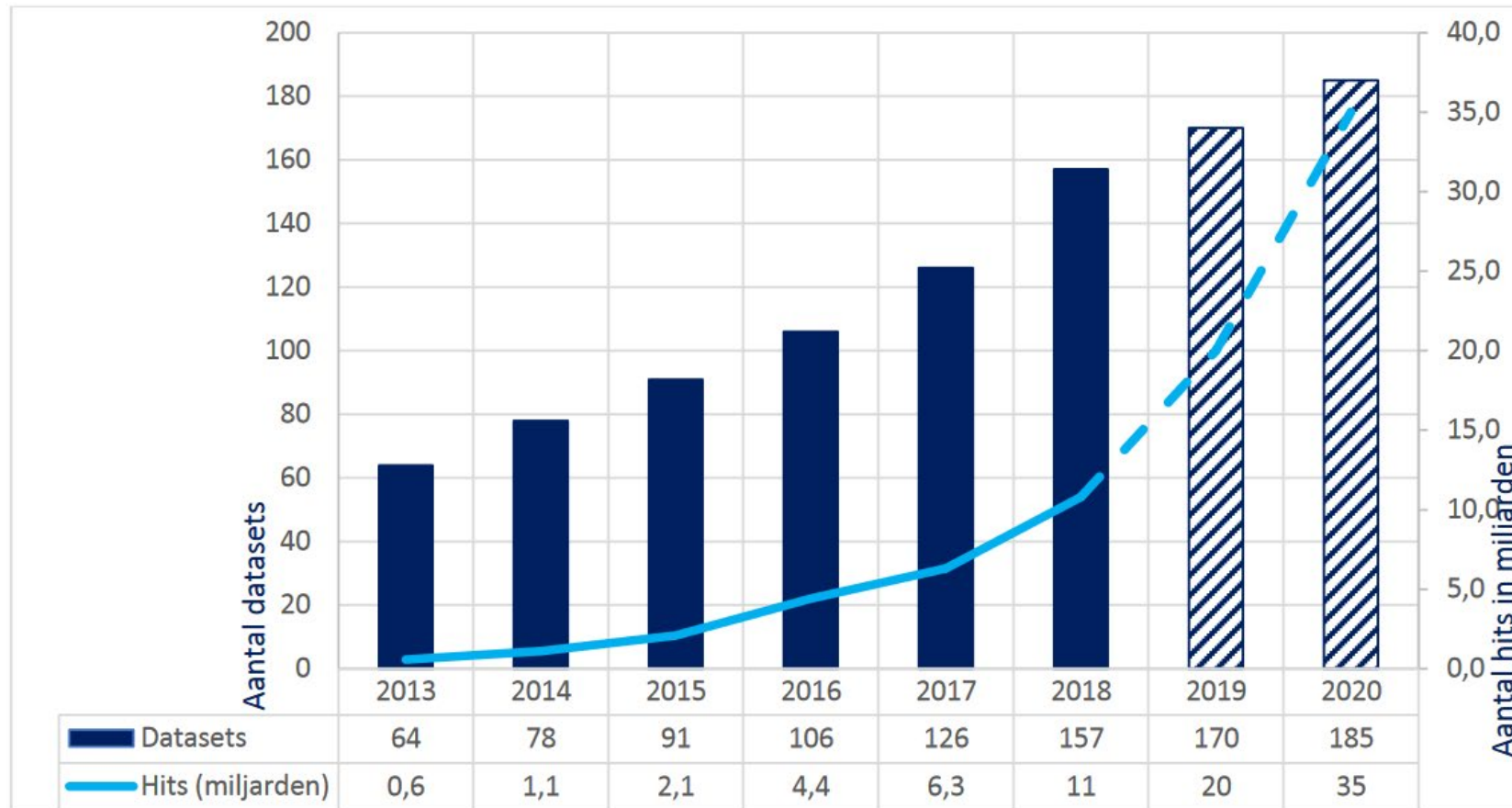
Check:

<https://blog.okfn.org/2023/03/16/updating-the-open-definition-to-meet-the-challenges-of-today/>

Open data

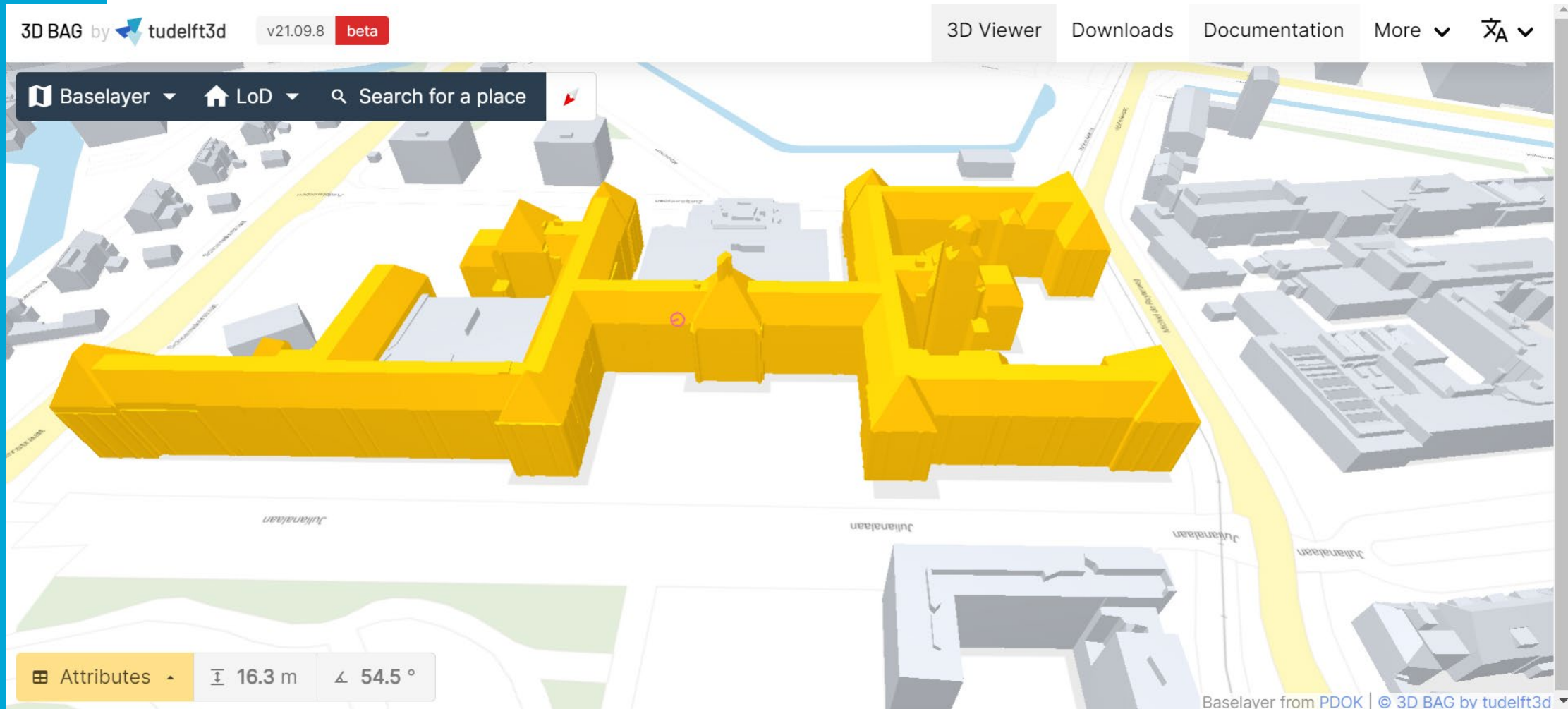
- Data without any restrictions in the (re-) use and provided free of charge

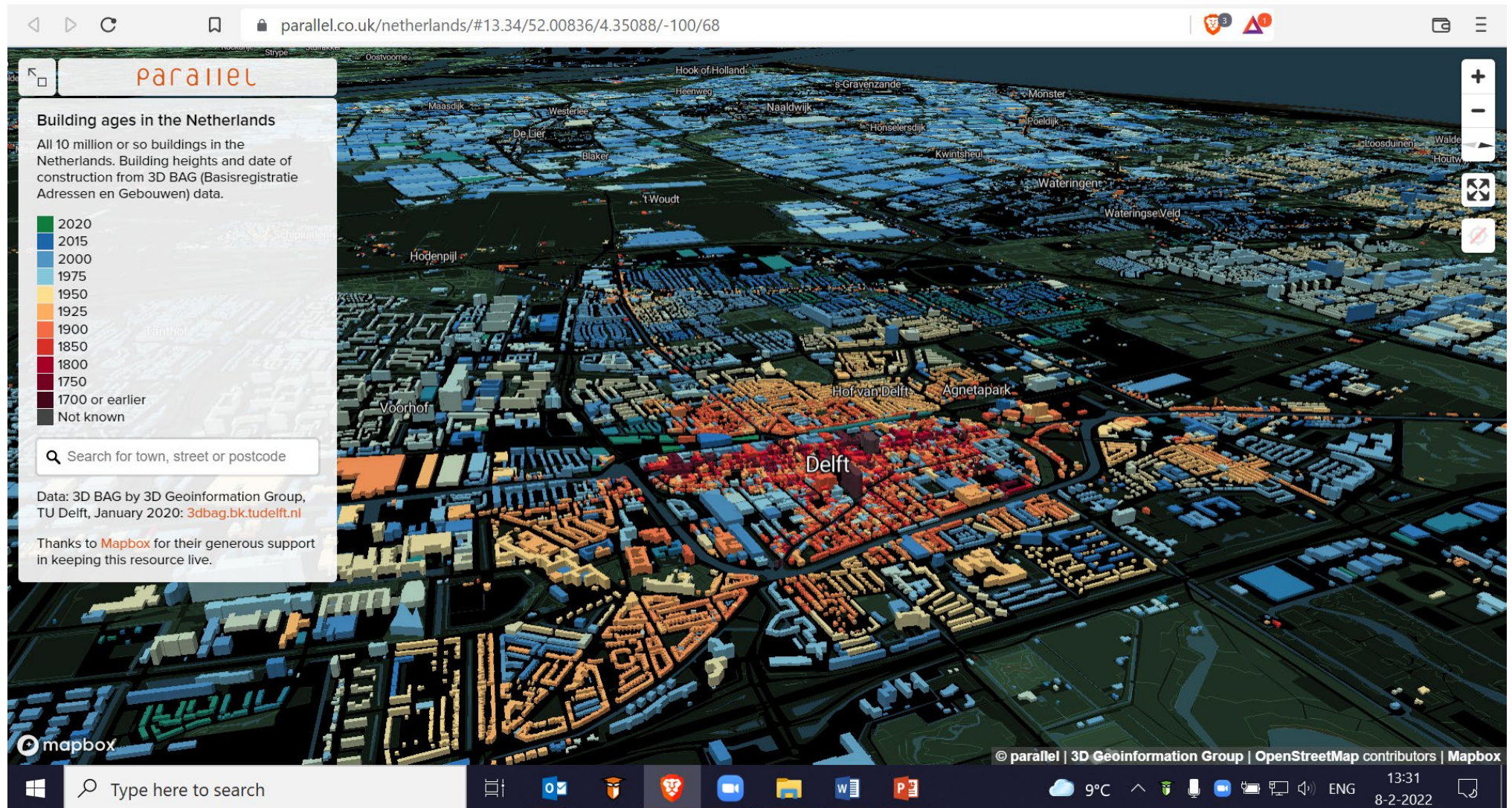
Spectacular increase in data use



Source: <https://www.pdok.nl/rapportages>

Open science: 3dbag.nl





Be careful. Your data may interfere with other interests:

- the confidentiality of the proceedings of public authorities, [..];
- the confidentiality of commercial or industrial information, [..];
- intellectual property rights;
- the confidentiality of personal data [..];
- the protection of the environment to which such information relates, such as the location of rare species,
-

The EU Open Data Directive

Stimulating the economy ...

Provides procedures for *reusing* **public sector** information including **publicly funded research data**

Research data (Art. 2(9))

‘research data’ means documents in a digital form, **other than scientific publications**, which are collected or produced in the course of scientific research activities and are used as evidence in the research process, or are commonly accepted in the research community as necessary to validate research findings and results;

Publicly funded research data:

- Reusable
- Free of charge
- following the principle of 'open by default' and compatible with the **FAIR principles**
- 'as open as possible, as closed as necessary'.

Those *national* open access policies shall be addressed to research performing organisations and research funding organisations.

FAIR?

Box 2 | The FAIR Guiding Principles

To be Findable:

- F1. (meta)data are assigned a globally unique and persistent identifier
- F2. data are described with rich metadata (defined by R1 below)
- F3. metadata clearly and explicitly include the identifier of the data it describes
- F4. (meta)data are registered or indexed in a searchable resource

To be Accessible:

- A1. (meta)data are retrievable by their identifier using a standardized communications protocol
 - A1.1 the protocol is open, free, and universally implementable
 - A1.2 the protocol allows for an authentication and authorization procedure, where necessary
- A2. metadata are accessible, even when the data are no longer available

To be Interoperable:

- I1. (meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
- I2. (meta)data use vocabularies that follow FAIR principles
- I3. (meta)data include qualified references to other (meta)data

To be Reusable:

- R1. meta(data) are richly described with a plurality of accurate and relevant attributes
 - R1.1. (meta)data are released with a clear and accessible data usage license
 - R1.2. (meta)data are associated with detailed provenance
 - R1.3. (meta)data meet domain-relevant community standards

Your research data

Try this at home

- Is your research data:
 - Findable?
 - Accessible?
 - Interoperable?
 - Reusable?
 - Free of charge?

To whom is it FAIR, and/or should it be FAIR?

The Open Data Directive relevant to you as a data user?

- If public sector information is publicly accessible: reuse should be required
- Conditions for reuse
 - in **formats** that are **open, machine-readable, accessible, findable and re-usable**, together with their metadata.
 - **no legal restrictions**, but if, those conditions shall not unnecessarily restrict possibilities for re-use and shall not be used to restrict competition
 - charges shall be **free of charge**, unless public sector bodies are required to generate revenue to cover a substantial part of their costs relating to the performance of their public tasks

Special regime for high value datasets

‘high-value datasets’ (HVD) means documents the re-use of which is associated with important benefits for society, the environment and the economy, in particular because of their suitability for the creation of value-added services, applications and new, high-quality and decent jobs, and of the number of potential beneficiaries of the value-added services and applications based on those datasets;

Six thematic categories of HVD

1. Geospatial
2. Earth observation and environment
3. Meteorological
4. Statistics
5. Companies and company ownership
6. Mobility

See [Commission Implementing Regulation \(EU\) 2023/138 of 21 December 2022 laying down a list of specific high-value datasets and the arrangements for their publication and re-use](#)

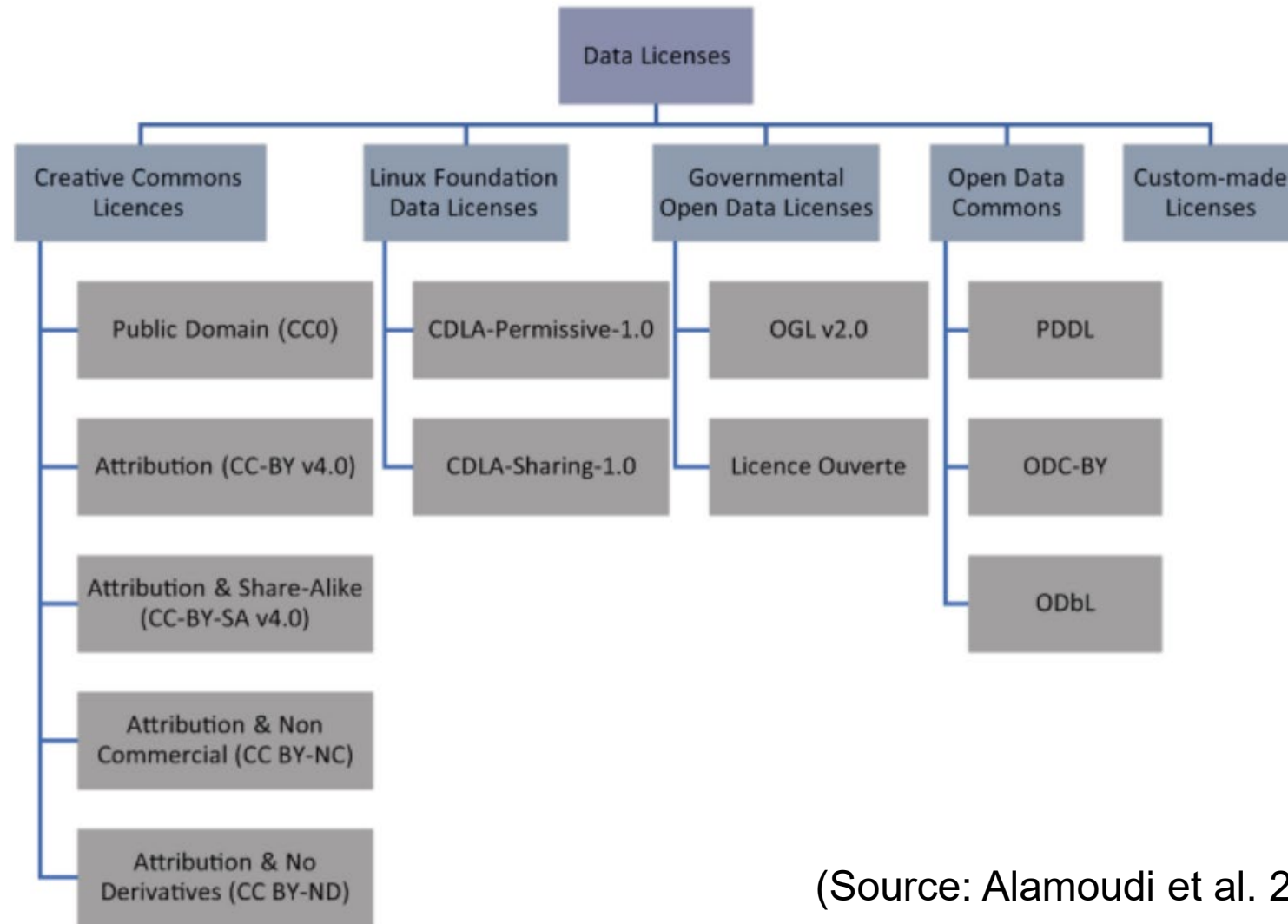
HVD (2)

- shall be made available for re-use in machine- readable format, via suitable APIs and, where relevant, as a bulk download.
- available free of charge, [..]

HVD Act (art. 4(3))

“High-value datasets shall be made available for re-use under the conditions of the **Creative Commons Public Domain Dedication (CC0)** or, alternatively, the **Creative Commons BY 4.0 licence**, or any equivalent or less restrictive open licence, as set out in the Annex, allowing for unrestricted re-use.”

Open licences



(Source: Alamoudi et al. 2020)

For CHEK

- Be transparent and consistent in your interpretation and implementation of open data/ open science in all facets of the project

Literature

- Alamoudi, E., Mahmood, DR., Al Judaibi, W., Albeshri, A. and Hasan, S. H. (2020) 'Open Source and Open Data Licenses in the Smart Infrastructure Era: Review and License Selection Frameworks', in Mehmood, R., See, S., Katib, I. and Chlamtac, I. (eds.) Smart Infrastructure and Applications: Foundations for Smarter Cities and Societies. Cham: Springer International Publishing, pp. 537-559.
- Open Data Directive, DIRECTIVE (EU) 2019/1024 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 June 2019 on open data and the re-use of public sector information. <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32019L1024&from=EN>
- HVD Act, European Commission (2023). Commission Implementing Regulation (EU) 2023/138 of 21 December 2022 laying down a list of specific high-value datasets and the arrangements for their publication and re-use. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023R0138&qid=1677593287379>
- Open Knowledge Foundation, Open Definition 2.1, <http://opendefinition.org/okd>
- PDOK rapportage, <https://www.pdok.nl/rapportages>
- Van Loenen, B., 2021, Open data history, definition, and impact, <https://www.youtube.com/watch?v=KPwrbsnPhPI>
- Wilkinson, M.D., Dumontier, M., Aalbersberg, IJ.J., G. Appleton, M. Axton, A. Baak, N. Blomberg, J.-W. Boiten, L. Bonino da Silva Santos, P.E. Bourne, et al.: The FAIR Guiding Principles for scientific data management and stewardship. Scientific data, 3(1), 1–9, 2016.

Questions?

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Thanks for your attention!

Bastiaan van Loenen

**OPEN SCIENCE:
JUST
SCIENCE
DONE RIGHT**

Open Science*

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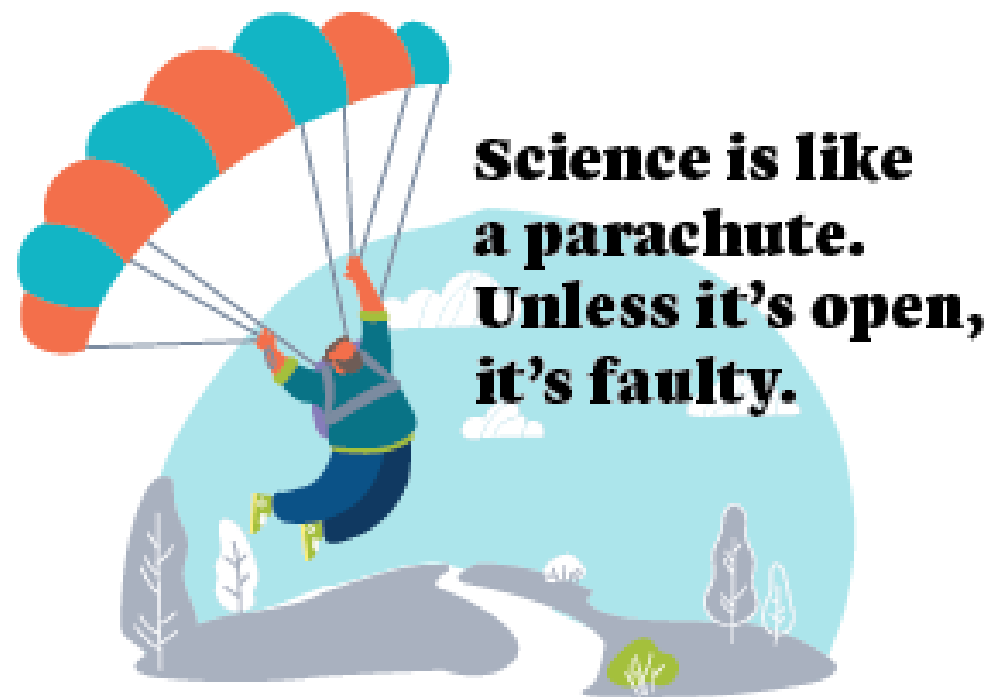
*This presentation is based on the original
presentation by Nicolas Dintzner



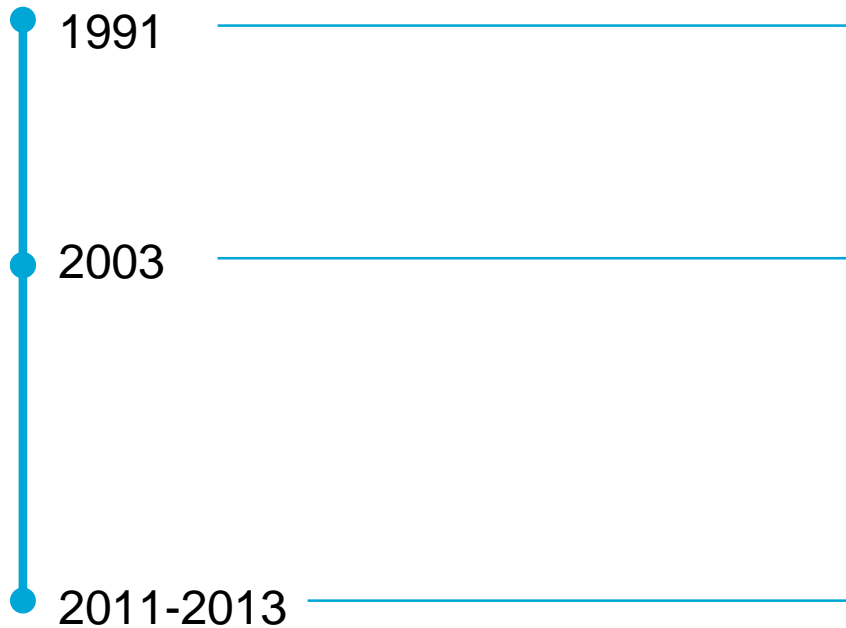
License: CC BY

Today:

- Why Open Science?
 - Open Access to Publications
 - Reproducibility Crisis
- What is Open Science?
 - Culture change
 - Definitions
- How to Open Science (data)



Open Access to Publications



arXiv

arXiv is a free distribution service and an open-access archive for 2,218,718 scholarly articles in the fields of physics, mathematics, computer science, quantitative biology, quantitative finance, statistics, electrical engineering and systems science, and economics. Materials on this site are not peer-reviewed by arXiv.

Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities

The Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities of 22 October 2003 was written in English. It is one of the milestones of the Open Access movement. The wording of the English version shall prevail.

The United States Vs. Aaron Swartz

“Information was the most valuable of currencies, a form of wealth no one should be deprived of”



RollingStones, [The Brilliant Life and Tragic Death of Aaron Swartz](#) by David Amsden



Open Access to Publications: Dutch approach



Taverne Amendment (Article 25fa of the Dutch Copyright Act)

Science without
open is just
anecdote



Reproducibility crisis

Google scholar results: “reproducibility clinical trials”

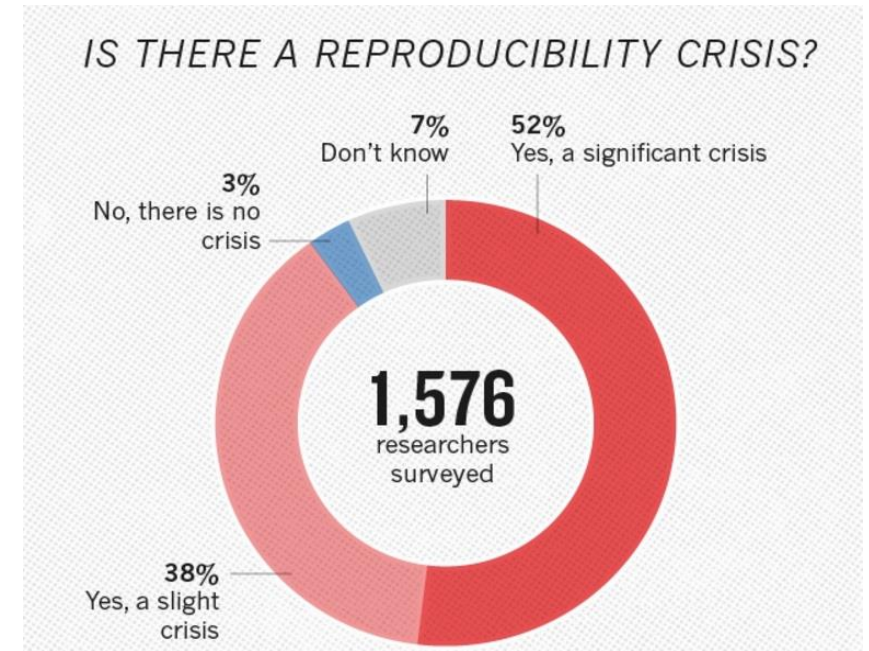
| | |
|------------|-------------|
| 2000-2011: | 18k results |
| 2012-2013: | 56k results |
| 2015 | |
| 2016 | |

RESEARCH ARTICLE

Estimating the reproducibility of psychological science

OPEN SCIENCE COLLABORATION Authors Info & Affiliations

<https://www.nature.com/news/1-500-scientists-lift-the-lid-on-reproducibility-1.19970>



Reproducibility crisis: data



2011

2020

Report finds massive fraud at Dutch universities

Investigation claims dozens of social-psychology papers contain faked data.

Ewen Callaway

When colleagues called the work of Dutch psychologist Diederik Stapel too good to be true, they meant it as a compliment. But a preliminary investigative report (go.nature.com/tqmp5c) released on 31 October gives literal meaning to the phrase, detailing years of data manipulation and blatant fabrication by the prominent Tilburg University researcher.



<https://op.europa.eu/en/publication-detail/-/publication/6bc538ad-344f-11eb-b27b-01aa75ed71a1>

Culture change: International Cooperation



- 2012 [DORA](#) agreement “*San Francisco Declaration on Research Assessment*” – funders and publishers
 - eliminate the use of journal-based metrics, such as Journal Impact Factors, in funding, appointment, and promotion considerations;
 - assess research on its own merits rather than on the basis of the journal in which the research is published; and
 - capitalize on the opportunities provided by online publication (such as relaxing unnecessary limits on the number of words, figures, and references in articles, and exploring new indicators of significance and impact).
- 2022 [CoARA](#) agreement “*Coalition for Advancing Research Assessment*” – research institutions
 - Supported by the European Commission
 - Agreement open for signature mid-2022, finalized by Dec 2022

Culture change: Global move towards OS



“Making science more accessible, inclusive and equitable for the benefit of all”

- 2017 UNESCO Recommendation on Science and Scientific Researchers
- 2019 UNESCO Recommendation on Open Educational Resources (OER)
- 2021 UNESCO Recommendation on Open Science

Culture change: EU Strategy



2020
2024

EU Research and innovation strategy 2020-2024:
The EU's Open Science Policy

“Open science is a policy priority for the European Commission and the standard method of working under its research and innovation funding programmes as it improves the quality, efficiency and responsiveness of research.”

A definition: Open Science as a goal (UNESCO)

Open science increases scientific collaborations and sharing of information for the benefits of science and society

makes multilingual scientific knowledge openly available, accessible and reusable for everyone

opens the processes of scientific knowledge creation, evaluation and communication to societal actors beyond the traditional scientific community.



A definition: Open Science as a goal and a method (European Research Council)



Open Science

The mission of the ERC is to support excellent research in all fields of science and scholarship. The main outputs of this research are new knowledge, ideas and understanding, which the ERC expects its grantees to publish in peer-reviewed articles and monographs. The ERC considers that providing free online access to these materials is the most effective way of ensuring that the fruits of the research it funds can be accessed, read, and used as the basis for further research.

WHICH MEANS:

- Open Science is
- by researchers
 - through “free access”
 - for more research
 - to maximize usefulness

Other definitions: OS as a practice



Open Science is **the practice of science** in such a way that others can collaborate and contribute, where research data, lab notes and other research processes are freely available, under terms that enable reuse, redistribution and reproduction of the research and its underlying data and methods ([FOSTER Open Science Definition](#)).

KEY POINTS

- 1) Other can collaborate and contribute
- 2) Data, notes, and processes are available
- 3) Under specific terms

Goal: re-use, reproduction, distribution

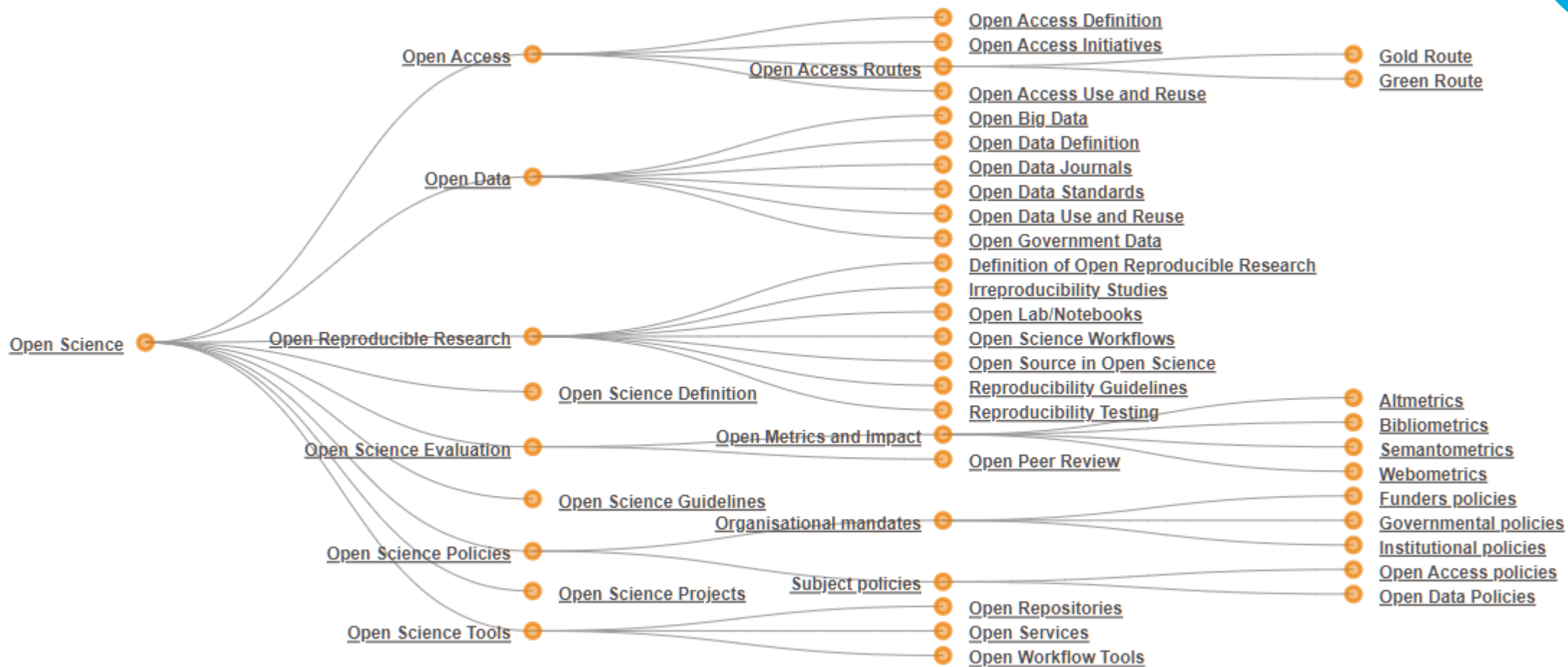
Open Science is transparent and accessible **knowledge** that is shared and developed through collaborative networks ([Vicente-Sáez & Martínez-Fuentes 2018, Open Science Training Handbook](#)).

Other definitions: OS as a movement



Open science is the **movement** to make scientific research, data and dissemination accessible to all levels of an inquiring society ([source](#)).

What is Open Science: the full view



EU Open Science Ambitions 2020-2024



- Open Data
- European Open Science Cloud (EOSC)
- New generation metrics
- Future of scholarly communication
- Rewards
- Research integrity & reproducibility of scientific results
- Education and skills
- Citizen science

Open/FAIR X



- **Open Access:** articles are freely available on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts.
- **Open Hardware:** Physical objects that are licenced in such a way that said object can be studied, modified, created, and distributed by anyone.
- **Open Methods:** Open methods are available details of the research methods, such as procedures, protocols, plans, notes and interpretations.

Open/FAIR X (cont.)



- **Open Education:** collective term that encompasses educational resources, tools and practices that can be freely used in the digital environment without legal, financial or technical barriers
- **FAIR Data:** the data is accessible, and I can see it, (re)use it and redistribute it (under conditions)
- **FAIR Software:** Open-source can be viewed, used, modified, and distributed for any purpose
- **Citizen Science:** The inclusion of members of the public in scientific research, to include citizens and communities in setting research priorities, and to engage them with the research process.

Open/FAIR X (finally)



Ideally:

- Open/FAIR **X**: I can see, (re)use, and redistribute **X**, and I know how **X** came to be (process that was followed)

**OPEN SCIENCE:
JUST
SCIENCE
DONE RIGHT**

Thanks for your attention!

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