naturhistorisches museum wien
1010 wien, burgring 7 | www.nhm-wien.ac.at

Introduction to Citizen Science

Dr. Katrin Vohland
Director General
Natural History Museum Vienna

Introduction to Citizen Science

- Some historical and definition issues
- Developement of citizen science the last years
- Reflection and research about citizen science
- What is next?

History and current definition

One Example:

Maria Sybilla Merian

natur

101

Citizen Science is

Epistemic Participation
- Increase of scientific knowledge

Transformative Participation
- Sustainable development

http://conservationcatalyst.org/journey-to-birding-mecca-cornell-lab-of-ornithology/

Citizens contribute knowledge
(Rick Bonney,
Cornell Lab of Ornithology, USA)

Science for Society -
Empowering citizens (Alan Irwin,
Copenhagen Business School, DK)

Citizen Science is

https://iiasa.ac.at/web/home/resources/publications/options/w17_The_power_of_the_crowd.html

© Inian Moorthy | IIASA

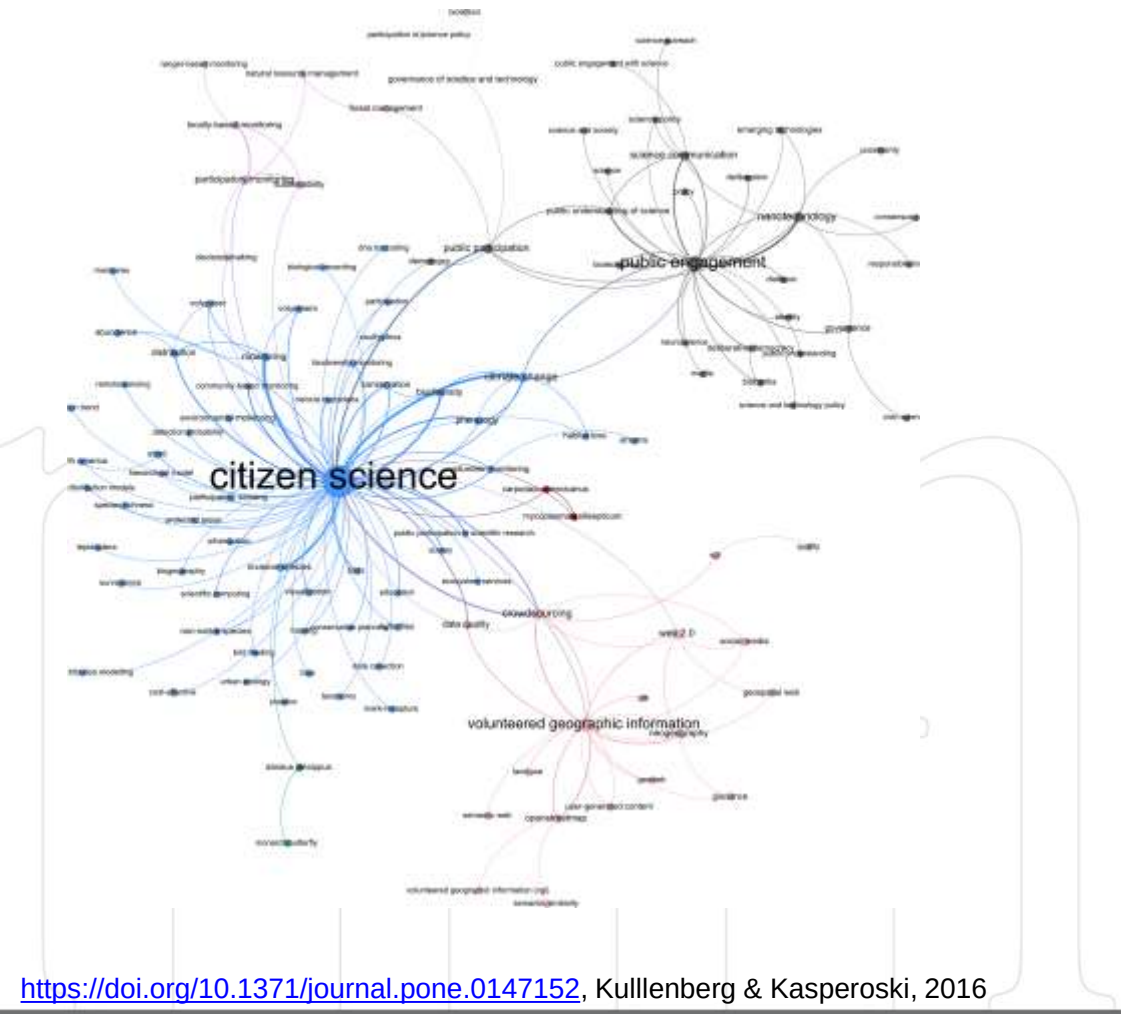
Univ. Köln

Sensebox-Univ. Münster

simple
(crowd sourcing)

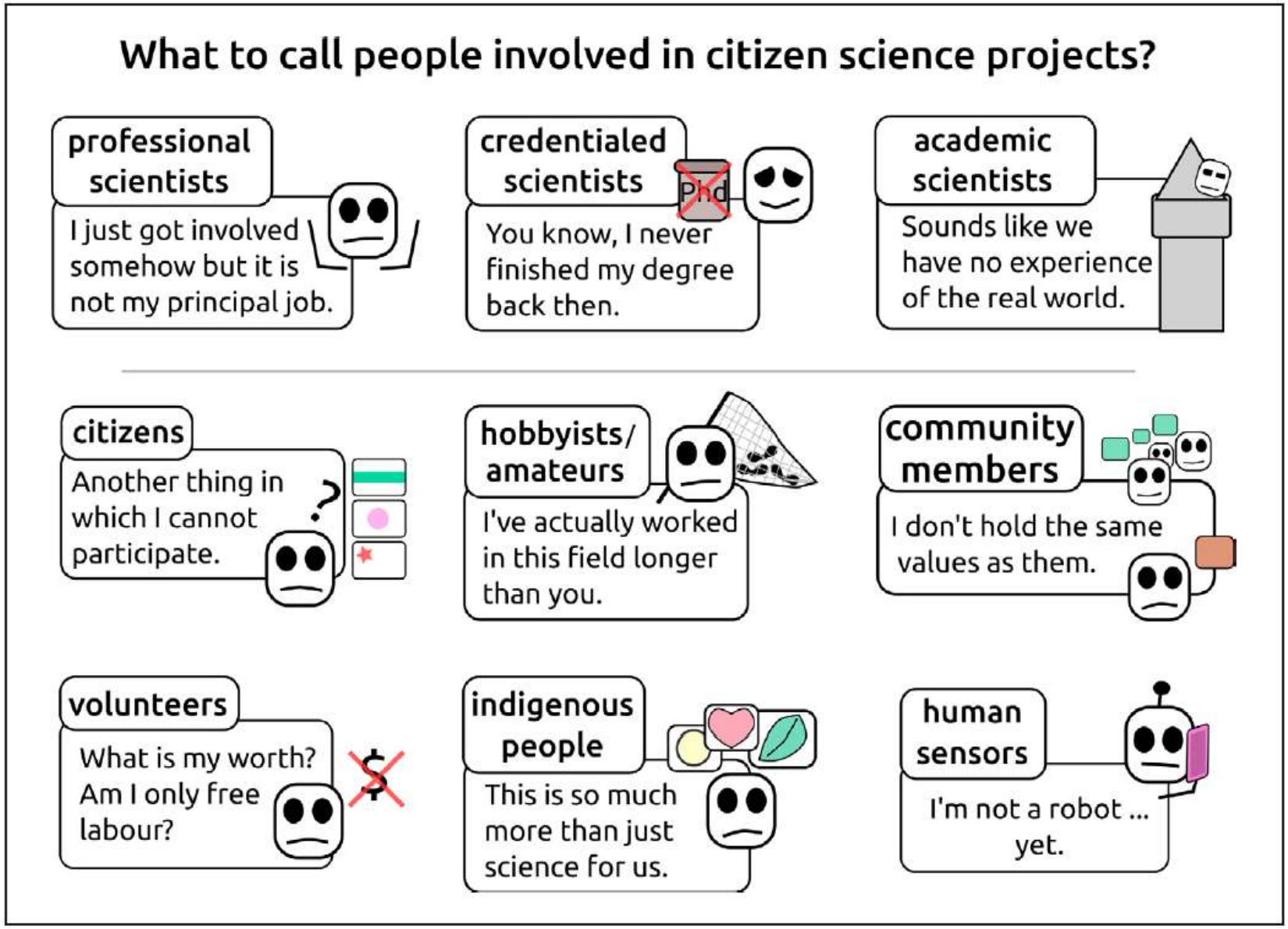
complex
(co-design)

Activities range from



- Crowdsourcing to biosystematic research
- Project planning to data elevation
- One day excursion to regular lab work

https://doi.org/10.1371/journal.pone.0147152, Kulllenberg & Kasperoski, 2016



Source: Eitzel et al.(2017) Citizen Science Terminology Matters: Exploring Key Terms. Citizen Science: Theory and Practice, 2(1): 1, pp. 1–20.

European Citizen Science Association

Version 1, April 2020

ECSA's characteristics of citizen science

Types of research

(Hypothesis-driven research, monitoring, inductive and exploratory and scientific database creation)

Roles and responsibilities

(ranges from equal partners to mere data contribution; key is transparency)

Initator organisations

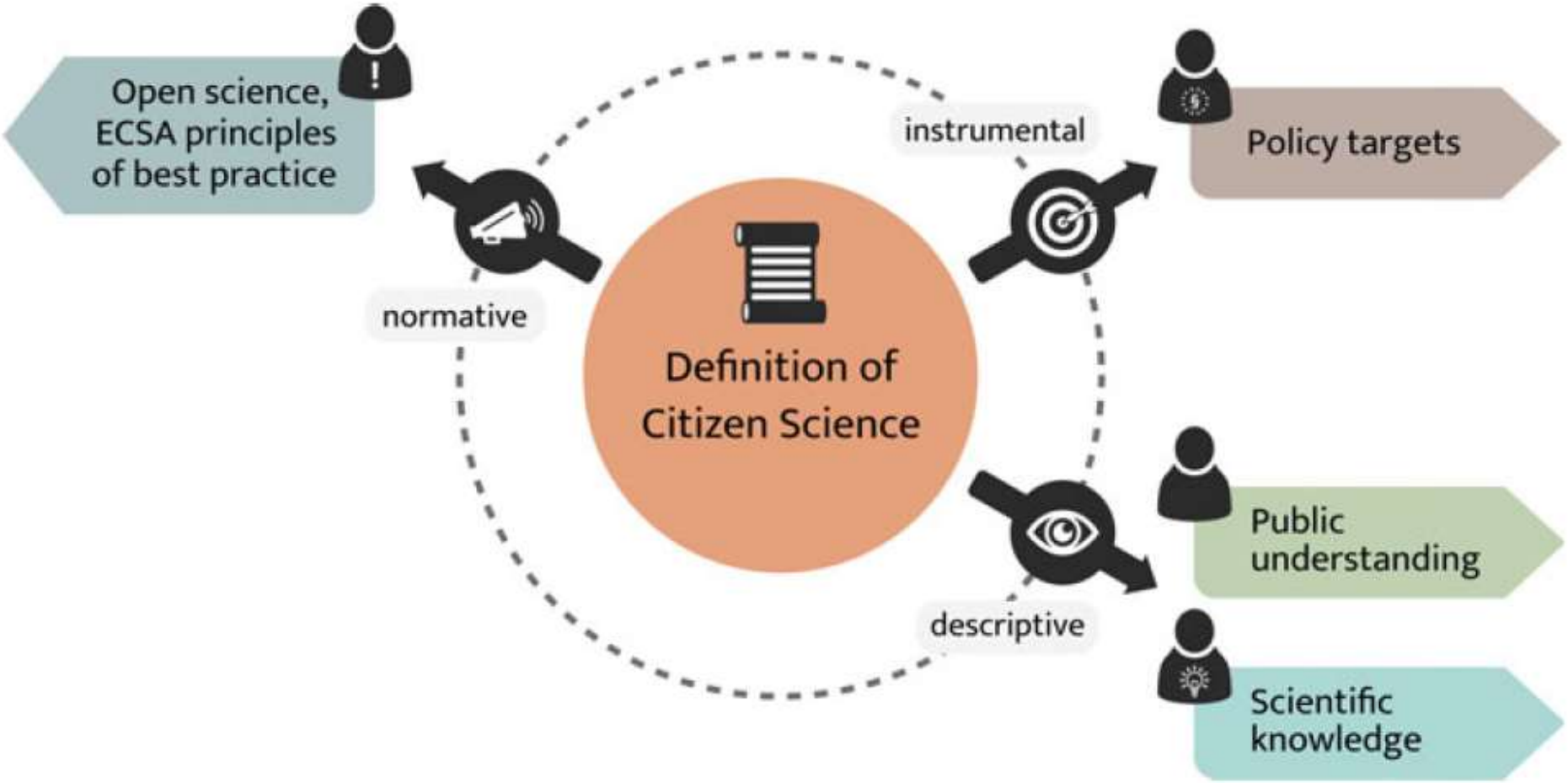
(Research-performing organisations, public bodies and instituions, non-governmental organisations)

https://ecsa.citizen-science.net/wp-content/uploads/2020/05/ecsa_characteristics_of_citizen_science_-_v1_final.pdf

Table 2.1 Selected definitions of citizen science

1	*Oxford English Dictionary* (2014)	Scientific work undertaken by members of the general public often in collaboration with or under the direction of professional scientists and scientific institutions
2	Wikipedia (2005)	A project (or ongoing program of work) which aims to make scientific discoveries or verify scientific hypotheses
3	Wikipedia (2019)	Scientific research conducted, in whole or in part, by amateur (or nonprofessional) scientists
17	US National Oceanic and Atmospheric Administration (NOAA)	Citizen science is defined as a form of open collaboration where members of the public participate in the scientific process to address real-world problems in ways that include identifying research questions, collecting and analysing data, interpreting results, making new discoveries, developing technologies and applications, and solving complex problems

Haklay et al., 2021; https://www.springer.com/de/book/9783030582777



Haklay et al., 2021; https://www.springer.com/de/book/9783030582777

And for whom and for which purpose you need a definition?

The citizens?

https://www.buergerschaffenwissen.de/projekt/fledermausforscher-berlin-gesucht

Funders?

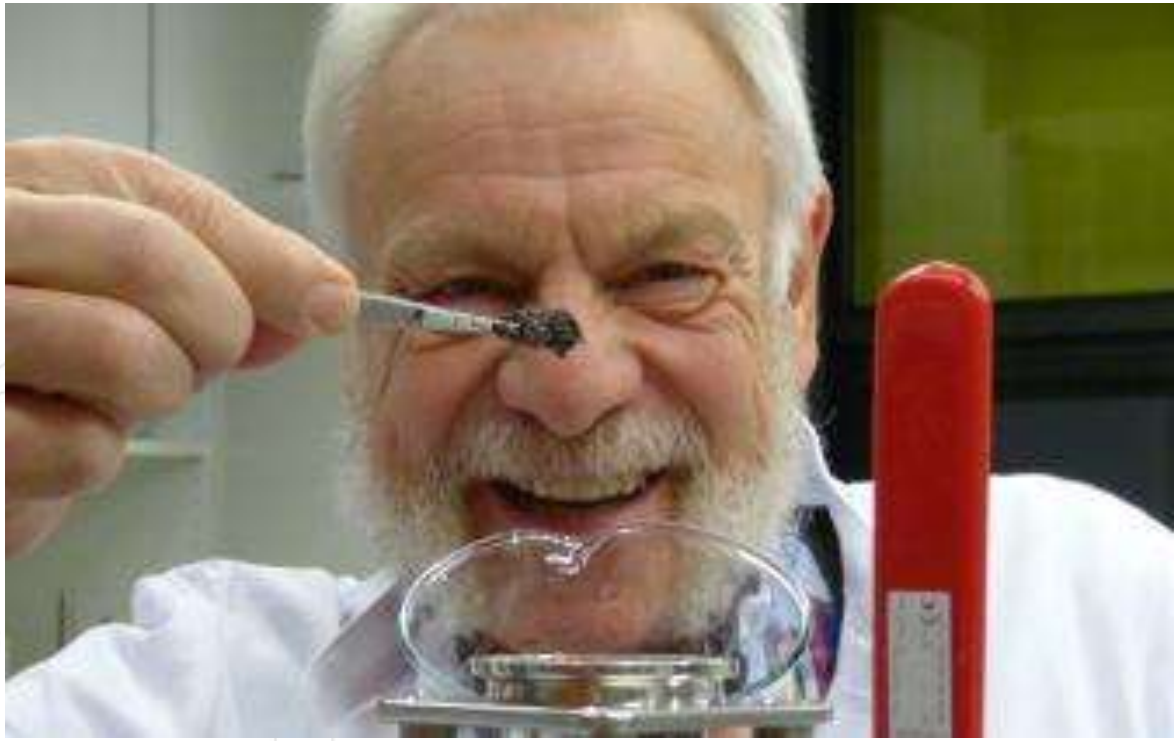
https://business-review.eu/investments/ft-eu-plans-to-cut-by-eur-30-bln-cohesion-funds-for-eastern-europe-and-boost-support-for-greece-italy-and-spain-171327

Science?

https://theconversation.com/seven-ways-universities-benefit-society-81072

Citizen Science is

- *the active and volunteer engagement of citizens*
- *in scientific research.*



Bürgerforscher Jupp Löhr. Foto: G. Coordes.
https://www.buergerschaffenwissen.de/projekt/mikroplastik-auf-der-spur-mitforschen-im-citizen-lab

Development of citizen science

National and international Citizen Science Networks

OPAL

Bürger schaffen Wissen
Die Citizen Science Plattform

ecsa | European Citizen Science Association

Österreich forscht
www.citizen-science.at

Zentrum für Citizen Science

CITIZEN SCIENCE ASSOCIATION

British Ecological Society
Citizen Science Group

sciencecité

Australian Citizen Science Association

eu-citizen.science

ExCiteS | Extreme Citizen Science

Citizen Science Strategies

Bürger schaffen Wissen
Die Citizen Science Plattform

Hwa Ja Götz 2014

Florian Pappert 2014

Ralf Rebmann 2015

UFZ 2014

Abb. 3: GEWISS-Veranstaltungen und Dialogforen im Projektverlauf von Juni 2014 bis März 2016.

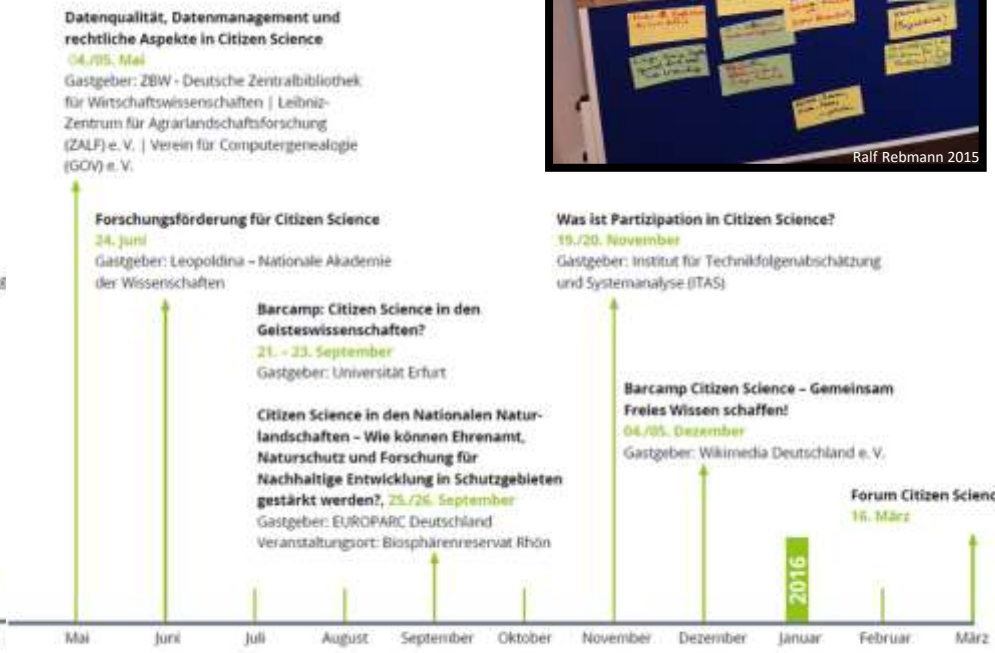


Abb. 4: GEWISS-Veranstaltungen und Dialogforen im Projektverlauf von Juni 2014 bis März 2016.

https://www.buergerschaffenwissen.de/sites/default/files/grid/2017/11/20/gewiss_endbericht_final_0.pdf

Citizen Science Strategies

Bürger schaffen Wissen
Die Citizen Science Plattform

https://www.buergerschaffenwissen.de/sites/default/files/grid/2017/11/20/gewiss_cs_strategy_englisch_0.pdf

Citizen Science Platforms

Bürger schaffen Wissen
Die Citizen Science Plattform

https://www.buergerschaffenwissen.de/

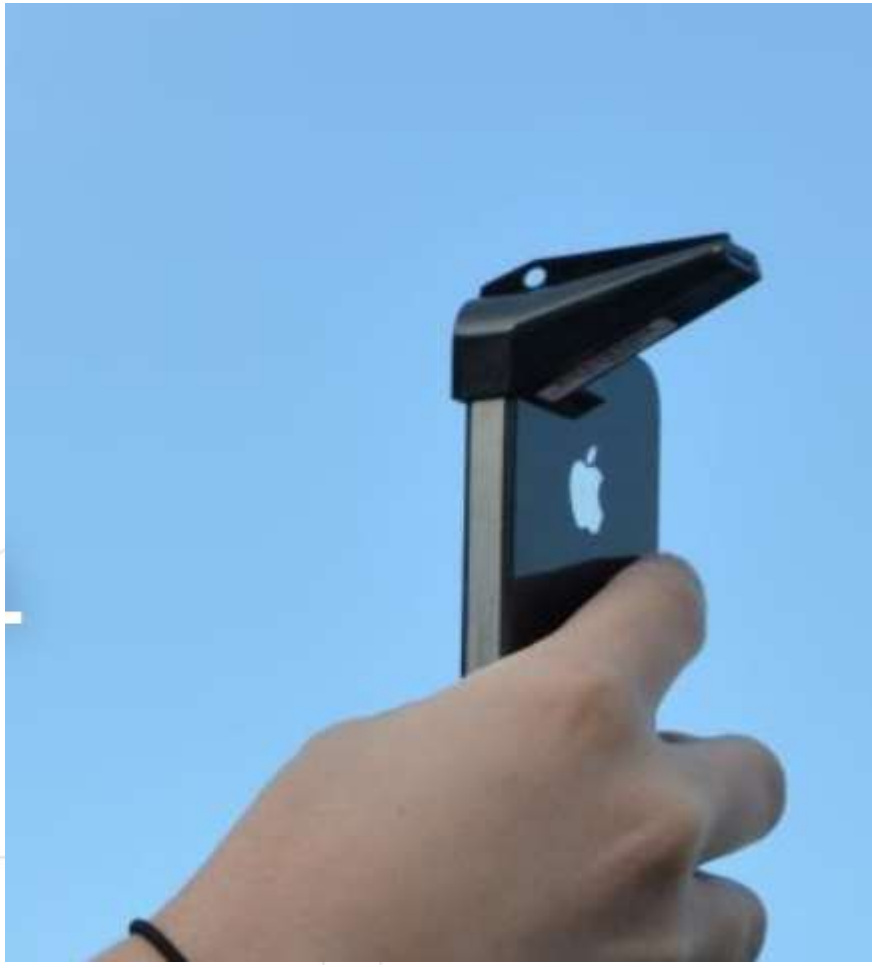
Citizen Science Platforms and projects

Air pollution

https://www.uantwerpen.be/nl/projecten/airbezen/

Citizen Science Platforms and projects

Air pollution



iSPEX

MINT / STEM

https://www.buergerschaffenwissen.de/index.php/projekt/ispex-wie-sauber-ist-der-himmel-ueber-berlin

http://ispex.nl/en/

Citizen Science Platforms and projects

Air pollution

URwatair

"περί ανέμων και υδάτων"

https://eu-citizen.science/project/40

Citizen Science Platforms and projects

Earth quakes

Citizen Seismology by CSEM EMSC

It is widely known that the more a population is informed of natural risks, the more it is resilient and able to face calamities. This is why **prevention and information are important in disaster management** and in the sociology of risk. Less well-known is the contribution populations themselves can provide. Knowledge is not a one-way road: scientists contribute to the general level of risk awareness in the population, but **citizens can also give scientists precious insights** that would otherwise have been overlooked.

https://www.citizenseismology.eu/

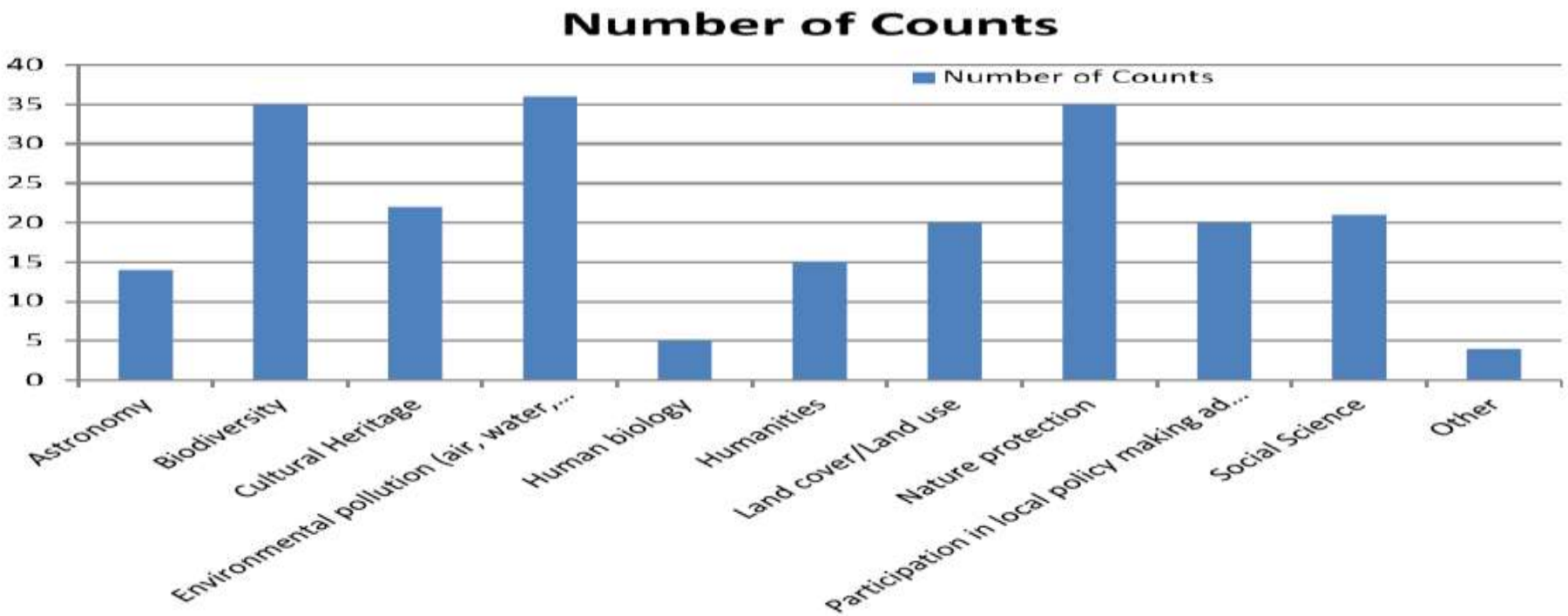
Citizen Science Platforms and projects

Nuclear energy

https://magazine.scienceconnected.org/2020/03/citizen-scientists-measure-nuclear-radiation-after-fukushima/

Citizen Science Platforms and projects

Q.16.In which domains is Citizen Science supported/applied in your country? (multiple choice)



https://cs-eu.net/sites/default/files/media/2020/02/CA15212_WG3_Vienna_Manzoni_Schade_Doerler_Heigl_PresentationSurveyTechnicalReport.pdf

Good Practice in Citizen Science

European Citizen Science Association

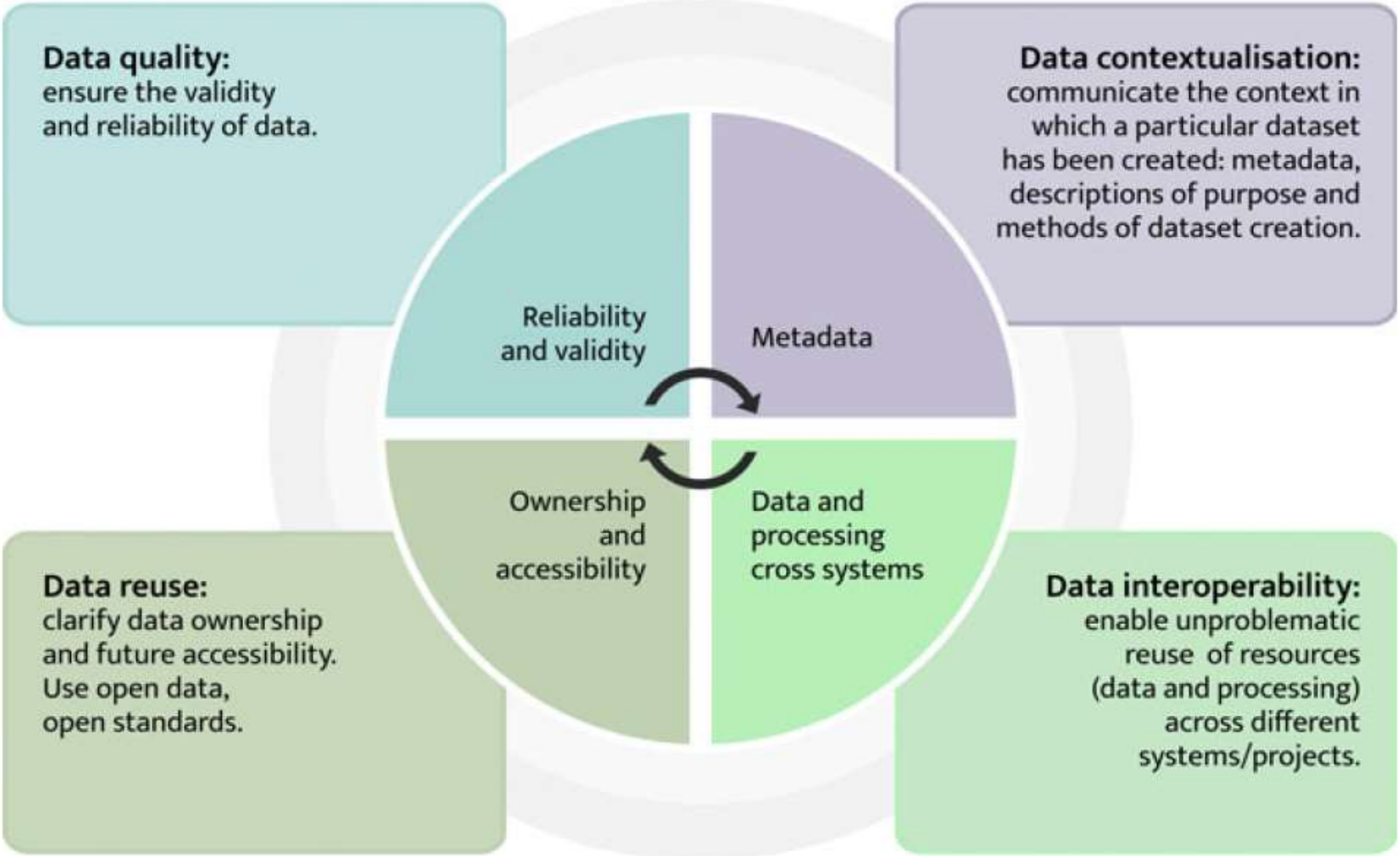


Fig. 8.1 Four aspects of data accuracy in citizen science

Balasz et al., 2021; https://www.springer.com/de/book/9783030582777

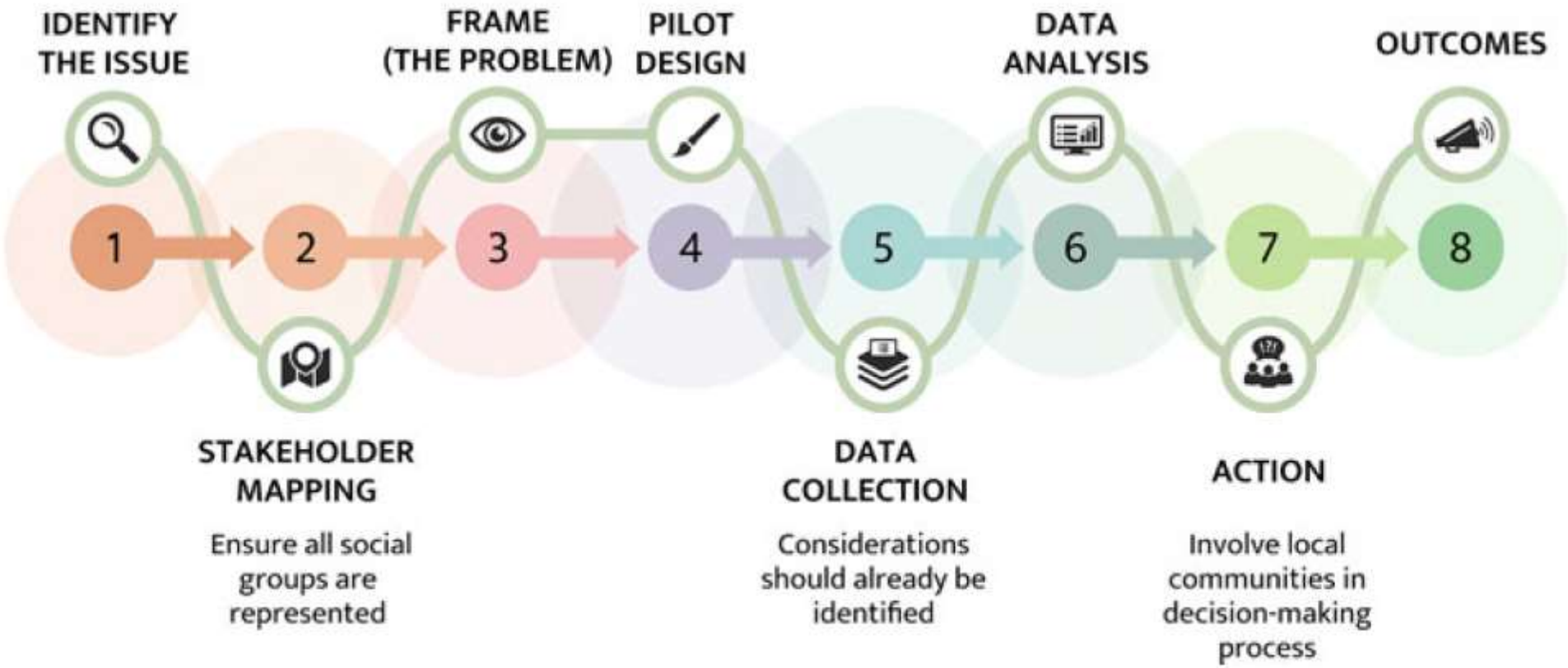


Fig. 14.1 The D-NOSES inclusive engagement model

Paleco et al., 2021; https://www.springer.com/de/book/9783030582777

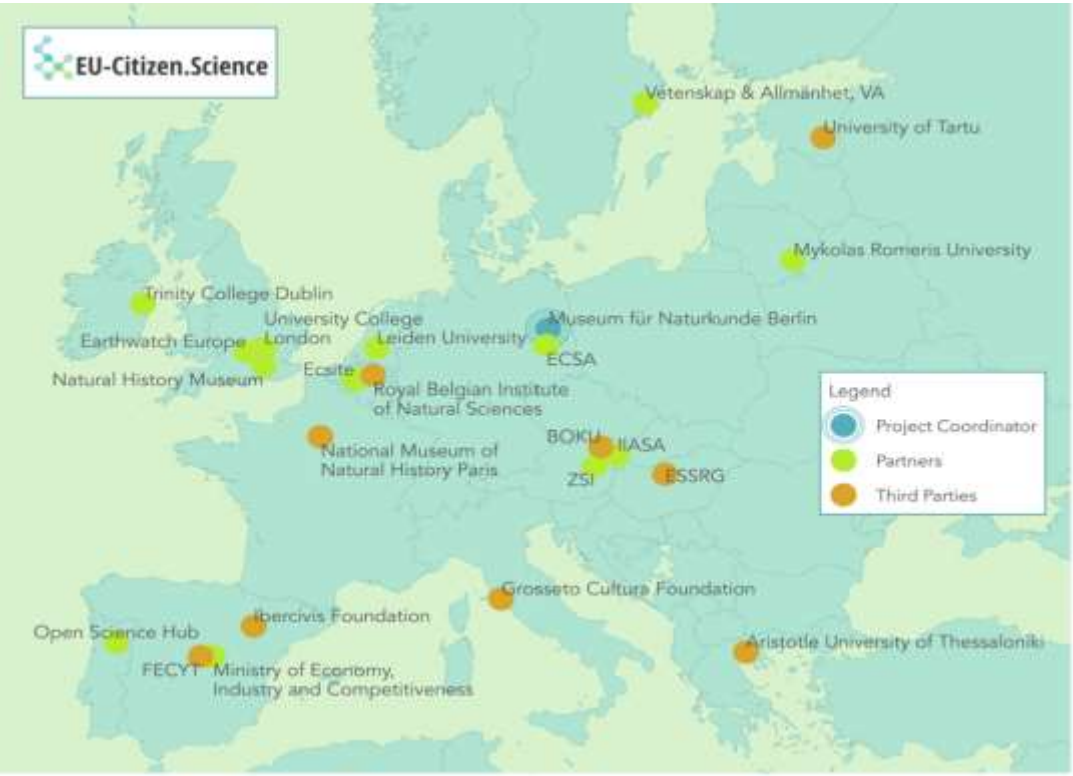
Good Practice in Citizen Science

naturhistorisches museum wien
1010 wien, burgring 7 | www.nhm-wien.ac.at

eu-citizen.science

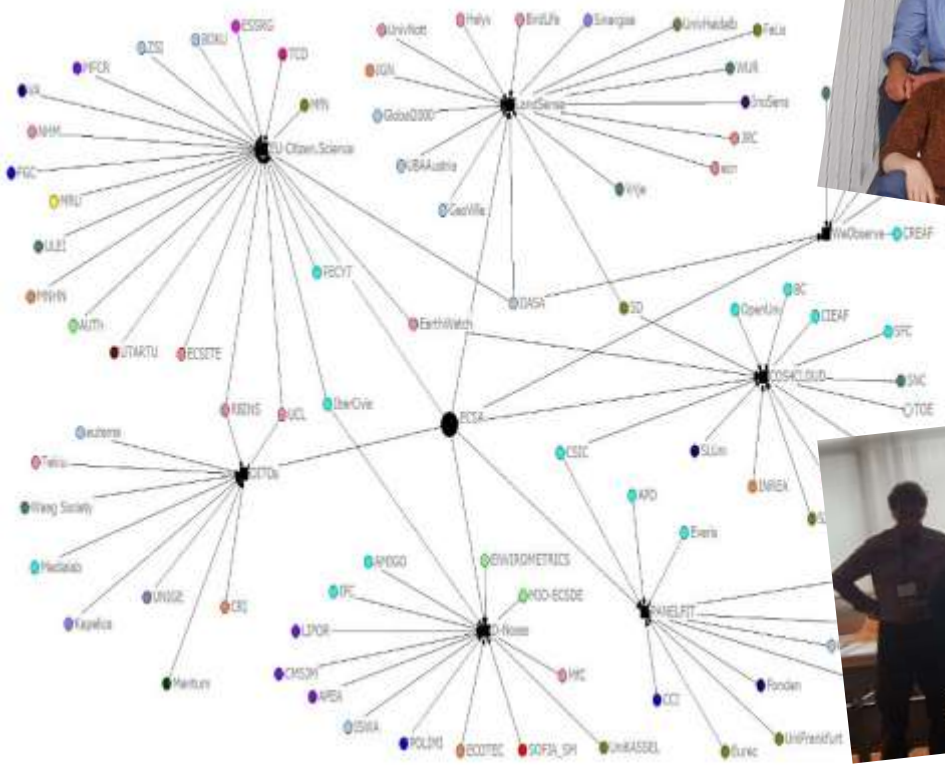
EU-Citizen.Science

The Platform for Sharing, Initiating, and Learning Citizen Science in Europe



Reflection about citizen science

CITIZEN SCIENCE COST ACTION



ecsa European Citizen Science Association

eu-citizen.science

https://cs-eu.net/

cost EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

Funded by the Horizon 2020 Framework Programme of the European Union

CITIZEN SCIENCE COST ACTION

- 277 registered scientists from 39 countries at https://cs-eu.net/
- 515 registered participants in e-Cost
- 27 workshops
- 4 training schools
- 27 STSMs
- 32 ITC Grants
- > 50 papers and reports

cost EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

Funded by the Horizon 2020 Framework Programme of the European Union

> 100 authors, 32 countries

- **Introduction / Definitions**
- **Epistemic contributions to different disciplines**
- **Societal impact**
- **Practice**

https://www.springer.com/de/book/9783030582777

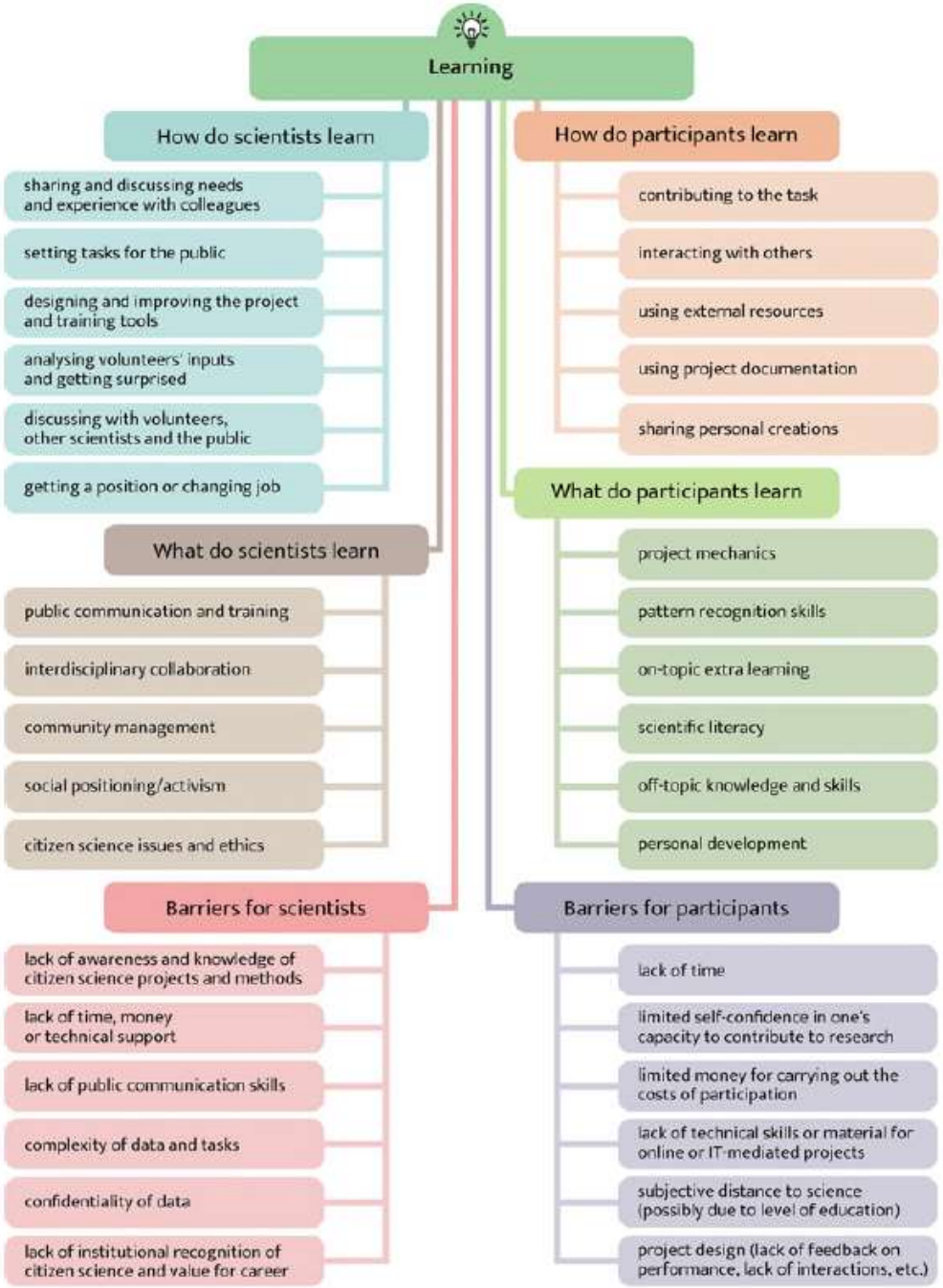


Fig. 15.4 Extended thematic map of volunteers' learning

ww.springer.com/de/book/9783030582777

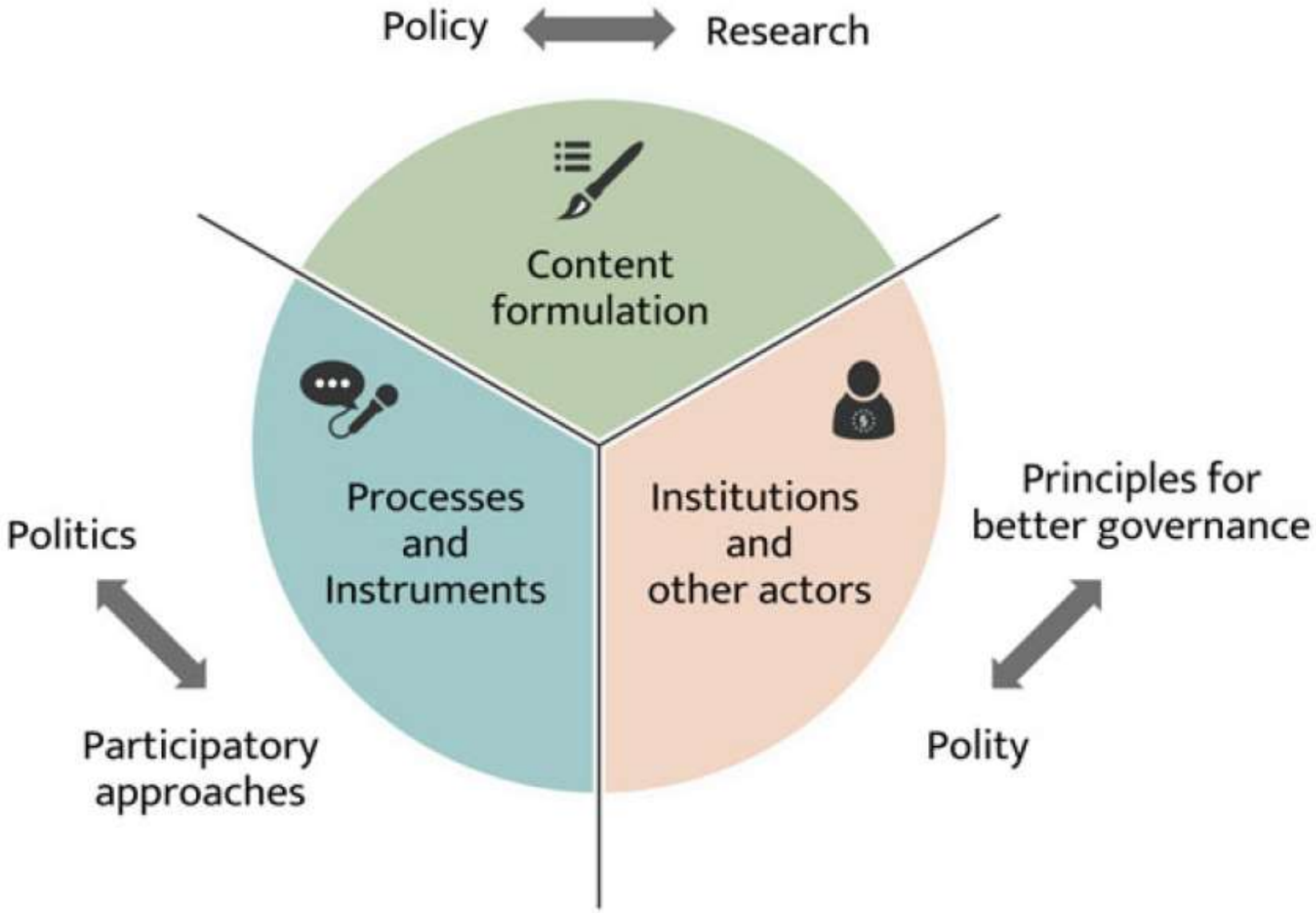


Fig. 18.1 The interdependent facets of citizen science (right) and policymaking (left) – mutual impacts

Schade et al., 2021; https://www.springer.com/de/book/9783030582777

What is next?

Citizen Science and the SDGs

CITIZEN SCIENCE SDG CONFERENCE

14.–15.10.2020

Knowledge for Change:
A decade of Citizen Science (2020–2030) in support of the Sustainable Development Goals

Declaration

https://www.cs-sdg-conference.berlin/en/

Citizen Science and Open Science

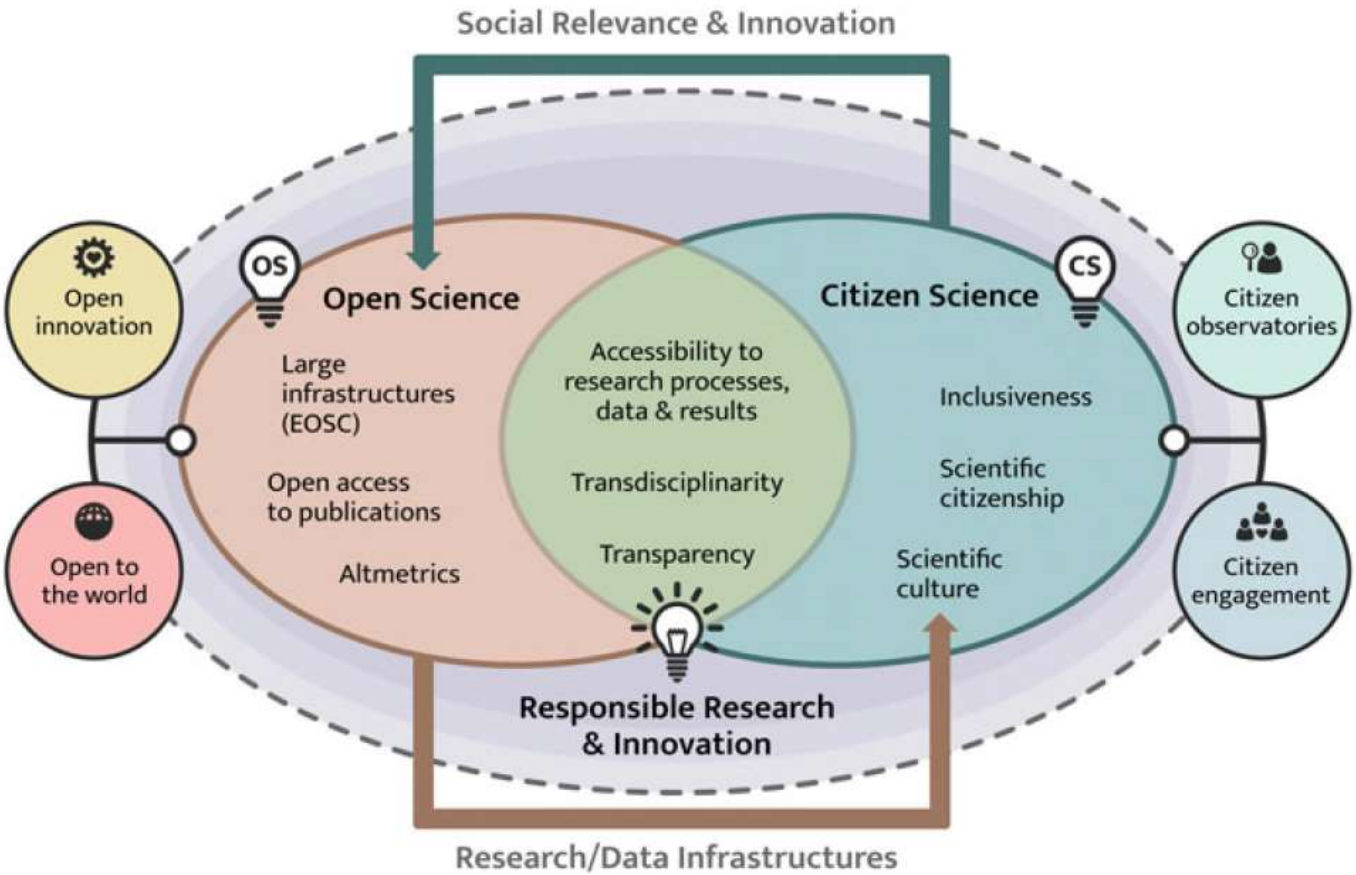


Fig. 18.2 The relationship between citizen science and open science. (Based on Vohland and Göbel (2017), modified)

Schade et al., 2021; https://www.springer.com/de/book/9783030582777

Citizen Science and Open Science

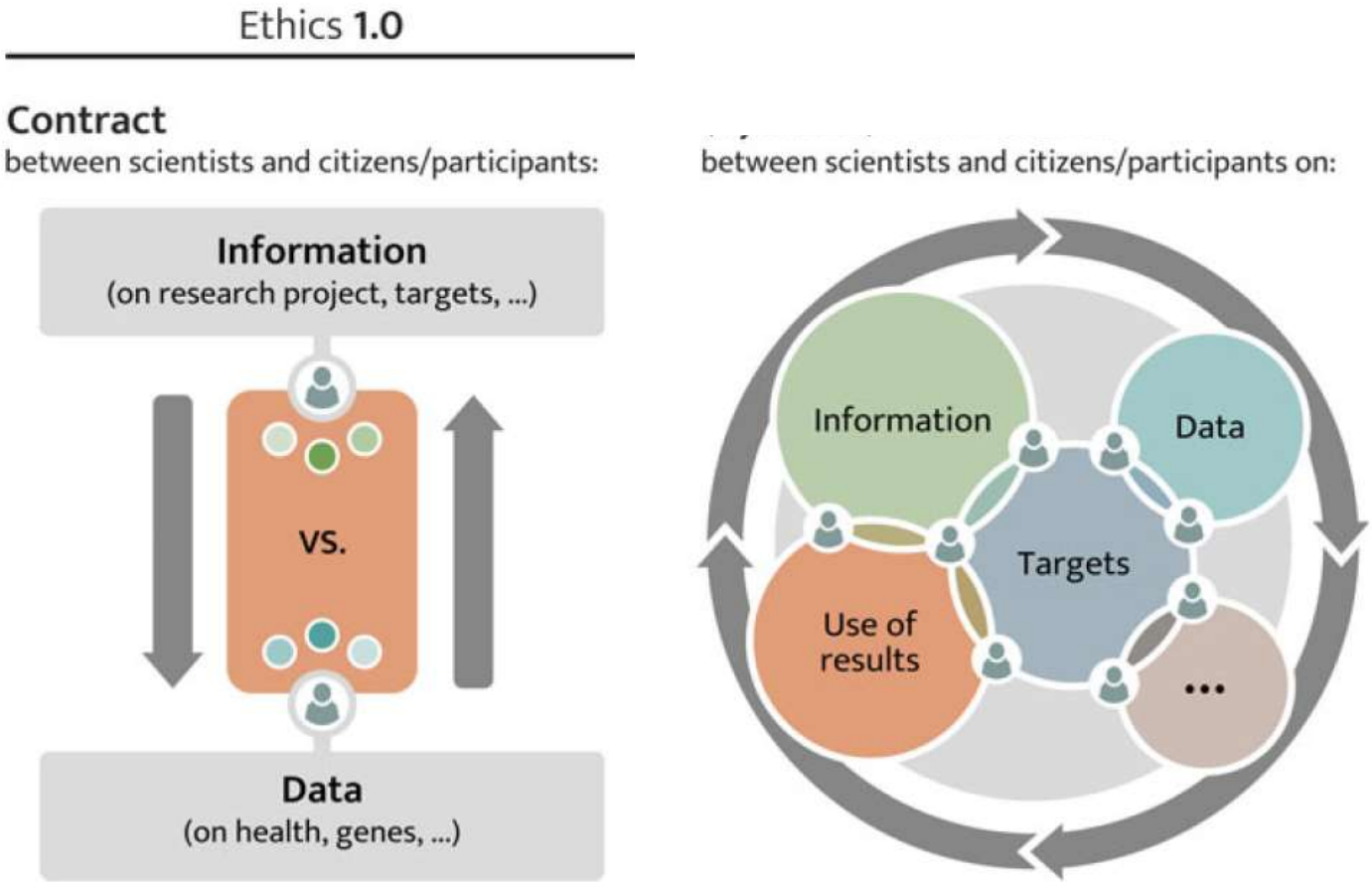


Fig. 20.1 The difference between informed consent in research ethics 1.0 and 2.0. Whilst, traditionally, informed consent is understood as a kind of contract, in ethics 2.0, there is a continuous – dynamic – interdependence between initiating researchers and participating citizens

Tauginienė et et al., 2021; https://www.springer.com/de/book/9783

Citizen Science and AI

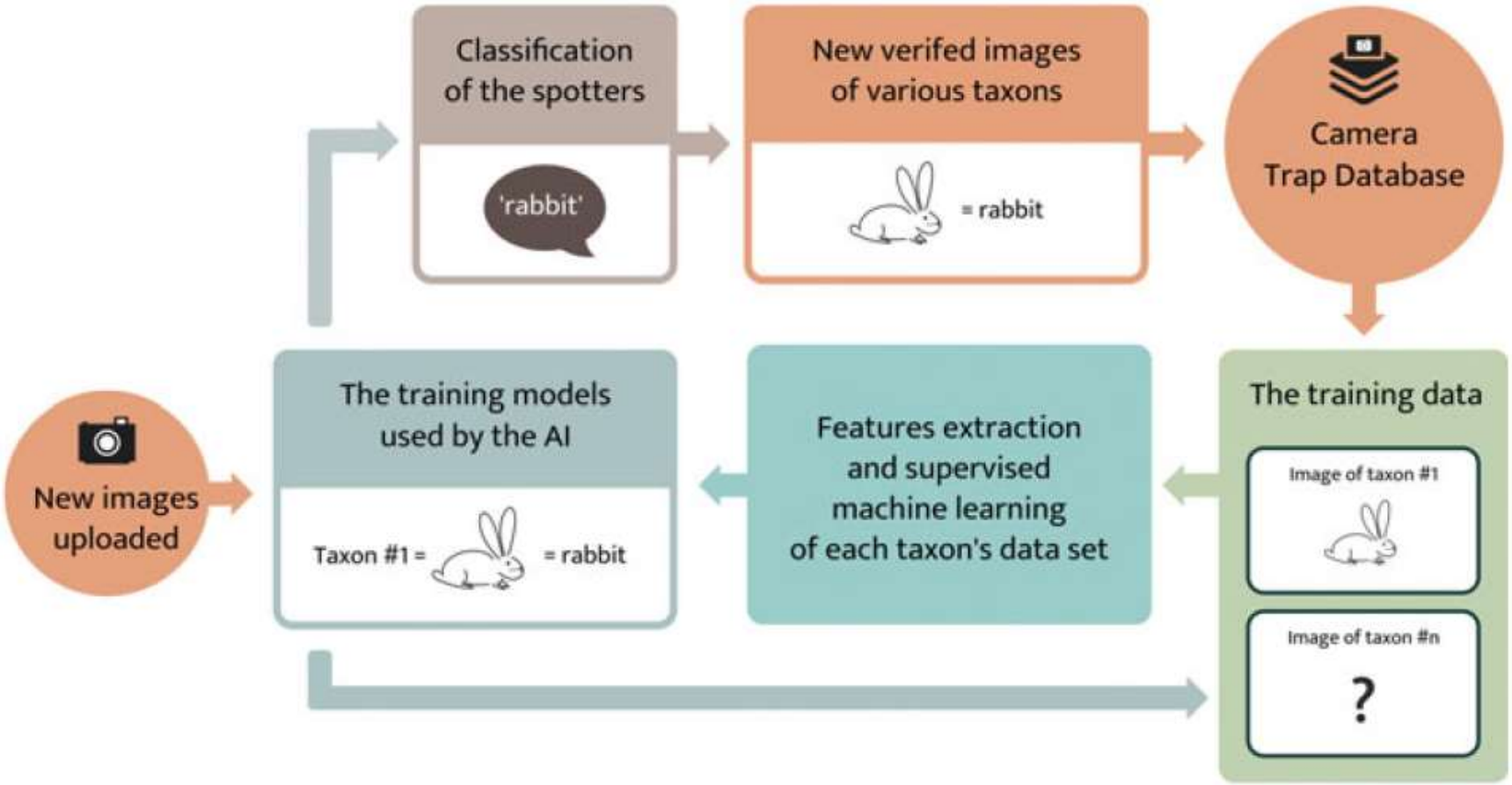


Fig. 10.1 The interaction between spotters and ML processes during image classification within the camera trap database

Franzen et al., 2021; https://www.springer.com/de/book/9783030582777

Thank you very much for your attention!