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Open Science Day 2025

Open and GDPR-Compliant Science

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University Library Mannheim

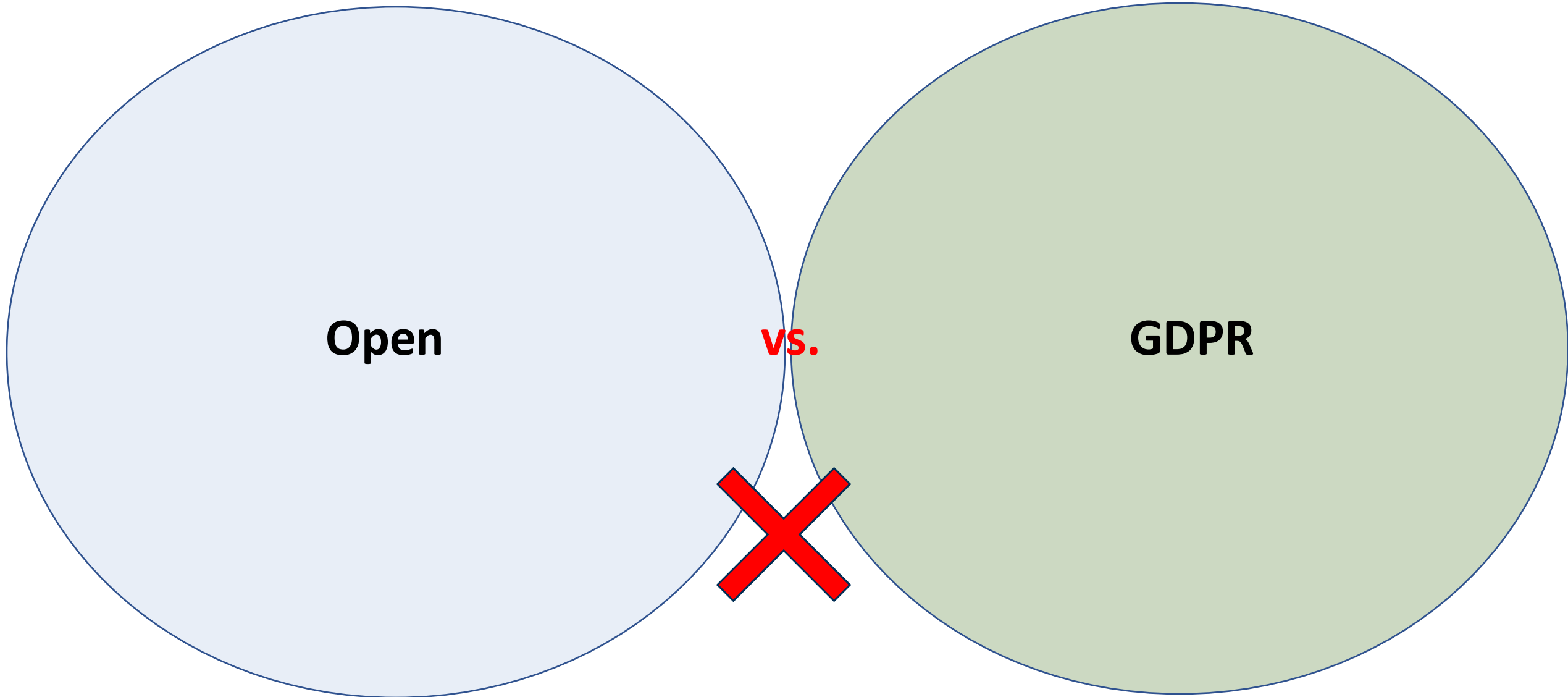


28 October 2025

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Open Science vs. GDPR-Compliant?





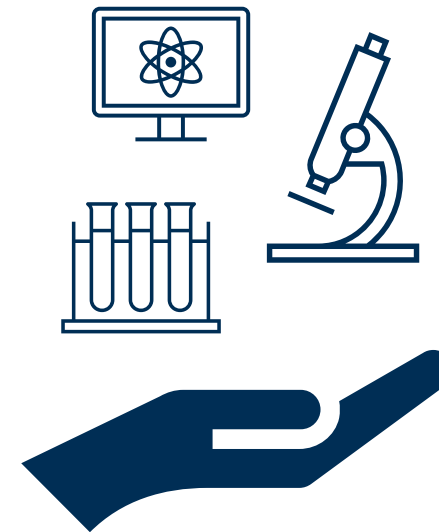
Open Science

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Open Science encompasses:

- Open Research (Methodology, Peer Review)
- Open Access
- FAIR and Open Data
- Open Research Software and Code
- Open Educational Resources (OER)
- ...



**Transparency, scrutiny,
critique and reproducibility**



to reinforce the rigor of scientific results, enhance the positive impact of science on society and increase society's ability to solve complex interconnected problems.

Equality of opportunities



to ensure that all scientists and those with an interest in science have equal opportunity to access, contribute to and benefit from science, regardless of origin or circumstance.

**Responsibility, respect and
accountability**



to be responsible for and aware of public accountability, potential conflicts of interest, intellectual integrity and the possible social or ecological consequences of research activities.

**Collaboration, participation
and inclusion**



to ensure that scientific collaborations transcend the boundaries of geography, language and resources, and include knowledge from marginalized communities to solve problems of great social importance.

Flexibility



to acknowledge that there is no one-size-fits-all way to practice open science and to encourage different pathways to practicing it while upholding the core values.

Sustainability



to be as efficient and impactful as possible by building on long-term practices, services, infrastructures and funding models to ensure participation of scientists from less-privileged countries or institutions.

Scientific Responsibility

Research is an essential basis for progress. The prerequisite for this is the freedom of research, which is particularly protected by the Basic Law/Constitution:

Art. 5 (3) of the Constitution of Federal Republic of Germany

“Arts and sciences, research and teaching shall be free. The freedom of teaching shall not release any person from allegiance to the constitution.”

Scientific Freedom and Scientific Responsibility, DFG



But scientific freedom and scientific responsibility go hand in hand:
Science needs freedom - freedom entails responsibility!

There is a general responsibility of science for guaranteeing human rights and research integrity.

European Level: European Code of Conduct for Research Integrity



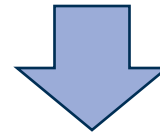
National Level: DFG* Guidelines for Safeguarding Good Research Practice, Scientific Freedom and Scientific Responsibility

*Deutsche Forschungsgemeinschaft = German Research Foundation

Guideline 10:

Researchers adopt a **responsible** approach to the constitutionally guaranteed freedom of research. They comply with **rights and obligations**, particularly those arising from **legal requirements and contracts with third parties**, and where necessary seek approvals and ethics statements and present these when required. With regard to research projects, the **potential consequences of the research** should be evaluated in detail and **the ethical aspects should be assessed**. The legal framework of a research project includes documented agreements on usage rights relating to data and results generated by the project.

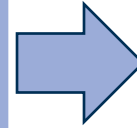
**DFG Guidelines for Safeguarding
Good Research Practice**



Legal (statutory and contractual) and ethical obligations

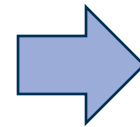
Ethical rules/principles = values, customs, habits of social coexistence

Note: not everything that is ethically relevant has to be legally regulated and not all legal regulation is ethically motivated



Data ethical requirements must be observed all the more if the handling of research data is not legally regulated, eg. anonymous data, data of dead persons, company data.

Academic freedom requires a high degree of ethical responsibility



It is crucial to avoid such behaviour that leads to significant harm to humans, animals, the environment, eg. misuse of research, unethical use of other people's research results, use of data without consent.

Foresighted responsibility

Respect for the rights of the parties involved

Data use and data sharing for the public good

Fit-for-purpose data quality

Risk-adequate level of information security

Interest-oriented transparency

Guiding principle:
"As open as possible, as closed as necessary"

Data Ethics Commission

Identifying and addressing ethics issues in your research

Higher ethics risks if the research involves:

- processing of ‘special categories’ of personal data (‘sensitive data’);
- processing of personal data concerning children, vulnerable people or people who have not given their consent to participate in the research;
- complex processing operations and/or the processing of personal data on a large scale and/or systematic monitoring of a publicly accessible area on a large scale;
- data processing techniques that are invasive and deemed to pose a risk to the rights and freedoms of research participants, or techniques that are vulnerable to misuse;
- collecting data outside the EU or transferring personal data collected in the EU to entities in non-EU countries.

Data ethics and data protection are very closely linked.

GDPR

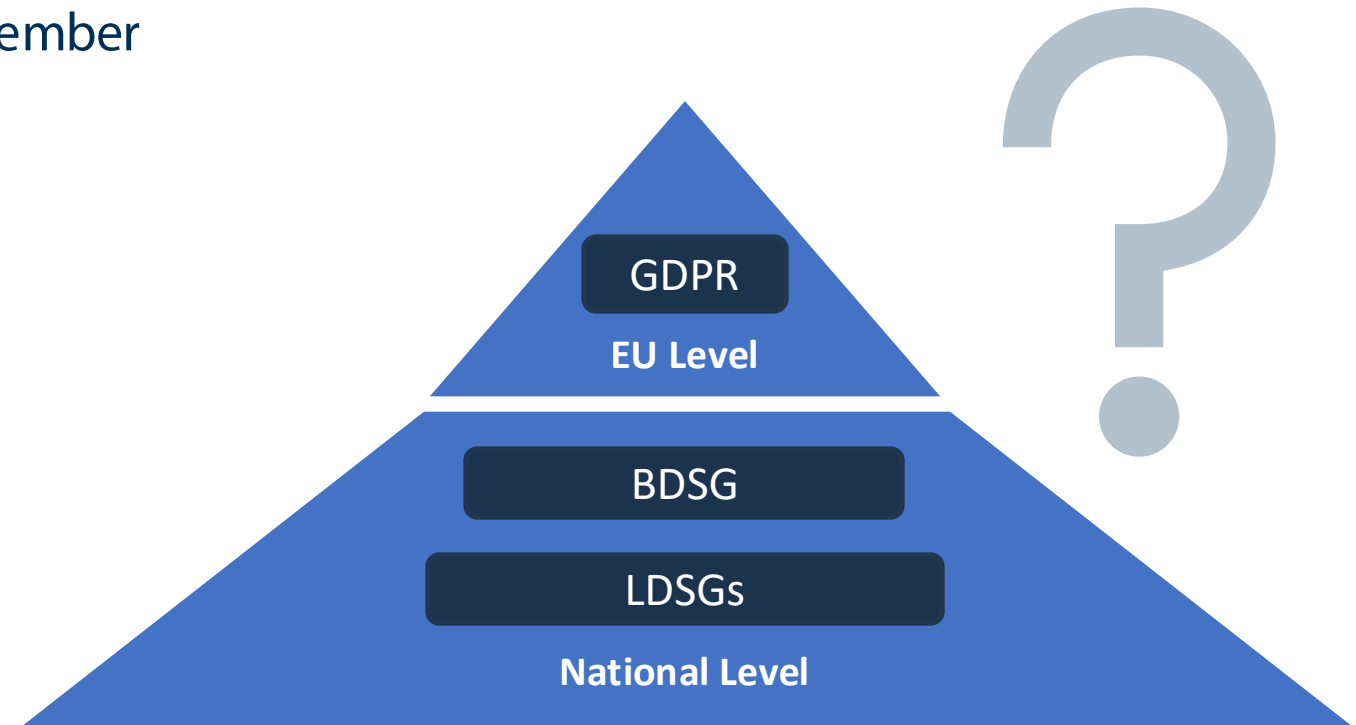
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What is the GDPR?

➤ The General Data Protection Regulation (GDPR) has been **directly** applicable in all EU member states since May 25, 2018.

➤ The GDPR **takes precedence** over national data protection laws.



Why do we need data protection?

What is data protection?

- Data protection generally refers to the "**protection of personal data**".

Why do we need data protection?

- Data protection is important so that **data misuse** can be avoided.



- **Data Protection**

GDPR, Recital 1

...“The protection of natural persons in relation to the processing of personal data is a fundamental right.”

- **Personal Data**

Art. 4 (1) GDPR

“personal data’ means any information relating to an identified or identifiable natural person[...].”



- **Personal Data**

Art. 4 (1) GDPR

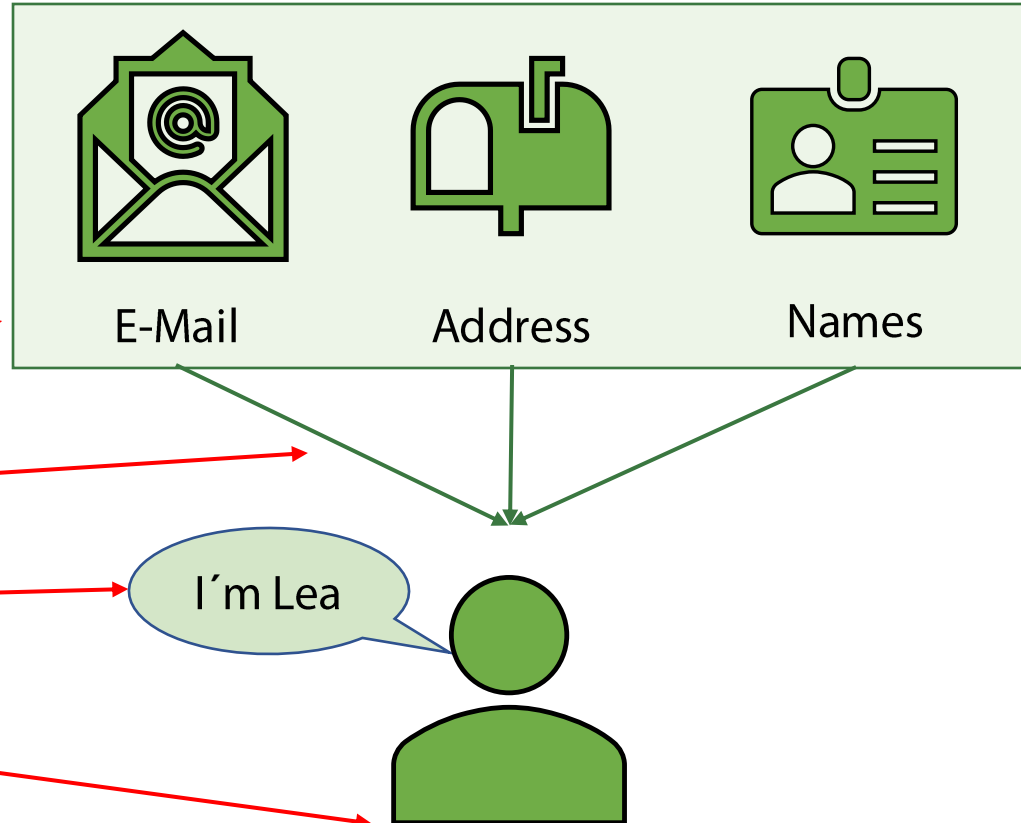
“personal data’ means

any **information**

relating to an identified or

identifiable

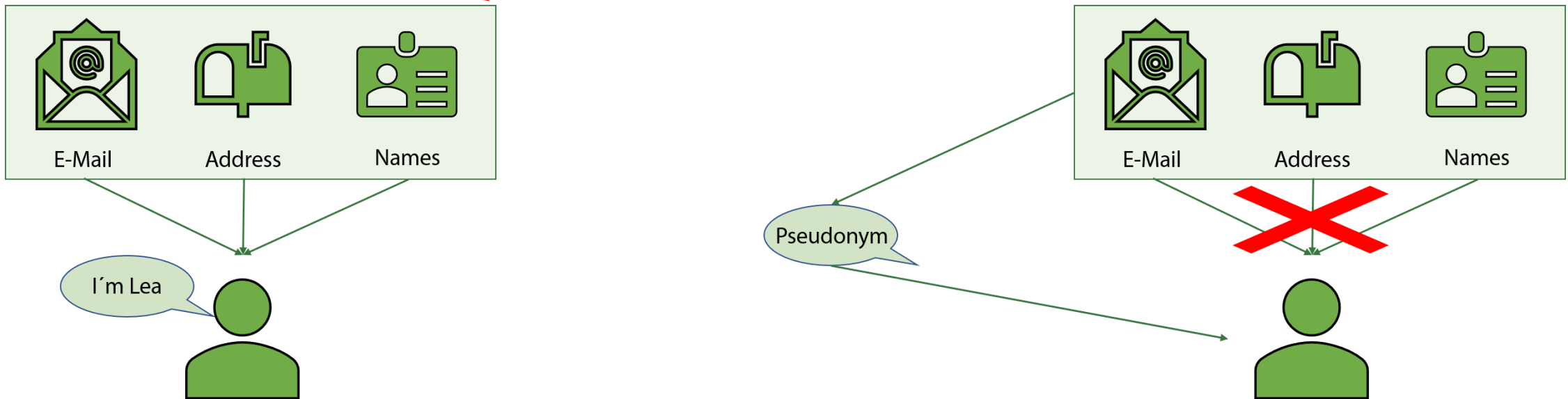
natural person[...].”



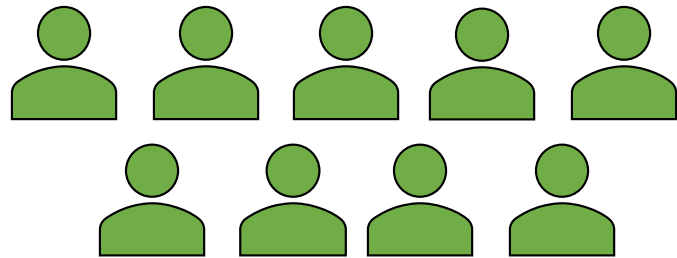
- **Identifiability**

Art. 4 (1) GDPR

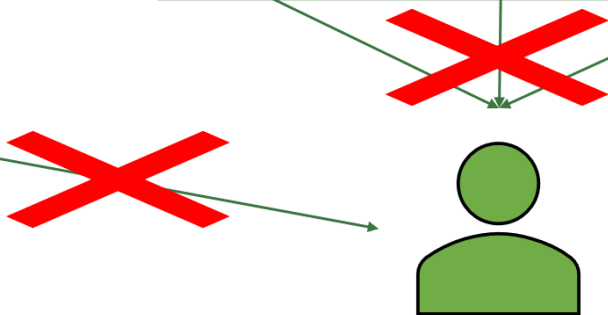
“an identifiable natural person is one who can be identified, **directly** or **indirectly** [...]”



• Anonymised Data



Pseudonym



• Pseudonymised Data



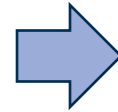
Pseudonym



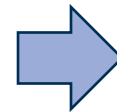
Personal Data

Art. 4 (1) GDPR

- ✓ Information
- ✓ Identifiability
- ✓ Natural person
- ✓ Personal reference



The GDPR is applicable.



Art. 6 (1) GDPR

A legal basis for the processing of personal data is always required!

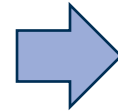
Legal bases in Art. 6 (1) GDPR:

- Consent
- Contractual relationship
- Compliance with a legal obligation
- Protection of vital interests of the data subject
- Task carried out in the public interest
- Legitimate interests pursued by the controller

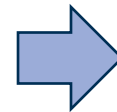
Personal Data

Art. 4 (1) GDPR

- ✓ Information
- ✓ Identifiability
- ✓ Natural person
- ✓ Personal reference



The GDPR is applicable.



Art. 6 (1) GDPR

A legal basis is required for the processing of personal data

Controllers are the ones responsible for the processing of personal data and decide on the purpose and essential means of processing.

Legal bases in Art. 6 (1) GDPR:

- Consent
- Contractual relationship
- Compliance with a legal obligation
- Protection of vital interests of the data subject
- Task carried out in the public interest
- Legitimate interests pursued by the controller

Data Protection Principles

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- **The 7 Principles of GDPR**

Art. 5 GDPR

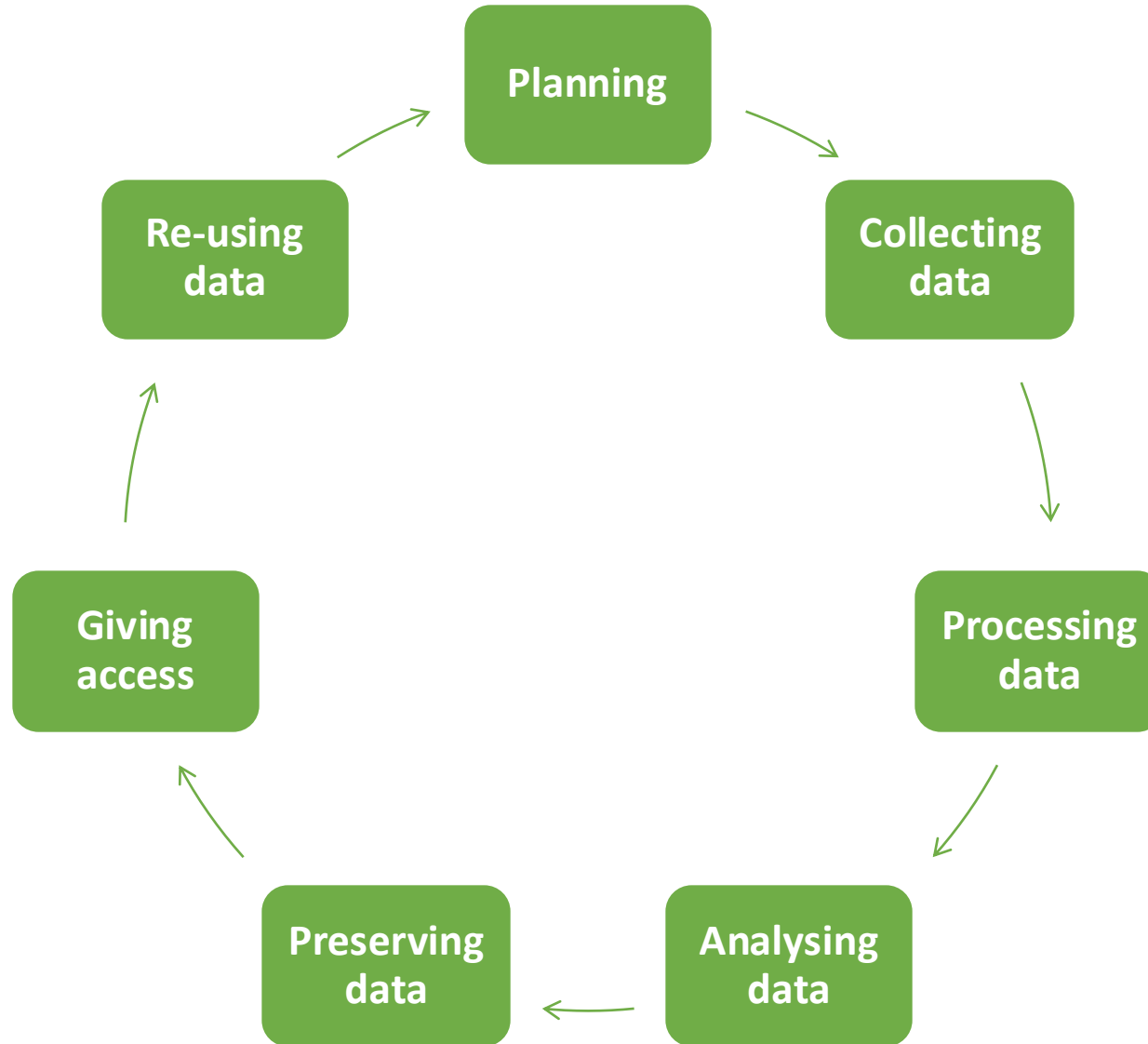
“Personal data shall be[...]”

- Lawfulness, Fairness and Transparency
- Purpose Limitation
- Data Minimization
- Accuracy
- Storage Limitation
- Integrity and Confidentiality
- Accountability



How to comply with the Principles?

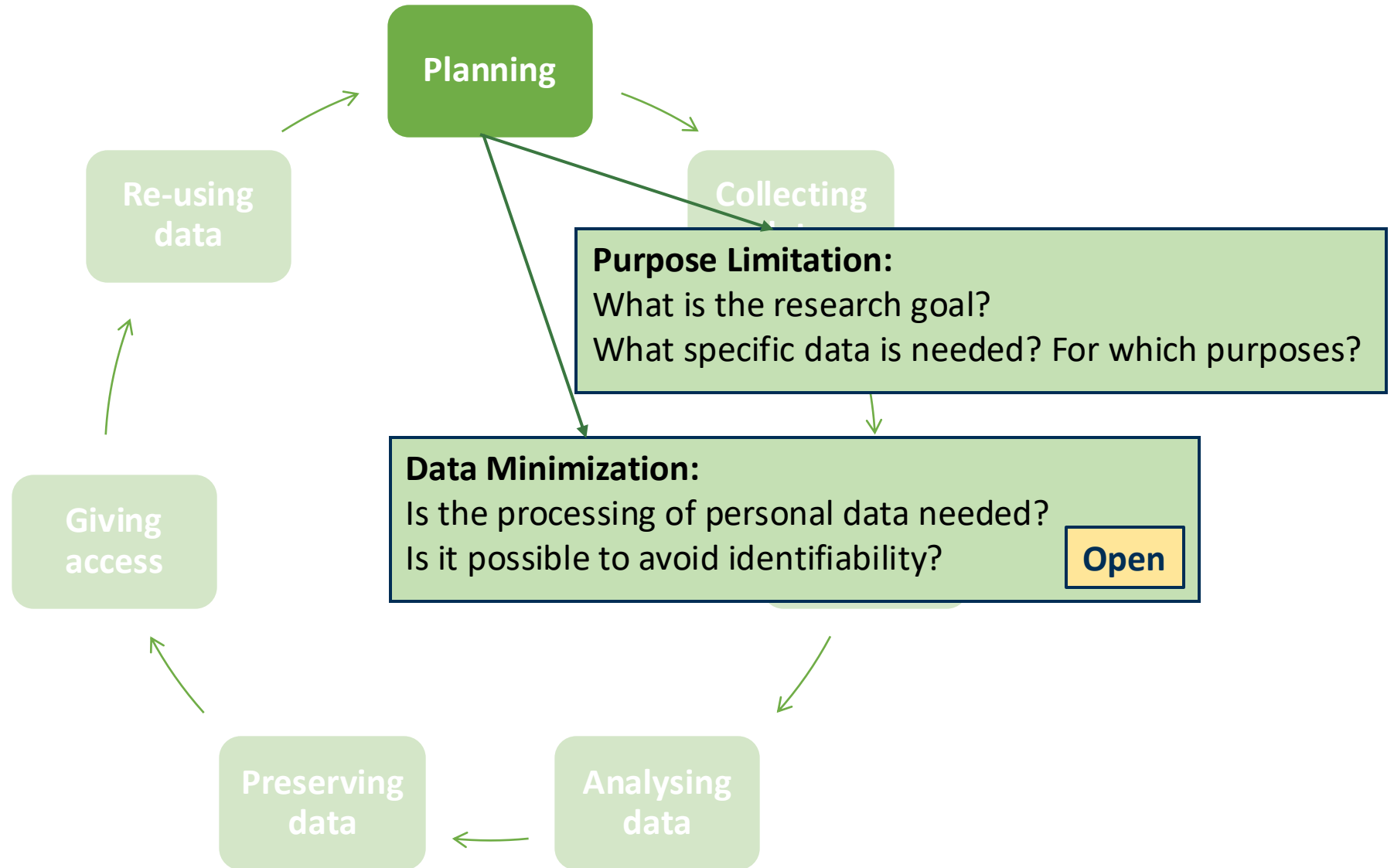
- Research Data Lifecycle



Where does Open Science play a role?

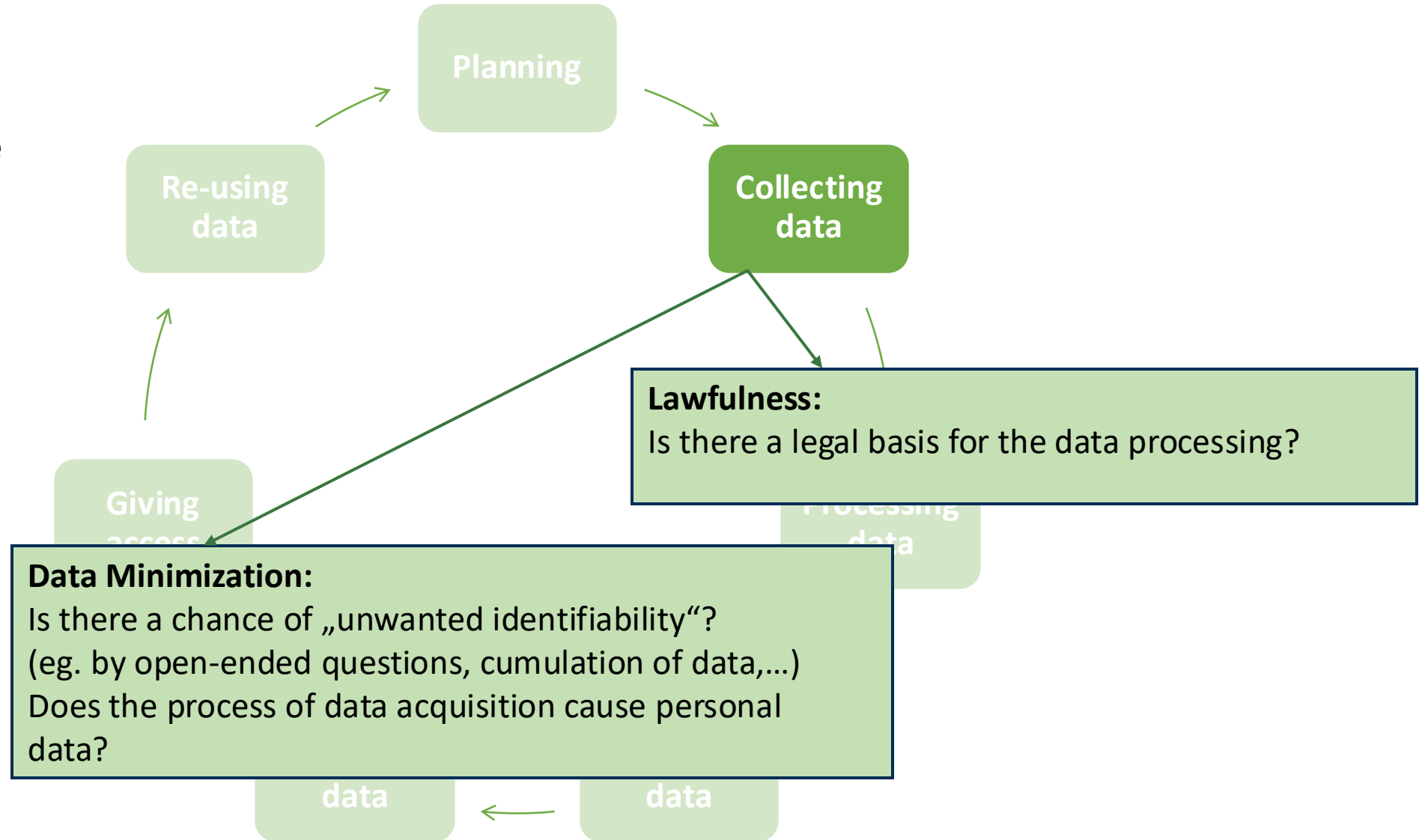
How to comply with the Principles?

- Research Data Lifecycle



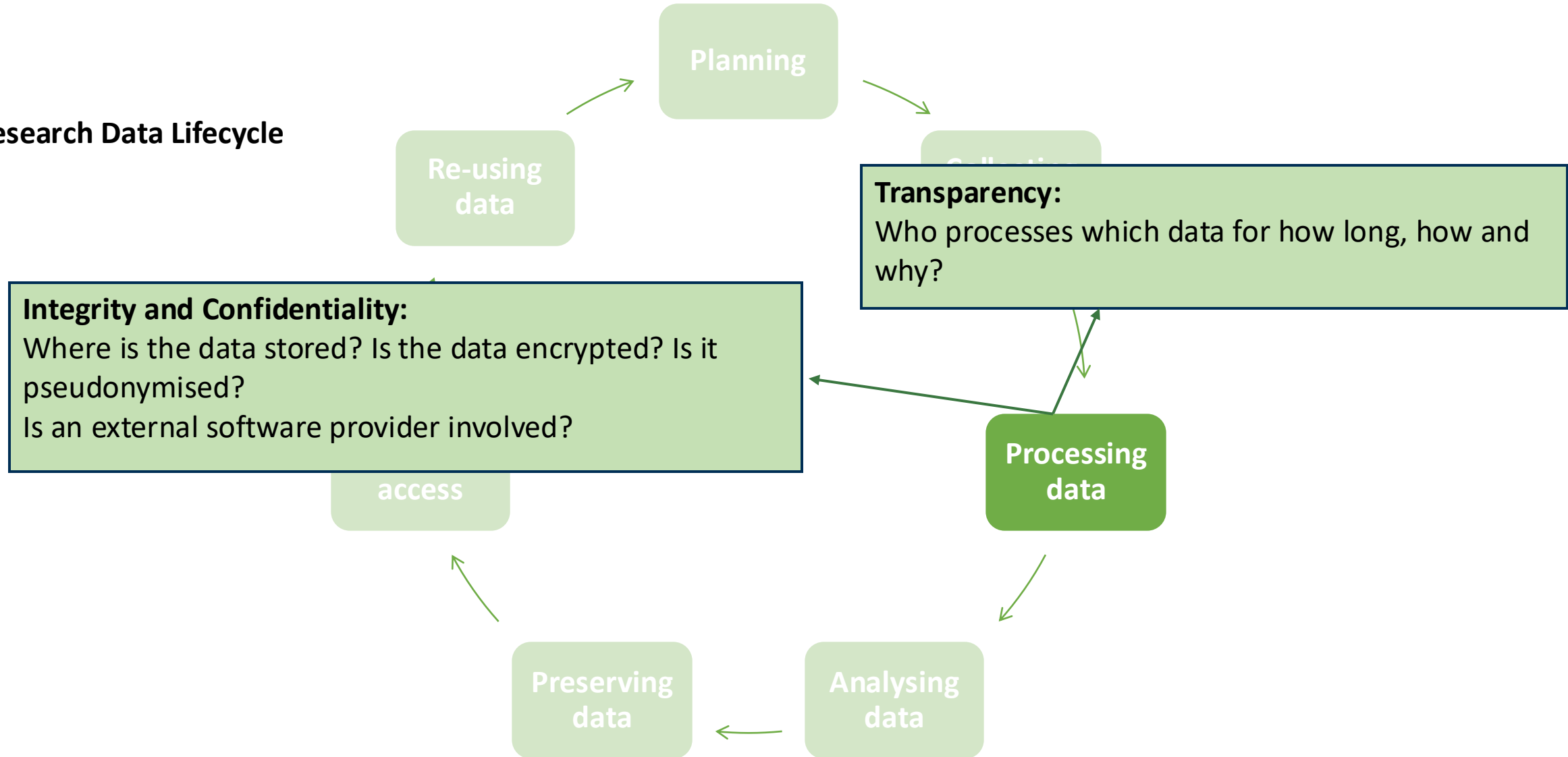
How to comply with the Principles?

- Research Data Lifecycle



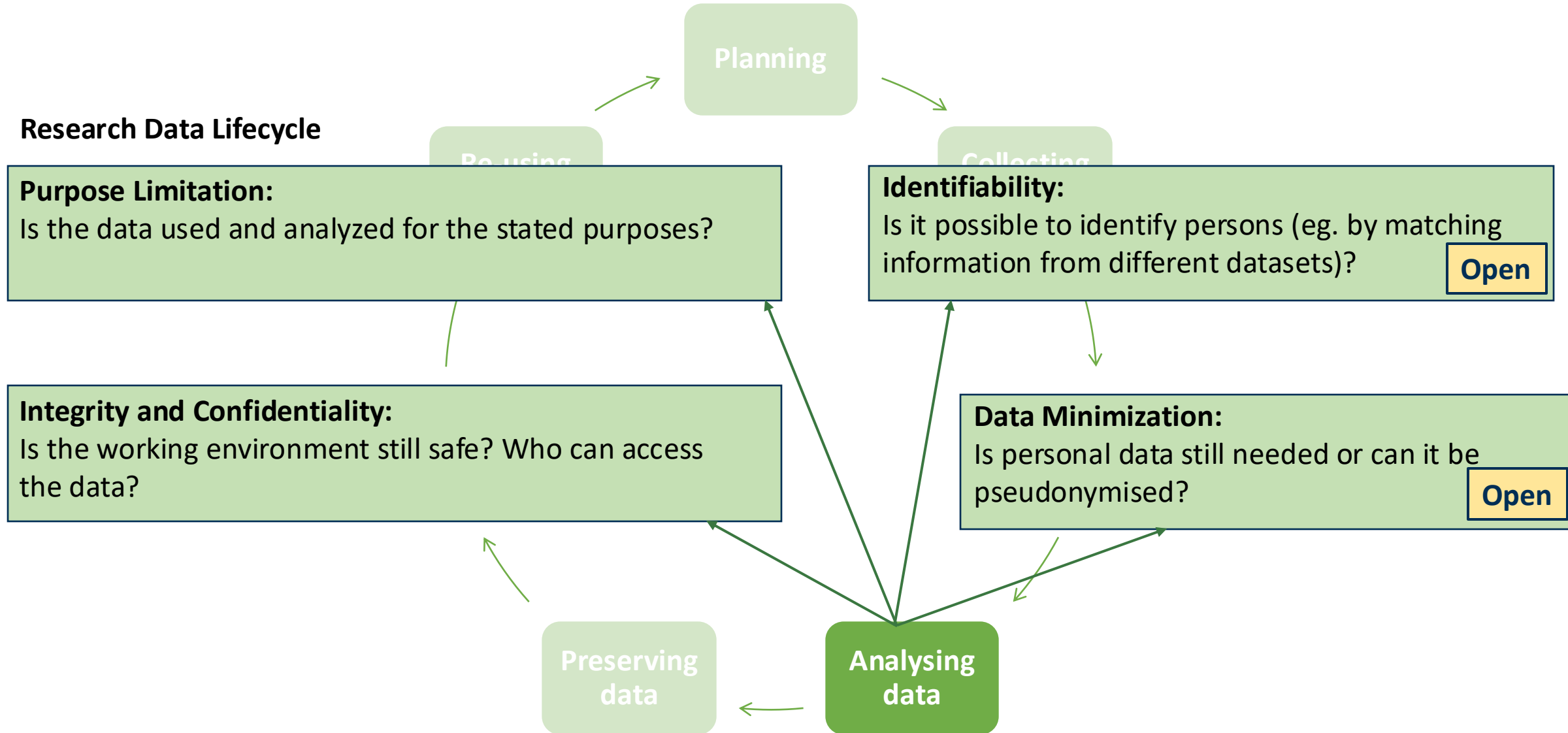
How to comply with the Principles?

- Research Data Lifecycle



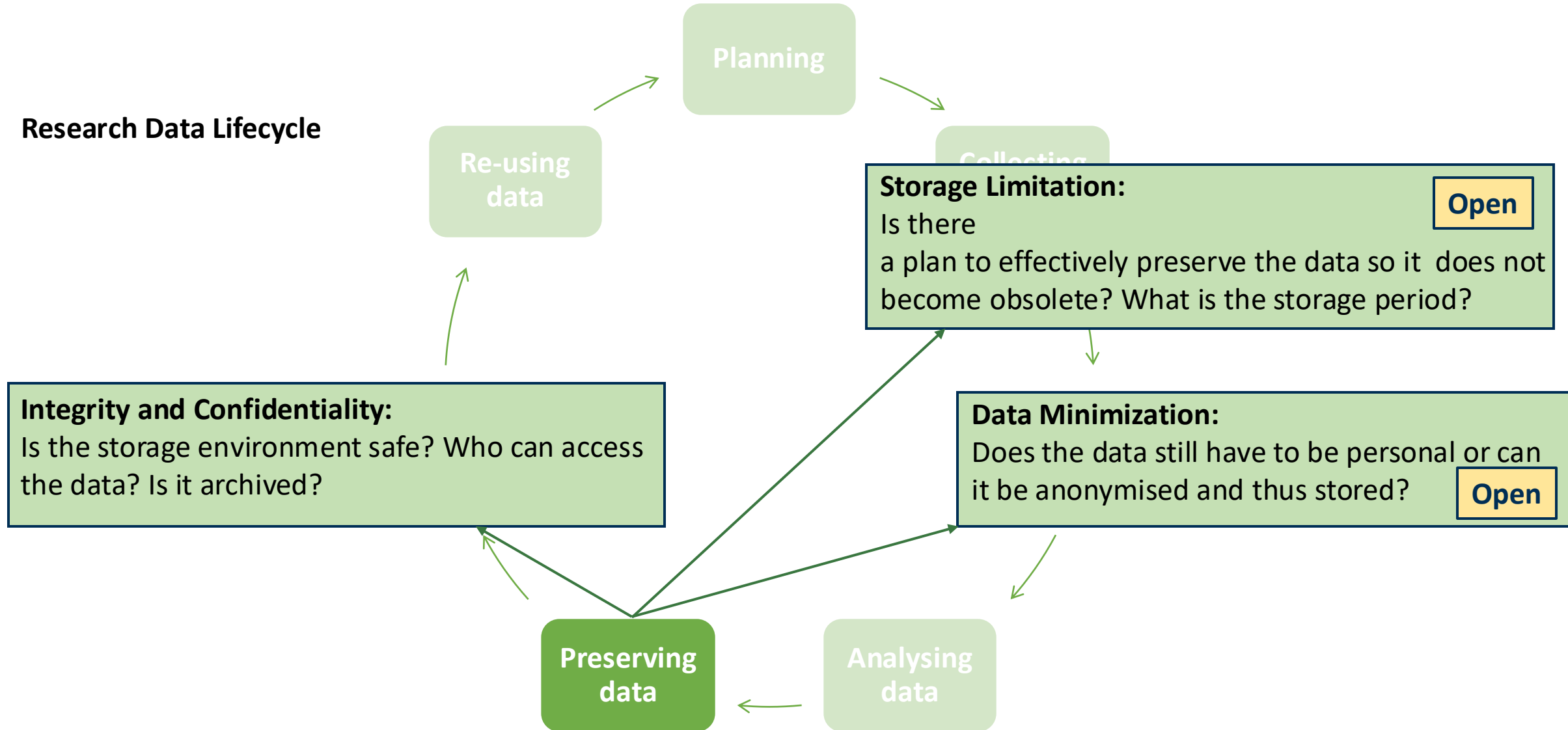
How to comply with the Principles?

- Research Data Lifecycle



How to comply with the Principles?


- Research Data Lifecycle

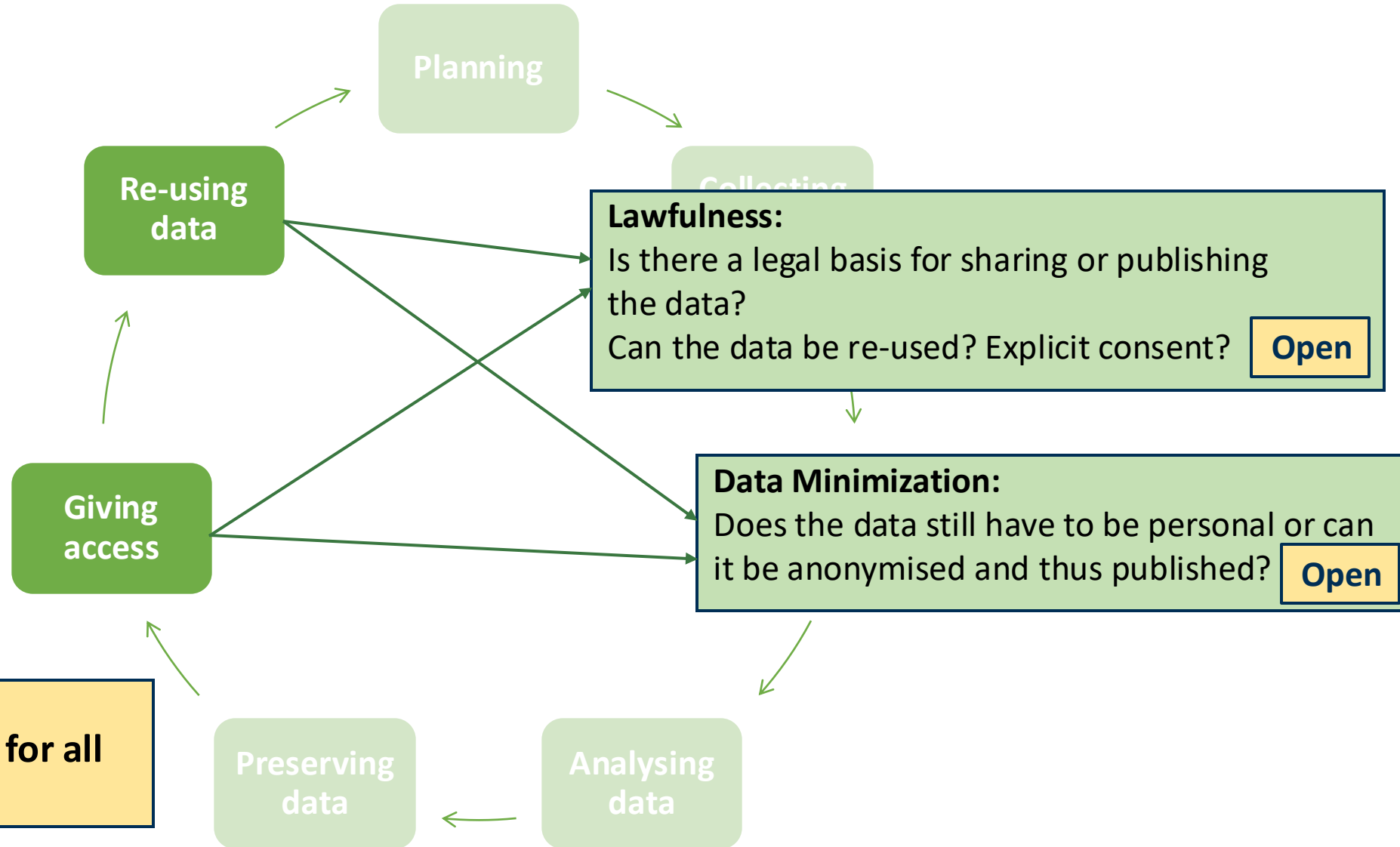


How to comply with the Principles?

- Research Data Lifecycle

Open Science and specifically Open Data should follow the FAIR principles:
making research data **F**indable, **A**ccessible, **I**nteroperable, and **R**eusable.

FAIR  **Open for all**



Open
and
FAIR

Data
Protection
measures

FINDABLE

- Pseudonymisation
- Data aggregation
- Non personal metadata

ACCESSIBLE

- Restricted access
- Data access committee
- Encryption
- Access rights

Data Access Committees comprise of one or more individuals (or data controllers) that review data access requests and make decisions on who can access sensitive data deposited at a repositiorium.

- metadata scemas
- Standardised terms
- Data Protection Impact Assessment

USABLE

- Consent
- DUO & Provenance
- Data use agreements & licenses
- EU Standard Contractual Clauses

The actual measures will always depend on the specific project and data!

Open
and
FAIR

Data
Protection
measures

- Pseudonymisation
- Data aggregation
- Non personal metadata

A Data Protection Impact Assessment (DPIA) is required under the GDPR any time you begin a new project that is likely to involve “a high risk” to other people’s personal information (Art. 35 GDPR).

- Data access committee
- Encryption
- Access rights

INTEROPERABLE

- Compatible metadata schemas
- Standardised terms
- Data Protection Impact Assessment

REUSABLE

- Consent
- DUO & Provenance
- Data use agreements & licenses
- EU Standard Contractual Clauses

Open and GDPR-Compliant – Overview & Examples

Open
and
FAIR

Data
Protection
measures

FINDABLE

- Pseudonymisation
- Data aggregation
- Non personal metadata

ACCESSIBLE

- Restricted access
- Data access
- compatible
- EU
-

The Data Use Ontology (DUO) provides a standard set of terms that can be used to tag datasets with use permissions, aiding researchers in discovering data.

EU Standard Contractual Clauses (SCCs), model contract clauses “pre-approved” by the European Commission, ensure appropriate data protection safeguards and serve as a ground for data transfers from the EU to third countries.

REUSABLE

- Consent
- DUO & Provenance
- Data use agreements & licenses
- EU Standard Contractual Clauses

Main Take Aways

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➤ Researchers should:

- Understand the basic **principles of Open Science**.
- Keep in mind that **academic freedom** requires a high degree of **ethical responsibility**.
- Mind the **data ethics principles** as listed by the Data Ethics Commission in Germany.
- Follow the guiding principle for data: "**As open as possible, as closed as necessary**".
- Be aware that **data ethics and data protection** are very closely **linked**.



- GDPR has set out to **balance research with the rights and interests of individuals.**
- To **ensure this balance** the GDPR sets 7 Data Protection or GDPR principles.
- **Following the 7 Data Protection Principles**, researchers should:
 - Make sure they have a legal basis for collecting and processing personal data
 - Avoid personal data, if it is not needed
 - Process, analyze and store personal data in a safe environment
 - Be aware of unwanted identifiability
 - Regularly check if the data can be pseudonymised or anonymised



- ✓ Ethics
- ✓ Data Protection
- ✓ FAIR Principles

- Intellectual property and Copyright Law
 - Licenses
- Contractual obligations
 - Rights of the publishers
 - Funding
- ...



Before sharing any material:

- Get ethics/DPO approvals, if needed, and ensure consent supports sharing.
- Remove or properly handle personal data; consider possible re-identification.
- Check the ownership and any third-party rights; verify license compatibility for sharing.
- Choose and apply appropriate open licenses (for data, code, text, images etc.).
- Confirm funder/publisher mandates and embargoes.
- Select a suitable repository and prepare metadata/README.
- Consider export control/sanctions if sharing internationally.
- ...

Tools and Resources

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Is privacy law non-transparent and incomprehensible?
Not necessarily.



Applicability of the GDPR

iVA1 shows you if the General Data Protection Regulation (GDPR) applies to your research data.

[Start here \(DE\)](#)

[Start here \(ENG\)](#)



Consent as legal basis

iVA2 helps you identify what you have to keep in mind to get a lawful consent for data processing.

[Start here \(DE\)](#)

[Start here \(ENG\)](#)



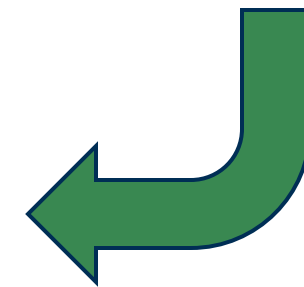
Research relevant legal bases

iVA3 guides you through the process of determining whether data processing in the context of your research project meets a federal or state legal basis.

[Start here \(DE\)](#)

An **online tool** to guide you through key questions with examples and clear definitions, helping you navigate **legal options for using data**.

iVA offers **three step-by-step modules**, each focusing on a specific data protection challenge researchers encounter.



<https://www.berd-nfdi.de/legal-questions/>

The FAIR Guiding Principles for scientific data management and stewardship:

<https://www.nature.com/articles/sdata201618>

NFDI Factsheet series “FAIR-Principles and Data Protection. How can FAIR data management be reconciled with the General Data Protection Regulation?” (in German)

- Factsheet 1 “Consent: FAIR and GDPR-compliant”: <https://zenodo.org/records/15912755>
- Factsheet 2 “Methods for FAIR and GDPR-compliant handling of personal data”: <https://zenodo.org/records/15916957>
- Factsheet 3 “Data Linkage: FAIR and GDPR-compliant”: <https://zenodo.org/records/15917014>

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Overview of iVA: <https://www.berd-nfdi.de/legal-questions/>

- iVA1: <https://www.berd-nfdi.de/iva1/>
- iVA2: <https://www.berd-nfdi.de/iva2/>
- iVA3: <https://www.berd-nfdi.de/iva3/> (in German)

Data Protection Impact Assessment: <https://gdpr.eu/data-protection-impact-assessment-template/>

EU Standard Contractual Clauses: https://commission.europa.eu/law/law-topic/data-protection/international-dimension-data-protection/standard-contractual-clauses-scc_en

Contract Template Data Use Agreement: <https://zenodo.org/records/10409864>

Contract Template Data Provision Agreement: <https://zenodo.org/records/10406480>

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Thank you!

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