Meta-Study – Open Research Data in Research Collaborations between Higher Education Institutions and the Private Sector

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This document sometimes uses masculine or feminine form of words to describe groups of people. In these cases, all members of the group are always meant, regardless of their gender.

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Executive summary

How can scientific openness and economic data protection be reconciled? This question is at the heart of this meta-study, which systematically examines the legal, organisational and technical framework conditions for handling research data in public-private collaborations. The aim is to create a sound basis for guidelines that enable scientific traceability while respecting the legitimate protection interests of private partners.

Open Research Data (ORD) follows the idea of transparent, verifiable and accessible research – in accordance with the FAIR principles: Findable, Accessible, Interoperable, Reusable. For companies, however, research data often constitutes a strategic asset that secures competitive advantages and should therefore be exploited economically. These interests are in a conflict with each other, which manifests in many collaborative projects – for example, when data is not disclosed for fear of loss of control and potential access by competitors.

The study follows the Swiss guiding principle: **"as open as possible, as protected as necessary"** (swissuniversities, 2021). It aims to provide practical guidance for the development of future guidelines that meet both scientific and economic requirements.

Key questions addressed by the study:

1. What structural tensions exist between ORD objectives and private sector interests?
2. How can data classification and governance be designed to best combine openness and protection?
3. What institutional framework conditions are required to promote trust, legal certainty and innovation?

Approach and methodology:
The meta-study is based on a qualitative analysis of relevant scientific publications, policies and international standards (CH, EU, USA). The focus is on the relevance for cooperative data practices since the introduction of the FAIR principles and the GDPR. Empirical validation will be carried out in a separate work package.

Key findings:

- ORD and shared data must be clearly distinguished. While ORD aims at open accessibility, shared data is subject to contractual control, as is necessary in many cooperation projects.

- The categorisation of data is essential: personal, pseudonymised, commercially sensitive or open – depending on the need for protection and legal assessment.
- Cooperation often involves structural conflicts: differing objectives, data protection requirements, publication timelines and a lack of institutional coordination often make it difficult to handle data in a meaningful way.
- Technical and legal standards – such as data management plans (DMPs), access restrictions, repositories and licensing models – are not yet uniformly established in Switzerland. Higher education institutions often lack roles such as data stewards and binding decision-making processes.

Systematic solution: archetype matrix:
A key tool in the study are the archetypes (with a focus on Switzerland), which classify public-private partnerships according to protection requirements and degree of openness. These archetypes represent prototypical constellations – from fully open environmental projects to highly protected health data platforms. These heuristic models serve as a basis for decision-making for funding institutions, project managers and governance bodies.

Recommendations for guideline development:

- Establish minimum standards:
  - Early data classification during the project lifecycle.
  - Establish clear roles to effectively support researchers in data-related matters (e.g. data stewards, legal services, data protection officers).
  - Documented decision-making procedures for data protection questions.
- Strengthen funding institutions as key actors:
  - Approval of hybrid data models (open, partially open, protected).
  - Promotion of technical infrastructures (e.g. secure repositories, sandboxes).
  - Incentive systems for incremental data release (e.g. bonus criteria in evaluations).
- Provide instruments for implementation:
  - Development of modular contract templates (data use agreements DUAs, licence models).
  - Standardised DMP templates with comment function.
  - Training, peer learning and national good practice platforms.

Key challenges remain:

- Handling shared data after project completion: There is a lack of clear procedures for reclassification and targeted disclosure of sensitive data.
- Governance for machine-readable licence formats and technical interoperability is still largely underdeveloped.
- Unclear responsibilities: Many projects struggle with opaque decision-making structures and coordination deficits.

The study provides a sound analytical basis for practical guidelines in the field of ORD. It shows that a rigid requirement for openness is not enough – what is needed are differentiated, context-specific solutions that reflect the reality of collaborative research. The archetypes and recommendations provide a robust starting point for this.

Implementation now lies with higher education institutions, funding institutions and political decision-makers – in the spirit of a multi-stage, learning-oriented policy process that combines scientific excellence with economic innovation.

1 Introduction

1.1 Objective and relevance of the meta-study

This meta-study systematically examines the legal, organisational and technical framework conditions for handling research data in public-private collaborations. The focus is on the tension between the principles of ORD – understood as a normative guiding principle for transparent and verifiable science – and the economic protection interests of private actors.

Private companies increasingly regard research data as a strategic asset: it forms the basis for product development, market analyses, regulatory strategies and competitive advantages. Accordingly, free access, as demanded by ORD, is in direct conflict with the legitimate interests of private companies in exclusivity, control and economic exploitation. In cooperative research projects with higher education institutions (HEIs), it is therefore often the case that ORD is not implemented because private partners see their economic interests threatened by ORD.

The study was developed as part of Action Line D2.5 of the National Action Plan for ORD and follows the programmatic guiding principle of the Swiss ORD Strategy: "as open as possible, as protected as necessary" (swissuniversities, 2021). The aim is to create comprehensible and practicable guidelines for the subsequent development of guidelines that reconcile scientific openness with legitimate protection interests.

The following key questions are at the centre of the study:

- What structural tensions exist between ORD objectives and private sector interests?
- How can research data be classified, protected and used without losing scientific traceability?
- What governance mechanisms and institutional arrangements enable cooperative models between HEIs and private actors?

The study is intended as an analytical basis for recommendations that can be applied to funding practices, contract design and technical implementation. It is aimed at university management, project managers, data stewards, legal services, data protection officers and funding institutions. Particular attention is paid to the development of practical governance instruments and the promotion of confidence-building framework conditions.

One postulate, which will be explored in greater depth later on, suggests that funding institutions should make more exceptions in their ORD requirements – for example, through hybrid models with controlled data release – in order to facilitate the participation of private partners.

In addition to this meta-study, a separate document ("Survey Results – Open Research Data in Research Collaborations between Higher Education Institutions and the Private Sector") is being prepared, which systematically presents the empirical results from the surveys conducted among HEIs and private sector stakeholders. These survey results serve to provide a more in-depth contextualisation of the legal, organisational and strategic findings presented in the meta-study. The two documents should be read in tandem: while the meta-study lays the analytical and conceptual foundation, the survey results provide practical perspectives and assessments from relevant stakeholders in the Swiss research and innovation system.

1.2 Methodological approach

The meta-study is based on a qualitative, conceptually designed document analysis. The aim was to identify key areas of conflict, legal uncertainties and proven management approaches in dealing with cooperatively generated research data. Relevant scientific papers, policy documents, strategy papers, institutional guidelines and regulatory frameworks from Switzerland, the EU and the USA were taken into account.

The selection of documents analysed was based on four criteria:

- Relevance for ORD in cooperation contexts: only sources addressing data policy, data protection, governance or legal aspects in public-private settings were considered (e.g. OECD recommendations, Thouvenin/Volz 2024).
- Timeliness: Focus on documents from 2016 (publication of the FAIR principles) and 2018 (entry into force of the GDPR).
- Geographical and institutional diversity: Inclusion of perspectives from different jurisdictions (Switzerland, EU, USA) as well as from HEIs, industry, funding institutions and international organisations.
- Normative and methodological substance: Consideration of documents with concrete control approaches, classifications or normative positions (e.g. SNSF-ORD Policy, NIH Data Sharing Policy, ISO standards).

The sources were identified, coded and thematically evaluated using scientific databases, repositories, institutional websites and targeted search clusters (e.g. "Shared Data", "Governance", "Open Science", "Data Stewardship"). An empirical survey was deliberately not conducted (see the note on the document "Survey Results – Open Research Data in Research Collaborations between Higher Education Institutions and the Private Sector" in 1.1).

1.3 Limitations of the study

The meta-study does not claim to be empirically complete or to provide an institutional evaluation. It is designed as an analytical and strategic basis for the subsequent development of guidelines. It is a literature- and document-based analysis; internal guidelines, confidential contracts and informal governance practices could not be taken into account.

For the sake of clarity, the topic of data protection is not scattered throughout the document, but is dealt with compactly and systematically in subchapter 3.2. The analysis essentially follows the legal clarifications of Thouvenin/Volz (2024), whose content is not duplicated, but embedded and supplemented.

Although key international regulations (HIPAA, GDPR, EOSC, etc.) have been integrated, the focus is on applicability to the Swiss higher education context. Supplementary detailed legal and technical analyses – for example, on contract design or licensing – will be specified later on.

The meta-study is intended as a preparatory building block in a multi-stage policy process. Validation by stakeholders, empirical supplementation through surveys and the subsequent derivation of concrete implementation obligations will take place in subsequent project phases.

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2 Context and challenges

2.1 Definition of terms: ORD, shared data, commercially sensitive data

The responsible handling of research data in public-private collaborations requires a precise conceptual distinction between different data categories. The focus is on the concepts of ORD and shared data, supplemented by the distinction between personal data and economically sensitive data.

ORD refers to publicly accessible research data that complies with the FAIR principles: Findable, Accessible, Interoperable, Reusable (Wilkinson et al., 2016). The aim is to promote transparent, reproducible and collaborative science. Publication usually takes place via repositories and under open licences.

Shared data, on the other hand, is exchanged between specified partners (e.g. HEIs and companies) but is not published. It is subject to contractual agreements (DUA, NDA) and access restrictions. Shared models are common in collaborative research projects where confidentiality or exploitation interests are paramount (Thouvenin/Volz, 2024; FPF, 2023).

Another distinction concerns the need for protection:

- Personal data is subject to data protection law (FADP, GDPR).
- Economically sensitive data includes trade secrets, operating data, algorithms, and strategic information, which are covered by intellectual property law.

This distinction is fundamental for subsequent governance: it influences legal assessment, contract drafting and access control.

2.2 Forms of cooperation and areas of tension (public vs. private)

Cooperation between HEIs and companies is characterised by different institutional logics: while science strives for openness, publication and reusability, companies pursue interests in confidentiality, control and exploitation.

Typical areas of tension are:

- Access rights and publication: publicly funded research requires ORD, while companies want to secure exclusive rights of use through contracts.
- Time interests: Companies need lead time for patents; researchers are subject to publication pressure.
- Data protection: Especially in medicine, mobility research or social sciences, anonymisation can be costly or even impossible.
- Ownership and rights: Unclear ownership structures lead to uncertainty in data management plans and funding reports.
- Ethical issues: Selective publication of publicly funded data can undermine trust in science.
- Internal coordination: A lack of coordination between PIs, data protection, legal services and IT often delays projects.

These areas of tension require differentiated governance models to reconcile legal requirements, scientific standards and economic interests.

International studies show that scientists' willingness to share research data depends largely on disciplinary norms, technical infrastructures and incentive systems (cf. Tenopir et al., 2011). Both ethical and practical hurdles – such as uncertainties regarding data protection and usage rights – are identified as obstacles to comprehensive data sharing.

2.3 ORD and the conflict of interest: data as a strategic asset

Private research partners increasingly view research data as a strategic asset. Data is perceived as a resource, as property and, at the same time, as a risk.

- As a resource, it serves internal innovation, product development or strategic positioning.
- As property, it is to be controlled, exploited or licensed.
- As a risk, its release carries potential disadvantages: loss of know-how, regulatory uncertainty or competitive threat.

In this context, ORD is often perceived as a threat rather than an opportunity. Companies invest in infrastructure and data generation – appropriate protective mechanisms (technical, legal, organisational) are therefore a prerequisite.

Practical example:
A mobility company provides GPS data from its fleet for a joint project with a university. Access is only possible in aggregated form via a sandbox. Publication is possible after a twelve-month embargo, provided that data protection requirements are met.

Companies with an open science strategy: motives and practice

Although this attitude does not yet represent the majority of private sector actors, there is growing interest among Swiss and international companies in voluntarily integrating open science principles into their research and innovation strategies. This observation is based on qualitative evaluations from the survey (see "Survey Results – Open Research Data in Research Collaborations between Higher Education Institutions and the Private Sector", 2025) and on international sources that point to an increasing institutional openness among private-sector research actors (see OECD, 2021; Future of Privacy Forum, 2023).

Motives and reasons

Companies that commit to a controlled form of openness pursue several, sometimes interrelated objectives: Firstly, the transparent handling of research data strengthens mutual trust in scientific collaborations, particularly between companies, HEIs, funding institutions and the public not only in the responsible use of shared data and, but also in the protection of commercially sensitive information.

Secondly, open access to standardised data formats and interoperable platforms enables more efficient collaboration in research consortia. Thirdly, targeted data sharing also serves to attract staff and young talent, as it facilitates access to academic networks and talents. Finally, openness is increasingly seen as part of corporate responsibility, especially in the context of sustainability and ESG strategies, where access to knowledge and social value creation are central guiding principles (see OECD, 2021).

Practical forms of implementation

In practice, such companies pursue tiered models that combine openness with protection interests for their data as economic assets. Typical examples include:

- The provision of anonymised or aggregated data sets in open repositories with clearly defined terms of use;
- The release of technical or methodological metadata, while sensitive raw data remains protected;
- The use of controlled sandbox environments in which researchers are given supervised access to certain types of data;

- The publication of open-source tools, documentation or code libraries as a contribution to scientific traceability.

Such approaches can often be observed in domains where cooperation and standardisation have a high innovation value, such as the environmental, energy, mobility, technology and life sciences (see Future of Privacy Forum, 2023). In Switzerland, too, the first corporate initiatives are emerging that actively implement open science principles, for example in co-creation projects with HEIs or as part of Innosuisse programmes, where data is shared under clearly defined governance conditions (see swissuniversities, 2021).

2.4 Tools for governance decisions

A decision-based guide can be used to assess whether data should be treated as ORD or shared data. The following decision tree operationalises typical assessment criteria:

a. Does the data contain personal information?→ **Yes**: Only limited disclosure possible – check shared data.→ **No**: Continue to (b).
b. Is there an economic interest in protection (IP, business model)?→ **Yes**: Regulate access contractually, use embargo/DUA if necessary.→ **No**: Continue to (c).
c. Was the data collection publicly funded?→ **Yes**: Check publication as ORD – after anonymisation or protection assessment.→ **No**: Internal project clarification necessary.
d. Are there institutional ORD requirements or funding conditions?→ **Yes**: Implementation in accordance with FAIR principles required.→ **No**: Cooperation-related decision.

This structured decision-making process does not replace a legal review of all the facts in each individual case; however, it offers governance-oriented decision-making support for researchers, project managers and legal services.

2.5 Outlook: Development trends for policy and practice

Despite a variety of models (embargo, DUAs, technical access systems), key challenges remain:

- Lack of standardised licence modules for hybrid models.
- Low international connectivity of licensing models.
- Unclear responsibilities in institutional governance (legal, data stewards, technological transfer offices TTOs).

- Lack of machine-readable licence terms for AI-based data use.
- Limited incentive systems for data sharing in shared contexts.

These open issues form the strategic framework for later chapters – in particular for the development of concrete guidelines, minimum standards and templates. They underscore the need for a multi-stage policy process that combines technical, legal and institutional requirements.

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3 Framework conditions for ORD collaborations

3.1 Political and strategic foundations (CH/EU/international)

The promotion of ORD in Switzerland takes place in the context of international standardisation and national circumstances. The ORD Strategy of swissuniversities (2021) forms the normative framework for HEIs and emphasises the guiding principle of "as open as possible, as protected as necessary". It emphasises decentralised implementation with a focus on discipline-specific solutions, institutional responsibility and the integration of technical, legal and ethical requirements.

Internationally, particularly at EU level, ORD is promoted within the framework of Horizon Europe. The FAIR principles (Wilkinson et al., 2016) form the normative basis for this. Political and strategic instruments such as the European Open Science Cloud (EOSC) and national strategies (e.g. UKRI, RIE2025 Singapore) also focus on transparent data access, although their implementation logic is highly centralised and compliance-oriented.

For Switzerland, this presents the challenge of remaining internationally compatible on the one hand, while taking into account the diverse higher education landscape and the economic protection interests of private partners on the other. Public funding logic must therefore be specifically adapted to hybrid cooperation models in which data can be made accessible in a graduated form.

3.2 Data protection (FADP, GDPR)

The Swiss Data Protection Act (FADP, revised in 2023) and the EU GDPR set the legal framework for ORD cooperation. The FADP provides for explicit exceptions for research, or if there is an overriding public interest or data has been anonymised. The Human Research Ordinance (HRA) supplements this in the medical field.

In comparison, the GDPR often requires the explicit consent of the persons concerned, but allows exceptions for scientific research under certain safeguards within the framework of Art. 89 GDPR. The challenge for Swiss actors is to collaborate with EU partners while remaining GDPR-compliant – for example, through pseudonymisation, access restrictions and technical security measures.

The Swiss focus should be on a risk-based understanding of data protection that reconciles legal requirements with practical research needs. The term "sensitive data" needs to be defined precisely – especially in an economic context, where "economically sensitive data" is more clearly differentiated from particularly sensitive personal data (Article 5(c) of the Data Protection Act).

3.3 Technical and organisational requirements

The FAIR principles form the basis of the technical requirements. In Switzerland, repositories such as SWITCHdrive, Yareta (UniGenève) and the ETH Research Collection are central infrastructures. These support long-term archiving, tiered access models and interfaces to the international data landscape (e.g. Zenodo).

DMPs are mandatory for SNSF projects. However, their quality and implementation vary between HEIs. Technical and organisational roles such as data stewards or legal counsel are not consistently established. There is a need to catch up in this area to ensure proper implementation of the FAIR principles, especially in public-private partnerships.

Through institutionalised governance (roles, processes, templates), Switzerland can create an environment in which trust, legal certainty and technical interoperability go hand in hand.

3.4 Legal use and classification of research data

Swiss law does not recognise ownership of data. Nevertheless, data is protected by copyright, trade secrets (Art. 162 Swiss Criminal Code, Art. 6 Federal Act on Unfair Competition) and contractual agreements. Legal use depends on classification:

- ORD-compatible data (public),
- Shared data (confidential use within a limited circle of contractual partners),
- Restricted data (legally excluded).

In many Swiss collaborations with the private sector, shared models dominate, which are regulated by embargoes, NDAs or licence agreements. The challenge is to transfer these into the context of ORD – through clear definitions, licences (e.g. CC-BY) and graded access rights.

3.5 International interoperability and regulatory connectivity

Switzerland is not a member state of the EU, but must comply with the GDPR when conducting cross-border research. In addition, regulations such as the US HIPAA are relevant for collaborations involving medical data.

Initiatives such as EOSC and OECD recommendations emphasise interoperability through standards, for example:

1. Metadata formats (Dublin Core),
2. Certifications (CoreTrustSeal),
3. Identifiers (DOI assignment).

It is important for Swiss stakeholders to be internationally compatible without neglecting their own governance structures. The implementation of appropriate policies and the integration of private partners into international data spaces are key building blocks for sustainable cooperation.

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4 Archetypes of cooperative data practices

4.1 Why archetypes?

Cooperative data projects between public and private actors are extremely heterogeneous in practice. They range from open environmental platforms to closed research collaborations involving data that is sensitive from an economic perspective. However, real-life case studies are often not publicly documented or are protected by contractual confidentiality agreements. In order to identify and systematically analyse typical patterns, this study uses abstract model forms – so-called archetypes.

Archetypes are heuristic constructs that represent prototypical constellations of data types, stakeholder structures, governance models and legal frameworks. They serve as a guide for the development of practical guidelines and governance models by systematically highlighting recurring areas of tension and needs for action.

This approach is particularly relevant in Switzerland, as many HEIs have different degrees of maturity in the implementation of ORD. While some institutions already have established policies, data infrastructures and role profiles, others are in an ongoing process of development and consolidation. This institutional diversity is reflected in the range of typical forms of cooperation, which can be addressed and systematised by the archetypes.

It is also important to emphasise that the archetypes presented in this study do not refer to specific institutions or real projects, but should be understood as abstract, generalised patterns. They are intended to avoid misunderstandings by making exemplary structures analysable in a manner – but not to evaluate or disclose individual practical cases.

The following archetypes are based on a combination of analytical modelling and practical insights from the research and consulting activities of FehrAdvice and Partners AG. In several projects on data-based collaborations, recurring patterns were identified that were used to systematise typical forms of collaboration. The archetypes presented here are therefore based on abstract case constellations that are comprehensible from the perspective of Swiss HEIs, public institutions and private-sector partners.

4.2 Systematics: Dimensions of cooperative data practices

The archetypes developed in this meta-study are based on five fundamental characteristics that can be used to systematically analyse public-private research collaborations. These characteristics – also known as dimensions – help to identify typical differences and similarities in the handling of research data. The aim is to create a clear, structured classification that is both scientifically sound and practical. The classification system is based on MECE logic (mutually exclusive, collectively exhaustive): the categories do not overlap, but together cover all relevant cases.

Particular emphasis was placed on ensuring that these characteristics are tailored to Swiss research practice – i.e. that they reflect the institutions, data types and legal framework conditions that actually exist in this country. At the same time, the classification system remains compatible with international initiatives such as FAIR, EOSC and OECD guidelines.

1. Data type

A distinction is made between four types of research data that typically occur in Swiss collaborative projects:

- Personal (e.g. patient data in the health sector);
- Pseudonymised (e.g. behavioural surveys in psychology);
- Economically sensitive;
- Open (e.g. environmental or biodiversity data that has already been published).

This classification reflects both data protection requirements under the FADP/GDPR and the economic interests of industry partners.

2. Need for protection

Data varies greatly in terms of its need for protection – this depends on its sensitivity, legal restrictions or economic relevance:

- Low (e.g. publicly available data),
- Medium (e.g. anonymised interview data),
- High (e.g. pseudonymised health data),
- Very high (e.g. genetic data or trade secrets).

In Switzerland, this need for protection is largely determined by the revised FADP and the HRA, supplemented by sector-specific rules (e.g. HIPAA for international cooperation).

3. Partner structure

The archetypes take into account typical forms of cooperation in Switzerland:

- HEI – company (e.g. ETH Zurich with industry partners),
- HEI – NGO (e.g. cooperation with environmental organisations),
- HEI – municipality or canton (e.g. for infrastructure or mobility data),
- HEI – hospital or research consortium (e.g. in medical studies or national data platforms).

This classification reflects real constellations in nationally funded projects (SNSF, Innosuisse, swissuniversities).

4. Governance complexity

The procedures for data control and decision-making differ depending on the type of cooperation:

- Basic contract (e.g. simple data use agreements or non-disclosure agreements),
- Repository with access restrictions (e.g. Yareta with user group rights),
- Project-internal review board (e.g. for pseudonymised data),
- Mandated third party or data trustee (e.g. for personal health data).

These models reflect common institutional practices, for example at UZH, EPFL or in the SPHN context.

5. Degree of openness

Data access varies depending on the type of data, partner interests and legal basis:

- Fully open (e.g. via DOI, with CC licence),
- Partially open (e.g. after embargo or with licence restrictions),
- Protected (e.g. only upon request via a controlled repository with contractual obligations),
- Closed (only usable internally, e.g. for trade secrets or IP).

This distinction makes it possible to reflect both open science requirements and corporate protection interests – a challenge that is particularly important for public-private partnerships in Switzerland.

4.3 Systematisation with archetypes

In order to present the diversity of cooperative data practices in a structured and comprehensible manner, this study uses an archetype table that systematically classifies typical forms of cooperation between universities, public institutions and private actors. The table is based on two key characteristics:

- Economic need for data protection: Ranges from low (e.g. publicly accessible environmental data) to very high (e.g. trade secrets or security-related content). The economic need for protection varies depending on the project – in some cases it is secondary, while in others, for example, the protection of personal data and compliance with data protection regulations may be paramount.
- Degree of institutional openness: Describes the extent to which data is made publicly available – from completely open to partially open and protected to completely closed.

Combining these two characteristics results in nine archetypes, which are arranged in a clear 3x3 table. Each entry represents a typical constellation from practice, characterised by specific requirements for data access, governance, legal protection and technical implementation.

Overview of archetypes:

	Need for protection			
Degree of institutional openness		**Low**	**Medium**	**High**
	Open	**A1 – Citizen science / NGO–HEI** Fully open data, no protection interests.	**A2 – Energy and infrastructure projects** Public institutions, anonymised data sets, open access after aggregation.	**A3 – Anonymised health or social research** Highly anonymised, publishable data sets with ethical approval.
	Partially open	**B1 – Agriculture and SME cooperation** Sensor data, embargo, restricted licence.	**B2 – Health and technology collaborations** Pseudonymised data in sandbox environments, open results.	**B3 – Social research with NGOs** Raw data protected, methodological documentation openly accessible.
	Protected/closed	**C1 – MedTech research with industry partners** Internal review processes, selective release.	**C2 – Mobility and industry platforms** Access only via secure repositories, embargo.	**C3 – Industry 4.0 / security research** Proprietary or security-related data, no publication.

Own representation based on FehrAdvice & Partners AG (2025); cf. swissuniversities (2021); Thouvenin and Volz (2024); OECD (2021).

This typology provides a quick heuristic guide for dealing with cooperation projects in a differentiated manner in planning, consulting or guideline development. It does not replace legal review or empirical case analysis, but it does enable a sound initial understanding of possible constellations and their challenges.

In combination with concrete examples (see 4.4), this table supports in particular the development of modular and adaptable guidelines that reflect both openness and legitimate protection interests.

4.4 Contextualised examples for Switzerland

The archetype system developed in Chapter 4.3 depicts typical constellations of research collaborations between HEIs and private actors in Switzerland. To make this system more tangible, nine consolidated archetypes are presented below.

Exemplary case scenarios (based on archetypes, see table above):

A1 – Citizen science in the environmental sector: An NGO, cantonal authorities and a HEI jointly collect biodiversity data in Alpine regions. The data does not contain any personal or economically sensitive information and is published in accordance with FAIR principles in a public repository (e.g. ETH Research Collection) with a DOI and CC-BY licence. This model represents the ideal of a completely open ORD project (see swissuniversities, 2021).

A2 – Energy and infrastructure projects (public sector and university of applied sciences): A university of applied sciences and a city administration analyse smart meter data to optimise the municipal power grid. After aggregation and anonymisation, the data is published as an open dataset with accompanying documentation (data management plan, DMP). Governance is based on local data protection regulations and the SNSF guidelines on data publication.

A3 – Anonymised health and social research: A university hospital provides highly anonymised patient data from an epidemiological project for secondary analysis. After ethical approval and FADP/GDPR review, the data is made publicly available via a national platform (e.g. Yareta or Swiss Open Data Portal) (cf. Thouvenin & Volz, 2024).

B1 – Agriculture and SME cooperation: An agricultural technology SME shares soil sensor and weather data with a university of applied sciences in order to optimise irrigation strategies. A twelve-month embargo applies during the project period. After that, an anonymised data extract is released with a CC-BY-NC licence. Governance via DUA and role-based access control (cf. Future of Privacy Forum, 2023).

B2 – Health app and start-up cooperation: A start-up provides a university with pseudonymised usage data from a fitness app. The data is stored in a secure sandbox that only authorised researchers are allowed to use. After the project is completed, aggregated results and analysis codes are shared openly (cf. OECD, 2021).

B3 – Social science and civil society: A university of applied sciences conducts a survey on integration and labour market issues in collaboration with an NGO. The raw data remains protected, but codebooks, variable descriptions and methodology are published via an institutional repository. This ensures scientific traceability without compromising data protection (cf. swissuniversities, 2021).

C1 – MedTech project with industry partner: A HEI research team is working with a medical technology company to develop AI-based diagnostic algorithms. Clinical data is pseudonymised and stored in an internal repository. An internal review board decides on approvals. After the end of the project, selected data sets are published in a controlled manner (cf. Thouvenin & Volz, 2024).

C2 – Mobility data platform (ETH and transport companies): A national mobility company provides ETH Zurich with GPS data from its vehicle fleet. Access is restricted to authorised researchers and is provided via a virtual research environment (Virtual Secure Research Environment, VSRE). After a 12-month embargo, aggregated, anonymised data sets can be published under a CC-BY-NC licence (cf. Future of Privacy Forum, 2023).

C3 – Industry 4.0 and security research: An industry consortium and a technical HEI are developing data models for production optimisation. The data contains proprietary algorithms and trade secrets; it remains internal. Only metadata and methodological documentation are made publicly available (see OECD, 2021).

4.5 Conclusion: Benefits and further use of the archetypes

The nine archetypes illustrate how HEIs and the private sector in Switzerland implement differentiated models of data cooperation. Complete openness is only possible in certain cases; more often, tiered or hybrid models are required. The system shows that an appropriate gradation of openness and protection requirements – in combination with clearly defined governance – is crucial for trust-based cooperation (see swissuniversities, 2021; OECD, 2021; Thouvenin and Volz, 2024; Future of Privacy Forum, 2023).

The archetypes can serve as practical guidance for funding institutions, university management and project managers in designing data access and contract models in line with the guiding principle of "as open as possible, as protected as necessary" (swissuniversities, 2021).

The analysis of the nine archetypes shows that collaborations between HEIs, public institutions and private actors in the field of research data do not follow a uniform logic. Instead, there are recurring patterns that can be systematically described in terms of the degree of openness and the economic protection requirements of the data. These two dimensions form the core of a practice-oriented typology tailored to the different conditions of the Swiss research landscape.

The archetypes are based on analytical and practice-oriented findings from collaborative research projects in Switzerland and thus reflect the empirical basis of the previous chapters. The archetype matrix (A1–C3) makes it clear that completely open models for research collaborations between HEIs and private entities – in the sense of an unrestricted open research data approach – are only practicable where data is neither personal nor economically sensitive. In most cases, however, tiered or hybrid models are required that combine scientific traceability with legal and economic protection interests. Archetypes B1, B2, C1 and C2 in particular illustrate how this can be achieved through contract-based agreements, embargo periods, internal review boards or technically controlled access systems.

The archetype system provides a directly applicable basis for the development of guidelines and governance instruments. It enables empirical differences between project types to be operationalised – for example, through differentiated specifications for data use, the role of data stewards or forms of licensing. In this way, it bridges the gap between the general principles of open science and their concrete implementation in public-private partnerships.

The Swiss context plays a central role in this. The federal structure, the high institutional autonomy of HEIs and different funding conditions (e.g. SNSF, Innosuisse, swissuniversities) lead to highly heterogeneous starting points. The archetypes take this diversity into account by not aiming for standardisation, but rather supporting context-specific solutions – from openly accessible citizen science initiatives (A1) to strictly regulated medtech collaborations (C1).

Overall, the analysis shows that the tensions between openness and the need for protection cannot be addressed by rigid guidelines, but only by differentiated, context-specific regulations. The archetypes represent a practical, analytically robust and politically compatible tool for this purpose. They offer HEIs, funding institutions and political actors a common reference point for systematically advancing the implementation of open research data in the context of scientific transparency, legal responsibility and economic confidentiality.

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5 Governance models and success factors

5.1 Review committees and decision-making processes

Reliable review committees are a key prerequisite for managing data-related decisions in public-private research collaborations. The meta-study shows that the degree to which such decision-making processes are institutionally anchored varies greatly. In many cases, decision-making processes are organised on an ad hoc basis and are not systematically aligned with the protection interests of private partners (OECD, 2021).

The picture in Switzerland is mixed: while some institutions already have structured review committees, other HEIs are in the process of gradually developing and establishing appropriate decision-making processes. This leads to delays, uncertainty and difficult coordination, especially in projects involving data that is sensitive from an economic perspective.

Strategically anchored governance structures – such as internal project approval committees, tiered review procedures or committees mandated by university management – enable a transparent balance of interests between ORD and economically sensitive data sets (Thouvenin/Volz, 2024). Such committees create transparent, verifiable and trust-building processes, especially when several actors with different regulatory frameworks are involved (European Commission, 2018). International open science initiatives such as the European Open Science Cloud and its Strategic Research and Innovation Agenda (EOSC SRIA, 2021) emphasise the importance of clearly defined governance and review processes for sustainable and secure access to research data. They reduce transaction costs and help to limit legal risks in data handling.

5.2 Roles: data steward, legal service, ombudsman

The institutional implementation of effective governance is based on a clear and well-coordinated distribution of roles. The meta-study shows that HEIs in Switzerland are at different stages of developing such structures. Many institutions are currently developing specific coordination mechanisms between data protection, contract law and data management in order to clarify responsibilities and further professionalise processes. This diversity of approaches reflects the dynamism and learning progress within the Swiss higher education system.

The following roles are particularly important:

- Data stewards (responsible for classification, access control and metadata standards);
- International standards such as ISO 23494-1:2023 define practical requirements for the recording and documentation of data flows as well as the description of data provenance and usage control;
- Legal services (review and creation of DUAs, licence models and embargo regulations);
- Data protection officers (compliance with FADP, GDPR);
- Technology transfer offices (IP management, exploitation);
- Ombudsman offices (mediation in conflicts over data access, publication or copyright).

In the Swiss context, the federal structure shapes the diversity of the higher education landscape. Different regulations and responsibilities between cantons and institutions lead to different approaches in the implementation of governance structures. At the same time, this diversity opens up the possibility of learning from existing models and gradually developing common standards. A clear allocation of roles and their anchoring in the respective structures contribute significantly to reliable processes and legally secure cooperation.

5.3 Contract modules and licence models

The legal structure of research collaborations is based on the distinction between ORD and shared data. While ORD data is publicly accessible and reusable in accordance with FAIR principles, shared data remains available within contractually regulated partnerships and is protected both legally and organisationally (Thouvenin/Volz, 2024).

The meta-study recommends a modular contract architecture, especially for Switzerland, where there are currently no binding templates or minimum standards for DUAs or NDAs. Proven building blocks include:

1. DUAs with purpose-specific access,
2. Embargo regulations for temporary control,
3. Role-based access systems with logging,
4. Graduated release mechanisms via review board or data steward.

In co-creation constellations – as are common in SNSF projects or Innosuisse programmes in Switzerland – hybrid contract forms are used. In these cases, data is used, aggregated, selectively published or tagged with metadata (e.g. in Yareta repositories) during the project period, but without immediate full disclosure in the sense of ORD.

Examples include solutions in which clinical data is only accessible after ethical approval or technical sensor data is published with a subsequent embargo period. This combination of legal and technical protection architecture allows for a graduated level of openness that takes into account both scientific requirements and economic protection interests – a key requirement from the perspective of many Swiss partner institutions.

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6 Recommendations for developing guidelines

Based on the preceding analysis, this chapter develops specific recommendations for the drafting of guidelines on the handling of research data in public-private partnerships. The aim is to define framework conditions that reconcile scientific openness and economic protection interests – in line with the ORD guiding principle: as open as possible, as protected as necessary.

The focus is on three key areas of action:

- Minimum standards for governance and data classification: Recommendations for the structured assessment of protection needs, the establishment of clear responsibilities (e.g. data stewards, review committees) and the assurance of transparent decision-making processes in data management.
- Role of funding institutions: Guidance on how funding institutions can promote the implementation of ORD in collaborative projects without deterring economic partners, for example through adapted guidelines, incentives or technical infrastructure support.
- Integration into funding practice: Proposals for operational implementation, e.g. through DMP requirements, modular templates, training opportunities or national platforms for good practices.

These recommendations are not to be understood as definitive solutions, but rather as a structured framework for the development of practical guidelines. They are based on typical constellations in the Swiss higher education and funding landscape and are compatible with international standards such as FAIR, EOSC or OECD guidelines.

6.1 Minimum standards for handling research data

Effective and responsible handling of research data in public-private collaborations requires clear and uniform minimum standards. These serve to ensure both scientific traceability and the necessary protection of sensitive or economically relevant data. Such standards should be defined and laid down as binding as early as possible in the course of the project – ideally already in the conception phase. Three areas are particularly central in this regard:

1. Systematic data classification:

At the beginning of each collaborative research project, a structured assessment of the existing data used and the data generated during the collaboration should be carried out. This classification is crucial for the subsequent handling of the data and concerns, among other things, the following questions:

1. Is the data personal, pseudonymised or anonymised?
2. Does the data contain commercially sensitive information (e.g. trade secrets, operating data)?
3. Is publication of the data planned, or will it remain internal to the project?
4. Is the project subject to public funding conditions that require openness?

This assessment should be documented in a comprehensible manner and form an integral part of the DMP. It forms the basis for further data protection and organisational decisions in the project.

2. Clear distribution of roles and institutional responsibilities:

The roles and responsibilities described in Chapter 5.2 (data stewards, legal services, data protection officers, etc.) form the basis of the minimum standards mentioned here. Instead of repeating them, please refer to the description in the designated location.

3. Traceable decision-making processes for data issues:

The decision-making structures and governance procedures described in Chapter 5.1 (review boards, approval processes, documentation, etc.) serve as a reference framework for the following recommendations on decision-making processes. Instead of repeating them, please refer to the description at the designated location.

6.2 Recommendations for funding institutions

Funding institutions such as the Swiss National Science Foundation (SNSF), Innosuisse and swissuniversities bear a central responsibility for establishing ORD in public-private collaborations. Their guidelines and framework conditions have a significant influence on how data in funded projects is classified, used and made accessible. The following recommendations aim to strengthen scientific openness without ignoring the legitimate protection interests of private partners.

1. Differentiated requirements for data openness:

Not all research data can or should be made publicly available immediately after the end of a project. Funding institutions should therefore recognise a graduated system of data access and take this into account in their guidelines. In concrete terms, this means the institutional approval and definition of three degrees of openness:

- Open data: publicly accessible immediately or after anonymisation (e.g. via repositories with open licences);
- Partially open data: delayed (e.g. after an embargo) or with restricted access (e.g. only for certain user groups or for non-commercial purposes);
- Protected data: only usable within the project or after explicit approval, e.g. in the case of personal information or economically relevant content.

This categorisation allows for differentiated handling of data and reduces conflicts in collaborative projects without compromising the objectives of open science.

2. Promotion of hybrid data models:

This meta-study expressly recommends establishing hybrid data models as a legitimate and practical option. Such models combine different types of data access within a project – for example, through the simultaneous use of open, semi-open and protected data structures. To facilitate their implementation, funding institutions should create appropriate framework conditions, including:

- Embargo regulations that allow for temporary exclusivity while ensuring later publication;
- Graduated access controls with legal and technical safeguards (e.g. through DUAs or role-based repositories);
- incentive systems for gradual disclosure, for example through bonus points in funding evaluations or follow-up funding;
- targeted funding of infrastructure for hybrid models (e.g. controlled repositories, virtual secure research environments, audit options).

Recognising hybrid models can facilitate the participation of private actors without sacrificing the transparency of scientific processes. The maxim remains: as open as possible, as protected as necessary.

3. Postulate for the targeted promotion of hybrid data models:

In collaborations with private-sector partners, conflicts often arise between the objectives of ORD and the protection of commercially relevant information. Many companies regard their research data as strategic assets whose disclosure they wish to avoid for competitive reasons (cf. Thouvenin/Volz, 2024; OECD, 2021).

Funding institutions should therefore create targeted exemptions to enable realistic and fair conditions for ORD in such collaborations.

We propose:

- Hybrid data models (e.g. temporary embargoes, restricted access via data access agreements [DUA], selective publication) should be recognised as legitimate exceptions to the full open access principle (cf. FPF, 2023).
- These exceptions should be clearly defined, transparently documented and limited in time. They must be justified on objective grounds, e.g. economically sensitive content or regulatory restrictions (cf. OECD, 2021).
- At the same time, incentives should be created for later (partial) opening, for example by:
    - Preferential funding assessment upon disclosure after project completion;
    - Support with legal or technical implementation;
    - Development of templates for tiered access models (cf. FPF, 2023; Thouvenin/Volz, 2024).

The aim of this postulate is to promote the openness of research data even under real conditions in public-private partnerships – without ignoring the legitimate protection interests of partners. This creates a practicable way to improve the long-term availability of research data while maintaining innovation capacity in sensitive areas.

6.3 Integration into funding practice

To ensure that the desired standards and recommendations for data processing are not only formulated conceptually but also effectively implemented, they must be systematically anchored in funding practice. Funding institutions are called upon to create suitable instruments, processes and support services that enable the implementation of ORD even in complex cooperation constellations.

Three areas of action are at the forefront:

1. Further development of DMPs:

DMPs are key control instruments for the responsible handling of research data. Their quality and binding nature currently vary considerably. In order to fulfil their strategic function, they should in future contain the following binding elements:

- Systematic data classification (e.g. personal, economically sensitive, open);
- Specific information on the degree of openness of the respective data sets (including embargo or release plans);
- Designation of responsibilities for data protection, legal matters and data management in the project;
- References to planned governance mechanisms, such as review boards or graded access concepts.

Mandatory commentary on these elements by funding institutions as part of project monitoring would further strengthen implementation.

2. Provision of standardised tools and templates:

Many projects require pragmatic tools to ensure compliance with data protection regulations and open science principles. Funding institutions should work with HEIs and other stakeholders to develop and provide a set of supporting materials, including:

- Modular contract templates (e.g. for DUAs, licence models, embargo clauses);
- Templates for DMPs with fields for data classification, access control and disclosure strategy;
- Checklists and decision-making aids for classifying protection needs and selecting appropriate governance structures.

These materials should be publicly accessible and adaptable to specific research contexts (e.g. medicine, engineering, social research).

3. Development of information and training opportunities:

The successful implementation of ORD requires not only guidelines, but also knowledge and skills on the part of all those involved. The following measures are effective in improving the quality and consistency of implementation:

- National knowledge platforms (e.g. at swissuniversities) for collecting and providing best practices, sample documents and archetypes;
- Training opportunities for researchers, data stewards, legal services and project managers, for example in the form of e-learning, workshops or micro-certificates;
- Peer learning formats and exchange forums to share experiences between projects, universities and sectors.

Such support measures not only contribute to quality assurance, but also promote trust and common standards in the handling of research data.

6.4 Open issues and need for further development

Despite the recommendations formulated, fundamental challenges remain that need to be clarified in the further course of the project and in the concrete development of guidelines. These open issues concern central aspects of strategic design and institutional implementation – especially in the context of the Swiss research landscape with its federal structure and diverse forms of cooperation.

1. Perspective on shared data: Disclosure as an open issue:

A key desideratum remains the question of how to deal with so-called "shared data" after the project has been completed. In many collaborations, data is initially not published for legitimate reasons – for example, due to embargoes, confidentiality or IP protection. However, there is currently no clear process for how such data should be

- Re-evaluated;
- Gradually opened up;
- Or made available for secondary use. There is a need here for strategic mechanisms for reclassification, for example through post-processing, governance reports or standardised review procedures.

2. Lack of standards and national reference models:

The analysis shows that there are currently no uniform standards for the contractual, technical and legal treatment of research data in public-private partnerships. The following are particularly necessary:

- Machine-readable licence formats (e.g. for AI use or restricted sharing);
- Compatible metadata standards that are connectable both nationally and internationally (e.g. EOSC, FAIR);
- Interoperable governance models that are widely accepted in Switzerland and can be used across institutions.

A common reference model – for example, in the form of a modular guideline structure with templates, role definitions and evaluation logic – could remedy this situation.

3. Unclear responsibilities in project governance:

The analysis has shown that in many projects there is uncertainty regarding responsibility for data issues – especially when data protection, IT, legal services and project management are not clearly coordinated. This uncertainty primarily concerns:

- Operational decisions on data classification and release;
- Coordination with external partners;
- Institutional responsibility in the event of data conflicts or misconduct.

What is needed here are role-based governance recommendations that define and formalise clear responsibilities beyond minimum institutional requirements (e.g. involvement of data stewards, mandating of review committees).

These open questions underscore the need to view the development of guidelines as a multi-stage, participatory and learning-oriented process. In this sense, the meta-study is intended as an analytical foundation, not as a definitive solution.

Validation by stakeholders, empirical supplementation with practical perspectives and the derivation of concrete implementation guidelines are key next steps on the path to practical and compatible ORD guidelines for public-private partnerships in Switzerland.

Conclusion:

The recommendations in this chapter show that the handling of research data in public-private collaborations requires differentiated but binding guidelines. ORD should not be understood as a purely technical goal, but as a normative framework that must be operationalised through clear governance structures, graduated openness models and institutional support.

The proposed minimum standards for data classification, role allocation and decision-making create the basis for responsible collaborations. Funding institutions have a responsibility to specifically enable hybrid data models and, in doing so, to create new paths to openness through transparent exemptions and incentives (see postulate in section 6.2). This will strengthen scientific openness without ignoring legitimate economic protection interests.

At the same time, it is clear that the development of such guidelines is not a one-off act, but an ongoing process. The strategic gaps – for example, regarding the long-term opening of shared data, the standardisation of interfaces and institutional coordination – show that further conceptual and empirical work is necessary. The meta-study provides the analytical basis for this. Its implementation is now in the hands of HEIs, funding institutions and political decision-makers.

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7 Conclusion

7.1 Key findings of the analysis

The meta-study clearly shows that the handling of research data in public-private collaborations is characterised by a structural tension between scientific openness (ORD) and the legitimate protection interests of private actors. This tension is particularly relevant in the Swiss higher education context, which is characterised by federal autonomy, institutional heterogeneity and a strong practical orientation.

Five key findings characterise the analysis:

1. ORD and economic interests are not contradictory, but special requirements must be met in order to reconcile them. In many projects, ORD goals are not rejected on principle, but because suitable protection mechanisms, contracts or technical implementations are lacking. Openness must therefore be designed – not imposed.

2. A differentiated data classification is a basic prerequisite for governance. The need for protection arises from the type of data, sensitivity, funding logic and institutional objectives. Only through structured classification (personal, economically sensitive, open, etc.) is it possible to implement a graduated access and publication policy that also opens up freedom.

3. The institutional implementation of ORD varies greatly in Switzerland. HEIs have different resources, role profiles (e.g. data stewards) and levels of experience in collaborating on research data. Some universities of applied sciences and smaller institutions are in the process of development, gradually expanding and consolidating structures, procedures and legal competences.

4. The archetype matrix offers an effective tool for systematisation. The 3×3 typology based on degree of openness and protection requirements allows for an initial, practical classification of projects – and lays the foundation for modular templates, governance requirements and contractual standards.

5. Funding institutions are key levers for trust and standardisation. Through targeted incentives, technical infrastructure support and the recognition of hybrid data models,

they can promote the transfer of ORD into practice – without losing economic partners.

These findings emphasise that successful data practice in Swiss cooperation projects does not require radical openness, but rather context-appropriate design – in line with the guiding principle of "as open as possible, as protected as necessary".

7.2 Notes Implementation prospects for Switzerland

1. Pilot projects at HEI level, e.g. by applying the archetypes and the postulate on hybrid data models formulated in Chapter 6.2 in SNSF or Innosuisse projects. An accompanying evaluation by swissuniversities could help to highlight institutional differences and identify good practices.
2. Establish a national good practice platform This should make key components (e.g. DUAs, governance protocols, access models) publicly available. Comparable models include the EOSC Marketplace and the DMP online service of the DCC UK, adapted to Switzerland's federal structures.
3. Develop standardised templates and training modules, joint development of DMP templates, embargo clauses and modular licences by HEIs and swissuniversities. These measures are supplemented by further training for data stewards, lawyers and project managers.
4. Ensure binding stakeholder involvement; roundtables with representatives from HEIs, industry, data protection and funding bodies (SNSF, swissuniversities) should be an integral part of the guideline process. This is the only way to build trust and acceptance, especially in collaborations involving sensitive data.

Further research and development needs:
Despite the clear recommendations, three key questions remain unanswered:

- Long-term handling of shared data: There is a lack of procedures for subsequent opening (e.g. after project completion), for example through reclassification, ethics boards or technical post-processing. The development of "re-assessment models" is necessary.
- Gaps in national standards: Machine-readable licences, interoperable metadata standards and contractual templates are not widely available. A uniform, modular reference model for data governance in Switzerland is needed.
- Unclear institutional responsibilities: In some cases, there are still different regulations governing who decides on issues of data classification, publication or access. At some

universities of applied sciences, the relevant responsibilities and roles – such as data stewards, review committees or ombudsmen – are still being developed or are currently being institutionalised.

Conclusion:
The implementation of ORD in public-private partnerships can only succeed through differentiated and binding framework conditions that take into account both scientific openness and economic protection interests.

The meta-study makes an initial, systematically sound contribution to this. In particular, the proposed postulate on hybrid data models can serve as a lever for practical opening strategies – between the legitimate protection interests of the private sector and the availability of knowledge to the community. Its further development now lies with HEIs, funding institutions and political decision-makers – in the service of trust-based and sustainable research cooperation in Switzerland.

8 Appendix

A. Glossary

Term	Definition
Data Management Plan (DMP)	Document describing how research data will be handled during the course of the project, including classification, storage, access, protection and publication. Mandatory in many funding programmes.
Data steward	Operational specialist for data organisation, classification, quality assurance and FAIR compliance. Central role for governance and implementation of ORD in projects.
Data Use Agreement (DUA)	Contractual agreement on the use of data that is not publicly accessible. Regulates rights, obligations, purposes of use, protective measures and, if applicable, embargoes.
Embargo	Temporary delay in the publication of research data, e.g. to enable protection interests, patent applications or publications.
FAIR principles	International principles for good data practices: findable, accessible, interoperable, reusable. Basis of ORD.
Governance Board / Review Board	Committee that decides on the release and use of protected data. Often consists of representatives from the fields of law, ethics, science and IT.
Interoperability	The ability of data and infrastructures to function seamlessly across institutions, countries and systems – technically, legally and semantically.
Metadata	Structured information about research data (e.g. creation date, format, method) that supports its discoverability, use and traceability.
Non-disclosure agreement (NDA)	Confidentiality agreement stipulating that certain information or data may not be disclosed to third parties or published.
Ombudsman for data issues	Neutral point of contact for mediating conflicts over data access, publication or copyright in collaborative research projects.

Open Research Data (ORD)	Publicly accessible research data, provided there is no legitimate need for protection. ORD follows the principle of "as open as possible, as protected as necessary".
Degree of openness	Degree of accessibility of research data. The meta-study distinguishes between four levels: open, partially open, protected, closed – depending on the need for protection and legal requirements.
Legal service	Institutional department that reviews contracts, licences, data protection regulations and IP issues from a legal perspective and designs them in an open manner. Closely involved in governance and risk management.
Protection requirements	Assessment of how strongly data must be protected against unauthorised access or disclosure. Depends on data protection, IP relevance or ethical sensitivity.
Shared data	Research data that is not public, but only used within defined partnerships. Use is regulated by DUA, NDA or other access agreements.
Virtual Secure Research Environment (VSRE)	Technical infrastructure with high security standards for particularly sensitive data (e.g. genetic or medical information). Access only for authorised persons under strict controls.

B. List and classification of analysed guidelines

Source / Title	Validity / Origin	Relevance
FADP– Data Protection Act	Switzerland	Data protection law, exceptions for research
GDPR – General Data Protection Regulation	European Union	Data protection, legal framework for cross-border cooperation
EOSC – Strategic Research and Innovation Agenda	EU / international	Open science infrastructure, FAIR principles
ETH Zurich – RDM Guidelines (RSETHZ 414.2)	Switzerland (ETH Zurich)	Institutional governance, role profiles, technical implementation

FAIR Guiding Principles (Wilkinson et al.)	International	Standard for data quality, findability, interoperability
HIPAA – Health Insurance Portability and Accountability Act	USA	Health data protection, de-identification
HRA – Human Research Act	Switzerland	Specialised data protection in the medical field
ISO 23494-1 – Provenance Information Model	International (ISO)	Technical standard for data provenance and traceability
NIH Data Sharing Policy	USA	Guidelines on data sharing in biomedical research
OECD Recommendation on Data Access and Sharing	International (OECD)	Policy governance, international recommendations
Singapore RIE2025 Handbook	Singapore	Data policy in innovation promotion, strategic embedding
SNSF – Open Research Data Policy	Switzerland	Funding requirements for ORD, DMP, data release
swissuniversities – National ORD strategy	Switzerland	Political and strategic basis for ORD implementation in Switzerland
UCL Research Data Policy	UK (University College London)	Institutional implementation of ORD and data protection
UKRI – Data Protection Policy	UK	Funding policy implementation of data protection in publicly funded projects
UNESCO Recommendation on Open Science	International	Normative framework for global open science standards
University of Zurich – Open Science Policy	Switzerland (UZH)	Internal rules on open access, data management and licensing

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