6.0 Activating FAIR implementation

To explore, analyze and assess technical processes and choices that enhance FAIR implementation

Why should I do this?

To develop technological foundations for your project that will help support your investment's FAIR implementation.

In this step you will:

In this step, you will be introduced to six technical themes and illustrative scenarios to help you navigate these themes:

6.1. Illustrative scenarios: Two scenarios illustrating how six technology themes can be navigated to help implement FAIR principles. This is a good starting point in this step, as these can be compared to your own projects before you work through the themes, each of which is independent but mutually supportive. You can work through this in any order, but covering all content will give you a good level of knowledge and confidence of the main technical aspects that can affect FAIR implementation in any project. The content includes introduction to these concepts, as well as approaches on how to get started for your investment.

6.2. Application Programming Interfaces (APIs): Establishing a set of rules and protocols that allows different software applications to communicate with each other, enabling the exchange of data.

6.3. Common Data Models (CDMs): Establishing a standardized, consistent and shared data structure designed to organize and describe data in a way that facilitates interoperability and data integration across various applications and domains.

6.4. Data standards: Establishing conventions or rules that specify how data is structured, represented and exchanged within a particular context or domain.

6.5. Data catalogs: Choosing an approach to structure the inventory of data assets within your investment.

6.6. Data licenses: Identifying the legal framework for granting permission to access, use, share and monetize data, and understanding the implication of those choices on the reusability of data.

6.7. Data privacy and security: Establishing practices that ensure personal and sensitive data is handled, stored and processed securely to prevent unauthorized access or misuse.

6.8. FAIR enabling resources (FERs): Exploring options that aid in achieving some aspect of FAIR and that are explicitly linked to one or more FAIR principles. They include a whole range of proven technology options (including repositories) to help with data findability, accessibility, interoperability and reusability to help you investigate your options. They also contain further information and comparison tables to aid evaluation. Unlike in the previous steps, you will not have a specific template or worksheet to complete, as the approach followed on each project may differ significantly. Please select your technical team's preferred choice to ensure process documentation is created.

When should I do this?

During proposal development:
Implementing FAIR is not possible at this stage. However, POs should initiate early thinking around FAIR implementation so that a grantee plans for it as a future activity in the proposal. The proposal should also clearly identify who is best positioned to lead this activity and whose support will be required. As this involves technical expertise, including someone with a technical perspective to plan for this in the proposal can help with more effective resource planning.

When the investment is live:
POs should consider initiating this activity with the grantee as early as possible. FAIR implementation is impacted by every stage of the data value chain. To make the implementation more effective and efficient, this should begin at the start of the data value chain (data collection or onboarding) rather than leaving it to the later stages of the project. Do this sooner rather than later, as leaving this activity until toward the end of the investment would diminish its value.

FAIR principles

Findable

To use data, it must first be found. Metadata and data should be easy to find for both humans and machines. Machine-readable metadata is essential for automatic discovery of datasets and services.

F1 – Data is assigned a globally unique and persistent identifier.

F2 – Data is described with rich metadata.

F3 – Metadata clearly and explicitly includes the identifier of the data described.

F4 – Data is registered or indexed in a searchable resource.

Accessible

Once the user finds the required data, they need to know how it can be accessed.

A1 – Data is retrievable by its identifier using a standardized communications protocol.

A1.1 – The protocol is open, free, and universally implementable.

A1.2 – The protocol allows for an authentication and authorization procedure, where necessary.

A2 – Metadata is accessible, even when the data is no longer available.

Interoperable

Data is more valuable when combined with other data, and it needs to interoperate with applications or workflows for analysis, storage and processing.

I1 – Data uses a formal, accessible, shared, and broadly applicable language for knowledge representation.

I2 – Data uses vocabularies that follow FAIR principles.

I3 – Data includes qualified references to other data.

Reusable

The ultimate goal of FAIR is to optimise the reuse of data. To achieve this, data and metadata should be well-described so that they can be replicated and/or combined in different settings.

R1 – Data is richly described, with a plurality of accurate and relevant attributes.

R1.1 – Data is released with a clear and accessible data usage license.

R1.2 – Data is associated with detailed provenance.

R1.3 – Data meets domain-relevant community standards.

Application Programming Interfaces (APIs)

A set of rules and protocols that allows different software applications to communicate with each other, enabling the exchange of data.

Common Data Models (CDMs)

Standardized, uniform data structure created to organize and describe data, enabling seamless interoperability and integration across different applications and domains.

Data standards

Conventions or rules that specify how data is structured, represented and exchanged within a particular context or domain.

Data catalogs

A structured inventory of data assets within an organization or for a particular project.

Data licenses

The legal framework for granting permission to access, use and share data, as well as to monetize it.

Privacy and security

Protection of personal information, ensuring that sensitive data is handled, stored and processed securely to prevent unauthorized access or misuse.

FAIR Enabling Resource (FER)

An FER is described as ‘any digital object that provides a function needed to achieve some aspect of “FAIRness” and is explicitly linked to one or more FAIR principles’.

FAIR implementation profile (FIP)

A FAIR implementation profile consists of making choices selecting FERs.

FAIR data enables the automation of data management processes, thereby streamlining the utilization of data for innovative purposes.

Defining at a practical level what FAIR means for AI models

Learn more

Acknowledgements

FAQs

Glossary

Accessibility

Privacy & cookies

T&Cs

FAIR Process Framework has been developed by the Enabling Data Access (EDA) project team at CABI and is funded by the Bill & Melinda Gates Foundation to support the foundation's Open Access Policy. The FAIR Process Framework is a tool to assist partners in developing data access and management plans (DMAPs) that incorporate FAIR and responsible data practices.