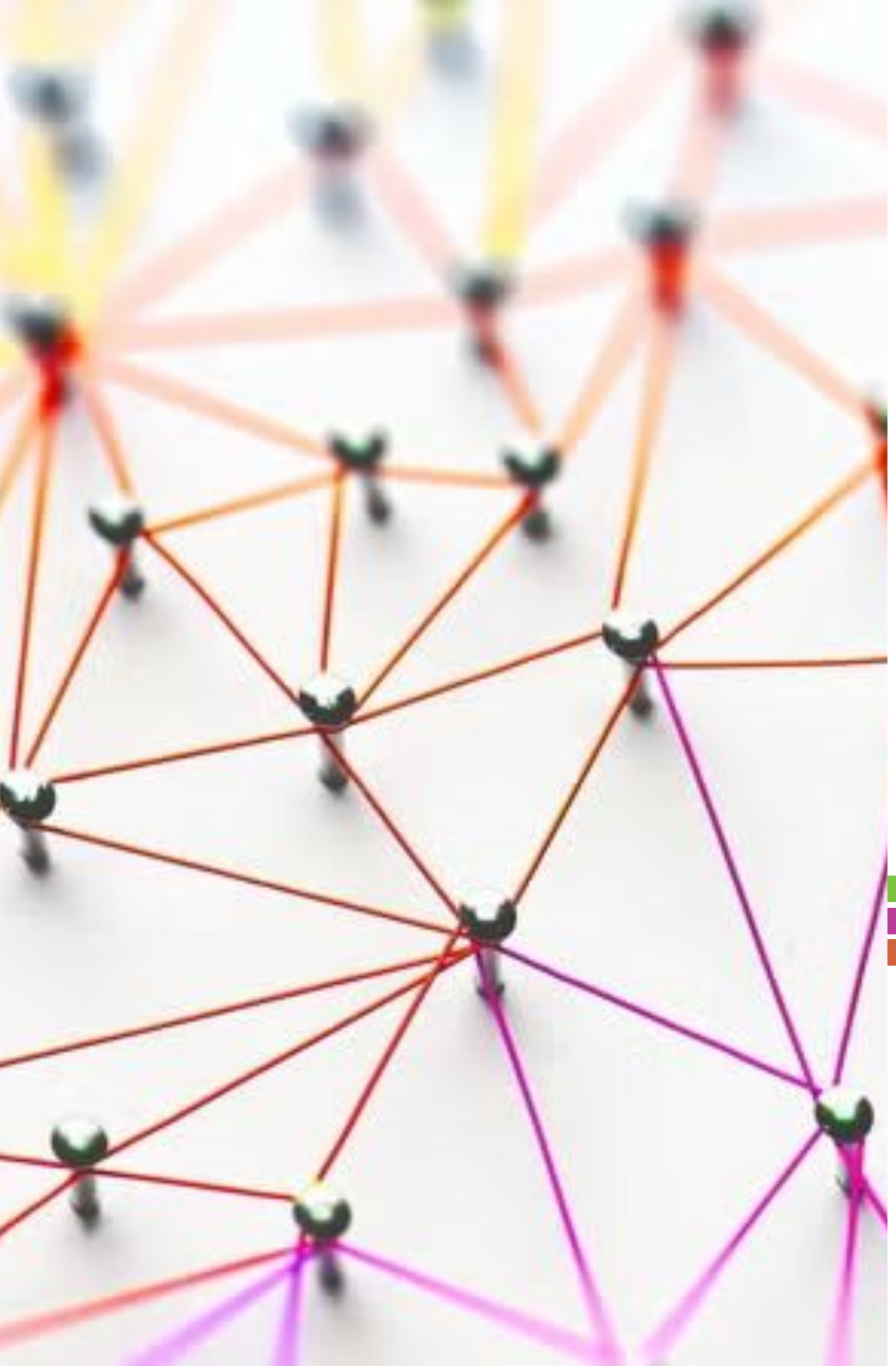

PRO-GRACE
PROMOTING A PLANT GENETIC RESOURCE COMMUNITY FOR EUROPE

Funded by the European Union

Towards interconnection of external phenotypic data with EURISCO

Kritika Adhikari

08/10/2025

Why does interconnection matter?

- Discovery of fragmented data
- Meta-analyses of crops, environments
- Prevention of loss of data

- Achieve open science and FAIR principles
- User efficiency
- Leverage EURISCO as a European reference point
- Identify gaps in phenotypic research and set funding priorities
- Increased exposure of European PGRs and networks with international PGR platforms

Better exploitation of PGR for sustainable crop production

Principles to guide interconnection

1. **User and provider value** – should provide recognition for providers and easy access to the users
2. **Federated network** – EURISCO as a discovery hub with virtual connection to external systems
3. **Minimal entry threshold** – all systems should meet a minimal data and metadata standards
4. **Provenance, governance and access**– Transparent rights, licenses and traceability
5. **Sustainable outlook** – connection for long-term persistence plan across evolution of technology
6. **Community coordination and evolution** – Interconnection is a shared responsibility
7. **FAIR by design** – Interconnection should progressively increase FAIRness of the data
8. **Interoperability as a priority** – Rely on broadly accepted standards

Mechanisms of Interconnection

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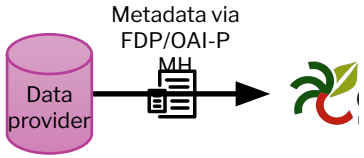
System-to-system interconnection

API

Metadata harvesting



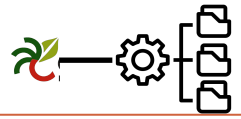
Accession-to-dataset interconnection

Landing pages (Accession URLs)

Persistent identifiers; Static links

Semantic links (Ontologies)

Broker services

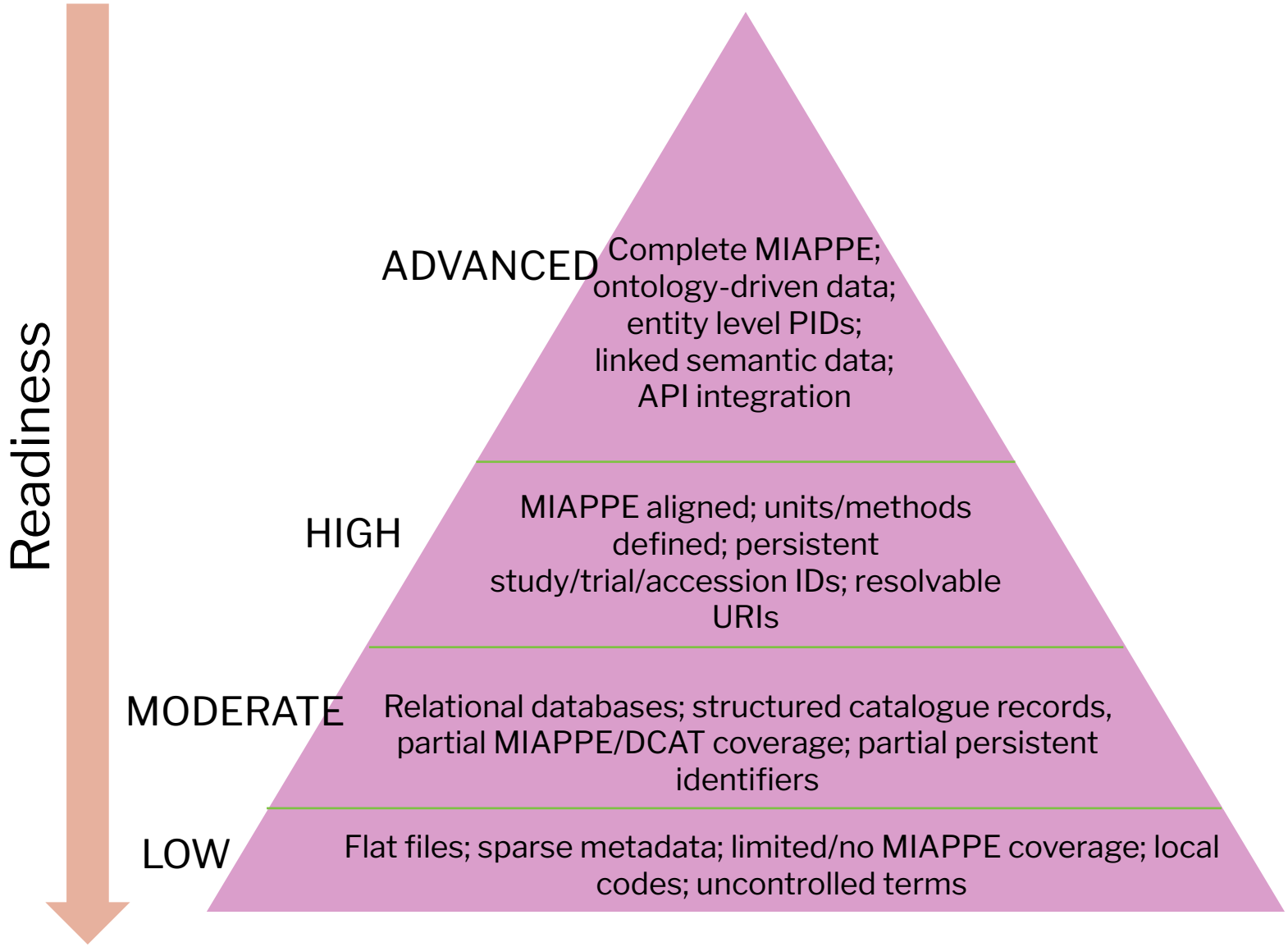


External data/system

Current status of phenotypic systems

Readiness : how prepared a system is to interconnect virtually with EURISCO or other portals. It depends on:

- Technical maturity
- Standard adoption
- Sustainability



Mechanisms of Interconnection

Accession-to-dataset linking

Best for: Low and moderate tier systems without complete structure of metadata and data exchange technologies

Example: Phenotypic datasets stored in repositories (Zenodo, CGIAR dataverse) linked through embedded DOIs, accession ID or stable URL in EURISCO's accession page

Requirement: Registered identifiers, resolvable URLs, metadata in EURISCO

Limitations: no dynamic querying

LOW

- Static linkout with stable URLs or DOI
- Embed links in the metadata or passport data
- **Future steps** – provide minimal MIAPPE templates and guideline to assign PIDs

MODERATE

- PID based linking
- Embed links in the metadata or passport data
- **Future steps** – Close MIAPPE/metadata gaps, map accession IDs to MCPD

Mechanisms of Interconnection

System-to-system linking

Best for- systems with technical infrastructures for querying and retrieving data

HIGH

ADVANCED

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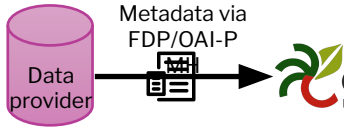
Technically matured systems with:

- structured, MIAPPE-aligned databases
- well defined API points
- capacity for programmatic access



Best for system that

- Exposes structured metadata
- Does not support further infrastructures.

SPARQL

Advanced systems with

- ontology driven data,
- entity-level identifiers,
- semantic technologies

Potential systems for early connection

BrAPI

GnpIS

PHIS

FAIDARE

PIPPA

Metadata exposure, static links

e!DAL Plant Genomics & Phenomics Research Data Repository

HARNESSTOM

GEN4OLIVE

G2P-SOL

BRASSICA INFORMATION PORTAL

Building an Interconnected Ecosystem

At data level:

- Adopt common metadata standards, incentives for metadata structuring and exposure
- Encourage assignment of PIDs and mapping local IDs to MCPD accession IDs
- Harmonize trait descriptors and ontologies
- Deposit data in trusted repositories/national repositories with open and clear licensing
- Utilize standard schemas for high-throughput/time-series data (emerging big data)
- Anticipate data curation and sharing with possible linking or connection in mind

Building an Interconnected Ecosystem

At PGR community level:

- Develop light-weight templates for small scale data providers to adopt in the early phases
- Train on standards specially to low readiness systems
- Expand proof of connections across crops and systems
- Define rules on ownership, licensing and responsibilities
- Foster collaborative pathways utilizing existing integrative systems

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