

EUROPEAN REGIONAL DEVELOPMENT FUND (ERDF)
A way to make Europe

HERCULES PROJECT

A System for Universities with Research Data Semantically Enriched

OISA and DEAM



Prof. Dr. Jesualdo Tomás Fernández Breis
Hercules project team

EuroCRIS membership meeting
November 2020

Table of contents

01

**Product 1: Ontological Infrastructure
and Semantic Architecture**

02

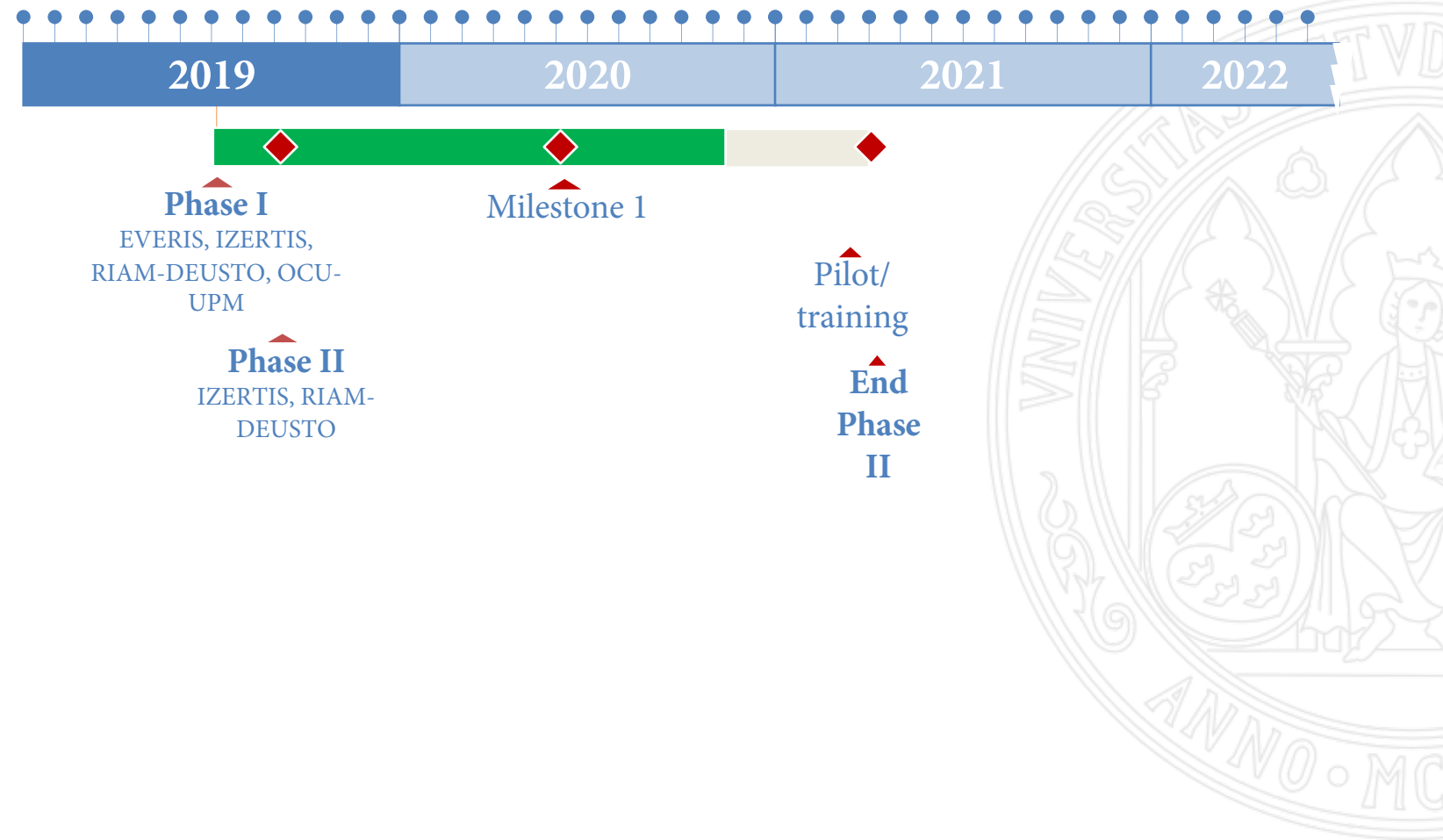
**Product 3: Data Enrichment and
Analysis Methods**



1. Ontological Infrastructure and Semantic Architecture (OISA)

Major expected results

- Network of Ontologies for the Research Management domain
- Semantic platform for the interoperability of research data
- Compatibility with major exchange formats (e.g., CERIF)
- Alignment with major international initiatives (e.g., Eurocris)
- FAIRness



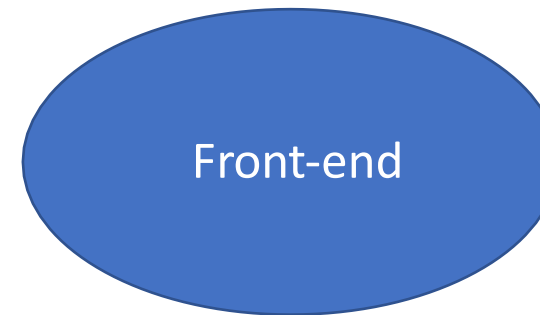
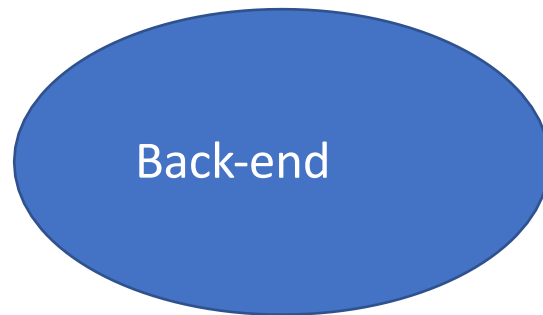
Ontological Infrastructure

The Hercules Project will create a “Hercules Ontology Network” with the following elements and connections:

- External Ontologies. Well-recognized, existing ontologies will be reused.
 - Internal Ontologies. They will be created to represent areas of Knowledge that are not covered by external ontologies or by conversions of external vocabularies and standards.
 - Methods for converting external vocabularies and standards to OWL will be developed
- ✓ Methods for controlling the versions of the ontology network will also be implemented.

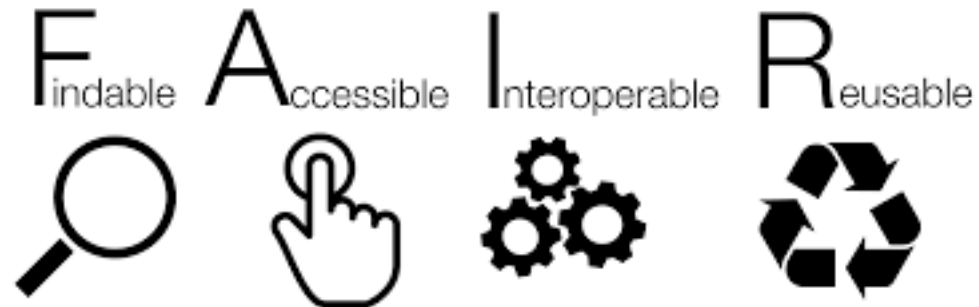
Semantic Architecture

- The back-end manages the research data in a distributed way, given that each University is expected to have an backend capable of interacting with other nodes in the Hercules cloud.
- The front-end will enable user interaction and data exploitation by humans and machines

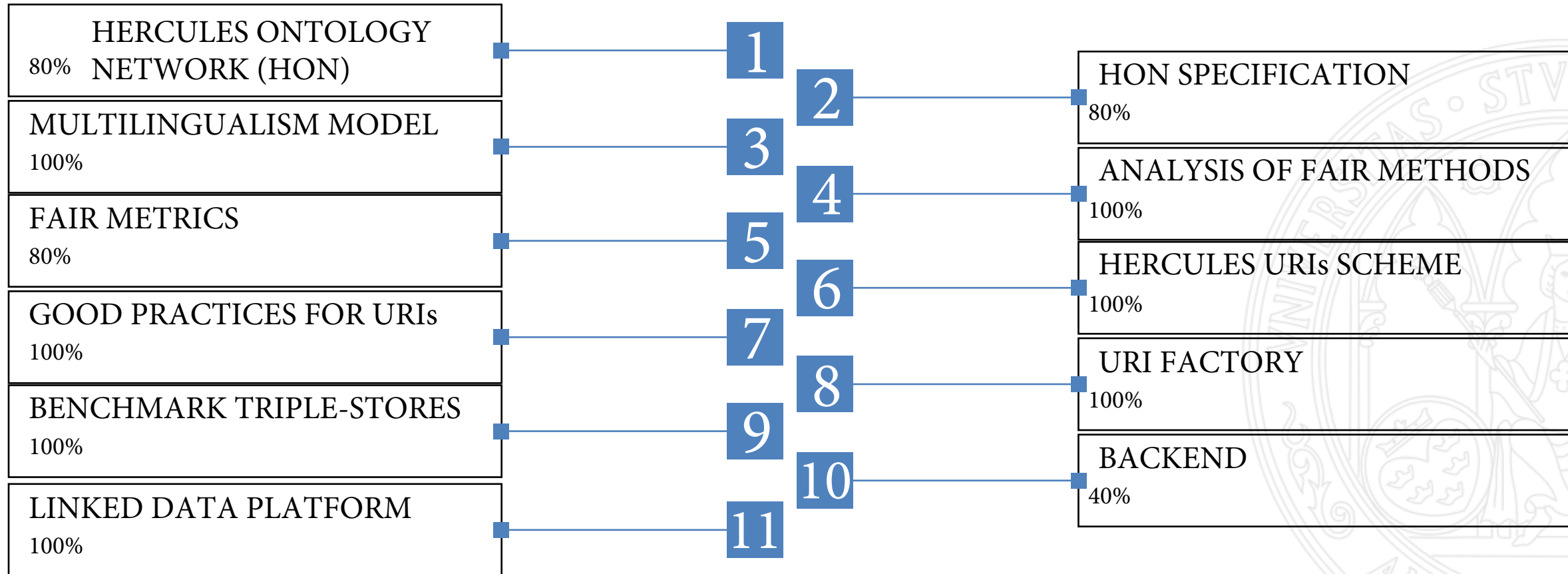


FAIRness

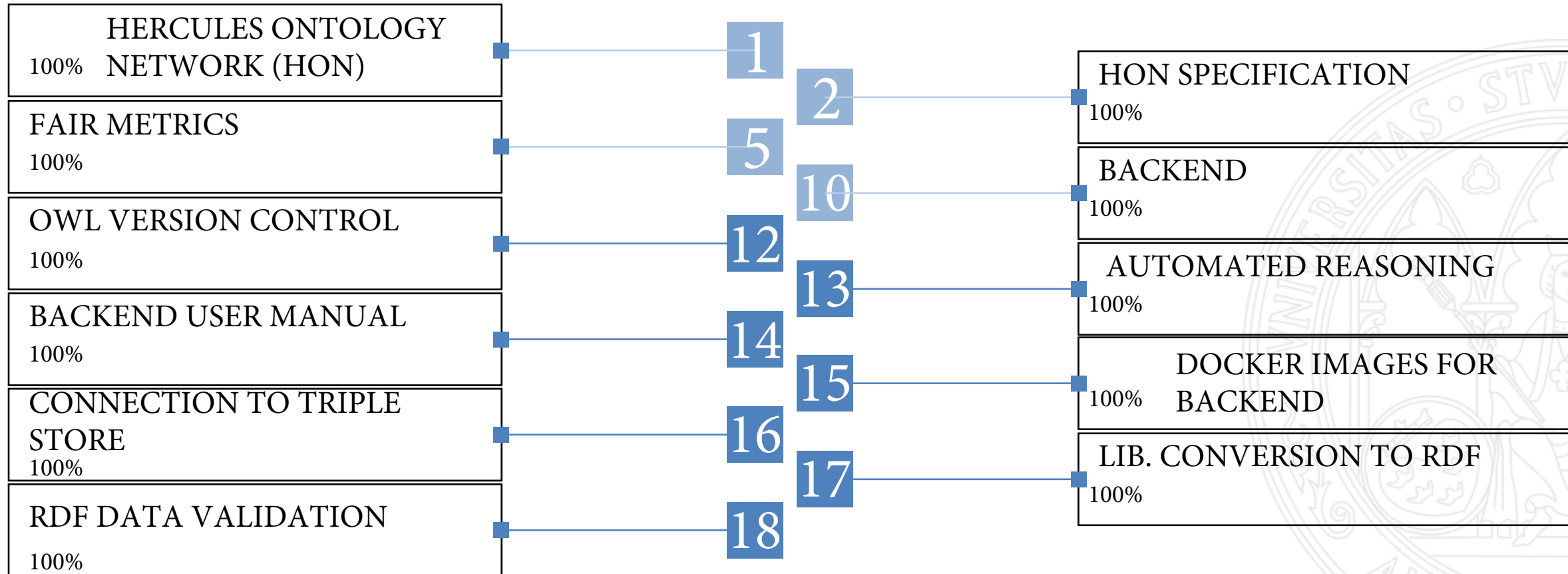
- The network of ontologies and the semantic data must be as FAIR as posible
- A set of metrics for measuring FAIR aspects will be proposed
- The FAIRness of the OISA resources and data will be tested



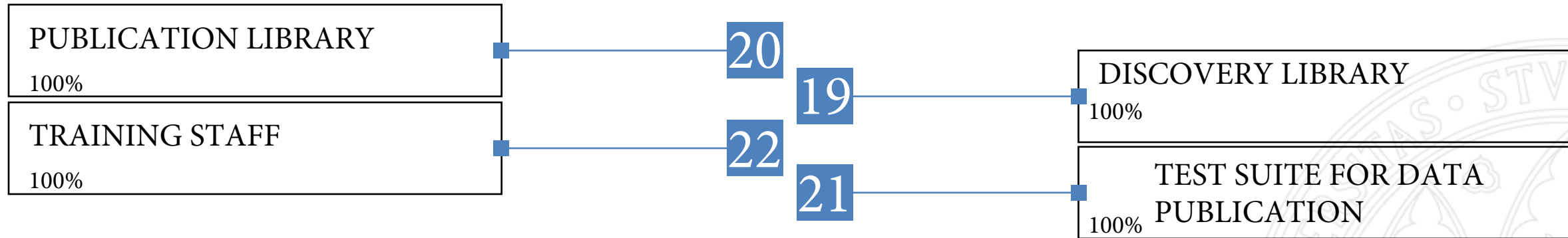
Deliverables linked to Milestone 1

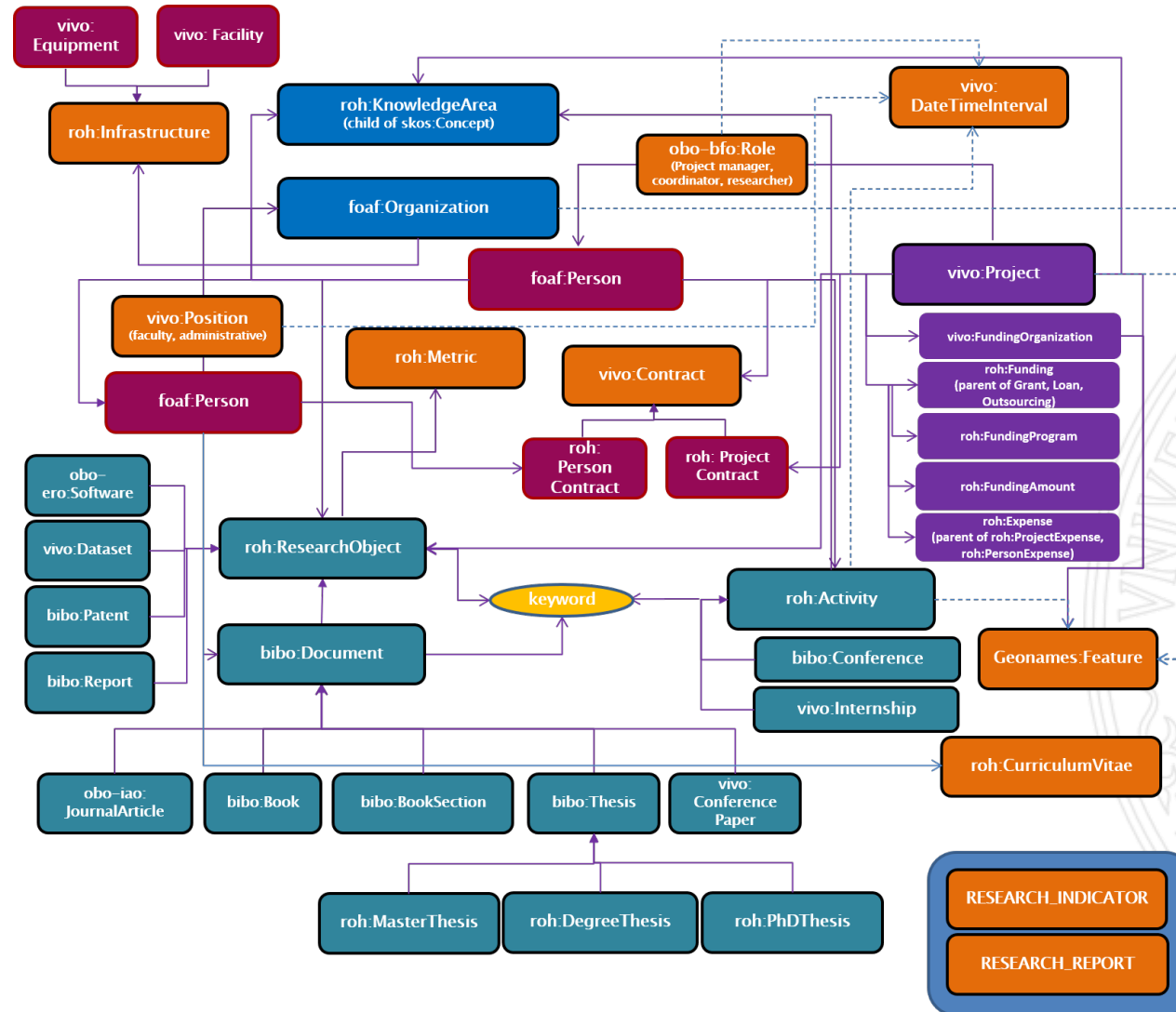


Deliverables linked to the end of the project



Deliverables linked to the end of the project

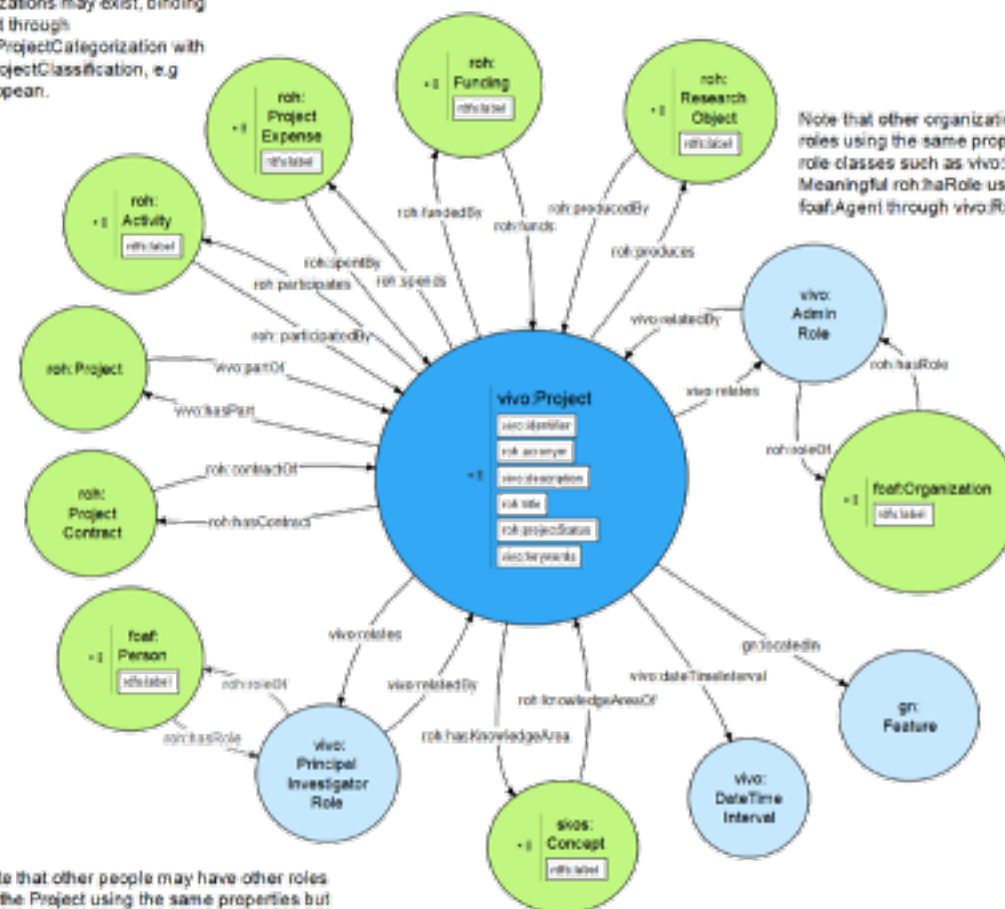




80% HERCULES ONTOLOGY NETWORK

Project Model 17 June 2020

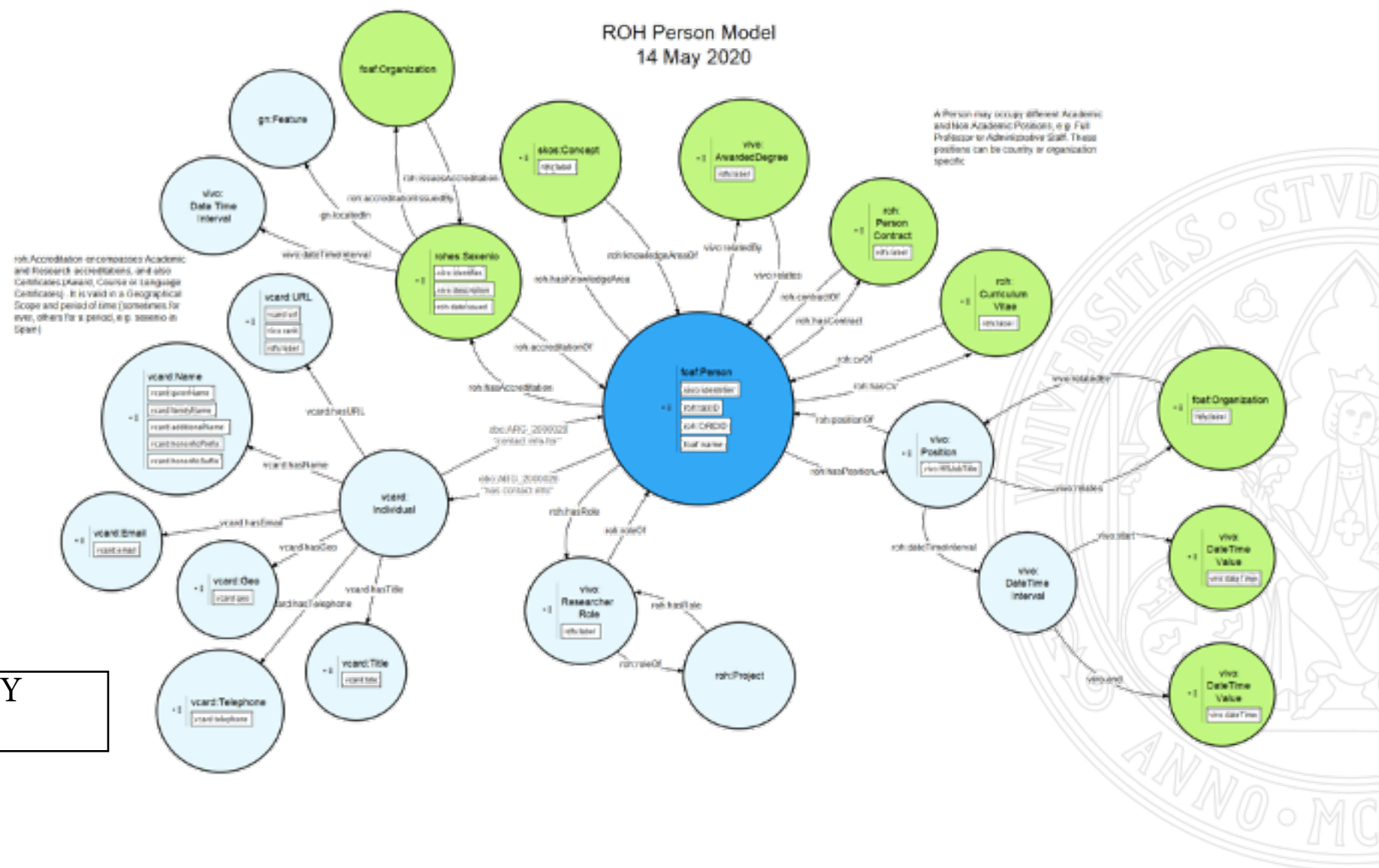
Notice that different Projects categorizations may exist, binding a project through `roh:hasProjectCategorization` with a `roh:ProjectClassification`, e.g. `roh:European`.



Note that other organizations may have other roles using the same properties but different role classes such as `vivo:MemberRole`. Meaningful `roh:hasRole` used to link `foaf:Agent` through `vivo:Role` with `vivo:Project`.

Note that other people may have other roles on the Project using the same properties but different role classes such as `vivo:CoPrincipal InvestigatorRole` and `vivo:InvestigatorRole`.

80% HERCULES ONTOLOGY NETWORK



HERCULES ONTOLOGY
80% NETWORK

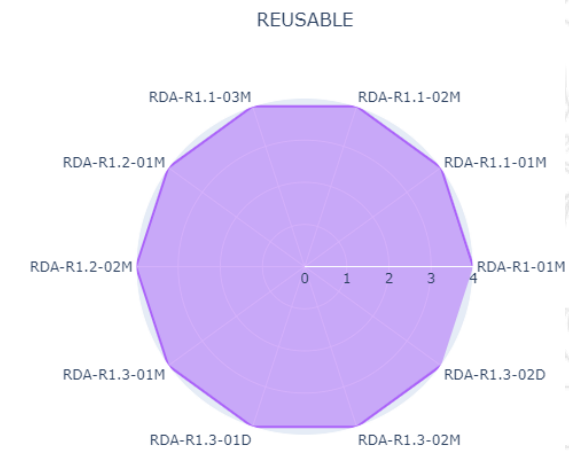
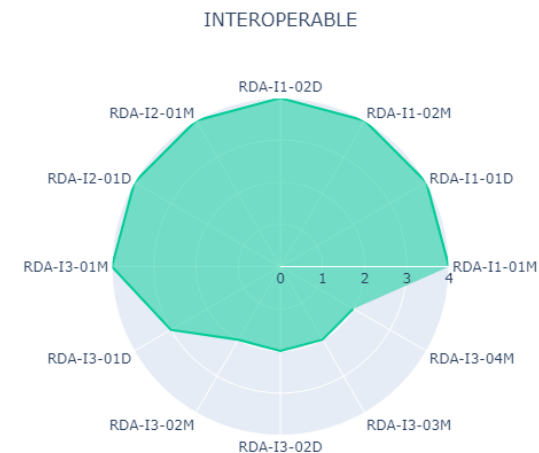
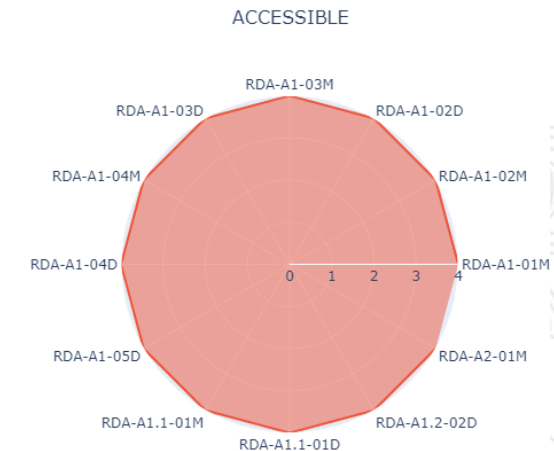
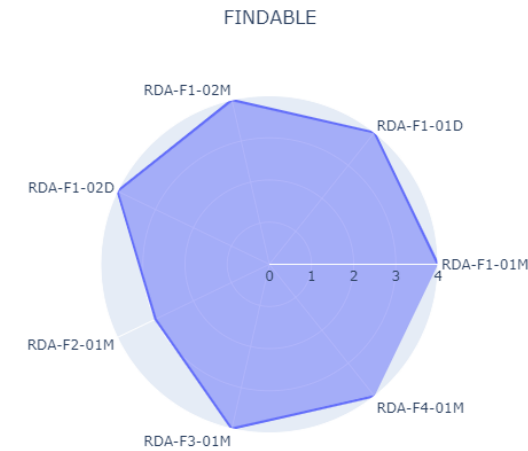
Properties:

FAIR approaches based on RDA Alliance and FAIRSharing

FAIR metrics have been identified, classified and implemented

FAIR METRICS

80%



Benchmarks

No seguro | herc-iz-front-des.a.atica.um.es:8081/benchmarks

No sincronizando

sobre ciencias de la computación), y realiza consultas sobre ellos para medir el rendimiento. El generador de datos usa como modelo la base de datos DBLP, ya que tiene muchas características de los datos en el mundo real, como por ejemplo el carácter social, e imita las correlaciones que existen en ella sobre entidades, tales como artículos, autores...., para crear los datos se analizan las frecuencias e interacciones de las entidades, de forma que el resultado es los mas fiel posible.

rango: [0,1]
Peso: 1
Peso Relativo Padre: 50%
Peso Relativo Global: 25%

Datos en crudo

Resultados

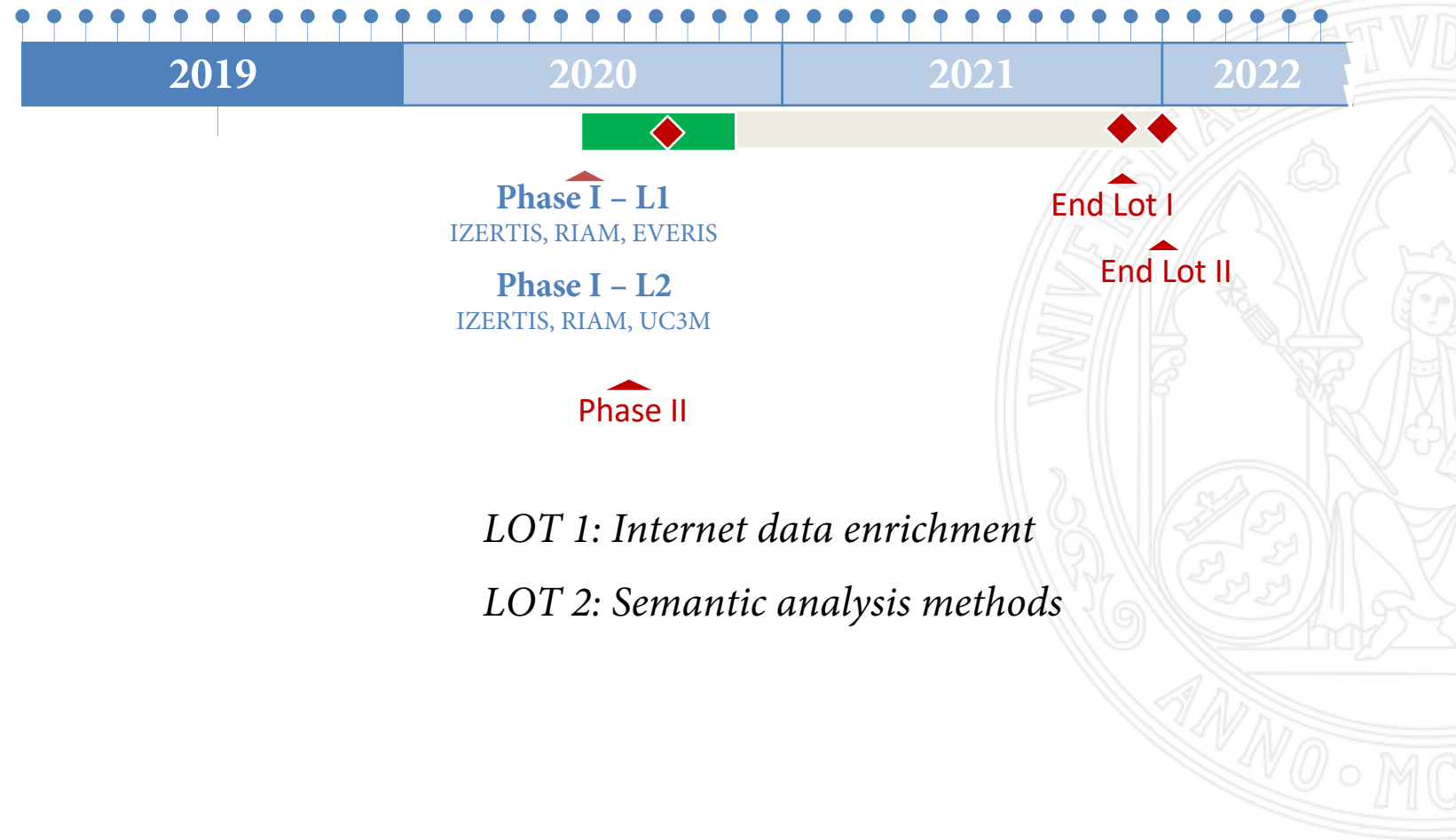
TripleStore	Val.	Ptos. Acum.	Inc.	Inc. Acum.
MarkLogic	0 (+0%)	0% / 0%	25%	25%
Openlink Virtuoso	16 (+17.391%)	17.39% / 25%	0%	0%
APACHE TDB2 + FUSEKI	13 (+14.13%)	14.13% / 25%	0%	0%
Amazon Neptune	0 (+0%)	0% / 0%	25%	25%
GraphDB	0 (+0%)	0% / 0%	25%	25%
Stardog-Union	0 (+0%)	0% / 0%	25%	25%
AllegroGraph	0 (+0%)	0% / 0%	25%	25%
BlazeGraph	0 (+0%)	0% / 0%	25%	25%
Eclipse RDF4J	22 (+25%)	25% / 25%	0%	0%

BENCHMARK TRIPLE-STORES

80%

3. Data Enrichment and Analysis Methods

- Enrichment of the data of the Research Information System.
- FAIR Research Objects
- Analysis of research results and activities
- Analysis of indicators and predictions



Project modules

DEAM development is structured through the different modules of each subproject

LOT 1: Internet data enrichment

- Central Services (HERCULES Core Services)
- Management of FAIR Research Objects (HERCULES FAIR RO)
- Research Objects Processing and Analysis (HERCULES RO Enrichment)
- Researcher Profile (HERCULES Researcher Dashboard)

LOT 2: Semantic analysis methods

- Search for potential partners (HERCULES Research Synergy Finder)
- Analysis of research projects (HERCULES Projects)
- Analysis of research indicators (HERCULES Indicators)

EUROPEAN REGIONAL DEVELOPMENT FUND (ERDF)

A way to make Europe

HERCULES WEBSITE

<http://hercules.um.es>

Thank you for your
attention

jfernand@um.es

Aula Virtual Biblioteca Sede Electrónica Tienda Directorio Webmail English Consultarnos Acceder

GOBIERNO DE ESPAÑA MINISTERIO DE CIENCIA E INNOVACIÓN FONDO EUROPEO DE DESARROLLO REGIONAL (FEDER) Una manera de hacer Europa Unión Europea

Inicio Sobre Hércules Proyecto ASIO Proyecto SGI Proyecto EDMA Otras licitaciones

Sobre Hércules

Español English

RESULTADOS DE LOS PROYECTOS

ARQUITECTURA SEMÁNTICA E INFRAESTRUCTURA ONTOLÓGICA

SISTEMA DE GESTIÓN DE LA INVESTIGACIÓN

ENRIQUECIMIENTO DE DATOS Y MÉTODOS DE ANÁLISIS

Resultado de los proyectos ASIO SGI EDMA