Research Object Profiles

There's More Than One Way To Do It

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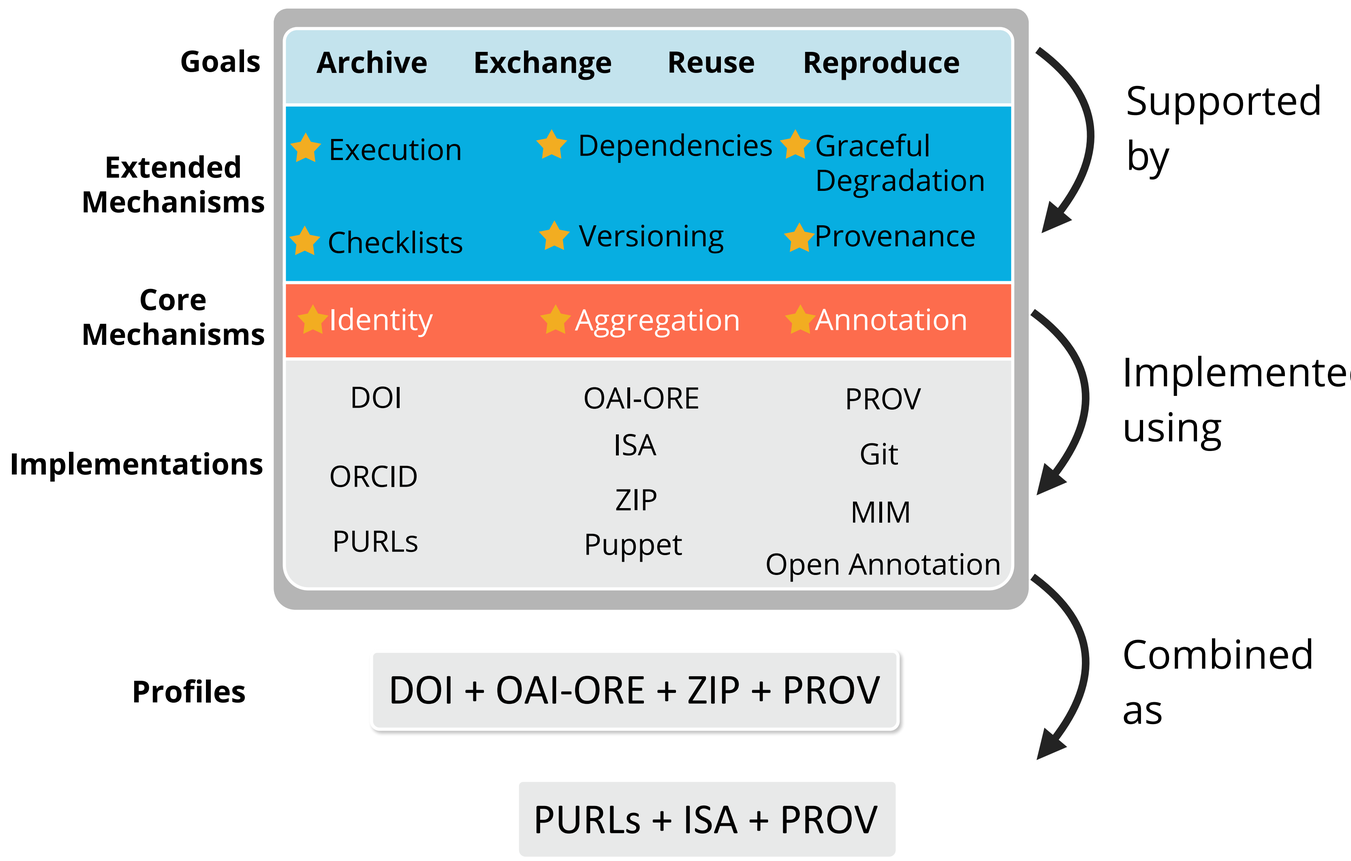
www.researchobject.org

The value proposition of research objects is now well understood - supporting the publication of more than just PDFs, making data, code, and other resources first class citizens of scholarship.

What is less understood is the **formats**, **protocols**, and **standards** that researchers need to use to make their research objects a reality?

Rather than a one size fits all approach to research objects, we are developing a growing collection of **Research Object Profiles.**

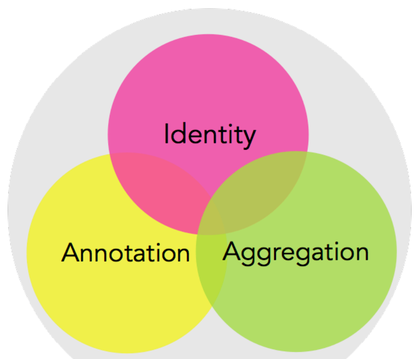
Requirements for research objects will vary depending on the **goal** of that research object: archiving, exchange, publication, replication, learning etc., as well as the prevailing norms of the **specific domain**.



Common Core

This collection of profiles is designed with two principles in mind:
1) **A common core** to ensure interoperability,
2) **Flexibility** to support domain specific requirements.

To support the common core we have developed the Research Object Model (http://wf4ever.github.io/ro/) a meta-model that captures the core mechanisms of Identity, Aggregation and Annotation. Using this common core we are able to implement research objects using a diverse set of technologies, whilst maintaining the ability to treat all research objects, to some degree in the same manner, for the purposes of exchange, discovery etc.



Profiles

Each **profile** describes a combination of existing formats, standards, and software such as *Docker*, *Zip*, *Git,* and *PROV* to build research objects for a specific purpose, and from the tools that researchers already use.

PROFILE: Simple JSON Description

Aggregation - **RO Model** Manifest in **JSON-LD**
Identifiers – **URIs**
Annotations – **Dublin Core** and **Open Annotation** w/ Custom JSON

***Purpose*:** Providing a simple description of an RO in response to an API call.

Used by: ClinicalCodes.org

PROFILE: RO Bundle

Aggregation – **Zip** to aggregate resources + **JSON Manifest** to describe
Identifiers – **URIs** for resources outside the zip, **uuids** for internal resources
Annotations – **Dublin Core** for Provenance, **Open Annotation** for custom annotations
Versioning – **PAV model** annotations and/or serialization of previous versions.

Uses Zip archive and RO model manifest to provide a physical serialization Of the RO for exchange or archiving. Appears to the the lay user as just another zip file!

Used by: Taverna

Compatible with: combine [1]

PROFILE: RO as a Web Page

Aggregation – **HTML** enriched with **RDFa** description using **RO Model**
Identifiers – **URLs** or **URIs**
Annotations – **Dublin Core** in **RDFa**, **schema.org**

***Purpose*:** Use the RO model in RDFa, to turn an HTML page description of a study into a machine readable Research Object!

Used by: rohub.linkeddata.es

PROFILE: Docker as a Research Object

Aggregation – **Docker Image** + **Docker Manifest** + **JSON Manifest**
Identifiers – **URIs** for Docker Images
Annotations – **Dublin Core** and **Open Annotation** in Manifest
Versioning – Docker uses **Git** for Versioning
Execution – **Docker Containers**

Purpose: Exchange an image that provides software, code, and data to reproduce computational experiments that can run on any linux platform. No configuration required!

docker

[1] Frank T. Bergmann et. al, **One file to share them all: Using the COMBINE Archive and the OMEX format to share all information about a modeling project, http://arxiv.org/abs/1407.4992**