Enhancing Repository Integration with Crossref Services

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What we will cover today:

- Introduction to Crossref API and its capabilities
- How repositories can use the API to query
- Workflows for metadata enrichment
- Benefits for repository managers, researchers, and funders
- Metadata schema updates

What is metadata?

"Metadata is communication.

It describes and identifies an item, it defines relationships, it sets parameters for the range of actions something can engage in.

As the things we read, write, create, use, move around, and engage with become more digital, metadata becomes more important, because without metadata, all that movement, interaction, and discovery, could not happen."

- Juliane Schneider, Metadata 20/20
https://metadata2020.org/blog/2017-09-14-metadata-and-communication

Why does metadata matter?

Research integrity

Metadata as signals of trustworthiness including provenance information

Reproducibility

Metadata as relationships between literature, data, software, protocols and more

Assessment

Metadata can be used to analyze the outcomes of research and demonstrate compliance

Discoverability

More metadata means more systems have more pathways to find your work

Crossref REST API

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https://search.crossref.org/
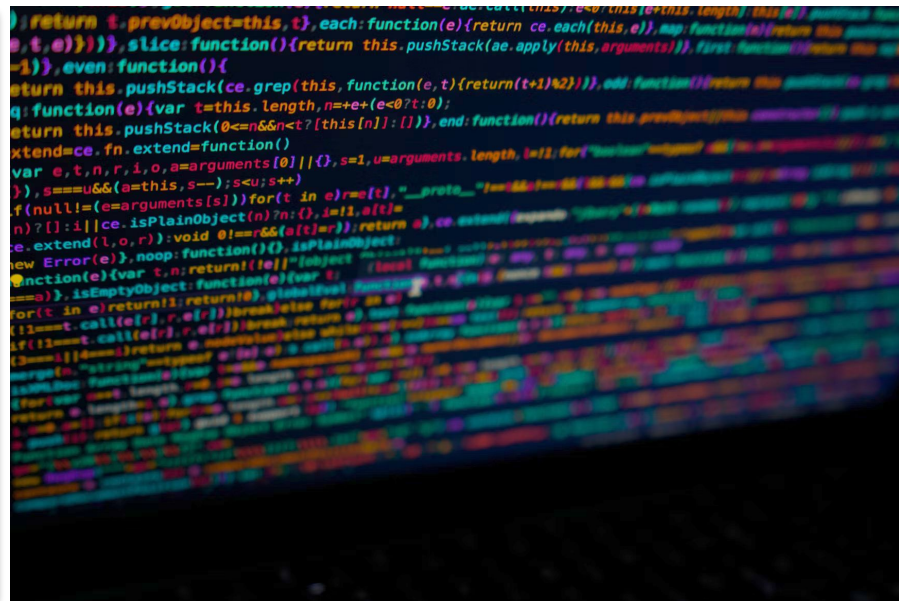
Photo by Jeremy Bishop on Unsplash

We make metadata open via the REST API

A software intermediary that allows two applications to talk to each other.

We make metadata open via the REST API

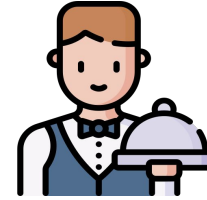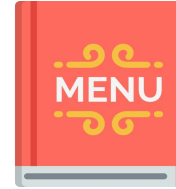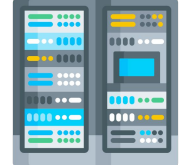A software intermediary that allows two applications to talk to each other.

We make metadata open via the **REST API**

https://api.crossref.org/
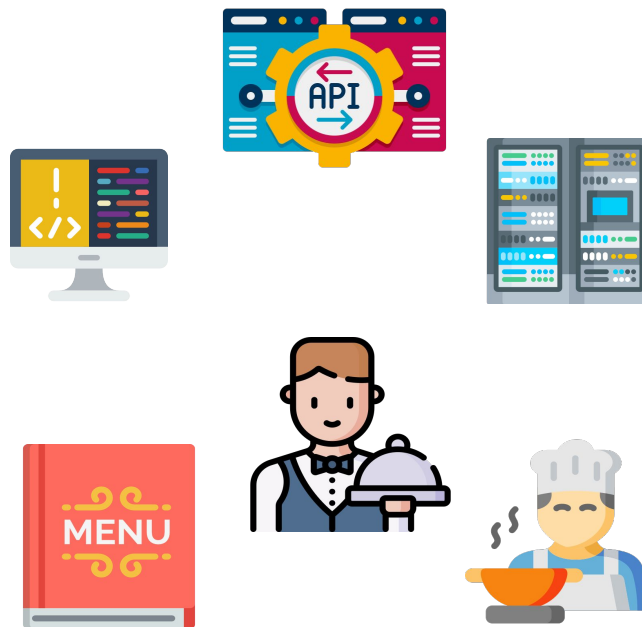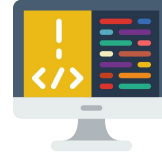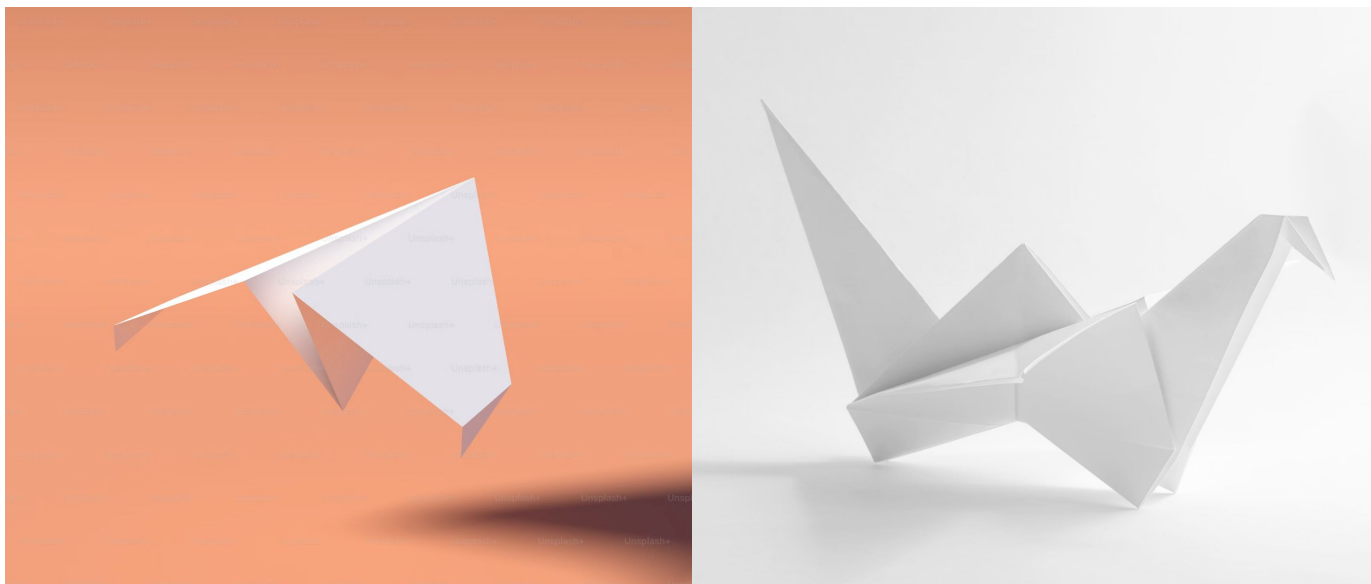
REST... API?

Communication between Client and Server

Information is organized into Unique Resource Identifiers (e.g. URL)

Unique addresses that identify and locate a resource

All requests from the client to the server must contain all of the information necessary to understand and complete the request

We won't login to a portal to get the data, there are no stored sessions

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Three basic elements

https://api.crossref.org/works?filter=from-pub-date:2025&rows=0

Server

Endpoints

?Parameters

Who is providing the data?

Digital locations where an API receives requests about specific resources

They determine the type of action you want to take on the resource

Funders Endpoints that expose funder related data

GET /funders/{id}/works

GET /funders/{id}

GET /funders

Journals Endpoints that expose journal related data

GET /journals

GET /journals/{issn}

GET /journals/{issn}/works

Works Endpoints that expose works related data

GET /works/{doi}

GET /works

GET /works/{doi}/agency

Prefixes Endpoints that expose prefix related data

GET /prefixes/{prefix}/works

GET /prefixes/{prefix}

Members Endpoints that expose member related data

GET /members/{id}/works

GET /members/{id}

GET /members

Types Endpoints that expose type related data

GET /types/{id}

GET /types

GET /types/{id}/works

How does this operation look like?

1. https://api.crossref.org/types

2. Let's paste this into our web browser

3. We should get a result like this

JSON Raw Data Headers
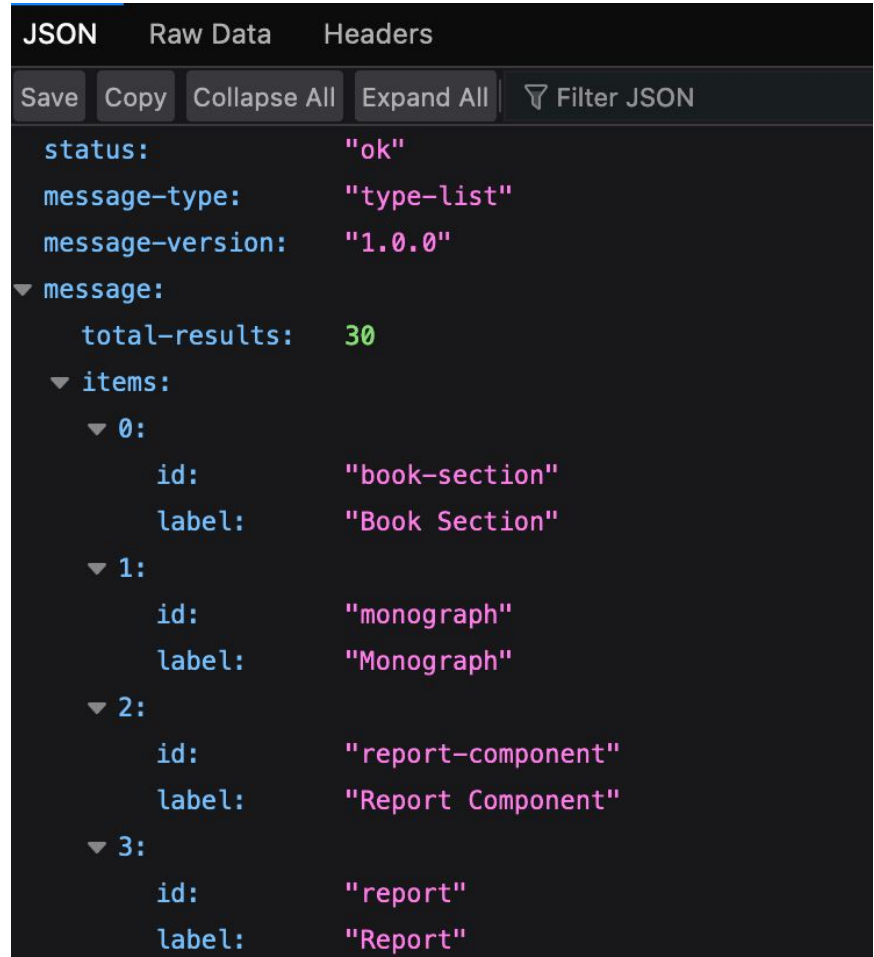
Save Copy Collapse All Expand All ▽ Filter JSON

status: "ok"
message-type: "type-list"
message-version: "1.0.0"
▼ message:
    total-results: 30
    ▼ items:
        ▼ 0:
            id: "book-section"
            label: "Book Section"
        ▼ 1:
            id: "monograph"
            label: "Monograph"
        ▼ 2:
            id: "report-component"
            label: "Report Component"
        ▼ 3:
            id: "report"
            label: "Report"
        ▼ 4:
            id: "peer-review"
            label: "Peer Review"
        ▼ 5:
            id: "book-track"
            label: "Book Track"
        ▼ 6:
            id: "journal-article"
            label: "Journal Article"
        ▼ 7:
            id: "book-part"
            label: "Part"
        ▼ 8:
            id: "other"
            label: "Other"

JSON format

Standard for machine data exchange

Key: value

Also nested and/or lists of Key: value

JSON   Raw Data   Headers

Save Copy Collapse All Expand All ▽ Filter JSON

status: "ok"
message-type: "type-list"
message-version: "1.0.0"
▼ message:
    total-results: 30
    ▼ items:
        ▼ 0:
            id: "book-section"
            label: "Book Section"
        ▼ 1:
            id: "monograph"
            label: "Monograph"
        ▼ 2:
            id: "report-component"
            label: "Report Component"
        ▼ 3:
            id: "report"
            label: "Report"

From JSON to a table

https://labs-toolkit.fly.dev/?tool_name=api_query_url_download_tool

API Query URL Download tool

Add your own API links below to retrieve results from the API

Add the URL here   ⓘ

Example link in the help section ❓

Run API Query

Multiple pools

You have three access levels to the API metadata:

- Public. Free, fully anonymous.
- Polite. Free, you provide your email (recommended).[1]
    - We only use this information to contact you in case of issues.
    - Include 'mailto' field in your API query.
- Plus. Premium service, you get:
    - A service level agreement guaranteeing you extra service and support, giving you a consistent and predictable experience.
    - Additional features such as snapshots and priority service/rate limits.

[1] We get rid of your information after 90 days.

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Guidance for every level

BEGINNING?

❯ You've heard Crossref metadata might be useful and want to know where to start.

EXPLORING?

❯❯ You have some specific queries and want a lightweight way to use Crossref metadata.

INTEGRATING?

❯❯ You rely on Crossref metadata and need to incorporate it into your product at scale.

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How repositories can utilize Crossref metadata

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How repositories can utilize Crossref metadata

- Enrich Records with Quality Metadata
  - Auto-populate records via Crossref's REST API
  - Pull titles, authors, funders, ORCID iDs, licenses, and more

- Persistent linking
  - Use DOIs to link to published content
  - Create connections between articles, datasets, and software

- Align with FAIR Principles
  - DOIs & metadata indexed for discovery
  - DOIs resolve to landing pages persistently
  - Open standards (XML, JSON, ORCID, ROR)
  - Licensing & funding info clarify reuse

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Crossref services that support repositories

- Reference linking
  - enables researchers to follow a link from the reference list to other publications, helping them to make connections and discover new things.

- Cited-by
  - shows how research has been received by the community by displaying the number of times it has been cited, and by linking to the citing content

- Similarity Check
  - Enables editors to assess the originality of the work before they publish it

- Crossmark
  - The Crossmark button gives readers quick and easy access to the current status of an item of content, including any corrections, retractions, or updates to that record.

Metadata updates

ROR can now be supplied as a funder identifier

Grants schema 0.2.0:

- new funding types: APC, BPC, infrastructure

5.4 update:

- publication types for citations
- status support for preprints
- version metadata

Typed citations

Can include a 'type' with citations supplied with metadata records

Types are:

blog	dissertation	preprint
blog post	journal	protocol
book	journal article	registered report
book chapter	other	report
collection	patent	software
conference paper	peer review	standard
conference proceeding	poster	web resource
dataset		

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Why it matters - for you and the community

- For repository managers - better record quality and linking

- For researchers - increased discoverability and citation tracking

- For funders - clearer funding links and impact visibility

- Alignment with FAIR and open science goals

Thank you

Mastodon: @crossref@mastodon.online

Bluesky: @crossref.bsky.social

What are we thinking about: crossref.org/blog

Conversations: community.crossref.org

Get in touch: feedback@crossref.org

Newsletter: Click `Get email updates` in website footer

Thank You