Linked Open Data

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By bringing Linked Open Data into the library, you're joining a metadata ecosystem of global discovery and comprehensive interoperability. Cataloging is more accurate and more automated. Additionally, search results are more relevant, reliable, and informative. Ex Libris is leading the way in Linked Open Data integration, connecting enriched library records across applications on a cloud-based platform.

Ex Libris continues its ongoing effort to leverage the global metadata ecosystem for Alma customers. This includes a game-changing approach to metadata, with a view to making it open and efficient. There are three basic, complementary methods to reach that goal:

- **Community Sharing:** Create a collaborative platform for openly contributing and sharing metadata. This is already happening in practice through the Ex Libris Community Zone, selected consortia, and other cooperative organizations. Our goal is to expand and support such collaborations, including access to an open-source metadata ecosystem.
- **Linked Open Data:** Create a production-scale solution for integrating libraries into the global semantic web, to realize the promise of Linked Open Data – more efficient cataloging, better discovery, and improved interoperability. Linked Open Data also makes it easier to implement free access or community-based sharing of metadata.
- **Data Enrichment:** Retrieve, display, and provide access to relevant data from additional sources beyond the library silo to enhance the experience of patrons and staff (e.g., displaying info card and contributor page with more information about a book's author).

Freeing Librarians: What We've Done, What We're Doing, and What's Next

Linked open data saves time and improves efficiency for both patron-facing and resource-management librarians. Catalogers can automatically add metadata from publishers and other sources, improving accuracy, reducing redundancy, and enhancing data reliability. This makes connecting resources, generating special collections, collating unique materials, and increasing their exposure to patrons easier. More valuable information is brought directly to the patron without library staff having to make connections or filter results manually.

Alma is using linked open data, with proven effectiveness. The next stage is to promote and further develop its use, making it more pervasive and ingrained throughout the library management system, as well as enhancing its availability and accessibility in discovery systems for patrons.

Note

All future capabilities described below are subject to change.

More Formats

Ex Libris continues to provide seamless support for a large variety of metadata formats, such as MARC21, KORMARC, CNMARC, UNIMARC, DC, and MODs. Linked Open Data provides new formats and is a critical addition to the existing toolbox, making it possible for customers to have the freedom to choose which format to use while gradually transitioning to new linked data formats.

Ex Libris has begun by supporting BIBFRAME in the Alma catalog as our first Linked Open Data format. This is being done while ensuring Alma will support additional Linked Open Data formats seamlessly per the Alma community's needs in the future. Ex Libris is collaborating with the community to integrate mappings of additional formats, such as RDA/RDF, to enhance support for the workflows required.

Unified Management of Multiple Resource Types

Alma is a next-gen library solution for coherent and streamlined management of electronic, print, and digital resources, catalogs, and collections. This includes curation, acquisitions, discovery, and analytics. As a unified system, Alma consolidates formats and metadata using common workflows and processes for maximum efficiency. Metadata based on Linked Open Data will be supported in Alma for any relevant resource, whether print, digital, or electronic.

Ex Libris is working on supporting end-to-end workflows, such as enabling creating and editing BIBFRAME records internally or in open-source programs and sending them directly to Alma.

We are addressing the various needs of our customers and, therefore, plan to allow the ability to use MARC side-by-side with Linked Open Data as long as needed. MARC format is, and will continue to be, fully supported and can be enriched with Linked Open Data and utilized for richer display. At the same time, customers can move gradually at their own pace from MARC to Linked Open Data formats. Part of supporting a multi-format environment is to provide our users with means to match records from different formats. We are working together with the community to define these workflows.

Creating Enriched Metadata

By using Linked Open Data to create works and instances, the cataloger can catalog metadata more efficiently.

Today, we support the display of MARC records enriched with URLs based on links to authorities in search results and in the metadata editor. This enrichment can be configured by each institution to support on the fly or permanent enrichment, and is also supported for local authorities. For more information on the linked data enrichment configuration, see Linked Data Enrichment Configuration - Ex Libris Knowledge Center.

It is also possible to see a BIBFRAME version of such a MARC record, highlighting the work and its individual instances in Alma's simple record view.

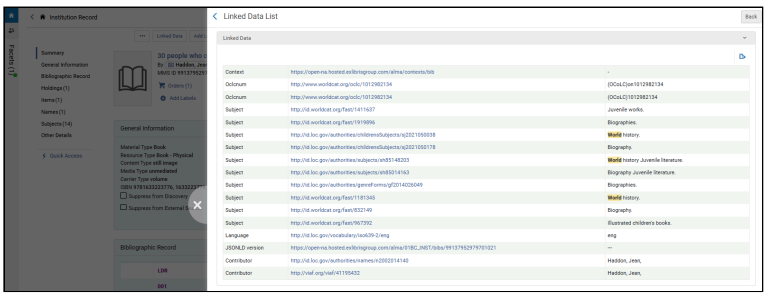

Figure 1: Displaying links leading to authority records in the title search results

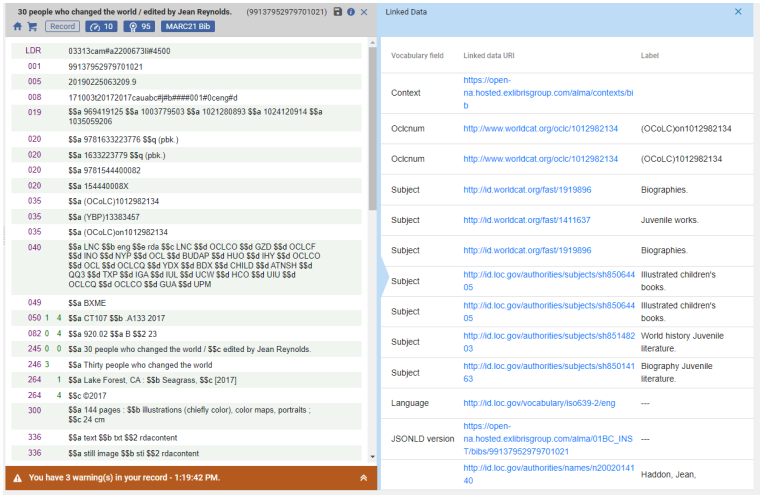

Figure 2: Displaying links leading to authority records in the metadata editor

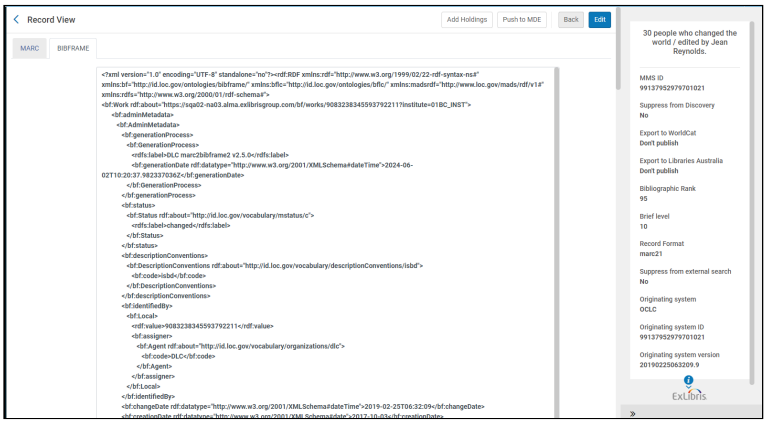

Figure 3: BIBFRAME record for a title in search results

In addition, the cataloger can refine Alma bibliographic records using OpenRefine services. To enrich the MARC record with URIs based on lookups within Alma, the cataloger should use the Alma Refine Cloud App. Currently, the supported linked open vocabularies are Getty, Wikidata, Geonames, Homosaurus and OCRID, while libraries can add their own sources that support the OpenRefine standards to their CloudApp. Ex Libris is working on improving the workflow for lookups in the metadata editor. For more information, see ORCID URI Enrichment for Bib Records Using Alma Refine - Ex Libris Knowledge Center

See How to use the Alma Refine cloud app for service Wikidata as an example.

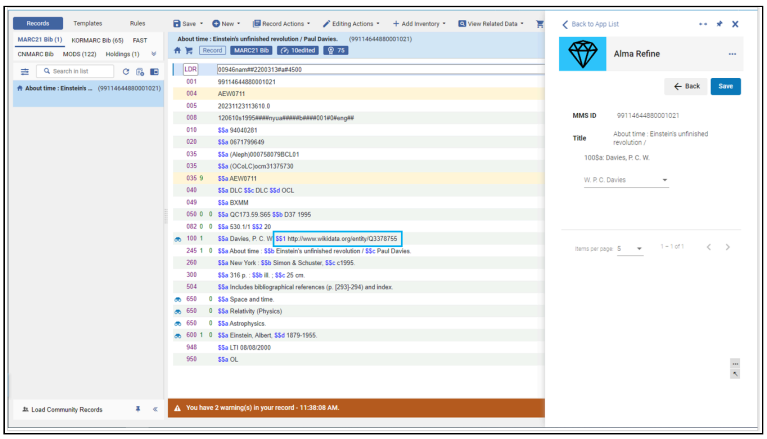

Figure 4: Metadata Editor with the Refine Cloud App

Cataloging in Sinopia

Alma supports an integration between Alma and the Sinopia linked open data editor. Such integration allows catalogers to create new LC BIBFRAME works and instances in Sinopia and use them in Alma workflows. These records are supported as part of Alma's standard functionality.

See BIBFRAME Support - Ex Libris Knowledge Center for enabling the integration with Sinopia.

Looking ahead, the cataloging of Linked Open Data relations will be part of Alma's core capabilities.

One of the main pillars of Linked Open Data is collaborative cataloging. Ex Libris is enhancing the collaboration with Sinopia , alongside expanding the API integration to other collaborative cataloging platforms such as Share-VDE and JCricket.

Linked Open Data Form Editor

Ex Libris, embarked on an innovative journey with the development of a **linked open data form editor**. This cutting-edge tool promises to revolutionize cataloging workflows within Alma, enhancing the efficiency and accessibility of linked open data for librarians. The Form Editor is designed to accommodate multiple formats, while the first format to be supported will be BIBFRAME. We recognize that the strength of linked open data lies in collaboration. That's why the Form Editor actively engages with the library community. Incorporating community-driven ontologies ensures that your cataloging experience aligns seamlessly with best practices and evolving standards. The form editor will assist the librarian in creating links between entities within the library catalog or using lookup services to external sources , providing a quick and easy workflow.

The Form Editor seamlessly integrates with multiple linked open data resources, providing lookups, and generates BIBFRAME records in formats that will ensure interoperability with the linked data ecosystem.

Development has begun with early access and testing by the linked data focus group, planned for H2 2025 and general availability for H1 2026

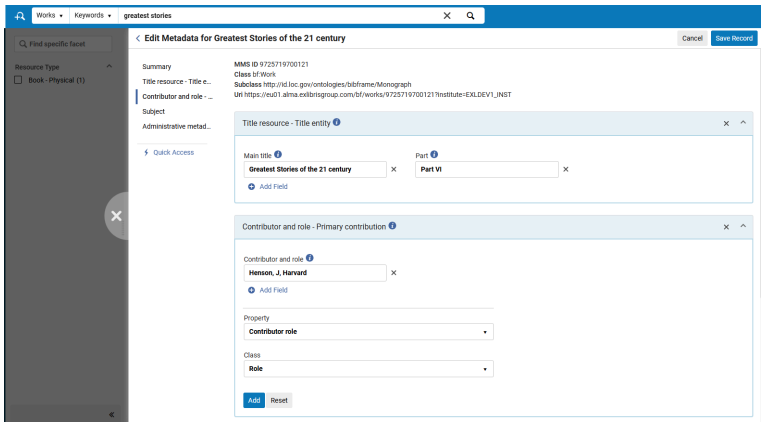

Figure 5: Editing a BIBFRAME work from within the work search, adding fields based on the ontology guidance

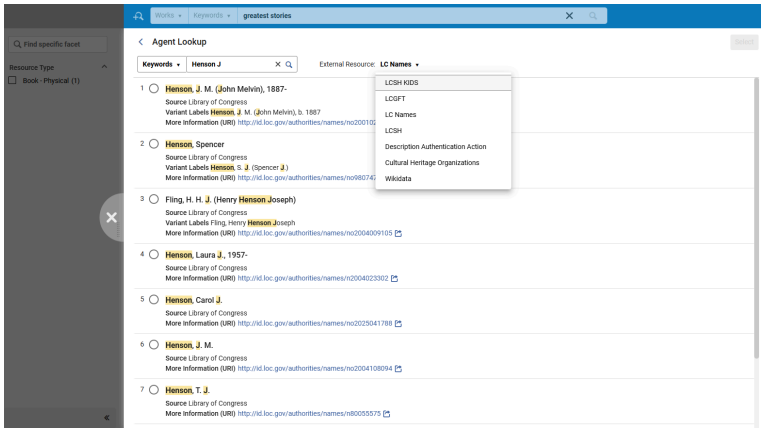

Figure 6: External lookup service to linked data sources within the cataloging workflow in the new LOD editor

See Form Editor - Early Access

Support Core Functionality

Currently, Ex Libris has developed the capabilities needed for Alma customers to upload, store, manage, and search records cataloged as BIBFRAME works and instances.

Library staff members will be able to search for a work or any instance of it, as both works and instances will be part of the catalog. The instances are accessible for related inventory, as bibliographic records are related to inventory categories such as holdings and portfolios.

All standard fulfillment workflows are the same at the inventory level. In later phases, there will be more options to incorporate BIBFRAME item records.

See BIBFRAME Support - Ex Libris Knowledge Center

See Linked Open Data - Work search

See Permanent Linked Data Enrichment of URIs in MARC Records

Info Card in Metadata Management

One of the advantages of using Linked Open Data is the ability to provide an enriched display, with more information on linked entities and related resources made available via URIs. This capability has been added to Alma's New all titles staff search and is part of the Authority selection in the Metadata Editor, using the Linked Open Data information from external sources, such as Wikidata, and supporting multiple authorities through VIAF clusters.

As Alma's linked data functionalities expand, the entity pages will expand to support more authorities, languages and entities.

See Linked Open Data - Info cards

See Supporting additional languages

See Supporting additional entities

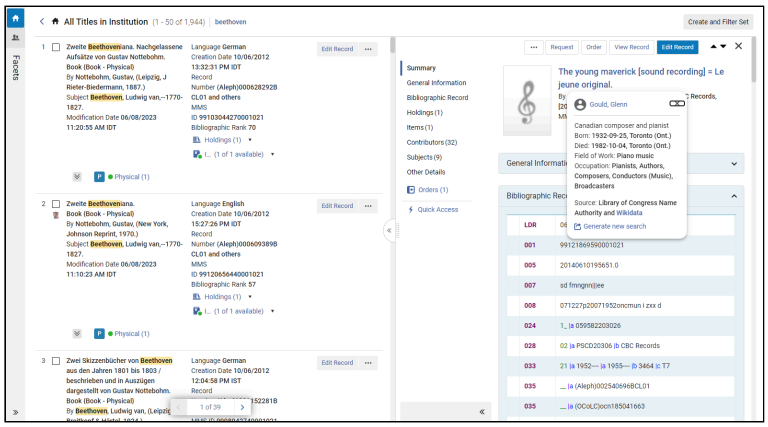

Figure 7: info card in all titles search

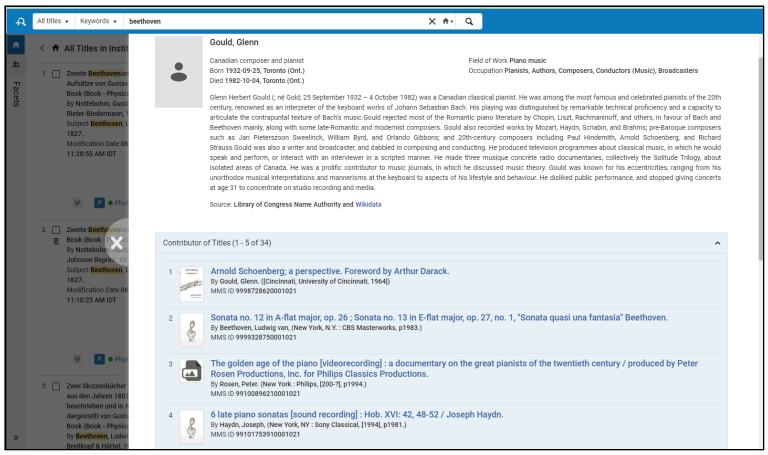

Figure 8: Contributor page in all titles search

Import

In the future, Ex Libris will also support full catalog import of Linked Open Data from relevant sources through various workflows, such as acquisitions, migration, and integration with other metadata sources. The support will be for existing formats converted to or from linked open data and for native Linked open data records in an end-to-end workflow. This will allow libraries to choose to work in a full linked open data sustainable eco-system or with converted Linked Open Data records regardless of their vendors' move to these formats.

Local and Global Interoperability via Export and Publishing

Linked open data in the library creates a common language for communication and discovery across silo systems within the customer's institution. This seamless interoperability is built on enriched library records – with URLs for language, name, subject, and other identifiers – which can be displayed and exported by various Ex Libris applications.

Linked open vocabularies also make it possible to discover and analyze resources held in external systems, such as research facilities, the Library of Congress, etc. Additionally, these external systems can use the resources at the customer's library to improve the quality and accuracy of their own data.

Alma supports exporting and publishing MARC bibliographic data in BIBFRAME and RDA/RDF formats and supports the export and publishing of linked open data records converted to MARC21 with all supported enrichments to support integration with external systems that support existing formats.

Alma also supports the export and publishing of linked data records in their original format and, in the future, will support attaching inventory, along with the ability to integrate with knowledge graph systems, as needed.

For more information, see Alma Export and Publishing support for BIBFRAME and RDA/RDF formats.

API – Supported

The bibliographic metadata found in Alma contains a rich set of information and objects that can be represented as linked open data.

Alma's Linked Open Data allows access to the institution's bibliographic information using Linked Data Principles for multiple purposes, including in the context of the Alma UI and APIs. It is also possible to create and update Linked Open Data records in Alma using APIs, starting with BIBFRAME works and instances. As our Linked Open Data support expands, we will continue to expand our APIs as well to ensure continuous interoperability for linked open data formats.

See Linked Open Data – LC BIBFRAME APIs

Linked Open Data Endpoint (Openness)

Alma currently supports access to metadata via a standard endpoint. Information on any bibliographic or authority record can be accessed using its specific ID.

Institutions can choose to provide open access to their catalog and create their own unique URI, through the linked data integration profile.

See, for example, https://open-eu.hosted.exlibrisgroup.com/alma/972NNL_INST/authorities/987007375772605171

BIBFRAME instances are also searchable in Alma's SRU service.

See Linked Data - Integration profile

Moving from Authorities to Entities

Today, local and global authorities are used to identify entities (such as contributors, locations, and more) while maintaining existing capabilities (such as enriching searches with non-preferred terms). Linked Open Data offers new possibilities for providing significantly more information regarding the entity itself, such as additional affiliations or colleagues of the author or similar titles. Ex Libris is moving in this direction and will be expanding the capabilities to adapt to new concepts that are based on entity management as opposed to authority management. The first phase for this capability is the Contributor pages that are part of the MD editor and the new all titles repository search, as mentioned above.

See View Contributor Page , Contributors Section

Additional References

Roadmap Highlights Overview: Linked Open Data

Ex Libris Developers Network: Linked Open Data

BIBFRAME Documentation: BIBFRAME support

The New LOD Editor in Alma Documentation: Navigating the New Linked Open Data Editor for BIBFRAME - Ex Libris Knowledge Center

Configuration of Integrations with External Systems: Linked Open Data

Ex Libris Linked Open Data Website: Linked Open Data

Whitepaper: An Expedition into the Future of Discovery and Cataloging - Transforming the Library Experience with Linked Open Data and AI

Linked Open Data as part of Alma's Roadmap Webinar Series: Alma 2025 Roadmap Webinar Series - Ex Libris Knowledge Center

Linked Open Data in Primo: Searching Linked Open Data - Person Entity