A tiny library with a million volumes: Open-source resource sharing with fulfillment interlibrary loan (ILL)

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Abstract. his paper is based upon a lightning talk given at the NISO Plus conference on February 14, 2023 and it describes interlibrary Loan syste4m, Fulfillment, developed by the Equinox Open Library Initiative. A thriving resource-sharing consortium allows libraries to offer broader and deeper opportunities for individual learning and greater community equity. It unlocks access to additional copies beyond what an owning library has available, along with a broad range of content owned within the network, which provides a diverse collection for library users. Providing access to such a rich network of resources is the goal of Fulfillment, an open-source resource sharing system which breaks down barriers to sharing collections.

Keywords: Interlibrary loan, open source, resource sharing, fulfillment, Equinox Open Library Initiative

1. Introduction

Fulfillment [1] is designed based on the integrated library system (ILS) Evergreen [2]. Evergreen was from the beginning designed to seamlessly scale to manage the needs of very large consortia. The developers of Evergreen founded Equinox to support Evergreen, and Equinox now also supports leading open-source software in libraries, including Koha, Aspen Discovery, VuFind®, CORAL ERM, and Fulfillment.

Equinox began looking at the challenge of providing Interlibrary Loan (ILL) services, leveraging the knowledge of large and highly scalable library systems. Specifically, Equinox considered how to take the foundation of Evergreen's proven consortial strengths and customize it to handle the alternative, but similar circulation workflows of an ILL system. Equinox recognized that adding an open-source ILL option would also provide an alternative in a market which at the time (2009–2011) consisted entirely of commercial solutions.

Interlibrary loan items are essentially shared circulations between libraries. While ILL is conceptually easy, it is very labor and cost intensive and has significant challenges for discoverability. Streamlining ILL workflows to mirror ILS workflows, as well as providing a union catalog to facilitate discovery, can be mammoth tasks. ILL consortia can be massive, representing statewide or regional conglomerates.

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2. The fulfillment system

This initial brainstorming about what would eventually become Fulfillment started in 2009. By 2011, Equinox built the first production-class Fulfillment test system and within a year pilot testing by users of Fulfillment began. In 2016 the Connecticut State Library in partnership with Bibliomation, Inc. became the early adopter of Fulfillment. The Connecticut union catalog, known as *findIT CT* [3], went live with Fulfillment providing discovery for the member libraries. In 2017 their resource sharing side, *requestIT CT* [4], went into production use. These systems are actively used today supporting resource sharing across the state of Connecticut, with *findIT CT* including twenty-five million bibliographic records representing the holdings of three hundred and thirty-two libraries [5].

Over the next several years Fulfillment underwent important overhauls both for the code and users. Since Fulfillment is based on Evergreen, periodic updates are performed to keep Fulfillment on a recent Evergreen baseline - this gives Fulfillment the advantage of getting Evergreen's most recent security improvements, bugfixes, and features. In 2020, this baseline was updated to Evergreen 3.6. Immediately on the heels of this update, the Fulfillment community rebranded and launched a new roadmap, continuing in 2023 with a Fulfillment baseline update to Evergreen 3.11.

While members of an Evergreen consortium can share materials directly, Fulfillment allows any library, using any integrated library system (ILS) or library services platform (LSP), to share a union catalog and lend physical materials. Fulfillment can support a variety of lending groups, from networks of specialized libraries to geographically-bounded groups of institutions.

In addition, while it is exciting to envision a small single library with access to a million volumes, larger libraries have even further reach. Studies have shown that larger institutions and consortia benefit even more because of an engaged community with power users that engage with the expanded shared collection [6]. As libraries and consortia consider the opportunities and longer-term efficiencies offered by collaborative collections platforms, Fulfillment provides a foundation for growth.

Fulfillment was designed for this purpose. It is not a federated system with records scraped and awkwardly mashed together from other systems. Fulfillment is a locally-indexed central catalog that allows for a true union catalog. Fulfillment ingests bibliographic records with fully automated loads, deduplication, and updates. Fulfillment also supports connectors which provide real-time status and patron updates as well as unmediated requests between library systems. Connectors currently exist for Evergreen and Koha, and additional connectors are planned.

A key strength of Fulfillment as an open-source system is transparency and the ability to easily integrate applications with one another. Fulfillment makes use of standard protocols such as SIP2 [7], NCIP [8], and Z39.50 [9] to get real time information and initiate transactions.

Unlike traditional resource sharing workflows that require searching and selecting materials based on what you can find first from those willing to share it, Fulfillment uses "metarecords" built from the bibliographic data to group like items into request sets. Metarecord groupings are built by a configurable algorithm that looks at MARC data to determine which bibliographic records represent the same work expression - for example, a metarecord set might contain bibliographic records for several print copies, audiobook copies, and ebook copies. Using highly-configurable request algorithms, Fulfillment targets the first available item from all possible holdings across metarecords matching your material format requirements and language. This streamlines the requesting and request-filling process, allowing items to get into the hands of patrons faster.

Fulfillment strives to streamline other staff workflows as well to speed request processing and minimize opportunities for staff error. A key feature of this is Fulfillment's Single Scan interface. Single Scan

prompts for the next logical request-processing action at the current location for the item in hand. Fulfillment will focus on the most logical action, but will also surface viable alternative actions for the item and location. Single Scan will prompt staff to fix unexpected statuses, and it supports flexible request targeting if you cannot find a specific item. Single Scan is smart enough to know that an adjacent item on the same metarecord will fill the request, and it will retarget in real time.

Fulfillment also offers options to block an item from request for one-time only, or permanently - though of course, with a way to update this blocked status if needed. This is in addition to extensive location and collection-based configurations that govern requesting, borrowing, and lending within your consortium.

Finally, another important benefit of an open-source product such as Fulfillment is that you own your data - no exceptions. With Fulfillment, you can make use of its internal highly robust reporting system or, for advanced users, run reports directly in the database.

Fulfillment development is done in the public, fully transparent and accepting both community review and input. The Fulfillment code is on GitHub [10] - it is released under a GNU [11] General Public License (GPL) version 2.0 [12].

Equinox is committed to the belief that open source is a critical part of the model of libraries. Libraries are repositories of not only data, but also of knowledge, and the cultural values of librarians are closely parallel to those of the open-source community. Both groups value knowledge and skill, encourage transparency to prevent bias, thrive on collaboration, and are really the result of a community with a goal to support individuals whether they are working at a reference desk or pushing a code branch.

Fulfillment reduces barriers to resource sharing which in turn offers the potential to lower barriers to learning and increase equity. Fulfillment as a product encourages equitable learning, and open source as a methodology supplies practical advantages and cost efficiencies. Just as a technology stack makes software work on computers, a support stack makes software usable for people. Equinox makes using open-source software easy through its stack of librarians, consultants, developers, and experts who are dedicated to both libraries and open source.

The near future of Fulfillment is already defined by the community. Future connectors include one for Sierra [13] which is currently in development, and one for Auto-Graphics [14] which is in the investigative stage. Equinox is also looking at development options for non-returnables and digital delivery, as demand for these features has steadily increased. Upstreaming requests by adding support for ISO18626 [15] is in discussion, as is better bilateral communication between Fulfillment and its member ILSes. Finally, staff and patron interfaces will be updated to use the latest version of ng-bootstrap [16] providing natively-responsive interfaces and improved usability.

With more than a decade of growth and development behind it, Fulfillment is a stable and mature resource sharing platform that has benefited millions of end users. Equinox is proud to support Fulfillment's future as the demand increases for robust, scalable, and proven open-source solutions in the library resource sharing and interlibrary loan space.

About the authors

Rogan Hamby (MLIS) has worked in libraries since the mid-1990s, with stints in academic, public, and government libraries. He has a BA in English literature with minors in computer science and sociology. Since completing his MLIS, he has worn many hats from branch manager to helping start a statewide Evergreen consortium. In his role as Data and Project Analyst at Equinox, he performs Fulfillment, Koha, and Evergreen data migrations and contributes to consulting, training, and implementation projects.

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