Development and Implementation of BIBFRAME

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BIBFRAME (Bibliographic Framework) is designed to replace MARC formatting. It is a data model for bibliographic description. BIBFRAME is designed to use linked data to make bibliographic data records more helpful wherever the user is, not just in a library environment (Miller, Ogbuji, Mueller, & MacDougall, 2012). BIBFRAME is very likely the next phase of bibliographic national standard and is designed to replace the outdated MARC format which has been around since the 1960s.

In the Beginning

Before looking at BIBFRAME, there was FRBR. Developed in the early 90's, it was a data model developed by the International Federation of Library Associations and Institutions (IFLA), dubbed as Functional Requirements for a Bibliographic Record (FRBR). FRBR was a conceptual entity-relationship-based model that was more user centric and hierarchical than MARC format cataloging. For the bibliographic record itself, the key concepts are work, expression, manifestation and item. A work is an intellectual or artistic creation. For example, the sci-fi film Star Wars would be a work by the writer and director, George Lucas. An expression occurs when the work is realized. Like when Star Wars was released on home video. A manifestation would be the physical embodiment of an expression of a work, like an actual copy of the Star Wars Blu-Ray Disc. If one took just one instance of that Blu-Ray, it would be an item as defined by the FRBR model (McCallum, 2017).

Another event that sparked the creation of BIBFRAME was the creation of Resource Description and Access. More commonly referred to as RDA, it has a controlled vocabulary better suited to create bibliographic data for the Semantic Web. To put it another way, the Semantic Web

uses data that's structured by RDA so computers can understand it with no help from the computer user. (Steele, 2019).

Another piece fell into place in October 2002 with the groundbreaking article, "MARC Must Die!". The author, Roy Tennant, gave context by pointing out that the Beatles were a hot up and coming group when MARC formatting came onto the scene. He noted that by the 21st Century the format was outdated and only used by libraries. Tennant created a list of requirements he thought would be necessary for whatever replaced MARC. The list included that the new format of the future be versatile, extensible, open, transparent, modular, hierarchical, granular, and cooperative with other databases (Tennant, 2002). Some say Mr. Tennant was ahead of his time and was the catalyst for starting the Replace MARC Movement.

The next step to arriving at modern BIBFRAME was when Linked Data officially came onto the scene in 2006. Tim Berners-Lee, the director of the World Wide Web Consortium (W3C) created the term while writing a report about the Semantic Web Project. Linked data uses Uniformed Resource Identifiers (URIs) to name things. A popular example of a URI would be internet Universal Resource Locators, better known as URLs for short (Bizer, Heath, & Berners-Lee, 2009). In the year 2007, the Library of Congress organized an inquiry focused on finding a way to move library metadata from the record bound format of MARC to a more resource description frame-based format collection of individual records which uses the same linked data that makes up the semantic web (McCallum, 2017). By 2012 the Library of Congress partnered with a company that specializes in data management called Zepheira. Their goal was to develop something similar to MARC but able to utilize linked data. This project would eventually come to be called the Bibliographic Framework Initiative or BIBFRAME for short. The CONSER BIBFRAME mapping project began in December 2015, and completed a mapping between the elements of the CONSER

Standard Record and BIBFRAME 1.0.(Balster, 2015). The very next year BIBFRAME 2.0 became the new standard (McCallum, 2017).

BIBFRAME 2.0 Overview

When a book or other resource is cataloged, the description includes various metadata elements like title, author, subject, format, and other descriptors. Version 2.0 organizes the information into three separate tiers of abstraction: work, instance, and item. This is a simplified form of organization than BIBFRAME's predecessor, FRBR. In BIBFRAME, a work is the conceptual essence of the catalogued resource (Park, Brenza, & Richards, 2020). Basically, what that means is a work comes from a creative source like when Shakespeare wrote the play Hamlet. Hamlet is a work of Shakespeare. The next tier would be an instance. An instance of a work is a material embodiment of that work. A series of bound leather editions of Hamlet under the same ISBN would be an instance of a work. An item is a specific copy of that work. An actual copy of that leather bound edition of Hamlet at your local library would be an example of item (Park, Brenza, & Richards, 2020). BIBFRAME is expressed in a Resource Description Framework (RDF) which is a standard for modeling and sharing information on the internet. It basically acts as the key building block for BIBFRAME. It uses basic sentences called triplets. The triplet is composed of a subject, verb, and object. A triplet is also known as a statement. RDF is based on three categories of abstraction (work, instance, item), with three additional classes (agent, subject, event) that relate to the core categories (McCallum, 2017).

Looking Ahead – The Future of BIBFRAME

There are drawbacks to the BIBFRAME format. Early on several issues have prevented the model from being used for serials cataloging. BIBFRAME lacks several serials-related data fields

available in MARC. According to UCLA's Kevin Balster, head of the Cooperative Online Serials Program (CONSERN) BIBFRAME can accommodate the information needed to describe serial resources, but only as static strings of text which isn't compatible with machine-actionable URIs. There are also concerns about the work content standard as not being adaptable enough having been designed for more static and stable resources like monographs (Park, Brenza, & Richards, 2020). However, these issues are not insurmountable, and solutions are in the works.

The popular ILS system known as Alma is currently being used in all Florida State Universities. It is designed to manage an entire collection with a single interface using BIBFRAME. Alma is able to enhance MARC records with URI either automatically or by the cataloger. The ILS will be able to export a catalog in BIBFRAME format. Alma will also be able to present a MARC record as a BIBFRAME record. Alma will also be able to display catalog records as BIBFRAME by utilizing URI. Eventually all ILS systems will have these capabilities and more. The ultimate plan is to eventually create a massive, connected collection of data records from libraries across the world with easy access, encouraging intuitive research, and promoting greater resource sharing among libraries (Pesch & Miller, 2016). To paraphrase Roy Tennant: "BIBFRAME must live!"

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