Towards Bibliographic Ecosystem: An Integrated Environment of Resource Description Based on FRBR-RDA and BIBFRAME

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Abstract—
Today’s libraries are facing major changes in their technical and operational standards. The traditional cataloguing code felt to full provision and access to digital documents. In cataloguing process, many standards have been developed worldwide such as RDA, FRBR, and BIBFRAME that will change the whole work process. Libraries are presently enabled to record management as well as data management. These three initiatives are closely related and depend upon each other for implementation and work on it. This paper presents the significance of various cataloguing code in the bibliographic ecosystem and it should be the future cataloguing code in libraries.

Keywords: Bibliographic ecosystem, Resources Description Framework, FRBR, BIBFRAME, Cataloguing code.

Emergence of BIBFRAME and consequence change in FRBR Model -

The ICT applications in the academic world are in a major transformation. Their technological complexities are become much more advanced level than anybody’s thinking. Every teaching-learning modules are now operated by modern web 2.0 applications. In the same way, libraries are facing major changes in their technical and operational standards. In cataloguing, RDA, FRBR, BIBFRAME are the three major initiatives that will change the whole work process. The tradition of record management to today’s need for data management. This three initiatives are discussed, practiced many where to appear in a strong foot solution. It is a problem to understand till now, what will be the catalogue look like in next decade and what expertise and skill are needed to handle these changes in the domain of cataloguing and metadata. (Bianchini & Guerrini, 2014)

Numerous data management projects are running in the various industries, not only in the library community. Even data service is now a separate discipline to study and research (Li, 2014).

In Library Science domain, three initiatives have the potential to be the transformative one for those who research and practices on cataloguing and metadata creation.
The first is IFLA’s Functional Requirements for Bibliographic Records Library Reference Model, which accumulates the various FRBR Models into one. The second is the Resource Description and Access, which standardize bibliographic description for worldwide access and sharing. The third is BIBFRAME (Bibliographic Framework) an encoding system, which will replace the current MARC format as the fundamental repository of bibliographic data.

These three initiatives are very closely related and depend upon each other for implementation and it should be clear to all for the LIS practitioners to predict the future and to be ready for that (Mering, 2014).

**FRBR, the complete framework behind RDA:**

In 1997, IFLA proposed to release a study result, which was named FRBR (Functional Requirements for Bibliographic Records). It is basically an entity-relationship model to describe the bibliographic data used by the users to carry out four major tasks, i.e. Find, Identify, Selected and Obtain.

![Figure 1: FRBR data model.](image)

FRBR data model was actually made for to describe relational databases, because of their structured approach to data. This model is also useful to semantic web application.
From the above example, it is shown that each element of a bibliographic Description consist of Subject-Predicted-Object can be recorded with a URI, the transfer of these statements in a way that can be understood by Machine in Web transforms. That is why FRBR is needed to connect the MARC record in the Semantic Web. For that requirement, two accompanying data model were developed to describe creators and subject, i.e. FRAD and FRSAD (Mering, 2014).

To cope up with this theoretical model, international cataloguing bodies felt to introduce a new code with full provision and access towards digital documents. Instead to revise AACR2 to AACR3, Joint Steering Committee proposed RDA (Resource Description and Access), which represents Cataloguing Rules in a way that was entirely new to cataloguers and librarians who were used to AACR2. It was fully compatible with the FRBR model, as it breaks down bibliographical description into fundamental entities of work, expression, manifestation and item (Godby, 2013).

RDA recognizes that there is no different in the information needed to describe same thing, regardless of the form. All the resources have or may be supported by title. All have a date of publication or copyright. All have a kind of extent or number of online files. By recognizing this functional requirement needed for description. RDA compact the description of a document in much more useful way.

RDA’s FRBR – inspired thoughts put some epic changes in the library Science domain. They first removed their traditional punctuation barriers (ISBD instructed), and not tied to MARC or any particular coding format. Rather it places itself towards web application, machine actionable data. In 2013, RDA was successfully implemented by Library of Congress (Mering, 2014).

**BIBFRAME: The application framework of FRBR and RDA**

From 2002 librarians and archivists realizing the limitations of MARC and need something to replace it. Library of Congress suggested an extensible XML based system that would allow for flexibility and granularity of data, and the recognition of hierarchical data. The new framework should be characterized by:-

- A high level of analysis and identification of data
- An emphasis on relationships
- Widespread use of controlled vocabularies
- Flexibility in the management of controlled items
Its theoretical development is based on the experience during the test phase of RDA. Now the convention of bibliographic data into linked data is a huge task. According to the paradigm shift of the semantic web, that is to say through the structure of URIs and through the decentralization and division of data. The proposed framework has to be done two works simultaneously, one side, it will share and description outside the library community and in the other side, distribution of task of attributing metadata among the different cataloguing agencies in order to coverage of bibliographic control (Kroeger, 2015).

BIBFRAME offers a simple data model, inspired by FRBR and RDA by distinguishing the conceptual content and physical manifestation, i.e. between work & instance (Biswas, 2015).

**Work**: The conceptual essence of catalogue resource, which is similar to the work & expression of FRBR.

**Instance**: An individual materialization of work.

**Authority**: Identification of entities that have relationship with work or instance.

**Annotations**: Everything from BIBFRAME model that decorated or enhances the resources with additional information.

![BIBFRAME data model](image)

Figure- 2: BIBFRAME data model.
BIBFRAME indicates to the library community and software vendors a path of change, centered on the information needs of the user, data re-use in different context of interoperability and the need for machines to be part of the creation of distribution of information (Guerrini & Possemato, 2016).

**Discussion & Conclusion:**

The diffusion of RDA, consolidation of BIBFRAME, emerging progress of the semantic web, excites Library and Information Science Professionals to think in a new way to information ecosystem. An ecosystem where every stage of lives is based on the upper or lower level; and finally on a whole makes a complete system. The new generation of LIS scholars are much more technically sound and service minded. The system is now much more mature and widespread. Besides some doubts may arise, how to fully achieve the transformation from the old to the new dimension of information management. How the millions of data (saved in MARC) can be effectively used by users in new RDF domain (Li, 2014).

Apart from all doubts, we have a lot of encouraging atmosphere now. The time has arrived to invest in this development. The application of RDA is the first step in achieving the change. BIBFRAME editor indicates scholars and R & D teams a way to think that is compatible with RDA and LOD environment. The evolution is still in progress and hope to be completed by the decisions taken in accordance to RDA principles and use all its instructions (Mering, 2014).

**References:**


