

Resource Description and Access schema build on the LRM, but does not necessarily incorporate all its features.<sup>16</sup> In developing bibliographic data into linked data environments, both FRBR-LRM and RDA rules should be interoperable with LLD models.

While LC is developing BIBFRAME, other libraries are working on different standards. One example is the decision by Online Computer Library Center (OCLC) to use Schema.org for its LDM. This choice is due to awareness at OCLC of the need to enhance the discoverability of library resources on the Web by search engines and web crawlers.<sup>17</sup> Schema.org was created in 2011 through the joint effort of internet companies such as Google, Yahoo!, and Microsoft Bing and designed for the web environment, rather than for library communities. OCLC is currently applying other ontologies beyond the Schema.org vocabulary, including BiblioGraph, an OCLC created extension of Schema.org.<sup>18</sup> The development of Bibliograph parallels work by other libraries in developing terms and concepts not currently present in existing Semantic Web vocabularies.<sup>19</sup>

The mapping and transformation of MARC into LD format or between different LDMs has been studied with the aim of enhancing the discoverability and interoperability of library resources in the web environment using RDF-compliant and LOD-friendly catalog records. Examples include the National Library of Spain's MARiMbA tool for publishing LD from library catalogs in MARC 21 formats<sup>20</sup> and the MarcOnt ontology, which is based on MARC 21, BibTeX, and DC.<sup>21</sup> Cole and others<sup>22</sup> have mapped from Metadata Object Description Schema (MODS) to RDF using Schema.org and SKOS and compared the schemas and ontologies used by OCLC, the National Library of France (BnF), and the British Library in LOD data sets. Mapping between LDMs for libraries from different countries has also been explored. An example is the mapping between BIBFRAME (LC's LDM for libraries in the U.S.) and EDM (the EU's LDM for digital cultural heritage in the Europe).<sup>23</sup> Another study conducted evaluations among four LDM frameworks by mapping various resources to assess the quality and comparability of LLD schemas in use or proposed for resources in such representative libraries as Harvard University, the LC, the National Library of Spain, and OCLC.<sup>24</sup>

Bratt and others<sup>25</sup> define big metadata as "the structured, semi-structured or unstructured descriptions of scientific data stored in repositories" (p.37) while acknowledging that library catalog data encoded in MARC or in other metadata schemas belongs in the realm of structured big data. Big data itself is defined by the 5Vs (volume, velocity, variety, variability, and value). Big metadata fits easily into these categories with millions of extent records in every large library and more records being added continuously.