Helping Everyone Play FAIR

These days, I often feel like Alice in *Through the Look-ing-Glass* when the Red Queen tells her, "Now, here, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!" As enterprises introduce artifi-cial/augmented intelligence initiatives—semantic enrich-ment, text and data mining, machine learning, and so on—into the workplace, I see the need for info pros to follow the Red Queen's admonition to run "Faster! Faster!"

One of the clearest roles for info pros is addressing the need for data and metadata—in internal, open access, and licensed content—to be consistent and functional across sources, so that data is both machine- and human-actionable. The guiding principles, first spelled out in a *Scientific Data* article in 2016 (nature.com/articles/sdata201618; doi.org/10.1038/sdata.2016.18), call for data and metadata to be FAIR:

- **Findable:** Metadata is assigned consistently and permanently and maintained in a searchable source.
- **Accessible:** Once identified, the data is accessible, given any necessary authentication and authorization. Equally important, the metadata remains accessible even if the data is no longer available.
- **Interoperable:** The data and metadata can be integrat-ed with other data and can be used by applications for analysis and further processing; metadata can refer-ence other metadata.
- **Reusable:** Metadata is applied to the data as thorough-ly as possible, so that it can be reused in unanticipated ways and so that context and provenance are retained.

The principles of FAIR data go to the heart of what informa-tion professionals are all about. Not only are we evaluating infor-mation sources and tools, working with teams to identify the best data source, and facilitating resource sharing within the organization, we can also see where and how the right informa-tion could make a big impact. We facilitate collaboration among users of a specialized resource; we find new ways to embed feeds into work processes; and we identify new data analysis tools to use licensed content in new ways.

As a result of our understanding of how various user groups acquire, use, and store information, info pros are uniquely suit-ed for roles in creating and maintaining FAIR data and workflow.

Enhancing findability: Info pros understand the value and importance of ontologies and vocabularies that reflect the specific domains of our organization and provide consistent structure to internal and licensed content. We can identify ex-isting internal ontologies, third-party taxonomies, and se-mantic enrichment tools and consult with user groups to consistently apply the right metadata to internal and external data. If we also take on the role of managing the enterprises ontologies, we can ensure that there are links between them to ensure findability across datasets and sources.

Enhancing accessibility: Info pros have always been re-sponsible for acquiring content, and that involves negotiat-ing access and storage rights. Our goal has always been to ensure access to as many people, in as many channels and formats, as is necessary for our organization. By expanding that focus on accessibility to internal data sources and open source content as well, we can help research and project groups find and use information that would otherwise re-main siloed within a single user group.

Enhancing interoperability: Research teams working with an information resource or data analysis tool often do not recognize the value of that resource to other groups within the organization. When info pros are brought in as consul-tants to project teams, we can identify opportunities for se-mantic enrichment of internal data, licensed content, and data streams. We can de-silo these resources by strategically adding metadata to enable the use in other applications or projects and increase the ROI of licensed content.

Enhancing reusability: Info pros have an enterprise-level perspective on which groups could benefit from an informa-tion resource or tool, and we know how to leverage acquisi-tions to make the purchase as cost-effective as possible. We work to build awareness within our organization of the need for licensing of copyright-protected content and of the trade-offs between using open-access content in an unenhanced for-mat such as a PDF as opposed to licensing the same content in a format that allows for further processing and analysis.

Info pros have long valued bibliographic metadata—DOI, source, keywords—used to enhance the findability of pub-lished material such as journal articles. What is new is the transformative power of semantic enrichment to capture rela-tionships among concepts. While a Boolean search of `cor ticosteroids and asthma`, for example, will retrieve thousands of articles that mention both concepts, a query of a semantically enriched database will retrieve only those articles in which the two concepts are related in a specific way.

We have new tools that can enhance our impact, so let's work to make our information resources FAIR.

Mary Ellen Bates *(mbates@BatesInfo.com, Reluctant-Entrepreneur. com) wishes her car keys were FAIR.*

Comments? Email the editor-in-chief (marydee@xmission.com).