

Executive Summary: Standards for Blockchain Applications in Libraries

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If you dig past all the hype surrounding blockchain applications, at their core, each of the applications of an open ledger system are essentially metadata management problems. These metadata might describe ownership, or provenance, or transactions, or rights, or state changes of things. Regardless of the application, blockchain systems are simply tools for managing metadata. If there is one thing that librarians and library systems are adept at is managing metadata, and as such, adapting to an open ledger technology in libraries should be something librarians are well positioned to accomplish.

Among the first things that is required when developing a metadata management system are standards. Standards can come in many forms, from the simple community practice that people communally adopt to the more formal world of de jure standards developed by organizations like NISO, the Library of Congress, the W3C, and ISO. How we set out to describe the collections, the items in those collections, the transactions we process, or the rights governing those items are all items that need to be standardized.

Beyond describing the metadata managed by an open ledger, there are also a host of standards questions around the blockchain system itself. In a 2017 paper, Reinforcing the Links of the Blockchain, the IEEE identified three core elements necessary to advance blockchain technology. Second among these elements was “A strategy for adopting technical standards.” Because like every digital system, the baseline standards we adopt at the outset impact so many other options further down the chain. Some of these are technical and interoperability questions surrounding the system itself, while others are more practical business-function questions related to how a particular system might operate and the business rules that govern its operation. Some of these issues might also interrelate to particular legal or ethical guidelines that govern how information is managed or shared in the library community.

As potential examples of library applications of blockchain technology, we might consider three potential use cases, identity management, the management of items in the library’s collection, and the supply chain of rights of library resources. Identity Management is critically important in a library environment where content is shared with a community of trusted patrons.

Blockchain applications could provide secure, limited attribute release model for sharing patron identity information. Blockchain applications could also allow for provenance information to be stored and publicly tracked, and thereby allow for unambiguous understanding of the copyright status of works. Each of these potential use cases have particular demands for standards.

There are at least five areas of focus where standards development can speed the adoption of blockchain technology, notably: Process management; data retention; definitions around State changes managed in blockchain; the provenance of information stored in the blockchain; and authenticity of the information in the blockchain. Under the topic of process management fall a variety of systems issues about how the blockchain itself functions. Data retention, similarly, is functional and has to do with issues around how to address questions about maintenance of the data in the blockchain. The remaining three standards areas for library blockchain have to do with the business processes and data quality issues around the data that are captured in an open ledger. The first of these has to do with deciding which states should be captured within the system and how those states are defined. The next has to do with the provenance of the data in the system and the rules for establishing a chain of control. Finally, there are standards focused on the authenticity of the data in the system.

As with all metadata systems, it is important to ask, Is the cost of managing the system, over time and at scale, worth the investment. Can blockchain be used to make the process of managing library metadata better, faster, more accurate, more secure, or cheaper overall? We should look at every new technology through the eyes of those questions when considering a new implementation. Because if the new system is not a significant improvement over existing systems, then we collectively have simply bought into the hype of that new, new thing.