PAPER

The BitViews project: can the librarian community achieve Open Access through blockchain and indirect incentives?

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# Introduction

The benefits of universal open access to all scientific, scholarly, and medical peer-reviewed research ought to be obvious: promoting research, ending the knowledge apartheid between rich institutions allowing their academics access to paywalled articles and poor institutions (mainly in the economic South) unable to do so, encouraging citizens science, providing access to research material filtered by the greatest innovation of all (peer review) rather than “fake science”, etc.

Why has such a clear-cut example of feasible, cheap, and welfare-improving change not been implemented for nearly twenty years? We believe the fundamental reason is subtle, rather technical, and poorly understood. The paper identifies it and provides a solution to the main obstacle to Open Access.

**Theoretical framework**

Imagine a world where all authors are keen and able to deposit the peer-reviewed approved manuscript (AM) of their research in an open access (OA) repository, leaving publishers free to charge for any post-AM services. The main objective of OA would have been achieved. It follows that the solution to the problem of attaining OA lies in the ***unbundling*** of the author’s Approved Manuscript from the published article. We have argued (Lamanna and La Manna (2019)) that in order to achieve the necessary “unbundling” AMSs must be given *value* vis-à-vis published articles and that, in turn, this can be obtained by leveraging the greater ***reach*** of open-access AMs compared to paywalled articles. Notice that what we have just described could have been done by authors years ago, but is not happening now nor anytime soon. Why? Because authors have ***no individual incentive*** to deposit their AMs on an OA basis. It can be argued that authors’ academic standing and esteem would be increased if there were a way of validating online usage data of their AMs (i.e., by removing malicious and improper hits), aggregating them across all OA repositories worldwide, and finally disseminating the clean data via a public, open-data ledger available to anyone at no cost. Enter ***BitViews***. As we argued in Lamanna and La Manna (2019), publishers (especially commercial oligopolistic ones) have no incentive to provide a mechanism that would provide validated, aggregated, and freely disseminated online usage data. It follows that the solution must be implemented by ***libraries*** (especially university and research libraries). We have argued (Lamanna and La Manna (2018) and (2019)) that blockchain technology provides a cheap, tested, and readily available solution to the technical problems involved in validating, aggregating, and disseminating online usage data. In a nutshell, BitViews does to AMs what Bitcoin does to money transfers: each time an individual piece of peer-reviewed research is accessed (viewed or downloaded) on an OA repository the “AM account” is increased by one “usage unit”. To explain: participating repositories constitute the ‘nodes’ of the network; over a fixed time period *t*, all nodes send their (encrypted) raw usage data (including the DOI of material accessed, time-stamp, and requesting IP address) to a single, randomly-selected node which collates the activity into a block for time *t* and applies agreed-upon open source rules (e.g., COUNTER criteria) to filter out non-human activity, double-clicks, and so on. A second randomly-selected node verifies that COUNTER criteria have been applied correctly and if so, the block is added to the chain. The process is then repeated, generating a validated, COUNTER-compliant blockchain of online usage with no central clearing house. Nor the user’s IP address nor the time of the event is recorded thereby protecting the user’s privacy. Also, no proof of work is required, thereby dispensing with the energy-hungry mining required for Bitcoin.

Designing, developing, and testing the BitViews blockchain application costs £250,000.

Describing a solution without specifying who will pay for it and how is no solution. We have suggested a novel mechanism for funding BitViews. We call it ***conditional crowdfunding***.

We have put forward the BitViews project as ***a challenge*** to the worldwide librarian community: we will provide you both with a blockchain application that can unblock open access and with a funding mechanism that solve some of the difficulties that have beset similar initiative in the past. Under conditional crowdfunding, the financial commitments undertaken by contributors are conditional in the sense that the effective amount of money to be disbursed depends on the *total* amount raised. Specifically, if the total amount falls short of the £250,000 target, all contributions will be returned and the project will be closed. If the total amount raised exceeds the £250,000 target, the surplus will be returned pro-rata to each contributor. It can be seen that this scheme provides a simple remedy to the problem both of pessimistic potential contributors who, expecting the project to fail, choose not to contribute at all and of over-optimistic contributors who, expecting the project to raise more than its target, reduce their own contributions. In order to introduce an element of fairness in the presence of potential contributors with vastly different economic resources at their disposal, we suggest that libraries make a (conditional) contribution equivalent to 0.05% of their annual journal subscription charges.

**Research questions**

The BitViews project is revolutionary in two key respects:

1. technologically, it is the first attempt to harness blockchain technology to validate, aggregate, and disseminate online usage data to provide an indirect route to universal open access to all peer-reviewed research;
2. organizationally, it is the first attempt to mobilize the international librarian community to self-fund a viable open access initiative “from the bottom up”, i.e., without the intermediation of library associations, funding bodies, or government agencies.

As the BitViews project will be formally launched in November 2019, with the three-month crowdfunding window opening on the 1st of February 2020 and closing on the 1st of May 2020, the paper to be presented at LIDA 2020 will be the very first piece of research reporting on the latter aspect of the BitViews project (the organizational challenge to the *status quo*). Specifically, the paper will address the following key questions:

1. Was the BitViews project able to mobilize several hundred libraries worldwide and create a grassroot community capable of self-funding an initiative aimed at revolutionizing the academic publishing landscape?
2. What are the distinguishing characteristics of the libraries contributing to the project and what lessons can be learned for future projects?
3. Was the conditional crowdfunding scheme (un)successful and why?

**Conclusion**

We are confident that most librarians and unbiased policy-makers would agree that unbundling AMSs and published articles does provide the basis for sustainable Open Access to all scholarly, scientific, and medical peer-reviewed research. The crux of the issue is how to achieve it. We discard the suggestion that a prime mover for change would come from the (commercial) publishing industry. Our analysis suggests if AMs were given value independent from published articles, then the beneficiaries of this newly created value would have a strong incentive to buy into the system. The direct beneficiaries are academic authors themselves who, under the mechanism we have described in this paper, would add a parallel channel of peer recognition and esteem based on the number, location, and dynamics of online usage of AMs. BitViews simply provides the technology for aggregating, validating, and disseminating online usage data. Instead of relying on Christmas-voting turkeys/publishers as the main actors who set in motion AM/article unbundling, the BitViews project is predicated on the assumptions that librarians worldwide are willing to take concrete steps to initiate the unbundling process. This is not to absolve academic authors of their responsibility (complicity?) in the slow progress of Open Access. The main reasons for targeting libraries as agents of change are that, compared to academics, they are counted in (a few) thousands rather than in hundreds of thousands and that they are far more well-disposed to reform the academic journal publishing system than citation-focused authors. The BitViews project is predicated on the goodwill of libraries worldwide and the use of conditional crowdfunding is meant to alleviate the worst features of the free-rider problem, by providing a simple mechanism to spread fairly the (relatively) small set-up cost of BitViews.

In conclusion, whether or not the BitViews project is successful in its attempt to galvanize the librarian community into taking direct action and ownership of a possible solution to the persistent difficulties in achieving Open Access, we believe that the LIDA paper would provide food for thought.

References

Lamanna C., La Manna M. (2018) BitView: Using Blockchain Technology to Validate and Diffuse Global Usage Data for Academic Publications. In: Dobreva M., Hinze A., Žumer M. (eds) *Maturity and Innovation in Digital Libraries*. ICADL 2018. Lecture Notes in Computer Science, vol 11279. Springer, Cham. <https://doi.org/10.1007/978-3-030-04257-8_28>.

Lamanna C. and La Manna, M. (2019), “The fundamental obstacle to open access and how to overcome it: the BitViews project”, *Insights,* forthcoming.