

Blockcerts and Learner-Owned Official Records: An Interview with Learning Machine

In 2016, Learning Machine and the MIT Media Lab introduced Blockcerts, the open standard for issuing and verifying student-controlled official records. The standard allows any institution to send tamper-proof, instantly-verifiable official documents to any learner, anywhere in the world. For institutions that don't want to carry the technology burden of developing or administering their own infrastructure, Learning Machine is rolling out a commercial platform, compliant with the Blockcerts standard, in 2017.

We sat down with Dr. Dan Hughes, Co-Founder and COO of Learning Machine, to discuss how the Blockcerts project and the Learning Machine platform came to be and to better understand how Learning Machine's larger vision of learner-centric official records connects with the mission of the Groningen Declaration Network.

What prompted Learning Machine to tackle the problem of learner ownership of records? Was there a particular moment that inspired you, or was it a slower process of development and insight?

Dan: Learning Machine grew out of a decade of experience working in skills-based hiring and university admissions with our previous company SlideRoom. We noticed again and again how cumbersome it was for applicants, particularly those moving across borders, to prove that they had in fact achieved certain competencies and credentials. Collecting and validating test scores, transcripts, diplomas, and other official documents was, and remains, a messy and pain-filled experience. The loss of time and money in the document request and verification process often translates into missed opportunities—to the detriment of educational institutions, employers, and the wider societies they function in. Also, the tragedy of the Syria conflict, which has produced the largest refugee flows the world has seen since World War II, further emphasized to us the need for learners to be able to take proof of learning with them—proof that remains verifiable even if the educational institutions or governments which issued the credentials cease to function.

What made you consider blockchain technology as a solution to this problem?

Dan: Some of it was just timing. Our work in the educational technology vertical auspiciously coincided with the development of the Bitcoin blockchain, which was introduced in 2009. The Bitcoin blockchain was built to have no central point of failure and to be impractically difficult to commandeer by any institution or government. To date, it is the most stable and reliable technology we have for storing value.

The idea to use the Bitcoin blockchain as an immutable ledger for recording the issuance of learner credentials came to us in early 2015. We called it “trustless transcripts” back then. One night the topic came up while we were out having a drink with some friends who work in the MIT Admissions Office. They suggested that we connect with the MIT Media Lab—particularly the Learning Initiative led by Philipp Schmidt—as they were also keenly

interested in this. Long story short, we developed an open standard together for shareable, verifiable, learner-owned official records. This standard is called Blockcerts. It can be thought of as a distributed notary. There is a lot more information on this project at blockcerts.org and on our Slack channel, which everyone is welcome to join.

That is quite an undertaking. But how will it benefit educational institutions?

Dan: The open standard includes a reference implementation that any technical team can stand up on their own servers and run for free. It is also a framework that developers at any institution can use to write their own applications for issuing and verifying credentials on the blockchain. We built everything in the Blockcerts project open source because we don't want to lock schools, individuals, or employers into using any particular company's product or technology. We see adoption of the open standard as crucial for establishing the global conditions for learner-owned, portable, and verifiable official records. Learners can receive, hold, and share their accomplishments with any service that supports the Blockcerts open standard, and their shared achievements can, of course, be verified by any of these services instantly and for free. Organizations who wish to issue blockchain credentials can use the Blockcerts open source code for free from the project's Github repo.

We also know that many institutions will prefer to license a fully supported commercial solution rather than compiling from code or rolling their own. For them, we created the Learning Machine platform, which not only allows for the batch-issuance of official documents (like diplomas, transcripts, test results, and badges), but also enables registrars and other administrators to see how these documents are being used in the world over time. One of the other key benefits for educational institutions, and even whole countries, is the ability to establish a verifiable credential depository. Today, these institution- or country-scale projects are insecure, expensive, and often little more than political window dressing after a fake qualification scandal. We can do better than this for all stakeholders.

You mention that the new technology is placing ownership of records in the hands of learners. How will this affect the traditional role of the registrar?

Dan: The registrar will always be an issuer, custodian, and verifier of learner records. We have been working closely with registrars as this project has unfolded. There was a great panel discussion on this topic at Educause last year that included MIT, Learning Machine, and our friend John Papinchak from Carnegie Mellon. We see the Registrar's Office as the critical institutional partner in this move to empowering learners with their official records.

What we've done with the Blockcerts standard is give learners the cryptographic proof of the transaction that occurs when they are issued a credit, test score, or diploma. This proof is something that the individual can carry with them wherever they go, so they don't need to rely on a registrar or a proprietary intermediary every single time they want to demonstrate—to a potential employer, for example—that they have a particular degree or skill. Learners can now carry with them a lifelong record of achievement from many different institutions at once using a free app like the Learning Machine Certificates wallet. The wallet

centralizes proof of learning from various institutions in a mobile, easily-accessible place that only the learner controls.

In short, we want to empower registrars to give the individuals whose records they are responsible for something of real added value to take with them into the world. We see this as a major alumni relations opportunity. Wouldn't it be nice to have your *alma mater* reach out to you because they want to officially issue your achievements from a decade ago (or three decades ago!) in a form that can be immediately used in the world? There is an opportunity here to benefit all of the living alumni of an institution, not simply the new graduates to come.

Do you see this technology being widely adopted in the coming years?

Dan: Yes! We have had an overwhelming institutional response so far. We have schools, companies, and governments from all over the world gearing up to begin the year with something concrete, innovative, and ready to go. For us, 2017 is a year of pilots expanding into system- and country-scale investments. There is a fundamentally new social infrastructure that is being born with the confluence of mobile, web, and blockchain networks. We are excited to be at the beginning of this secular shift.

How would you envision a collaboration between Learning Machine and the Groningen Declaration Network to ultimately define the future of digital student data portability?

Dan: We are very excited to be contributing what we can to advancing the aims of the Groningen Declaration Network—which dovetail so closely with our own. We would love to play whatever role is appropriate to see this shared mission achieved. At bottom, we are scientists, artists, and engineers building infrastructure in support of the institutional needs of our partners. While each school, system, and nation are unique, there are common patterns that, when recognized in our policies and systems, enable interoperability across local contexts. It's not often thought of in this way, but ultimately structural interoperability creates the conditions for an emancipatory self-sovereignty. The systems and the individuals momentarily inhabiting them benefit together. That is our aim.

We want to learn as much as we can about the unique challenges of GDN signatories and offer some simple but powerful solutions to needs that are in common. We welcome an open and ongoing conversation. There is a lot of good content on our websites:

<http://www.learningmachine.com> and <http://www.blockcerts.org>. We also have prepared a 2-minute video for the GDN community: https://www.youtube.com/watch?v=xlzYrjZ_MC8.

Most importantly, please feel free to contact us directly. We look forward to meeting many of you in 2017!