

What We Do Not Know About Badges: Challenges for Learning Analytics and Decision Support^{*}

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Abstract

Open Badges must provide information to support decision making across a wide range of institutions. While Open Badges currently provide more information than predecessor technologies, this additional information can paradoxically increase the burden of information processing and make valuation more difficult. This limits the potential for Open Badges in business and higher education, in particular, and could ultimately contribute to stratifying learners into higher and lower quality credential groups. We propose a solution called Open Badge Exchange that leverages historical transaction information to reduce the burden of valuation and increase the quality of decision making around Open Badges.

1 Information and Valuation

Imagine you are an art appraiser. Your job is to estimate the value of art objects that are brought to your attention. Someone brings you a piece of art that you have never seen before. How do you decide if it is valuable?

One approach would be to look only at the features of the artwork itself. Is it old? Is it signed? Is it authentic? Obviously an inauthentic art object would be worth less

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than an authentic one, and perhaps even worthless. But after establishing that the art object is authentic, how would you proceed?

What art appraisers actually do next is to consult databases that provide historical and transactional information about the artwork. Has this artwork been sold before? Has the artist painted thousands of pieces, or only this one? Which collectors are seeking artwork by this artist? How much have others paid for this artist's work? Because, it turns out, the value of art is just as much a process of understanding what has been done with artwork as it is about noting the properties of the art object itself.

As things stand currently, Open Badges carry significant amounts of metadata that either directly (via text) or indirectly (via links) provide information about the conditions under which the badge was created. So, for example, anyone looking at an Open Badge should be able to determine who issued the badge, to whom, for what purpose, and under what criteria, at minimum.

This is, of course, useful information. But the purpose of this paper is to suggest that this information is insufficient for many purposes of valuation. To sustain a badge economy that depends on durable, scalable, and trustworthy valuation of Open Badges by employers, institutions of higher education, and lifelong learners, we must find a solution that extends beyond the badge object itself.

We propose that what is missing from Open Badges is a system for recording and retrieving the historical information that locates an Open Badge within the broader badge economy. Employers, higher education institutions, and lifelong learners need information about what has been done (or not) with an Open Badge to make crucial and costly decisions about badge acceptance, issuance, and earning. We propose such a system in the form of Open Badge Exchange.

2 Decision Support

It may seem strange to claim that information is missing from Open Badges. It is more conventional to think analogically about Open Badges as digital, evidence-laden versions of x , where x is CVs or gold stars or merit badges. From that perspective, Open Badges provide more information than previous technologies. So, for example, instead of a CV line that reports completion of a project, an Open Badge communicates the completion and also provides a link to evidence of that completion. Open Badges are, in this sense, better providers of information than their predecessors.

But if we think of Open Badges as digital devices for communicating decision support information, then we must compare the information that Open Badges provide against the information requirements for decision support. Open Badges are obviously better providers of information than their predecessors, but they also present a decision support challenge. With added evidence provided either as included metadata or links to other data sources, Open Badges actually increase the burden of assessment for anyone making valuation decisions. More information has been provided, certainly. But is it the right information?

Consider three use cases. One, an employer looks at Open Badges to decide whether or not to hire an applicant. Two, an institution of higher education looks at Open Badges to decide whether or not to issue an advanced credential or certification to an applicant. Three, a learner looks at Open Badges to decide whether or not to pursue a particular badge as part of a lifelong learning trajectory.

In each of the three cases, someone has to make a decision about the value of an Open Badge (or Badges). In each of the three cases, the decision maker has information provided by the Open Badge (or Badges) available to them, either as baked-in metadata or via links to the badge assertion. They can tell, for example, if the badge has been legitimately issued and what criteria are required to earn the badge. They can even retrieve and review supporting evidence.

But the added information comes with added expectations. The employer is expected to spend more time and effort deciding whether or not to hire an applicant. The institution of higher education is expected to spend more time and effort deciding whether or not to issue an advanced credential. The learner is expected to spend more time and effort deciding which badge will help them achieve their lifelong learning goals. The expectation built into Open Badges and, by extension, into the current Open Badge ecosystem, is that more people will spend more time and effort assessing more information.

The paradoxical result may well be that Open Badges offer an information system that provides more information, but leaves individuals no better informed than before. This phenomenon has been observed across many forms of new media. For example, as political scientist Markus Prior has noted, increasing political information across new media by providing more media choices does not actually increase political knowledge (Prior 2005). Expecting that more information and more choices provided by Open Badges will automatically lead to better decision support is an expectation that is unsubstantiated by empirical evidence.

Furthermore, it is not clear that the information provided in Open Badges is

actually the right information for decision support. An employer may not want or need to track down the provenance of every badge if they can simply look up whether or not a badge has been accepted by other employers in their field. A university may not want or need to evaluate a backpack of Open Badges individually if they can simply look up whether or not the badges have ever been accepted by peer institutions. A learner may not want or need to navigate extensive information, instructions, and dependencies if they can simply look up whether or not a given badge is accepted in exchange for a higher credential that they are seeking.

Certainly Open Badges contain more information than their predecessor technologies. But as it stands they do not communicate all of the information necessary for efficient, reliable decision support. Many decisions about Open Badges could be made quickly, reliably, and at scale simply by referring to historical transaction data that tracks actual Open Badge activity across institutions. But currently there is nothing in Open Badge(s) that tells the employer whether the issuer issues thousands of different badges or just this one, whether peer institutions of higher education accept these badges in their program, or whether one Open Badge rather than another is more likely to be accepted by employers or higher educational institutions. We need a better information solution.

3 Open Badge Exchange

For many applications, historical transaction information is probably not necessary. For example, an Open Badge that communicates participation in a low-stakes workshop on how to make paper cranes is unlikely to be submitted for university credit or to an employer for hiring consideration. There are good reasons to let that Open Badge stand alone and speak for itself. We recognize that many collections of Open Badges are collections of just such badges, and that such badges are obviously not intended to participate in a broader badge economy.

But as Open Badges gain traction in business and higher education, a better decision support solution is necessary for Open Badges. We propose such a solution in the form of Open Badge Exchange. Open Badge Exchange is a system for reporting successful badge transactions and retrieving information on prior transactions. Figure 1 provides a basic illustration of Open Badge Exchange. The center of Figure 1 shows a process flow for evaluating a set of badges, making a decision about whether those badges qualify the holder for a higher credential or certification, and issuing the resulting advanced credential (or not). Above the process flow is the de-

cision support currently provided by Open Badges. Below the process flow is the decision support that would be provided by Open Badge Exchange.

Open Badge Exchange provides a distributed transaction ledger with an API for reporting and retrieving information on transactions for a particular Open Badge. We expect that the typical transaction will be an “exchange” of multiple existing badges for a more advanced credential, certification, or degree. As illustrated in Figure 1, a user would present a collection of badges (e.g. in a Backpack) for evaluation. The evaluator could look at the badge metadata and badge assertion, but also retrieve information on historical activity of these badges, such as how many have been issued, whether they have been exchanged for badges elsewhere, and who else accepts these badges in exchange for advanced credentials. If the evaluation yields a positive result, then the more advanced badge is issued and the record of the “exchange” of the submitted badges for the higher badge is reported back to the ledger.

Note that Figure 1 does not suggest a particular scheme or algorithm for determining the value of a badge. Like the databases that support art appraisals, it merely provides the information to support decisions, rather than suggesting what the decisions ought to be. But Open Badge Exchange enables decision support algorithms or policies to be implemented at scale. For example, if two peer institutions agree to accept each other’s badges, a decision at one institution only requires an API call to see if a given Open Badge has already been accepted by the other institution, rather than an assessment of the evidence in each Open Badge individually. In this example, Open Badges provide more information, but Open Badge Exchange provides the right information for decision support.

Figure 1 does not contain detailed technical information. There are several possibilities for the underlying technologies of the Open Badge Exchange, and we do not discuss them here. The key point is not to endorse a particular language, data storage technology, or API framework, but to establish that the Open Badge Exchange system provides information for decision support that current Open Badge technologies do not provide.

4 Supporting the Badge Economy

By providing information for decision support, Open Badge Exchange also contributes to the growth of a broader badge economy across a variety of institutions. At the most general level, participation in Open Badge Exchange demonstrates commitment to an open record of transactions that builds trust with learners, employ-

ers, and other institutions of education by reducing the risk that a given micro-credential will be worthless in the broader badge economy. But it also provides specific benefits to different groups that are currently stratified by reputation in business and higher education.

Currently the value of Open Badges is highly dependent on the existing reputation of their issuer. In a political and social climate where there is pressure on existing educational institutions to provide evidence of learning and value to the learner, even established higher education institutions launching Open Badges may be at a disadvantage in a playing field dominated by existing reputational stratification. For example, a state college may offer a new course that awards Open Badges, but without evidence of acceptance or uptake by employers or other educational institutions, learners might well shy away from trying an unproven experience and pursue an Open Badge issued by a higher-status institution, rather than focusing on whether the state college's course helps them meet their learning goals.

The current dependence on existing institutional reputation in Open Badges also potentially locks out innovators and disrupters who may have good ideas and contributions but do not already have status to endorse their product or service. Open Badge Exchange provides opportunities for new kinds of institutions that can build status by providing a desired service. For example, DeakinDigital, a subsidiary of Deakin University in Melbourne, Australia, offers learners credentials and certifications for their "knowledge, skills and abilities," some of which have already been recognized by an open badge (DeakinDigital 2015). Figure 1 shows how participating in Open Badge Exchange allows any new educational venture such as DeakinDigital to start building credibility from day one, based on actual events.

Of course, many high-reputation, high-demand employers and higher education institutions benefit from the current reputational stratification in the badge economy. This is a challenge for Open Badges generally, as the obvious strategy for these institutions would be to forego Open Badges altogether and rely on their reputational advantage in issuing traditional degrees and credentials. The result could well be a stratified population of learners in which Open Badges are a marker of lower-quality education and employment. This problem cannot be addressed in the current Open Badges system. But adding Open Badge Exchange to the process shifts the basis of rapid assessment from reputation and tradition to real-world acceptance and exchange, and ultimately bases the value of Open Badges on what learners are able to do with those badges.

5 Conclusions

Despite the challenges and risks, Open Badge Exchange provides a distributed record of actual badge transactions that is necessary for decision support in a growing badge economy. We cannot anticipate all the ways that Open Badge Exchange will enable more informed and better decision making about the value of badges. But it is clear that Open Badge Exchange helps advance Open Badges beyond their current limitations, and recognizes that relationships among people give Open Badges their value.

References

- DeakinDigital. 2015. "Credentials for Your Career." Retrieved 22 January 2015 from <http://deakindigital.com>.
- Prior, Markus. 2005. "News vs. Entertainment: How Increasing Media Choice Widens Gaps in Political Knowledge and Turnout." *American Journal of Political Science* 49:577–592.

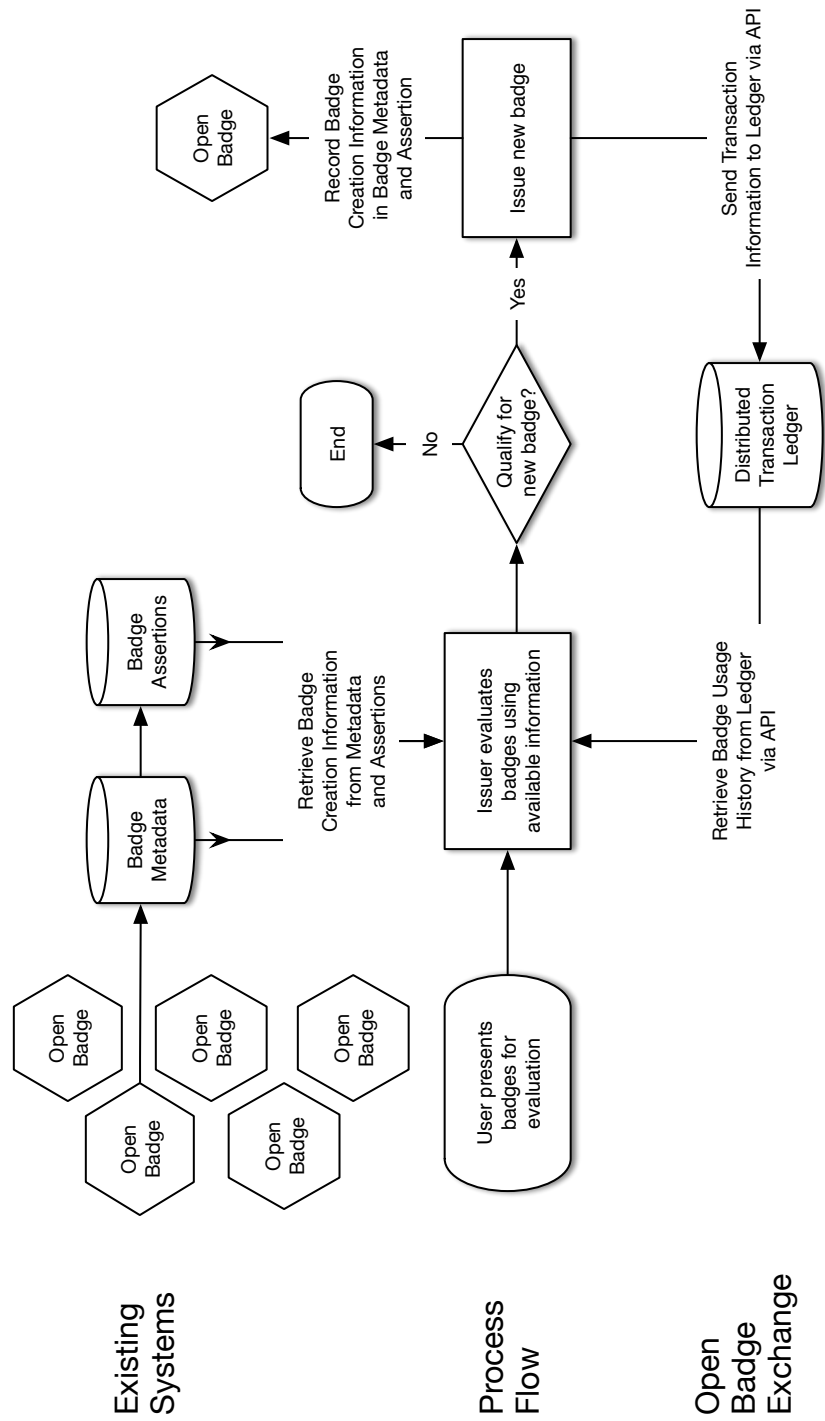


Figure 1: Information and process flows in the assessment of open badges.