Open Badges for Lifelong Learning

*Exploring an open badge ecosystem to support skill development
and lifelong learning for real results such as jobs and advancement*

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Working Document

Learner Scenarios

First, let's consider four learners:

There's Kareem, a 16-year-old Chicago southsider, who loves robots and movies and naturally can't wait to see the new Transformers film, especially because they shot part of it in his hometown. He struggles in school because he does not understand how those things apply to his interests or to real life, so it's easy to get bored and tune out. Luckily, he's been able to pursue his interests through more informal learning opportunities with his peers through his local Learning Network after-school program: he's made short films in a series of youth-oriented digital media workshops, mentored some younger kids at the local FabLab, and participated in a hands-on, sustainability-focused 'hackfest' competition, in which his team took second prize for designing and building a mechanism to sort recyclables. But these experiences are currently isolated and cannot be carried with him to other contexts, including his formal school environment. So instead, he gets negative feedback in school and has started to think of himself as unintelligent and below-average.

And then there's Sara, an 18-year-old web developer who started building websites when she was 13, when she got her first computer and connected via a spotty Internet connection. She has developed and refined her skill set by tinkering on her own sites and those that she has built for friends, by viewing the work of others and by reading whatever she can get her hands on. Her mother is pushing her to go to college because it is assumed that she needs a degree to get a job. She doesn't want to disappoint her mom, but she has already taken a few university-level classes and found them to be unchallenging and redundant for her skill level. In fact, looking through the course catalog, it seems her skill set is already well beyond that of the relevant courses in the local university degree program. She has taken a few open education courses through Peer to Peer University on specific new technologies and learned a great deal both in the course work as well as the peer community she met there. And yet she has nothing formal to put on a resume, which has made it impossible to get in the door at any employer.

There's Jin, a 28-year old artist and writer from Philadelphia who completed part of an associate's degree at the local community college in management but dropped out to pursue her creative interests full-time. She is an active participant in a local art community through online social networking, city meet-ups and annual conferences and shows. Through her connections, she's found a small network of local buyers and opportunities for free-lance work. Jin is fairly well known in the community and her work is very respected. She has a reputation of being "avant garde" because she is always pushing the boundaries of the community with her style and tone of her work. She is moving to Portland, Oregon in a few months with her boyfriend and is nervous about leaving her local community and "starting over" in a new place with new people. She wants to continue focusing on her art but other than the finished pieces, she has very little to show for her work and experience back east, and without the camaraderie and support of the community, she is losing confidence.

And, Antonio, a 39-year-old father of two young girls who has a BA and has been working as a publishing professional for many years, but was recently laid off. Despite his experience and hard work, the industry has advanced considerably around him and new professionals are coming in with a leg up because they better understand the technological advances. He is now faced with increasing bills and responsibilities and needs to find a job. He has considered staying in the publishing field but he cannot afford to go back to school for the additional technology skills the jobs require, nor is he sure exactly which skills he would need to develop. He has considered trying to break into a new field like environmental policy, which has always interested him and been a personal hobby of sorts. He feels he has learned a lot that is relevant to the new field throughout his undergraduate education, work experience and personal projects, but he has nothing to show for it. Further, he is unsure which skills to develop first or how to 'break into' the discipline and associated community of practice. To date, his resume has not been well received for either jobs in either industry.

These examples illustrate many types of learning other than traditional classroom learning, including interest-based projects, self-directed tinkering and information gathering, community participation or on-the-job experience. In most cases, the opportunities, communities and material are there and sufficient to support each learner in discovering and pursuing interests, developing and refining skills, often digital literacies and 21st century skills, and gaining momentum and progressing in life. However, each of these learners encounters a problem in making their knowledge and skills visible and consequential in terms that are recognized by formal educational institutions and broader career ecosystems. Most existing systems of educational degrees and job-relevant accreditation require enrollment in formal programs and institutions and dictate that learning needs to follow prescribed paths. Informal, peer-based and self-directed learning is only acknowledged to the degree that it supports the formal curriculum. Further, most of these formal systems do not account for newer skills like digital literacies or for granular skills and incremental learning, and thus a degree or report card tells a limited story about what relevant skills and competencies people have developed along the way.

Imagine instead, a world where your skills and competencies were captured more granularly across many different contexts, were collected and associated with your online identity and

could be displayed to key stakeholders to demonstrate your capacities. In this ideal world, learning would be connected across formal and informal learning contexts, and you could discover relevant opportunities and craft your own learning pathways at your own pace, based on your own interests and learning styles. Whether it was through discussion with peers, structured classes or workplace experience, you could collect evidence of skill development, including new or often neglected skills such as social skills or digital literacies. This evidence could be acquired automatically from your interactions with online content or peers, explicitly sought out through various assessments or based on nominations or endorsements from peers or colleagues. This would allow you to present a more complete picture of your skills and competencies to various audiences, including potential employers, mentors, peers and collaborators.

This world is not purely fictional, but instead is the direction that many entrepreneurial and innovative learners are currently moving. They are seeking learning opportunities, building relationships and developing skills by creating their own connected learning ecology that extends far beyond formal channels. But we can do much more to support learners' access to this kind of connected learning ecology. It should not be up to individuals to have to craft their own infrastructures and mechanisms to make their learning visible across formal and informal contexts. The next step is to more systematically support and acknowledge this learning so that these skills and competencies are available and become part of the conversation in hiring decisions, school acceptances, mentoring opportunities and even self-evaluations. This is where badges come in.

What Is A Badge?

> badge [baj]: a special or distinctive mark, token, or device worn as a sign of allegiance, membership, authority, achievement, etc. – Dictionary.com

A 'badge' is a symbol or indicator of an accomplishment, skill, quality or interest. From the Boy and Girl Scouts, to PADI diving instruction, to the more recently popular geo-location game, Foursquare, badges have been successfully used to set goals, motivate behaviors, represent achievements and communicate success in many contexts. A "digital badge" is an online record of achievements, tracking the recipient's communities of interaction that issued the badge and the work completed to get it. Digital badges can support connected learning environments by motivating learning and signaling achievement both within particular communities as well as across communities and institutions. This paper outlines and addresses a working set of definitions, ideas and guidelines around the use of digital badges within connected learning contexts.

Why Do We Need Badges?

As we saw in the learner scenarios, in today's world learning can look very different than traditionally imagined. Learning is not just 'seat time' within schools, but extends across multiple contexts, experiences and interactions. It is no longer just an isolated or individual concept, but is inclusive, social, informal, participatory, creative and lifelong. And it is not sufficient to think of

learning simply as consumption, but instead learners are active participants and producers in an interest-driven, lifelong learning process. The concept of a 'learning environment' no longer means just a single classroom or online space, but instead encompasses many spaces in broader, networked, distributed and extensible environments that span time and space. And across these learning environments, learners are offered multiple pathways to gain competencies and refine skills through open, remixable and transparent tools, resources and processes. In this *connected learning*[1] ecology, the boundaries are broken and the walls are down — now we just need to help it reach its full potential.

Much of this shift is due to the fact that our world is very different than the one when the current education system was developed and standardized. With the Web and its core principles of openness, universality and transparency, the ways that knowledge is made, shared and valued have been transformed and the opportunities for deeper and relevant learning have been vastly expanded. The open Web has enabled increasing access to information and each other, as well as provided the platform for many new ways to learn and new skills to achieve. We no longer must rely on the expert authority or professionally-produced artifact to provide us with the information or experience we seek, instead we can find it from peers or make it ourselves online. Courses are no longer simply confined to classrooms or expensive universities, but instead open education initiatives such as [MIT OpenCourseWare](), [Peer-2-Peer University]() (P2PU) and [OERCommons](), which Sara and Antonio have utilized, capitalize on the openness of the Web and the peer network it supports. These projects provide paths to learning that are unbundled from the financial, social, geographical and cultural barriers of formal education. Similarly, efforts like the Chicago and New York Learning Networks, which Kareem participates in, as well as the Digital Youth Network, create informal learning environments that enable youth to connect to resources, experiences and each other. And of course, there are seemingly endless ways for us to connect, participate and learn online through social media.

In addition to differences in the way learning happens today, there are also new skills and literacies that are important in modern society. It used to be that the basic requirements to be a literate citizen were reading and writing skills, but literacy now extends well beyond into digital and media literacies that include skills needed to use various technologies effectively (e.g. using a computer, basic Web skills), to navigate and seek out information online (e.g. 'crap-detection' [2]), to produce and author content (e.g., creating a profile or using digital media for self-expression), and to be a good citizen in a digital community (e.g., managing copyright, protective privacy, contributing constructively to a conversation). Many of these skills are critical not only for jobs and career advancement, but also for individuals to fulfill basic needs, get equal access to opportunities and become active participants in modern society. Jenkins[3] goes further to state that these new literacies - including appropriation of information, judgment of information quality, multitasking and networking - are relevant for almost any career path and are critical to success in today's information culture. Despite the importance and relevance, these skills are not typically taught or captured in traditional schools. Instead, they are often being developed and built upon through open, social or informal experiences across the Web and across different environments.

And yet, in the current formal education and accreditation systems, much of this learning is ignored or missed entirely. Institutions still decide what types of learning 'count', with little room for innovation, as well as who gets to have access to that learning. Their end products, the grade or degree, are the only way that learning is currently communicated and recognized within the system, as well as the larger society. As alluded to above, we know that learning from someone lecturing at us with little opportunity for interaction, by reading a textbook on our own or by taking a multiple-choice exam represents only a tiny part of what and how we learn and often involves a small subset of the skills that are relevant for our work and quality of life. And yet these are the types of learning that are formally recognized and required for advancement. Without a way to capture, promote and transfer all of the learning that can occur within a broader connected learning ecology, we are limiting that ecology by discouraging engaged learning, making critical skills unattractive or inaccessible, isolating or ignoring quality efforts and interactions and ultimately, holding learners back from reaching their potential.

Thus, badges can play a crucial role in the connected learning ecology by acting as a bridge between contexts and making these alternative learning channels, skills and types of learning more viable, portable and impactful. Badges can be awarded for a potentially limitless set of individual skills regardless of where each skill is developed, and the collection of badges can serve as a virtual resume of competencies and qualities for key stakeholders such as peers, schools or potential employers. Specifically, badges support:

Capturing and translating the learning across contexts:
- *Capturing of the Learning Path* – With degrees or cumulative grades, much of the learning path is abstracted and lost. Badges could capture and explicitly represent a more specified set of skills and qualities as they occur along the learning path, and could also track a broader, and perhaps more granular, set of skills. So when you encounter a good web developer or writer, you can look at their set of badges (and issue dates!) to determine the skills an aspiring web developer or writer should learn, and even perhaps in what order s/he should learn them.
- *Achievement Signaling* – Badges can represent skills or achievements and thus signal peers or outside stakeholders, such as potential employers or institutions. For example, recruiters could look for people with badges that align with certain job requirements or needs. In this way, badges start to function somewhat like degrees or certifications, but with room for much more granular or diverse skill representation.

Encouraging and motivating participation and learning outcomes:
- *Motivation* – Badges can provide intrinsic feedback or serve as milestones or rewards throughout a course or learning experience to encourage continued engagement and retention. Badges could make learners aware of skills or topics and encourage them to go down new paths or to spend more time trying to develop those skills. Further, badges could serve as entry points to become aware of and attain new levels of privileges.
- *Supporting Innovation and Flexibility* – Badges can be used to capture a wide range of skills, including those that are often missed or ignored by formal channels, or newer skills like digital literacies that evolve with the ever-changing society. Badges can give us

the flexibility to award innovation and recognize new skills as they emerge and gain relevance.

Formalizing and enhancing existing social aspects of informal and interest-driven learning:

- *Identity/Reputation Building* – Badges can serve as mechanisms to encourage and promote identity within the learning community, as well as reputation among peers. Much of this identity and reputation development may be already occurring within each community and badges can help make them more explicit and portable, as well as aggregate identities from across communities.
- *Community Building/Kinship* – Badges can signal community or sub-community membership and can help people find peers with similar interests or mentors to help teach them skills they lack. Further, badges can serve as a means of social capital, and community-oriented or -defined badges could formalize camaraderie, team synthesis or communities of practice.

In summary, we are living in an age of opportunity for learning, specialization and innovation like none ever seen before. But we are not fully capitalizing on the potential. The time has come to connect interest-driven learning, as well as new skills and literacies, to a broader ecosystem of accreditation and recognition to enable each learner to capitalize on the learning experiences that they are already having, or to inspire and help them to seek out new ones, as well as to communicate their achievements and skills to necessary stakeholders. To do so, we must not only recognize that people learn across many contexts in many different ways, but also find a way to capture that learning, collect it across the contexts and communicate it out. Thus, a badge ecosystem is a critical and missing piece to achieve connected learning for diverse learners across the Web, and to translate that learning into a powerful tool for getting jobs, finding communities of practice, demonstrating skills or seeking out further learning.

Badge System Framework

The Mozilla Foundation and MacArthur Foundation are leading efforts to implement and evaluate a badge ecosystem for connected learning. Together we are working to provide the infrastructure to support this critical ecosystem, as well as the resources and guidance to seed it with high quality badges and meaningful pathways for learners through the badges.

As we start to move beyond the conceptual framework for badges, to a functioning badge ecosystem, it is critical for this ecosystem to be open and decentralized to allow for badges from any contexts where learners are learning, to support any and all types of learning occurring, to provide portable and sustainable value and to give each learner complete control. To meet these demands, we have identified a badge system framework to guide the initial development of the badge systems in this ecosystem. This badge framework includes:

- the badges (skills, interests, qualities, status and achievements, with the associated badges),
- assessment (assessing the skills, determining who should get a badge and mapping badges to solid evidence of learning and skill development), and

- infrastructure (supporting the earning of badges across various experiences, moving badges around, extending the value of each individual badge).

Badges

Every badge system needs, of course, badges. Those badges can represent various skills, competencies, qualities, achievements and interests achieved across many contexts over time. One of the benefits of the badge system over the traditional cumulative and normative grades or high-level degrees, is that it can be used to assess a much broader and deeper set of skills or competencies and capture each competency in a badge so that the learning path or more subtle, yet critical, skills and experiences are not glossed over or lost. For example, a learner may earn a badge for more traditional accomplishments such as completing a course, or demonstrating a comprehensive "hard" skill such as mastery of a specific programming language or math concept, or for very granular activities or skills, such as leaving helpful comments for other learners, or logging into an online learning environment for 10 consecutive days. Badges may also be used to explicitly capture and transfer social skills such as critical thinking, communication or collaboration, existing community aspects such as reputation and status, and new skills such as the aforementioned digital literacies. Thus, we can use badges to capture a much wider range of learning and interaction and support innovation moving forward. This allows the learner to not only more easily signal specific skills and find specific relevant opportunities, but also to combine and remix their skills in different ways for different audiences and goals.

There may be different types of badges such as 'smaller' badges may be used for motivational and formative feedback purposes, like those used on the popular forum site Stack Overflow, and 'larger' badges used for certification purposes. For the former, it may be possible to have a lot of badges, perhaps defined by the community as they go and tied to smaller behaviors or achievements. The latter may have more rigorous or defined assessments and be endorsed by organizations or other authorities. Multiple motivational badges or certification badges may be aggregated into higher-level 'meta' badges that represent more complex literacies or competencies. It may be that these meta-badges are developed top-down, created and issued by organizations to target specific sets of skills, or bottom-up, as reflections and narratives around sets of badges important within a certain community or for a particular individual. Badges give us the flexibility to support learning innovation, recognize skills and achievements at multiple stages and granularities and create taxonomies of achievement that help people discover learning opportunities and extend the value of that learning.

In the same vein, badges may be hierarchical or, said another way, there may be different levels of badges. Basic or foundational badges could provide the core or entry-level framework for various skills, and intermediate and expert level badges could provide the pathways and milestones to guide learners through to mastery. Some lower level badges may be pre-requisites, or be required to unlock the higher level badges, much as we have seen in various gaming environments. This may be explicit, through published pathways or instructions, again giving the learning a roadmap towards mastery, or it may be more of a stealth assessment approach[4] where certain actions or accomplishments suddenly unlock higher levels, making

7

the learner more aware of their learning and serving to motivate continued engagement. In this way, badges can also serve as a sort of claim-based authentication mechanism for opportunities and advancement.

Further, instead of top-down determination of what skills to teach or promote, badges may be identified and defined by a number of sources, including traditional authorities, such as experts or accredited institutions, but also communities of practice, such as open education projects or peer learners, or the individual learners themselves. Together, these multi-skill, multi-sourced badges can form a more complete picture of a person for potential employers, future or current institutions or schools, peer groups and even him or herself.

The badge itself is more than a static image or button, but instead much of the value of the badge comes from the metadata attached to it. Badges are conversation starters, and the information linked to or 'behind' each badge serves as justification and even validation of the badge. For example, a badge should include information about how it was earned, who issued it and the date of issue. Most importantly, the badge should be hyperlinked back to something demonstrating the criteria for the badge and/or the evidence such as an artifact, document or testimonial. The information 'behind' the badge may differ based on the skill, assessment and issuer, but the concept of a badge as the gateway to further information remains the same. This reduces the capacity for gaming the system (i.e. copying a badge and putting it on your site) and builds in an implicit validation system. Thus each badge should carry sufficient information with it to provide initial, and in many cases, sufficient validation.

For many badges, this will be enough for them to carry significant value within various communities or the broader ecosystem. Certainly some badges, such as social or digital literacy badges, may have more universal value and in combination, many badges will represent a much wider and deep set of skills and thus communicate more value for learners. However, further accreditation may be required for certain types of badges or for certain audiences. This could come more formally, from experts or authorities, as in institution or authority-issued or – endorsed badges. Or it could come more informally through recognition or issue from discipline-specific communities of practice or through the use of the badges, such as hiring people with the badges, accepting them for credit or incorporating badges into evaluation processes.

Thus, badges can come in many types and levels and be used to capture a much wider and more granular set of skills, represent those skills and competencies important to the learners' communities and relevant stakeholders and provide evidence of the skill, competency or quality. However, badges alone do not tell us much without the associated assessments, which define what a learner must do to earn the badge and determine when someone has earned it.

Assessment

In order for any badge system to accumulate value and for badges to carry or contend with the weight of formal grades or degrees, quality and vetted assessments will be critical. However, the rigor may differ based on the use case, community or intended audience, and badges give us the flexibility to have multiple levels of assessment. Many badges will be associated with distinct

pre-defined assessment exercises and success criteria, whereas others may be more loosely defined and require learner reflection or peer recommendations. The level, or rigor, of the assessment may differ based on the skill. Most hard skills may have fairly standard or rigid rubrics to compare learner work against, whereas social or 21st Century skills will be more fluid and may require more open and social assessments, such as peer reviews or endorsements. The intended audience may also determine the assessment level. If badges are simply intended to build community or reward immediate behaviors, as with motivation badges, simple assessments or in some cases, no predefined assessment, may be used. For certification badges meant for audiences such as hiring managers or admission boards, more rigorous assessments may be required to demonstrate critical competencies. Each learner may collect a wide range of badges across many different levels of assessment.

In addition to levels of assessment, badges give us the ability to support open innovation around new or relevant types of assessments, provide more personalized assessments for learners and move away from isolated or irrelevant testing practices. Instead of being forced to take an exam at a pre-determined time, in many cases learners will seek out the assessment on their own, thus encouraging reflection on their learning and competency development. In other cases, assessment and badge awarding could happen automatically and provide immediate formative feedback, and capitalize on the benefits of 'stealth assessment'[4], which is difficult to achieve in a formal classroom. The badge system also fits well with the increasingly popular portfolio assessment, and in fact creates a distributed portfolio by using the badges as markers or entry points to specific skills and achievements, and each earned badge could then be linked directly to the relevant artifacts in the portfolio.

Badges also allow for multiple assessors. Whereas in formal classrooms, the instructor does most, if not all, of the assessing, an open badge system supports assessments by authorities from many contexts, course organizers, peers, the system or the learner him or herself. This flexible and networked nature could mean that there are multiple paths or assessment options for earning a badge, making the system more flexible, ensuring that the needs of each learner are met and limiting the learning path constraints.

Regardless of the level, type or assessor, assessments should honor the spirit of connected learning. They should be interest-driven and flexible to individual interests and learning paths, and support recommendations and endorsements from peers. Further, they should be valuable and relevant outside of the assessment context and thus encourage development of relevant artifacts or allow learners to submit existing work.

Building from here, once there are badges and associated assessments, the final piece of the badge framework is the foundational infrastructure to support the issuing, collection and display of badges across contexts.

Infrastructure

In order to give learners control and to help them capture their learning, again, we must recognize that they learn across many contexts, across the Web and across time. Thus, there

needs to be an infrastructure that allows this learning to be captured wherever it happens (through issued badges) and lets each learner carry and display the badges wherever they go or feel is valuable. This requires that the infrastructure be open and decentralized, support badges from multiple independent sources and enable display across many sites. This open badge infrastructure should support:

- *Independent-Source Badge Issue*: Issuers come in many shapes and sizes, from formal to informal channels, from academia to industry to agencies to individual websites. While each of these issuers' badge systems carries value within its own right, the true optimum value comes from these badge systems working together, with the learning at the center. Thus the infrastructure needs to support badges from many independent sources across the Web and across each learner's experience to ensure that the badge system supports all of their learning.
- *Badge Collection*: Badges should be collected in a way that ties them to the learner identity and enables use across websites or experiences. Learners can get badges from many environments or experiences, through many different types of assessments, and store them in a single badge collection as they go. Each badge should carry comprehensive metadata to communicate information about the issuance of the badge, provide a link back to the learner's work as demonstration and justification of the badge and enable authentication back to the issuer. The learner should also have an interface to their badge collection to manage badges and set privacy controls.
- *Badge Display:* The value of badges increases exponentially when they become portable and learners have control over where to display them across audiences and contexts. The learner should be able to control which badges are available for which audience and share subsets of badges with selected audiences, ranging from target groups or networks, to the open web. Further, the infrastructure should allow learners to add badges to any external website or environment that supports badge display, including personal websites, such as blogs, and social networking environments such as LinkedIn or Facebook. Finally, these display sites should be able to authenticate the badge to ensure that the badge was issued to this particular user and is still valid.
- *Badge Endorsement:* While many badges will carry significant value on their own, the interpretation of value on the display/consumption side can be streamlined by supporting endorsements within the ecosystem. This involves allowing third parties endorse or sign badges to indicate their support and vetting of those badges, and that additional information can be carried with the badge. For example, the Department of Education may endorse a series of badges from informal learning providers, giving those badges some extra weight and perceived value.

Mozilla is building this open and decentralized badge infrastructure that will support badges from any issuer across the Web, manage badge endorsements and authentication and allow learners to collect their badges, associate them with a single open identity and carry the badges with them across websites and experiences. The *Open Badge Infrastructure* is essentially the underlying plumbing for the wider, functioning and interoperable badge ecosystem. Ultimately, the goal is to support learning as it occurs all across the Web, keep each learner in control of

her own learning and credentials, and allow people to share that learning and evidence of skills and experiences with anyone, thus adding flexibility and value to the system and supporting personalized learning paths.

Summary

This badge framework outlines the key elements of open badge systems for connected learning contexts, including the badges, associated assessments and an open infrastructure to support a wider ecosystem of issuance, collection and sharing of badges. This framework will support the development of high quality badge systems that can support and encourage learning, promote and recognize important skills and foster real outcomes for real people.

User Stories Revisited

Revisiting our user stories with the badge system in mind:

Kareem: Because the Open Badge Infrastructure supports badges from many issuers and environments, the Chicago and New York Learning Networks have created a set of badges for their participants. Kareem has just finished his latest movie project and submits his storyboards for the *Storyboardin'* badge, as well as his end product for the *Movie Maker* badge. His peers and facilitators review his work against a predefined rubric and decide to issue him the *Movie Maker* badge, which is linked back to his work. His storyboards are missing a key narrative element and from that feedback, he refines his storyboards, resubmits and earns the *Storyboardin'* badge. In the meantime, one of Kareem's peers who he worked with on several projects decides to award him the *Good Teammate* badge based on their experience together. Kareem also looks up the badge collection of another peer whom he really looks up to and sees which badges he should try to get to 'level up' his skill set. Kareem returns to school on Monday and shares his badge collection with his teachers who are impressed with his work and ask him to assist with an in-class narrative activity and lead his classmates through a storyboarding exercise. It is the most fun Kareem has ever had in school and many of his classmates, who he considers to be very smart, seem to have a new respect for him. Whereas Kareem's extracurricular work used to be isolated from his formal school context, the badges demonstrate his capacities to his teachers, his peers and himself, contribute to formal evaluations of him as a student and help his teachers understand his strengths and find ways to capitalize on his interests. Further, within the Learning Networks environment, badges have helped Kareem develop confidence, build relationships, recognize the potential of his interests and become aware of ways to continue to improve his skill set.

Sara: Sara already has developed an impressive skill set, and has many artifacts - mostly websites - to demonstrate those skills. P2PU has a wide set of badges available through the School of Webcraft courses and community and she submits some of her websites and work for these badges. The Webcraft community reviews the work and rates it based on established rubrics. At some threshold of rating, Sara is issued the *JavaScript Expert*, *HTML5 Pioneer*, *JQuery Guru* and *CSS Expert* badges. While reviewing the pre-existing websites that she submitted for these various badges, several of her peers were impressed by her code and commenting, and decided to issue her a *Clean Code* and *Doc Rock Star* badges. In addition to

submitting existing work, Sara also builds several new web pages with a web framework she is learning called Django, as part of her course on this new technology, and issues herself the *Django Basic* badge once she has completed and successfully run the initial set of exercises. Finally, she posts a blog post about her experience to date with challenged users and her overall attitudes about the importance of accessibility in web development, and is issued the *Accessibility Evangelist* badge by one of the accessibility gurus from the community. When applying for a job, she can point potential employers to her collection of badges, each linked to validating work or recommendations, providing a clear and complete picture of Sara and her skill set. She adds the badges to her personal blog so that her peer community sees them, as well as her mom!

Jin: Jin has a very specialized skill set and focus that carries significant value within certain relevant communities. She has garnered status and reputation within her local art community, which could create badges to formalize those identity and reputation aspects and through the Open Badge Infrastructure, make them portable across communities, like the one she hopes to find in Portland. For example, the Philadelphia community members issue her the *Avant Garde* or *Cutting Edge* badge, which is linked back to images of her work, to signal her style, categorize her interests and demonstrate her strengths. The Philadelphia community also has levels of badges, representing the level of community contribution or status, and thus Jin earns the *Gold Level* badge. Jin then carries all of these badges with her and as she starts to meet new artists in Portland and as she tries to enter that community, her badges bootstrap that process and help her find her place more seamlessly. Further, she has badges she earned from her community college experience, so instead of nothing to show for her stint in college, she has collected evidence of a broader set of foundational skills and achievements that she can use to more accurately demonstrate her experience and skill set, as well as help her gain confidence in her career.

Antonio: Antonio can use badges to represent the skill set that he has in a way that is translatable to more disciplines, as well as to discover opportunities for expanding his skill set. Within the publishing world, he looks at the badge collections of other former colleagues to see what skills they have, and even click through the badges to find opportunities to develop those skills through less expensive, less formal channels. Additionally, to break into the environmental policy world, he looks through the badge offerings of several open education providers, as well as the badge collections of others in the field to better understanding the required skills set, and find learning opportunities and mentors. Through this process he realizes that he has already developed many of the skills that seem relevant over the course of his education, work experience and personal research, including the *Critical Thinker*, *Public Speaker*, *Pro Presenter*, *Debater* and *Green Evangelist* badges. He takes some assessments through some open education providers to demonstrate these skills and earn the badges. The assessment feedback helps him realize that he needs to learn more about environmentally friendly technology and practices and he signs up for a P2PU course on the subject. For Antonio, badges help him to find mentors and a path to this new discipline, as well as to capture his learning path across his formal education, work experience and personal learning efforts, including a much more

granular set of hard and soft skills that are important for his future career path. He adds his badges to his career social network profile and gets several recruiter calls within days.

Kareem, Sara, Jin and Antonio are just four examples of many learners out there learning outside of the formal channels, and participating and continuing to learn, interact and develop skills within a broader connected learning ecology. Across these learners, we can see how an open badge ecosystem could provide them with more opportunities and allow them to leverage their comprehensive skill sets, peers and learning experiences further and with more impact.

What's Next?

The value of the badge ecosystem increases with adoption of that system – including various issuers pushing badges into the ecosystem, learners actively managing their collections and displayer or consumers using badges on the other end to connect learners with real results. Thus, initial efforts will be focused on bootstrapping this ecosystem in line with the framework:

Badges and Assessments: The 4th annual Digital Media for Learning Competition is focused on soliciting and supporting the development of high quality badge systems for lifelong learning. Each badge system developed through the competition will consist of a set of badges and associated assessments that effectively represent the learning and skills occurring in each respective learning environment. The framework above can guide the development of the badge systems, and we also hope to build on the framework and understanding through the shared exploration.

Infrastructure: In parallel, Mozilla is building the Open Badge Infrastructure, which will support the issuance of badges from all the badge systems, the collection of the initial badges by learners and the capacity for badges to then be shared across participating sites including career website and credentialing portfolio and profile systems.

For more information on the DML Competition, see http://www.dmlcompetition.net
For more information on the Mozilla Open Badge Infrastructure, see http://openbadges.org

Who Should Be Involved?

You. Just as the badge ecosystem should be open, comprehensive and supporting of innovation, so should the exploration of badges. To truly accomplish the goals of supporting lifelong learning wherever it happens and translating that learning in to real results, we need a thriving badge ecosystem where there many opportunities to earn badges, many different types of badges and many organizations and sites consuming or using the badges. This is an important moment in time where we have the opportunity to not only start a conversation about limitations of the current system and opportunities for change, but also to make immediate impact for people across all disciplines, across stages in life and across the globe. Together we can make a difference, one badge at a time.

FOOTNOTES & REFERENCES

[1] Our approach to badges aligns with the principles of 'connected learning' being defined by the MacArthur Foundation's Digital Media and Learning Initiative. 'Connected learning' is: 1) participatory, demanding active social engagement and contribution in knowledge communities and collectives; 2) learner-centered, empowering individuals of all ages to take ownership of their learning linked across a wide range of settings -- in school, at home, and informally with friends and peers; 3) interest-driven, propelled by the energies of learners pursuing their unique passions and specialties; and 4) inclusive, drawing in people from diverse backgrounds and walks of life across generational, socioeconomic, and cultural boundaries.

[2] Rheingold, H. (2009). Crap Detection 101. *SF Gate*, http://www.sfgate.com/cgi-bin/blogs/rheingold/detail?entry_id=42805

[3] Jenkins, H. (2006). Confronting the challenges of participatory culture. *White paper for the MacArthur Foundation*. http://digitallearning.macfound.org/atf/cf/%7B7E45C7E0-A3E0-4B89-AC9C-E807E1B0AE4E%7D/JENKINS_WHITE_PAPER.PDF

[4] Shute, V. J. (in press). Stealth assessment in computer-based games to support learning. To appear in S. Tobias & J. D. Fletcher (Eds.), *Computer games and instruction*. Charlotte, NC: Information Age Publishers. http://myweb.fsu.edu/vshute/pdf/shute%20pres_h.pdf