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ESTABLISHING OPEN BADGES IN EUROPE – THE OPEN BADGE NETWORK

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Introduction

Mozilla Open Badges are Web-enabled tokens of learning and accomplishment (Casilli & Hickey, 2016). The Mozilla Open Badges initiative and the Open Badges Infrastructure (OBI) both advocate badges as open micro-credentials which can be used as indicators of skills, achievements or credits for all types of learning (Knight & Casilli, 2012). Open badges are unique in that they are information-rich due to the embedded metadata as well as interoperable due to the open standard. Since the introduction of open badges in 2012, a number innovators worldwide have developed both technical solutions to extend and optimise the badge system and educational programs focusing on issuing, earning and sharing open badges. The open badge community has been growing ever since with both global and regional initiatives enhancing the uptake of badges and badging systems. One of such initiatives is the Open Badge Network (OBN), an Erasmus+ strategic partnership, which brings together organisations from across Europe to support the development of the open badge ecosystem, promoting the use of open badges to recognise all forms of learning. This paper introduces the project Open Badge Network and its mission to promote Open Badges in Europe. First, it describes the emergence and development of Open Badges technology, projects and initiatives since 2011 until 2016 including the establishment of the Open Badge Network in 2015. Then it discusses Open Badges from three perspectives, i.e. (a) as an *open infrastructure* (technical perspective), (b) as *open educational practice* (educational perspective), and (c) as an *open movement* (sociological perspective), and go on to illustrate how these three perspectives are reflected in the vision, mission, activities and outcomes of the Open Badge Network (OBN). The paper closes with recommendations for promoting and establishing a European network aligned with the Open Badges standard, practice and movement.

The emergence and development of Open Badges

Open Badges emerged in 2011 together with the foundational white paper authored by the Peer 2 Peer University (https://courses.p2pu.org/en/) and the Mozilla Foundation (https://www.mozilla.org/en-US/foundation/) (P2PU, 2014). This first badge framework outlined the key elements of an interoperable, decentralised, open badge system for connected learning, including badges, assessments and an infrastructure for issuing, collecting and sharing of badges. This first paper took a look at how learning is occurring outside of formal

contexts and how learners are pursuing self-directed learning supported by online resources and communities. The conclusion was that while online learning opportunities, communities and resources are sufficient to support any learner, there are no means of recognising knowledge and skills acquired in such contexts. The authors argued that since traditional systems of educational and job-relevant accreditation require enrolment in formal programs and institutions, the outcomes of informal learning, e.g. in online settings, remain invisible and unrecognised both by the formal educational and by the career systems. Another key issue raised was the drawback of formal systems of accreditation not accounting for incremental learning, i.e. a history of how skills were developed over time remains indiscernible. Based on these observations, the authors set out a future vision of a system which would support skills to be captured more granularly across different contexts, collected and associated with an online identity and displayed to various audiences, including potential employers, mentors, peers and collaborators (P2PU, 2014; p.3). The evidence for such learning would be acquired in different ways, e.g. (a) automatically from interactions with content or peers, (b) through various assessment types, or (c) based on nominations or endorsements. With learners actively seeking learning opportunities, developing skills by following multiple pathways and creating own connected learning ecologies, this self-directed, interest-driven learning would be systematically supported and acknowledged to make skills visible, available and viable for career development, school acceptance, mentoring opportunities and personal development. Acting as bridges between learning contexts, badges would make various learning contexts and types of learning more *viable, portable and impactful* (P2PU, 2014; p.5). Learners would be able to collect badges from different sources. Collection of badges could serve as digital resumes or portfolios. In this way badges would help to demonstrate a more complete picture of individual skills, competencies and achievements.

Following (P2PU, 2014), Mozilla released the first public beta version of the Open Badge Infrastructure in 2011 and later in 2012 a formalised Version 1.0, in this way establishing a technical, metadata-based standard for Open Badges (Casilli & Hickey, 2016). The first Open Badges were issued at the Peer 2 Peer University, in the online course *School of Webcraft* (https://courses.p2pu.org/en/schools/school-of-webcraft/) in 2011. Since the introduction in 2011, a number innovators worldwide have developed both technical solutions and educational programs focusing on issuing, earning and sharing open badges on the Web. In 2012, shortly after the release of Version 1.0, the Badges for Lifelong Learning competition (https://www.macfound.org/press/press-releases/badges-lifelong-learning-competition-winners-announced/) were founded by the MacArthur and Gates Foundation. This Digital Media and Learning (DML) competition attracted hundreds of submissions and founded over 30 innovative badge systems and 10 research studies between 2012 and 2013 (https://www.hastac.org/competition/digital-media-learning-competition-4). In this context, the first comprehensive research on design principles of Open Badges – Design Principles Documentation Project (DPD Project – http://dpdproject.info) – was carried out to document and study the practices developed in the DML competition winning projects (Hickey et al., 2014). The DPD research systematically analysed specific practices that emerged across 30

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projects and distinguished four sets of design principles for badge systems, i.e. (a) recognizing, (b) assessing, (c) motivating, and (d) studying learning.

In 2014 the Badge Alliance (http://www.badgealliance.org), an organisation coordinating use and implementation of open badges in diverse settings was founded with the aim of supporting a self-sustaining open badges ecosystem (Casilli & Hickey, 2016; p.123). The Badge Alliance is based on a model of working groups, which help individuals and organisations connect with others around specific points of interest, e.g. OB endorsement, OB standard, OB infrastructure, OB research, OB for higher education or OB for employment. Members of the Badge Alliance aim to foster and grow the OB ecosystem in a distributed and sustainable way. In 2015, the Badge Alliance started refining the OB technical specification to enhance its compatibility and interoperability. In 2015, the IMS Global (https://www.imsglobal.org/aboutims.html) – non-profit member organization that strives to enable the adoption and impact of innovative learning technology – announced an initiative to establish open badges as common currency for K-20 and corporate education (https://www.imsglobal.org/pressreleases/pr150421.html). Since 2015, IMS has partnered with Mozilla Foundation to accelerate adoption and interoperability of OB in the education and workforce sectors. The vision of the IMS Digital Credentialing initiative is to augment current IMS interoperability standards with the Open Badge standard and to explore new models of badge system design, storage, usage, and evaluation in the institutional context (IMS, 2015). Two digital credential projects initiated by IMS in 2015 are the *eT – extended Transcript* project making use of the Open Badges Standard and the *Digital Credentials Currency Framework* project augmenting the metadata embedded in badges by defining a structure that communicates value and aids consumer comparison (IMS, 2015).

In 2013, the Badge the World (http://www.badgetheworld.org) initiative began at Mozilla Festival in London (http://2013.mozillafestival.org), with the aim of documenting OB projects around the world. Badge the World provides an inventory of projects and helps like-minded organisations to connect and collaborate. The vision of the Badge the World website is to function as a place where those working with OB can learn about the work of others, discuss relevant issues with like-minded colleagues and find new collaborators to work with. Badge the World has been coordinated by Digitalme, a partner organisation in the Open Badge Network, supported by Nominet Trust, Mozilla, Badge Alliance and recently through the Erasmus+ funding in the Open Badge Network project. Currently there are about 200 Open Badges projects and initiatives pledged by users on the Badge the World website.

The above mentioned projects, research and initiatives paired with further development of the OB Infrastructure catalysed the growth of open badges with a number of initiatives sprouting across the globe. One of such initiatives is the Open Badge Network (OBN – http://www.openbadgenetwork.com), an Erasmus+ strategic partnership which brings together organisations from across Europe to support the development of the open badge ecosystem, promoting the use of open badges to recognise all forms of learning. The project was started in 2014 as Badge Europe and then renamed in 2015 to Open Badge Network to

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reflect the change in the constellation of the founding partner organisations and a shift in focus towards establishing a European network linked to the global community.

The Open Badge Network advocates the development of Open Badges in Europe on three levels – technical infrastructure, educational practice, and social movement. Below we describe these three perspectives and then illustrate how these are reflected in the vision, mission, activities and outcomes of the Open Badge Network.

Three Perspectives on Open Badges

Open Badges as an Open Infrastructure

Open Badges include development and deployment of the Open Badge Infrastructure (OBI), which is the underlying technology supporting badge issuing, collection, and display. The OBI is defined by two aspects: (a) the OB specification, which technically describes the OB standard, and (b) the Badge Backpack, which is a service that provides badge earners a way to collect and manage badges (http://openbadges.org/legal_faq/#open-badges).

The OB standard is documented in the Open Badges Technical Specification (https://openbadgespec.org). This specification defines the metadata that must be included in a badge for it to be considered OBI-compliant. Each Open Badge carries the information needed to understand that badge as it is transferred in the OB ecosystem. This information includes how the badge was earned, where it was earned, who earned it, if and when it expires, what criteria were used to issue the badge. The specification ensures that badges are interoperable with other open badges and Badge Backpacks. The current version of the specification V 1.1 published in 2015 includes term definitions for representations of data in JSON-LD (v1.1) (https://openbadgespec.org/v1/context.json). The OB specification is made up of three types of core Badge Objects: Assertions, BadgeClasses, and Issuers. The 1.1 version also introduces Extensions as a means for issuers to add additional metadata to Badge Objects (https://openbadgespec.org/#Extensions). The OB metadata specification is available under an open license – the W3C Community Contributor License Agreement (CLA). The Badge Backpack is a repository for collecting and displaying badges from a variety of sources. It is a user management interface where the earner can import and delete badges, set privacy controls, create and publish collections of badges. The Mozilla Badge Backpack (https://backpack.openbadges.org) is a Mozilla hosted service that uses Mozilla's authentication platform called Mozilla Persona to tie badges to a specific user. Badges are earned on issuer sites and can be added by the earner to a Badge Backpack by accepting the badge and pushing it into their Backpack. Pushing badges to the Backpack means adding individual badges the larger OB ecosystem. Once in a Backpack, a badge may remain private or may be made publicly available on the Web. While Mozilla is hosting a reference Backpack – the Mozilla Badge Backpack – further backpacks can be hosted by different entities, enabling a federated model of providers.

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Open Badges as Open Education

Open Education (OE) has been inspired by the open source software movement and as such has promoted the use of the Internet and the Word Wide Web to free knowledge, use and reuse of resources, link ideas, enhance worldwide collaboration and also "receive credit and kudos for contributing to education and research" (Baraniuk, 2013; p.229). Open Badges go beyond the technical infrastructure and are also used as a term to describe educational practices. In fact, these practices can be framed as Open Educational Practices (OEP). The traditional understanding of OEP focuses on the educational practices related to Open Educational Resources (OER). The International Council for Open and Distance Education (ICODE – http://www.icde.org) defined OEP as "practices which support the production, use and reuse of high quality open educational resources (OER) through institutional policies, which promote innovative pedagogical models, and respect and empower learners as co-producers on their lifelong learning path". This understanding of OEP, however, does not take other elements of open educational into account. In order to be inclusive, the author proposes the following, wider definition of OEP:

> *"Open Educational Practices are practises which support and promote the use open resources and systems combined with innovative pedagogical models to empower learners as co-producers of their self-directed, interest-driven lifelong learning paths."*

Based on a comparative literature review, Buchem (upcoming) analysed how Open Badges have been conceptualised in current publications. The emerging key conceptualisations of open badges are *Open Badges as Pathways*, *Open Badges as Bridges* and *Open Badges as Catalysts*. These concepts are closely linked to Open Education. The concept of *Open Badges as Pathways* emphasises the potentials of OB to document and visualise individual learning pathways over time. Casilli (2013) describes badge pathways as a way to visualise the learning journey. The value of digital badges in this context is defined not by experts (e.g. teachers) but by learners themselves. Open badges enable learners "to connect the outlying dots that constitute lifelong learning" (Casilli, 2013). Grant (2014) also points out that badges enable creating lifelong learning pathways by reflecting flexible and modular types of curricular design across multiple organizations. The concept of *Open Badges as Bridges* emphasises the potential of OB to enhance and bring together learning in and from different contexts, including formal, non-formal and informal learning contexts. The potential of OB has been seen in encouraging connections between in- and out-of-school learning, bridging differences in opportunities for learning, improving school-community partnerships and making information about student learning available to formal and informal education providers (Mozilla, 2013). The value of badges has been especially seen in connecting learning across contexts by making different learning context and different types of learning more significant and viable (Knight & Casilli, 2012). Finally, the concept of *Open Badges as Catalysts* emphasises the role of OB as catalysts for discussions about learning and for a change in educational practice, especially towards a learner-centred and learner-driven approach to learning as well as towards a more integrative educational approach. For example, Wyles

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(2013) describes OB as a catalyst for a new learning design. Goligoski (2012) sees OB as a catalyst for legitimising informal learning experiences, particularly in view of gaining jobs, community recognition and learning opportunities. Charleer et al. (2013) show how OB can serve as a catalyst for discussion using a badge board in class to stimulate and moderate discussions and a deeper reflection about learning. Finkenstein, Knight and Manning (2013) argue for OB as a catalyst for interdisciplinary explorations, discussions and collaborations.

These three conceptualisations of open badges help to frame an extended version of Open Educational Practices by emphasising supporting learners in creating own learning pathways, bridging learning contexts and bringing together learning from different settings as well as catalysing change in educational practice and learning design. The understanding of Open Badges as an Open Educational Practice also corresponds to the Connected Learning initiative supported by the MacArthur Digital Media and Learning Initiative. The Connected Learning Initiative emphasises interest-driven, openly networked and shared educational and learning practices (Ito et al., 2013). The Connected Learning model focuses on supports and mechanisms for building environments that connect learning across the spheres of interests, peer culture and academic life (Ito et al., 2013), and as such provides a valuable framework for a broader conceptualisation of Open Educational Practices.

Open Badges as an Open Movement

Open Badges can be also viewed as an open movement inspired by the open source communities. The open movement begun with free software and open source in the mid 1980s and can be linked to the "philosophical foundations of modern education with its commitments to freedom, citizenship, knowledge for all, social progress and individual transformation" (Peters & Britez, 2008). The OECD (2007) report points out that the open source software movement focusing on *sharing software programs*, and the open access movement focusing on *sharing research results* have been followed by the open educational resources movement which focuses on *sharing learning resources*. However, the movements promoting opening of research and education have been recently complemented by the open badges movement focusing on *sharing learning outcomes*. Following Peters and Britez (2008) in saying that open education and education for openness are one of the most significant educational movements in the 21st century, and taking into account that the open source software movement is one of the most significant approaches to software development and intellectual property in the 21st century (Warger, 2002), the open badges movement can be considered as a movement at the intersection of both open source and open education movements. By combining both spheres, open badges help to realise the potential of the Web for learning – creating an extended, connected learning environment focused on transparency and creating opportunities for creating, sharing, recognising and distribution of learning outcomes.

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Open Badge Network

The Open Badge Network advocates the development of Open Badges in Europe on three levels, i.e. (a) open infrastructure, (b) open education, and (c) open movement. These three perspectives are reflected in the vision, mission, activities and outcomes of the Open Badge Network (OBN) as outlines below.

The *vision* of the Open Badge Network is to build and cultivate a self-sustainable network of various Open Badges stakeholder groups in Europe at the same time linking European innovators, projects and initiatives to the global OB community. The Open Badge Network recognises the need for regional associations of stakeholders sharing similar educational and employment contexts, especially credentialing practices and approaches to recognising qualifications and competencies. For example, in Europe the credentialing system in higher education has been determined by the Bologna process and the European Credit Transfer System (ECTS – http://ec.europa.eu/education/ects/ects_en.htm). Similarly, credentialing in the vocational education and training has been by the European Credit System for Vocational Education and Training (ECVET – http://www.ecvet-team.eu/en). These and other European credit systems frame the discourse around transfer, recognition and accumulation of individual learning outcomes in Europe. In order to enhance the uptake of Open Badges in Europe it is necessary to refer to these systems, look for connections and define delineations. Regional credentialing practices as is the case of Europe substantiate the need for initiatives such as the Open Badge Network.

The *mission* of the Open Badge Network is to provide a trusted source of independent information, tools and informed practice to support people who are interested in creating, issuing and earning badges across Europe. The project partners and associate partners of the Open Badge Network drafted a common Charter, which includes the key principles for promoting and establishing Open Badges in the European context. These principles include (a) advocate the adoption of Mozilla Open Badge standard across Europe to recognise learning achievements gained in variety of contexts, (b) provide information, guidelines and use cases to enable the widest possible adoption of Open Badges across policy, education, employers, service providers and individuals, (c) advocate for and enable social inclusion by ensuring marginalised groups are able to gain recognition for all their skills and achievements, supporting their personal and professional progression, (d) raise the value and profile of informal and non-formal learning taking place outside of formal education, (e) support on-going development of Mozilla's open source backpack and other open badging tools, to ensure end users' data is portable between systems and retained by the individual. All partners of the Open Badge Network are encouraged to agree, support and advocate the OBN Charter expressing its mission.

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The *activities* and *outcomes* of the Open Badge Network are organised around seven output areas addressing specific challenges of establishing Open Badges in Europe (http://www.openbadgenetwork.com/outputs/):

- Activities and outcomes related to the promotion of OB as an *open infrastructure* are embedded in two outputs, i.e. *Open Badge Infrastructure* and *European Open Badge Network*. The infrastructure output focuses on the elicitation and collection of use cases, describing a specification for the European OB infrastructure, and designing a prototype of a European competency repository with the aim of sharing competency descriptions to complement the creation and sharing of badges. The network output focuses on the provision of the infrastructure, services and resources needed to support the construction of the European Open Badges community.
- Activities and outputs related to the promotion of OB as *open education* are embedded in three outputs, i.e. *OB for Individuals and Organisations*, *OB in Territories* and *OB Policy*. The first two outputs investigate the use of OB from the perspective of individuals, organisations and territories, also producing guidelines for implementation and testing these guidelines in pilot case studies. The third output focuses on enhancing awareness for Open Badges among policy makers and eliciting policy recommendations for promoting OB in Europe.
- Activities and outputs related to the promotion of OB as *open movement* are embedded in two outputs, i.e. *OB Framework and Leadership* and *Research, Evaluation and Quality*. While the first output is dedicated to designing self-/sustainability of the OB Network and promoting the OB movement in Europe, the second output focuses on the quality aspects of OB, with focus on the European context. Both outputs aim at promoting a cross-stakeholder discussion about open badges and eliciting recommendations for issuers, earners and users of open badges in Europe.

Recommendations for establishing Open Badges in Europe

The Open Badge Network members believe that Open Badges can enrich and expand Open Educational Practices. A growing body of evidence suggest that more and more learning is taking place outside of formal education in digital settings. Especially digital opportunities are used by learners to engage in self-directed and interest-driven learning. Open badges can streamline and recognise such learning in effective and innovative ways. In order to mainstream Open Badges in Europe reflecting the unique educational and employment local contexts, the Open Badge Network recommends stakeholder working with open badges in Europe to (a) examine the unique educational and occupational potentials for issues and earners in context of specific projects and initiatives, (b) apply open badges to facilitate and recognise learning, enhance employment opportunities and build new communities of practice, (c) provide information and guidance on how open badges can benefit individuals, organisations and territories. The Open Badge Network invites all interested stakeholders to join the common effort of promoting and establishing Open Badges in Europe.

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