O5A2 White Paper on Open Badges at Policy Levels (Final v1.0)

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Authors	Partner
Erik van den Broek	Dienst Uitvoering Onderwijs (DUO)
Ilona Buchem	Beuth Hochschule für Technik Berlin
Reviewers	Partner
Ilona Buchem	Beuth Hochschule für Technik Berlin
Nigel Lloyd	Cambridge Professional Development

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Corresponding author:

Erik van den Broek

Senior Consultant

DUO, International Services

Kempkensberg 12, 9722TB Groningen, NL

erik.vandenbroek@duo.nl

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Executive Summary

The Erasmus+ strategic partnership "Open Badge Network": http://www.openbadgenetwork.com, brings together organisations from across Europe to support the development of an Open Badge ecosystem, promoting the use of Open Badges to recognise non-formal and informal learning. This White Paper provides background information on Open Badges. After explaining context and scope, and referring to some basic reading materials that were also produced by this partnership, Chapter 3 "General Issues" is the real starting point for recommendations for policy makers. Here we cover questions that arise when organisations start to consider implementing Open Badges. An example of a frequent question is "What is the value of an Open Badge?", also many questions always arise around the subject of privacy and security. These frequently asked questions are covered in Section 3.1 "Higher aspects of Open Badges". In Section 3.2 "Technical aspects explained" we attempt to clarify key facts about Open Badges, which are relevant for anyone wanting to implement Open Badges, including some key technical issues like the important issue of "Validation and verification" (which is a strong point of Open Badges, compared to other ways of credentialing).

Chapter 4, "Specific approaches, guidelines and recommendations for relevant policy areas" focuses on recommendations for policy makers, such as the way Open Badges enhance and connect different European transparency tools, how Open Badges can be used in professional development and, last but not least: especially focuses on the way Open Badges fit within Open Education.

This paper ends with an extensive list of online resources, for further reading in Chapter 5.

What are the objectives of this paper?

One of the key strategic aims of Open Badge Network was to initiate a discussion among policy stakeholders via a Discussion Paper on Open Badges at Policy Levels (Output 5, Activity 1). This is now followed by the White Paper (Output 5, Activity 2). The Discussion Paper states: "*Given the complex challenges facing formal, non-formal and informal education in the twenty first century, there is a need for cooperation of diverse stakeholders and a harmonisation of a diversity of views and approaches related to the further development and modernisation of credentialing systems*"[1]. Clearly this situation has not yet totally changed since its publication, but we hope we have been, and still are with the publication of this paper, contributing to the cooperation and harmonisation needed.

www.openbadgenetwork.com/wp-content/uploads/2016/01/OBN-O5-A1-Policy-Discussion-Paper-31-July-2016.pdf

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[1]

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We learned from research we made in Discussion Paper that Open Education may be the most promising policy area for the future of Open Badges - therefore we build on the insights from research done in O5A1 and focus strongly on Open Education in this White Paper.
A new development since the publication of the Discussion Paper is that the European Commission is envisioning major modernisation around Lifelong Learning tools like Europass. We expect that Open Badges definitely will play a role there, and we look into possibilities how to use them in different EU-instruments.
In general, we will reflect on "commonly accepted" views on the subject, but hopefully also give some new ideas. Therefore we hope this document helps make decisions on implementing Open Badges in diverse educational, vocational and employment policies.

Who does this paper address?

This paper provides policy makers, especially from the areas of education, employment and volunteering with an overview of the basic principles, concepts and applications of Open Badges as micro-credentials; from the perspective of policy-makers in different European countries and formulates some actionable recommendations that will support developing, implementing and evaluating digital credentialing policies, strategies and action plans. It links Open Badges to the subject of Open Education and relevant EU policy areas and formulates recommendations about incorporating Open Badges into European and sectoral policies.
The aims and the scope of this paper are outlined in Chapter 1.

Contributors

Prof. Dr. Ilona Buchem, is a professor for Communication and Media Sciences at Beuth University of Applied Sciences in Berlin, Germany. She is the coordinator of the Open Badge Network strategic partnership founded by the Erasmus+ program. Her research and teaching focus on the intersections of digital media and society, including digital media design and communication, digital media sociology, media research and digital media economy.

Erik van den Broek, is senior information consultant at "Dienst Uitvoering Onderwijs" (DUO), the executive department of the Ministry of Education, Culture and Science in the Netherlands. Erik has an IT background, is appointed to the DUO/International services department since 2005, and currently also co-chair of the Europass Innovation working group.

Acknowledgements

1. Context and scope

This White Paper is part of the efforts of the Open Badge Network Erasmus+ strategic partnership in promoting and establishing Open Badges in Europe and beyond.

Building on the Discussion Paper from the first cycle (O5-A1, led by Beuth University of Applied Sciences Berlin, Germany), this follow-up White Paper as a second cycle (O5-A2, led by DUO, the Netherlands), uses the key discussions from O5-A1 to draft more advanced policy guidelines and outline more concrete future directions for establishing Open Badges at policy levels in Europe and support policy-makers in developing, implementing and evaluating digital credentialing policies, strategies and action plans.

Especially, this White Paper focuses on establishing Open Badges within the framework of Open Education and related policies. Open Education as a key policy area emerged from the research conducted with policy makers in Europe as part of the first cycle (O5-A1, Discussion Paper, URL: http://www.openbadgenetwork.com/wp-content/uploads/2016/01/OBN-O5-A1-Policy-Discussion-Paper-31-July-2016.pdf) as well as due to consultations and intensive discussions with policy makers and a broader audience around policy issues related to Open Badges as part of the OBN MOOC, URL: http://www.openbadgenetwork.com/mooc/. This especially includes the valuable perspective on Open Badges within Open Education provided by Dr. Andreia Inamorato dos Santos, Scientific Officer at the European Commission's Joint Research Centre (DG JRC). The recording of the webinar with Dr. Andreia Inamorato dos Santos, Scientific Officer at the European Commission's Joint Research Centre (DG JRC) as part of Session 3 of the OBN MOOC dedicated to Open Badges and Open Policies in Higher Education can be viewed here: https://eden-online.adobeconnect.com/pxm8rqsrha26/

The nature of this paper is that it does not have to be read from A to Z, but it is written in the form of "Capita Selecta". Readers are invited to choose the chapters that are relevant for their area of work or interest.

2. Prequel to this paper

This White Paper is not meant to provide a general or basic introduction to Open Badges which has been already covered by other outputs of the Open Badge Network project. For readers new to Open Badges, we recommend the following resources about the **background and rationale** of Open Badges:

1. Discussion Paper on Open Badges at Policy Levels[2] (O5-A1), especially Chapter 2, which contains:

- A case study illustrating the application of Open Badges in practice (section 2.1)
- Short summary of history and current status of educational credentialing (section 2.2)
- Establishing rationale for Open Badges as digital credentials (section 2.3)
- Applications and tools for using Open Badges as digital credentials (section 2.4)
- Transforming credentialing practices with Open Badges (section 2.5)

2. Discussion Paper on Open Badges for Organisations (O3-A2)[3], especially chapters 1 to 6:

- Introduction to Open Badges
- Open Badges from the Organisations point of view
- Open Badges for the public sector
- Open badges for private companies
- Open badges in Higher Education
- Open Badges non-governmental organisations

3. Discussion Paper on Open Badges for Individuals[4] (O3-A1), especially chapters 2, 3 and 4:

- Advantages and risks of Open Badges from the individual point of view
- The role of individuals in the Open Badge ecosystem
- Open Badge best practices

4. Guidelines for the implementation of Open Badges for individuals and organisations (O3A3)

5. Discussion Paper on Open Badges in Territories (O4-A1)[5], especially chapters:

- What does an Open Badge Network look like?
- Case studies on Open Badge networks

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[2] www.openbadgenetwork.com/wp-content/uploads/2016/01/OBN-O5-A1-Policy-Discussion-Paper-31-July-2016.pdf

[3] http://www.openbadgenetwork.com/wp-content/uploads/2016/10/O3_A2_final-IB_mn.pdf

[4] http://www.openbadgenetwork.com/wp-content/uploads/2016/01/O3A1DiscussionPaperonIndividuals_FINAL-VERSION-JUL-21.pdf

[5] http://www.openbadgenetwork.com/wp-content/uploads/2016/01/O4A1_DiscussionPaperonOpenBadgesinTerritories_Digitalme.pdf

- IMS Digital Credentialing Initiative

6. Guidelines for Open Badges in Territories (O4-A3)[6].

These Discussion Papers and Guidelines (and other useful Open Badge Network publications) can be found on the official Open Badge Network portal:
http://www.openbadgenetwork.com/outputs/

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[6] http://www.openbadgenetwork.com/wp-content/uploads/2016/01/O4A3_GuidelinesforOpenBadgesinTerritories_Digitalme.pdf

3. Special issues around the implementation of Open Badges

Some of the general aspects related to the implementation of Open Badges are covered by a separate OBN Report titled "Guidelines for the implementation of Open Badges for individuals and organisations **(O3A3)"**[7]. Therefore, the issues around the implementation of Open Badges in this White Paper focus on the selected special aspects: higher aspects of value and trust (3.1.1), privacy and risk (3.1.2) and internationalisation issues (3.1.3).

3.1 Higher aspects of Open Badges

3.1.1 Value and trust

"What is the value of Open Badges?" might be the most frequently asked question, when introducing Open Badges to a new audience. Similar to paper certificates, this is not at all catered for automatically. The value of different Open Badges will vary enormously depending on a number of issues, just as diplomas from different organisations may have different values to different audiences. For example, a diploma from the University of Cambridge is appreciated more than a diploma from an "average" university. A diploma of any legitimate university is infinitely worth more than a diploma from a so-called Diploma-Mill. (Diploma-Mills are shady businesses that produce impressive looking diplomas from non existing fake universities, that can be bought through the internet). As soon as Open Badges become mainstream, one can expect Badge-Mills popping up too.

Value and quality of an Open Badge come from the metadata embedded in the badge and depending on the complexity of evidence provided and assessment applied may be a more or less valuable way of proving a recognition or documentation of an achievement, skill, competency or any similar quality.

Carla Casilli identifies a spectrum of value as follows (please add reference here!):
- Institutional value - intended by the issuing institution
- Social value - recognised in academic, professional, cultural and community contexts
- Generic value - rooted in the desire for a standard currency
- Personal value - perceived by the earner
- Consumer value - attributed by the audience or the "market"

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[7] link follows, as soon as this report is formally publicized

These five different value types are described in relation to Open Badges below:

Institutional value
Institutions that design Open Badges and badge systems, have to invest time in doing that. There is no investment without the idea of creating value. This value can lie in the professional development of the staff. That starts often with charting the competences needed for different roles (if not already present, which is often the case). For the issuing institution, badges also create value, by enhancing an institution's reputation and visibility. Open Badges can be published on the institution's website and seen by a wider audience when shared by the the earners. This creates an institutional value, for example in relation to image/reputation building or transparency/public relations of the issuing organisation.

Social value
Social value is related to group, community or society perception. Carla Casilli defines social value as follows :

> *"The social value of a badge is complex. There are a number of ways that badges contain and contribute to social value, including: academic value; professional value; cultural value; and group value. I could probably write a few long paragraphs about each of these types of value but in the interests of brevity and because you're smart, try thinking through those on your own. I will note, however, that somewhat perversely, the group value of badges appears to be the most underappreciated of all of the possible values. Considering that society is predicated on the concept of in-groupness and out-groupness, this under-appreciation always strikes me as odd. Badges are indicators of community and consequently carry the values that are related to the communities in which they circulate."*
> (Casilli, 2016,The prismatic value of badges[8])

Clearly, the value of a badge system increases also through recognisability, which will be much larger within a local or regional territory. This subject is covered by a separate OBN report: **O4-A3 Guidelines for Open Badges in Territories.[9]**

Generic value
Open badges are a new "currency for learning" and in this way have a generic value as digital credentials. The value of Open Badges as a new currency is still evolving. Currently traditional (non-digital or paper credentials are perceived to have value and there seems to be a mutual acceptance of what traditional credentials really testify. The acceptance of traditional credentials is usually not based on a profound understanding about the level, quality and amount of the

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[8] https://carlacasilli.wordpress.com/2015/03/15/open-badge-opticks-the-prismatic-value-of-badges/

[9] http://www.openbadgenetwork.com/outputs/in-territories/

achievement certified by a traditional credential, but is based on social and psychological mechanisms in which evaluators use traditional credentials as shortcuts to tentatively estimate skills, competencies, achievements etc. For example, it is common to use traditional credentials such as academic diplomas, academic degrees, certifications or licenses for recruiting and employment decisions with recruiters/employers relying on the face value of a traditional credentials and not questioning or investigating further what skills, competencies, achievements exactly are recognised or what type of assessment has taken place to issue the credential. This phenomenon is known as credentialism as has been extensively described in sociology, e.g. Collins, R. (1979). The Credential Society: An Historical Sociology of Education and Stratification. New York: Academic Press. Open Badges offer an opportunity for a more transparent and information-richer recognition compared to traditional credentials as they may be designed in such a way as to inherently include the information about the what exactly is recognised, based on what criteria, following which assessment procedures, even including evidence and endorsements. Open Badges as information-rich, digital credentials should be therefore well able to achieve the same generic value as traditional credentials.

Personal value
Earning a badge can help a learner/earner get a more in-depth insight into gained skills, competencies, abilities etc., compared to traditional certificates, e.g. through transparent criteria for issuing a badge, evidence and endorsements. As such, there is already a great intrinsic value in earning an Open Badge. The learner/earner might not even have the need to share an Open Badge, as receiving meaningful recognition may have a stronger personal than social value. There have been a number of discussion about the inflation of Open Badges and low-quality Open Badges. In the future, undoubtedly "spam"-badges will appear, but the "earners" of those low-quality Open Badges without any personal value will not take the effort to share them with others and may not even be motivated to accept meaningless "spam" badges at all. .

Consumer value
Consumer value is related to the intended or real audience of a credential. Carla Casilli states that this value can be thought of as the "*market value"* (Casilli, 2016,The prismatic value of badges[10]) or the effective total sum of all elements that define the value of a badge (reference). In order to have a high consumer value, an Open Badge should be self-explanatory, concise but complete and specific about learning outcomes certified with an Open Badge and the way they the outcomes such as knowledge, skills, competencies, achievements were assessed (or not). This aspect is also related to trust. The consumer (e. g. an employer with a job opening) should trust the that the issuer really is the one that is stated in the badge (also see the chapter "Technical aspects - data validation" in this paper), and that the information in the badge is correct or true. There have been discussions about the risk of fake Open Badges. This risk however is comparable to traditional

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[10] https://carlacasilli.wordpress.com/2015/03/15/open-badge-opticks-the-prismatic-value-of-badges/

credentials. It is possible to fake any credential - be it a traditional paper certificate (and there have been certainly practical examples of this) or possibly an Open Badge. However, Open Badges have built in mechanisms to minimise possible fraud (again see: "Technical aspects - data validation" in this paper) and further mechanisms may be integrated into the existing Open Badges standard to prevent faking a badge. This includes such security mechanisms as 128 bit encryption (e. g. eNetBadges[11]) or integration with the Blockchain[12], which are especially important and valuable for the so called "high-stakes" credentials such as formal education or industry certificates. In the end the consumer or market value of Open Badges seems to be a critical aspect that matters most, not only in case of high-stakes credentials: The consumer value determines what the badge can "buy" or "unlock" for its owner.

Beyond the institutional, social, generic, personal and consumer values as described above, there are also more practical variables and factors that influence the value of an Open Badge:

Badge type:
Badges can be designed for practically anything, e.g. for:

- interest and engagement

- attendance or participation

- membership

- knowledge or dispositions

- formal certification (degrees, certificates)

- learning, achievement of skill or competency on various levels of proficiency...

- affiliation

- project-complete

- credential

There have been a few attempts to provide a taxonomy of Open Badges, e. g. Digital Badges / Open Badges Taxonomy by Buchem (2015)[13] or a taxonomy of Open Badges for City & Guilds by Belshaw (2015)[14]. The type of badge clearly matters for how the badge is used in a later stage by the earner. The type of badge clearly matters for how the badge is used in a later stage by the earner. Some types of Open Badges may enhance a position of show-casing or even "showing off" in peer communities, while other types of Open Badges can be more suitable for job applications.

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[11] http://www.ecomscotland.com/products-services/enetbadges.aspx

[12] https://www.w3.org/2016/04/blockchain-workshop/interest/lemoie.html

[13] https://ibuchem.wordpress.com/2015/02/28/digital-badges-open-badges-taxonomy/

[14] http://dougbelshaw.com/blog/2015/05/20/badge-taxonomy/

In this way, the type of an Open Badge influences its value at the institutional, social, generic, personal and consumer levels . Some types of Open Badges really deserve (and need) other value increasing elements, like a explicit description of the learning outcomes achieved, and the type of assessment that was done to validate that. And some badges do not need such things.

Badge size

As Open Badges can serve multiple purposes, also the "size" of a badge may differ: "small" badges (e. g. badges recognising a fine-grained skill, a small portion of knowledge or participation in an event) can be designed to act as motivator and supply formative feedback. Small badges can be stacked in a predefined way, which defines which steps are necessary to earn a larger, more valuable or high-stake badge, e. g. that is more suitable for the use in a job application. To support this, pathways for earning small badges leading to a larger badge may be defined and supported by a badging system. For example, the badging system Badgr, launched its Open Pathways features in 2016[15] to enable organising educational goals in form of a comprehensive structure and to map goals or stages of learning with Open Badges.

Assessment type

One of the key factors affecting the value of an Open Badge is the type of assessment. There is a perceived difference in value of Open Badges which recognise outcomes or achievements but are not based on assessment, e. g. badges certifying participation in an event, and those which require more effort to achieve a badge and are issued based on transparent assessment procedures, e. g. knowledge test or work samples. This makes Open Badges to an adaptable and flexible system which can be used to link recognition of skills with assessment of skills in one data-package . Requirements or criteria for receiving a digital badge may also vary depending on the issuer and/or on what type of outcomes or achievements. Open Badge Infrastructure does not offer out of the box solutions for this: Organisations have to choose and decide themselves under which conditions a badge can be earned, which criteria are relevant and necessary and what assessment method are adequate. This can be seen as a virtue of not forcing the issuing organisation to a narrow, predefined framework which may not suit individual needs. Clearly, the description of criteria, assessment and evidence has a great influence on the perception of the value of the badge by the audience (consumer value). The following types of assessment are possibly some of the key forms for issuing Open Badges:

- Self assessment
  Based on performing a (self) test by learners, reflecting on their own performance, rubrics are often used

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[15] https://concentricsky.com/articles/detail/open-pathways-connect-badges-to-what-you-care-about

- Peer assessment
  Comparable with self assessment, but students assess each other, 360-degrees feedback is also an example

- Formative assessment
  Formal and informal assessment procedures conducted during the learning process in order to modify teaching and learning activities to improve student attainment. Involves qualitative feedback (rather than scores) for both student and teacher that focuses on the details of content and performance

- Summative assessment
  The goal of summative assessment is to evaluate student learning at the end of an instructional unit by comparing it against some standard or benchmark.

Evidence
Evidence used within one of the assessment methods above, linked from the badge, can increase the transparency of the process and thus increase the value of this badge.

Standardisation
Standardisation will possibly lead to more recognisable or high-quality badges (see research results in the Discussion Paper O5-A1). Or the other way around: the lack of standardisation (in the extreme: every issued open badge is unique) will lead to the need to study every badge to understand it completely. That might fit many environments, but is not helpful for some contexts such as the labour market.
So for some uses of Open Badges a set of predefined standards would be of value, especially establishing a set of standards , shared with other organisations. Setting up a good badge system (graphics, description of learning outcomes, criteria, evidence type, assessment methods etc.) is not a 5 minute job - an established set of flexible/adjustable standards could help issuers build a high-quality badge system. Adopting another organisation's badge system would then become even easier.

3.1.2 Privacy and risk

Privacy
Badges are essentially open and free, but unlike "free services" such as Gmail or Facebook, there is no multinational organisation behind it, gathering all kinds of personal data for commercial purposes. The drawback is that there is no corresponding marketing budget either. Third party software might gather data (and ask for fees, for delivering additional functionality to the Open Badge Infrastructure), so the data privacy policy of third-party badging systems/providers should

be always checked. For an overview of bading systems/providers please refer to the Open Badge Network Output 1 related to the Open Badges Framework (O1-A1):
http://www.openbadgenetwork.com/outputs/obn-framework-and-leadership

In fact there is only little personal data related to the earner contained in an Open Badge. At this moment e-mail is normally used as an identifier of an earner, and most often, even this information is obscured (hashed). From the version 2.0 of the Open Badges specification on, also telephone number or website url of the earner can also be used as an identifier.

Moreover, Mozilla Backpack, the standard user hub for earners administration of earned Open Badges, has quite strict privacy[16] rules. As mentioned above, if third party software is used to issue and/or store Open Badges, the privacy policy of the provider has to be checked on an individual basis, e.g. the Badgr Privacy Policy defines the information collected by the providers and describes how this information is collected[17]. Current practice amongst the providers proves that the providers of badging systems respect privacy of users and badge earners and comply with standards regulations. Within these Open Badge backpacks/eportfolios, there is a default privacy setting: the badge earner is the owner, and he or she is the only person that is allowed to see or work with the badge. Also, the badge owner decides how and when the badge is shared through social media, or sent to an HR-department within his digital CV. The badge owner can decide to make one or more badges publicly visible. Some eportfolio platforms have social media functionality. This brings the possibility to make a badge available only to a certain group, like his classmates, or maybe to a defined teacher o guidance counsellor.

Risks

Even if an issuer did their very best to create and issue high-quality badges of real value and complying with privacy regulations, the largest risk might be that the Open Badges are still not recognised as credentials by other organisations. In many countries and in many organisations the concept of digital credentialing with Open Badges is still new and unknown. The Open Badge Network created a report about the use of Open badges "Use Cases" (O2-A1)[18]
However, the problem lies not only in the adoption of Open Badges in general, but also in the proper communication of the rational and the implementation of own Open Badges to the key stakeholders. This issue is addressed by the Open Badge Network report titled "Guidelines for Open Badges in Territories (O4-A3)[19], authored by DigitalMe, one of the OBN partners, and one of the most prominent Open Badge advocates in the UK.

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[16] https://backpack.openbadges.org/privacy.html
[17] https://info.badgr.io/privacy-policy.html
[18] http://www.openbadgenetwork.com/wp-content/uploads/2016/01/Use-Cases_for_OBN_portal.pdf
[19] www.openbadgenetwork.com/wp-content/uploads/2016/01/O4A3_GuidelinesforOpenBadgesinTerritories_Digitalme.pdf

Another risk is that the badge earners do not understand the value or the concept of Open Badges . Open Badges are a new development and a new technology, which can be used to help individuals to "stand out from the crowd", but individuals may not understand and experience value of badges unless they have a chance to use them (most commonly for job hunting). Also in this case the communication about the value of Open Badges to individuals becomes crucial.

As soon as digital credentialing becomes a mainstream procedure and Open Badges and similar credentialing technologies become widely popular, one can expect large numbers of digital credentials of different types. The same development occurred with e-mail systems. We can even expect "spam-badges". There is nothing that can prevent that development - in the end, badges are "open" in the sense that the technology can be used, adapted, modified and extended by anyone. With e-mail systems, we can now rely upon spam boxes and virus scanners for minimising risks. In the future we might need the same kind of tools within the digital credentialing/Open Badge ecosystem. Some badging systems and badge backpacks already offer the possibility to group badges into sub-collections, which are comparable with the different e-mail folders which help to keep e-mails sorted. One of such initiatives is Badge Rank[20], a community where issuers can showcase the badges they issue, and where Open Badges can be endorsed by the community. In this way, Badge Rank helps users discover popular badge issuers and find out more about what badges are available and where.

3.1.3 Internationalisation

Open Badges originate from the USA and at the beginning Open Badges were only available in English. Currently, the technology is used around the world and there are Open Badges issued in many different languages., Due to the global use of Open Badges, internationalisation and localisation of Open Badges becomes crucial to enable badges issued in one language (and possibly in one culture) can be understood in another language (and culture). Cultural localisation of Open Badges has also become an important topic. An example of cultural localisation is given in the presentation by Buchem (2015) titled "Cultural Localisation of Open Badges"[21].
Since the version 2.0 of the Open Badges Specification additional features are available to issuers and platforms to use Open Badges in more than one language. Also multiple equivalent versions of the same Open Badge are made possible. This is a very good development because the localisation/language feature is a necessary precondition for adaptation of Open Badges within multilingual EU-tools. The language feature of the Open Badge Specification 2.0 is yet to be adapted by the badging systems

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[20] https://www.badgerank.org/
[21] https://www.slideshare.net/ibuchem/cultural-localisation-of-open-badges

Additional to that, there is a concept of linking Open Badges to external (multilingual) reference frameworks, such as multilingual occupational and competency frameworks such as ESCO[22], and opening the possibility to compare different Open Badges, from different countries (see section 3.2.1 in this paper).

> *Side remark In the paragraphs above, we have tried to respond to many good questions that arise when organisations consider the implementation of Open Badges. Many of these questions should have been covered in the past also, during implementation projects of paper credentials systems.*

3.2 Technical aspects explained to non-technical persons

This section provides some information about the technical aspects of Open Badges, described in non-technical terms as much as possible. These aspects might influence your choices on how your organisation might implement Open Badges, especially if you plan to issue "high stake" badges.

3.2.1 Technical operability and semantic operability

The sections above touched upon the importance of describing competencies and formulating criteria for issuing Open Badges. When the aim and ambition of the issuer is to increase the value of the badge by creating standardised and recognisable Open Badges of high-quality, the use of competency categories and descriptions originating from a recognised competency standard (international, national or sectoral) is important for enhancing the value of the Open Badge system at the institutional, individual, social, generic and consumer value (see also the description of value types at the beginning of this paper). The sections below introduce the Open Badge Standard 2.0 and the possibility to reference competencies in Open Badges to Competency Frameworks such as ESCO or EQF.

Open Badge Standard 2.0 - technical interoperability
Since 2016, the Open Badges community has been actively working toward the release of Open Badges 2.0, the most significant upgrade to the specification since its release. This upgrade will make possible dozens of high-priority use cases that were identified by key stakeholders. IMS Global Learning Consortium, the world's leading open standards consortium for education technology, in partnership with Mozilla Foundation and Collective Shift/LRNG, has agreed to become the organization responsible for managing the effort to advance the development, transferability and market adoption of the Open Badges specification and community effective

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[22] https://ec.europa.eu/esco/portal/home

January 1, 2017. This work will take place under a licence granted by Mozilla. The work of the Badge Alliance Standard Working Group will be taken up by a new working group within IMS. In addition, all existing efforts of Badge Alliance will also transition to IMS. (Lewis, 2017,Open badge Infrastructure[23])

Reference to Competency Frameworks - semantic interoperability

Open Badges are digital, and can be "read" by computers. However, if you describe competencies in plain languages, and two people describe the same competencies in different words, it is hard for a computer to understand that the same thing is meant. This issue becomes worse when competencies are expressed in different languages.

Comparing competencies automatically, e.g. finding potentially matching cv's for a job vacancy, would need competency frameworks being made available in a decentralized way (e.g. on the internet), in a certain standardized semantic vocabulary.

ESCO is developing in this direction, but until now, as the only one.

> *ESCO is a multilingual classification system for European skills, competences, qualifications and occupations. By providing a common reference terminology, ESCO can enhance the way the labour market functions, help to build an integrated labour market across Europe and help to bridge the communication gap between the world of work and the world of education and training.* European Commission (2017) ESCO Strategic Framework [24]

After years of preparation, ESCO version 1.0 is published and operational.[25]

Other frameworks could develop in this direction, after being supplied with a digital taxonomy.

Having such vocabularies used and expressed in a machine readable format, would allow issuers to search competencies which are formulated in standardized competency frameworks, and document them in a badge. This allows expression of competencies in badges in human readable form, as well as in machine readable form.

In Open Badge Network Outputs related to the Open Badges Infrastructure, *Johannes Konert* describes a specification for the Open Badge Infrastructure, developed in cooperation with the international Open Badges community in "Competency Repository (O2-A3)"[26]. This specification is included in the latest Open Badge definition (2.0). The overall goal is to allow "machine readable" detection of similarity of defined badges in terms of competencies.

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[23] http://www.openbadgenetwork.com/wp-content/uploads/2017/09/O2A2_Infrastructure_Digitalme.pdf

[24] https://ec.europa.eu/esco/portal/document/en/01192a20-a7c0-4d0d-b5d3-29d1f9b819c8

[25] https://ec.europa.eu/esco/portal/howtouse

[26] http://www.openbadgenetwork.com/wp-content/uploads/2017/08/OBNO2-A3__CompetencyAlignmentAndDirectory__final_v1.2.pdf.

3.2.2 Validation and verification of an Open Badge

To understand how the validation and verification of Open Badges (3.2.2.3) works, it is necessary to have knowledge about the data structure of an Open Badge (3.2.2.1), and the way they are constructed (3.2.2.2).

3.2.2.1 Badge data structure

An Open Badge always contains the following three groups of data: an assertion, a badge-class and a profile. An Open Badge may also contains additional data, as long as that follows the "grammar" of the Open Badge specification, preferably in the form of an Extension. More detailed information about the data structure can be found at the Open Badges v2.0 specification draft[27] and the changes in version 2.0 can be found under Open Badges Specification Version 1.1[28]. Extensions are community developed contributions and not part of the core specification. One of the current Extensions are the Open Badges for Education Extensions (OBEE)[29]. OBEE includes two Extensions:

1. The Issuer Accreditation extension - provide a reference to a single or multiple accreditation bodies that certifies the badge issuer.
2. The Assessment extension - provides information about single or multiple assessments that are required as part of the badge issuance process.

Badge-class
A collection of information (or reference to this information), about the accomplishment recognised by the Open Badge. It is in fact the **description of the badge**. Next to necessary technical identifying information: (1) It always contains the name, issuer-profile, description, criteria and image, and (2) It may contain tags and alignment (the educational standards this badge aligns to).

Assertions
An assertion is the **administration of an awarded badge**, used to share information about a badge belonging to one earner. It might be seen as one line in an Open Badge "Ledger". Many assertions may be created for one badge-class. Next to necessary technical identifying information:

● It always contains a reference to the badge-class

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[27] https://www.imsglobal.org/sites/default/files/Badges/OBv2p0/index.html
[28] https://www.imsglobal.org/sites/default/files/Badges/OBv2p0/history/1.1.html
[29] https://www.imsglobal.org/initiative/enabling-better-digital-credentialing

- It always contains the identity of the badge earner (usually the email address), issuing date and verification instruction
- It may contain: evidence, narrative, expiration date, revocation, revocation reason and image (when the badge is to be baked, see further)

Profile

A Profile normally describes the **issuing organisation or entity** (required, but also can describe endorsers or recipients). Each Profile that represents an Issuer may be referenced in many Badge-classes that it has defined. An Issuer Profile is a subclass of the general Profile with some additional requirements. Next to necessary technical identifying information:

- It always contain the name of the issuer, endorser
- It may contain the description, url of its website, image, telephone, email, verification info, revocation list

3.2.2.2 Types of badge construction

As explained in the paragraph above, assertions are the representations of an awarded badge. They describe:

- who a badge was awarded to
- what that badge represents
- who issued the badge

They are used to verify the validity of an Open Badge, they are the "source of truth". There are two ways in which assertions can be registered: hosted and signed.

Hosted

A hosted assertion is a file containing the assertion-data, stored at a safe and stable space under control of the issuing organisation. As long as this data is available over the internet, the issued badge can be verified.

Signed

The assertion can also be encrypted, and stored within the badge data. So the verification can be executed "internally" without the need of hosting the assertion.
For more (really technical) information, see the Baking Specification[30]

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[30] http://www.imsglobal.org/Badges/OBv2p0/baking/index.html

3.2.2.3 Validation and verification

Issuing Open Badges is one part of the Open Badges Infrastructure, yet another one is displaying Open Badges. To display Open Badges, software "understanding" the Open Badges Specification has to be in place. The OB compliant software is then able to process and use all the data contained in the Open Badge. An important function of this agnostic software is to validate the badge. Backpacks and eportfolios like Mozilla Backpack or Open Badge Passport are able to perform the validation of displayed badges.

Building own software for badge displaying, must take care of the validation. For this, an Open Badges validator tool is available and can be integrated into the new software[31].

Open Badges validation ensures a number of checks which have to be passed, amongst others :

- Validation of the correct structure of the three different badge objects, including a correct relationships between them. (e.g. pointing to an existing badge issuer, etc.),

- Validation that the badge is really issued by the described Issuer, and that this issuer really issues this type of badges,

- Validation that the badge is awarded to the email address of the badge earner; the reader/consumer of the badge should check himself if the email address (until now, the usual identifier) belongs to the person presenting the badge,

- Validation of the identity of the issuing organisation: Open Badges contain profile information about the Issuer who awarded the credential, including contact information if additional questions arise. The relevant information should be present,

- Validation of cryptographic elements: for instance baked badges contain a cryptographic signature, these signatures are validated (using the Issuer profile) to be sure the badge is not tampered with,

- Validation that the badge is not expired: an Open Badges may have an expiration date, allowing for organisations to accompany an issued badge with a time frame in which the stated skills, competences or knowledge has to be re-evaluated. (E.g. a First Aid course),

- Validation that the assertion has not been revoked by the issuer. (For hosted badges, this is registered in the hosted assertion. To be able to revoke a signed badge, it is necessary for the issuer to host a revocation list)

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[31] https://github.com/mozilla/openbadges-backpack/wiki/Verifying-Badges-for-Display#verification-steps

3.2.3 Life span of Open Badges

Open Badges normally are stored within user hubs such as Badge Backpack[32] or Open Badge Passport[33]. Different options are available, from different providers, commercial and non commercial. If a provider discontinues the backpack service, the badges within this backpack are no longer available.

Also when an issuer stops hosting data that is referenced by a badge (some data is also needed for signed badges), validation of that badge becomes impossible.

Depending on the badge that is no longer functioning, the effect of this varies from annoying to disastrous (for "high stake" badges).

This leads to a conclusion: badge issuing platforms have the responsibility to take care of long term availability of Open Badges. Some technical possibilities are given by *Kerrie Lemoie* in **Open Badges for Keeps - Now and Near.[34]**, like hosting badge data on a cheap server (so criteria and evidence can be stored for the long term. When making use of a commercial badge issuing platform, this issue might be covered within a service level agreement.

A promising development is Blockchain. Blockchain is a distributed database on which one can put encrypted data, that can not be tampered with, and "can not get lost". It is a digital "ledger" and also the technical basis for bitcoin. Open Badges data could be stored on the Blockchain. In the article "The Opportunity Space for Open Badges + Blockchain"[35], Kerri Lemoie introduces the concept of the BadgeChain, which links Open Badges and Blockchain technologies:

> "One particular issue that we've been focusing on relates to long-term badge storage. The problem: in the existing implementation of Open Badges, issued badges become an artifact that must be hosted permanently. Currently, badges reside on the originating badge issuers' servers. If a badge is no longer hosted there, whether accidentally or intentionally, it becomes a potential liability to both the earner and the open badges ecosystem. Without the vital hosting reference links that confirm it, the badge can no longer be validated or verified. Consequently, the badge becomes orphaned and theoretically useless. Because blockchain acts as both a distribution and storage mechanism, that aspect of the technology alone immediately improves upon the verifiability and long-term storage of badges." (Lemoie, 2016).

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[32] https://backpack.openbadges.org/backpack/welcome
[33] https://openbadgepassport.com/
[34] https://medium.com/badge-chain/open-badges-for-keeps-now-and-near-1caa3a1478a8
[35] https://www.w3.org/2016/04/blockchain-workshop/interest/lemoie.html

3.2.4 Summary

In this chapter 3 we have covered the general aspects of Open Badges that we think matter most: The value of a badge has to be created, and depends on many factors. The risk of a badge which value is not seen by an employer that has never encountered an Open Badge before. The importance of multilinguality in world with lesser borders. Maybe to your own surprise you even found yourself reading about technical aspects, of importance to know how the origin of a badge can be trusted and for implementing badges that will need a more extended lifetime .

4. Specific approaches, guidelines and recommendations for relevant policy areas

After covering general aspects, this chapter focuses on larger areas. It describes how Open Badges could enhance and connect different European transparency tools, how Open Badges can be used in professional development and, last but not least: it especially focuses on the way Open Badges fit within Open Education.

4.1 EU Policies

In the Discussion Paper[36] (page 35 and further) we defined and discussed relevant EU policy areas. Here we try to relate EU instruments within these areas to the Open Badge Infrastructure, which and

4.1.1 Overarching policy frameworks

Lifelong learning
Unesco: "In order to be innovative and inclusive, learning and education strategies must recognize all places where learning takes place: at work, in the community, in the family, and in social and civic life".

The European Commission designed the Lifelong Learning Programme (LLP) to enable people, at any stage of their life, to take part in stimulating learning experiences, as well as developing education and training across Europe. The programme ran from 2007-2013 and funded a range of exchanges, study visits, and networking activities. From 2014 on, the program continued under the new umbrella name "Erasmus+", which contains several programs and projects.

Within the given ambitions, to enable people and recognize all kinds of learning, the Open Badge infrastructure fits excellently, being an open world standard and free of use.
Within the following paragraphs we will cover major programs under the "Lifelong Learning" umbrella in which Open Badges can be applied.

The latest EU policy framework adopted by the European Commission in 2016, is the "New Skills Agenda for Europe"
It aims to make sure that people develop the skills necessary for the jobs of today and tomorrow. This task is essential to boost employability, competitiveness and growth across the EU. It looks to

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[36] http://www.openbadgenetwork.com/wp-content/uploads/2016/01/OBN-O5-A1-Policy-Discussion-Paper-31-July-2016.pdf

reduce the number of Europeans lacking adequate reading, writing, numeracy and digital skills. At the same time, it seeks to help highly-qualified young people find work that suits their potential and aspirations, to make it easier for employers to recruit employees with the right profiles and to equip people with the skills and mindset to start their own businesses. The following ten actions are to be taken:

- A Skills Guarantee to help low-skilled adults acquire a minimum level of literacy, numeracy and digital skills and progress towards an upper secondary qualification.

- A review of the European Qualifications Framework for a better understanding of qualifications and to make better use of all available skills in the European labour market.

- The "Digital Skills and Jobs Coalition" bringing together Member States and education, employment and industry stakeholders to develop a large digital talent pool and ensure that individuals and the labour force in Europe are equipped with adequate digital skills.

- The 'Blueprint for Sectoral Cooperation on Skills' to improve skills intelligence and address skills shortages in specific economic sectors.

- A "Skills Profile Tool for Third Country Nationals" to support early identification and profiling of skills and qualifications of asylum seekers, refugees and other migrants.

- A revision of the Europass Framework, offering people better and easier-to-use tools to present their skills and get useful real-time information on skills needs and trends which can help with career and learning choices.

- Making Vocational Education and Training (VET) a first choice by enhancing opportunities for VET learners to undertake a work based learning experience and promoting greater visibility of good labour market outcomes of VET.

- A review of the Recommendation on Key Competences to help more people acquire the core set of skills necessary to work and live in the 21st century with a special focus on promoting entrepreneurial and innovation-oriented mindsets and skills.

- An initiative on graduate tracking to improve information on how graduates progress in the labour market.

- A proposal to further analyse and exchange best practices on effective ways to address brain drain.

Open Badge Network is convinced that Open Badges can play a key role to help achieve the targets set within these overarching policies.

At the moment of the publication of this white paper, a new Europass Decision is prepared by the European Commision. This new decision paves the way for a totally new landscape of tools, Open Badges included, for the recognition of learning in Europe.

4.1.2 European Qualifications Framework (EQF)

Qualifications are the formal outcome of an assessment and validation process by a competent authority and typically take the form of documents such as certificates or diplomas. They determine that an individual has achieved learning outcomes to given standards. Qualifications signal to employers what their holders in principle know and are able to do ('learning outcomes'). They may be a prerequisite for accessing certain regulated professions. They help to determine the level and content of learning acquired by an individual. They are also important for an individual as an expression of personal achievement. Therefore qualifications play an important role in raising employability, easing mobility and access to further education.

The European Qualifications Framework, EQF is designed to make national qualifications more transparent across Europe, promoting mobility between countries. The core of the framework consists of 8 qualifications levels described through learning outcomes (knowledge, skills and competence). National qualification frameworks are related to the EQF to better understand and compare the qualifications levels of different countries and different education and training systems. Since 2012, all new qualifications issued in Europe carry a reference to an appropriate EQF level [37].

Open Badges that refer to a completed qualification (so-called "high-stake badges") should refer to the EQF and preferably also to NQF (national qualification frameworks, for an example of a National Qualifications Framework see e.g. the German DQR[38].).
Designing a simple paragraph structure within the badge description would suffice. Such a paragraph might link to the description of relevant national qualification framework, plus the indication of the level of the qualification within this framework.

4.1.3 The European Inventory on validation of non-formal and informal learning

An important development in Europe has been the adoption of the Council Recommendation on the validation of non-formal and informal learning (December 2012). The Recommendation calls for Member States to put in place, by no later than 2018, arrangements to enable individuals to have their knowledge, skills and competences acquired via non formal and informal learning validated, and to be able to obtain a full qualification, or, where applicable, part qualification on the basis of validated non-formal and informal learning experiences. The Recommendation asks the Commission to support Member States and stakeholders, including by regularly reviewing the European Inventory on the validation of non-formal and informal learning, in cooperation with the

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[37] https://ec.europa.eu/ploteus/sites/eac-eqf/files/EQF-liensactifs-110318.pdf

[38] https://www.dqr.de/

Member States. This Inventory provides a record on how validation is being used at national, regional and local level in Europe. It is based on the work of a large network of national experts, extensive review of documents and interviews with key stakeholders. The Inventory reports point towards some challenges that need addressing (see https://cumulus.cedefop.europa.eu/files/vetelib/2014/87250.pdf).

Open badges, as being very suitable for use in non-formal and informal contexts, will play a very useful role here to address a number of the challenges.

4.1.4 European Skills/Competences, Qualifications and Occupations (ESCO)

ESCO is the multilingual classification of European Skills, Competences, Qualifications, and Occupations. It introduces a standard terminology in 25 European languages and categorizes skills, competences, qualifications and occupations relevant for the EU labour market and education and training; ESCO identifies and categorizes skills, competences, qualifications and occupations in a standard way, using standard terminology in all EU languages and an open format that can be used by third parties software. ESCO enables to match CVs and job vacancies, for instance within Eures (see further).

However still under development, ESCO might be an important instrument for standardising, because Open Badge designers (such as education or training institutions) are able to describe badge criteria alongside ESCO's skills and competences terminology, making them more transparent. Next to that, ESCO in combination with Open Badges would enhance the "internationalisation" by making use of competence descriptions in ESCO in different languages, thus making skills represented by Open Badges comparable and accessible in different countries and languages. As an example: in ESCO the transversal skill "Work as part of a team" is one of the defined skills, the German and Finnish and French translations are easily found: "Mit Anderen arbeiten", "Yhteistyötaidot", "Travailler en équipe".

Competency directory

In paragraph 3.2.1 we already referred to *Proposal on Competency Alignment and Directory,* Johannes Konert (2017)[39] From page 15 on, you can find a concept solution for an ESCO based repository, that can be used to align Open Badge criteria.

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[39] http://www.openbadgenetwork.com/wp-content/uploads/2017/08/OBNO2-A3__CompetencyAlignmentAndDirectory__final_v1.2.pdf.

4.1.5 Europass

Europass[40], an initiative of the European Commission, is a set of documents that can be used to document and show skills and competences. The European Commission's aim with the Europass is to simplify and promote labour mobility in Europe. It assumes that more mobility among the working population will aid economic and social development, a high level of employment and balanced and sustainable growth. Greater mobility will also allow the European economy, labour market and working population to react more flexibly and efficiently to the changing and increasingly globalised economy, which is characterised by strong competition.

The basis of the Europass is the CV which the user can supplement according to own needs with documents relating to language skills, international work placements and qualifications.

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[40] https://europass.cedefop.europa.eu/

Curriculum vitae

PERSONAL INFORMATION | Erik van den Broek

📍 (Netherlands)

✉ erik@

🌐 https://www.linkedin.com/in/erik

POSITION | Consultant for the Dutch National Europass Centre;

WORK EXPERIENCE

May 2005–Present | **Consultant**
National Europass Centre Netherlands

Dec 2004–Present | **Owner**

IT Consultancy
Web applications

The Europass CV is a European standard model CV that people can use when looking for a job or work placement in the European Union. The Europass is used throughout Europe so it is available in all European languages which makes it ideal for international applications.

And few would argue that Europass is a European Commission success story, over 60 million Europass CVs have been created and it is one of the European Commission's best known brands. However, there is a problem with Europass….

The "Europass Decision" is from 2005, so it is now 12 years old and some of the Europass documents even precede that Europass Decision. Except for cosmetic changes, Europass remained the same, in a very document and paper oriented way.

In the meanwhile, labour markets, education systems, ways of learning and the underpinning technology has changed enormously. Digitisation has revolutionised the way information and data is used, and Europass must change to prevent becoming obsolete.

A "Europass Innovation Paper[41]" that was published in 2016, envisages that Europass should develop from the paper world where it in most cases still is now, into an online service that contains all sorts of information about the user's skills, qualifications, working experience and more. When that information is verified, like Open Badges are, it will also be of far more value for employers, when used to apply for a job.

> *Dutch research,* Career Builder (2008)[42] *shows that about half of CVs used in job applications contain lesser or larger untruths. LinkedIn nickname is "the Portfolio of Lies". Not surprisingly is that pre-employment screening is becoming booming business in some European countries. (reference)*

The first important step within the Europass eportfolio should be that this environment is also able to host Open Badges, from any source (and of course making sure those are properly validated). In this way a European Backpack would arise.

Second step would be to be to transform existing Europass documents from paper to the Open Badge format:

- Europass Mobility is a record of an organised period that the candidate has spent for the purpose of learning or work. This might be a work placement or period of practical vocational training in a company, an academic semester as part of an exchange programme or a work placement in a non-profit organisation. Instead of this paper document, the organisers of these periods can "badge" their learning programmes.
- Europass Language Passport is a collection of statements about the learners' language competencies, bases on the COMMON EUROPEAN FRAMEWORK OF REFERENCE FOR LANGUAGES[43] , again on paper and non-interoperable. Also excellently badgeable, on the different proficiency levels A1 to C2.
- The Europass Qualification Supplements (Certificate supplement for VET, Diploma supplement for HE) are also excellent examples of documents that would be very effective when issued as a badge. *The Diploma Supplement is a document accompanying a higher*

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[41] https://www.scribd.com/document/358799703/Europass-2020-Innovation-Paper

[42] http://agconnect.nl/artikel/bijna-helft-werkgevers-treft-leugens-in-cv-aan

[43] https://www.coe.int/t/dg4/linguistic/source/framework_en.pdf

education diploma, providing a standardised description of the nature, level, context, content and status of the studies completed by its holder. It is produced by the higher education institutions according to standards agreed by the European Commission, the Council of Europe and UNESCO. Bologna Follow Up Group (1999)

4.1.6 How Open Badges can become the linking pin between Europass, EQF, ESCO and many other EU Tools

In the area of EU transparency instruments, Open Badges are still relatively unknown, but these instruments could profit from them enormously. The other way around, O.pen Badges will get a tremendous boost, when for instance they get adopted by the EU

As mentioned above, the originally paper documents form the Europass portfolio, could very well be issued as an Open Badge. For instance by a European "Badge Issuing Environment". Such an environment can be built around EU standards on competences and learning outcomes, like ESCO or agreements reached within ECVET.

In a broader policy perspective, such an environment delivers enormous amounts of interesting and verified "Big Data" on skills and qualifications. In the survey we conducted among policy officers, on the question "What statistical data collected with Open Badges would be of interest?", more than 90% responded with "Data related to the types of competencies recognised with Open Badges".

Such data can be utilised to inform policy makers, to anticipate skills needs, to identify regional skills gaps, to match skills to jobs and provide education and labour market intelligence.

Of course, privacy must be ensured, and the data in such a collection must be "depersonalised", so it can not be related to a person.

The inclusion of ESCO skill descriptions in Open Badges may be one of the most powerful instruments for making 21st century skills accessible and visible in Europe and beyond. Both ESCO and Open Badges follow a skill-centered approach. While ESCO's vision is to provide a common "language" of skills, the vision of Open Badges is to provide a common instrument for representing skills in a digital, interoperable format.

EURES

EURES is the European Employment Service. It aims to facilitate the free movement of workers within the countries of the European Economic Area. Partners in the network include public employment services, trade unions and employer organisations.

EURES has a cloud based service, designed as a platform where job seekers and employers can find each other.

Interoperability between Europass and the EURES-platform looks like a logical path to take.

> *"Ultimately, the learner decides how his or her data (in this case a badge) to help potential employers to bring together relevant information about a prospective employee through search results and social media profiles" (Grant, 2014)*

ECVET
ECVET is intended to facilitate the recognition of learning outcomes for the purpose of achieving a qualification. It makes use of a *Memorandum of Understanding* as well as a so called *Learning Agreement*. Focus of ECVET is, next to geographical mobility, on flexible and individual pathways. Open badges are really very well suited for designing pathways. And also for modularisation of education.
ECVETs connection with Europass, and especially Europass Mobility, is evident. The Memorandum of Understanding as well as the Learning Agreement (LA) currently used by ECVET could be incorporated into a new database for Europass Mobility. Europass Mobility (implemented as Open badges) could be used to record ECVET, thus strengthening both services and increasing their visibility.

Youthpass
Youthpass[44] is about recognition, it is a program for non-formal and informal learning in youth projects. It is available for projects funded by Erasmus+ and Youth in Action programmes. It also has an accompanying document, and it could be modernised in a similar way as described for the Europass Mobility (above). When the "Youthpass" product would be issued as an Open Badge instead as a paper document, it seems logical to do such with the same infrastructure as would be needed for the issuance of Europass Badges. Might we set our hopes high for a "European Badge Factory"?

European Skills Panorama

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[44] https://www.youthpass.eu/en/

The European Skills Panorama[45] helps regular monitoring of skills anticipation and skills assessment at the national and European level. It is a central access point providing data, information and intelligence on skills trends in occupations and sectors at the national and EU level. The Skills Panorama can benefit from "Big Data" of Open Badges, regional statistics on skills and skill gaps that might originate from a central European tool.

EHEA

EHEA, led by the Bologna Follow Up Group supports the Bologna Process since 18 years.
The European Higher Education Area (EHEA) is the result of the political will of 48 countries which, step by step during the last eighteen years, built an area using common tools. These 48 countries implement reforms on higher education on the basis of common key values – such as freedom of expression, autonomy for institutions, independent students unions, academic freedom, free movement of students and staff. Through this process, countries, institutions and stakeholders of the European area continuously adapt their higher education systems making them more compatible and strengthening their quality assurance mechanisms. For all these countries, the main goal is to increase staff and students' mobility and to facilitate employability.[46]
One of the outcomes of the Bologna process is the so called "Diploma Supplement", *The Diploma Supplement is a document accompanying a higher education diploma, providing a standardised description of the nature, level, context, content and status of the studies completed by its holder. It is produced by the higher education institutions according to standards agreed by the European Commission, the Council of Europe and UNESCO.* Bologna Follow Up Group (1999)
It now is also a document in the Europass portfolio). The Diploma Supplement might be seen as a paper predecessor of an Open Badge, as it does exactly the same, and a perfect candidate to be "badged".
In the Netherlands, a pilot around modularisation in Higher Education has started. Study units of one semester can be followed at another institution and rewarded with a badge, mutual recognition will be arranged .This opens also possibilities for employees who are discouraged to complete a Bachelor degree, but are interested in doing this one course. A nice and practical example of micro-credentialing and of Open Badges as "the new currency for learning".

4.2 Open Education

Open Education (OE) has been inspired by the open source 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

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[45] http://skillspanorama.cedefop.europa.eu/en

[46] https://www.ehea.info/

education and research" (Baraniuk, 2013, p. 229). Open Education as a relevant policy area for Open Badges has been discussed in the Open Badge Network Discussion Paper on Open Badges at Policy Levels (O5-A1), see chapter 4.3 Open Education, page 49 ff[47].

Building on the inclusive definition and vision of Open Education proposed by the Cape Town Open Education Declaration[48], the OBN Discussion Paper (O5-A1) called the attention to the fact that Open Badges are a technology and concept inherent and critical to the Open Education and should be considered in current discussions about Open Education (Buchem et. al, 2016, p. 50).

Following the recommendations of OECD (2017) for supporting OER projects, the OBN Discussion Paper (O5-A1) argues that:

- Open Badges *expand access to learning* for everyone but most of all for nontraditional groups of students and thus widen participation in formal education.
- Open Badges can be an efficient way to *promote lifelong learning* for both the individual and the government.
- Open Badges can *bridge the gap* between non-formal, informal and formal learning.

Also, following the The key recommendations of the 2012 Paris OER Declaration[49] the OBN Discussion Paper (O5-A1) argues that the following policies and activities are crucial to mainstream Open Badges (similar to mainstreaming Open Educational Resources):

- Fostering awareness and use of Open Badges,
- Reinforcing the development of strategies and policies on Open Badges,
- Supporting capacity building for the sustainable development of Open Badges quality,
- Fostering strategic alliances of Open Badges,
- Encouraging the development and adaptation of Open Badges in diverse languages and cultural contexts,
- Encouraging research on Open Badges,
- Facilitate finding, retrieving and sharing of Open Badges.

Furthermore, following the memorandum of the Accreditation Organisation of the Netherlands and Flanders (NVAO) on the formal recognition of online learning, including MOOCs, in higher education, the OBN Discussion Paper (O5-A1) argues that Open Badges are a helpful technology for issuing digital MOOC certificates as Open Badges enable to:

- clearly state on whose authority the MOOC certificate was issued,

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[47] http://www.openbadgenetwork.com/wp-content/uploads/2016/01/OBN-O5-A1-Policy-Discussion-Paper-31-July-2016.pdf

[48] http://www.capetowndeclaration.org/

[49] http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/Events/English_Paris_OER_Declaration.pdf

- provide information on the content, level and study load, states that the holder has achieved the desired learning objectives,
- provides information on the testing methods employed and lists the credits obtained, according to a standard international system or in some other acceptable format;
- is demonstrably based on authentication;
- states that the examinations have been administered under supervision and specifies the nature of this supervision. (see criteria for MOOC certificates defined by NVAO, 2014, p.9)

Based on the first analysis of current Open Education Policies, the OBN Discussion Paper (O5-A1) comes to the conclusion that Open Badges are a crucial part of the Open Education ecosystem:

- Open Badges enhance new Open Educational Practices (OEP) related to recognition of learning both in the process (formative) and at the end of a process (summative).
- Open Badges, in their function as open digital credentials, contribute to enhanced motivation, better orientation and unlocking of new opportunities once they are shared freely on the web.
- Open Badges, similar to OER, have built in mechanisms for using open licenses such as Creative Commons licences, which enable sharing and using of digital content.

Since Open Education emerged as one of the key policy areas from the research and consultations conducted as part of the OBN Discussion Paper (O5-A1), the links of Open Badges to Open Education as a policy area have been deepened in the second cycle of policy-related activities in the Open Badge Network project (see: Output 5)[50]. One of the key activities included consultation and discussions with Open Education experts (e.g. stakeholders active in promoting Open Educational Resources) and representatives of policy-makers (e .g. the European Commission's science and knowledge service and European Commission's Directorate General for Education and Culture, DG EAC). One of the key inputs on this topic was provided by Dr. Andreia Inamorato dos Santos, European Commission, DG Joint Research Centre (JRC) in her presentation dedicated to Open Badges and Open Education as part of the Open Badge Network MOOC, Session 3[51]. The recording of this webinar can be accessed here: http://www.openbadgenetwork.com/mooc/mooc-webinar-recordings/ > Session 3 > D2 Activity: Webinar[52].

Some of the three key points discussed by Dr. Andreia Inamorato dos Santos in relation to Open Badges and Open Education are:

1) 10 dimensions of Open Education and the relevance for Open Badges

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[50] http://www.openbadgenetwork.com/outputs/policy-levels/

[51] http://www.openbadgenetwork.com/course/session-3/

[52] https://eden-online.adobeconnect.com/pxm8rqsrha26/

2) Open Credentials and the results of the current research

3) Open Education Policies for recognition of Open Learning

10 dimensions of contemporary Open Education and the relevance for Open Badges:

The key 10 dimensions of open education are listed and defined in a model published in the European Commission JRC Science for Policy Report titled "Opening up Education: A Support Framework for Higher Education Institutions."[53] The report supports the Communication "Opening up Education: Innovative Teaching and Learning for All through New Technologies and Open Educational Resources"[54], launched by the European Commission in 2013. The OpenEdu framework also contributes to the 2016 Communication "A New Skills Agenda for Europe – Working Together to Strengthen Human Capital, Employability and Competitiveness"[55] and as such emphasised that lifelong learning via open education is a route for enhancing employability. The goal of the model is to promote transparency for collaboration and exchange of open education practices in higher education, incite change and innovation, and ensure appropriate policies and practices.

The JRC report proposed a broad definition of Open Education which is inclusive for Open Badges:

> *"Open education is an umbrella term, under which different understandings of open education can be accommodated. In Europe, and particularly in higher education, opening up education does not refer specifically to the opening up of educational materials under an open license. It does not only mean the availability of open access research in repositories either, but these two can and should be included in the broader concept of open education."* (JRC, 2016, p. 7)

In fact, the report explicitly mentions certification as part of Open Education:

> *"Through open education each and every individual, at every stage in their lives and career development, can have appropriate and meaningful educational opportunities available to them. These include access to content, courses, support, assessment and **certification** in ways that are flexible, and accommodate diverse needs."* (JRC, 2016, p. 7)

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[53] http://publications.jrc.ec.europa.eu/repository/bitstream/JRC101436/jrc101436.pdf

[54] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52013DC0654

[55] http://ec.europa.eu/social/main.jsp?catId=1223&langId=en

The OpenEdu framework for higher education presented in the JRC report includes 10 dimensions for opening up education, with each dimension being interrelated with all the other dimensions:

"The 10 dimensions of the framework are divided into two categories: core dimensions and transversal dimensions. There are 6 core dimensions (access, content, pedagogy, recognition, collaboration and research) and 4 transversal dimensions (strategy, technology, quality and leadership). All dimensions are interrelated; the core dimensions are not more important than the transversal ones. Core dimensions represent the 'what' of open education and transversal dimensions indicate `how' to achieve it." (JRC, 2016, p. 9)

Figure: 10 dimensions of Open Education (JRC, 2016)[56]

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[56] http://publications.jrc.ec.europa.eu/repository/bitstream/JRC101436/jrc101436.pdf

This holistic framework for opening up education with 10 dimensions also includes the "recognition" dimension which strongly corresponds to digital credentials such as the ones created using Open Badges. The definition of the recognition dimension explicitly mentions badges as an instrument for recognition in open education:

> *"Recognition in open education has two meanings: a) it is the process, usually carried out by an accredited institution, of issuing a certificate, diploma or title which has formal value; b) it is also the process of formally acknowledging and accepting credentials, such as a* **badge***, a certificate, a diploma or title issued by a third-party institution. These credentials should attest that a set of learning outcomes (e.g. knowledge, know-how, skills and/or competences) achieved by an individual has been assessed by a competent body against a predefined standard".* (JRC, 2016, p. 28)

The report emphasised the important role of credentials for the recognition of open learning, which can be done in a variety formal or informal ways and sets out a quality standard for credentials including digital credentials such as Open Badges:

> *"When submitting their credentials for recognition, learners expect to gain valid credits which will help them to move ahead professionally and in their personal lives".* (JRC, 2016, p. 28)

In relation to the transversal dimensions of open education, which cover 'how' educational practices are opened up, digital credentials, including Open Badges, can be looked at from the perspective of a *strategy* (in the sense of the creation of a unique and valuable position on openness, involving different sets of activities), *technology* (in the sense of technological infrastructures and software), *quality* (in terms of 5 concepts of quality: efficacy, impact, availability, accuracy and excellence) and *leadership* (in terms of the promotion of sustainable open education activities and initiatives via a transparent approach and creating more openness by inspiring and empowering people). These four transversal dimensions offer a relevant framework of reference for a systematic and holistic design of Open Badges.

Open Credentials and the results of the current research

Open Credentials or OpenCred is part of the OpenEdu Framework and is covered by the JRC Science for Policy Report titled "Validation of Non-formal MOOC-based Learning An Analysis of Assessment and Recognition Practices in Europe (OpenCred)."[57] OpenCred is a qualitative study based on in-depth interviews and desk research providing an analysis of current practices for the

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[57] http://publications.jrc.ec.europa.eu/repository/bitstream/JRC96968/lfna27660enn.pdf

assessment and recognition of non-formal learning via MOOCs. the report presents examples of how recognition is dealt with in formal higher education and continuing professional development.

Some of the examples presented in the report and related to the use of Open Badges include:

- France Université Numérique (FUN)[58]: MOOC providers on the platform are advised to issue digital badges, mainly as a way of encouraging participation, and to introduce an element of gamification to increase learners' motivation. Badges can be awarded automatically for completing tasks and so can act as a gradual record of completion, rather than a statement of learning outcomes achieved.

- The French MOOC platform Unow[59]: provided over 65,000 awards for learning since its inception in 2012. Learning outcomes are credentialed through both certificates of completion and Canvabadges[60], i. e. badges created within the Canvas Learning Management System in collaboration with Mozilla Open Badges.

- The Institute of Informatics at the University of Tallinn in Estonia: in an open course on preparing digital training materials badges were created through the Mozilla Open Badging system . The course instructor designed a badge system connecting the seven learning outcomes of the course and eight assignments were connected to 15 possible badges.

- The Swedish Digitala Skollyftet[61]: Open Badges were used in a MOOC for school teachers, librarians and school leaders to share good practice – a "Digital School Initiative Badge" was awarded on completion of the course to participants who made sufficient contributions to the community.

- The Open University in the UK - OpenLearn[62]: OpenLearn is piloting a badging initiative for courses that increase employability. A growing selection of courses allows to display and share learning achievements by gaining a free Open University digital badge as well as a statement of participation. Open Badges are used to demonstrate interest in a subject, evidence of continuing professional development or a commitment to studies.

- Beuth University of Applied Sciences in Berlin, Germany: a research and development project called Beuth Badges[63] has been established to develop pedagogical, design and technology concepts and prototypes. Beuth University has also led the projects Credit Points[64] and BeuthBonus[65] for migrant academics, both funded by the German Ministry of

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[58] http://www.france-universite-numerique.fr/

[59] https://badge.unow.fr/about

[60] https://www.canvabadges.org/

[61] http://www.digitalaskollyftet.se/

[62] http://www.open.edu/openlearn/get-started/badges-come-openlearn

[63] https://beuthbadges.wordpress.com/

[64] https://projekt.beuth-hochschule.de/creditpoints/

[65] http://beuthbonus.beuth-hochschule.de/

Education and Research, the Ministry of Labour and Social Affairs and the Federal Agency of Labour. Open Badges are used to improve academic and career opportunities of migrant academics.

● University of Applied Science, Munich in Germany: MOOC called COER13 for teachers in a joint venture with University of Tübingen and several non-profit organisation. Digital credits for successful participation in the course were defined as getting the badge level II.

● Croatian Academic and Research Network (CARnet): a professional E-Learning Academy, which offers online courses for a fee. Participants can earn one or more of the three badges offered: Attendant, Designer or Distinguished Attendant.

● Borders College in Scotland: The college has completely replaced paper certificates for staff CPD with Open Badges, and badges are recognised as meeting the required professional development standards for employees, both by Borders College and the National Health Service, two major employers in the region.

These examples show how Open Badges are already used in Europe to open up education. The quote from the Borders College in Scotland explains the motivation for current practice:

"This reflects the College's belief in the long-term value of Open Badges for staff and students. We are also looking to work with HR [the Human Resources department] to improve the automation of the process and in particular to flag up expiry dates on badges to ensure legislative compliance is maintained (E1)." (JRC, 2016, p. 56).

"An open badges system […] is another possible solution, much more aligned with the open education philosophy than recent developments in the MOOC ecosystem. [It…] offers students the possibility of displaying skills they acquired by showing evidence to back them up (E1)." (JRC, 2016, p. 64).

The JRC report emphasises that the evidence displayed by Open Badges can also provide a basis for the recognition of prior learning, which may be especially relevant if the MOOC does not award ECTS credits.

4.3 Employment

4.3.1 Professional development (Employees' needs…)

The Open Badge concept can also change the way we think about professional development. Learning doesn't stop at school. Badges can be used to recognise prior informal learning and in ongoing company training. Therefore it provides recurringly evidence throughout lifelong learning.

In the future, badges will more and more align with commonly accepted competency frameworks that are useful for working contexts. Those same badges can model and clarify the competencies needed for a job, and the training programs that lead to it.

The technology enables to make skills visible and shareable across contexts and environments. "*Open Badges can be used as connectors in the digitalised worlds of education and work which shift away from the relatively static infrastructure of 20th century to the more fluid 21st century digital systems*" (*Grant*, 2014).

4.3.2 The need for skills (Employers' needs)

Above is stated that badges can be used to clarify the competencies needed for a job or role within an organisation. Often competency frameworks are set up by educational experts, not necessarily aware of the actual demands of employers. In the Netherlands, we often hear employers complain about schools not delivered the skills they need. In other countries, this probably is not much different. Badges might be helpful to have employers articulate those needs.

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