

EDUBADGES

NRENs and Education Technology Workshop
& TF EDU

SURF

Frans Ward

Budapest, Nov 4-5-, 2019



Photo by Plush Design Studio on Unsplash



**SURF is the
collaborative ICT
organisation for
Dutch education
and research**

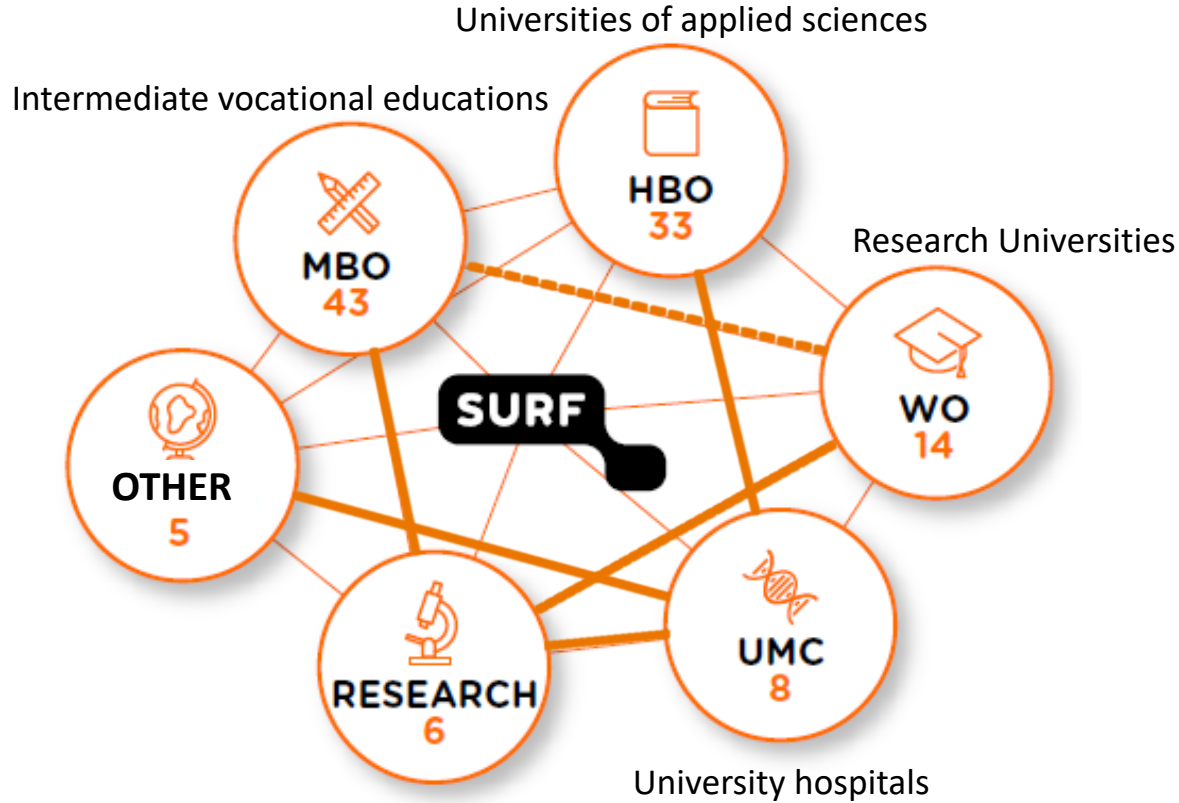
SURF

Our mission

SURF ensures that students, lecturers, researchers and employees in education and research have access to the **best possible ICT resources** on favorable terms for the purpose of top-level research and talent development, including in **national and international** collaborative efforts.



Serving over 1 million users



<https://www.youtube.com/watch?v=nrTEdLAIzjs>



Learning is something you do all the time and everywhere.



LET'S TALK ABOUT BADGES FIRST

OPEN BADGES

'the new currency for learning'

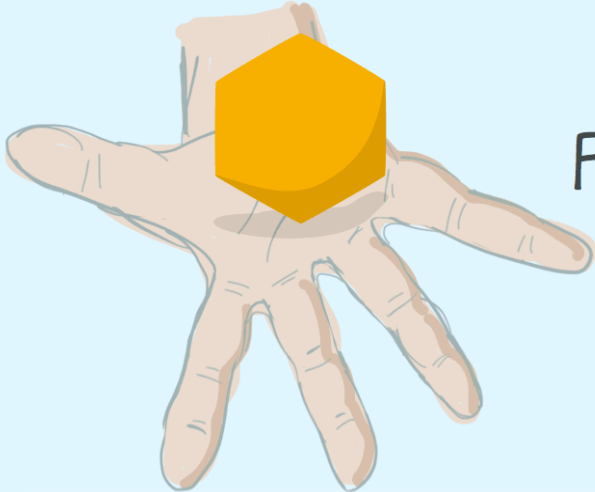
Photo by Joao Izanno on Unsplash

@bryanMMathers



THERE'S DATA INSIDE!

Evidence based



Free & Open



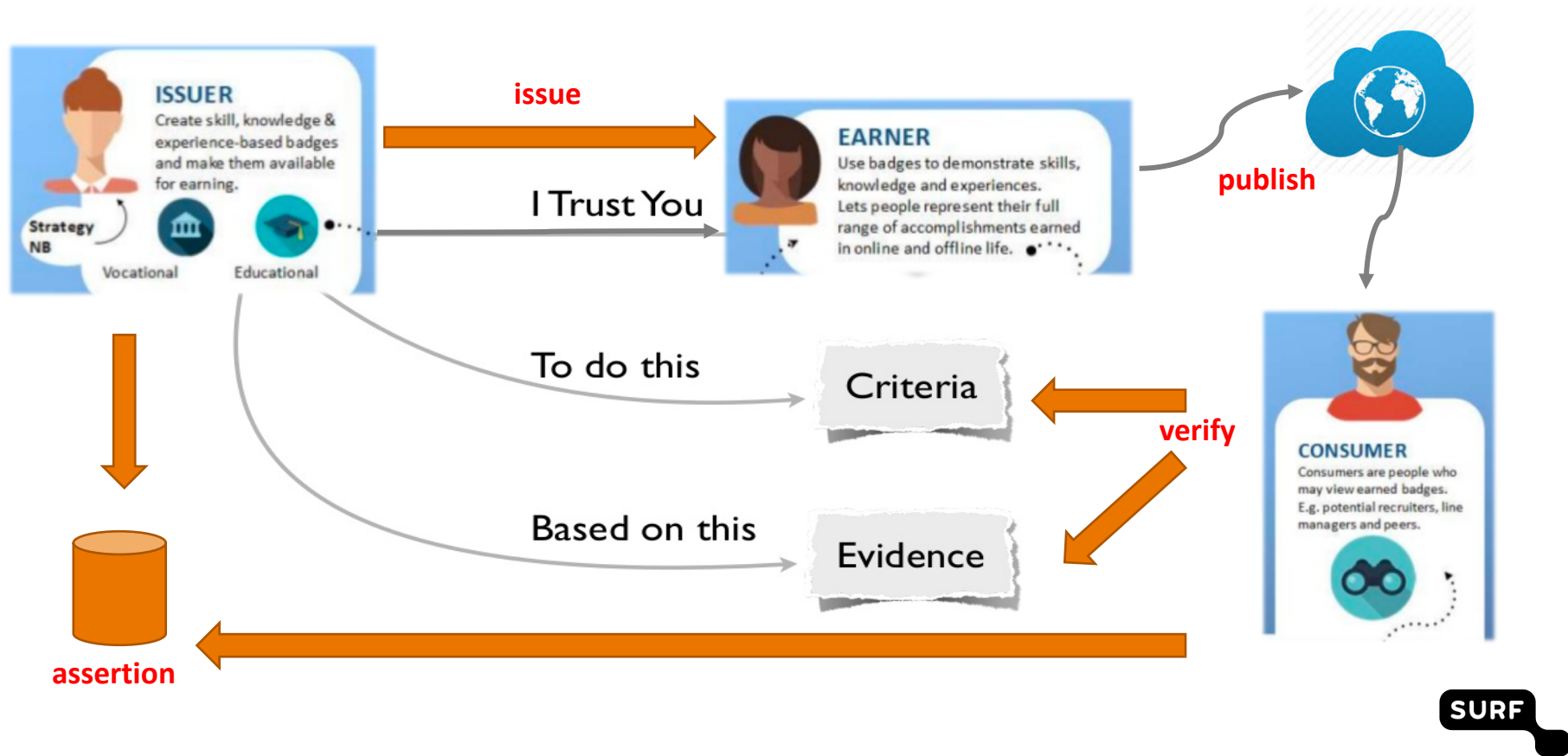
Stackable



OLD CONCEPT
NEW TECHNOLOGY



How does an Open Badge Infrastructure (OBI) work?



Why do we need Open Badges in education?

- (Renewed) interest because of high demand for more **flexible education and student mobility**
- Enabler of **micro-credentialing**
- Institutions can offer and market smaller, separate parts of a course
- Attractive to a broader audience
→ lifelong learning



@bryanMMathers



OLD SCHOOL
CREDENTIALS



NEW SCHOOL
CREDENTIALS





PRESENTING EDUBADGES...

Edubadges: tool for flexible education.
It will provide a more flexible and
transparent approach to curriculum and
grading for all learners



SURF & Open Badges

2016 Pressure cook session with stakeholders



Whitepaper published

Experiment with Mozilla open badges

2017 - 2018 Proof of Concept

2018 - 2019 Pilot eduBadges



2020 eduBadges service offering for Dutch HE

PUBLICATIONS



7 arguments for a national approach to open badges in education

1. MAKE KNOWLEDGE AND SKILLS TRANSPARENT
2. FLEXIBLE TRANSFER TO DIFFERENT EDUCATIONAL INSTITUTIONS
3. LESS WORK, SAME FREEDOM OF CHOICE FOR THE EDUCATIONAL INSTITUTION
4. PREVENTING PROLIFERATION AND ENSURING MEANINGFUL BADGES
5. AUTHENTICATION, VERIFICATION AND PRIVACY WELL ORGANISED
6. ALIGNMENT TO INTERNATIONAL STANDARDS
7. EASIER COLLABORATION THANKS TO OPEN SOURCE

7 arguments for a national approach to use open badges in education

PUBLICATION AVAILABLE:



7 ARGUMENTS FOR A NATIONAL APPROACH TO OPEN BADGES IN EDUCATION

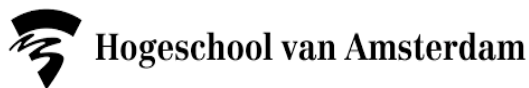
1 MAKE KNOWLEDGE AND SKILLS TRANSPARENT
More and more people are embracing the philosophy of lifelong development. Being a student is no

2 FLEXIBLE TRANSFER TO DIFFERENT EDUCATIONAL INSTITUTION
Higher education is becoming more flexible. A growing number of institutions encourage their students to obtain a part of their education elsewhere, in addition to their alma mater. Many students pursue their master's degree at an institution other than where they gained their bachelor degree. With edubadges, they can prove what knowledge and skills they have gained. As the infrastructure will become available to all higher education institutions in The Netherlands, comparability of the badges across institutions is assured. This can help simplify the admission procedure of transferring students. Edubadges can also help in the transition from education to the job market. For employers it becomes easier to select



EDUBADGES PILOT

Participating institutions eduBadges Pilot



Utrecht University

UNIVERSITY
OF TWENTE.



Aim eduBadges Pilot

- Prove the use case for Open Badges in HE.
- Show how Open Badges could enable micro-credentialing.
- Show how this process could work and what's needed to make it work.



Photo by Nick Karvounis on Unsplash

About the eduBadges PoC & Pilot

- ✓ Open Badge Infrastructure based on Open Source Badgr
- ✓ Development on Github: <https://github.com/edubadges>

SSO SURFconext – OIDC, LTI integration component, Roles and permissions model extended, Frontend Theming options, Management interface

- ✓ Code audit
- ✓ GDPR compliant
- ✓ New enrolment workflow
- ✓ Preparing business model for service delivery by SURF to Dutch HE
- ✓ Increasing effort on policy support for enabling micro-credentialing within Dutch HE
- ✓ Working on European metadata extensions

eduBADGES SURF edubadges

Edubadges is a SURF project

Netherlands <https://edubadges.nl> info@edubadges.nl

Repositories 9 People 7 Teams 0 Projects 0 Settings

Find a repository... Type: All Language: /

badgr-ui

Forked from concentricsky/badgr-ui
Frontend code for the SURF edubadges project.

surf badges openbadges open-badges

edubadges surfnet microcredentials

TypeScript AGPL-3.0 18 0 0 Updated 4 hours ago

badgr-server

Forked from concentricsky/badgr-server
Edubadges: A SURF project for Open Badges Django.

surf openba edu

surfnet digit creden

Python A

eduBADGES

badgr

SURF

SOME TECHNICAL CHALLENGES



Photo by Chinh Le_Duc on Unsplash

European
Metadata
Extension

Need a
persistent
identity!

Only
Signed
Badges?

Interna-
tional
alignment

Pathways
in badge-
metadata?

Endorse-
ments! On
Blockchain?

Accredited
vs non-
accredited

Federated
Badge
search

....and
much more!

Metadata Extensions

Adding European centric metadata extensions and aligning with Bologna tools like the Diploma Supplement

ISSUER

- InstitutionIdentifierExtension
- GradingTableExtension

BADGECLASS

- LanguageExtension
- ECTSExtension (Number of European Credit Transfer Points)
- EQFExtension (European Qualifications Framework)
- LearningOutcomeExtension
- EducationProgramIdentifierExtension

YES! I'm
number
one!

Should we explain him
our country's grading
system ?!

Not yet...



Clear distinction between formal and non-formal micro-credentials

- Choice made when creating badgeclasses
- Metadata extensions made mandatory on formal learning badgeclass form
- Formal learning badge will be hosted badge
Informal learning badge will be signed badge

Mockup:

<https://edu.nl/gpn&w>

edu.nl BADGES Pilot

BACKPACK COLLECTIONS ISSUERS ACCOUNT MANAGEMENT

ISSUERS | UNIVERSITY EXAMPLE ISSUER

University Example Issuer

EDIT

frans.ward@surfnet.nl | Your Role: Owner
Demo issuer for University Example

VISIT WEBSITE MANAGE STAFF

NON-FORMAL MICRO-CREDENTIAL
CREATE BADGECLASS FOR NON-FORMAL LEARNING



FORMAL MICRO-CREDENTIAL
CREATE BADGECLASS FOR FORMAL LEARNING

What is the difference?

Badgeclasses can be created for formal accredited learning and for skills recognition. The mandatory metadata is different.

LEARN MORE

BadgeClasses

BADGECLASS	TYPE	BADGECLASS	CREATED	RECIPIENTS
 Economics Introduction Msc	 Formal		Apr 10, 2019	150



2) NEED PERSISTENT IDENTITY

Characteristics of the eduID



- Identity for students
- Life long usable
- Under the control of the user
- Respects privacy
- Increase level of assurance
- Enriched with attributes from external sources

eduID, a persistent student identity



NL | EN

POC

Login to eduID

E-mail address

Password

Login

[Password forgotten?](#)

[Register](#)

[I do not have an eduID-account yet](#)

[What is eduID?](#)

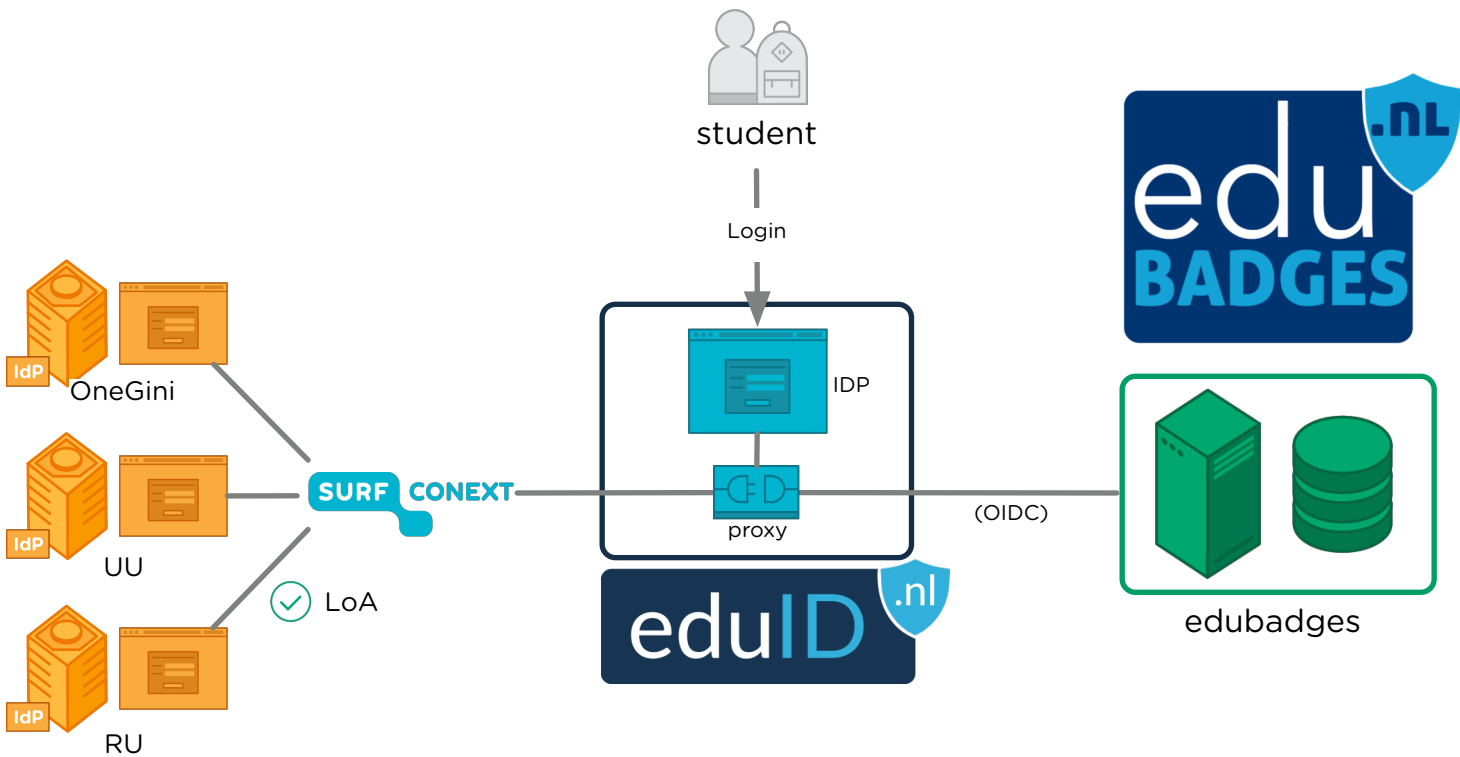
[Privacy statement](#)

Use a linked account to login

You can login using another account if you have configured this.

urn:mace:eduid.nl:1.0:1befe8a3-94ad-41b3-832a-bcbbe2ddeaaa:66bb6968-a89c-4f4d-a7ee-26d44e0c0dc3

Current flow eduID - edubadges



Hosted vs Signed Open Badges



A full version of the badge **resides on the web**: hosting a JSON version of each badge object, Assertion, BadgeClass, and Issuer.

- **Hosted servers may become unavailable over time, rendering badges unverifiable!**

Need to do key management:
The Assertion is baked into a portable image file with a **digital signature** that has a public key.
Data is verified with a private key.

- **Portable even if the server goes down and is more resilient to servers failing.**
- **Concerns if the Issuers' key is compromised**



Signed Open Badges

How to employ **digital signatures** to **permit validation** of open badges without a need to access an assertion database?

Desired longevity for such Signed Open Badges is about 50 years.
(Life Long Learning).

→ need long-lived signatures

All currently used algorithms will be broken in 10 to 15 years by quantum computers (expectation).

- need for (automatic) re-signing badges
- need for multiple signatures (JWS in JSON serialization)
- need validation based on alternative signature schemes



Full report that reviews cryptographic practices for Signed Open Badges:
<https://wiki.surfnet.nl/display/OB/Signing+Open+Badges>

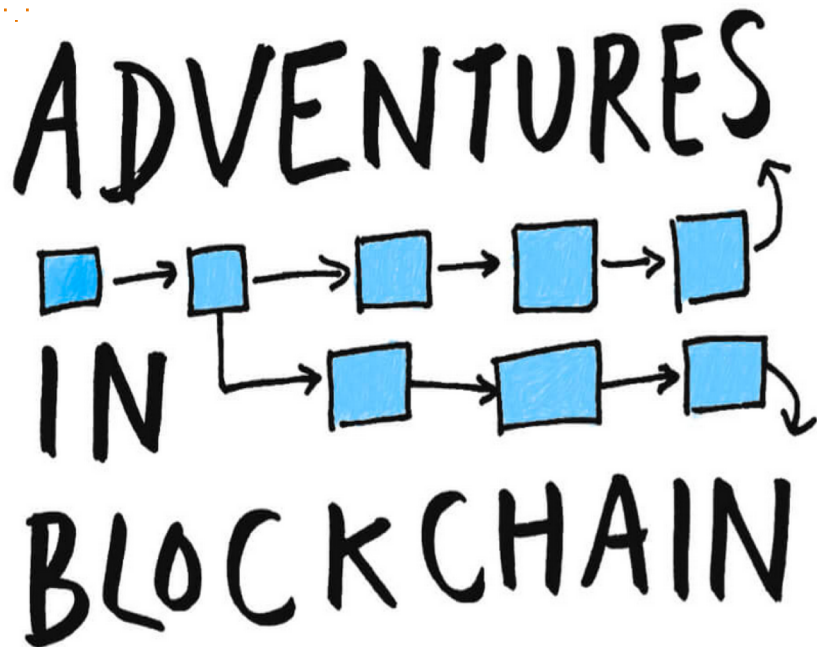
A woman with brown hair, wearing a brown leather jacket over a light pink top, is smiling and giving a thumbs-down gesture with both hands. She is standing outdoors at dusk or sunset, with a view of the ocean and some buildings in the background. The sky is a mix of orange, pink, and blue. A semi-transparent orange banner is overlaid across the middle of the image, containing the text "3) NEED A BLOCKCHAIN OR NOT?".

3) NEED A BLOCKCHAIN OR NOT?

Blockchain experiments: Endorsements & Timestamping

Is there **additional value** in using **blockchain technology** in the eduBadge infrastructure?

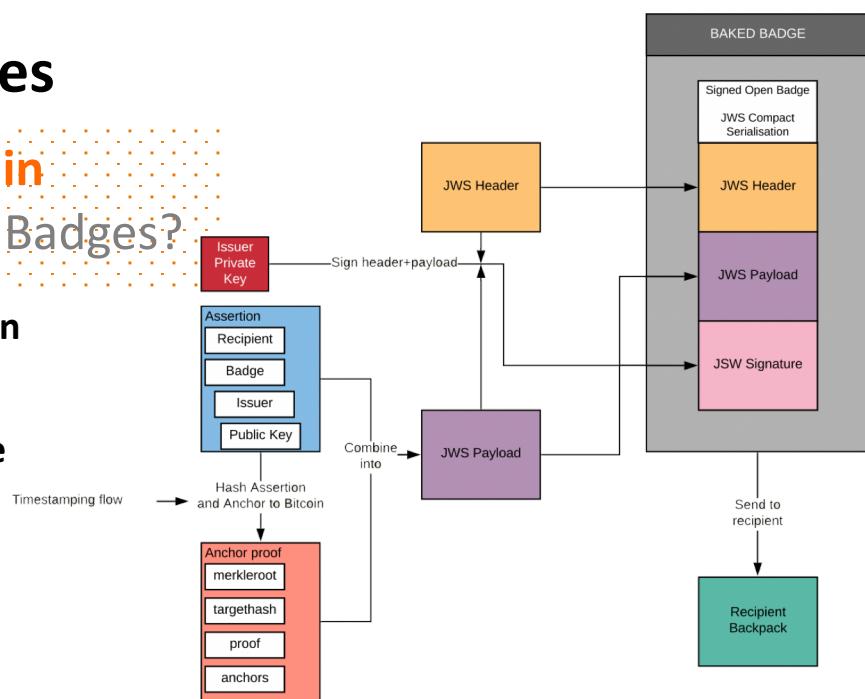
- ✓ Endorsements add value to issued badges, but where do we store the endorsement data?
- ✓ Blockchain technology can make access to endorsements and badge classes more **transparent** and **verifiable**.
- ✓ Do we want to use the public blockchain or should we use a permissioned private blockchain?



Signed & Timestamped Open Badges

Is there **additional value** in using **blockchain technology** to store **timestamps** of signed Badges?

- **Timestamps** are important for keeping records of **when** information (an eduBadge) is being created
- A **timestamp** is usually fetched from a third-party **time** stamp authority associated with its trusted certificate.
 - via Trusted Timestamping Authorities (TSA's)
 - via an immutable Blockchain (Bitcoin Anchor Proof)



EXPERIMENT IN PROGRESS

- Use JWS Compact Serialisation as signing mechanism
- Use RSA* or EdDSA as signing algorithm
- Use Bitcoin as timestamp anchor?

*) <https://latacora.micro.blog/2018/04/03/cryptographic-right-answers.html>



4) NEED LMS INTEGRATION

Currently available: Canvas LTI module

- In high demand by institutions
- Needs testing by institutions
- Needs support for other LMS (Moodle,....)

Remin x Danie x Slack x Why i x scout x TIL th x 1200V x LTI ter x Cursu x

SURFnet bv [NL] | canvas.edubadges.nl/courses/4/settings/configurations

LTI > Instellingen

Startpagina Aankondigingen Opdrachten Discussies Cijfers Personen Pagina's Bestanden Syllabus Leerdoelen Toetsen Modules Openbadges **Instellingen**

Externe apps + App

Apps zijn een eenvoudige manier om nieuwe functies aan Canvas toe te voegen. Ze kunnen worden toegevoegd aan afzonderlijke cursussen of aan alle cursussen onder een account. Nadat de apps geconfigureerd zijn, kun je ze koppelen via cursusmodules en kun je opdrachten maken voor hulpprogramma's voor beoordelingen.

Bekijk een paar LTI-tools die uitstekend met Canvas werken

Naam	
daanzap badges	⚙️
EduBadges	⚙️
saltire	ℹ️
vialink	⚙️

63 Weergave voor cursist

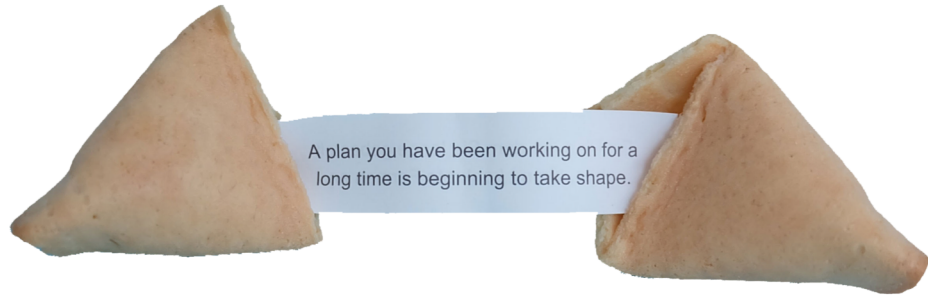
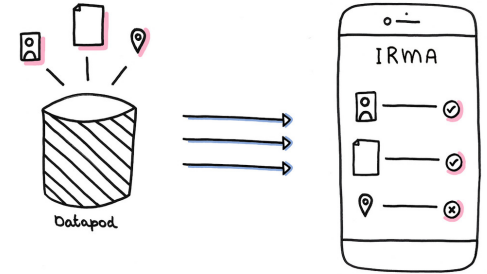
016_- layout.docx 014_specifi....docx bonne.tif 20190826094....ics Show all



OTHER (FUTURE) PLANS

Future developments

- Work on the eduBadges Service offering
- Improve LTI integration to support more LMS
- Student Research project 'Solid based Personal Data PODS'
- Alignment with European exchange and description frameworks
- Research on open badge and SIS integration
- Think about a national backpack service
- Implement pathways
- Implement endorsements
- & many things more...



Some Topics for Today....

- Is there a common ground for an European Open Badge Metadata Extension?
- Is there any interest for a joint effort on developing an Open Source Badge platform? aka Filesender, OpenConext...
- Are you aware of any badge initiatives in your own country that we should know off?
- Is this a subject that your NREN should take up?



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