EDUBADGES

NRENs and Education Technology Workshop
& TF EDU

Frans Ward
Budapest, Nov 4-5-, 2019

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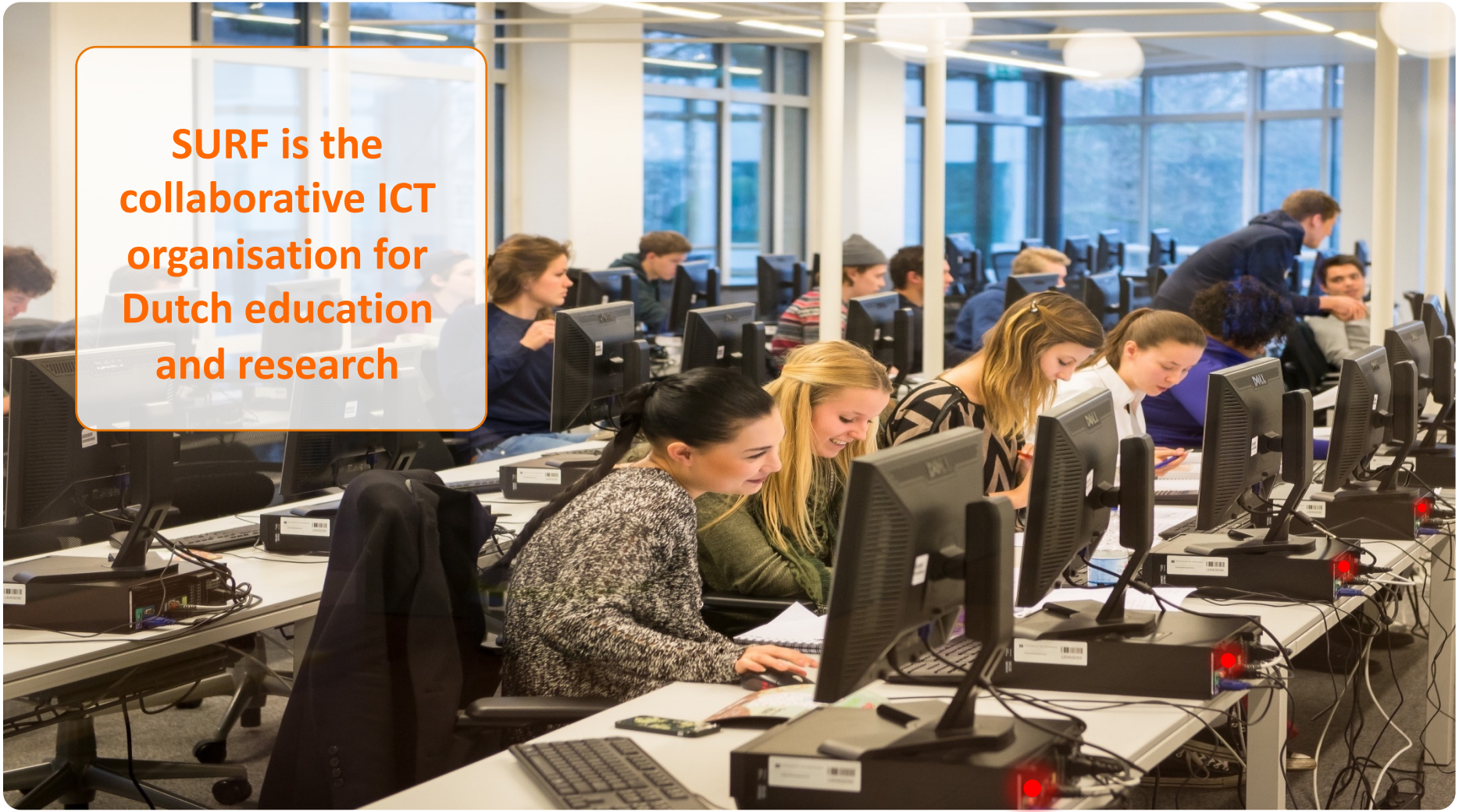
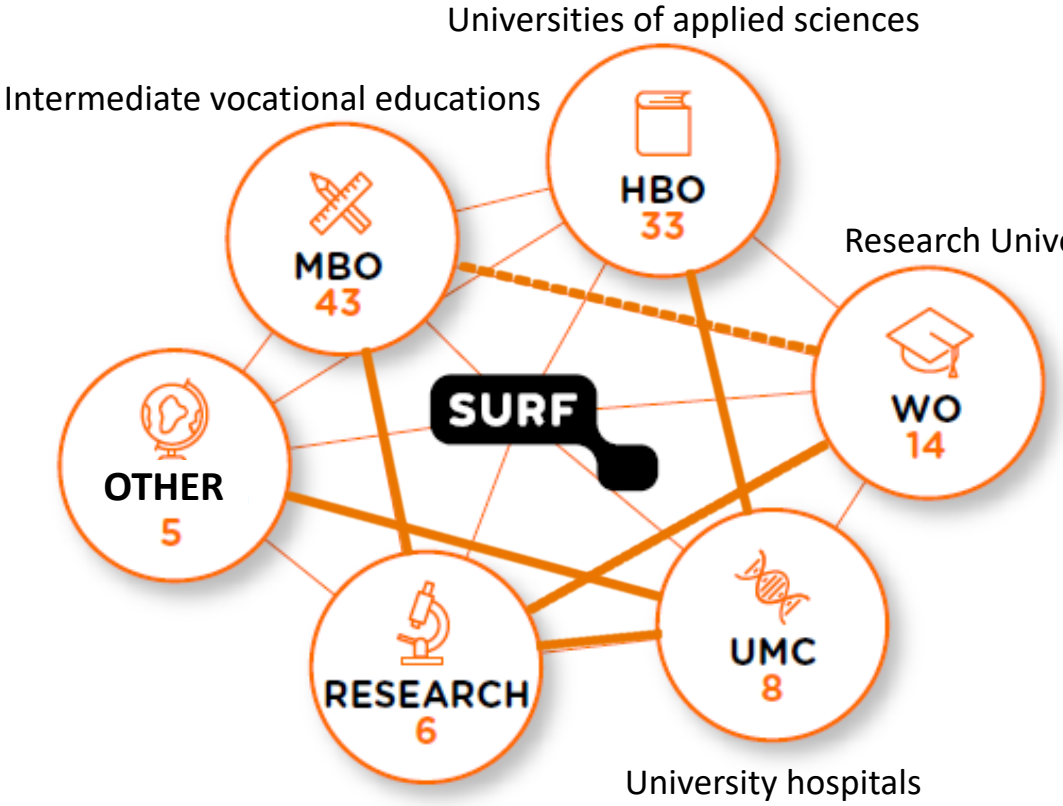

SURF is the collaborative ICT organisation for Dutch education and research

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

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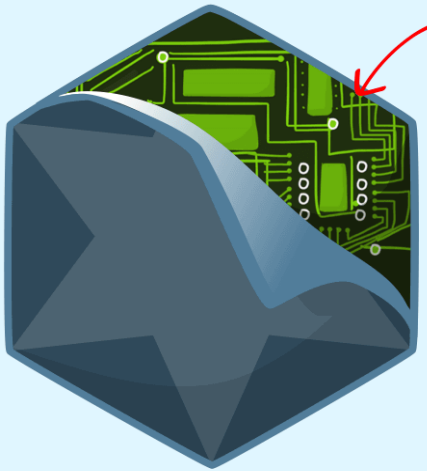
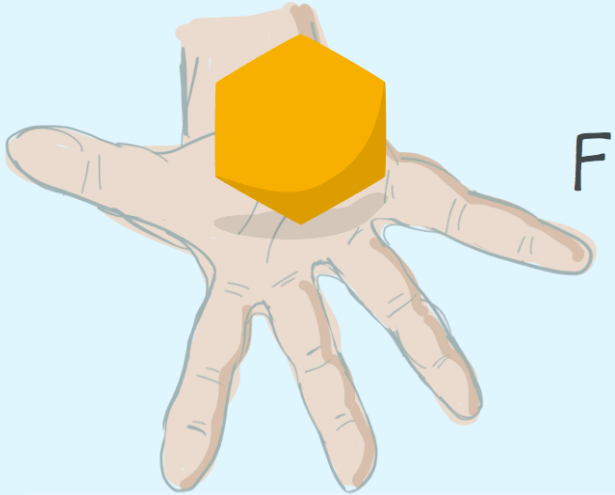
@bryanMMathers



Evidence based



Free & Open

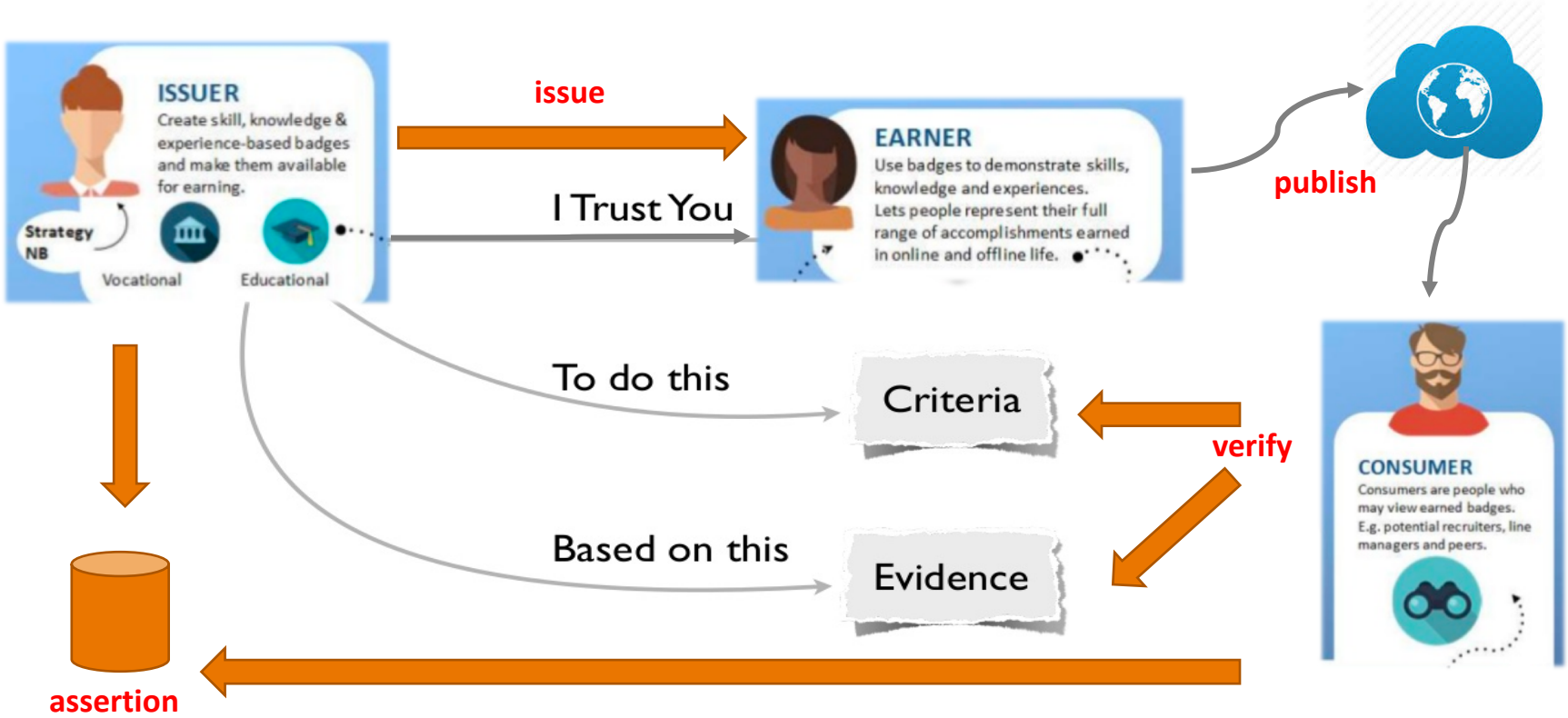
Stackable

mozilla OpenBadges

OLD CONCEPT
NEW TECHNOLOGY

IMS GLOBAL Learning Consortium

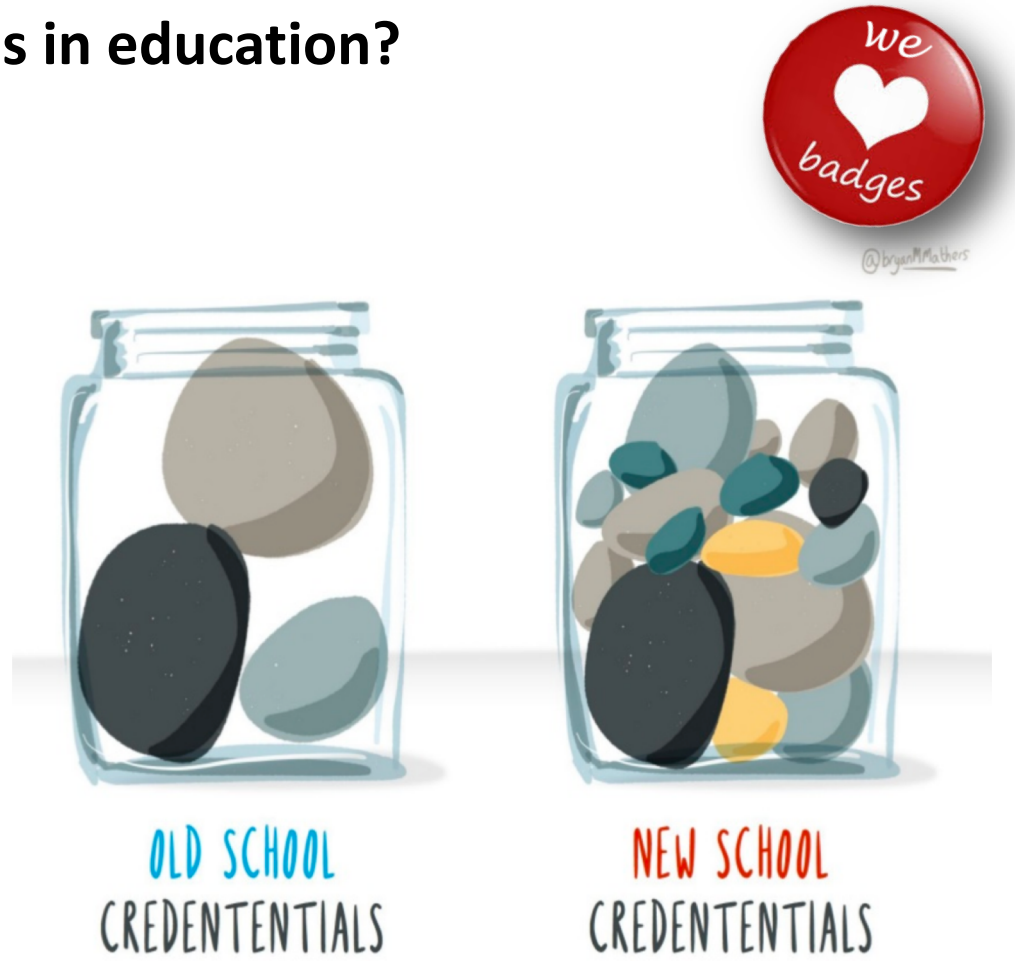
How does an Open Badge Infrastructure (OBI) work?



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



PRESENTING EDUBADGES…

Photo by Honey Yanibel Minaya Cruz on Unsplash

Edubadges: tool for flexible education.

It will provide a more flexible and transparent approach to curriculum and grading for all learners

Photo by Caleb Woods on Unsplash

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

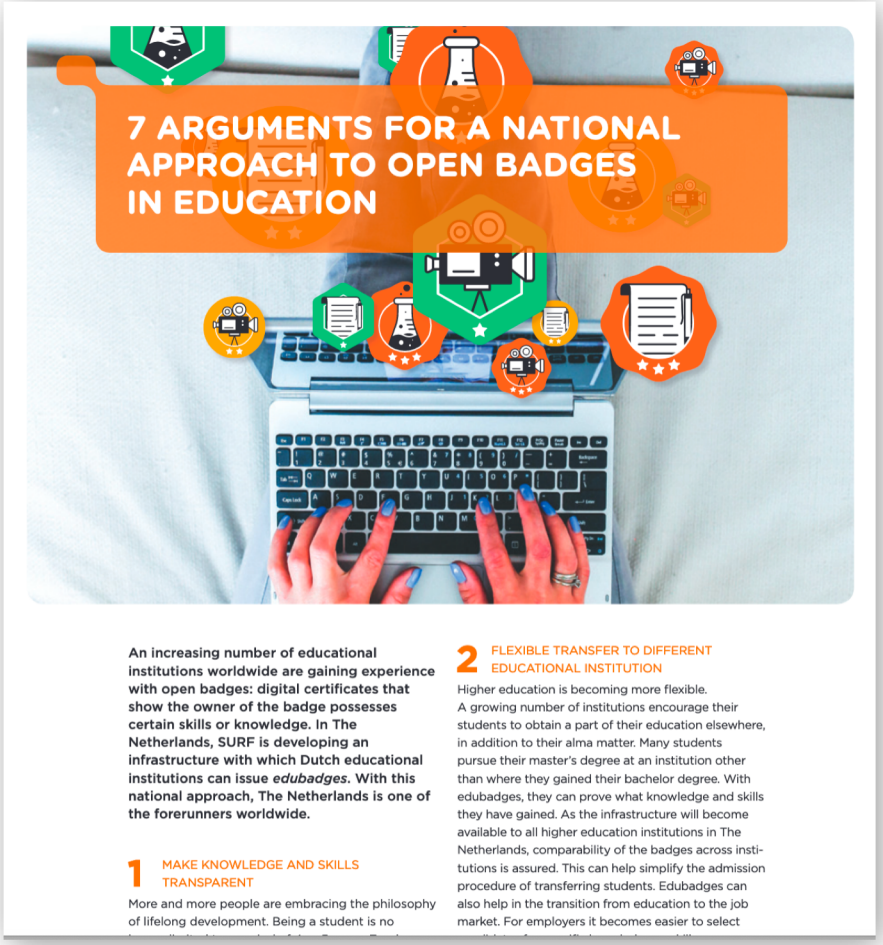
PUBLICATIONS

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

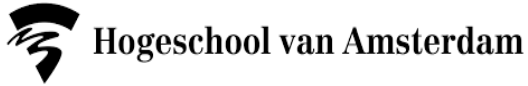
PUBLICATION AVAILABLE:



EDUBADGES PILOT

Photo by Nick Karvounis on Unsplash

Participating institutions eduBadges Pilot



Aim eduBadges Pilot

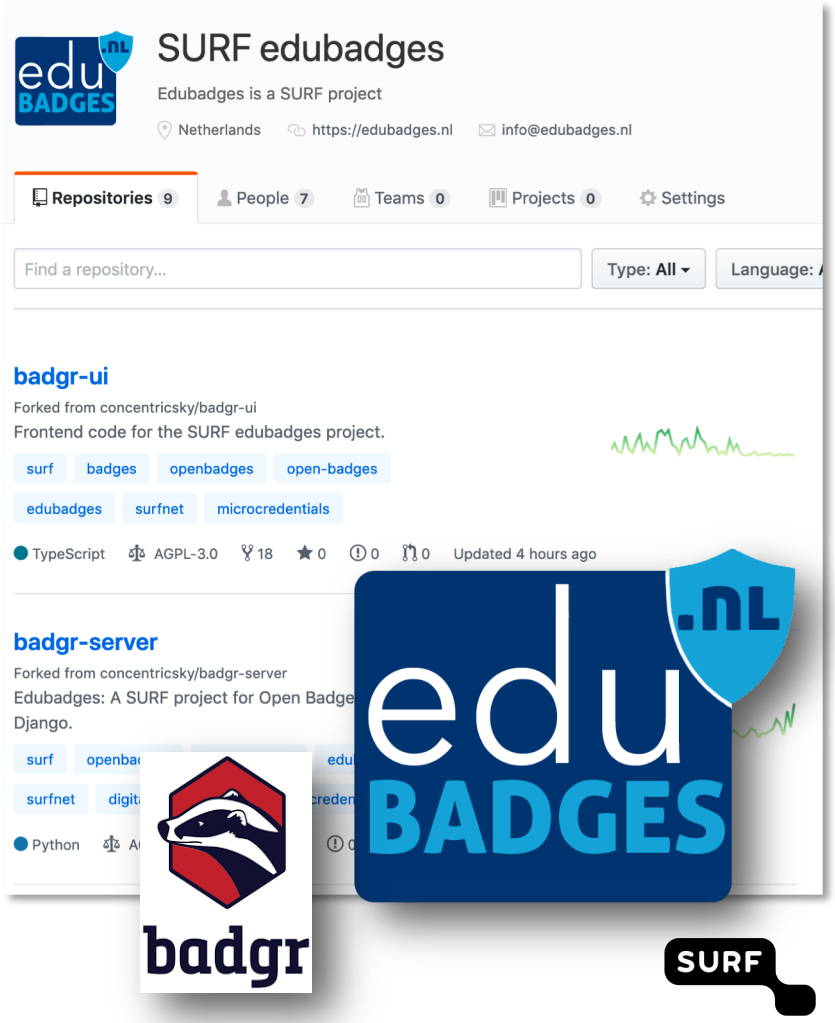
- Prove the use case for Open Badges in HE.
- Show how Open Badges could enable micro-credentialing.
- Show how this process could work and what's needed to make it work.

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



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!
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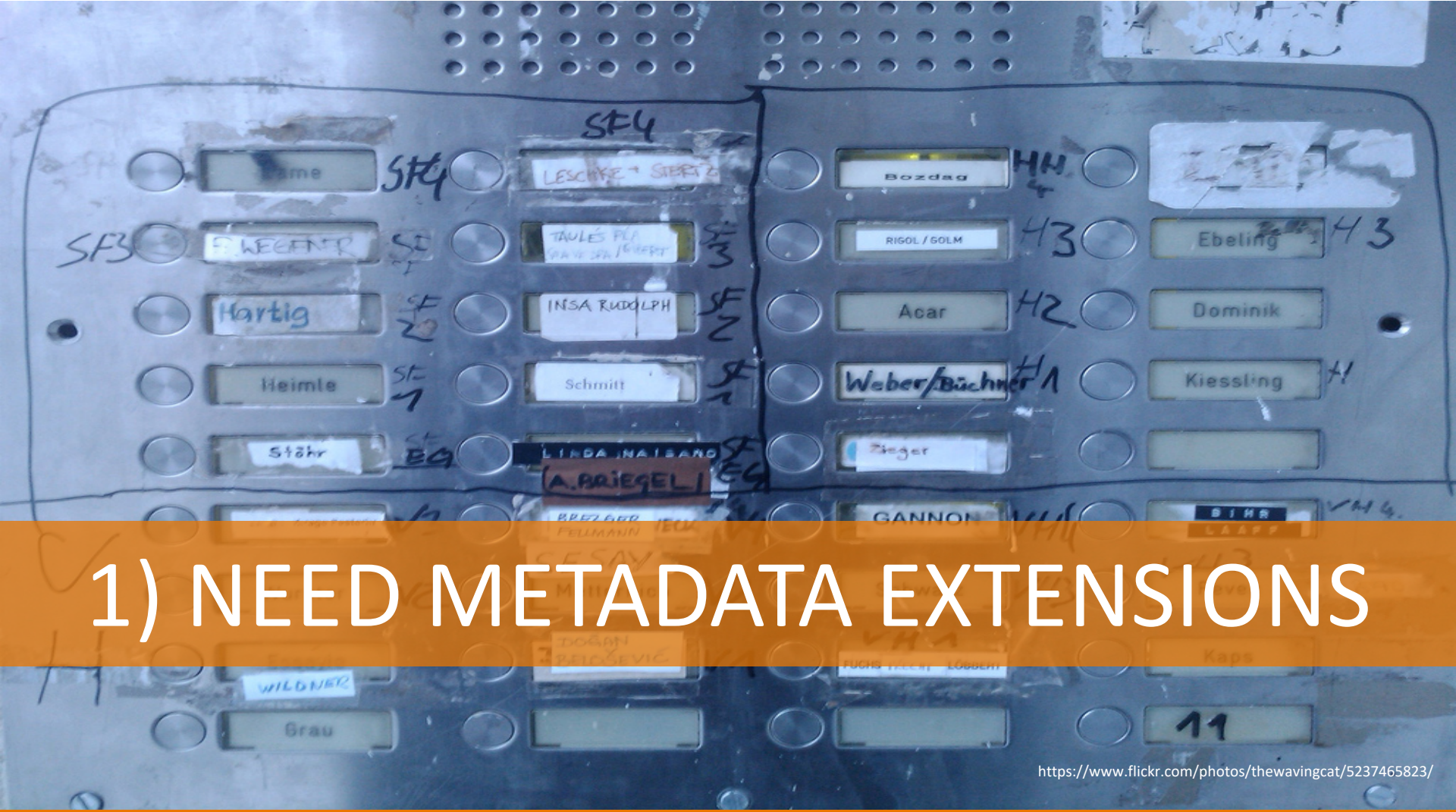


1) NEED METADATA EXTENSIONS

https://www.flickr.com/photos/thewavingcat/5237465823/

Metadata Extensions

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

ISSUER

- InstitutionIdentifierExtension
- GradingTableExtension

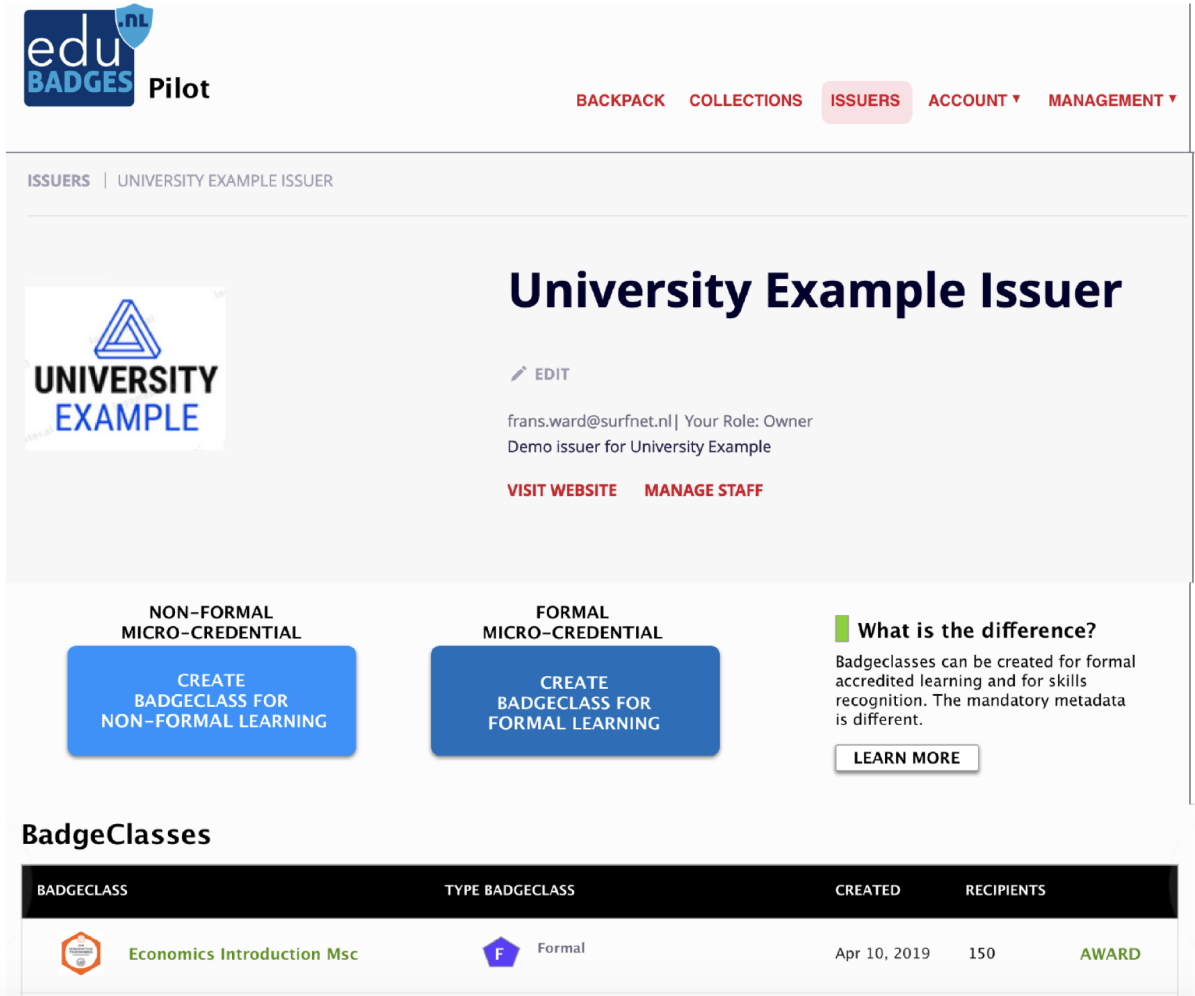
BADGECLASS

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

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/gpn8w



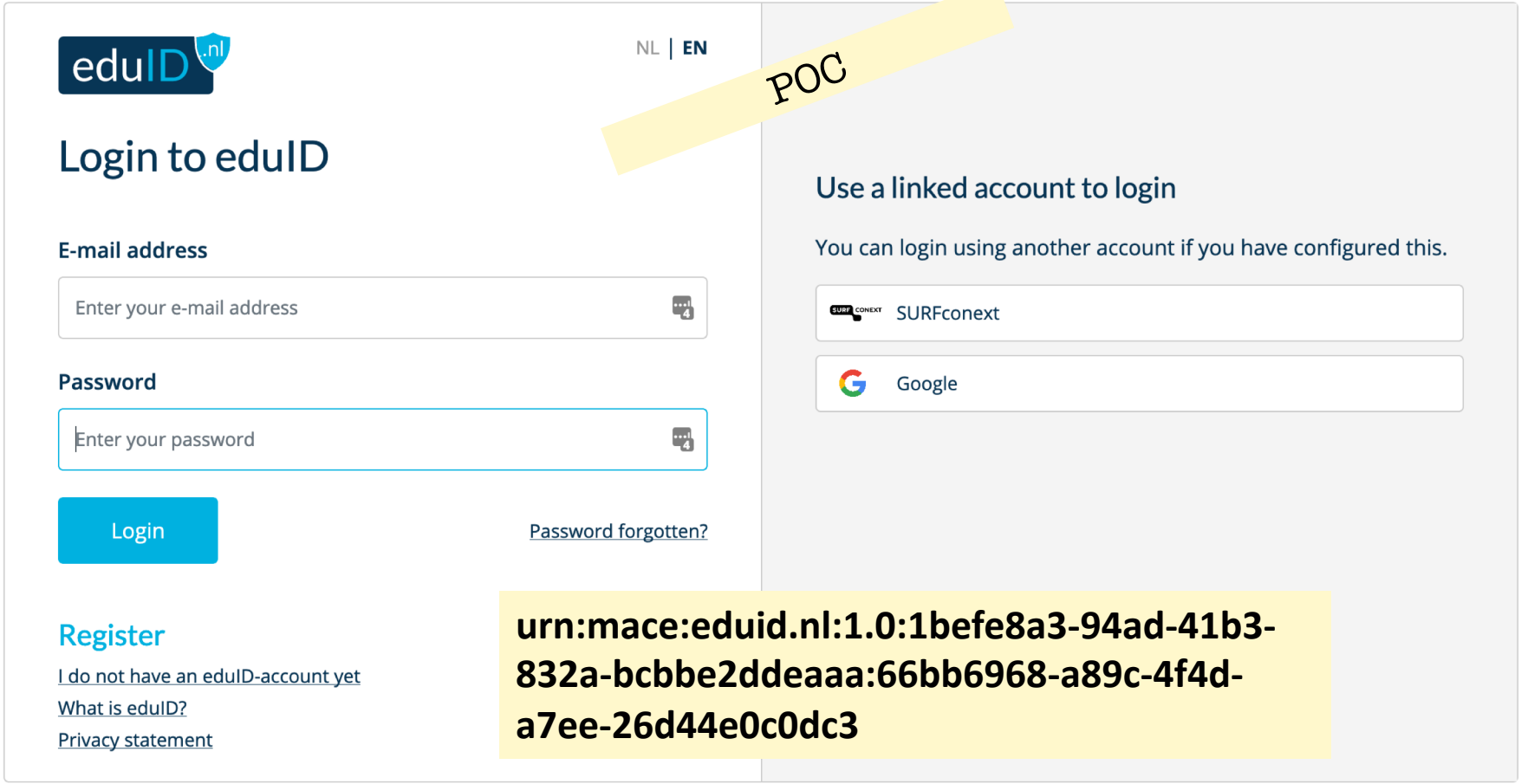
2) NEED PERSISTENT IDENTITY

Photo by Alex Iby on Unsplash

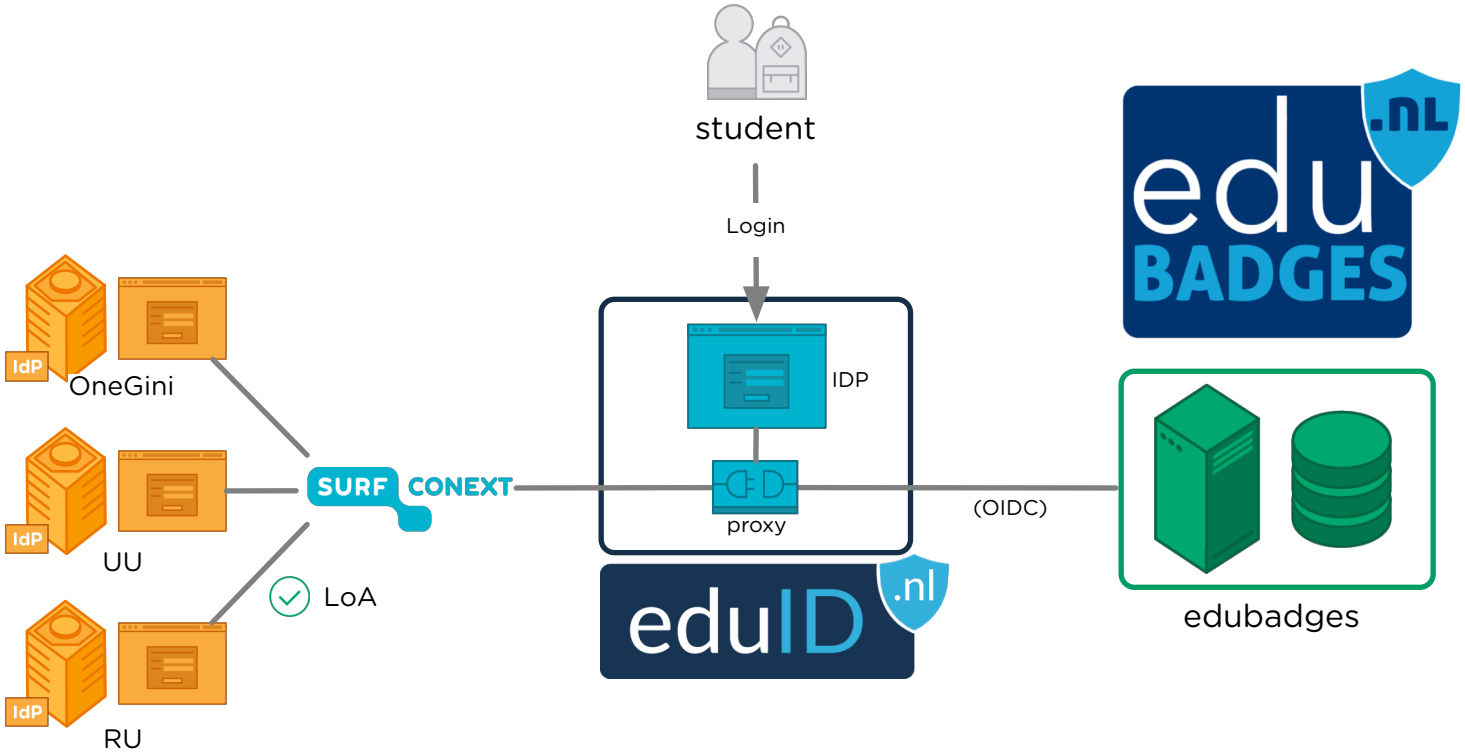
Characteristics of the eduID

- 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



Current flow eduID - edubadges



3) NEED LONG TERM VALIDATION

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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**

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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

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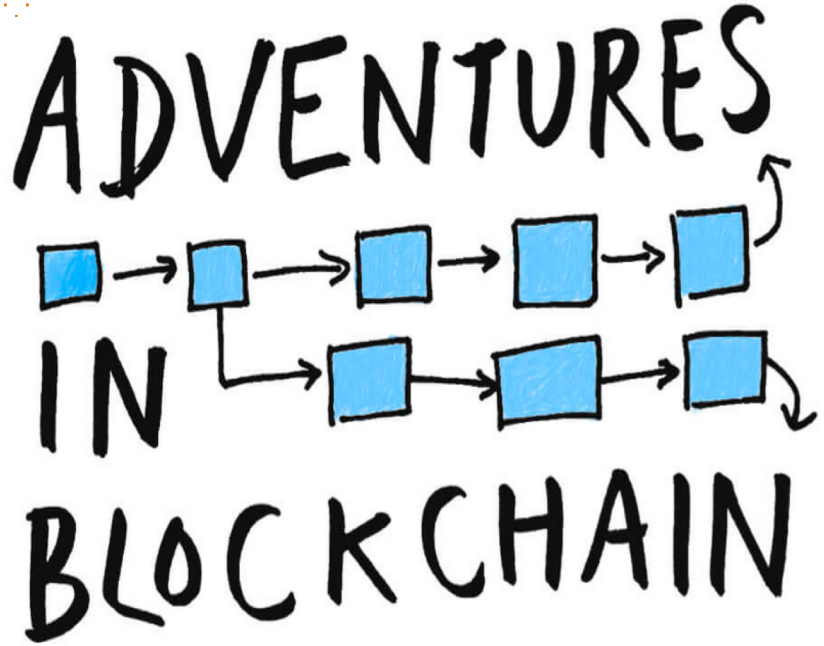
3) NEED A BLOCKCHAIN OR NOT?

https://www.flickr.com/photos/dmourati/10055307125/

Blockchain experiments: Endorsements & Timestamping

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

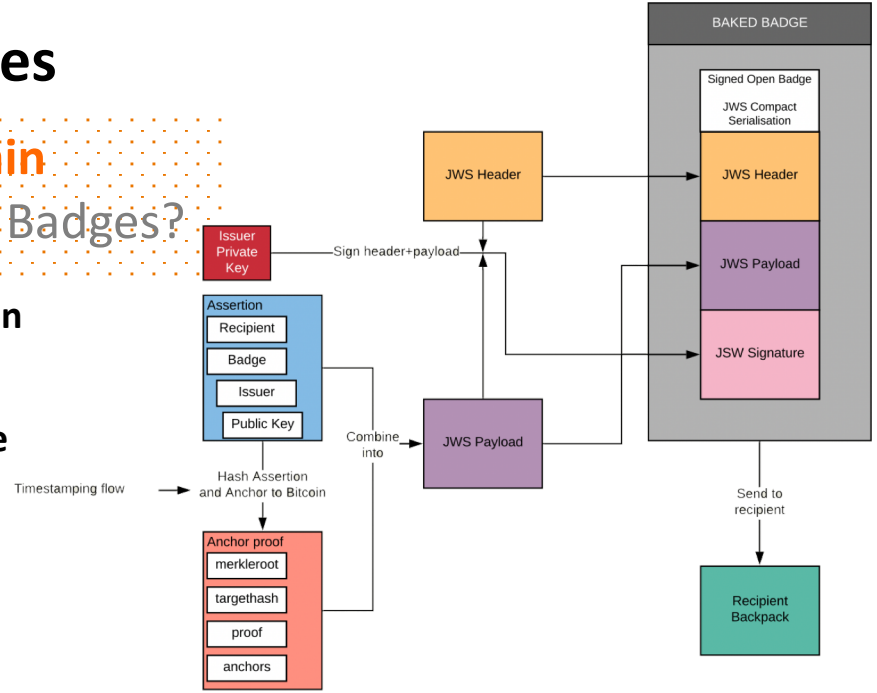
- ✓ Endorsements add value to issued badges, but where do we store the endorsement data?
- ✓ Blockchain technology can make access to endorsements and badge classes more **transparent** and **verifiable**.
- ✓ Do we want to use the public blockchain or should we use a permissioned private blockchain?



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 algorism
- Use Bitcoin as timestamp anchor?

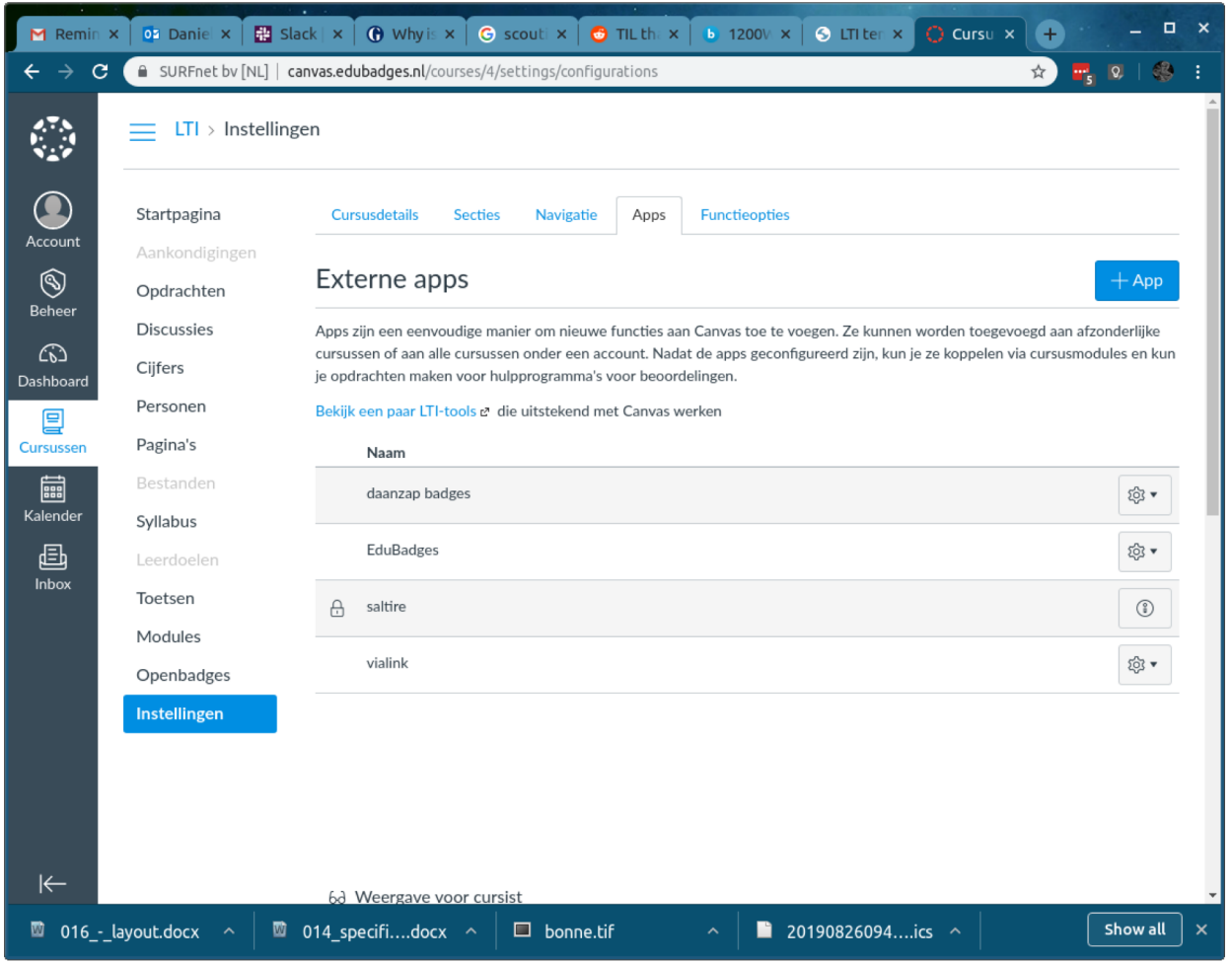
*) https://latacora.micro.blog/2018/04/03/cryptographic-right-answers.html

4) NEED LMS INTEGRATION

https://www.flickr.com/photos/tpapi/2765541278/

Currently available: Canvas LTI module

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

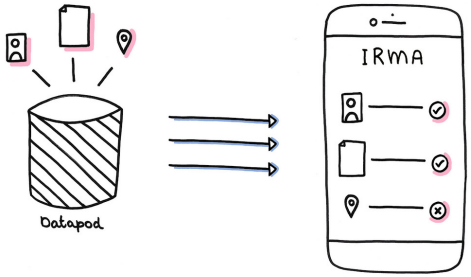


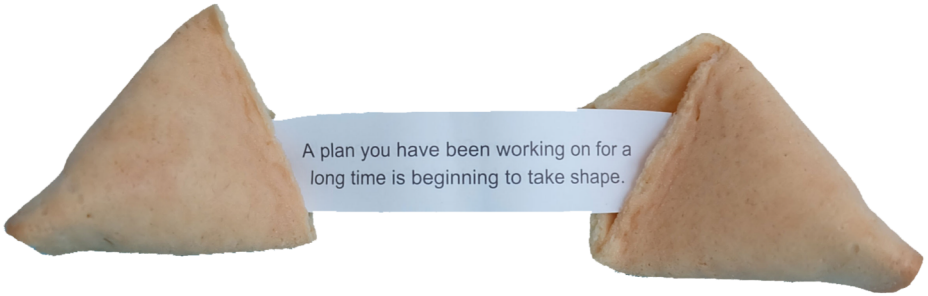
OTHER (FUTURE) PLANS

https://www.flickr.com/photos/gsfc/22150617080/

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…





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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?

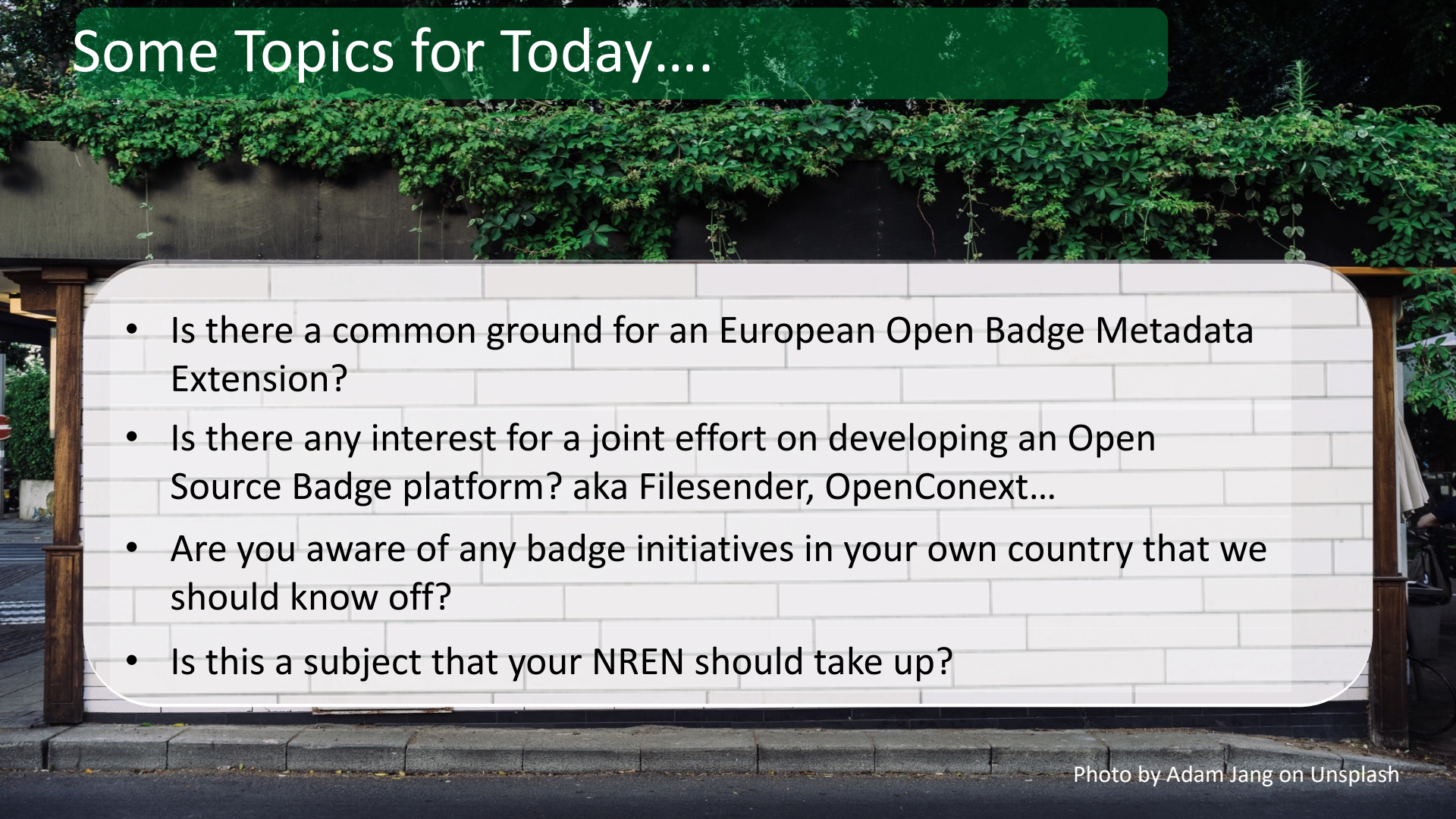

Photo by Adam Jang on Unsplash

Projectteam
Open Badges

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