TB MED

EUGLOH

European University Alliance for Global Health

Digitized Card Pilot for European HEIs (EUGLOH Work Package 5 – Campus Life)

European Campus Card Association Conference 2022 @UPorto - May 18th 2022

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European University Alliance for Global Health

EUGLOH Consortium Partners

- Université Paris-Saclay (UPSaclay)

- Lund University (LU)

- Ludwig-Maximilians-Universität München (LMU)

- Universidade do Porto (UPorto)

- University of Szeged (USZ)

EUGLOH New Consortium Partners

- University of Alcalá (UAH)

- University of Hamburg (UHH)

- University of Novi Sad (UNS)

- Tromsø University - The Arctic University of Norway (UiT)

https://www.eugloh.eu/

EUGLOH Work Package 5 – Campus Life

EUGLOH focuses on:

- Increasing in the number of **short and long mobilities** at **all levels** within the network,

- Developing opportunities for **virtual mobility** and **online courses**,

- Developing the reception of exchange students in collaboration with the students' unions,

• Implementation of the European Student Card → interoperable services

- Activities with a focus on lifelong learning in cooperation with employers,

- Student employability,

- Increasing opportunities for students to gain research experience,

- Creating joint programs at master's and doctoral levels.

Background

✓ Vision of the European Commission: Towards a European Education Area

✓ The European Student Card Initiative (ESCI)

✓ European Charter for Higher Education (ECHE) of the Erasmus+ Program

A great vision!

Background

Vision of the European Commission: Towards a European Education Area

It is in the shared interest of all EU Member States to harness the full potential of education and culture as drivers for job creation, economic growth and improved social cohesion, as well as a means to experience European identity in all its diversity.

The Commission is developing initiatives to help work towards a European Education Area.
The vision contained within this policy is that, across the EU:

→ **spending time abroad to study and learn should become the norm**

→ school and higher education qualifications should be recognised across the EU

→ knowing two languages in addition to one's mother tongue should be standard

→ everyone should be able to access high-quality education, irrespective of their socio-economic background

→ people should have a strong sense of their **identity as a European**, of **Europe's cultural heritage** and its diversity

Source: https://ec.europa.eu/education/education-in-the-eu/european-education-area_en

Background

Benefits of the European Student Card Initiative

- **For students:**
  - → Easy access to course materials prior to mobility, online course registration and automatic recognition of ECTS credits
  - → **Immediate access to services at the host university, such as libraries, transport and accommodation**
  - → **Discounts on cultural activities throughout the EU**

- **For Higher Education Institutions:**
  - → Easy, online management of the entire mobility process – from student selection to the recognition of ECTS credits
  - → Online identification of students, simplified and secure exchange of student data - including academic records - between Higher Education Institutions
  - → Reduced administrative burden associated with student mobility

Source: https://ec.europa.eu/education/education-in-the-eu/european-student-card-initiative_en

Background – Services

Higher Education Institutions should **provide services** to their **own (outgoing)** and **incoming students**

- ✓ **Identification and status verification / prove of entitlement**

- ✓ Electronic payment / cashless campus
    - ✓ canteen, cafeteria and vending machines
    - ✓ printer / scanner

- ✓ Library and learning spaces

- ✓ Access-Control
    - ✓ Areas / buildings / rooms → also special services for disabled persons
    - ✓ Single Sign On / 2FA / FIDO2
    - ✓ Attendance check (check-in for exams, attendance at courses)

- ✓ Public transport

- ✓ Accommodation

- ✓ **Electronic Signature** of legal documents (→ eIDAS)

- ✓ *Discounts on cultural activities throughout the EU → Museums, theaters, cinemas, …*

Background – Projects

European Student Card Initiative (ESCI)

erasmus without paper
Connecting universities

E+ Erasmus+
Connecting students

MyAcademicID
Online identification and authentication

ESC THE EUROPEAN STUDENT CARD
Connecting student services

European Commission
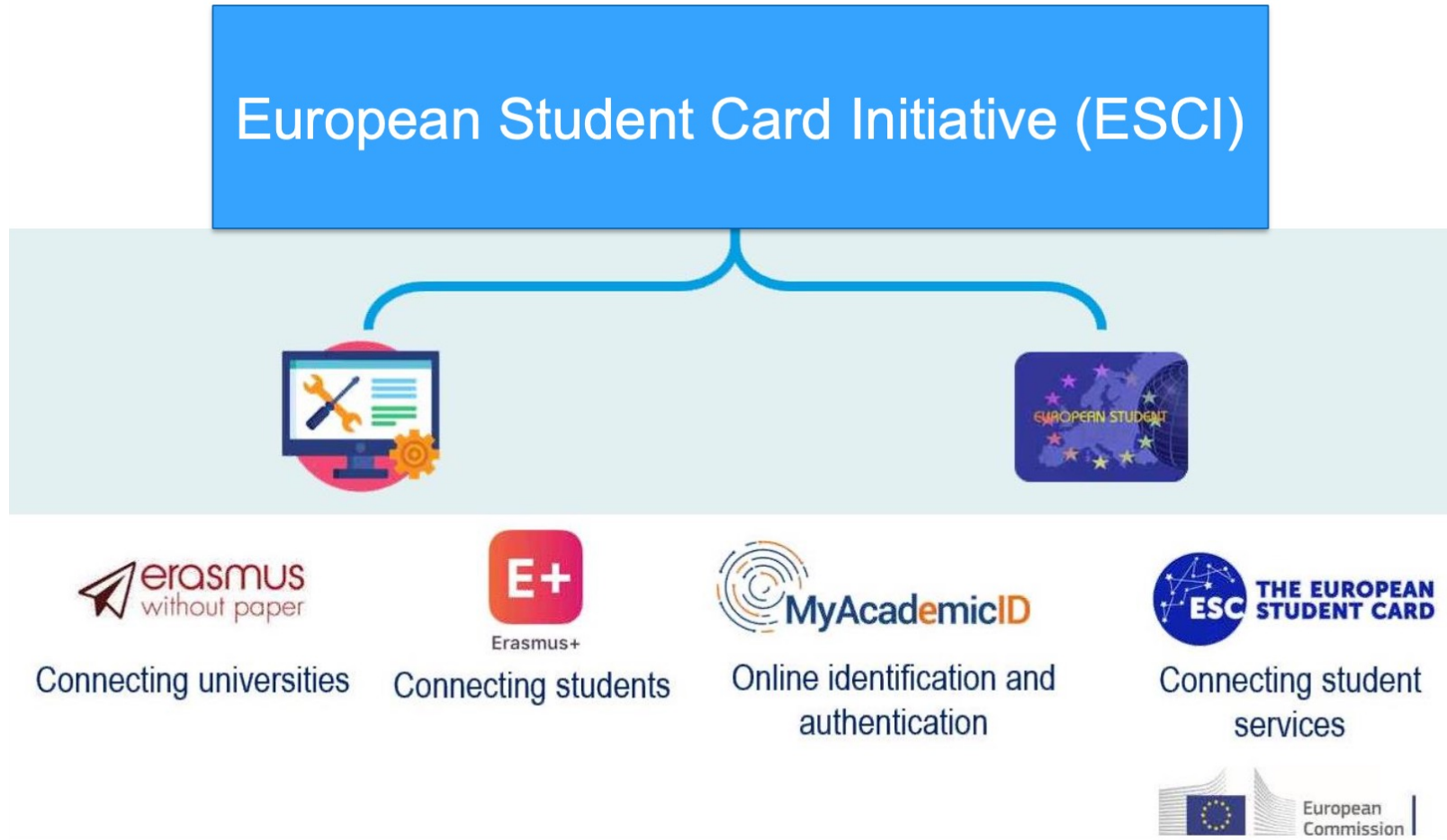
Backgrounds – ECHE requirements for HEIs

„Implement the priorities of the Programme:

- By undertaking the necessary steps to **implement digital mobility management** in line **with the technical standards of the European Student Card Initiative**.

- …"

Timeline

- Erasmus Without Papers (EWP)
    - 2021 – Online Learning Agreements (OLA)
    - 2022 – Inter-Institutional Agreements (IIAs)
    - 2023 – Exchange Student Nominations, Acceptances, Transcripts of Records

- European Student Card Initiative (ESC)
    - **2025 – Implement European Student Card**

Backgrounds – Expected Interoperability

EUROPEAN STUDENT

ESCN (16 octets)

SIGNATURE (72 octets based on ESCN(16) + UID(7))

UNIVERSITY CERTIFICATE ~600 bytes

Student name
Student code
HEI PIC code
Country code (or flag)

HEI
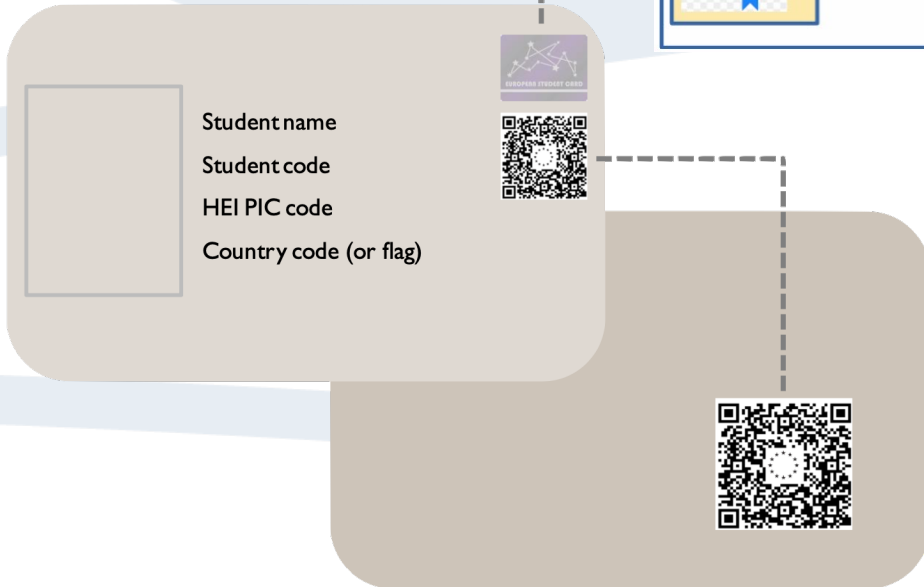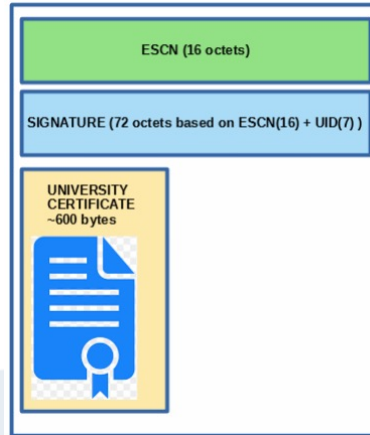
Available options for interoperability

	Plain regular card	Card with QR code	Chip card with electronical control	Smart card
Potential impact on card production process	✗			
Reading device available	👁			
Possibility to add new services on demand	✗	✗	✗	✔
Level of interoperability				

Legend

👁	Visual check Manual ESC-R search
	QR Code reader
	Contactless chip reader

Background

✓ Vision of the European Commission: Towards a European Education Area

✓ The European Student Card Initiative (ESCI)

✓ European Charter for Higher Education (ECHE) of the Erasmus+ Program

A great vision!
BUT

Backgrounds – BUT (legal aspects & IT-Security aspects)

- The European Student Card Project specification is not transparent,

- Conflicts with GDPR requirements
  - → **Student IDs are not optional**; therefore, they could not be issued consent
  (Article 7 - Conditions for consent, define when GDPR Art. 6 par. 1 lit. (a) did not apply)
  - Centralized Infrastructure conflicts with GDPR Article 24 & 25

- Conflicts with competition law and procurement law
  - Not vendor neutral
  - Holograms for example exclusive by one provider

- IT-Security
  - QR-codes are not considered secure
  - **NEVER EVER** code an URL into QR-Codes → communicate Trusted verification Apps or Websites
  → corona vaccination pass verification as best practice

→ not a specification that could be implemented by all HEIs

EUGLOH

Background – BUT (existing implementations)

European Student Card Integration within the
Erasmus+ App (https://erasmusapp.eu/card)

- Very simple for HEI, only certain, following
  LDAP-Attributes have to be passed on the IDM:
  - schacHomeOrganization
  - schacPersonalUniqueCode → **ESI**

- Simple for Students, no interaction with HEI necessary

BUT

- It is an absolute NO-GO

- Framework of Trust → non-existing
  - Ignores all IT-Security Best Practices
  - QR-Code is not secure
  - Embedded URL → Phishing like attacks
  - No status verification with the HEI or Student Data
  - No security against screenshot sharing

- Issues for HEIs
  - No Branding of the HEI
  - Information propagation
  - No person or image verification
  - Issuing of virtual ID cards on behalf of the HEI
    without their consent
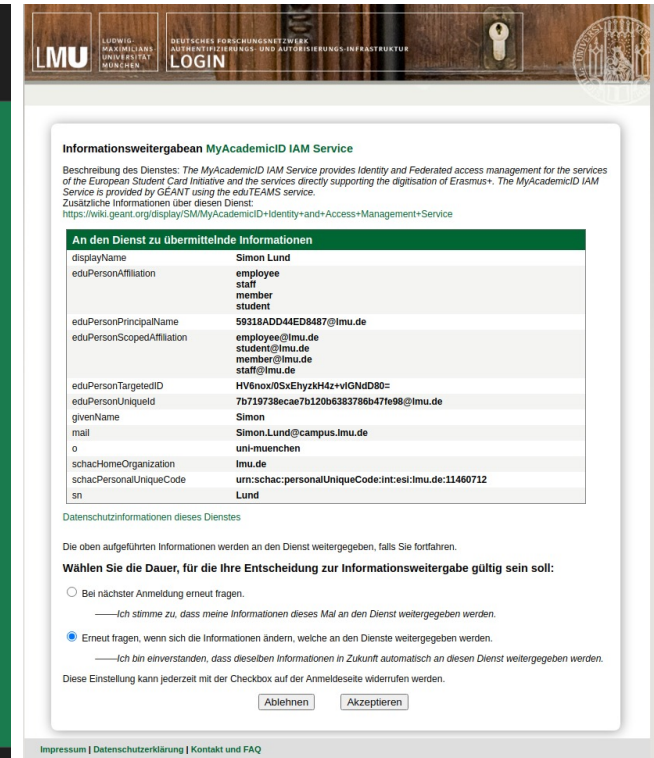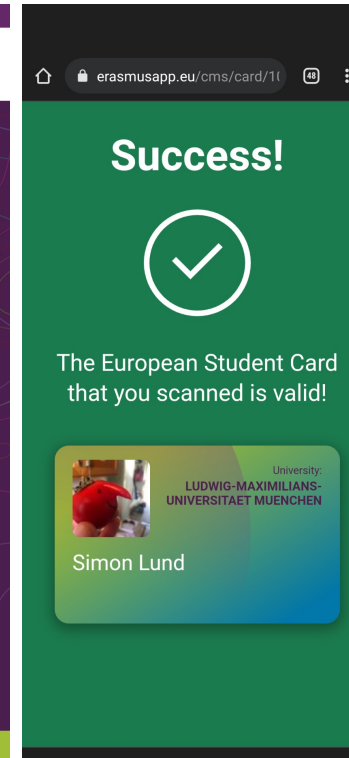
This Implementation should be revised!

Background

The vision of a European Education Area & the European Student Card Initiative is

a great vision!

But an overhaul of its specification and implementation is necessary!

Another approach for the objectives

Understand the requirements

A Step back – Objectives – reconsider requirements

✓ spending time abroad to study and learn should become the norm
✓ Immediate access to services at the host university, such as libraries, transport and accommodation
✓ Discounts on cultural activities throughout the EU

→ It is all about **"short- and long-term mobility" – services on site** (→ campus life)

✓ Easy access to course materials prior to mobility, **online course registration** and automatic recognition of ECTS credits
✓ Easy, **online management of the entire mobility process** – from student selection to the recognition of ECTS credits
✓ **Online identification of students**, simplified and secure exchange of student data - including academic records - between Higher Education Institutions
✓ **Reduced administrative burden** associated with student mobility

→ It is all about **"service optimization" through digitalization – online services**

Services → Service provider

Success factors

- ✓ Vision of the European Commission: Towards a European Education Area
- ✓ The European Student Card Initiative (ESCI)
- ✓ European Charter for Higher Education (ECHE) of the Erasmus+ Program

→all about **Service optimization**

→a *classical* Digitalization Project

apply appropriate Practices for such a project

Success factors – do not re-invent the wheel

*A complex system that works is invariably found to have evolved from a simple system that worked. The inverse proposition also appears to be true: A **complex system designed from scratch never works and cannot be made to work**. You have to start over, beginning with a working simple system.*

Source: "John Gall's law" - from "Systemantics: How Systems Really Work and How They Fail" - 1975

- Digitalization Projects are complex enough, don't try to build everything from scratch

If I have seen further it is by standing on the shoulders of Giants.

Source: "Sir Isaac Newton letter to Robert Hooke dated 5 February 1675"

- We can build on fantastic existing technology and systems:
  - Directory-Systems (IDM) and Schema: eduPerson & SCHAC
  - Federated Authentication and Authorization Infrastructure (AAI) → eduGAIN   **eduGAIN**
  - Prior Work
    - MyAcademicID → European Student Identifier
    - InAcademia → online Student verification process

Success factors – Design Principals

- Implementing a virtual Campus ID, the following base line must be meet
  - ✓ Compliance: GDPR and other relevant laws
  - ✓ IT-Security best practices and state of the art implementations
  - ✓ UI/UX focusing on the **users** (not the Institutions)
    - ✓ Involve persons from all Stakeholders and Users
    - ✓ Students, Faculty, Staff, Alum, Affiliates
  - ✓ Accessibility
  - ✓ Sustainability
  - ✓ Vendor / technology neutrality → independency of HEIs
  - ✓ Costs

&

→ Establish a **compatible base line** for other use cases

Success factors – understand the critical points

- Stakeholder
  - Users
  - Higher Education Institutions
  - Service Providers (on and off campus + online)
- Provided Services
  - Requirements for service provision
  - Requirements for identity or entitlement verification
  - Security Requirements
- Involved Technology and Providers

<div align="center">

→ **Communication**

</div>

EUGLOH Unites More Than...

210,000
Students

23,000
Academic Staff

73
Faculties & Schools

450
Research Groups

15-20 % foreign students

40 % European citizens

60 % from other nations

Key Goals of EUGLOH

- Interdisciplinary Global Health programs across universities – striving **towards a joint European degree**

- **A vibrant, multicultural and inclusive inter-university campus**

- **Seamless mobility for students, staff and professionals – physical and virtual**

- Strong links between higher education, research and local socio-economic ecosystems to prepare young people for the jobs of tomorrow

- Empowering future generations to find solutions for Global Health challenges

EUGLOH WP5 Working Group Partners

Higher Education Institution Partners – involved IT

EUGLOH Consortium Partners

- Université Paris-Saclay (UPSaclay)
- Lund University (LU)
- Ludwig-Maximilians-Universität München (LMU)
- Universidade do Porto (UPorto)
- University of Szeged (USZ)

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- University of Alcalá (UAH)
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- Tromsø University - The Arctic University of Norway (UiT)

EUGLOH WP5 Working Group Partners

Service Providers

EUGLOH WP5 Working Group Partners

Technology Partners

EUGLOH WP5 Working Group Partners

In contact with essential Technology Providers for the future

Google   Apple

Success factors – Services

Higher Education Institutions should **provide services** to their **own (outgoing)** and **incoming students**

✓ **Identification and status verification / prove of entitlement**

✓ Electronic payment / cashless campus
  ✓ canteen, cafeteria and vending machines
  ✓ printer / scanner

✓ Library and learning spaces

✓ Access-Control
  ✓ Areas / buildings / rooms → also special services for disabled persons
  ✓ Single Sign On / 2FA / FIDO2
  ✓ Attendance check (check-in for exams, attendance at courses)

✓ Public transport

✓ Accommodation

✓ **Electronic Signature** of legal documents (→ eIDAS)

✓ *Discounts on cultural activities throughout the EU* → *Museums, theaters, cinemas, …*

Are Students the only service consumers?

→ **Analyze Users**

eID.AS

Success factors – understand the services

Types of services and their requirements

inner HEI services	On site Services	Discounts / Third party services (online & on site)
• Access to course material • Online course registration	• Library • canteen, cafeteria and vending machines • printer / scanner • Physical Access-Control → Areas / Buildings / Rooms • Attendance checks • Public Transport • Accommodation	• Affiliation / Scoped-Affiliation Verification • *Contracts and governmental Services → VISAs / registrations, …*

✓ **eduGAIN**
→ Login to the Campus-Management-System / Learning-Management-Systems

→A Campus Card / virtual Campus / Service Cards
→ *Legacy Identifiers*
→ *Offline Data → OSS / Physical Access Control*
→ *Cash on Card / Cash on Server*
→ *Open Loop vs Closed Loop*

✓ inAcademia
✓ Verification-App / Hardware for Cashing-Systems → to **verify status** of Campus Cards / virtual eID
✓ **eIDAS**

Trust Level and Identification Medium

high

- eIDAS
  - → in eID of EU Citizen
  - → provided by HEI for *foreign* Students

substantial

- Certificated based authentication
- FIDO 2
- Smart ID

normal

- Username / email + password
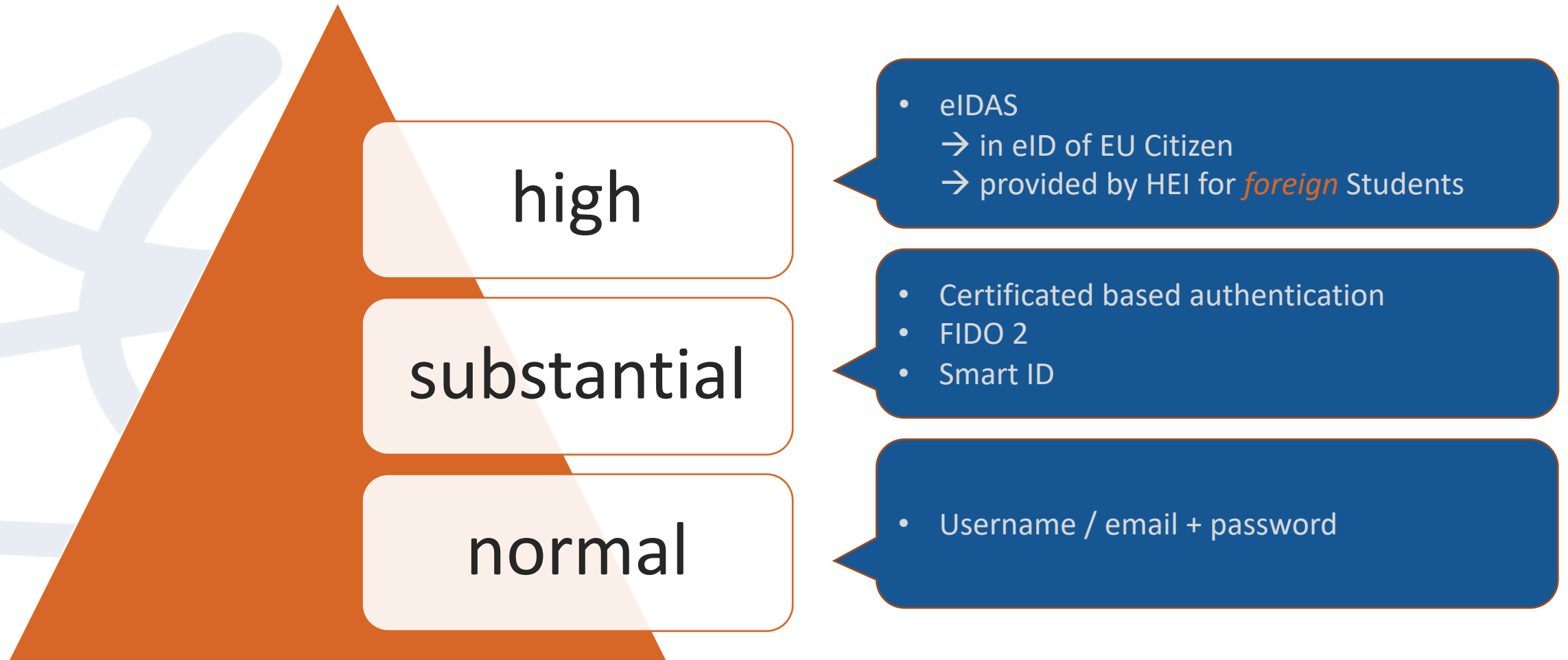
→ Any Security problems harms the full Framework of Trust

EUGLOH

Success factors - Stakeholders

Benefits of the European Student Card Initiative

For students:

→ Easy access to course materials prior to mobility, online course registration and automatic recognition of ECTS credits

→ **Immediate access to services at the host university, such as libraries, transport and accommodation**

→ **Discounts on cultural activities throughout the EU**

For Higher Education Institutions:

→ Easy, online management of the entire mobility process – from student selection to the recognition of ECTS credits

→ Online identification of students, simplified and secure exchange of student data - including academic records - between Higher Education Institutions

→ Reduced administrative burden associated with student mobility

→ Long- and short-term mobility

Service Providers

- On Campus
- Off Campus
- Just Online
- Existing legacy systems
- Different types of validation needed
  → prove entitlement
  → Identification
  → own data

Students → Users

eID

Service-Providers

HEIs
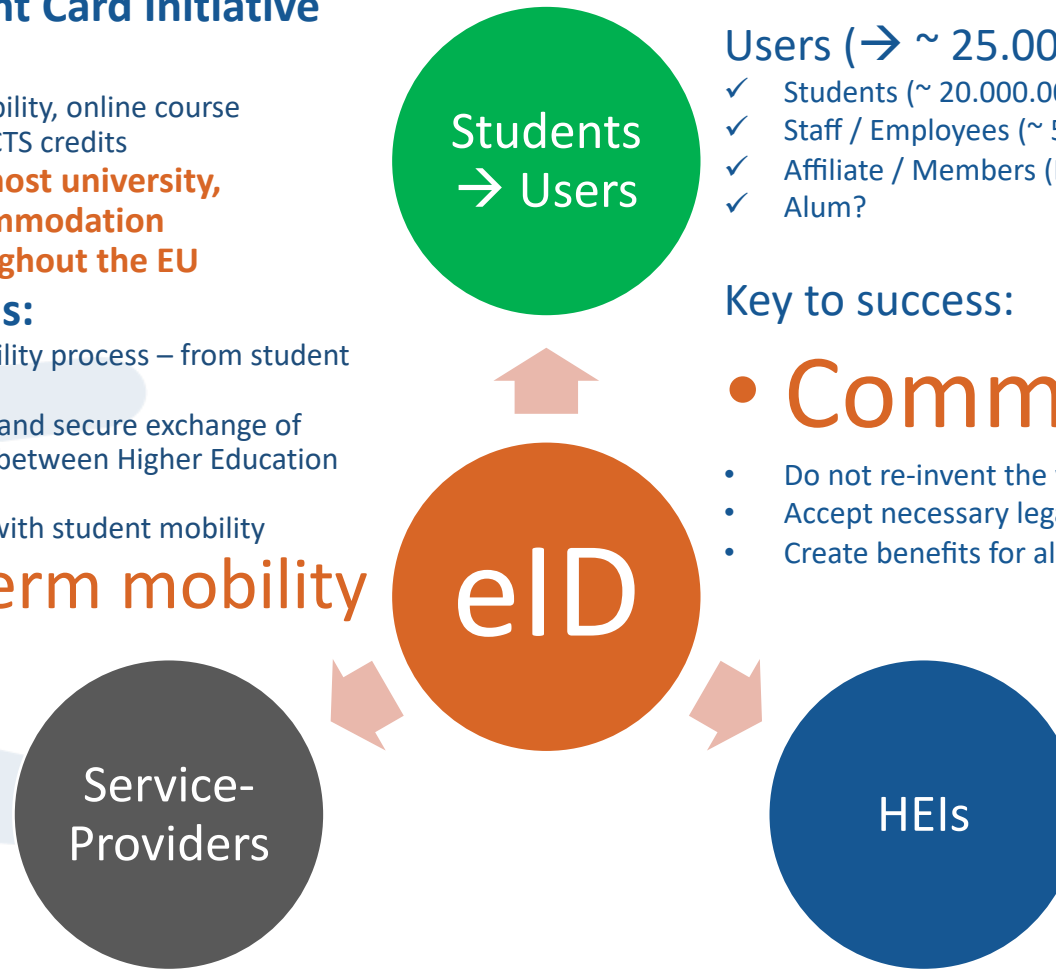
Users (→ ~ 25.000.000 – 200.000.000 Persons)

✓ Students (~ 20.000.000 Students)
✓ Staff / Employees (~ 5.000.000 Staff members)
✓ Affiliate / Members (Lecturers, Scholarship recipients, …)
✓ Alum?

Key to success:

- # Communication

- Do not re-invent the wheel
- Accept necessary legacy requirements
- Create benefits for all stakeholders

HEIs

- Host Institution
- Service Provider
- Identity Provider
- **Original Identity validation** ← Sovereign mandate

Success factors – Stakeholders – Users
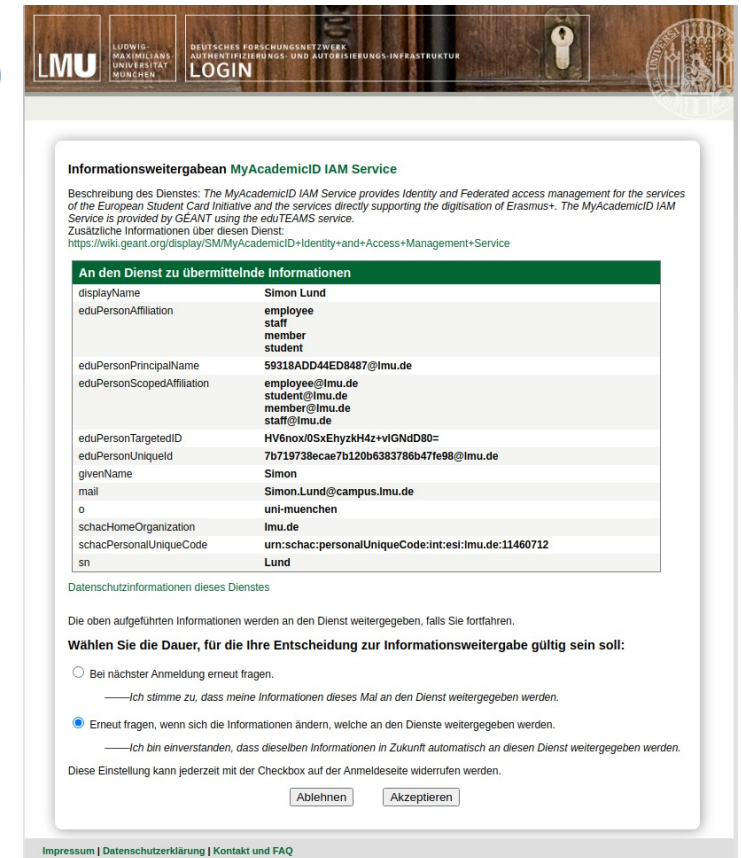
At Higher Education Institutions you have **persons**, with **different roles**
(taken from **eduPersonAffiliation / eduPersonScopedAffiliation** – RFC4512 definition – OID: *OID:*1.3.6.1.4.1.5923.1.1.1.1)

- **Student (ISCED – Levels 6 – 8;** but could also be applied to lower levels**)**
- **Faculty** (members of research and teaching → scientists and employed lectures)
- **Staff** (members of administration)
- Employee
- **Member** (is intended to include faculty, staff, student, and other persons with a full set of basic privileges that go with membership in the university community)
- Affiliate (e.g., lectures, volunteers, contractors, external auditors, guests)
- Alum
- ~~Library walk in~~ (used for electronic devices within library with privileged access to licensed content)

→ **7 Roles** to consider – most HEI also distinguish between levels within faculty members

→ A Person can have **multiple Roles** and the **same role in multiple Institutions**

→ **Services are provided to all persons and roles**
(maybe different privileges)

→ Faculty and Staff members are more often
on **short term mobility** than Students

Success factors – Users Expectations

- Don't stick to old technology if your user expects something modern

- Integration and Interoperability

- **Smartphone** is the essential working tool for younger generations

- Higher Education Institutions should provide credentials in modern ways

- **Student IDs / Campus IDs should be recognized and accepted anywhere**

✓ Be compliant

✓ Be Secure → implement IT-Security best practices

✓ Respect privacy

✓ Respect self sovereignty and decisions of users

Success factors – Benchmark

The ISIC+ITIC Cards (International Student / Teacher Identity Card)

Both
- ✓ physical medium (card)
- ✓ virtual medium (native Smartphone App) available

Provided Data:
- Higher Education Institution (Name)
- Name
- Photo
- Date of birth
- Signature (back)
- Validity

Accepted by third party service providers

→ **NO** ESC **equivalent** for a Staff / Faculty ID

Success factors – Enhanced Benchmark

✓ **Sustainable & Interoperable** Virtual eID on Mobile Devices in **Europe**, starting now!
✓ **Fulfil User Expectations**
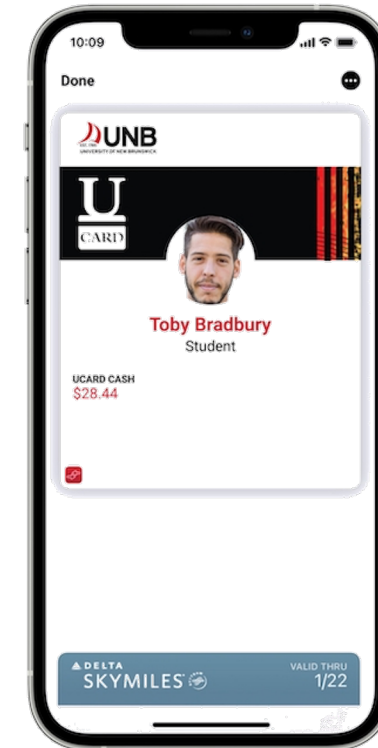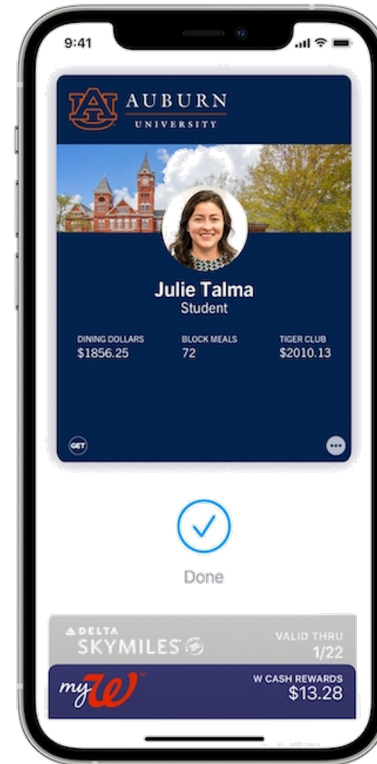
Success factors – technology and information

User and Role bind services → **Identity Management**

- Existing technologies:
  - Directory Services → LDAP (Protocol and Schema definitions)
- LDAP-Schema for Higher Education
  - **eduPerson** (V4.3 from 30. November 2021; V1.0 from December 2007)
  - SCHAC – SCHema for ACademia (V1.6.0-prposed from 24. March 2022 / V1.5.0 from 15. April 2015; V1.0 from May 2006)
  - SAML – Security Assertion Markup Language
- Essential **LDAP-Schema Attributes**:
  - eduPersonAffiliation / eduPersonScopedAffiliation → Roles
  - eduPersonEntitlement → Mapped Entitlements ← **Services provided**
  - eduPersonAssurance → Assurance Class of Data
  - schacHomeOrganization
  - schacPersonalUniqueCode → European Student Identifier
    - → additional Identifiers necessary
  - Paiwise Id → Pseudonym
  - Subject Id → Unique Person Identifier
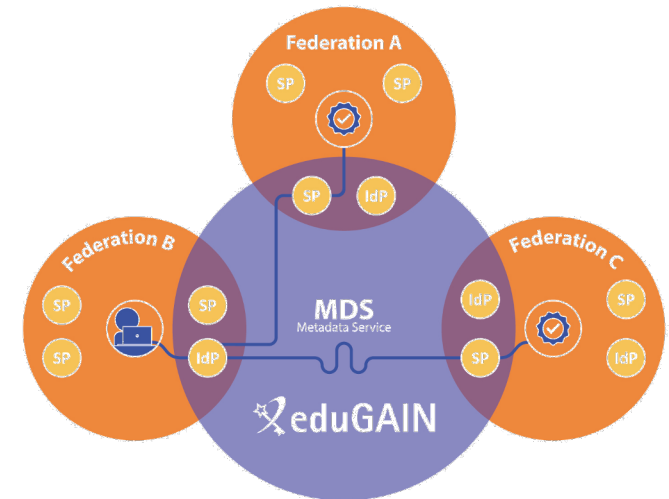
European Student Identifier

The European Student Identifier can take on one of two forms, depending on the qualifiers needed to make a given student code globally unique:

- **ESI with nation-wide (or region-wide) scope student code**

```
urn:schac:personalUniqueCode:int:esi:<country-code>:<code>
```

(for countries that support a national student identifier, e.g., France, Finland, Greece, Italy, Netherlands and Spain → University of Paris-Saclay case)
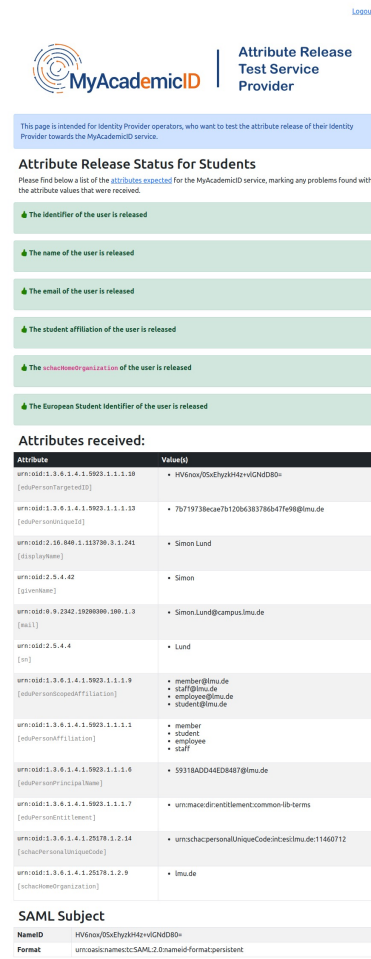
- **ESI with HEI-wide scope student code**

```
urn:schac:personalUniqueCode:int:esi:<sHO>:<code>
```

(for most countries that have institution level student identifiers, e.g., Portuguese/UPorto case, German/LMU Munich + HU Berlin case)

Géant recommends NRENs to enforce the adoption of ESI

→ **Additional schema scopes necessary for other roles**

https://myacademicid.devtest.eduteams.org/sp/

Federated Authentication and Authorization Infrastructure (AAI) Identity and Access Management

The MyAcademicID Identity and Access Management

- The MyAcademicID IAM Service is **provided by GÉANT** using the eduTEAMS service

- Provides Identity and Federated access management for the services of the European Student Card Initiative and the services directly supporting the digitization of Erasmus+

- Connected services: OLA, PHD Hub and Erasmus+ App, …

→ **From a virtual Identity back to an Identification Document**

→ *quick Affiliate / Entitlement validation on site*

→ HEI are about mass processes
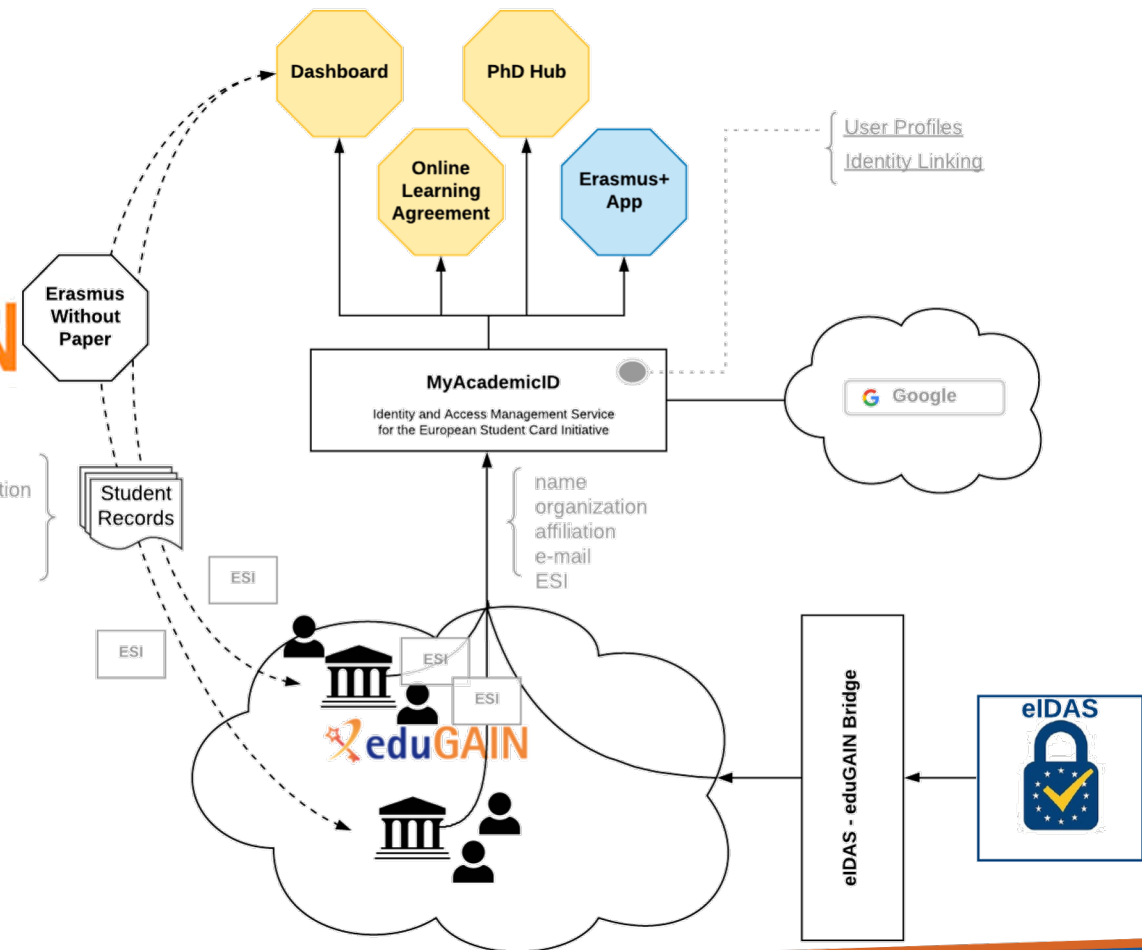
Available option for interoperability on medium side

Possible technological implementations:

1. Plain Card with Hologram (?)
2. Plain Card with Hologram + QR-Code (?)
3. Chip card (whith Hologram + QR-Code) (?)
   1. Chip card technology neutral
   2. Mifare DESfire chip card with App
   3. Multi-technology chip card with App
4. Smart card (with Hologram + QR-Code + App) (?)
5. Virtual eID (Smartphone) ✓
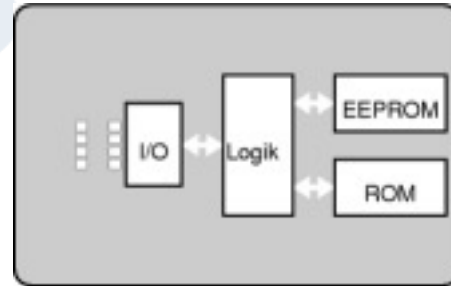
→ Costs are an essential point for decisions

→ Smartphones are cheap for HEIs

Available options for interoperability

Virtual eID on mobile devices
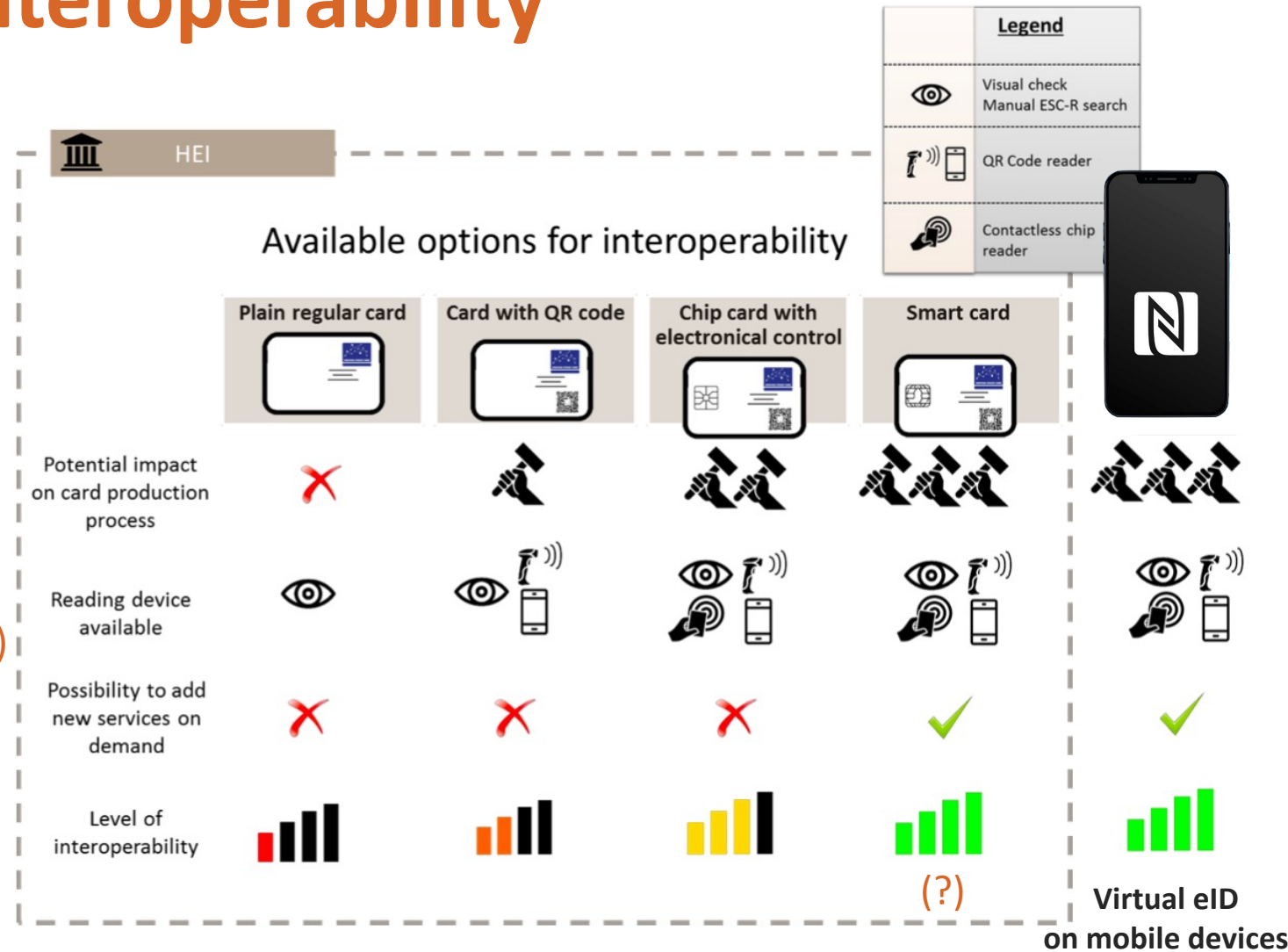
Interoperability on card side?

Chip cards → bind to one certain technology

- NXP Mifare DESfire

- Legic Advant

- HID iClass

- …

Smartcards → expensive

- JCOP
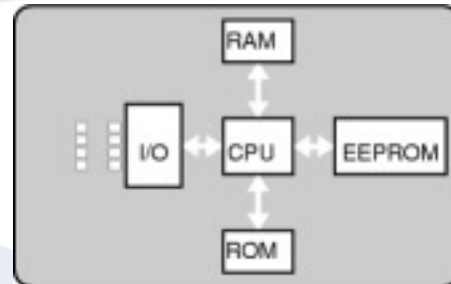
→ Plastic cards are not the solution, so…

✓ Sustainability

✓ Interoperability

Responsibility

Interoperability happens on the reader side

- Almost all readers in the market could read more than one standard (*maybe a firmware upgrade necessary*)

- QR-Codes are not considered a secure identification element

- NXP Mifare DESfire is currently the base line for being read everywhere
  → **Core Application / Card** is Mifare DESfire
  all other services could use their preferred technology

→ classic migration approach

Ok, but where to store my Virtual eID?

Again, do not reinvent the wheel

→ **Wallets**

European Commission, Funded Projects, SMEs
& HEIs, **listen**, **connect** & **communicate** with

- Each others
- Key players in the field
- Research Organizations

to achieve a common and better solution for EU!

Our Partners are making it possible

- Learning from us and at the same time, helping us to improve

→ *in a Smartphone Wallet it is not necessary to integrate all services into one card*

→ One Card for each Service

→ **Rely on technology providers, they know their ecosystem better**
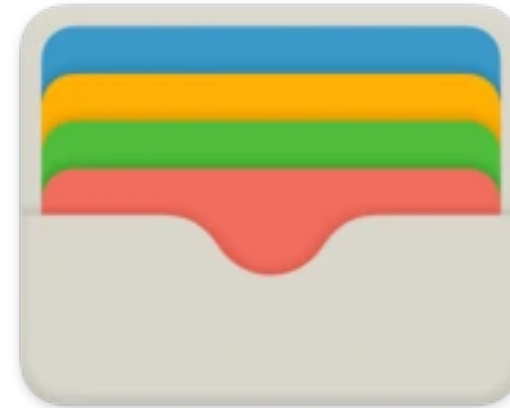
The future starts now

A Digitized Card Pilot for European HEIs

- First contributes for a better solution, not a final one → **concept phase**
- **Ongoing work** but already happening inside EUGLOH
  - Library use case at LMU Munich for Android & iOS
- EUGLOH is already collaborating with edssi² CEF Funded Project
- Upgrade now?
  - Soon… guaranteeing an enhanced solution
  - Be prepared and for now, avoid to invest in solutions that only work inside your HEI, Union, Alliance or Country
- Shall not forget
  - Business continuity for HEIs
  - Legacy equipment & systems
  - Co-existence with plastic cards

→ **There is a demo at the venue, you can test it**

Connect with EUGLOH WP5 Working Group Members at the showroom
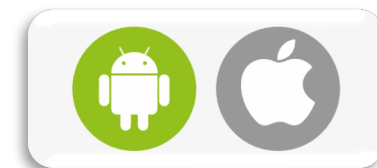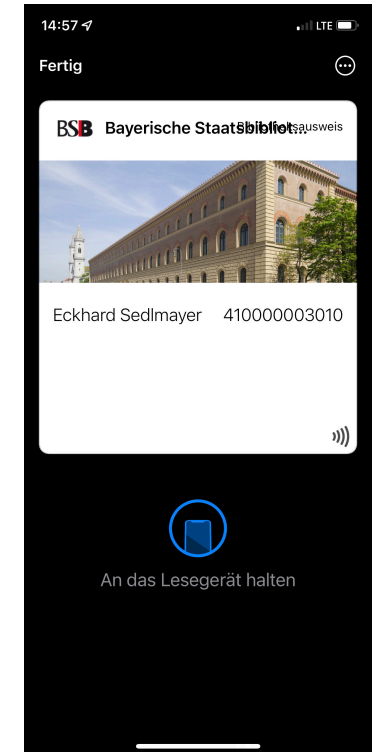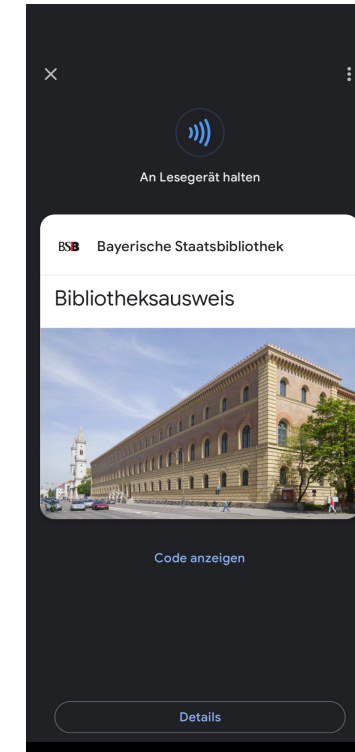
The future starts now

- Apply for your core card and add service cards on need

- A centralized listing of services that could be integrated into local / federated identity portals → API based

- Data propagation over eduGAIN Infrastructure

- **Users could look up new services on the fly**

- **Select / book services – self sovereignty**

- one central management of their identity data at their home institution

- Revocation mechanism for lost credentials

The future starts now

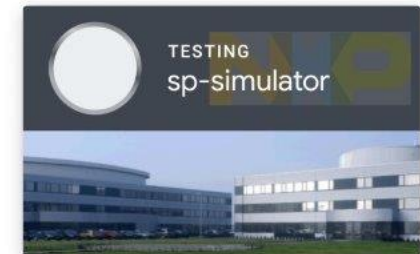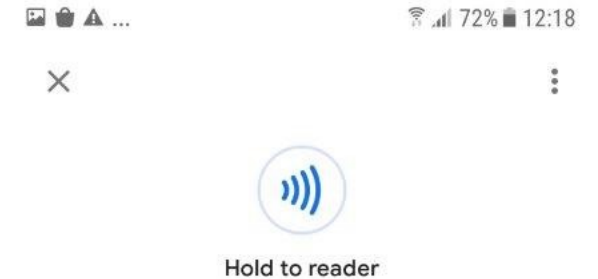Different approaches
Look of the presentations of our partners

→ MIFARE2GO – Mr. Senne James, NXP

→ Flexibility – security – scalability:
technology considerations for virtual cards
Mr. Felix Pütz, Legic Identsystem AG

→ Student IDs digitized on Android devices
Mr. Micheal Hill, Google

→ Whats Next in Campus Cards.
Mr. José Filipe Alves, UPorto
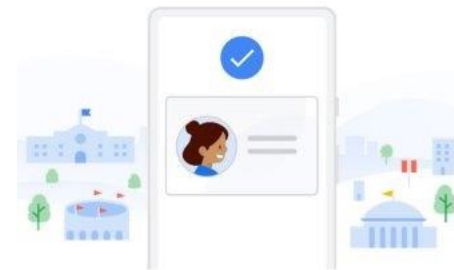
Invitation to the EUGLOH Annual Summit 2022

Next Steps

Continue the discussion and development of our concept and prototype implementation

➢ Discuss with the people from the International Offices which data are necessary for inner HEI services

➢ Discuss with users, their expectations and requirements

➢ Prepare communication materials

➢ Speak with the European Commission and relevant HEIs

➢ Participation of technology providers desired

We'd love to hear from you!

Get in touch:

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- José Filipe Alves (UPorto)
- Morgan Persson (LU)

Join us in Paris! &

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