EUGLOH

European University Alliance for Global Health

eduTAP

A Concept and System of Digital Identity Credentials for proximity on-site service access

Modern Campus ID (Student ID / Staff ID) for universities in Europe & the world

Alexander Loechel – FOREU4All-IT – Lightning-Talk – 2025-12-16 - online

Terms and Definitions

Interoperability *(Noun)*

- The ability of computer systems or software **to exchange** and **make use of information**.

Definition as of Oxford Languages

Credential *(Noun)*

- a qualification, achievement, quality, or aspect of a person's background, especially when used to indicate their **suitability** for something.

- a document proving a person's identity or qualifications.

Definition as of Oxford Languages

Short-term vs long-term mobility

Short-term mobility   long-term mobility

hours   days   weeks   month   2 month   3 month   a semester   full academic year   longer than a year

Terms and Definitions

Digital Credentials for Higher Education: TWO Digital Credential Verticals, ONE Wallet Environment

Long-Term Digital Credentials	**European Digital Identity Wallet (EUDI-Wallet)**	**Short-Term Digital Credential**

- Diplomas / Diploma Supplements
- Transcript of Records
- Micro-Credentials

- Container for Credentials
- Web-Wallet

- Student IDs
- Library-IDs
- Event-Tickets

→ *Digitization of Academic Proofs of Achievement*

→ DC4EU / EBSI / EDEH Interoperability Framework

→ *Digitize, **digitalize** and simplify administrative processes*

→ *Digitalization of Service Access*

→ European Student Card / **eduTAP**

Recognition of eduTAP @ Conferences

ECCA Conference 2025 LMU Munich, Germany   EUNIS Conference 2025 Belfast, UK → Elite Award
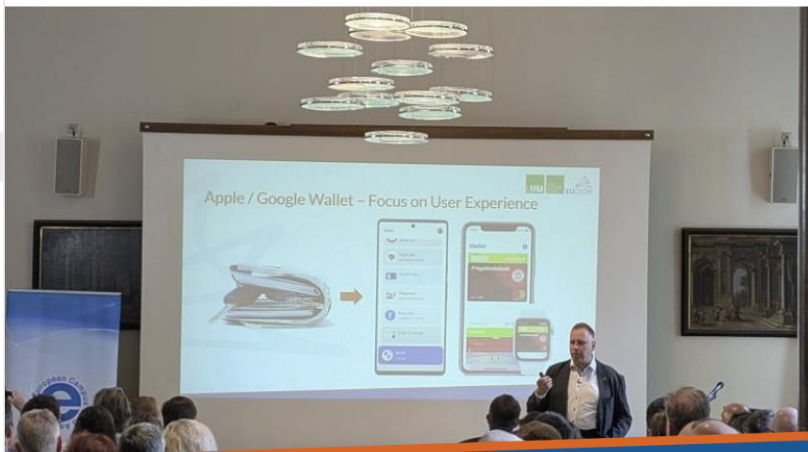
The European Student Card (ESC)

Background and 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

The European Student Card (ESC)

The **European Student Card** – a project to add a **European dimension** to local Student IDs

✓ Securely **validate** the **student status**
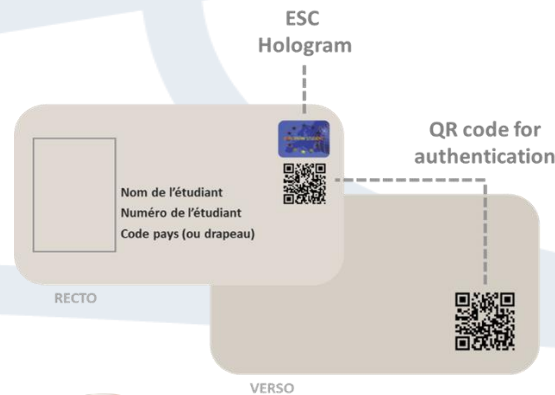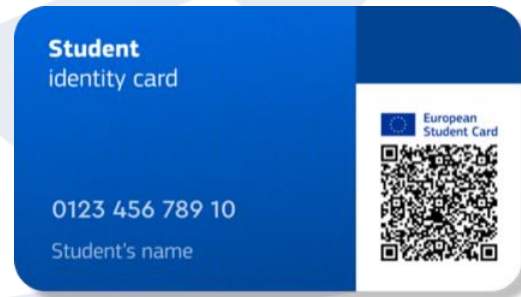
European Student Card logo

Combines the European identity (text & flag) with the QR code. It facilitates the implementation and recognition of the ESCs

ESCN - European Student Card Number

Unique card identifier that serves to link a specific card to the specific higher education institution who produced it and to identify a card

ESI - European Student Identifier

Unique identifier that allows to link a given student to a specific ESC. It is not recommended to be printed on the card.

ESC Hologram

QR code for authentication

Nom de l'étudiant
Numéro de l'étudiant
Code pays (ou drapeau)

RECTO

VERSO

Idea by →
Jean-Paul Roumegas
(les Crouse)

✓ A great vision

The European Student Card (ESC)

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

→ **European Student Card Project** as implementing instance

The European Student Card (ESC) - History

2012 – 2013
- Signing of a protocol of Intent
- Bilateral Franco-Italian agreement between:
  - Fondazione ENDISU
  - ANDISU,
  - les Crous

November 2013
- Exchange between the Cnous and the CPU on European Student Card

2016
- Institutional structuring at European level
  → Erasmus+ Strategic Partnership

2016 – 2018 → **European Student Card Project**

Base-line for technical specification

2019 – 2020 → **MyAcademicID Project**

2025 - Goal
- All European / Erasmus+ Higher Education Institutions offer their students a European Student Card

European Student Card

Oct. 2024 – New ESC
- New ESC-Router
- New Design
- QR-Code Mandatory

1   2   3   4   5   6   7   8   ...

December 2015
- Memorandum of Understanding
- Student Unions of 4 countries:
  - France
  - Germany
  - Ireland,
  - Italy
- Exchange within ECStA

2020 – 2022
- European Digital Student Service Infrastructure Project
- ESC-Tension Project – European Student Card Extension and Adoption

Idea by →
Jean-Paul Roumegas
(les Crouse)

→ sole focus: students

les Crous

Comité National de la Carte Étudiant et de ses Usages

FONDAZIONE ENDISU

Deutsches Studentenwerk
DER VERBAND DER STUDENTENWERKE

The European Student Card (ESC)

Basic concepts

The European Student Card (ESC) is a new standard created by European Higher Education Institution (HEI) **to promote student mobility within Europe** (EHEA zone).

→ The long-term objective is **to give all European Students the same rights as a local student** when travelling abroad.

So, the idea is to **create a card that can be accepted anywhere within Europe**. This card **gives access to an unlimited number of services** that students use in their daily life, such as borrowing book from university library, accessing student cafeteria with discounted prices, accessing university premises, using public transportation etc.

Short- and long-term perspectives

The first basic service to be set up is **student status authentication**. This service offers the possibility for any organization (private business, public administration, association, HEI…) to confirm whether a card holder is a student or not. **This service is a necessity because student status authentication is usually a prerequisite to give access to other services that are restricted to students**.

- **Other services will become available afterward**, such as:
    - The possibility to use the card as an **electronic wallet** for day-to-day expenses
    - The possibility to write new information on the card after it has been delivered, granting access to a wide range of new services for the student
    - The possibility of using the card as a **key** to allow **exchange of data between HEIs**, to facilitate administrative procedures during student mobility
- **Dematerialisation of the card itself**, using a smartphone

→ Interoperability

The European Student Card (ESC)

ESCI – ECHE requirements for HEIs: „Implement the priorities of the Program:

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

- …"

Source: https://ec.europa.eu/info/funding-tenders/opportunities/docs/cap/eplus2020/eche-fp-2020/1877638-charter-annotated-guidelines-feb2020_en.pdf

Timeline – European Student Card Initiative (ESCI)

- Erasmus Without Papers (EWP)
  - 2021 – Online Learning Agreements (OLA)
  - 2022 – Inter-Institutional Agreements (IIAs)
  - 2023 – Exchange Student Nominations, Acceptances, Transcripts of Records
- MyAcademicID
  - 2022 – European Student Identifier (ESI)
- European Student Card Project (ESC)
  - **2025 – Implement and Issue European Student Cards** ← **2020 Plan → postponed**

The European Student Card (ESC)
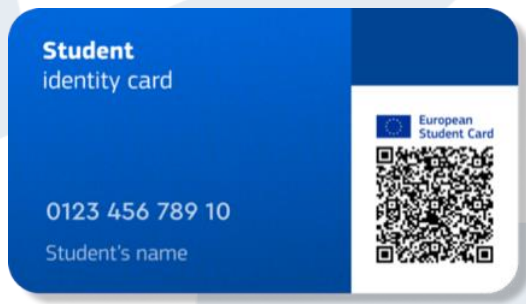
Seamless access to physical and digital services
while on mobility, e.g. Library, Public Transport, Physical Access

One Credential to rule them all?

With a QR-Code or a verifiable credential?

→ not realistic
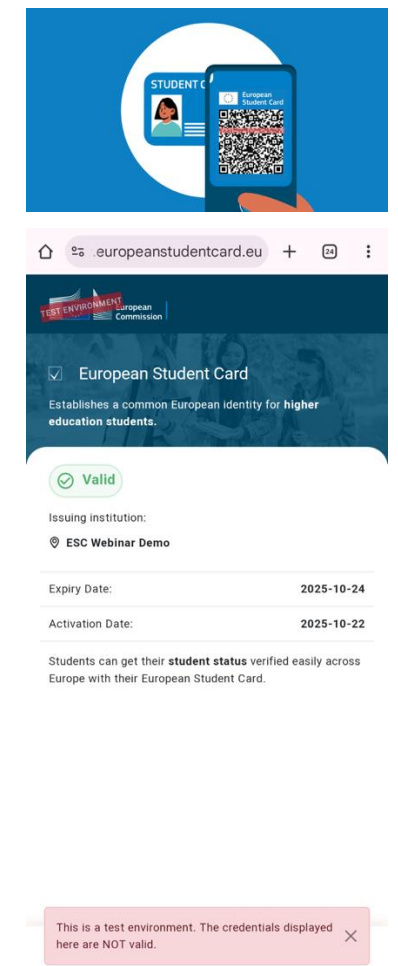
The European Student Card (ESC)

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

→ The European Student Card Vision can not be solved top-down
   with the current technical specification and implementation

→ A new approach is required, based on existing, proven technologies, and a simple working system

9 Universities, 1 Goal

Building Europe's Campus for Global Health

➤ Equipping students and staff with the skills needed to shape the future of global health

➤ Creating a **seamless, inclusive European campus** that enables **mobility**, joint learning opportunities, and **shared infrastructure**

➤ Addressing pressing health issues through interdisciplinary, co-created education, research and innovation that engages with social needs

338,500 Students

54,000 Academic Staff

112 Faculties & Schools

15-20 % foreign students
40 % European citizens
60 % from other nations
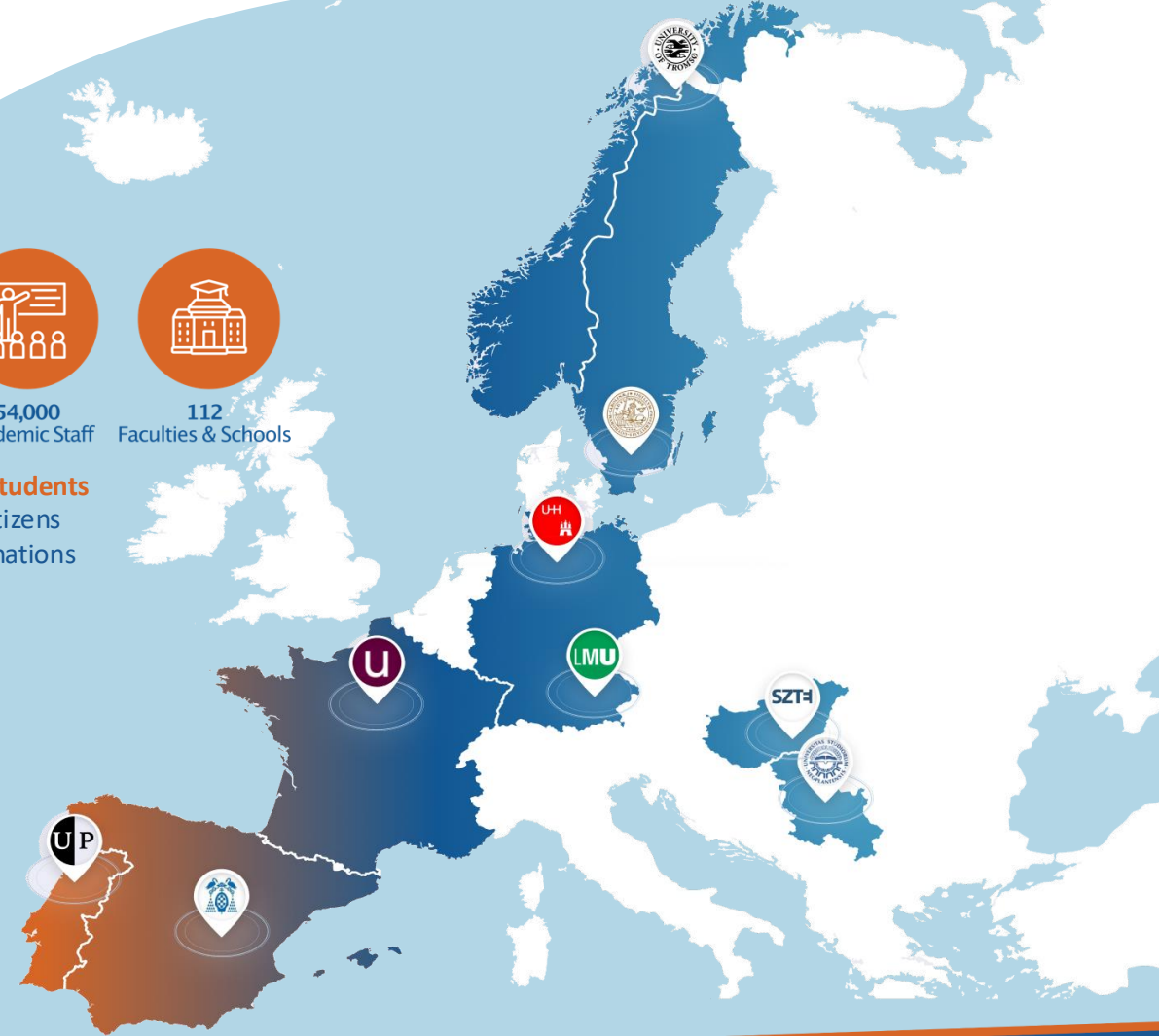
LMUcard + European Student Card (ESC)
LMU as an international university
International Partners and the European University Alliance

Strategic partnerships

- LMU-Bordeaux Research Cooperation Program
- Cambridge LMU Strategic Partnership
- LMU-China Academic Network (LMU-ChAN)
- LMU-NYU Research Cooperation Program
- LMU-TAU Research Cooperation Program
- LMU-Todai Cooperation in the Sciences
- LMU-UCB Research in the Humanities

Global collaborations

- LMU - China Scholarship Council (CSC) Program
- LMU-Harvard Young Scientists' Forum
- LMU's Latin America Network
- Venice International University

International alliances

- League of European Research Universities (LERU)
- European University Association (EUA)
- Europaeum

EU projects – The European University Alliances

European University Alliance for Global Health (EUGLOH)

Infinity partners → infinity stakeholders → infinity systems

EUGLOH campus cards
state and connected services

→ **Vision:**

All university members should be able to use services of host university while on visit → easy and contactless

→ ~~**Interoperability**~~

Status of four core members (IT wise - 2020)

Ludwig-Maximilians-Universität München

- Legic CTC Cards (Legic Advant + Prime)
- Payment (Studierendenwerk München)
- Cloud-Printing and Scanning (Secure-Printing and Payment)
- Library
- Ticket for Public Transport System

Université Paris-Saclay

- NXP Mifare DESfire Cards
- Payment (izly – les Crous)
- Library
- Physical Access Control

Lunds universitet

- NXP Mifare Classic Cards
- Physical Access Control (online and offline)
- Login at copiers (for copy/print/scan)
- Library
- Several other services, but not any payment services

Universidade do Porto

- NXP Mifare Classic Cards / Java Cards with Mifare Classic emulation
- Library
- Physical Access Control
- Canteen & cafeterias
- Printing Service
- Attendance

All contactless, but
Not compatible technologies

A shared vision – seamless mobility

EUGLOH & the European Student Card have a shared vision

✓ **Seamless mobility**

✓ **Easy service access**

For:
✓ students,
✓ staff and
✓ professionals

EUGLOH ESC Working Group formed end of 2020:

All EUGLOH universities should adopt ESC and define services to share (Lead Paris-Saclay).

2022 LMU took over the technical lead

But differ in the audience and baseline technical requirements → real **technical interoperability**

EUGLOH & ESC – a shared vision and ambitions

We have a shared vision: seamless mobility & easy service access

But an ESC QR-Code was no option for us (GDPR & IT-Security wise), the long-term perspective a digital smartphone pass looked fascinating

→ a great vision

EUGLOH wanted to share their services across the alliance, and beyond (as we all have more partners)

The IT-Persons from LMU, U.Porto and Lund already knew each other → we met at ECCA 2019
- ✓ **understand the technological possibilities**,
- ✓ knew and **understand** the topics, have access to major technology providers
- ✓ but also, the capabilities of the ESC Project team

→ *If we want a good and **interoperable solution** in the near future, we must come up with a working proposal*

→ *That meets our requirements and audience (students, staff and professionals)*

Campus Cards are about Accessing Services

Identification
- **Identification**
- **Status verification**
- **Proof of entitlement**
- Single Sign On / 2FA / FIDO2
- Attendance check
  - *Check-in for exams*
  - *attendance at courses*
  - *Time recording*
- Electronic Signature
  (*of legal documents*)

Electronic payment / cashless campus
- Canteen & cafeterias
- Vending machines
- Printing / scanning
  (*secure & follow me printing*)
- Ticketing
  (*events and conferences*)

Physical Access Control
- Areas (*campus, parking lot*)
- Buildings
- Rooms
  - Classrooms
  - Labs
  - Computer rooms
  - Learning spaces
  - Offices
  - Accommodation facilities (*i.e., dorms*)
- Athletic facilities

Library services
- Access to / borrow
  - Physical media (book, audio and video media)
  - E-media (book, audio and video media)
- Learning spaces

Transport
- On campus services (*university shuttle service*)
- Public transport tickets & discounts

Discount and promotions
- **Discounts** on cultural activities
  - Museums
  - theaters
  - cinemas
- Shops
- Restaurants

On- & Off-Campus → **On-Site Usage / Proximity Use-Cases** + Online Services

providing service → create benefits

Campus Cards from a User Experience Point of View

Campus Cards (Student IDs / Staff IDs / Affiliate IDs) function as:

- **Official** (visual) **Identity Documents** and for university branding

- Primary medium for **Service Access** on-site → **proximity use-cases**

- Service Domains:
  - On-Campus
    - **Identification** and attendance tracking (courses, internships, exams)
    - **Payment** (open loop or closed loop payment) and discounts eligibility
    - **Physical Access Control** (buildings, labs, dorms)
    - **Library Services**
    - on-campus & public **Transport** integration (regional semester ticket models)
  - Off-Campus (Museums, theaters, shops, restaurants, ...)
    - **Status-based Identification** for third-party services
    - **Eligibility Verification** (e.g., student status, age-based discounts)

Campus Cards are about Accessing Services

The Service Domains

- Payment / Cashless Campus,

- Physical Access Control ,

- Library services,

- Transport

are "**LOCAL**" services, which only needs to be solved on a local level

✓ Separate service passes can choose best fitting technology

Educational role system (from eduPerson)

✓ Services are provided to **ALL** persons (not only one role, e.g., students)

→ Student IDs / Staff IDs are **legally limited** to enrolled / employed members of a Higher Education Institution (HEI)

→ Dedicated service passes can be legally issued to not enrolled / employed persons ← Users of the service

Think outside the card: Medium → Services

Identification
- Identification
- Status verification
- Proof of entitlement
- Single Sign On / 2FA / FIDO2
- Attendance check
  - *Check-in for exams*
  - *attendance at courses*
  - *Time recording*
- Electronic Signature
  (of legal documents)

Electronic Payment / cashless campus
- Canteen & cafeterias
- Vending machines
- Printing / ... *(secure & fo...)*
- Ticketing *(secure & fo...)*

Physical Access Control
- Areas *(campus, parking lot)*
- Buildings
- Rooms
- ...

Library services
- Access to / borrow
  - Physical media (book, ...)
  - E-media (book, audio and ...)

Transport
- On campus services *(university shuttle service)*
- Special case of "Proof of entitlement"
- ...port tickets
- ... of "discount"

Discount and promotions
- Discounts on cultural activities
  - Museums
  - theaters
  - cinemas
- Shops
- Restaurants
- → Special case of "Identification" / "Status verification" / "Proof of entitlement"

Separate Service Passes
- Local Services
- Each service is associated with a distinct pass
- Providers can choose appropriate technology per pass

→ Working solutions by solutions providers

A **Common ID** pass
for all HEIs
(ISO/IEC 18013-5 based)
→ **Identity Pass**

eID.AS

providing service → create benefits

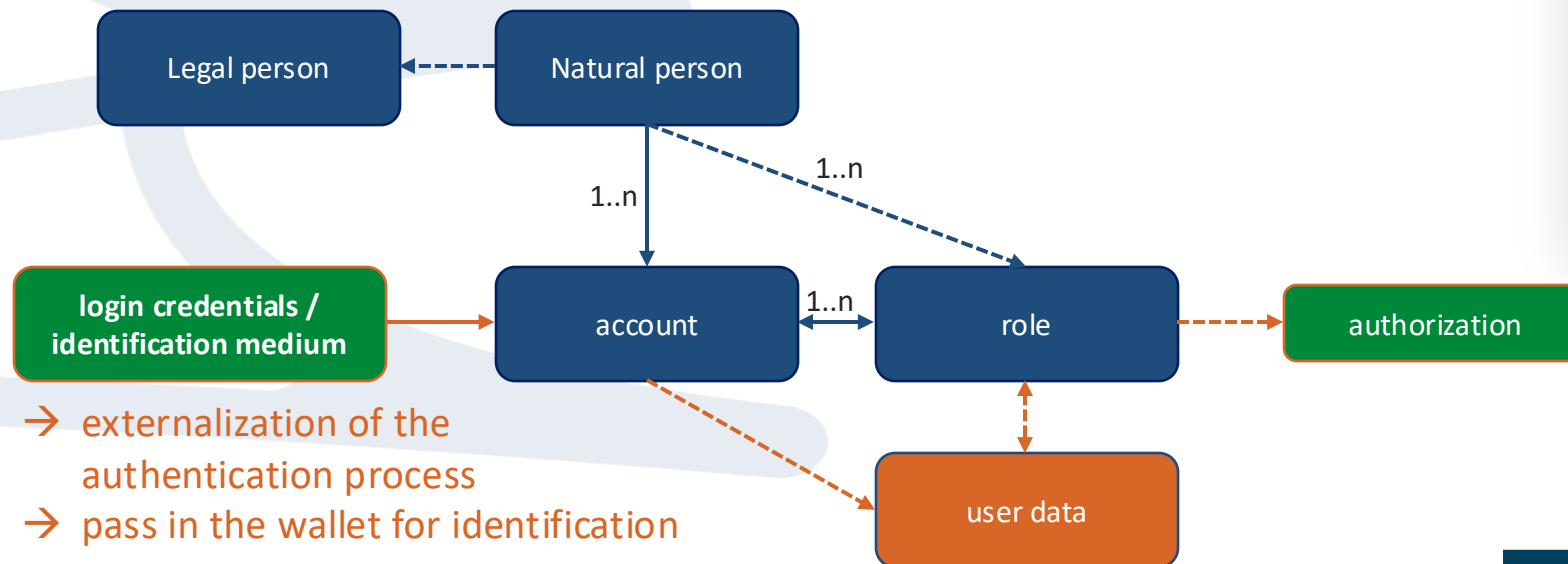# Key to all Services → Identification / Authentication

- Triple-A-System
  - (Identification)
  - ## Authentication
  - **Authorization**
  - **Accounting**

- **On-site services access** is about proving your entitlements and identity

- "*something you know*" as an authentication method for on-site service access is not very efficient, best a combination of "*something we have*" + "*something we are*" → **Medium**: Smartphone **Wallet Passes** + authentication via biometrics

- We already have a powerful IDM System for **online-services** → **Shibboleth** → **eduGAIN-AAI**

Authentication Factors

Something you KNOW
- Password PIN

Something you HAVE
- Chip card
- Token
- Smartphone

Something you ARE
- Biometrics
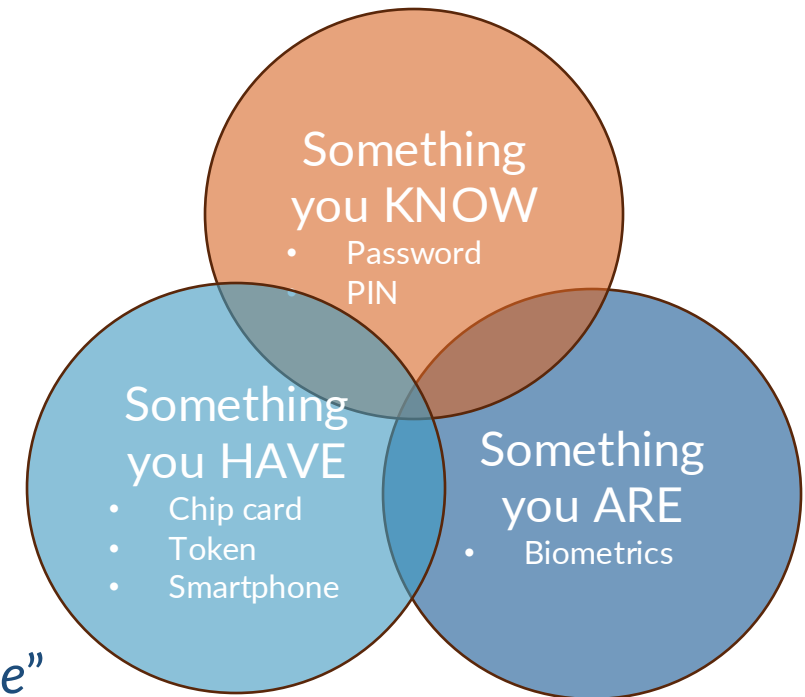
Identity Linking → from eduGAIN to eduTAP

- Utilization of decentralized / federated Authentication and Authorization Infrastructure
  - Online - fewer individual login credentials → higher assurance levels
  - Bridging online identity to mobile credentials for reliable and trustworthy on-site service access → service-oriented + interoperability-oriented
  - Focus on Flow of data
  - The medium **Wallet Pass** as an extension of a **Digital Identity**

→ externalization of the authentication process
→ pass in the wallet for identification

Identification / Authentication for Service Access

- ✓ **Interoperability happens on the reader side** → contactless communication protocols are better than visual codes

- ✓ 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 (especially with an URL as content)

→ It is all about User Experience

EUGLOH

European University Alliance for Global Health

eduTAP

https://eduTAP.eu

*Modern Campus ID (Student ID / Staff ID)
for universities in Europe & the world*

Concept of eduTAP

User Experience is key

eduTAP ist about **Service Access** on site (on and off campus)

- For Member of the Higher Education Institution
- For incoming members of other Higher Education Institutions / Partners ← Mobility (short- and long-term)

For the Person **User Experience** is key, it should be as easy and simple as possible

- Benchmark Examples
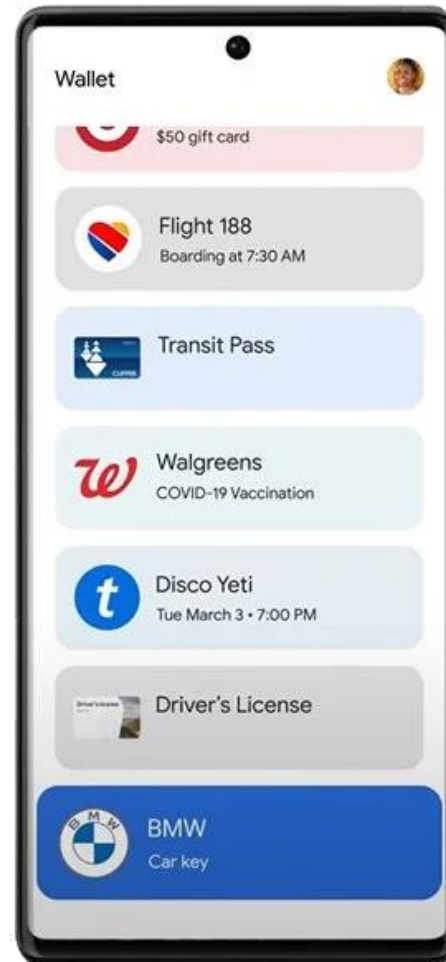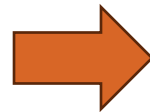
WLAN Access   Login to Online Services

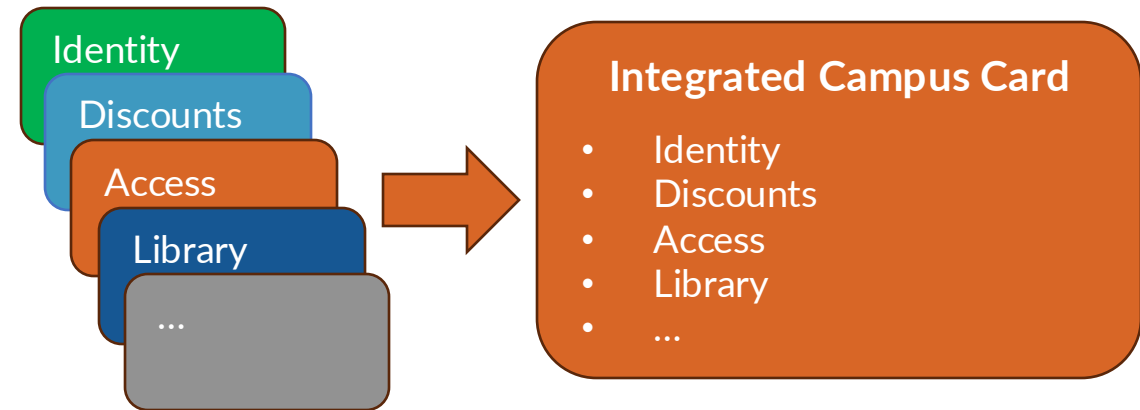→ To access services on site it should be as easy as using the WLAN with eduroam

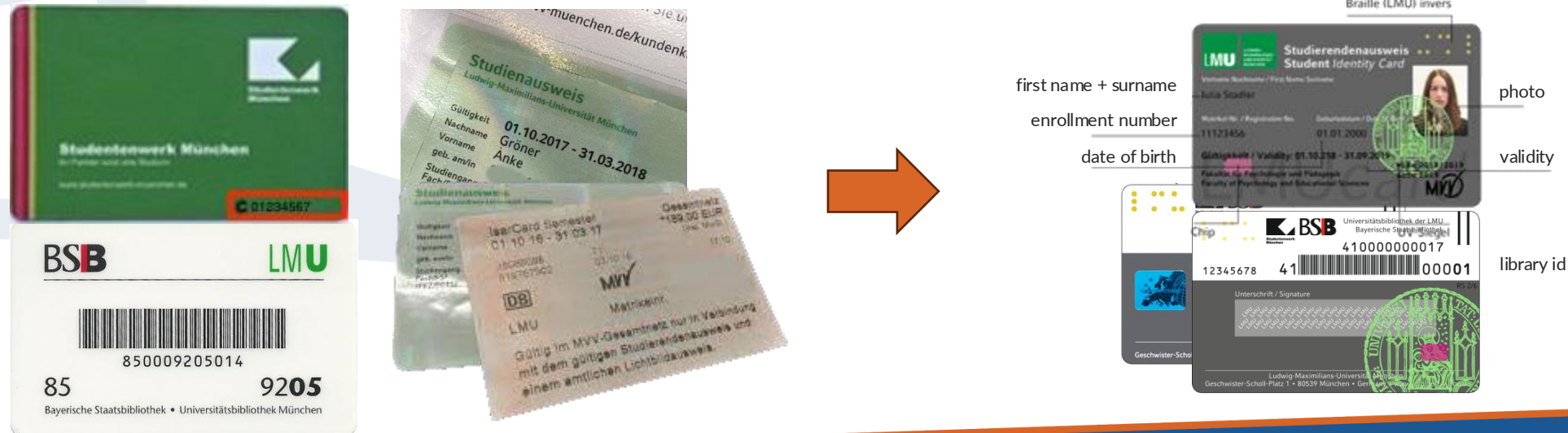# Apple / Google Wallet – Focus on User Experience

Campus Cards from a User Experience Point of View

User preferences for **Physical Wallets**:

✓ Less cards are better

✓ **Contactless** cards are better

Identity
Discounts
Access
Library
...

Integrated Campus Card

- Identity
- Discounts
- Access
- Library
- ...

Example LMU 2015 – Transition from multiple cards into **ONE** integrated Campus Card

first name + surname

enrollment number

date of birth

Braille (LMU) invers

photo

validity

library id

Campus Cards from a User Experience Point of View

User preferences for **Smartphone Wallets:**

✓ NFC / Contactless passes are better than scanning visual codes

✓ **One pass per service** is better

➢ User control over which services to use

➢ Auto-Presentment of pass needed

➢ Clear contextual communication
   (additional information on pass
    specific for the service,
    specific branding of service)

Integrated Campus Card

- Identity
- Discounts
- Access
- Library
- …

Identity
Discounts
Access
Library
…

divide and conquer
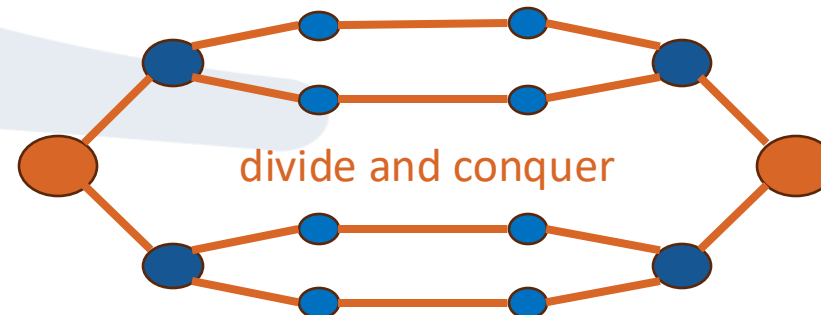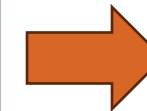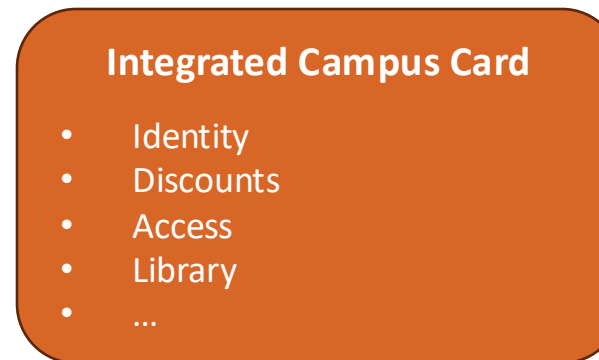
Digitizing cards **vs.** Leveraging the possibilities of smart devices → Stages of Digitalization – Period of Digital transformation

Digitalization 1.0

- Digitization – create digital versions of analog documents

→ Digitization vs. Digitalization (machine readable content / payload)

Digitalization 2.0

- Digitalization with internal focus
- Optimize internal administrative processes – **organization centric optimizations**
- Processing of data

→ Digital transformation (a hard shift)

Digitalization 3.0

- Digitalization with focus on the user – **user centric optimizations**
- Optimization on how services are discovered and seamlessly used
- Flow of data

→ Service-oriented
→ **Digital identity**
→ Interoperability
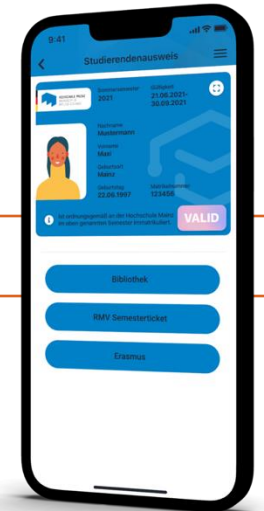
→ User Experience

eduTAP – educational tapping

TAP TO PAY

tap to ...

- ✓ identify yourself,
- ✓ verify your status,
- ✓ proof your entitlement,
- ✓ claim a discount,

tap to access a service on-site directly:

- ✓ tap to pay (open and close loop-payments),
- ✓ tap to open a door,
- ✓ tap to lend a book,
- ✓ tap to take a campus shuttle.

no app, just tap!

https://eduTAP.eu

User Experience is key

eduTAP ist about **Service Access** on site (on and off campus)

- For Member of the Higher Education Institution

- For incoming members of other Higher Education Institutions / Partners ← Mobility (short- and long-term)

For the Person **User Experience** is key, it should be as easy and simple as possible

WLAN Access

Login to Online Services

Authentication to physical (on-site) services

→ To access services on site it should be as easy as using the WLAN with eduroam

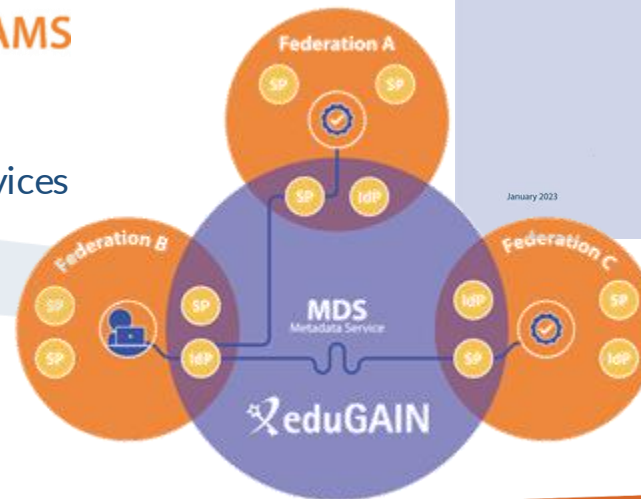# GÉANT – The IT provider for Higher Education in Europe

The GÉANT Association is the collaboration of European National Research and Education Networks (NRENs)

- Non-Profit Organization

- Service-Provider for IT / e-Infrastructure services for the European Higher Education Sector

- Pan European – Non EU members

- Key Services:
  - **GÉANT Trust & Identity Services**

    eduGAIN   eduTEAMS

    eduroam   (InAcademia ONLINE STUDENT VALIDATION)

  - GÉANT Network and Connectivity Services
  - GÉANT Security Services
  - GÉANT Cloud Services
  - Procurement Agency for EU-HEIs

GÉANT membership

NATIONAL MEMBERS
1 per country

REPRESENTATIVE MEMBER
NORDUnet

ASSOCIATES
CERN
DeIC (Denmark)
European Space Agency
CSC/FUNET (Finland)
RHnet (Iceland)
KREN (Kosovo Research and Education)
SUNET (Sweden)
Sikt (Norway)

January 2023

→ eduTAP is a perfect fit for GÉANT Trust & Identity Services

eduTAP – educational tapping – What is eduTAP?

- eduTAP the concept
  - Splitting integrated campus cards into **dedicated service passes** and a **harmonized identity pass**
  - Leveraging the full potential of digital wallets
  - **Use existing**, secure and proven contactless **standards** – do not invent new standards

→ Focus on **User Experience** and **interoperability**

- eduTAP the software – to enable HEIs and Service Providers to:
  - create, issue, and manage passes within the smart device wallet
  - interact with wallet passes to give access to services, identify,
    and verify the status of students and staff members

→ **eduTAP** helps to fulfill the
great vision of the European Student Card
and enables interoperability and a better user experience

EUGLOH

European University Alliance for Global Health

edu**TAP**

https://eduTAP.eu

*Modern Campus ID (Student ID / Staff ID)
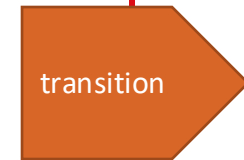for universities in Europe & the world*

*Concept of edu**TAP***

www.eugloh.eu

The LMU Student ID (over time)

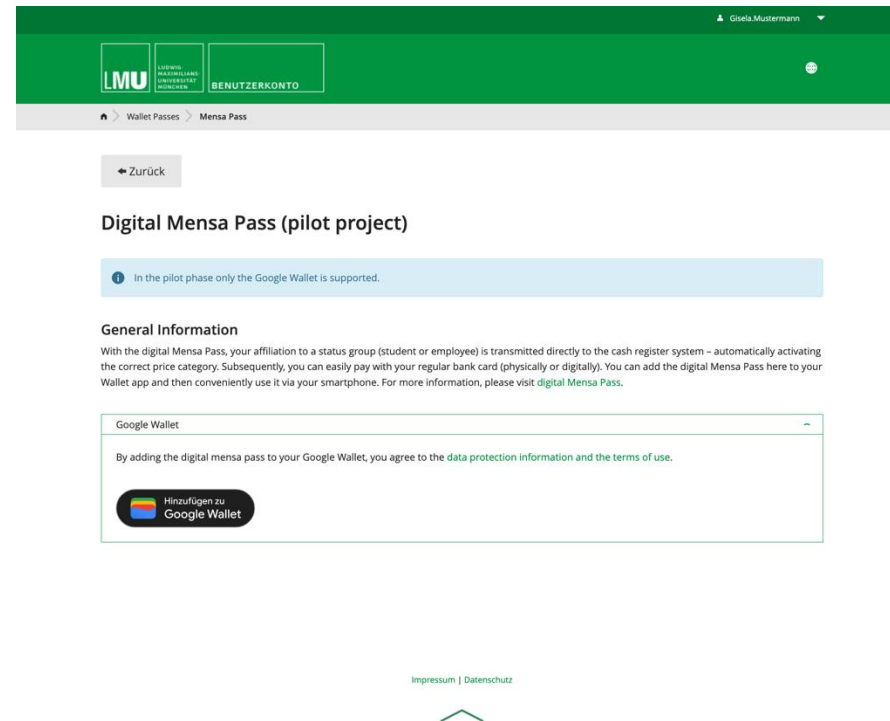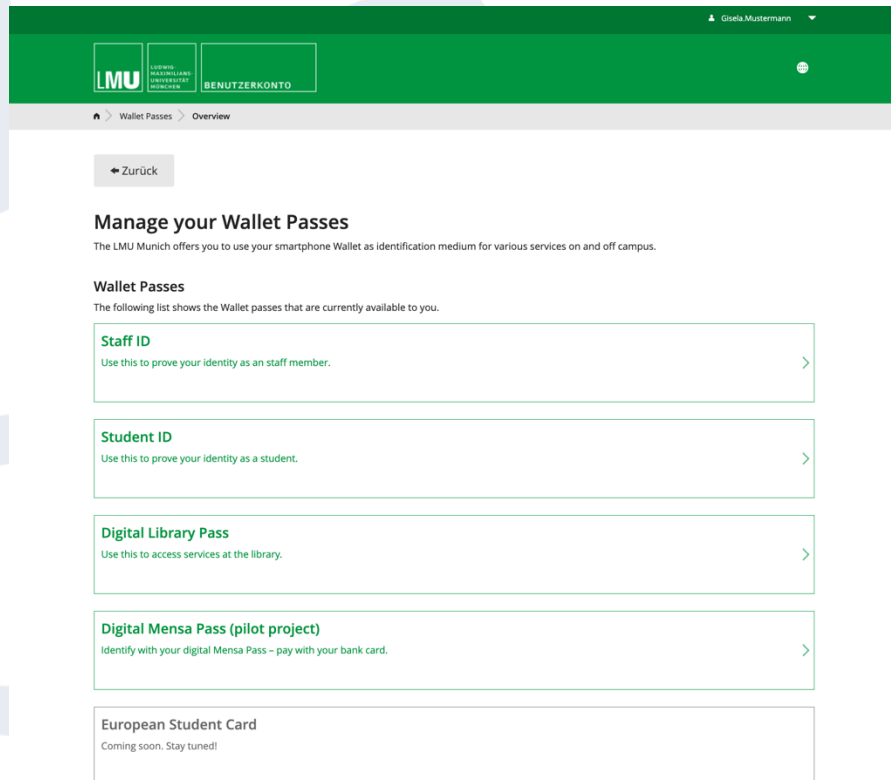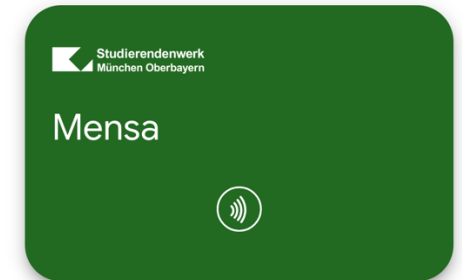# Transition of credentials into the Smartphone Wallets
Examples: LMU Munich Benutzerkonto – Central Pass Portal for HEI member

Left screen:

Gisela.Mustermann

🏠 Wallet Passes › Overview

← Zurück

Manage your Wallet Passes
The LMU Munich offers you to use your smartphone Wallet as identification medium for various services on and off campus.

Wallet Passes
The following list shows the Wallet passes that are currently available to you.

Staff ID
Use this to prove your identity as an staff member. ›

Student ID
Use this to prove your identity as a student. ›

Digital Library Pass
Use this to access services at the library. ›

Digital Mensa Pass (pilot project)
Identify with your digital Mensa Pass – pay with your bank card. ›

European Student Card
Coming soon. Stay tuned!

Impressum | Datenschutz

Middle screen:

Gisela.Mustermann

🏠 Wallet Passes › Mensa Pass

← Zurück

Digital Mensa Pass (pilot project)

ℹ In the pilot phase only the Google Wallet is supported.

General Information
With the digital Mensa Pass, your affiliation to a status group (student or employee) is transmitted directly to the cash register system – automatically activating the correct price category. Subsequently, you can easily pay with your regular bank card (physically or digitally). You can add the digital Mensa Pass here to your Wallet app and then conveniently use it via your smartphone. For more information, please visit digital Mensa Pass.

Google Wallet

By adding the digital mensa pass to your Google Wallet, you agree to the data protection information and the terms of use.

Hinzufügen zu Google Wallet

Impressum | Datenschutz

Right screen:

Add loyalty card

Studierendenwerk München Oberbayern

Mensa

After adding your loyalty card to Wallet, you'll see your point balance and loyalty benefits in places like Maps, Shopping, and more. You can turn this off in Google Wallet passes data or on an individual pass in the Google Wallet app.

Pass providers can automatically add related passes, promotions, offers and more to your existing passes which can be controlled on your device in Wallet settings.

Terms and Privacy Policy

Add

→ Plan to have all pass types online at LMU in the summer semester 2026 mostly design questions and information on the back are discussed

Transition of credentials into the Smartphone Wallets
LMU Student ID

The new **LMU Student ID** in the Wallet

✓ will come operational in summer semester 2025 (optional to LMUcard)

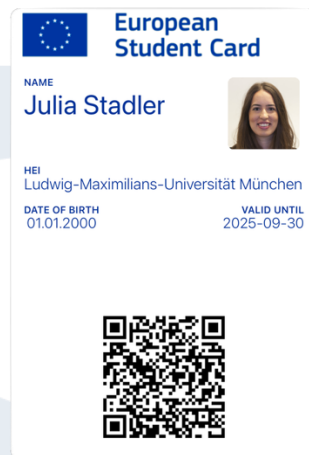✓ for summer semester 2027 either physical LMUcard or wallet ID

Google

Apple

more wallets to come

Transition of credentials into the Smartphone Wallets
The European Student Card
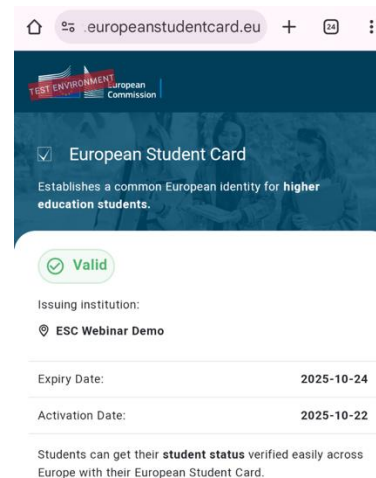
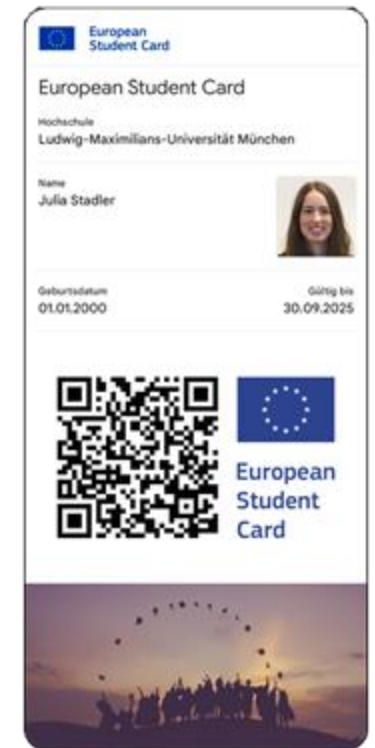The European Student Card (v1.1 new ESC Design)   (v1.5)

Google   Apple

- ✓ Discounts off-campus
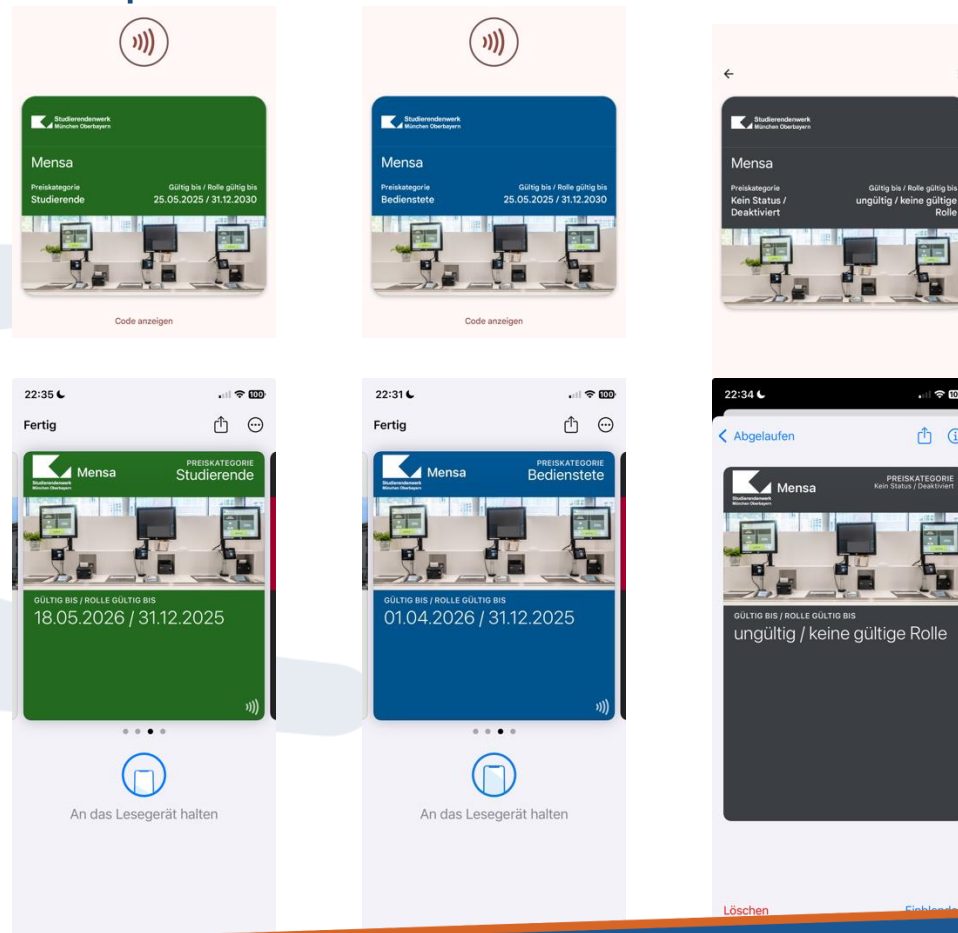- ✓ European dimension → Erasmus+ marketing
- ✓ Online status verification

Discount-Pass for Mensa
Studierendenwerk München Oberbayern

Eligibility verification for discounts with the Apple / Google Wallet via NFC, payment with an Open-Loop Bank / Credit-Card

Google Wallet
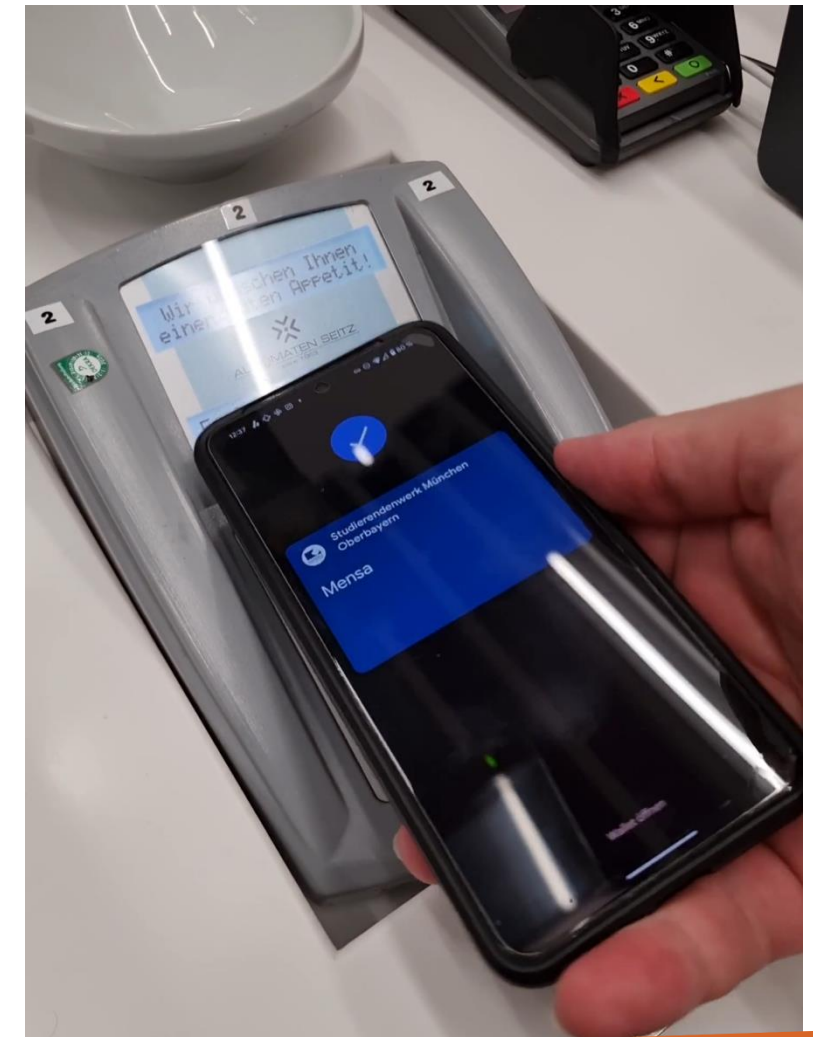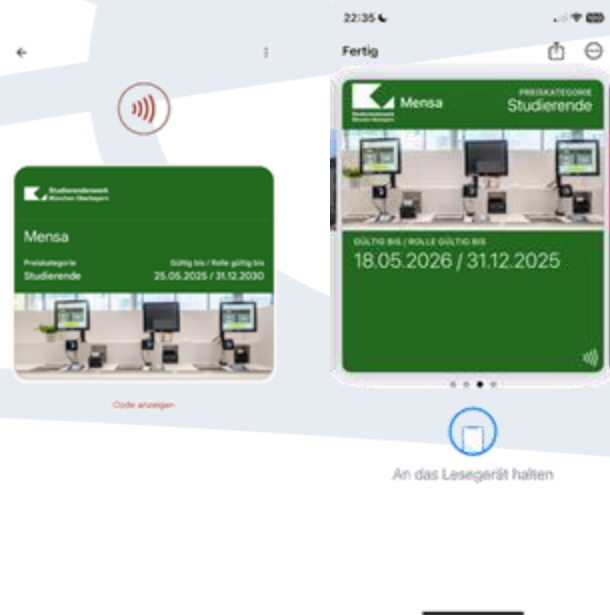Since Feb. 2025

Apple Wallet

Discount-Pass for Mensa
Studierendenwerk München Oberbayern

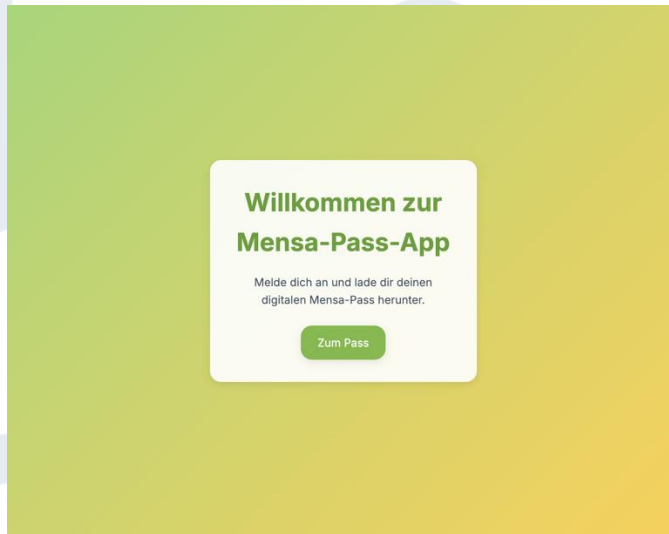Studierendenwerk München Oberbayern

Payment Process in the Mensa

Double Tap:

1. Eligibility verification of status group (Student, Employee, Guest)
   → Discount will be applied

2. Pay with an Open-Loop Bank / Credit-Card

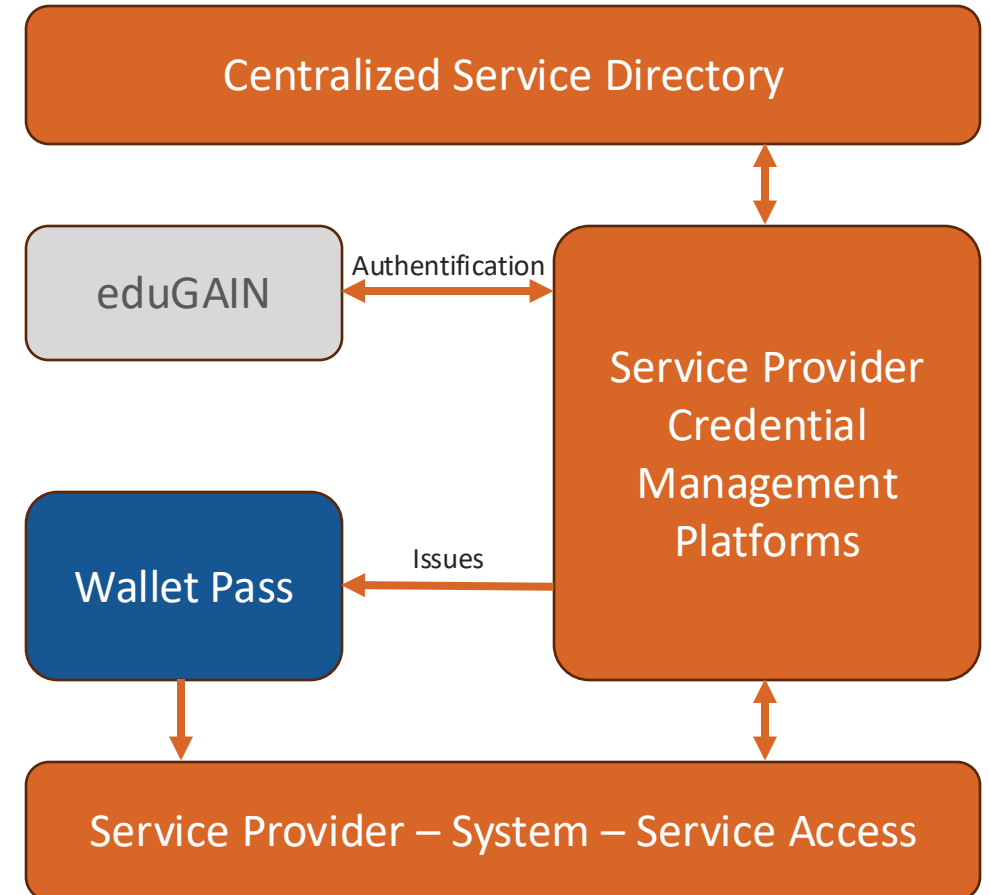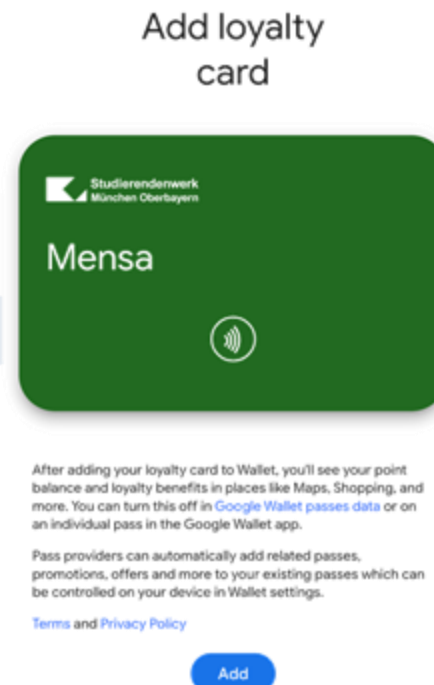# Transition of credentials into the Smartphone Wallets
Dedicated Pass Portals for login via eduGAIN

Add loyalty card

Willkommen zur Mensa-Pass-App

Melde dich an und lade dir deinen digitalen Mensa-Pass herunter.

Zum Pass

Studierendenwerk
München Oberbayern

Mensa

After adding your loyalty card to Wallet, you'll see your point balance and loyalty benefits in places like Maps, Shopping, and more. You can turn this off in Google Wallet passes data or on an individual pass in the Google Wallet app.

Pass providers can automatically add related passes, promotions, offers and more to your existing passes which can be controlled on your device in Wallet settings.

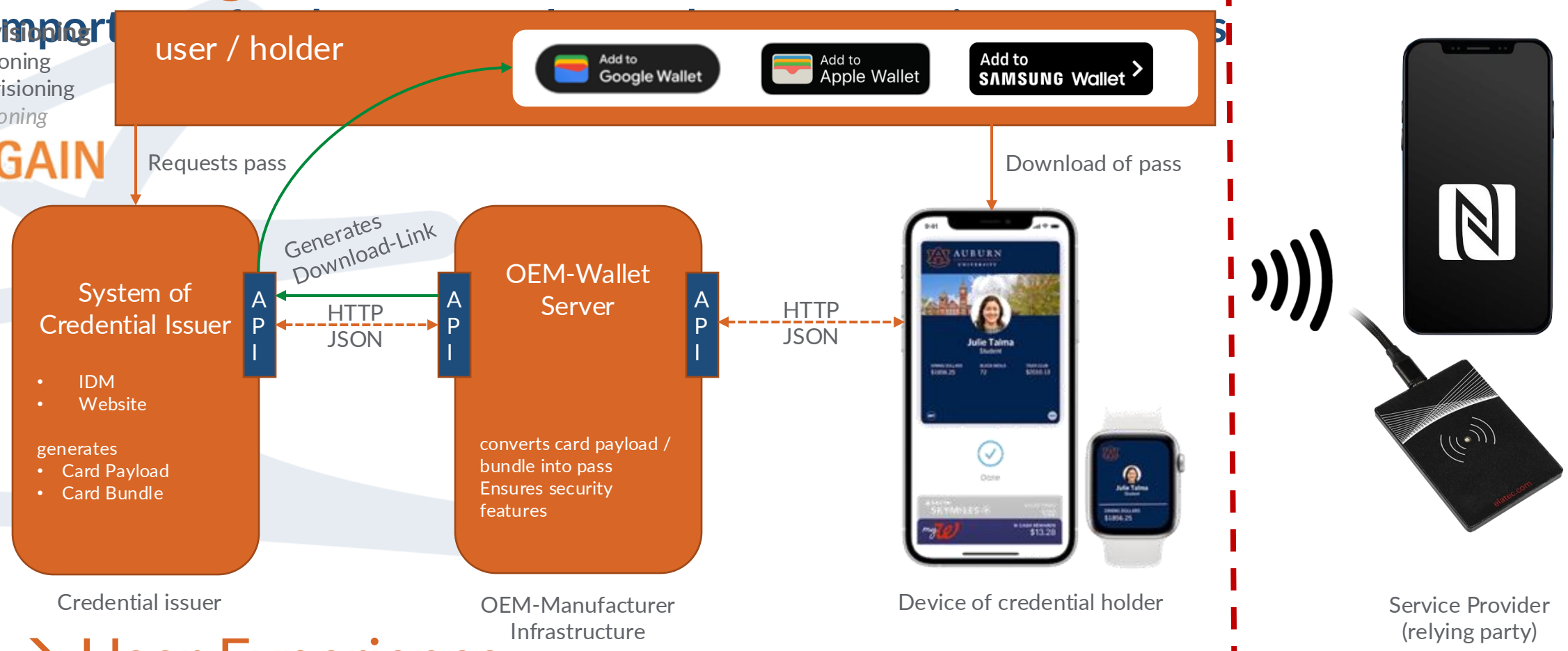Terms and Privacy Policy

Add

https://mensapass.stwm.de/

Currently only open to Munich HEIs, as guests don't get discounts, but can pay directly via Open-Loop-Payment

→ Discounts for Alliance Members are politically discussed and in preparation

Centralized Service Directory

eduGAIN — Authentification — **Service Provider Credential Management Platforms**

Wallet Pass ← Issues —

Service Provider – System – Service Access

Issuing process of wallet passes reedeming

→ important for understanding the wallet passes

- **Web-Provisioning**
- App-Provisioning
- Wallet-Provisioning
- *Push-Provisioning*

eduGAIN

user / holder

Add to Google Wallet
Add to Apple Wallet
Add to SAMSUNG Wallet

Requests pass

Download of pass

Generates Download-Link

System of Credential Issuer

- IDM
- Website

generates
- Card Payload
- Card Bundle

API — HTTP JSON — API

OEM-Wallet Server

converts card payload / bundle into pass
Ensures security features

API — HTTP JSON —

Julie Talma
Student

Credential issuer

OEM-Manufacturer Infrastructure

Device of credential holder

Service Provider (relying party)

→ User Experience

Transition of credentials into the Smartphone Wallets
Library ID

NFC enabled by default

Google

Apple

Transition of credentials into the Smartphone Wallets
Use Case: Physical Access Control (Access to learning spaces)

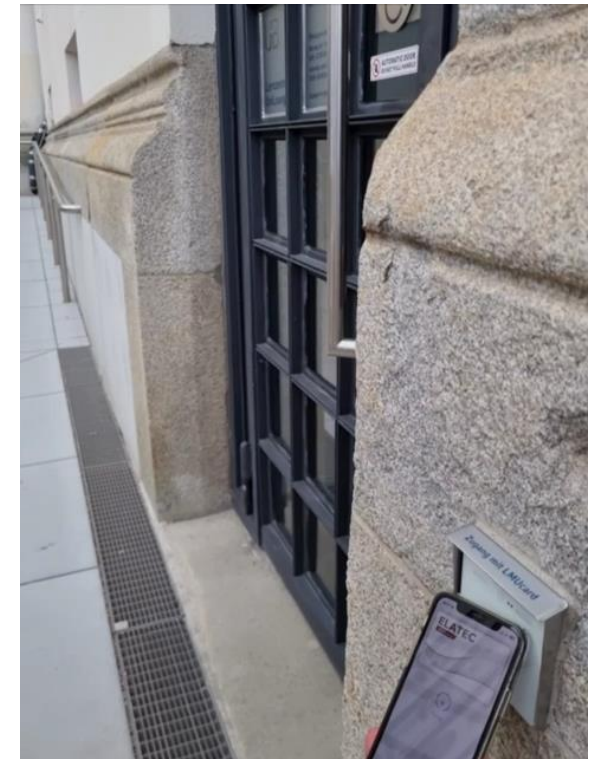## Physical access to the learning spaces (provided by the library)

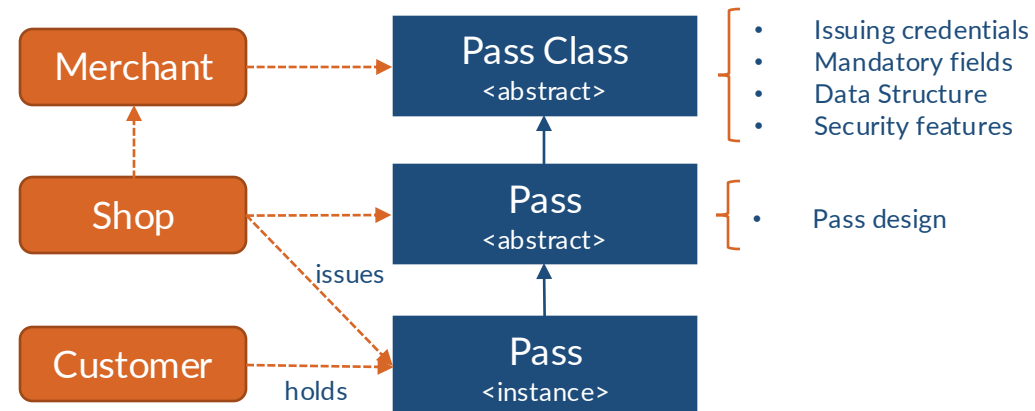LMUcard

Access

Google Smart Tap

Apple

Technical details and features of Wallets / Passes

The wallet is a **container for multiple passes**

Technical features:

- **Auto-Presentment / Smart Select** ← **reader selects the specific pass to interact with** (if available)

- Selectable Authentication requirements ← **security features**

- Express-mode (Apple)

- Battery reserve (pass is still usable if phone has powered off; important for keys, transit tickets, payment)

- Groupable

- Validity dates

- Remote updateable / revokable

- Offline usable (→ non traceable)

- *Host Card Emulation possible*

Merchant → Pass Class
- Issuing credentials
- Mandatory fields
- Data Structure
- Security features

Shop → Pass
- Pass design

Shop issues / Customer holds → Pass <instance>

VISA

Technical details and features of Wallets / Passes

Auto-Presentment / Smart Select of an NFC enabled Pass in the Wallet
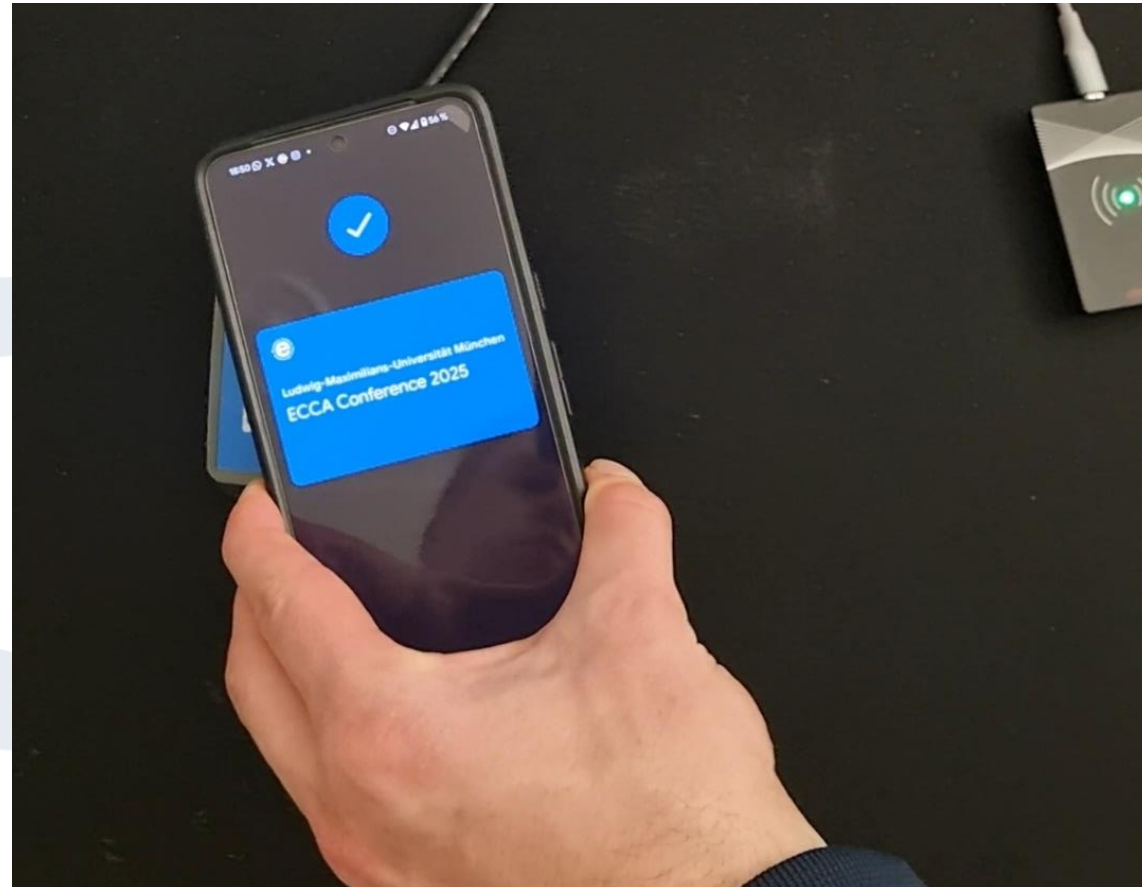
Technical details and features of Wallets / Passes

Battery Reserve Mode – Use the Wallet even if it's powered of

- for Keys (Dorm-Rooms, Class-Rooms, Building Access, Cars)
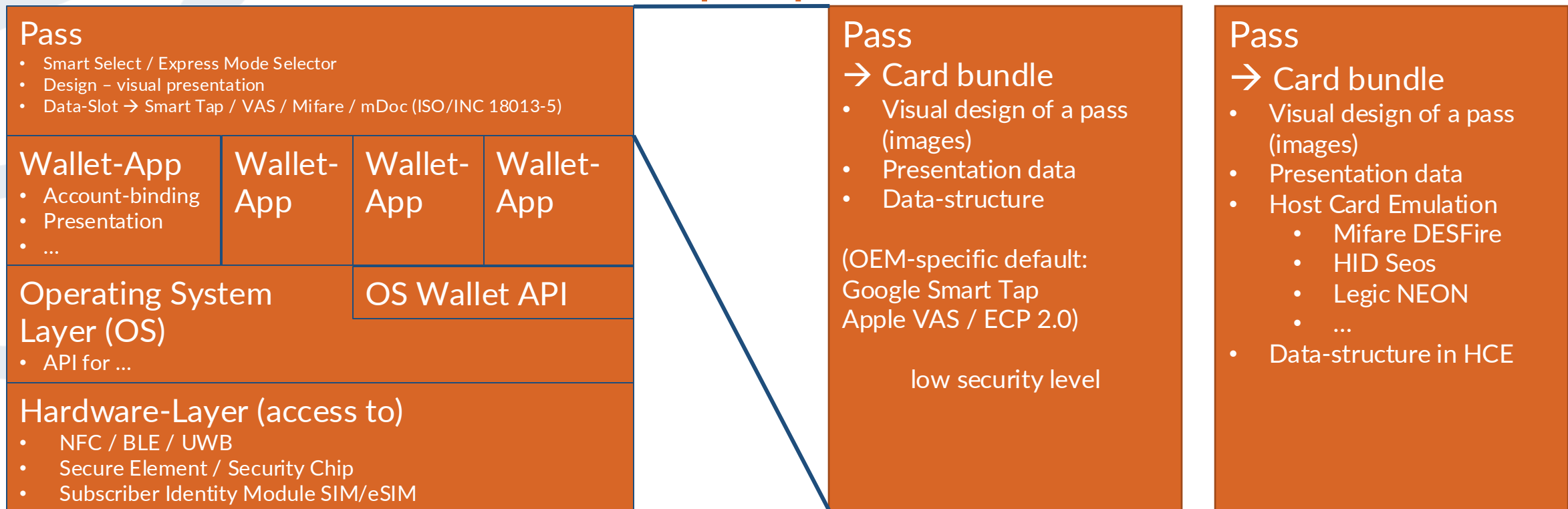- for Payment
- for Transport Tickets

Up to 7 Days after shutdown of the smartphone

Technical details and features of Wallets / Passes

✓ Technical details and features of wallets / passes → Path to an **interoperable** campus card

✓ If each pass (technology) can be individually selected and leveraged, and the pass in the wallet can be selected by the reader (**Smart Select / Auto-Presentment**)

→ **One pass per service**

Pass	Pass
• Smart Select / Express Mode Selector • Design – visual presentation • Data-Slot → Smart Tap / VAS / Mifare / mDoc (ISO/INC 18013-5)	→ Card bundle • Visual design of a pass (images) • Presentation data • Data-structure

Pass
- Smart Select / Express Mode Selector
- Design – visual presentation
- Data-Slot → Smart Tap / VAS / Mifare / mDoc (ISO/INC 18013-5)

Wallet-App	Wallet-App	Wallet-App	Wallet-App
• Account-binding • Presentation • …			

Operating System Layer (OS)	OS Wallet API
• API for …	

Hardware-Layer (access to)
- NFC / BLE / UWB
- Secure Element / Security Chip
- Subscriber Identity Module SIM/eSIM

Pass
→ Card bundle
- Visual design of a pass (images)
- Presentation data
- Data-structure

(OEM-specific default:
Google Smart Tap
Apple VAS / ECP 2.0)

low security level

Pass
→ Card bundle
- Visual design of a pass (images)
- Presentation data
- Host Card Emulation
  - Mifare DESFire
  - HID Seos
  - Legic NEON
  - …
- Data-structure in HCE

Technical details and features of Wallets / Passes

- For contact less communication is NFC the protocol
- Communication via ISO 14443
- Data Formats (File System access)
  - Google Smart Tap
  - Apple VAS (Value Added Services)
  - NFC ECP 2.0 (Enhanced Contactless Polling)
  - Host Card Emulation (HCE: of proprietary Protocols)
    - Mifare DESfire (via Mifare2GO / NXP secure element)
    - Legic NEON / Advant (via Legic Connect)
    - HID Seos
    - → Internal the Secure Module acts as a JCOP smart card

  - ISO 18013-5 Personal Identification
    → NFC handover to BLE or WiFi
    Core functionality in Android and iOS OS API

- Security consideration required by **use case**

Security Level
Chip / Smartcard
high

Legic NEON
Legic Advant
Mifare DESfire
HID Seos

ISO 18013-5

Mifare Classic /
Card UID

low

Security Level
Smartphone
high

ECP 2.0

Smart Tap
VAS

Technical details and features of Wallets / Passes

Detail view on the Wallet

Pass • Smart Select / Express Mode Selector • Design – visual presentation • Data-Slot → Smart Tap / VAS / Mifare / mDoc (ISO/INC 18013-5)			
Wallet-App • Account-binding • Presentation • …	**Wallet-App**	**Wallet-App**	**Wallet-App**
Operating System Layer (OS) • API for …	**OS Wallet API**		
Hardware-Layer (access to) • NFC / BLE / UWB • Secure Element / Security Chip • Subscriber Identity Module SIM/eSIM			

EU Digital Identity Wallet

EWC

OpenWallet FOUNDATION

Necessary to issue passes to all relevant wallets

→ The eduTAP solution is wallet **agnostic**, not bound to a specific wallet provider or company

→ eduTAP just enables HEI and Service Providers to easily **create** and **issue** wallet passes

Issuing process of wallet passes reedeming
→ important for hardware-based open loop credentials

- **Web-Provisioning**
- App-Provisioning
- Wallet-Provisioning
- *Push-Provisioning*

user / holder

Add to Google Wallet   Add to Apple Wallet   Add to SAMSUNG Wallet

Requests pass

Download of pass

Generates Download-Link

System of Credential Issuer

- IDM
- Website

generates
- Card Payload
- Card Bundle

API — HTTP JSON — API

OEM-Wallet Server

converts card payload / bundle into pass
Ensures security features

API — HTTP JSON

Credential issuer

OEM-Manufacturer Infrastructure

Device of credential holder

Service Provider (relying party)

→ User Experience

Credential Management Platform and eduTAP Components

→ Architecture of the delivery system
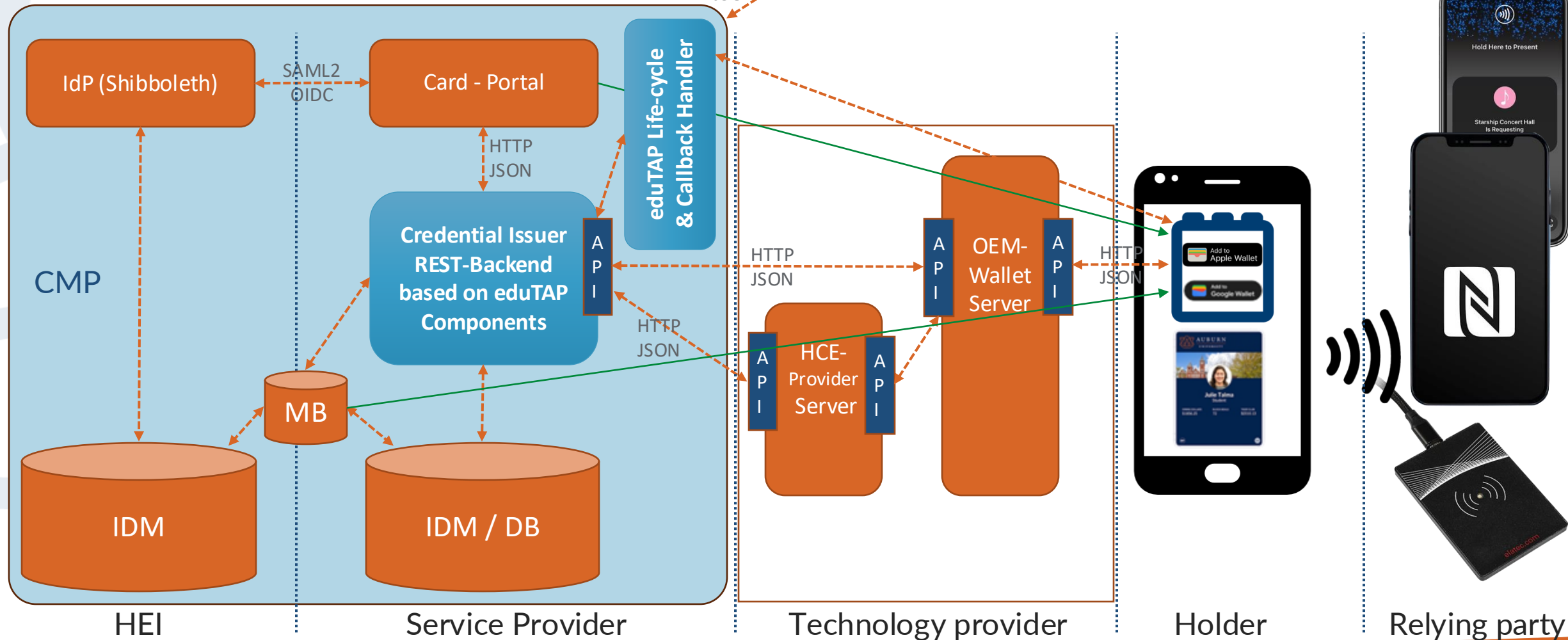
Credential Management Platform and eduTAP Components

eduTAP vs Credential Management Platforms build on top of eduTAP

eduTAP → works for large Universities (Developers and Skills are available)

- ✓ eduTAP is Community Open Source
- ✓ eduTAP is a set of libraries and example implementations
- ✓ eduTAP does provide a set of templates for Pass Designs and necessary legal and technical documentation
- ✓ eduTAP does not provide a Fronted or Pass-Designer

Commercial Credential Management Platforms (CMP) → make or **buy**

e.g. HEIDI (Heigher Education Institution Digital Identities) Platform is a CMP on-top of eduTAP-Components

- ✓ Provide Adapters to Business Applications (e.g. Campus-Management Systems, Library-Systems, …)
- ✓ Provides a Pass-Designer
- ✓ Provides a Management-UI

eduTAP

*A **sneak peek** into the future of Student IDs*
→ More interoperability and less passes by Verifiable Credentials
***eduTAP** Common ID*

eduTAP and the current Apple / Google Student IDs

How about the native, current **Student IDs** in Apple Wallet & Google Wallet (Mifare or HID based)?
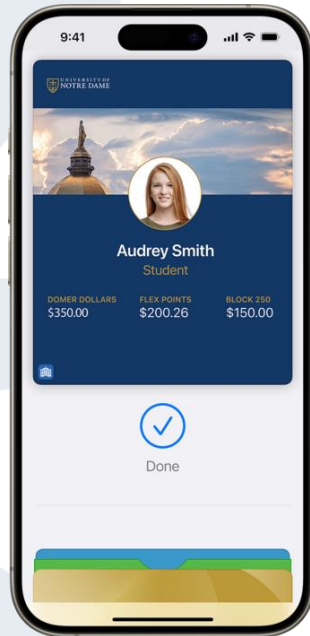
✓ Fantastic integrated cards (**one card** for all services, perfect for **corporate**)

✓ *Should be used **for all** university services* (Apple's intention)

→ University / organisation-centric optimization

→ Does not support the "seamless mobility" requirement

→ Shared services, how about other users than own students?

→ **LESS secure** (if following the ESC data zone approach)

→ Not the required User Experience, and does not meet the legal requirements

This is a dead-end solution, it will not help or bring benefit, it actually provides a WORSE User Experience

It does NOT support **Selective Disclosure** and **Zero Knowledge Proof**

Apple and Google is aware of this and working on it!

Apple and Google Access Platform are good for PAC and Payment passes
→ NOT for Student or Staff IDs
→ GOOD dedicated service passes

Wallet Passes are about a great User Experience

A **great User Experience** is key to adoption and usage

✓ Non-NFC Passes are **NO GOOD** User Experience

✓ Unnecessary passes should be avoided ← NO dedicated pass for
simple eligibility verification (status, institution affiliation)

Is there a better solution?
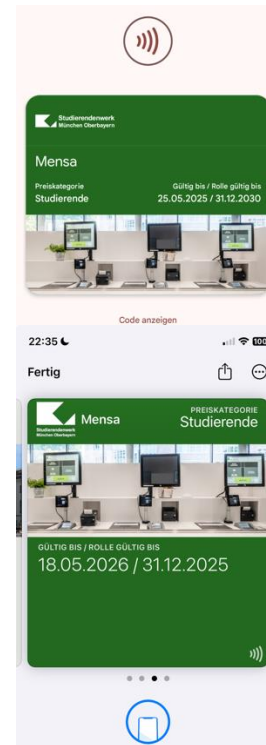
transition

✓ **Verifiable Credentials**

✓ **Selective Disclosure**

✓ **Zero Knowledge Proofs**

Think outside the card: Medium → Services

Identification
- Identification
- Status verification
- Proof of entitlement
- Single Sign On / 2FA / FIDO2
- Attendance check
  - *Check-in for exams*
  - *attendance at courses*
  - *Time recording*
- Electronic Signature
  (*of legal documents*)

Electronic Payment / cashless campus
- Canteen & cafeterias
- Vending machines
- Printing /
  (*secure & fo...*)
- Ticketing
  (*secure & fo...*)

Physical Access Control
- Areas (*campus, parking lot*)
- Buildings
- Rooms
- ...

Library services
- Access to / borrow
  - Physical media (book,
  - E-media (book, audio and

Transport
- On campus services
  (*university shuttle service*)
- Special case of
  "Proof of entitlement"
- ...port tickets
- ... of
  "discount"

Discount and promotions
- Discounts on cultural activities
  - Museums
  - theaters
  - cinemas
- Shops
- Restaurants
→ Special case of
  "Identification" /
  "Status verification" /
  "Proof of entitlement"

Separate Service Passes
- Local Services
- Each service is associated with a distinct pass
- Providers can choose appropriate technology per pass

→ Working solutions by solutions providers

A **Common ID** Pass
for all HEIs
(ISO/IEC 18013-5 based)
→ **Identity Pass**

eID.AS

providing service → create benefits

Service Domains: Identity and Discount

From a legal point of view, Identity Documents of public universities are **official state photo IDs**

✓ Legal requirements

✓ Security considerations

✓ High assurance level

→ **International standards** for HEI Identities → eduGAIN (incl. eduPerson, SCHAC) e.g. European Student Identifier → routable information for course participation at other institutions (during mobility programmes)

Identity Documents (Student ID, Staff ID and Affiliate IDs) are used

On-Site (proximity use-cases)

On-Campus

✓ Attendance at courses

✓ Check-in for exams

✓ Time recording

✓ Discounts in canteen & cafeterias

✓ Identification for university authorities (Student legal office and examination offices, campus security)

Off-Campus

✓ Identification for public authorities (e.g., police)

✓ Identification for third party (e.g., checkin at hostels)

✓ Eligibility verification for discounts and access (e.g., role-based, age-based, institution related)

Online

✓ As authentification factor

Verifiable Credential for HEIs (Prototypes)

European Student Card as Verifiable Credential

DC4EU non-foundational Ids

Table with available schemes for non-foundational IDs

Scope	Data model name	Brief explanation	Status/ Detailed explanation	Schema URL	Registry URL
Non-foundational identity	EducationalID	Identifies the natural person in the context of an educational organisation, including national extensions	Available	Schema	Verifiable Data Registry
Non-foundational identity	AllianceID	Identifies a student or staff member as affiliated with a European university alliance	Available	Schema	Verifiable Data Registry
Non-foundational identity	EuropeanStudentCard	European Student Card for student mobility, based on DG-EAC's service	Available	Schema	Verifiable Data Registry
Non-foundational identity	MyAcademicID	Identity credential for student mobility, based on MyAcademicID and eduGAIN infrastructure	Available	Schema	Verifiable Data Registry
Non-foundational identity	ProfessionalID	Identity credential for , based on	Available	Schema	Verifiable Data Registry
Non-foundational identity	DoctorID	Identity credential for , based on	Available	Schema	Verifiable Data Registry
Non-foundational identity	EngineerID	Identity credential for , based on	Available	Schema	Verifiable Data Registry

https://github.com/dc4eu/educational-pilot/tree/main/sectorial-eaa-catalogue

Digital Identity in the Wallet

Common Verifiable Credential Formats / Protocols for Digital Identities

- SD JWT (EU)

- ISO/IEC 18013-5 (mDL & mDoc)

- W3C Verifiable Credential Data Model

Issuing and Redemption Protocols

- OID4VC (OID4VCI and OID4VP)

- ISO/IEC 18013-5

For **proximity** use-cases **NFC / BLE transmission** is crucial

→ Our choice ISO/IEC 18013-5 (mDoc) for Wallet credentials   DC4EU → SD JWT

Image Source: https://www.linkedin.com/feed/update/urn:li:activity:7333379048112361472/

A Common Identity Pass using the ISO/IEC 18013-5 model

- The "ISO/IEC 18013-5 Personal Identification" model is designed to support
  - A protocol for two devices to establish a secure wireless communication channel
    and exchange structured request and response message
  - **Identification** of the credential holder (user binding)
  - Selective release of data elements by the credential holder (data minimization / consent)
  - **Pre-consent** mechanism for frequently repeated processes (e.g., discount payment at Student Affairs Unions)
  - A protocol to retrieve credential data directly from the mobile device of the holder,
    purely offline, facilitating availability and non-traceability
  - An optional protocol to retrieve additional data from the issuing authority
  - A mechanism to establish **integrity** and **authenticity** of the credential data
  - A mechanism to confirm device binding (signing at transaction time)
  - Multi-document and multi namespace aware ← extendable for other use cases

- **Established governmental credential format that is already in use** ← **Following the ARF of EUDI-Wallet**
  → mobile driving licence / eu.europa.ec.eudiw.pid.1 (prototype of national eIDs in Europa)

- **Already supported** by the OEM-Smartphone-Manufactures (Apple and Google)
  → see: https://android-developers.googleblog.com/2020/11/privacy-preserving-features-in-mobile.html

EU Digital Identity Wallet

Identity Pass: ISO/IEC 18013-5 Data model
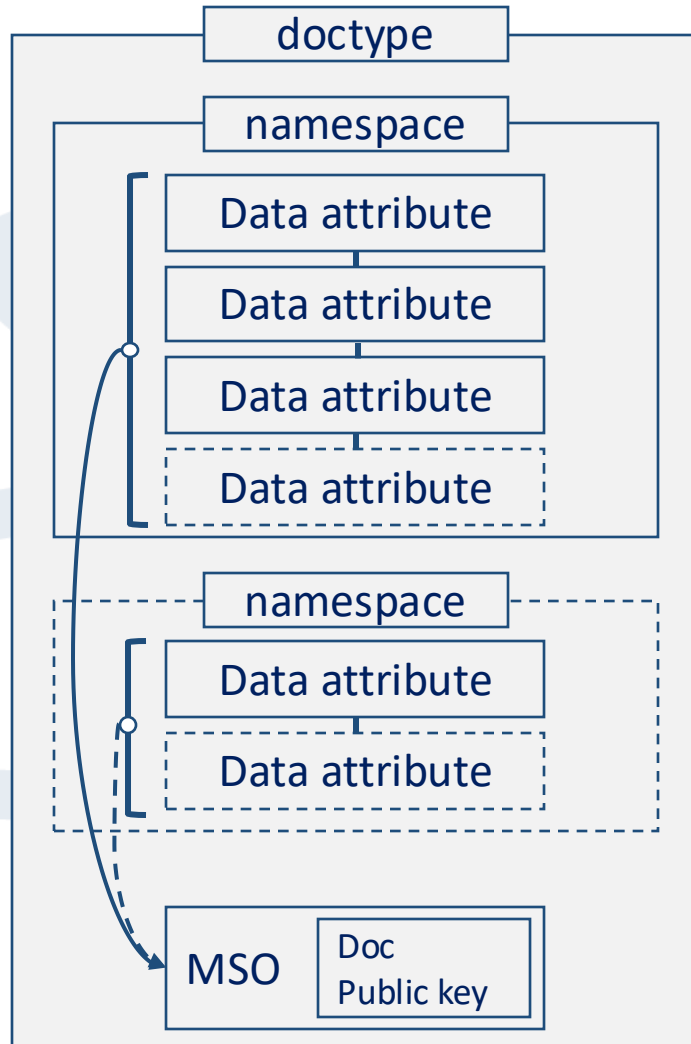
Reuse of directory data (common eduGAIN attributes)

- portrait (photo, *mandatory for identification documents*)
- givenNames
- sn (surname)
- email
- eduPersonAffiliation / eduPersonScopedAffiliation
- eduPersonEntitlement
- eduPersonAssurance
- schacHomeOrganization
- schacPersonalUniqueCode → European Student Identifier (ESI) - MyAcademicID
- schacDateOfBirth
- schacYearOfBirth
- schacPlaceOfBirth
- schacExpiryDate
- …

*works like a Shibboleth authentication
on-site → trained processes*

see also DC4EU education ID
(https://code.europa.eu/ebsi/json-schema/-/tree/main/schemas/vcdm1.1/education/verifiable-education-id)

Identity Pass: Reuse Shibboleth / eduGAIN data schema:
The common authentication method in the educational sector

✓ Shibboleth – local or in federation (national or multi-national) → eduGAIN-AAI → SAML2 or OIDC

Identity Pass: Path to the best User Experience and Interoperability
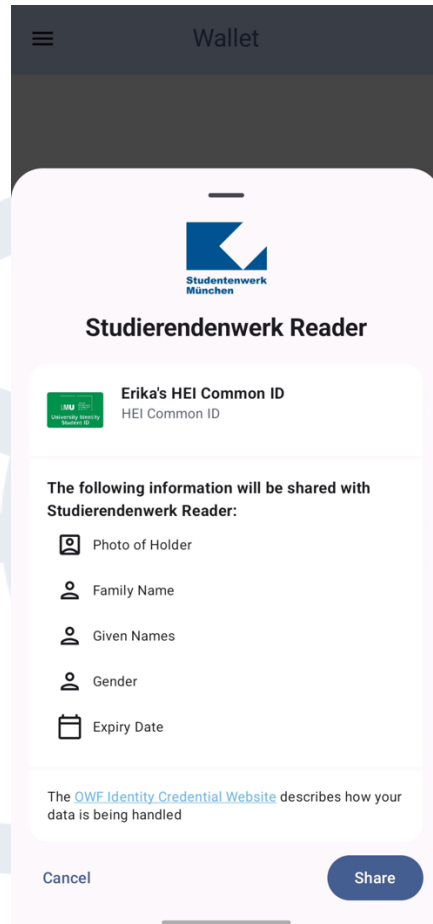
Informed Consent
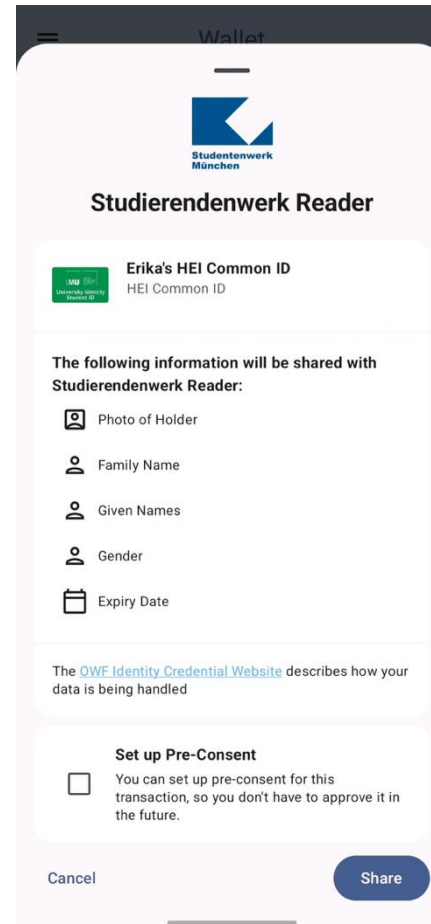
Informed Consent
+ Pre-Consent

Verifier App

A question of scale: Student IDs
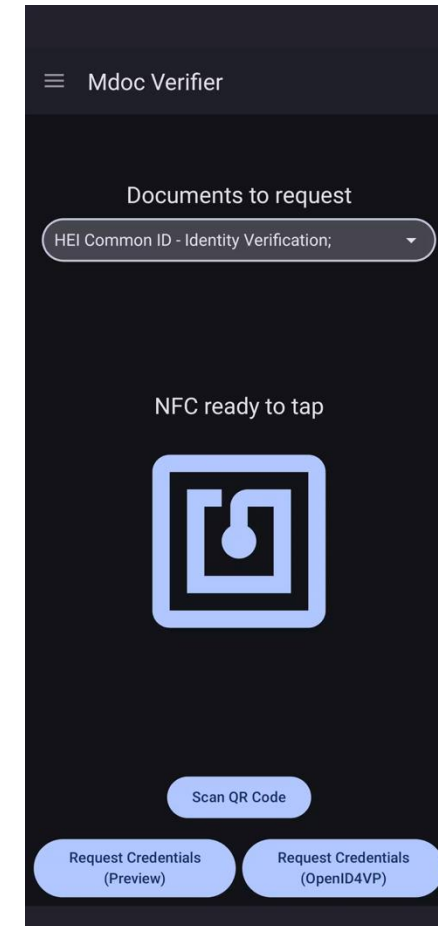
European Union

- ~ **5,000** Higher Education Institutions (HEIs)
- ~ **18,800,000+** tertiary students (2022)

→ Organized in
National Research and Education Networks (NRENs)

Erasmus+ Countries

- Includes EU + Iceland, Liechtenstein, Norway, North Macedonia, Serbia, Turkey
- Significantly expands the European higher education landscape → ~ **20,000,000+** tertiary students

Worldwide

- ~ **18,000** recognized HEIs across 180+ countries
- ~ **200,000,000+** tertiary students globally

→ It should work everywhere: seamless mobility & easy service access

→ a GLOBAL Student ID ←

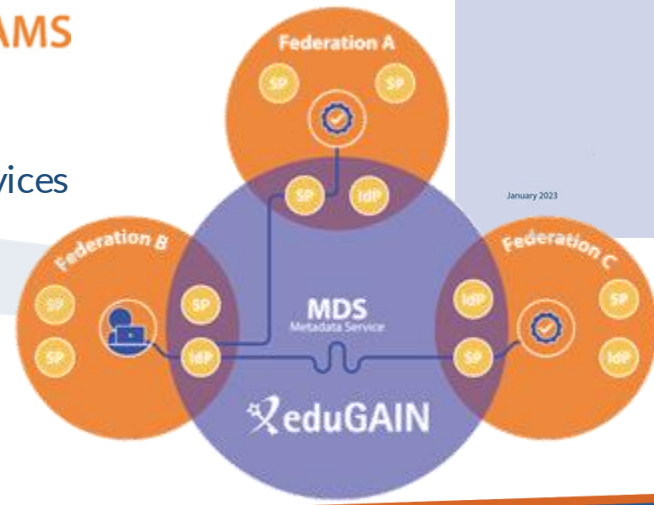# GÉANT – The IT provider for Higher Education in Europe

The GÉANT Association is the collaboration of
European National Research and Education Networks (NRENs)

- Non-Profit Organization

- Service-Provider for IT / e-Infrastructure services
  for the European Higher Education Sector

- Pan European – Non EU members

- Key Services:
  - **GÉANT Trust & Identity Services**

  - GÉANT Network and Connectivity Services
  - GÉANT Security Services
  - GÉANT Cloud Services
  - Procurement Agency for EU-HEIs

GÉANT membership

NATIONAL MEMBERS
1 per country

REPRESENTATIVE MEMBER
NORDUnet

ASSOCIATES
CERN
DeIC (Denmark)
European Space Agency
CSC/FUNET (Finland)
RHnet (Iceland)
KREN (Kosovo Research and Education)
SUNET (Sweden)
Sikt (Norway)

January 2023

→ eduTAP is a perfect fit for
GÉANT Trust & Identity Services

eduTAP

https://eduTAP.eu

*Modern Campus ID (Student ID / Staff ID)
for universities in Europe & the world*

www.eugloh.eu

Demo → Download an eduTAP created pass

https://demo.edutap.eu/

eduTAP – educational tapping

TAP TO PAY

tap to …

- ✓ identify yourself,
- ✓ verify your status,
- ✓ proof your entitlement,
- ✓ claim a discount,

tap to access a service on-site directly:

- ✓ tap to pay (open and close loop-payments),
- ✓ tap to open a door,
- ✓ tap to lend a book,
- ✓ tap to take a campus shuttle.

no app, just tap!

https://eduTAP.eu

eduTAP – educational tapping – What is eduTAP?

- eduTAP the concept
  - Splitting integrated campus cards into **dedicated service passes** and a **harmonized identity pass**
  - Leveraging the full potential of digital wallets
  - **Use existing**, secure and proven contactless **standards** – do not invent new standards

  → Focus on **User Experience** and **interoperability**

- eduTAP the software – to enable HEIs and Service Providers to:
  - create, issue, and manage passes within the smart device wallet
  - interact with wallet passes to give access to services, identify,
    and verify the status of students and staff members

  → **eduTAP** helps to fulfill the
  great vision of the European Student Card
  and enables interoperability and a better user experience

We'd love to hear from you!

Get in touch:

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eduTAP Links and Documentation

Websites:

- https://eduTAP.eu/ Project Homepage

- https://eduTAP.eu/presentations Presentations about eduTAP

- https://docs.eduTAP.eu/ Documentation for eduTAP

- https://github.com/edutap-eu GitHub Organization with Core Libraries

- https://github.com/edutap-collective GitHub Organization for non-Core Packages of eduTAP Components – Examples and Templates

Papers:

- https://easychair.org/publications/paper/Lvsf - eduTAP – a Concept and System of Digital Identities for Proximity On-Site Service Access

- https://easychair.org/publications/paper/ZpCzX - eduTAP Common ID - A Standardized Digital Identity Document for HEIs

Standards:

- https://www.iso.org/standard/69084.html ISO/IEC 18013-5

- https://www.iso.org/standard/76927.html ISO/IEC 14443-4:2018

- https://eudi.dev/2.5.0/architecture-and-reference-framework-main/ Architecture and Reference Framework – EUDI-Wallet

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