

**Bridging online identity to  
mobile credentials  
for reliable and trustworthy  
on-site service access  
(in the educational sector)**

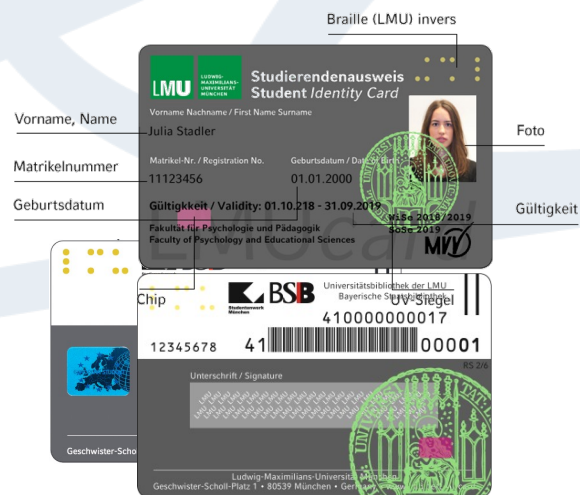
**eduTAP**

**ECCA Conference 2024 – Milan - 2024-05-16**  
**Panel discussion on**  
**„Campus Card requirements and**  
**interoperable solutions for all HEIs“**

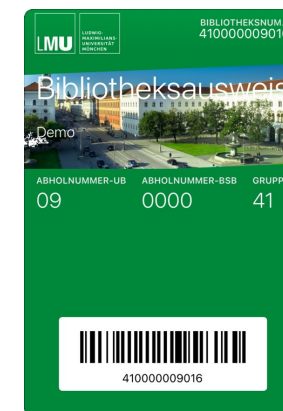
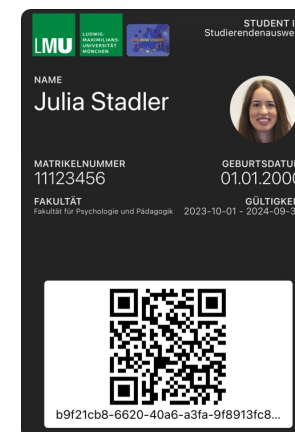
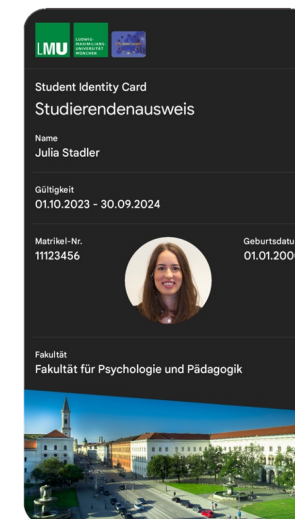
**Alexander Loechel**  
**Referent IT-Projekte**



# Transition of credentials into the Smartphone Wallets



transition





# providing services on-site → card / smart device as a medium

## 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 (secure & follow me printing)



## Physical Access Control

- Areas (campus, parking lot)
- Buildings
- Rooms
  - Classrooms
  - Labs
  - Computer rooms
  - Learning spaces
  - Offices
  - Accommodation facilities (i.e., dorms)
- Sports 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  
online services



providing service → create benefits

# The European Student Card

- ✓ Vision of the European Commission: Towards a European Education Area
- ✓ The **European Student Card Initiative** (ESCI)
  - Students can get their **status verified** easily across Europe
  - **Access to on- and off-campus services**
  - **easier** access to student services at host universities on a **mobility** programme
- ✓ European Charter for Higher Education (ECHE) of the Erasmus+ Program



# A great vision!





# Interoperability ?

to access on and off-campus services?

→ a hologram does not provide interoperability

## security, privacy, ...?

# 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

### Digitalization 2.0

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

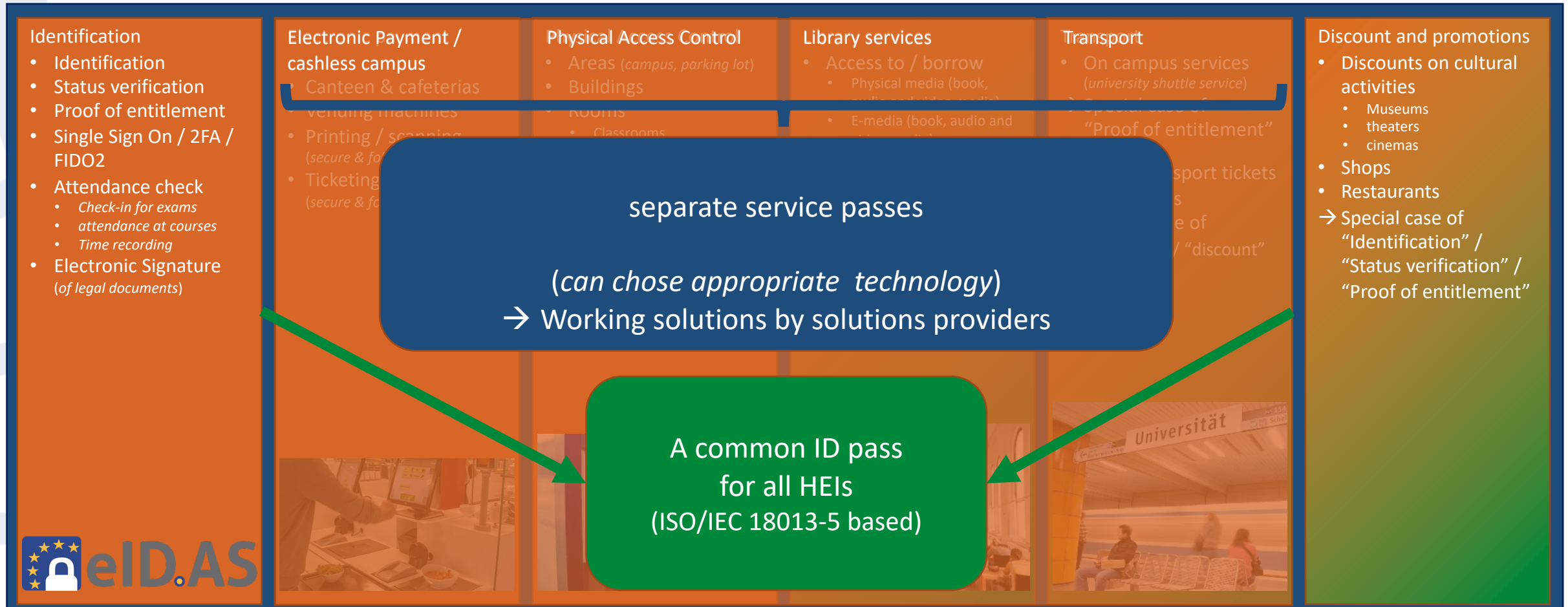
### → Digital transformation (a hard shift)

### 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

# providing services on-site → card / smart device as a medium

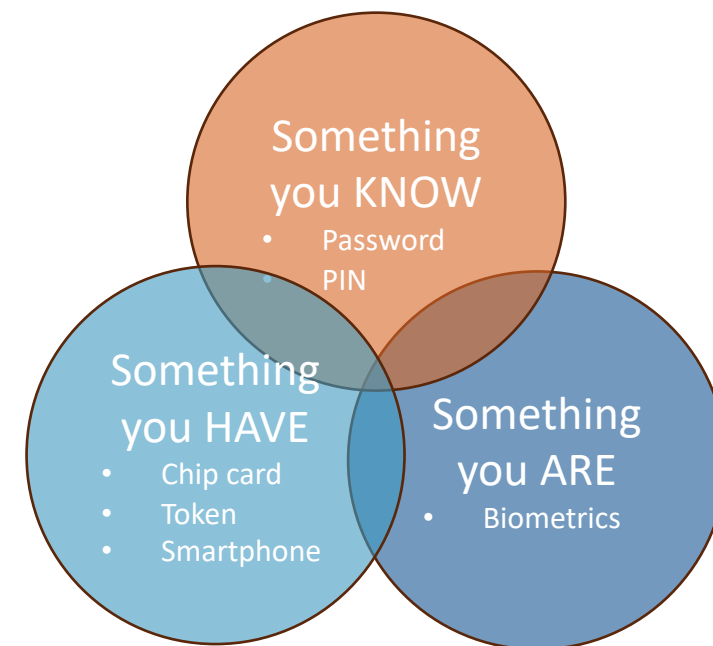




# Key to all Services → Authentication

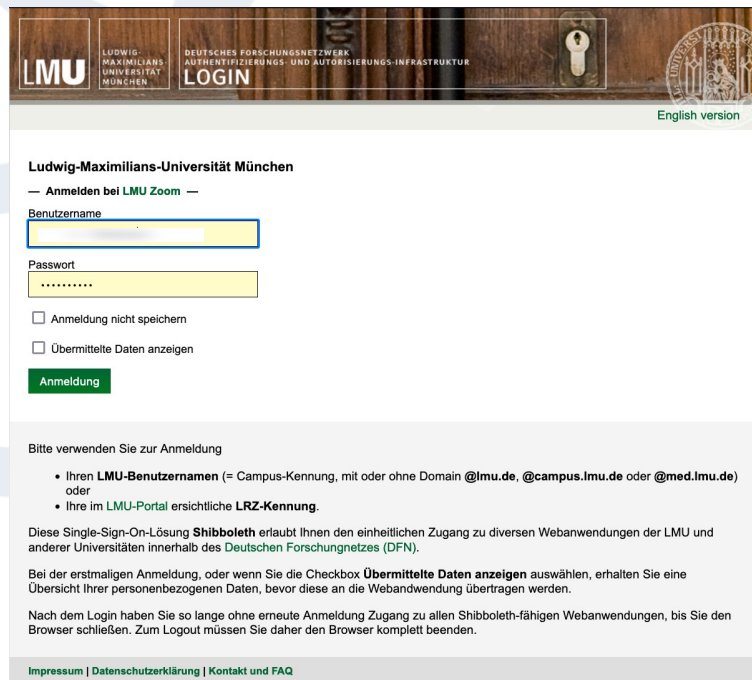
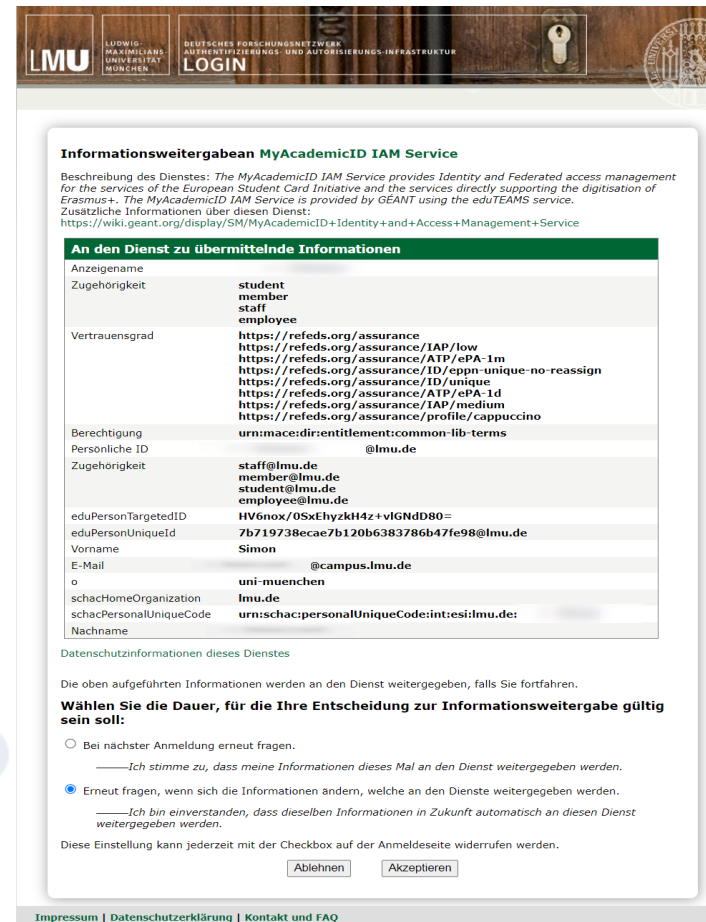
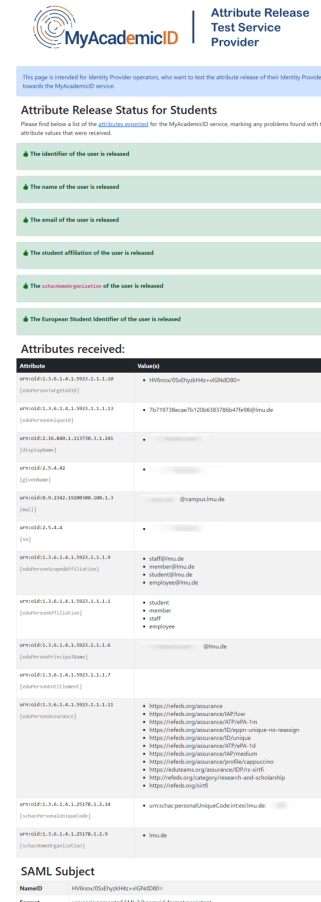
- Triple-A-System
  - (Identification)
  - **Authentication**
  - **Authorization**
  - **Accounting**
- **On-site services access** is about proving your entitlements and identity
- “something we know” as an authentication method for on-site service access is not very **efficient**, best a combination of “something we have” + “something we are”  
→ Smartphone Wallet passes + Authentication via biometrics

## Authentication Factors



# The common Authentication method in the educational sector

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

# Trust level / Assurance Level

- Very important for **IDENTIFICATION & AUTHENTICATION**
- Quality of identity (personal) data
- Type of authentication & consequences for identification medium

no trust

normal

Authentication:  
 • username / email  
 + password  
 Identity proofing:  
 → self-asserted  
 → verified e-mail address

substantial /  
medium

Authentication  
 • certificate based  
 • FIDO2  
 • Smart ID  
 Identity proofing:  
 → officially confirmed  
 → check of a government issued photo-ID

high

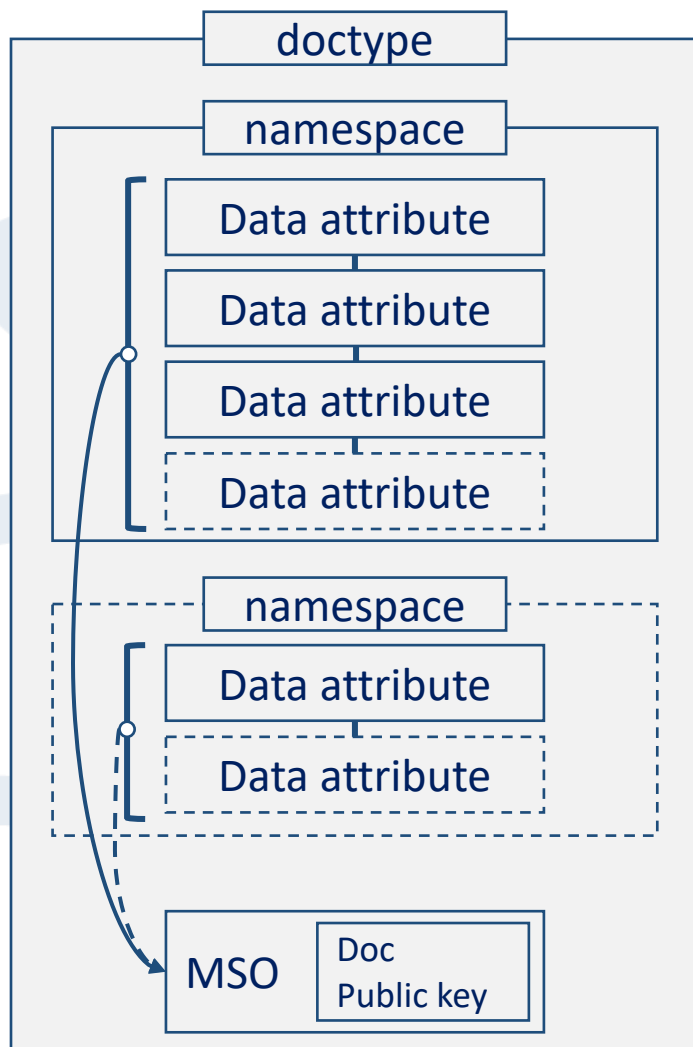
Authentication  
 • **eIDAS** compliant  
 → In eID of EU Citizen IDs  
 → Provided by HEI for foreign Students  
 Identity proofing:  
 → Officially confirmed  
 → Identity document checked to be genuine and represent the claimed identity  
 • **Qualified signature**



# Common Identification pass using 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 → mobile driving licence / eu.europa.ec.eudiw.pid.1
- Already supported by the OEM-Smartphone-Manufactures (Apple and Google)  
→ see: <https://android-developers.googleblog.com/2020/11/privacy-preserving-features-in-mobile.html>
- No additional infrastructure costs

# ISO/IEC 18013-5 Data model



Reuse of directory Data (common eduGAIN attributes):



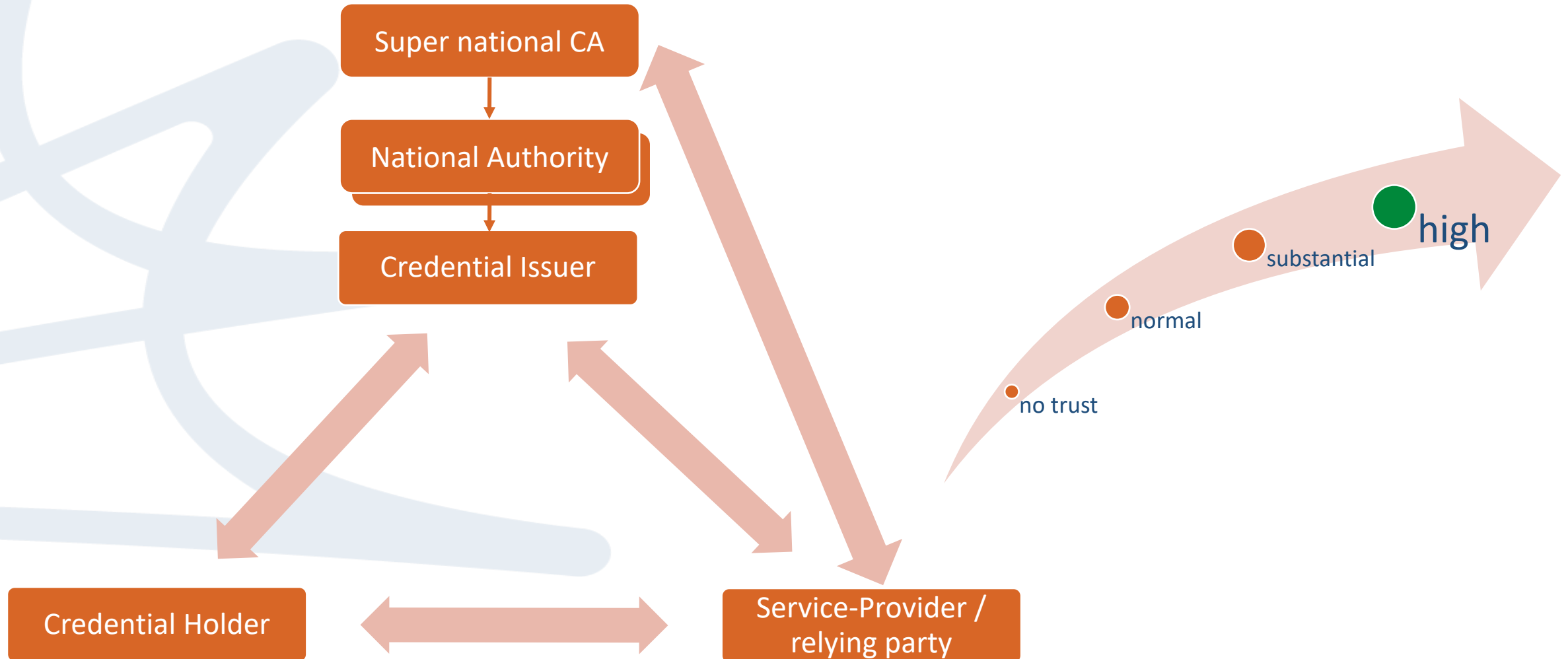
- portrait (photo, *mandatory for identification documents*)
- givenNames
- sn (surname)
- email
- eduPersonAffiliation / eduPersonScopedAffiliation
- eduPersonEntitlement
- eduPersonAssurance
- schacHomeOrganization
- schacPersonalUniqueCode → European Student Identifier (ESI) - MyAcademicID
- schacDateOfBirth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



**Shibboleth**

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

# Chain of Trust & Trust level





# providing services on-site → card / smart device as a medium

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## Discount and promotions

- Discounts on cultural activities
  - Museums
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- Shops
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on- & off-campus → on-site usage  
online services



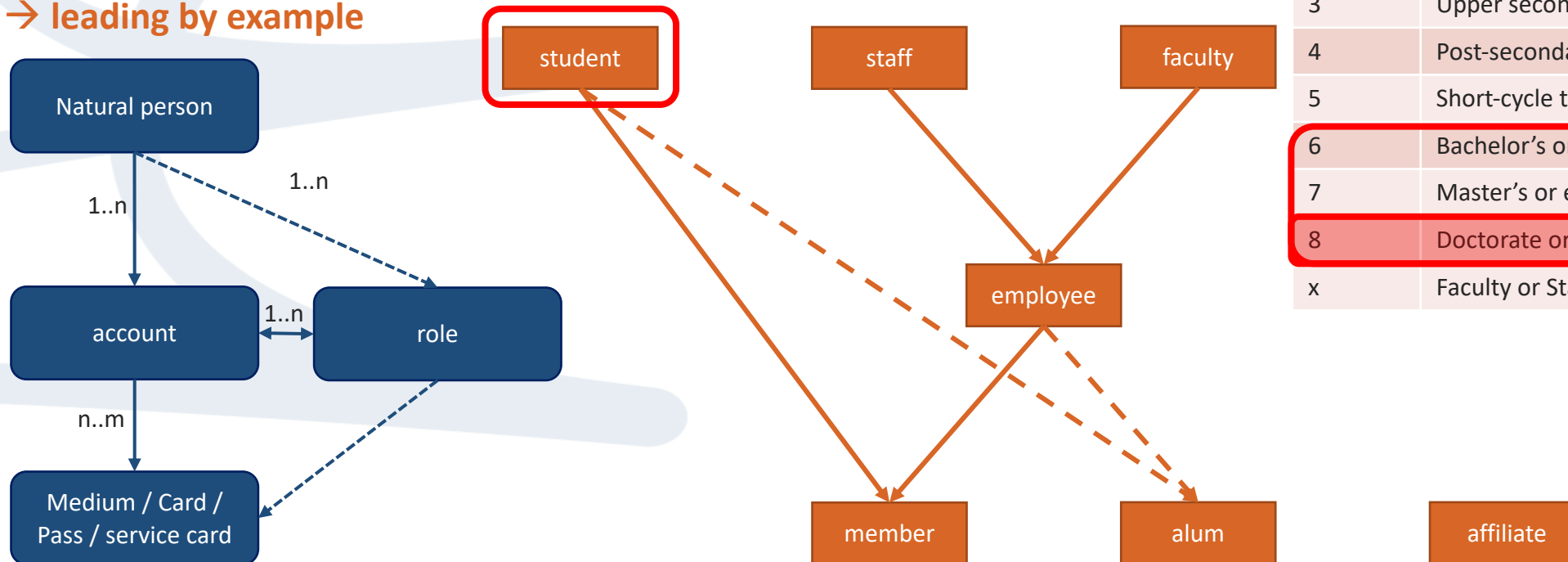
providing service → create benefits

# European Student Card → Services and Service Consumers

- Why focus on students and ISCED:2011 Level 6/7/8 for ESC?
- It is about **providing services** → **eduTAP is for anyone**
  - For users of the (home or host) institution
  - User incoming for a short-term or long-term mobility
- Staff / faculty members are more likely on short-term mobility than students  
→ **leading by example**

## ISCED:2011 Level

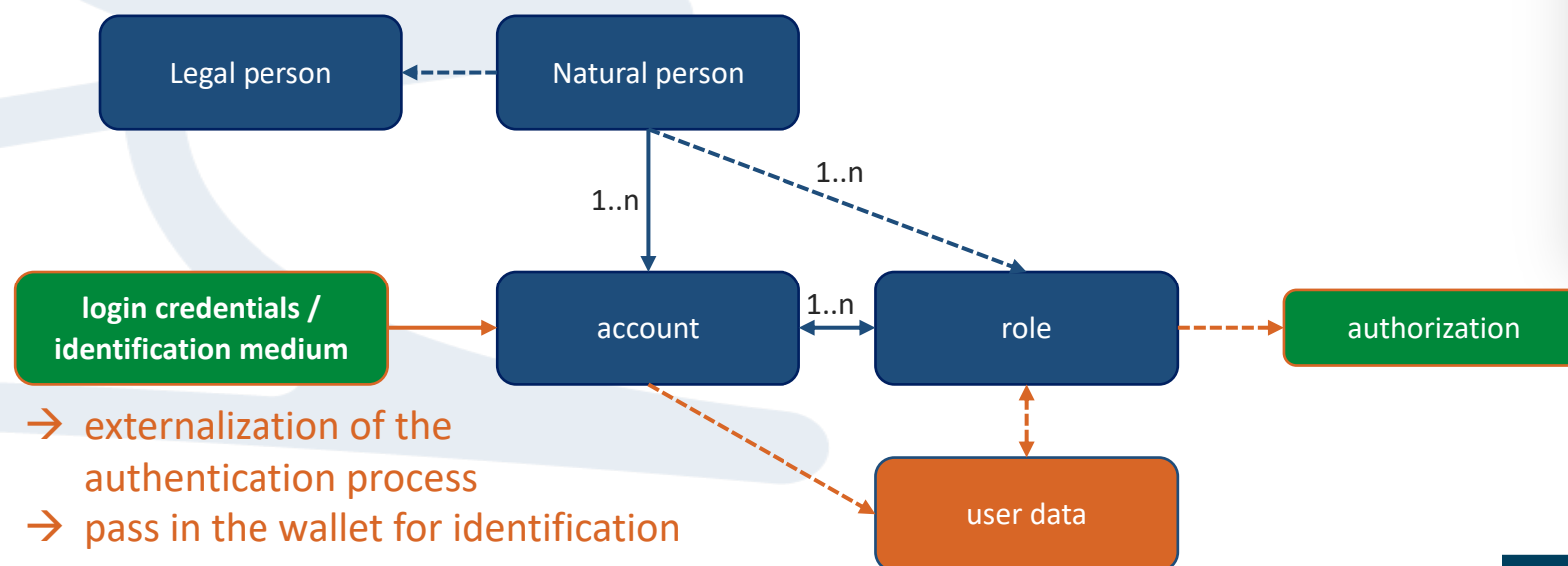
Level	Label
0	Early childhood education
1	Primary education
2	Lower secondary education
3	Upper secondary education
4	Post-secondary non-tertiary education
5	Short-cycle tertiary education
6	Bachelor's or equivalent
7	Master's or equivalent
8	Doctorate or equivalent
x	Faculty or Staff member of HEI



# Identity: from online (eduGAIN) to on-site (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



Co-financed by the Connecting Europe Facility of the European Union

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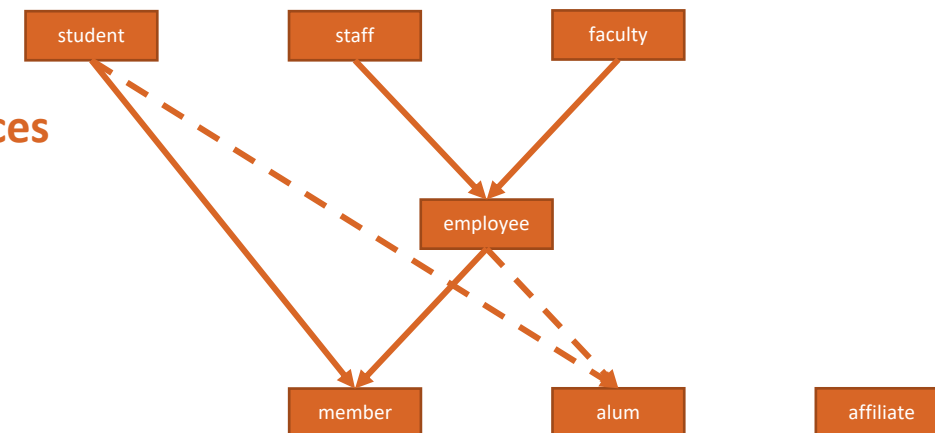
# From eduGAIN & eduroam to eduTAP

- eduGAIN is an **inter-federation** of **identity-federations** in Higher Education
  - Each Member of a Higher Education Institution (HEI) should have a **user-account** that allows him to **access online-services**
  - eduGAIN uses **Shibboleth** (federated SAML2 or OIDC) and is an “**Authentication and Authorization Infrastructure**” (AAI)
  - All HEIs Identity Management Systems uses the same common set of LDAP-Schema (eduPerson & SCHAC + SAML)  
→ shared set of Attributes and understanding of those Attributes
- eduroam (educational roaming) gives all HEI members **access** to a **WLAN service** with SSID eduroam
  - WPA2/3-Enterprise with a Radius Authentication Service (based on the eduGAIN user-account - login)
  - A common WLAN at almost all HEIs world-wide and public spots

→ It is all about **accessing services**

## → eduTAP

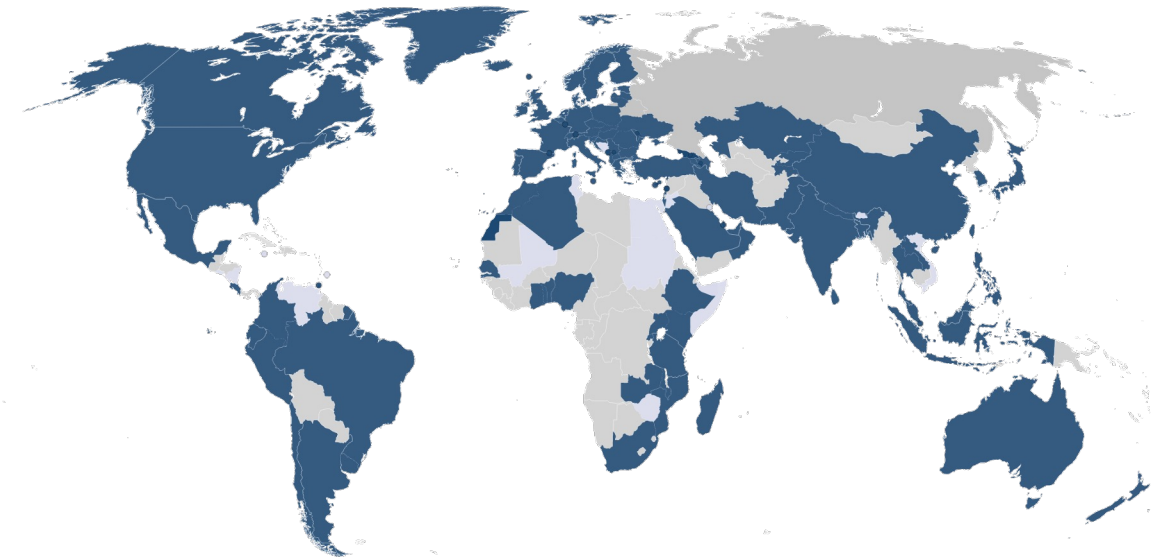
- identification / authentication / authorization to **access services on-site**
- uses eduGAIN and legacy system attributes for service access



# eduGAIN & eduroam Member Countries

→ eduGAIN Federation Members

→ eduroam Service Providers



- eduTAP fits perfectly into GÉANT Trust & Identity Services and compliments eduGAIN for offline on-site identity use cases
  - can reach the same adoption world-wide



# GÉANT – The IT provider for Higher Education in Europe

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

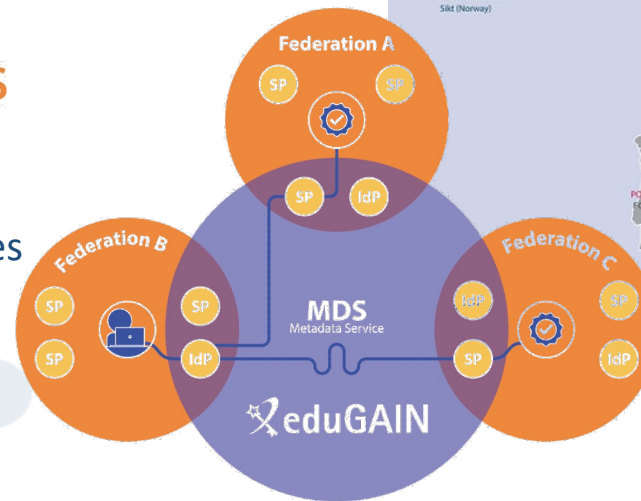
- Non-Profit Organization
- Service-Provider for IT / e-infrastructure services for the European Higher Education Sector

- Key Services:

- GÉANT Trust & Identity Services



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



→ eduTAP fits perfectly into GÉANT Trust & Identity Services and compliments eduGAIN for offline on-site identity use cases

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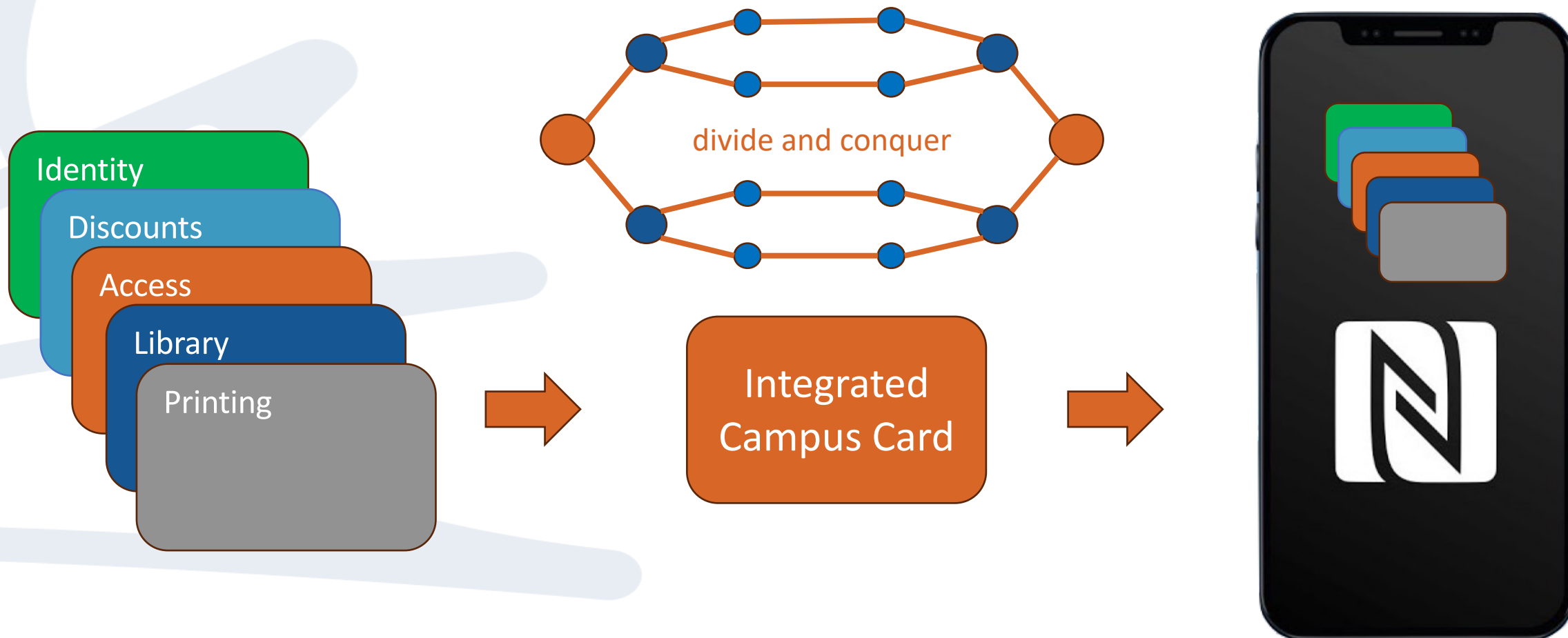
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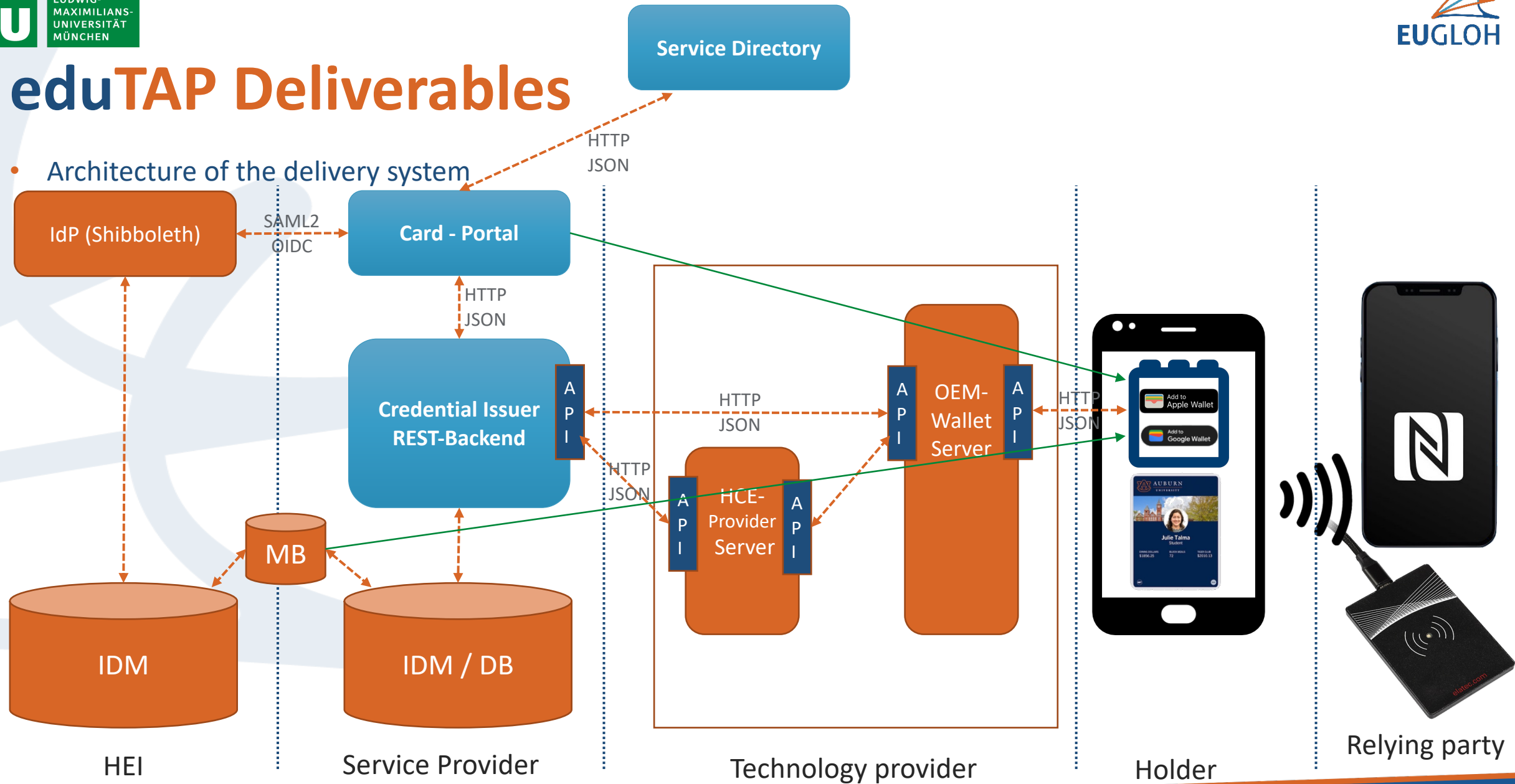
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# Path to an interoperable campus card

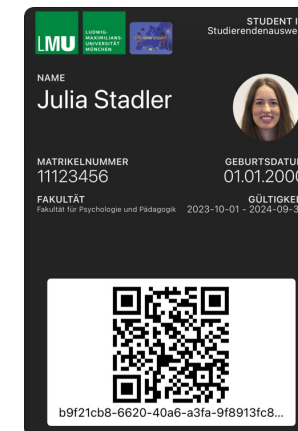
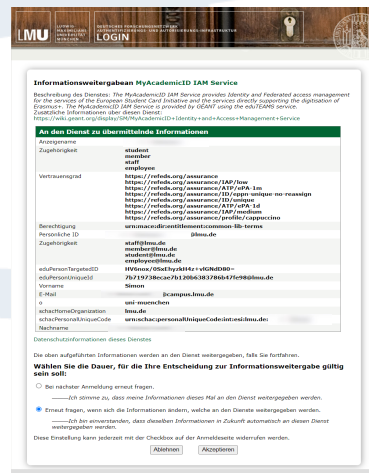


# eduTAP Deliverables

- Architecture of the delivery system



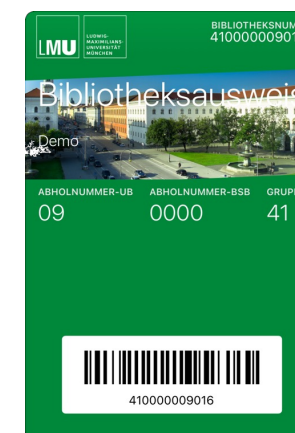
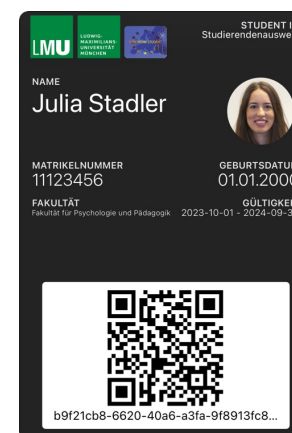
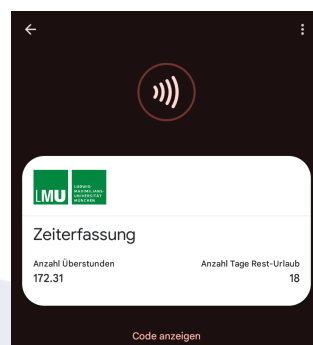
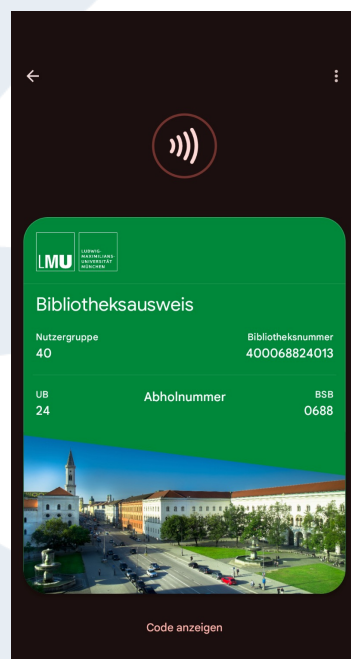
# transition



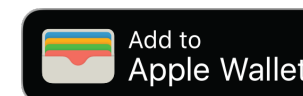


# Transition of credentials into the Smartphone Wallets

## Examples: potential IDs for LMU Munich



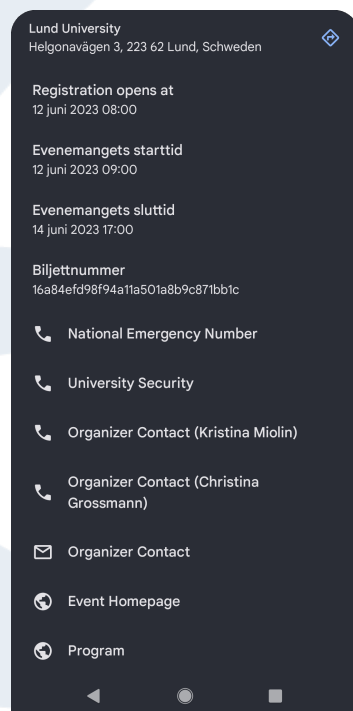
→ all NFC enabled



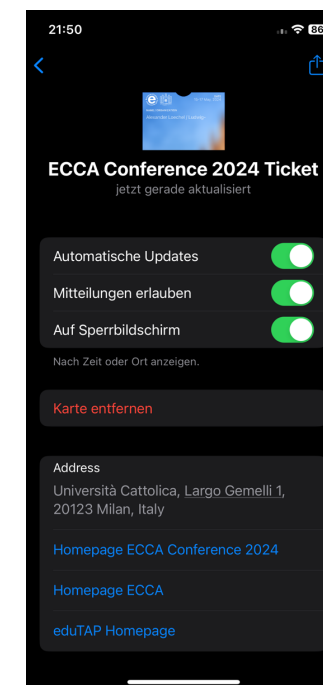
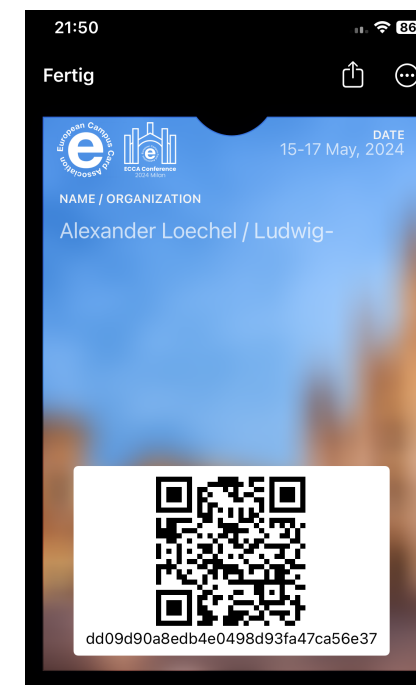
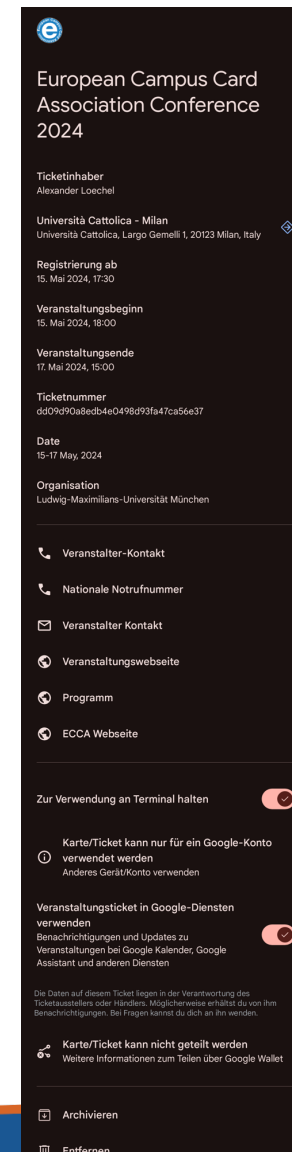
# Transition of credentials into the Smartphone Wallets

## Examples: Event Tickets

### EUGLOH Annual Summit 2023 in Lund

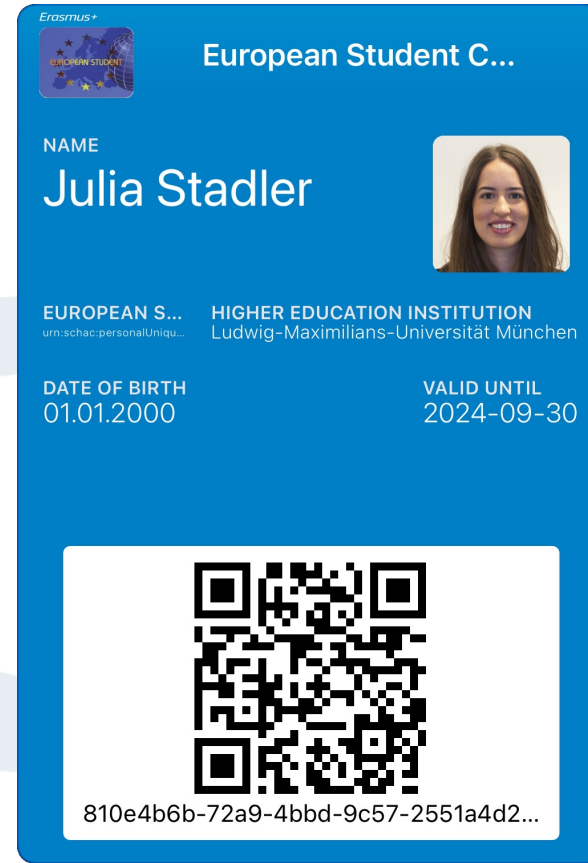
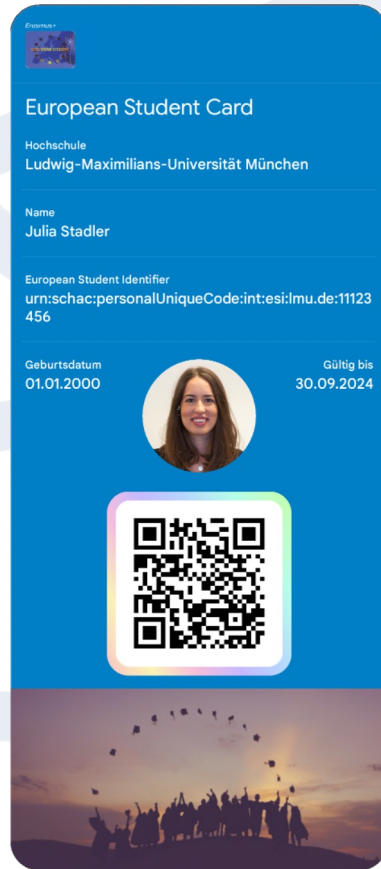


### ECCA 2024



# Transition of credentials into the Smartphone Wallets

## Examples: European Student Card in the Wallet



- Discount off-campus
- For usage at HEIs that accept the ESC
- No NFC or additional data

# Demo → Download an eduTAP created pass



<https://demo.edutap.eu/>



Add to Google Wallet



Add to Apple Wallet



European University Alliance for Global Health

# eduTAP

*Bridging **online identity** to **mobile credentials** for  
reliable and trustworthy **on-site service access**  
(in the educational sector)*





# eduTAP – educational tapping

tap to ...

- ✓ tap to identify yourself,
- ✓ tap to verify your status,
- ✓ tap to proof your entitlement,
- ✓ tap to 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.

TAP TO PAY



# eduTAP Deliverables

- eduTAP core → generic libraries and tools; everything to create and issue passes in the wallets
- eduTAP libs → generic libraries and tools; everything to read and process data from a wallet pass
- eduTAP docs → Information about eduTAP and Wallets
- Central Service Directory → find service and obtain a service pass if necessary
- Infrastructure and Deployment helpers
- Mandant Specific Applications (MasA) → eduTAP@institution implementation

eduTAP is community open source

More Information's → <https://eduTAP.eu> • <https://docs.eduTAP.eu> & <https://github.com/edutap-eu>

## We'd love to hear from you!

### Get in touch:

EUGLOH Work Package – Campus Life /  
EUGLOH ESC Working Group (IT people):  
[heis.it.wp5.eugloh@up.pt](mailto:heis.it.wp5.eugloh@up.pt)

- Alexander Loechel (LMU Munich)
- José Filipe Alves (UPorto)
- Morgan Persson (LU)
- Pierre Gabrielle (Université Paris-Saclay)

### Follow us on social media:



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**Martiusstraße 4 · 80802 München · Tel. +49 89 2180 9831**  
**[Alexander.Loechel@lmu.de](mailto:Alexander.Loechel@lmu.de) · [www.lmu.de](http://www.lmu.de)**

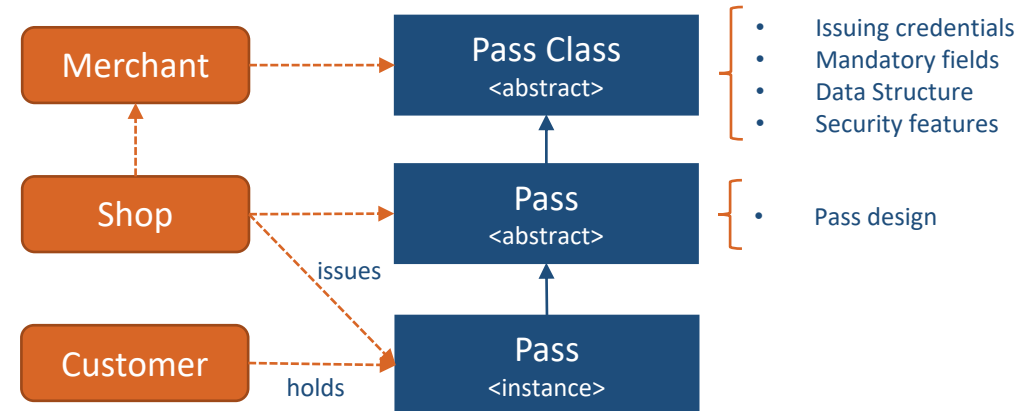


# Technical details and features of Wallets / Passes

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

**Passes** provide the following features:

- Smart / Quick Select option (Express-Mode)** ← reader selects the specific pass to read (if available)
- Battery reserve** (important for keys, transit tickets, and payment)
- Authentication requirements ← **security features**
- Groupable
- Validity dates
- Remote updateable / revokable
- Offline usable** (→ non traceable)
- Host Card Emulation possible*

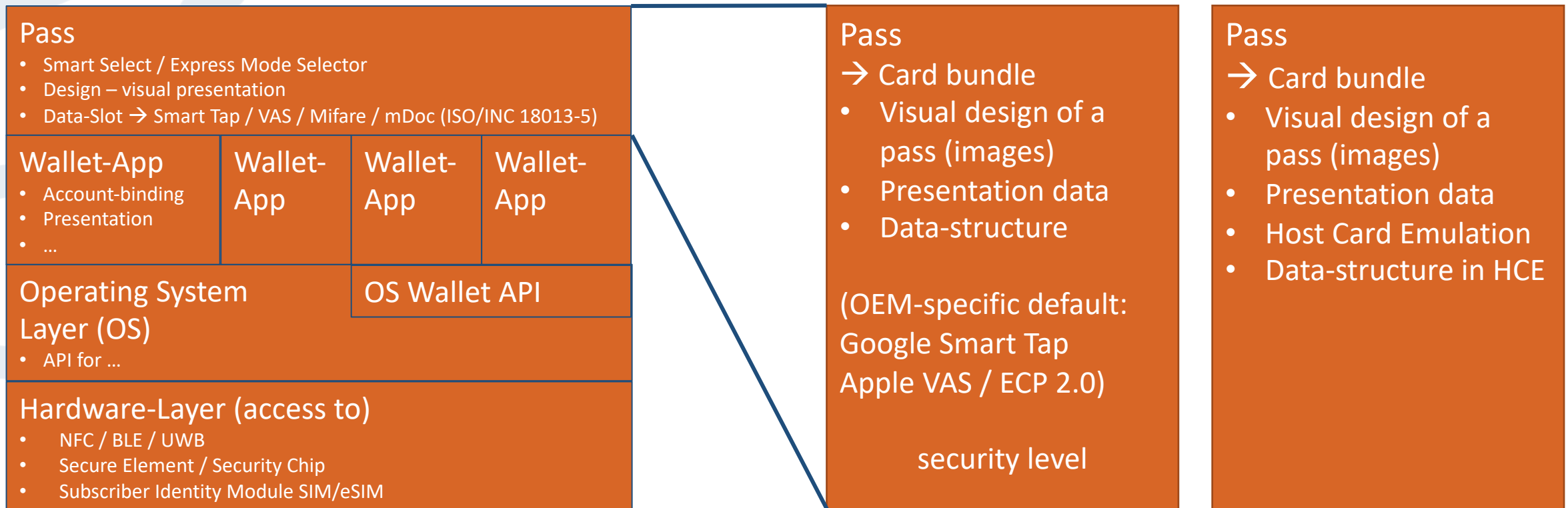




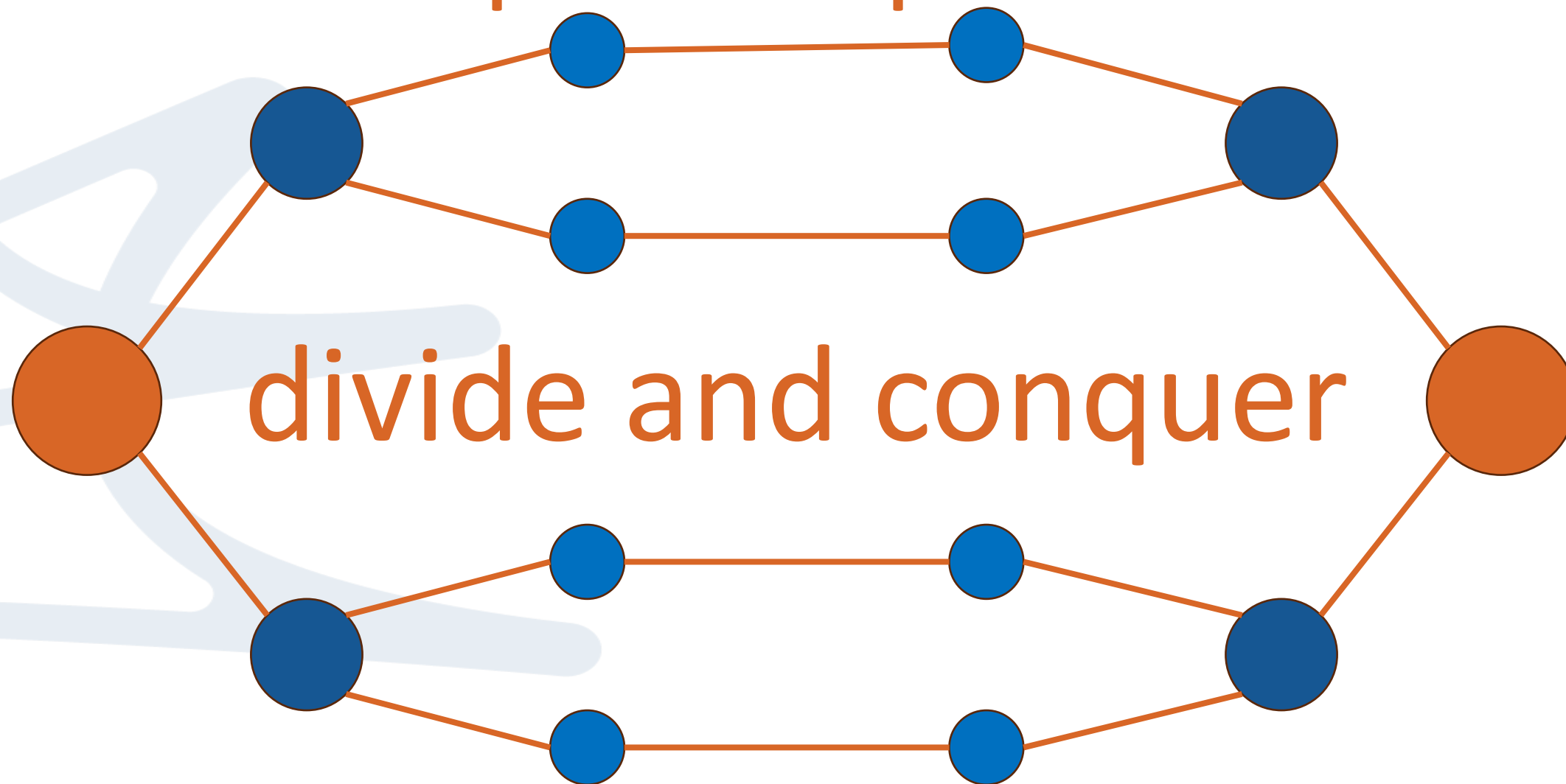
# Technical details and features of Wallets / Passes

- ✓ 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**)

→ one pass per service

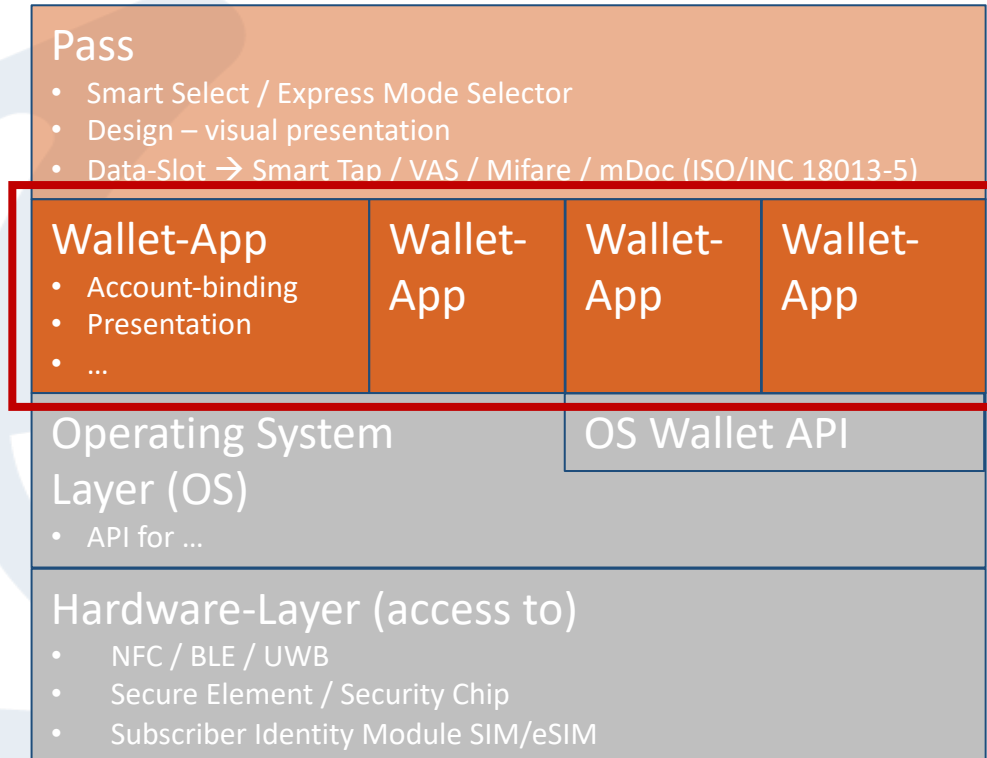


# Path to an interoperable campus card



# Technical details and features of Wallets / Passes

## Detail view on the Wallet



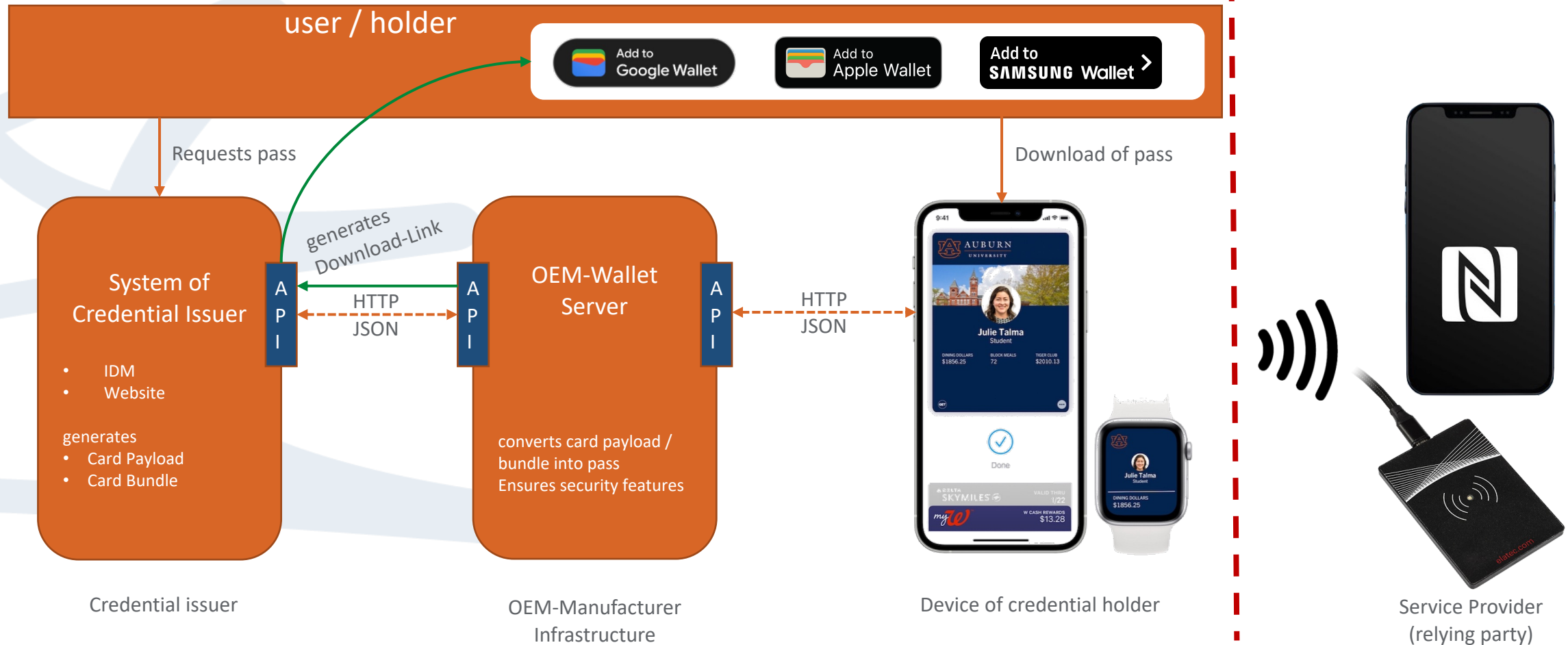
→ The eduTAP solution is wallet **agnostic**, not bound to a specific Wallet provider or company

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

# Issuing process of wallet passes

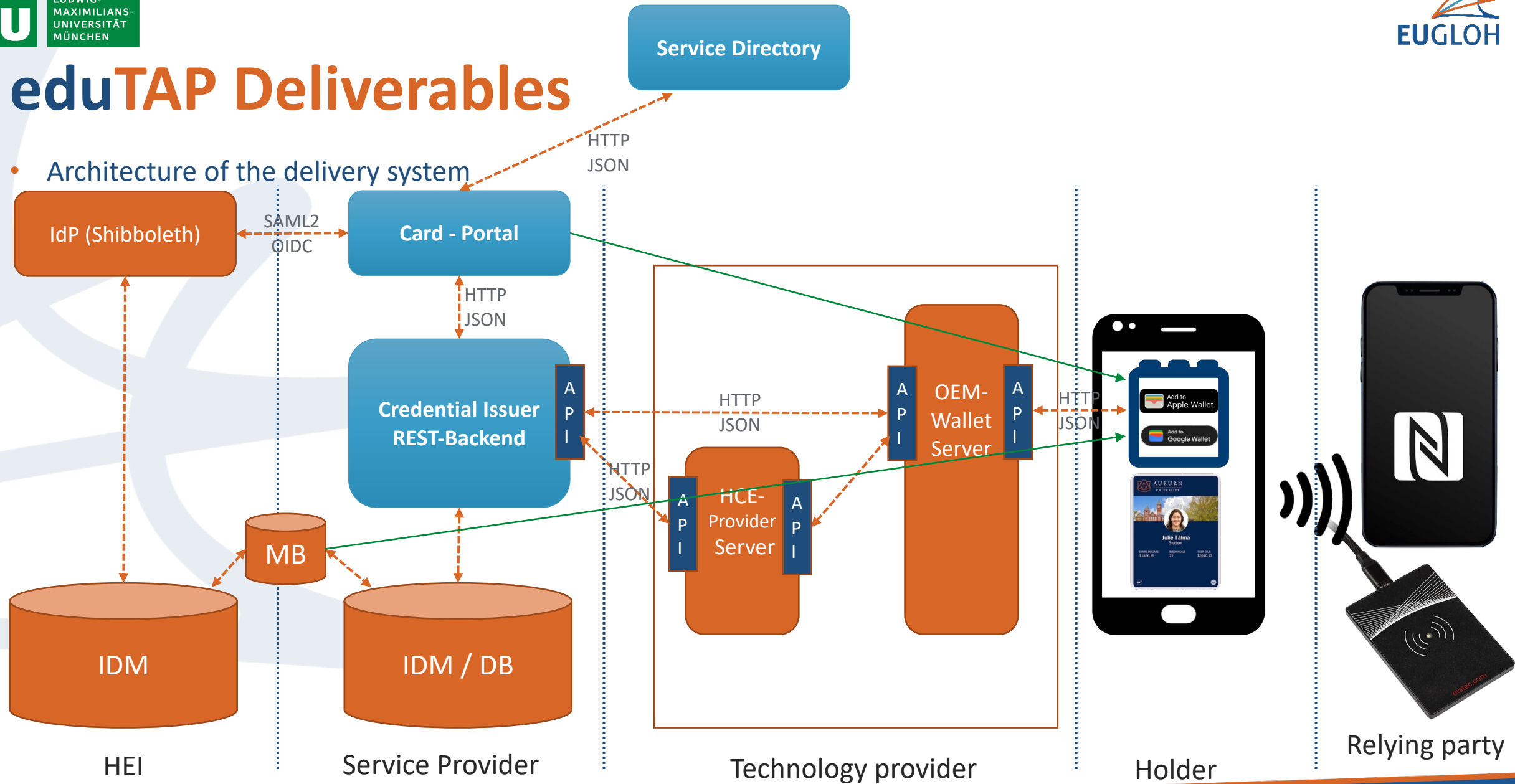
→ importance for the users – always the same process

# redeming



# eduTAP Deliverables

- Architecture of the delivery system





European University Alliance for Global Health

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# European University Alliance for Global Health



Co-funded by the Erasmus+ Programme of the European Union

## EUGLOH 2.0 Consortium Partners



UiT The Arctic University of Norway



Universität Hamburg  
DER FORSCHUNG | DER LEHRE | DER BILDUNG

→ UNS & UiT are from non-member states of the European Union



338,500 Students



54,000 Academic Staff



112 Faculties & Schools

15-20 % foreign students  
40 % European citizens  
60 % from other nations





## European University Alliance for Global Health

9 Universities, 1 Goal:

Building Europe's Campus for Global Health



### EUGLOH 2.0 Consortium Partners



LUND UNIVERSITY



UNIVERSITY OF SZEGED



LMU

LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN



Universidad de Alcalá



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UNIVERSITAS STUDIORUM NEOPLATENSIS



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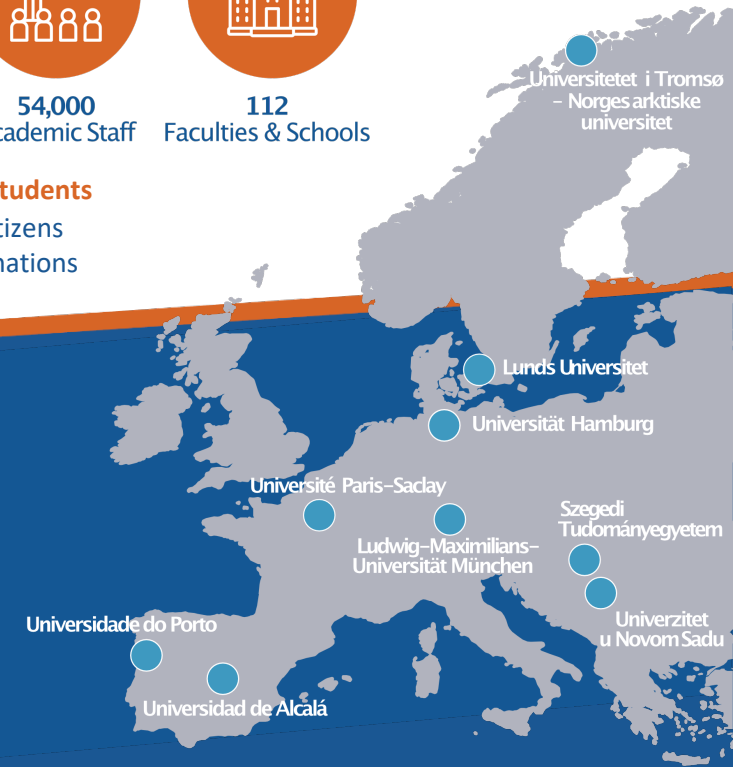
40 % European citizens

60 % from other nations

### Key Goals

- Interdisciplinary Global Health programmes 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.

} **Interoperable services and identification**





European University Alliance for Global Health

# 9 Universities, 1 Goal: Building Europe's Campus for Global Health

*A vibrant, multicultural and inclusive inter-university campus.  
Seamless mobility for students, staff and professionals – physical and virtual.*