



European University Alliance for Global Health

# eduTAP

## Turning the European Student Card Vision into Reality

*ECCA / DC4EU: Standardization in Digital Credentials for Education Workshop*  
*September 21<sup>st</sup>, 2023 - Hybrid (online & U.Porto)*

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“EUGLOH ESC Working Group”



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

[www.eugloh.eu](http://www.eugloh.eu)

- ✓ 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!



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.*



## European University Alliance for Global Health

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



### EUGLOH 2.0 Consortium Partners



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

### 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 → passes & service cards**



# EUGLOH campus cards

## current state and connected services

### → Vision:

*All university members should be able to use services of host university while on visit*



### Status of four core members (IT wise)

#### 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

Not compatible technologies

ESC - BUT



# Interoperability ?

a hologram does not provide interoperability

# security, privacy, ...?

# ESC - BUT (legal aspects & IT-Security aspects)

- The European Student Card Project specification is not transparent,
- Today it does not reflect the state-of-the-art of technology
- Conflicts with GDPR requirements
  - → **Student IDs are not optional**; therefore, they could not be issued on 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 – **new router does make it worse**
- 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

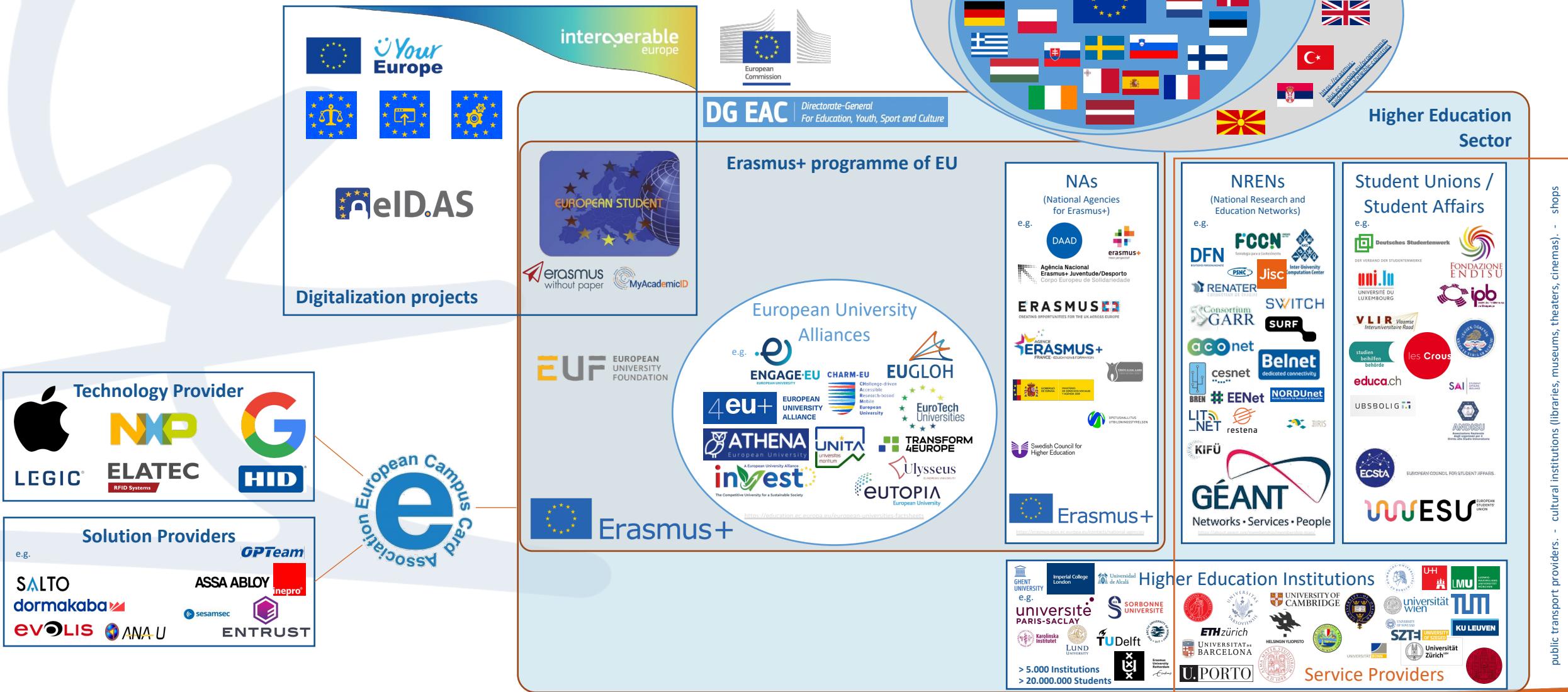
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**A great vision!  
That does not work,  
but is worth to be fulfilled**

Why does it not work?  
What is necessary to  
make it happen?

# The Stakeholder-Landscape



public transport providers. - cultural institutions (libraries, museums, theaters, cinemas). - shops

# System design

A complex system that works is invariably found to have evolved from a simple system that worked. A complex system designed from scratch never works and cannot be patched up to make it work. You have to **start over with a working simple system.**

“Law of Gall” – John Gall – Systemantics: How Systems Really Work and How They Fail

→ Start over

→ Take the **vision from the European Student Card Initiative** and current state-of-the-art technology on credentials, identity management and cards, combined with current legal baseline and **make it work**

→ eduTAP

More Info's: <https://eduTAP.eu>

# What is eduTAP

- Fulfill the interoperability vision of the European Student Card
- By being compliant, secure and trustworthy by design, but respecting legacy systems in the field
- Having a decentralized, scalable, secure and state-of-the-art system, without reinventing the wheel

→ for Europe and the world

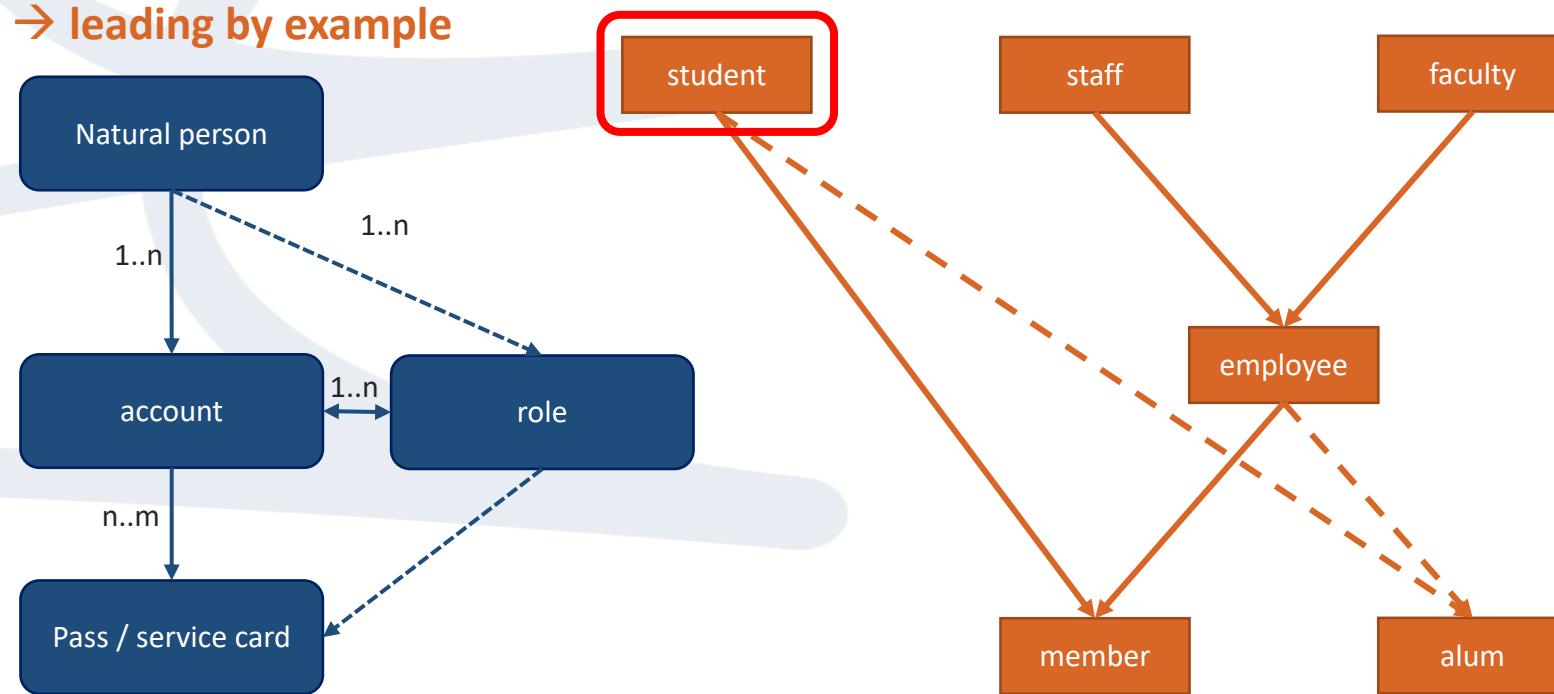
eduGAIN online – eduTAP on-site

→ Make it work by a **change of perspective**

- Perspective of multiple different Higher Education Institutions and their audience, services and current situation
  - **user centric** (Digitalization with focus on the user) implementation

# Audience: User Scope → For all persons @ HEIs

- Why focus on students and ISCED:2011 Level 6/7/8?
- It is about **providing services**
  - 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

# Interoperability of Services

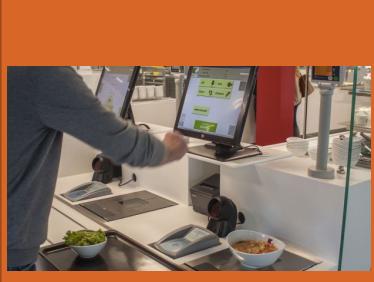
## Identification

- 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 (*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

# Trust level / Assurance Level

- Very important for **IDENTIFICATION**
- 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

-  **eID.AS** 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**

# Interoperability: Question of the medium

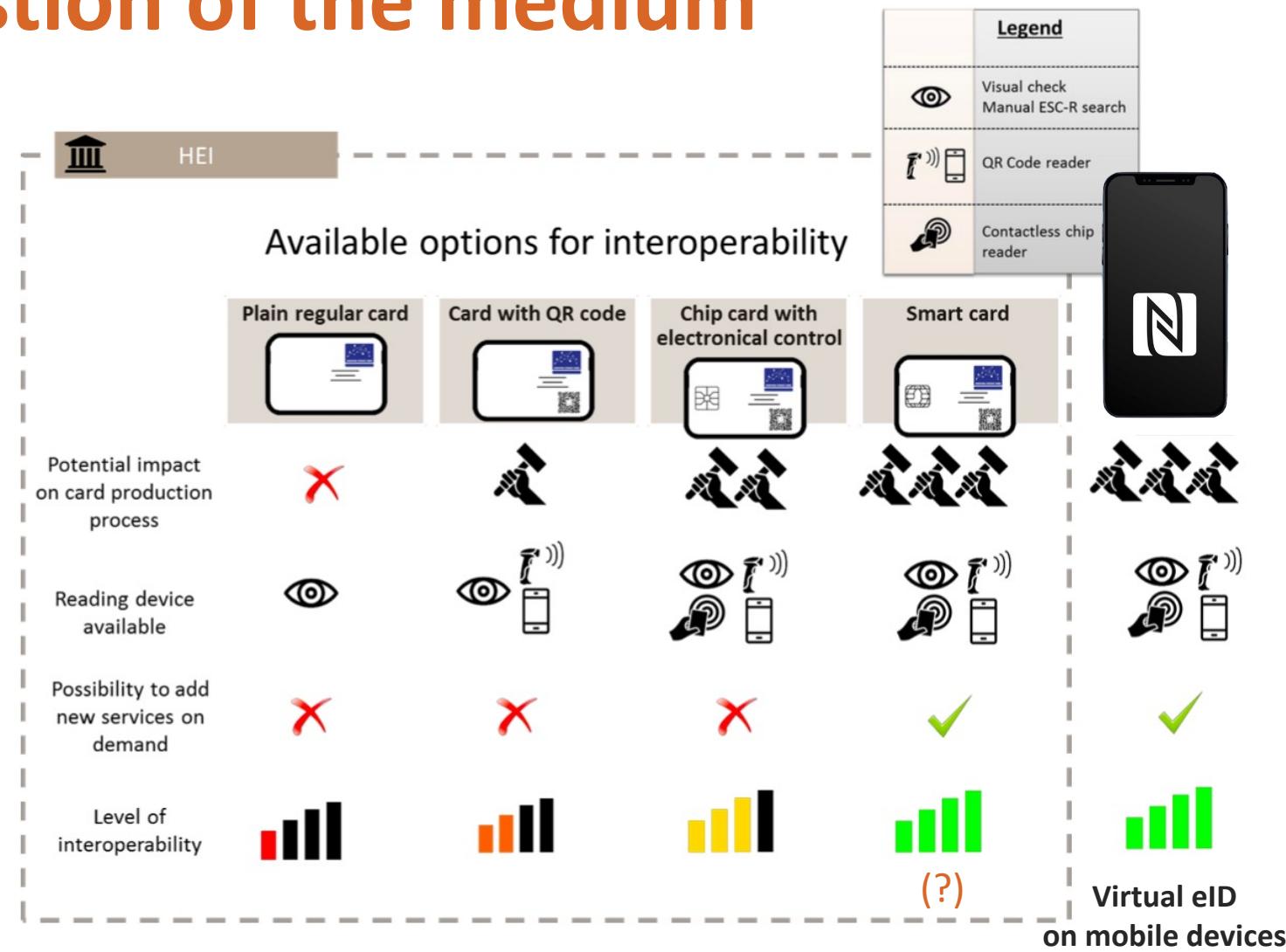
*Baselined on the ESC specification*

Possible technological implementations:

1. Plain Card with Hologram
2. Plain Card with Hologram + QR-Code
3. Chip card (with 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

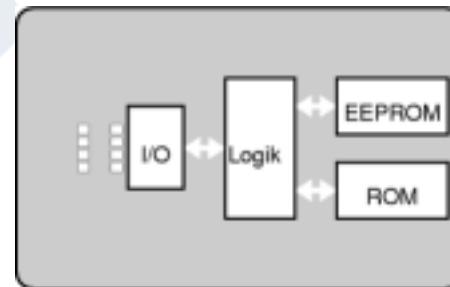
→ Smartphones are cheap for HEIs



# Interoperability: Physical card side?

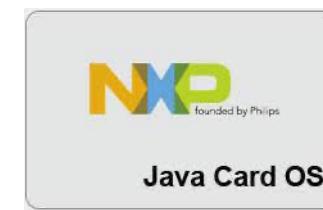
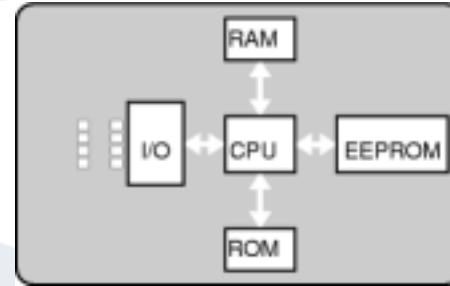
Chip cards → bind to one certain technology

- NXP Mifare DESfire
- Legic Advant
- HID iClass
- ...



Smartcards → expensive

- JCOP



→ Plastic cards are not the solution, so...

- ✓ Sustainability
- ✓ Interoperability

} Responsibility

## Interoperability: Cards – Communication Protocols and Data / File Systems

Different standards of Transponder technologies – “standards” – NOT Compatible to each other

- MIFARE Classic
- MIFARE DESFire EV1/EV2
- HID iCLASS
- HID Prox
- Indala
- ioProx
- AWID
- Keri
- CASI-RUSCO

- MIFARE Classic
- MIFARE DESFire EV1/EV2
- HID Prox
- EM4102

ISO 14443A	ECM-340
ISO 14443B	ECMA-352
ISO 15693	ISO 11784
ISO 18000	ISO 11785
ISO 18092	NFC Tag Types 1-5



- MIFARE Classic
- MIFARE DESFire EV1/EV2
- LEGIC
- Calypso
- Moneo
- Oyster
- HID Prox
- EM4102

- LEGIC
- MIFARE Classic
- MIFARE DESFire EV1/EV2
- SONY Felica
- TIRIS
- CEPAS
- Octopus
- EM4102

- LEGIC
- MIFARE Classic
- MIFARE DESFire EV1/EV2
- EM4102

- MIFARE Classic
- MIFARE DESFire EV1/EV2
- HITAG
- HID Prox

# Interoperability happens on the reader side

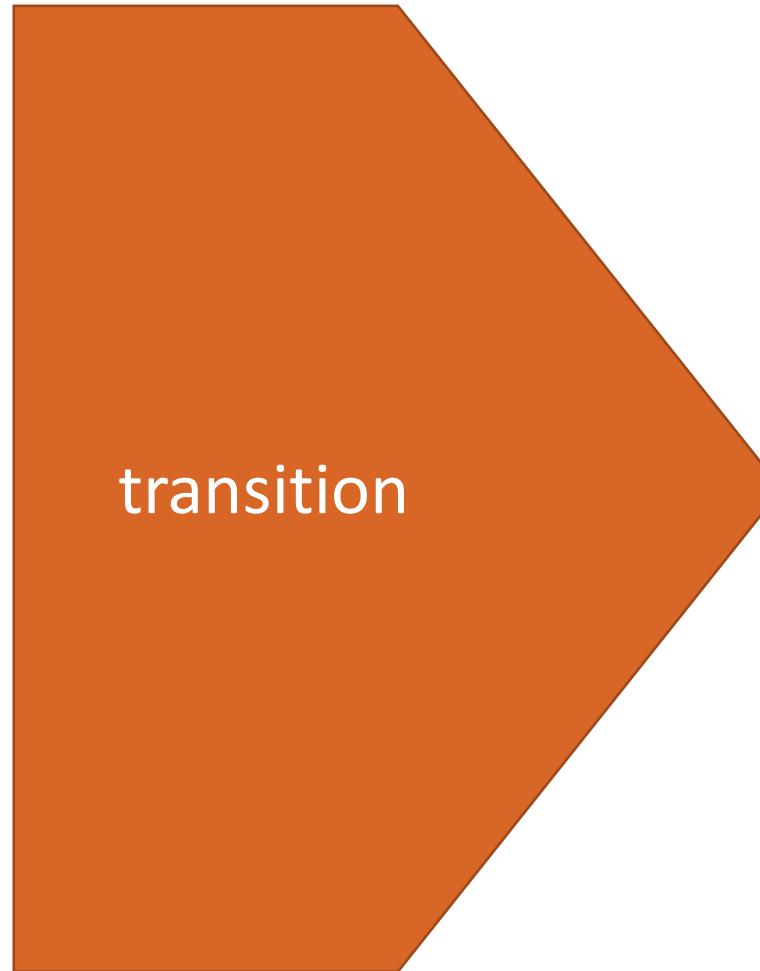
- Almost all readers in the market could **read more than one standard** (*maybe a firmware upgrade necessary*)
- QR-Codes are **not considered a secure identification element** (especially with an URL as content)



# The path to an interoperable Campus Card



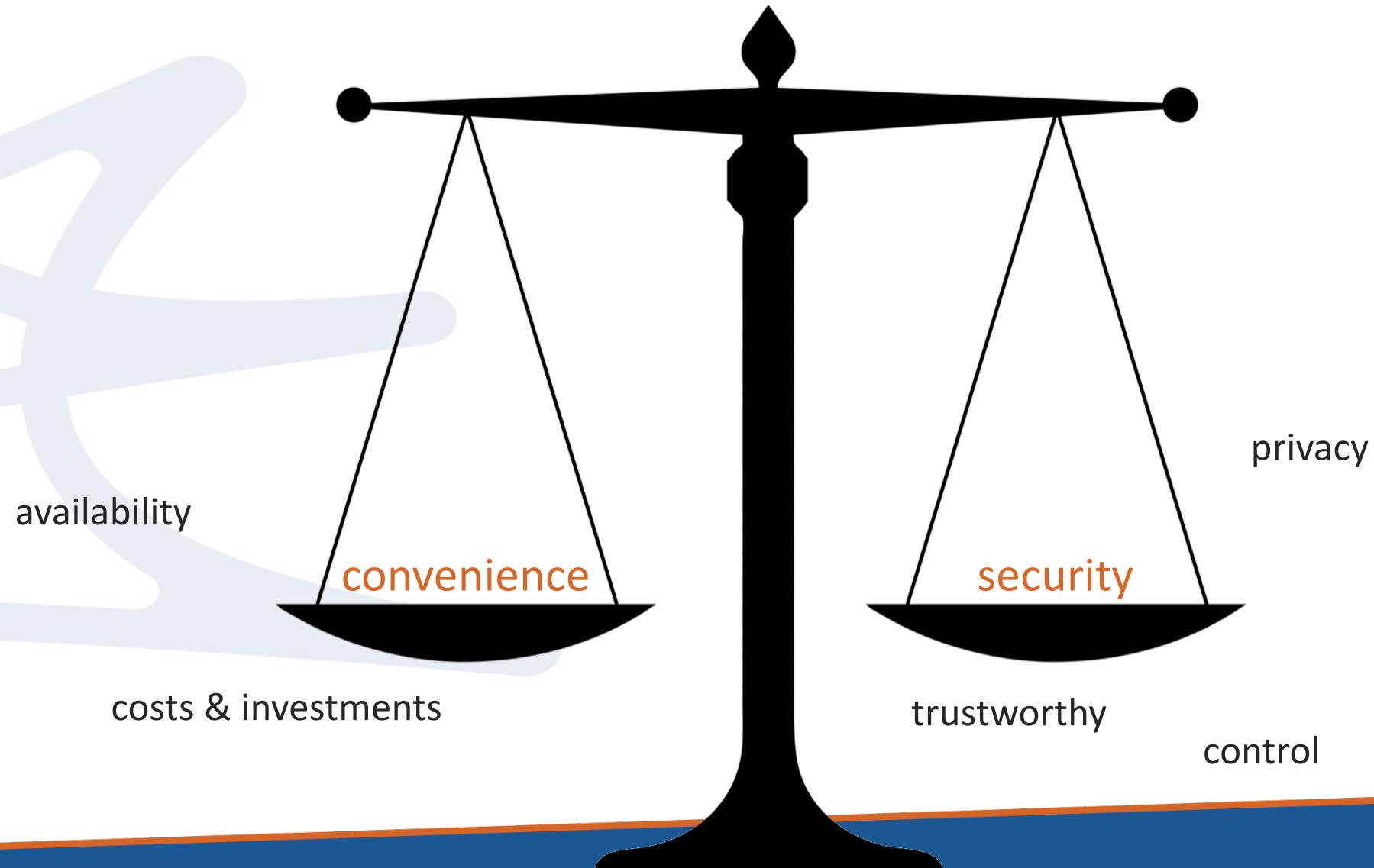
Trust-Level: NO-TRUST



# One Technology provider did not solve all problems



# balance of objectives



# Medium → Services

- Identification**
- Identification
  - Status verification
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  - Single Sign On / 2FA / FIDO2
  - Attendance check
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- Electronic Payment / cashless campus**
- Canteen & cafeterias
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  - Printing / scanning (secure & fast)
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- Physical Access Control**
- Areas (campus, parking lot)
  - Buildings
  - ROOMS
    - Classrooms

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

- Transport**
- On campus services (university shuttle service)
  - “Proof of entitlement”
  - sport tickets
  - e 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

(can chose appropriate technology)  
 → Working solutions by solutions providers

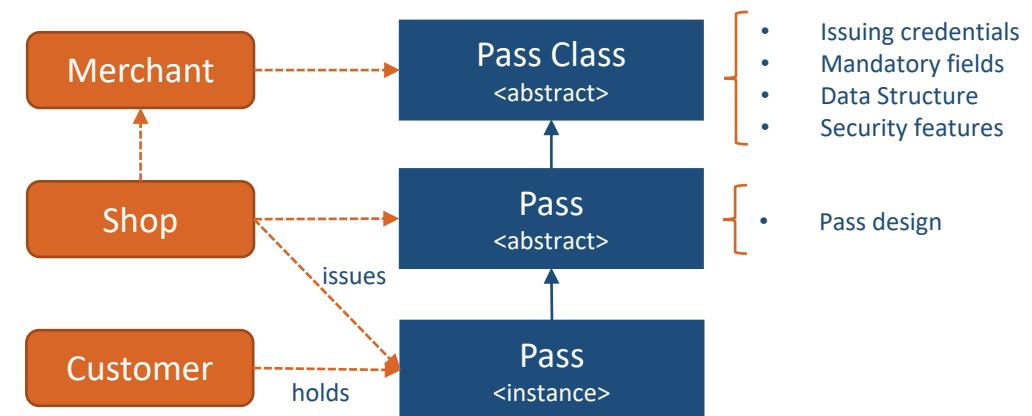
A common ID pass  
 for all HEIs  
 (ISO/IEC 18013-5 based)



providing service → create benefits

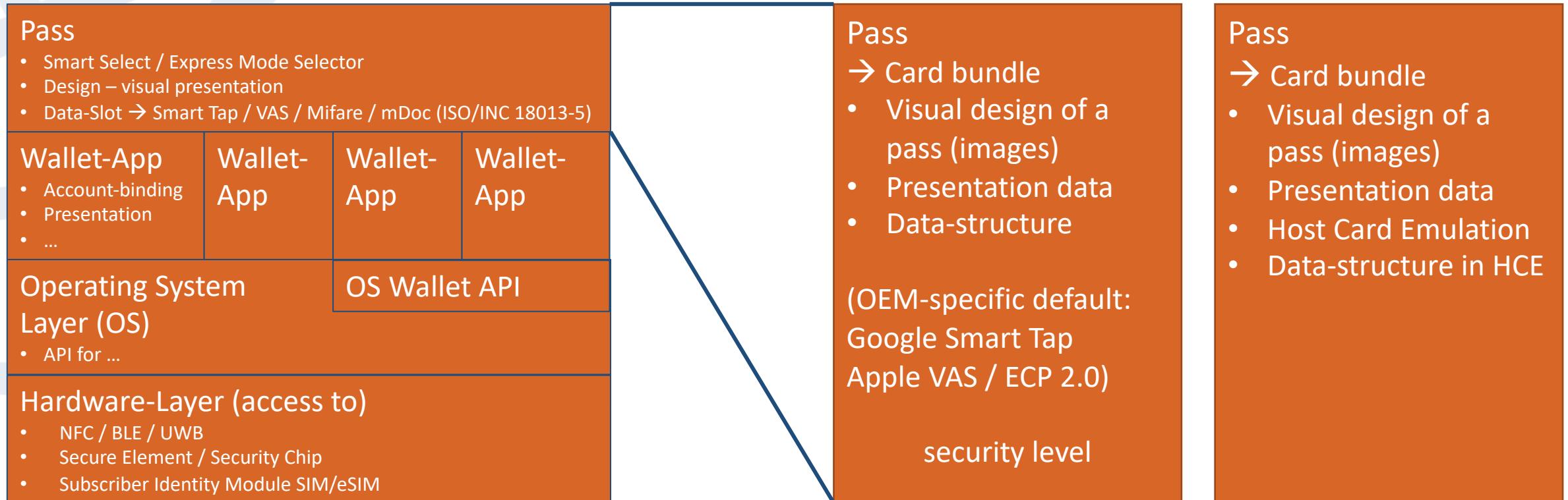
# Technical details and features of Wallets / Passes

- Smart / Quick Select option (Express-Mode)
- Battery reserve (important for keys, transit tickets, payment)
- Authentication requirements ← security features
- Groupable
- Validity dates
- Remote updateable / revokable
- Offline usable (→ non traceable)
- Host Card Emulation possible



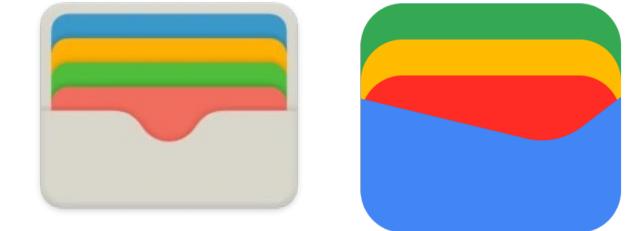
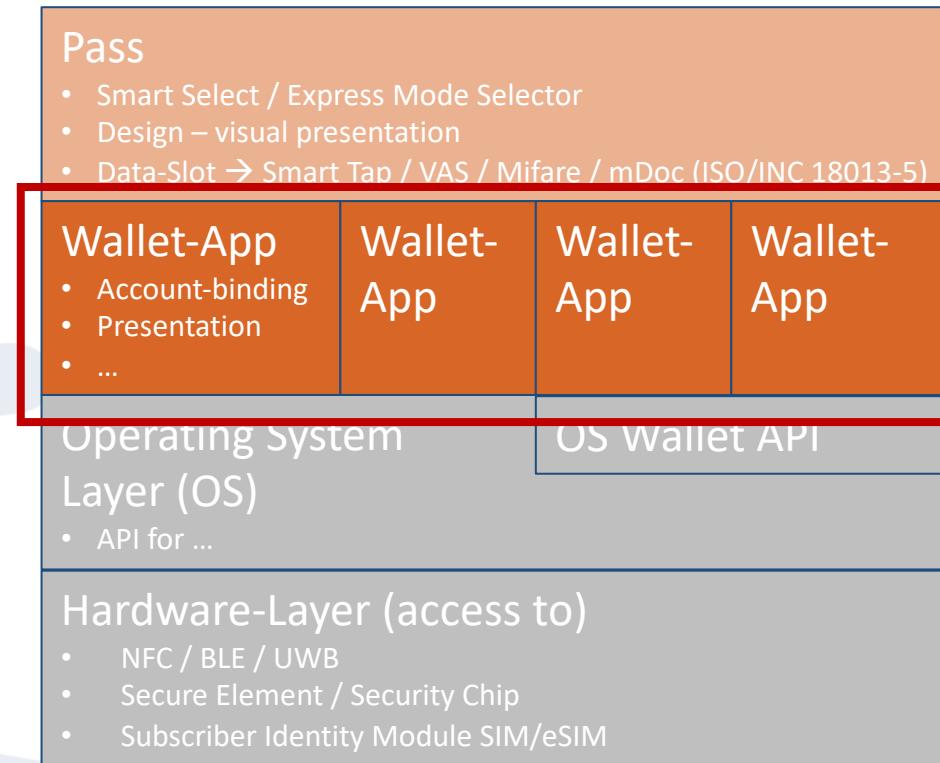
# Technical details of Wallet passes

## Detail view on the Pass



# Technical details of Wallets / Passes

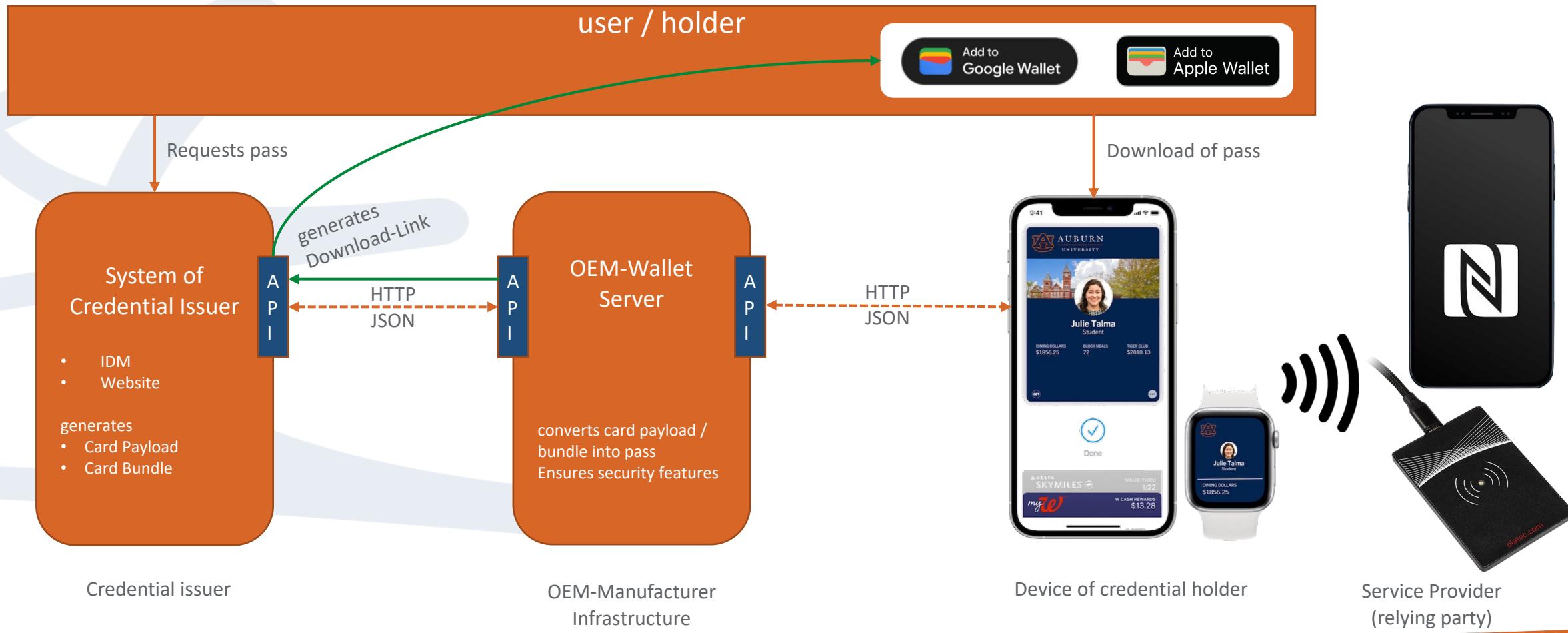
Detail view on the Wallet



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

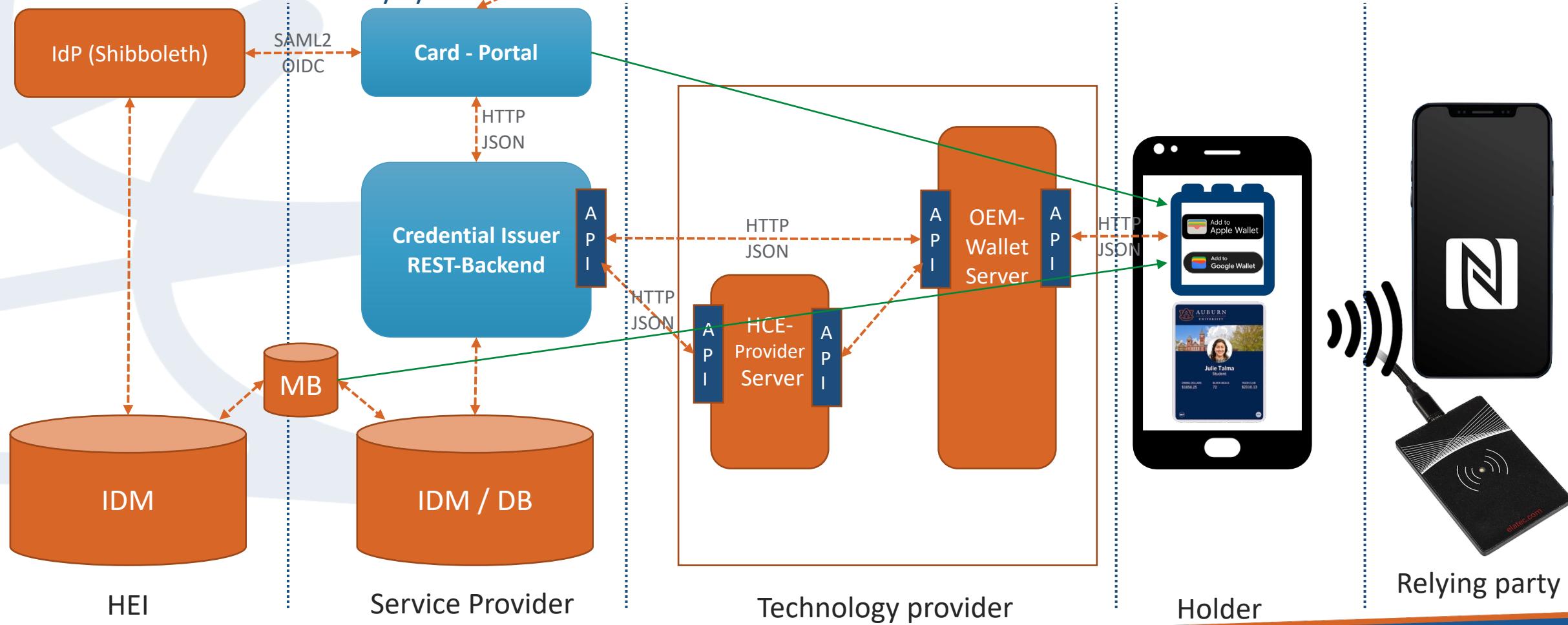
# Issuing process of wallet passes

→ importance for the users – always the same process



# eduTAP Deliverables

- Architecture of the delivery system



## Advantages of EUGLOH & eduTAP in the context of digital credential projects

- **eduTAP** is independent and not externally funded
  - we spent our own money / budget of EUGLOH members
  - because we believe in the vision and the need for a secure & interoperable solution
  - we do not need to please anyone
- We do **NOT** develop new protocols or standards, we just **filling the gap** by documenting and putting together existing technologies → a working baseline
- EUGLOH is an **excellent playground to test interoperability** in the real world
  - Different technologies currently in use
  - Different countries and legal background
- **eduTAP** will be completely open source and **free of charge**, for all HEIs and SPs

# Further Information's

We will present a more policy-based presentation at EAIE 2023 in Rotterdam

**Session 10.09**

**One Europe, one mobile solution:  
Turning the European Student Card vision into reality**

Friday 29 Sept. 2023 - 10:30-11:30



<https://www.eaie.org/rotterdam/programme/programme-overview/activity/174.html>

We'd love to hear from you!

### Get in touch:

EUGLOH Work Package – Campus Life /  
EUGLOH ESC Working Group (IT people):  
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- Alexander Loechel (LMU Munich)
- José Filipe Alves (UPorto)
- Morgan Persson (LU)
- Pierre Gabrielle (Université Paris-Saclay)

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