

Digital Campus Cards

From Regulations and Contracts to an Interoperable Solution using existing Standards and Technologies

Digital Identity & Mobile Credential Use Cases and the practical implications of these regulations for HEIs'

ECCA Webinar on
Empowering the Future of Student Identification
with Focus on essential Regulations
2024-11-27

Alexander Loechel



Regulations and Standards for Campus Cards and connected services a perspective from a German / Bavarian University

- European Regulations & Contracts

- Regulation (EU) 2024/1183 of the European Parliament and of the Council of 11 April 2024 amending Regulation (EU) No 910/2014 as regards **establishing the European Digital Identity Framework (eIDAS 2.0)**
- Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on **electronic identification and trust services** for electronic transactions in the internal market and repealing Directive 1999/93/EC (**eIDAS**)
- Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the **processing of personal data and on the free movement of such data**, and repealing Directive 95/46/EC (**GDPR**)
- Directive (EU) 2022/2555 of the European Parliament and of the Council of 14 December 2022 on measures for a **high common level of cybersecurity** across the Union, amending Regulation (EU) No 910/2014 and Directive (EU) 2018/1972, and repealing Directive (EU) 2016/1148 (**NIS 2 Directive**)
- **European Student Card Initiative (ESCI)**, binding by the **Erasmus Charter for Higher Education (ECHE)** – Period 2021-2027

- German Federal Regulation

- Gesetz über **Personalausweise** und den **elektronischen Identitätsnachweis** (Personalausweisgesetz - PAuswG)

- Bavarian Free State Regulations

- Bayerisches **Hochschulinnovationsgesetz** (BayHIG), 2022-08-05
- Allgemeine Geschäftsordnung für die Behörden des Freistaates Bayern (AGO), 2000-12-12

→ Rules for a Campus Card / Student ID / Staff ID / Affiliate ID?

Regulations and Standards for Campus Cards and connected services a perspective from a German / Bavarian University → Rules that apply for a Campus Card / ID Document

- Bavarian University Law (BayHIG) does not require Universities to issue a Student ID
- University must issue a document (can be paper/PDF) that prove matriculation state.
- General Rules of Procedure for the Authorities of the Free State of Bavaria (AGO) requires University to issue a “Dienstausweis” / Staff ID (AGO § 35 Dienstausweise) for University employees on request, that must contain:
 - Institution
 - First name
 - Surname
 - Photo
 - Signature
- Cards with an electronic data storage can be used for additional services (Physical Access Control and Digital Signature)

Regulations and Standards for Campus Cards and connected services a perspective from a German / Bavarian University → Rules that apply for a Campus Card / ID Document

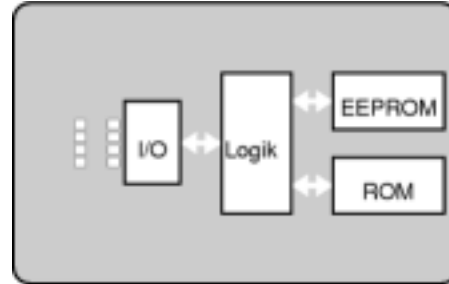
- Cards issued by Universities are official **Governmental Photo IDs**, so the following Rules apply
 - No person may possess more than **ONE** valid identity card in his or her name
 - Identity cards / documents are the **property of the Issuing Authority**, the Free State of Bavaria
 - Identity cards have a maximum **validity date**
- The collection and use of personal data from the ID card or with the help of the ID card may only be carried out by
 1. Authorities authorized to establish identity in accordance with §§,
 2. Public authorities and non-public authorities in accordance with §§ 18 to 20.
- § 20 Use by public and non-public bodies
 1. The holder may use the ID card as proof of identity and legitimation document with public and non-public bodies.
 3. The serial numbers may not be used to retrieve or link personal data using automated procedures.

→ **Conflict with ESC**, as ESCN should not be used for linking services

Technical Standards for Physical Campus Cards

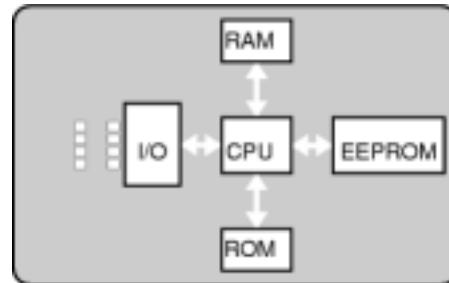
Chip cards

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



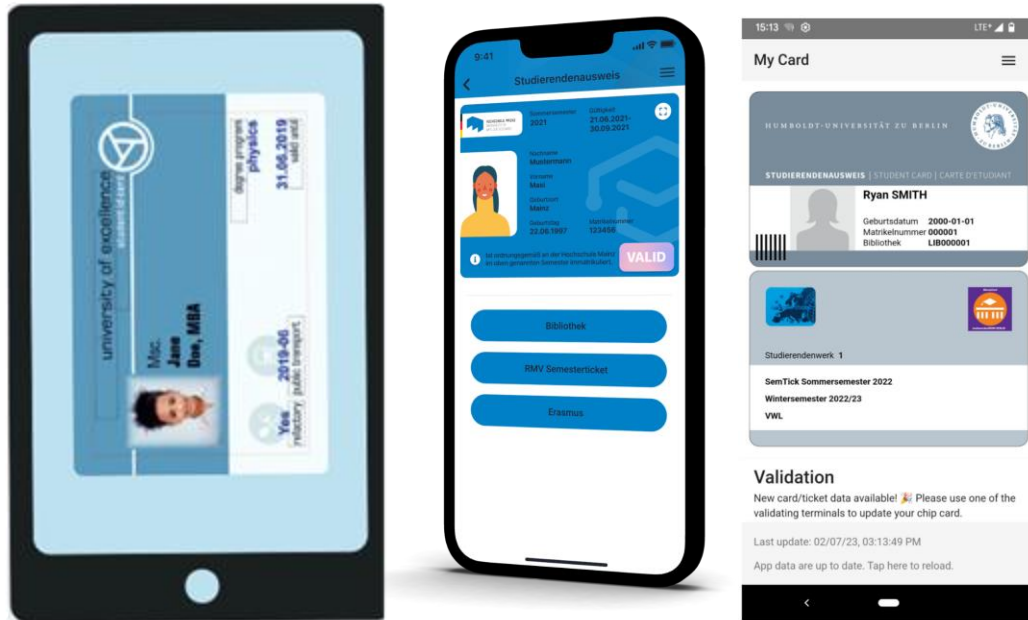
Smartcards

- JCOP

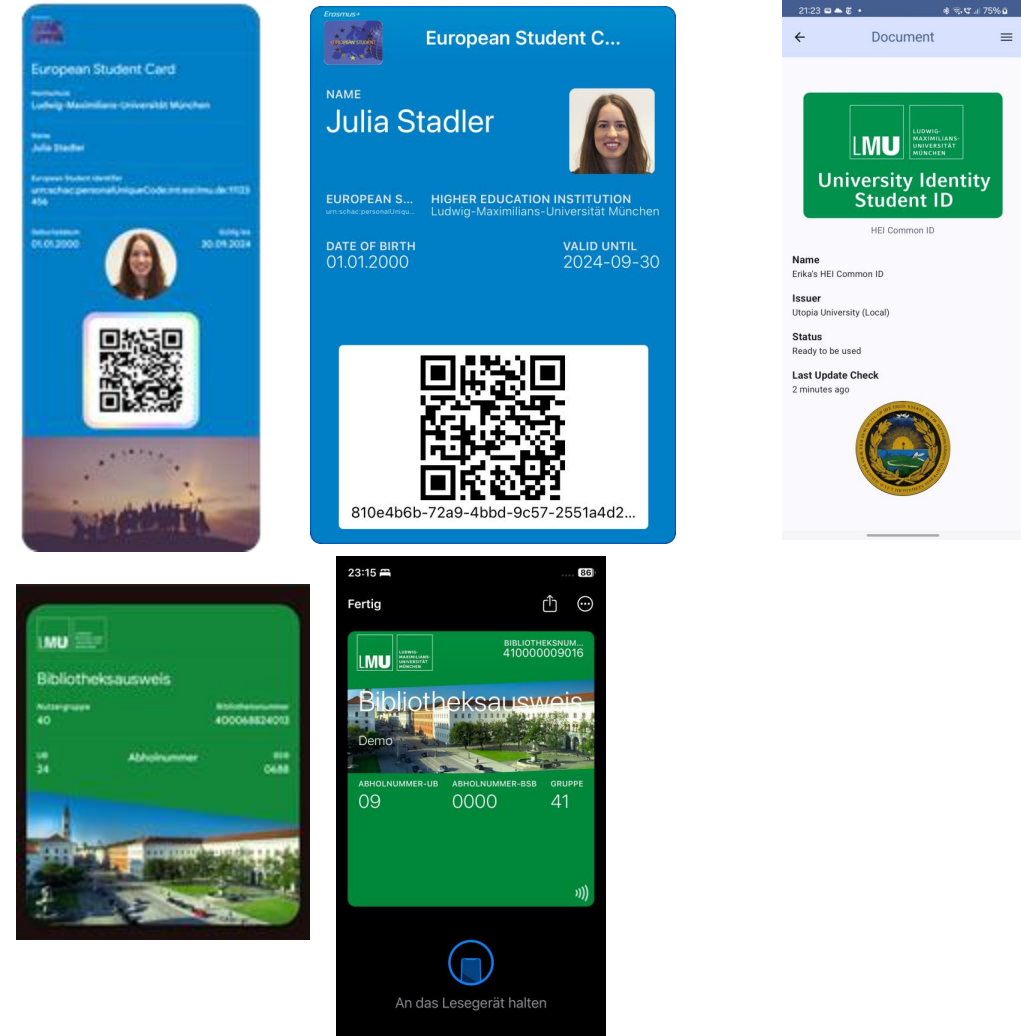


Technical Standards for Digital Campus Cards

Smartphone Apps



Wallet Passes



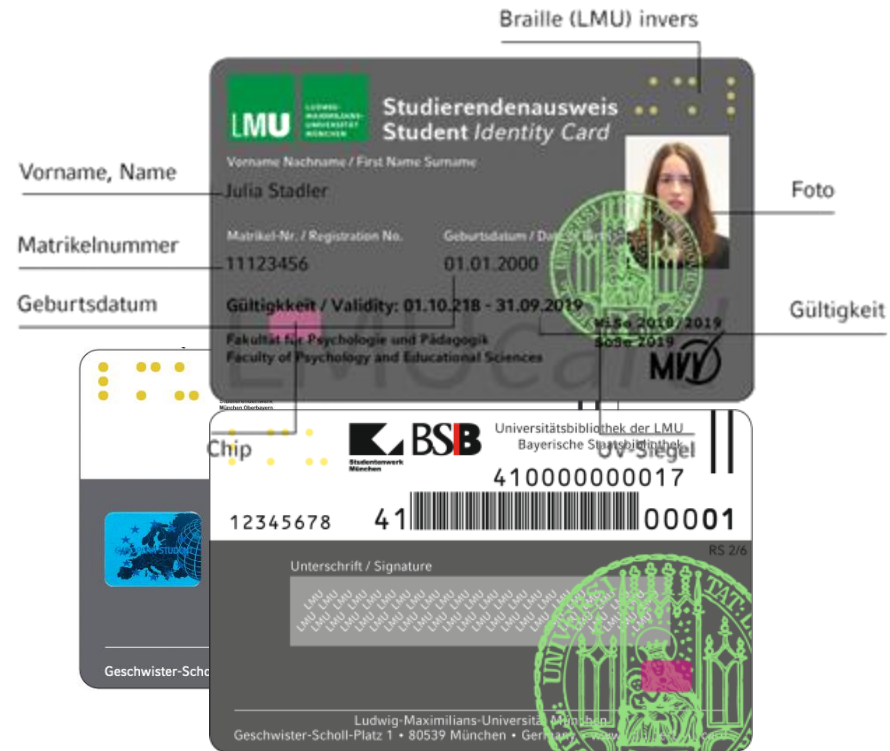
- It is all about data payload and how to access those data
- Visual codes (e.g. QR-Codes)
- Contactless (e.g. NFC, BLE, UWB)
- **An Image is not an Identity Document**

Technical Standards for Data Payload

- Block-Sequence (e.g. String, or HEX data)
- File-System like Structure with a Block Sequence
- Structured Payload:
 - eXtensible Markup Language (XML) [RFC 5364](#)
 - JavaScript Object Notation (JSON) [RFC 8259](#)
 - JSON Web Token (JWT) [RFC 7519](#)
 - Verifiable Credentials Data Model (VC data model) <https://www.w3.org/TR/vc-data-model/>
 - Personal identification — ISO-compliant driving licencePart 5: Mobile driving licence (mDL) application ([ISO 18013-5:2021](#))
 - EUDI-Wallet Architecture Reference Framework (ARF) <https://eu-digital-identity-wallet.github.io/eudi-doc-architecture-and-reference-framework/>



LUDWIG-
MAXIMILIANS-
UNIVERSITÄT
MÜNCHEN



From Regulations & Standards to use cases

EUDI-Wallet Architecture Reference Framework

user cases

2. Use Cases

1. Identification and authentication to access online services
2. Qualified electronic signature
3. Mobile Driving Licence
4. Pseudonyms
5. Other use cases
 1. Health
 2. Educational credentials and professional qualifications
 3. Digital Finance
 4. Digital Travel Credential

The European Digital Identity Wallet is a Web-Wallet (remote)

→ Focus on online Services

→ on-site Services and proximity use cases are *mostly* out of scope

Scope for Universities Focus of Campus Cards

Campus Cards (physical and digital) are primary for:

→ **on-site service access,**

→ can support online services

Shibboleth and eduGAIN are for online services

Access 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

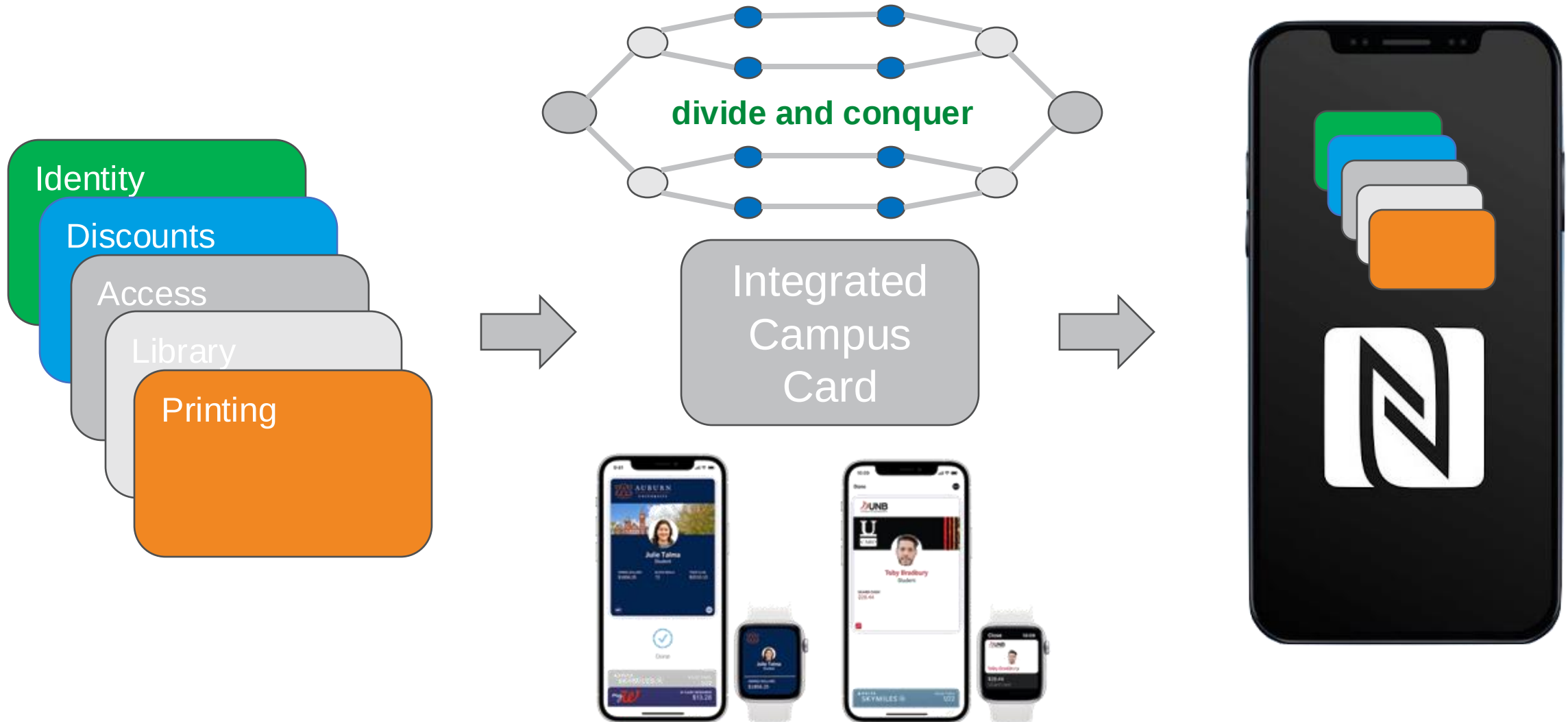


What is the Right Technical Solution?



Verifiable Credentials / mDoc for everything?

Path to an interoperable campus card → The eduTAP concept



Path to a successful Interoperability Story and User Experience

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.

John Gall - Systemantics: How Systems Really Work and How They Fail

For User Experience it must be
simple, secure and quick

→ *Learn from Apple and Google Wallets*



*as a perfect example of good user experience
within Higher Education sector*

Scope for Universities

Focus of Campus Cards → on-site service access

my opinionated point of view:

Neither the
European Digital Identity (EUDI) Wallet
nor the European Student Card
solves the proximity issue with on-site service access
well enough

eduTAP Wallet Passes

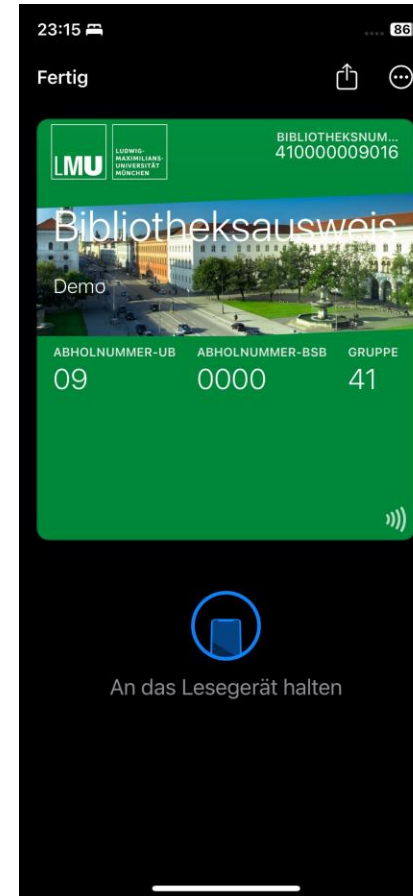
- eduTAP is **NOT a new standard** that tries to solve the problem comprehensively.
- eduTAP uses **existing standards** that have been used and proven for many years.
 - A separate dedicated service pass in the wallet is used for each service (use case), which uses the appropriate technology and data structure for the service
- For Library just a plain String Library ID Number
- For Physical Access Control a technology of the PAC System (e.g. CIV/PIV, OSS, Aliro, ...)
- For a specific Service Provider Discount a JWT
- For Identification and off-campus discounts a Verifiable Credential (ISO 18013-5 mDoc)
 - ARF compliant to be in the EUDI-Wallet
- *Educational credentials (e.g. transcript of records, diploma) are out of scope as they are not a proximity use case*

Example Use Case – Library ID

A 12-digit Number as **NFC Payload** of

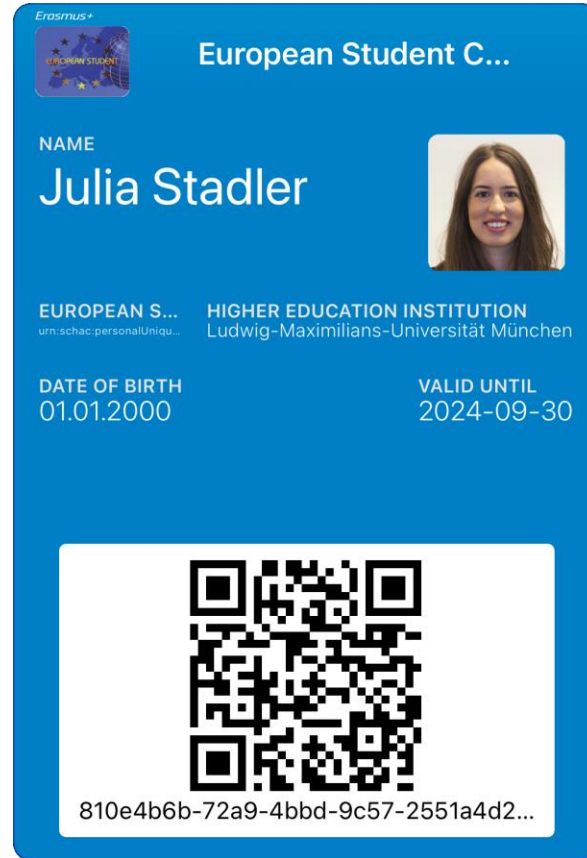
- Apple VAS Store Card
- Google Smart Tap Loyalty Object

Only the Library can read the NFC Payload



Example Use Case – European Student Card v1 for off-site discount

QR-Code of an URL to the ESC-R



Example Use Case – Discount (but offline)

Discount Information as JWT (following pure [RFC 7519](#))

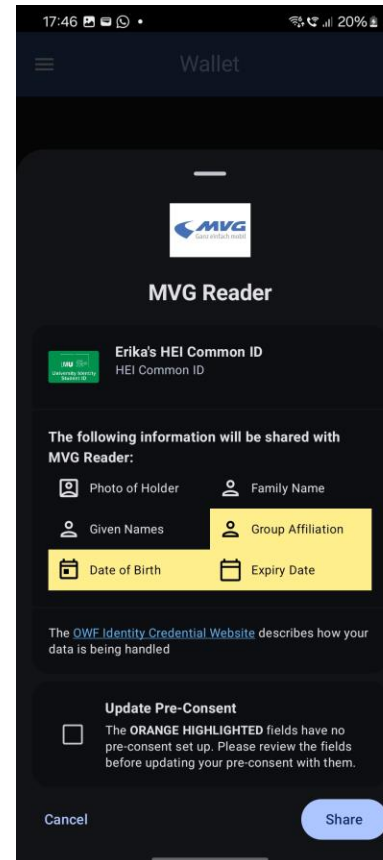
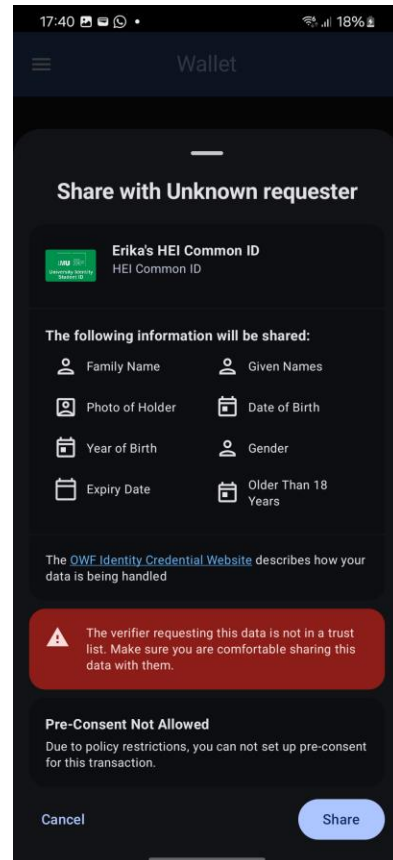
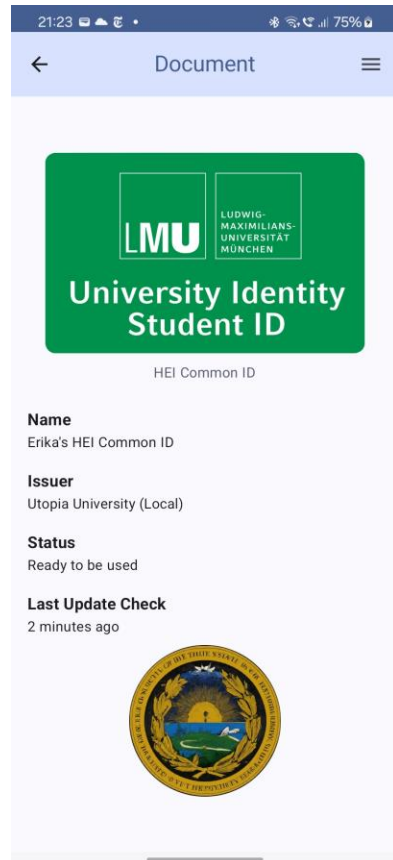
```
{
  "iss": "<Higher Education Institution of the Issuers>",
  "iat": "<issued at timestamp>",
  "exp": "<expiry timestamp (not more than 7 days into the future)>",
  "eduPersonScopedAffiliation": [
    "student@lmu.de",
    "member@lmu.de"
  ]
}
```

The JWT is signed by the Issuer using an ECDSA Algorithm,
the Public key is online available

The JWT can be payload of NFC or a QR-Code

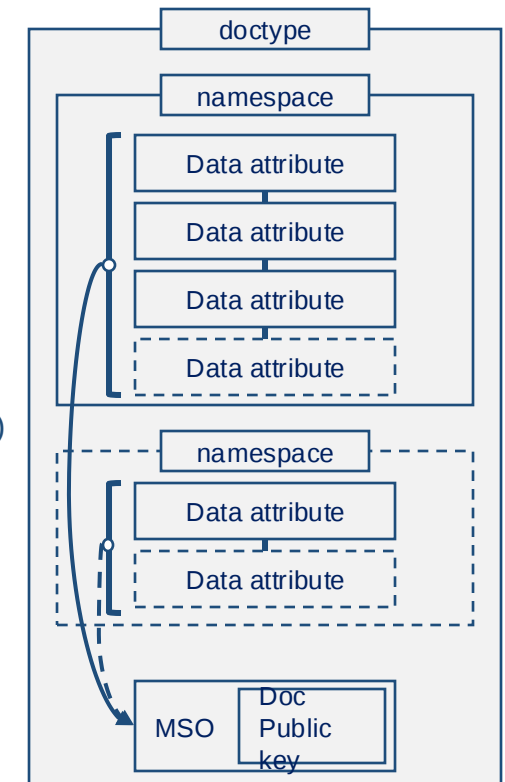
Example Use Case – Identification – Student ID

Example Implementation of an ISO 18013-5 mDoc for Higher Education Institutions IDs



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
- ...



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.



no app, just tap!



LUDWIG-
MAXIMILIANS-
UNIVERSITÄT
MÜNCHEN

Alexander Loechel
Referent IT-Projekte
Dezernat VI · Zentrale Universitätsverwaltung · Ludwig-Maximilians-Universität München
Post-Adresse: Geschwister-Scholl-Platz 1 · 80539 München
Office: Martiusstraße 4 · Raum 213 · 80802 München · Tel. +49 89 2180 9831
Alexander.Loechel@lmu.de · www.lmu.de

