DE4A Digital Europe For All

SSI Authority agent
Demo of SA Diplomas UC - Video
Wrap-up: lessons learnt in DE4A

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DE4A Workshop: Highlights for Other Projects

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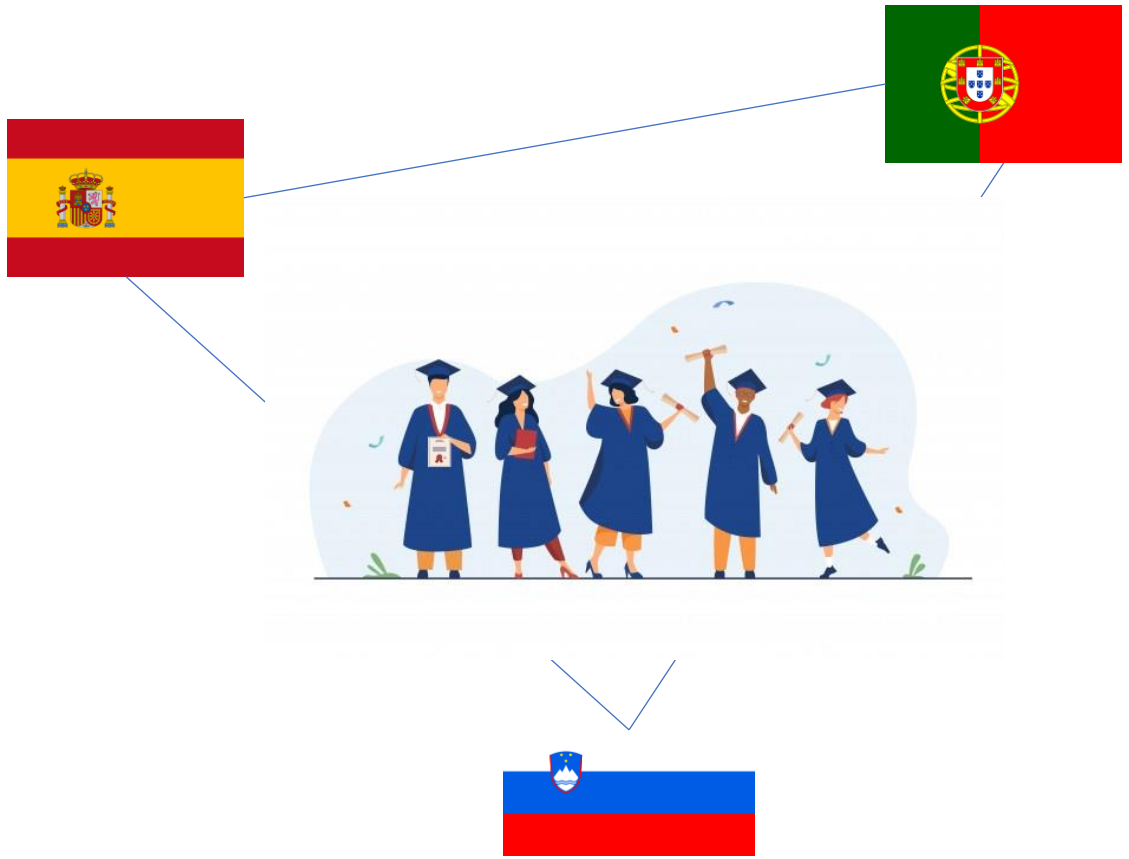
DE4A has received funding from the European Union's Horizon 2020 research and innovation programme under GA. No. 870635

Authority agent = Enterprise wallet

- The Enterprise wallet had to be used by our Public institutions (Trusted Issuers)
  - ISSUERS | VERIFIERS
    - Ministry of education of Slovenia
    - SGAD (Spain)
    - University of Lisbon (Portugal)



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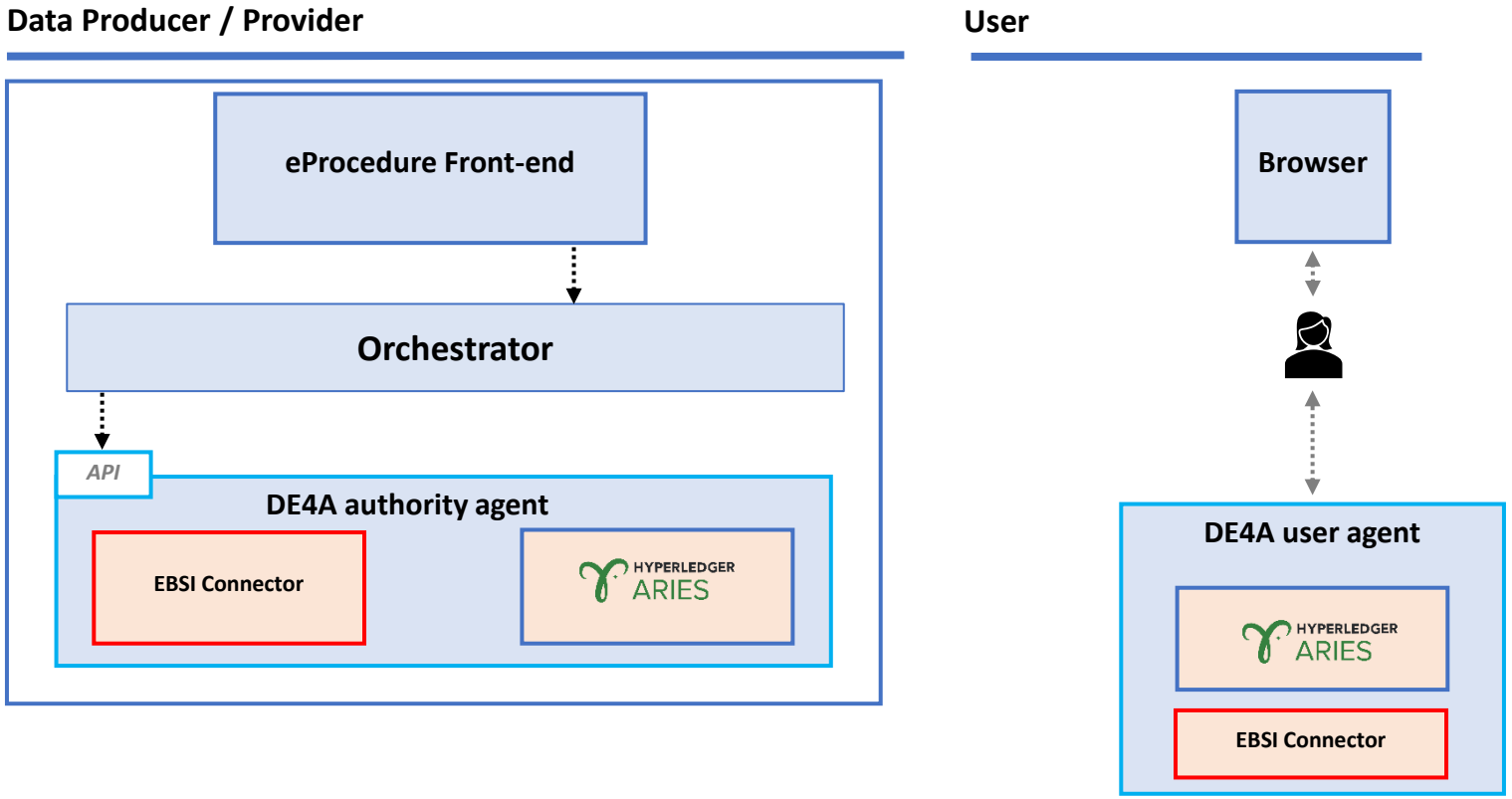
Authority agent = Enterprise wallet

- Core technical components of DE4A, including the Enterprise wallet (left side)



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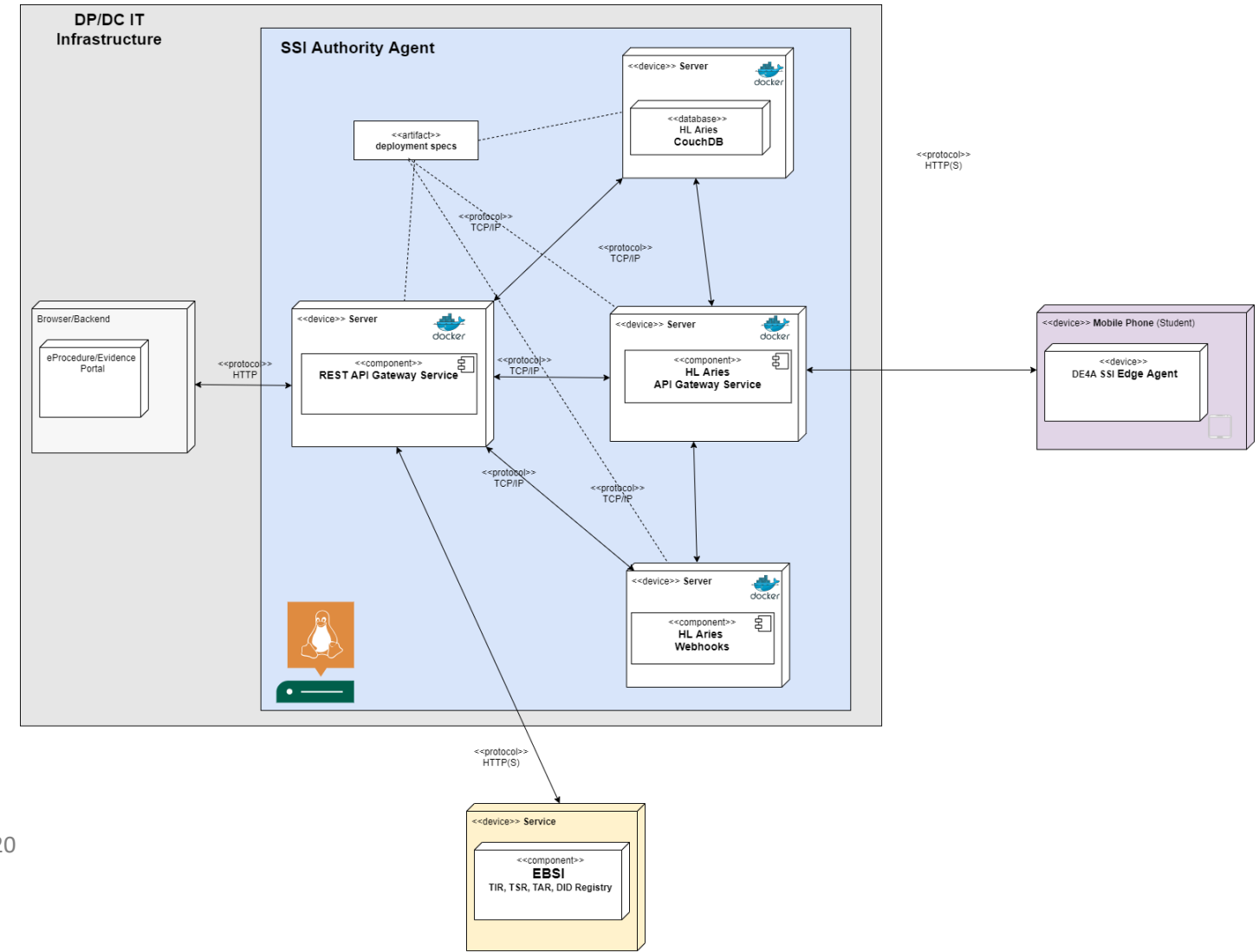
Authority agent = Enterprise wallet

- Deployable as a Docker image
  - Connectable to the existing business logic (backend)
  - Exposes Java-based REST API
  - Built on Hyperledger ARIES
  - Includes EBSI Connector
    - **Generates DID:ebsi**
    - **Onboards on EBSI (DID Registry)**



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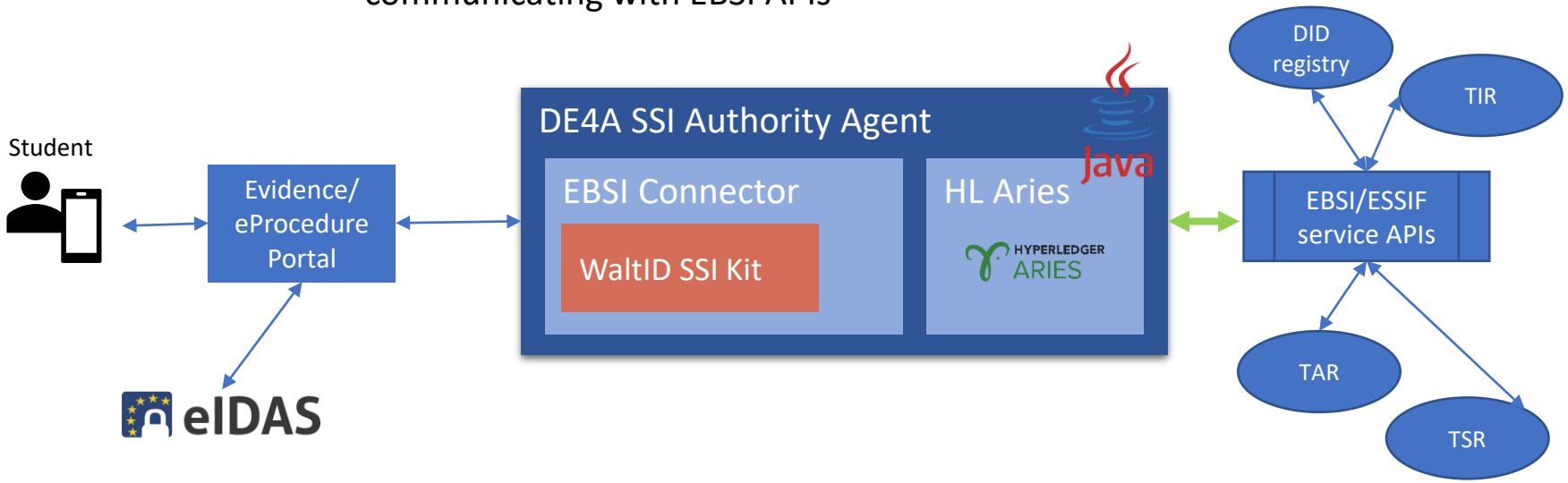
Authority agent = Enterprise wallet

- ***SSI Authority Agent*** – Server-side java-powered high-level REST API for managing DID connections and support the VC issuance (DP side) and VP submission (DC side)
  - ***EBSI Connector*** – A component responsible for generating and anchoring DID:EBSI
    - ***Walt.ID SSI Kit*** – separate component responsible for communicating with EBSI APIs



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Authority agent = Enterprise wallet

- Adapting the current infrastructure
  - FRONTEND
  - BACKEND

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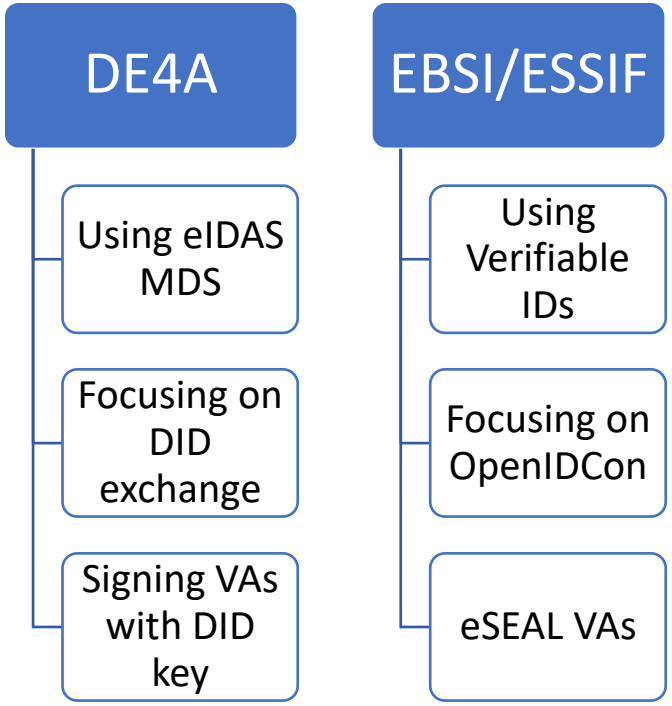
Authority agent = Enterprise wallet

- General discrepancies between DE4A and EBSI/ESSIF
  - We had to use eID and eIDAS for identification and authorization
  - We wanted to support SSI as much as possible



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Authority agent = Enterprise wallet

- Example DID:ebsi generated, anchored and used


```
{
  "@context":[
    "https://w3id.org/did/v1"
  ],
  "id":"did:ebsi:22q6B7AYycMWkSHMDZGEbVBC4DmoR16iXBg6LfRjCZYVAfkP",
  "verificationMethod":[
    {
      "id":"did:ebsi:22q6B7AYycMWkSHMDZGEbVBC4DmoR16iXBg6LfRjCZYVAfkP#fdb0a9a7e15740c
386fff60d647bdcbf",
      "type":"Ed25519VerificationKey2018",
      "controller":"did:ebsi:22q6B7AYycMWkSHMDZGEbVBC4DmoR16iXBg6LfRjCZYVAfkP",
      "publicKeyJwk":{
        "kid":"fdb0a9a7e15740c386fff60d647bdcbf",
        "kty":"OKP",
        "alg":"EdDSA",
        "crv":"Ed25519",
        "use":"sig",
        "x":"ECZQH1qErFm8H0DOlvDxWD2Adm_WJJ2c0DVRj50nH9Q"
      }
    }
  ],
  "authentication":[
    "did:ebsi:22q6B7AYycMWkSHMDZGEbVBC4DmoR16iXBg6LfRjCZYVAfkP#fdb0a9a7e15740c386fff
60d647bdcbf"
  ]
}
```


- Example of signed VC for students


```
{
   "@context":[
      "https://www.w3.org/2018/credentials/v1",
      "https://www.w3.org/2018/credentials/examples/v1"
   ],
   "id":"http://example.edu/credentials/1d57b526-f0e6-4be7-8664-187bd3339fc5",
   "validFrom":"2021-07-14T08:13:41.211Z"
   "expirationDate":"2022-07-14T08:13:41.211Z",
   "issuanceDate":"2021-01-31T00:00:00.000Z",
   "issuer":"did:ebsi:224AEY73SGS1gpTvbt5TNTTPdNj8GU6NAq2AVBFmasQbntCt",
   "credentialSubject":{
      "personIdentifier":"123456789"
      "currentFamilyName":"Alves",
      "currentGivenName":"alice",
      "dateOfBirth":"1997-01-01T00:00:00.000Z",
      "agentReferences":{...},
      "assessmentReferences":{...},
      "awardingProcessReferences":{...},
      "learningAchievement":{...},
      "learningOpportunityReferences":{...},
      "learningSpecificationReferences":{...},
      "locationReferences":{...},
   },
   "proof":{
      "created":"2021-07-14T08:13:41.3055157Z",
      "jws":"eyJhbGciOiJFZERTQSIsImI2NCI6ZmFsc2UsImNyaXQiOlsiYjY0Il19..PqpeDK_KvWaW5QlqRc81yB2akihyMAN3ZILk0sS18vi_GcMNpDwanA7
      "proofPurpose":"assertionMethod",
      "type":"Ed25519Signature2018",
      "verificationMethod":"did:ebsi:224AEY73SGS1gpTvbt5TNTTPdNj8GU6NAq2AVBFmasQbntCt#d1cfefc53fdf4287b6786e8486c80edd"
   },
   "type":[
      "VerifiableCredential",
      "UniversityDegreeCredential"
   ],

}
```

Authority agent = Enterprise wallet

- Re-usability of existing Enterprise wallet
  - Already piloted with real Public Institutions
  - Supports DID Comm not OIDC
  - Possible Limitations of HL Aries
  - Static Canonical evidence transformation towards VC diploma based on EBSI (EDCI) schema
    - eIDAS MDS needed

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Authority agent = Enterprise wallet

- DEMO

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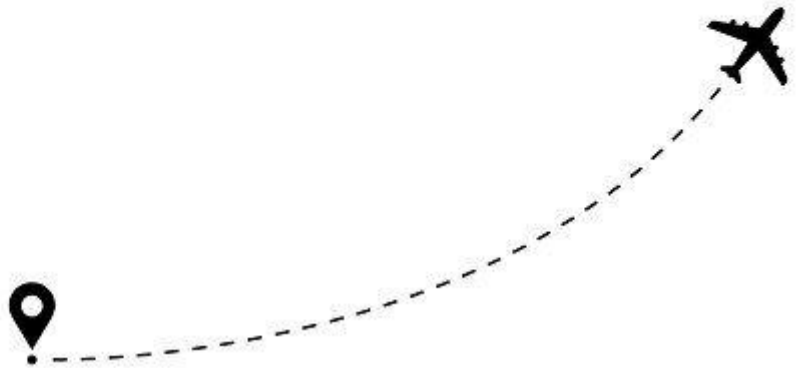
PILOTING within DE4A

- **Real-life piloting, MS-driven & MS-oriented**
- **Real users, real data, integrated with MS infrastructure**
- **Validated multi-pattern architecture and (general & domain specific) solutions to facilitate MS integration with OOTS**
- **Solutions beyond OOTS anticipate further evolution**
  - VC supported on DLT infrastructure => synergies with revised eIDAS Regulation (EUDI Wallets)



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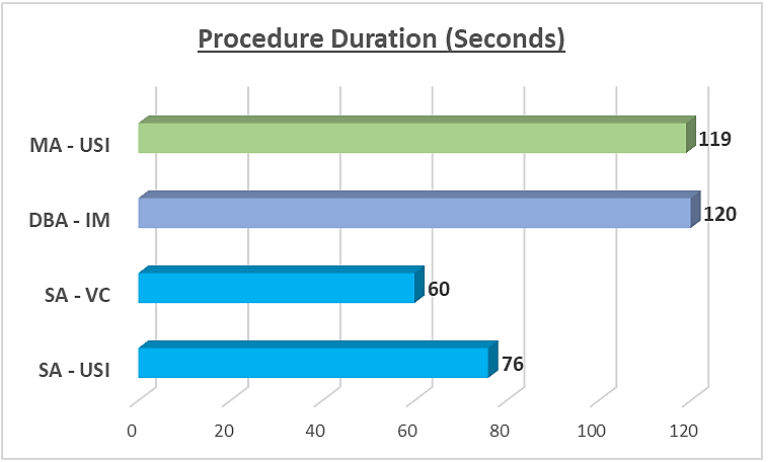
Lesson learnt - BENEFITS

DE4A
Digital Europe For All

- **From public institutions perspective**
  - **Experience with Verifiable Credentials** aligned with Europass-EDCI data models for **student-centric evidence provision**
  - **Efficiency gains and reduction of administrative burden, costs and barriers** in cross-border public services => **High quality delivery of cross border public services**
  - **Trustworthiness and quality of data** key for adoption and error reduction in processing
  - **Administrative burden reduction**: from days to 20-30 minutes in SA per end-user at DEs when all data are available (15 min saved per end-user at DOs; hundreds of person-hours per year and per DE (DBA)
  - **High satisfaction with procedure duration**
    - Few minutes (2-5 minutes most cases), Slightly faster for VC pattern (60 seconds) at each endpoint



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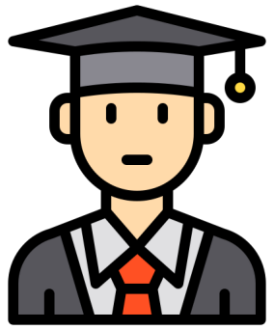
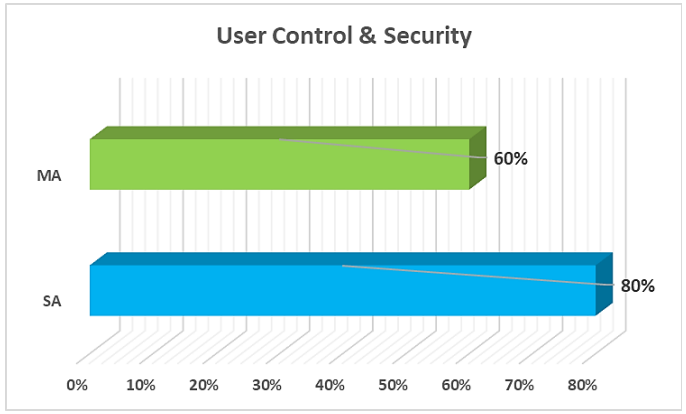
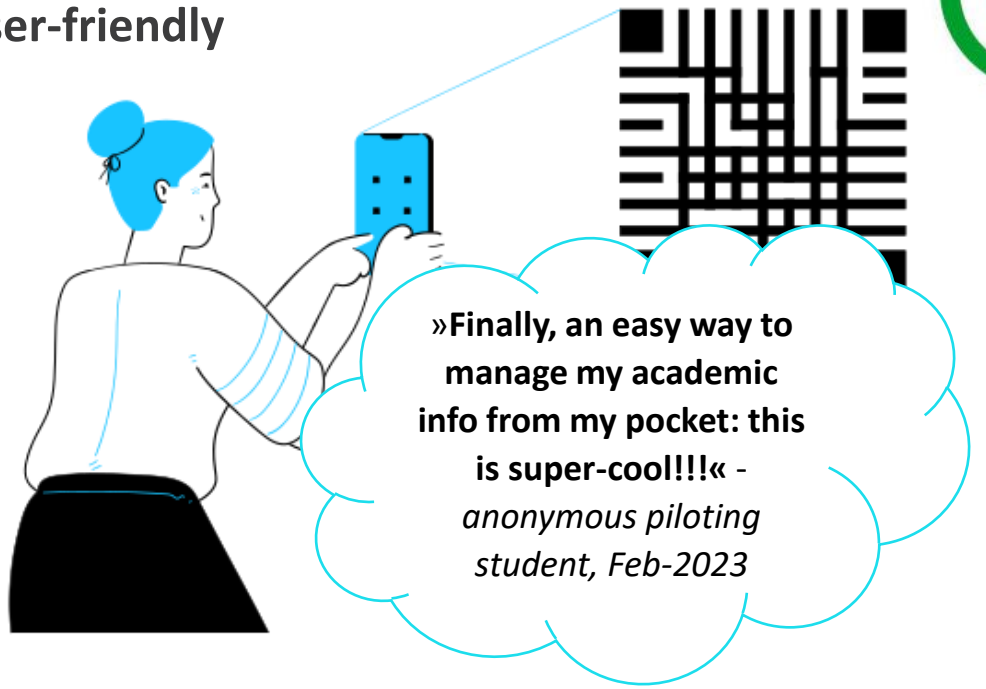
Lesson learnt – BENEFITS



- **From students perspective**
  - **Experience with modern tech (VC, digital wallets etc.)**
  - Gathers evidences and builds a portofolio
  - **Saves a lot of time**, since the moment the student has acquired the evidence (e.g., diploma) **once**
  - Are **more organized**
  - **Full control of her data** (even if cross broder)
  - **Mobile-first approach** is naturally more **user-friendly**
  - Enables selective disclosure





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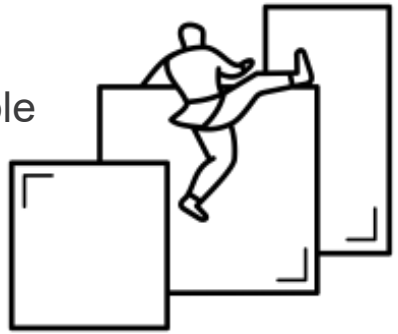
Leasons learnt - CHALLENGES

- Challenges and lessons learnt 1/2
  - **Integrating into existing IT infrastructure and services**
  - Understanding the reasons **WHY**
  - **Understanding new concepts** (DIDs, VCs, DID:Comm)
    - In-depth technical expertise (eIDAS, EBSI)
  - **Deploying** and **kickstarting**
    - Security assessments
    - **Connectathons** helped
  - Could take up to 3-6 months for a Hello World
    - Collaboration between multiple technical teams during the critical phases of pilot customization, integration and testing addressing issues
      - use of instant messaging channels e.g. Slack
    - Consideration of MS decision-making procedures with varying internal requirements (e.g. security and audits)
    - Use of reference implementations of common components and common testing environment (‘Playground’ in DE4A) has proven extremely valuable



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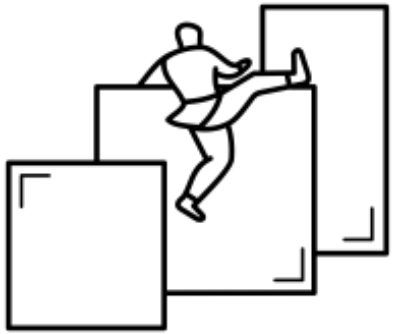
Leasons learnt - CHALLENGES

- Challenges and lessons learnt 2/2
  - **Continuous changes of the standards**
  - Need to consider national (jurisdictional) barriers that may arise in certain procedures
  - Semantic data models are key for interoperability and record matching procedures are key to avoid errors in issuance but also in presentation of evidence
    - The Enterprise wallet takes Canonical evidence in XML and transforms it into VC



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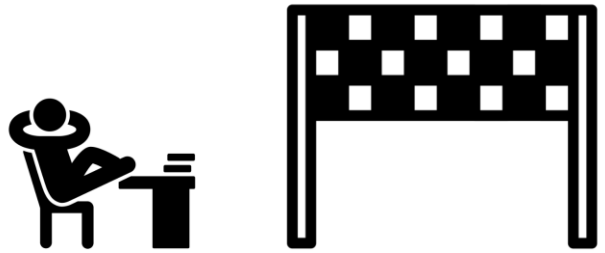
- Open challenges
  - No legal base for accepting DID signed VCs (not eSEAL)
  - Trusted Issuers and EBSI/ESSIF governance
  - SSI facilitates Data Exchange, while business-logic based processes still have to be executed
    - Verifying the VP Diploma contextually, since Enterprise Wallet **only verifies** the **subject**, the **signatures** and **issuers from TIR**



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Thank you for your attention

Any questions?

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