European Blockchain Service Infrastructure, explained

Master Class – European Blockchain Convention

15/12/2020
Hello.
Who is in the call today?

- Pierre MARRO
  - DG CNECT
  - Policy Officer

- Joao FRADE
  - DIGIT
  - Head of sector

- Zaira LIN
  - DIGIT
  - SMO

- Robert CZARNY
  - DIGIT
  - Project Manager

- Saky KOURTIDIS
  - DIGIT
  - SMO

- Kevin AMBROGI
  - DIGIT
  - Product Owner

- Iulian NITA
  - DIGIT
  - EBSI Architect

- Alen HORVAT
  - DIGIT
  - EBSI Architect
What are we going to do today? Let’s have a look at the objectives and agenda

01
Introduction and Policy context of the European Blockchain Service Infrastructure (EBSI).

02
Introduction to blockchain technology and what it means for PAs.

03
Discover and get Inspired by the European Blockchain Service Infrastructure (EBSI).

04
Discover EBSI capabilities through scenario example (diploma UC).

05
Get engaged and start with EBSI (CEF Digital and EBSI Community).
How we will keep this call interactive and interesting?

Go to www.menti.com and use the code 65 90 96 7
Policy context and the European Blockchain Services Infrastructure
Our ambition is to establish global leadership in blockchain and distributed ledger technologies

Joined-up political vision (EU-MS)
Joint declaration on the establishment of the European Blockchain Partnership (EBP) and the development of the European Blockchain Services Infrastructure (EBSI) for cross-border digital services of public interest

Public-private partnership
Supporting the creation of the International Association of Trusted Blockchain Applications (INATBA), a multistakeholder organisation to promote trust and interoperability at Global level

Connecting Global Expertise
The EU blockchain observatory and forum brings together the leading global experts to identify obstacles, incentives and practical solutions to promote blockchain uptake.

Investing in EU Innovation and start-ups
Through the Connecting Europe Facility and H2020 Programmes, the EU is co-investing in the most advanced digital infrastructure and the most innovative EU start-ups New EU investment scheme for AI and blockchain + support programme

Promoting an enabling DSM
Promoting and enabling legal framework interoperable standards and skills development
EBSI aims at seizing the opportunities offered by blockchain and in particular to exploit them for enhancing cross border services.

### 2019
- Initial funding conditions

In early 2019, the European Commission published the 2019 Telecommunications Work Programme of the Connecting Europe Facility (CEF) creating initial funding conditions for EBSI.

### 2020
- Release of the first version of EBSI

In early 2020, release of the first version of EBSI. Start of EBSI testing by EBP members, national administrations and interested public authorities parties.

### 2021
- Digital Europe Programme

From 2021 on EBSI will be supported under the Digital Europe Programme. New use cases selected by the EBP will be added, cooperation with industry reinforced and more legal certainty provided for market actors through regulatory sandbox activities.
European Blockchain Partnership. EBSI is supported by 29 participating countries* and the European Commission forming the European Blockchain Partnership (EBP) - (*in 2020)

https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITALATEBSI/List+of+EBSI+Representatives
Practically, four use cases have been selected by the EBP and are currently under development. 
(V1 as a sandbox and v2 in production)

+ 3 new use cases
SME financing, European Social Security Identification Number, Asylum process management

- Notarisation of documents
- European Self-Sovereign Identity
- Diplomas Management
- Trusted data sharing

(Reserved for TAXUD’s Community at this stage)
In 2019 and 2020, we built and launch the foundations. In 2021 we aim at releasing EBSI v2 and launching a number of pilots.
We started piloting EBSI with public actors. But soon, we will also engage with private companies. e.g. for the development of wallet applications.

<table>
<thead>
<tr>
<th>Public market (MSs)</th>
<th>Private market</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepare to integrate your application with EBSI.</td>
<td>European Blockchain PCP – Call is open</td>
</tr>
<tr>
<td>Deploy a blockchain node and connect to the network.</td>
<td>Looking at the wallets’ market (Coming soon)</td>
</tr>
<tr>
<td>Take a citizen’s journey and test the EBSI services.</td>
<td></td>
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</tbody>
</table>
02

Introduction to blockchain technology and what it means for public administrations

15’
Governmental entities are important intermediaries of many transactions happening in our society.
We need to address the challenge of digital fraud. Governments need technology to verify the authenticity of information.

Interpol has seen a sharp uptick in the number of missing passports — within Europe and around the globe.
These are two of the key patterns for sharing and verifying official documents.

**Pattern 01**
“Digital Post”
Just in time evidence issuance

**Pattern 02**
“Digital Wallet”
Verifiable Credentials
The traditional data sharing scenario replicates the post office pattern*. 

*The just in time evidence issuance pattern: this model is similar to a traditional paper-based flow of post-office

**Public Key Infrastructure
Let’s have a look at the concept of verifiable credential and the Digital Wallet: How does it work?
A new paradigm for making data trustworthy. Blockchain is often misunderstood as another data sharing protocol.

01 Blockchain is not a protocol for sending and delivering data between systems but a shared ledger that creates permanent digital records.

02 Blockchain uses cryptographic methods and a distributed consensus that creates trust between disparate systems.

03 Blockchain is a new trust system that is used to anchor verifiable claims so parties can trust them.

04 Blockchain allows greater control for the end-user.
What are the key advantages of using blockchain and the verifiable credentials?

- Data control by the citizen
- Enhanced selective data discloser
- Improved traceability of the origin and of the recipient
- Increased efficiency (no need of “just-in-time evidence issuance”)
- Reduced verification costs (once at scale)
In summary, the Digital transition propels public administrations to a new paradigm.

<table>
<thead>
<tr>
<th>OLD PARADIGM</th>
<th>Digital Transformation</th>
<th>NEW PARADIGM</th>
</tr>
</thead>
<tbody>
<tr>
<td>ONE SIZE FITS ALL</td>
<td></td>
<td>USER CENTRIC</td>
</tr>
<tr>
<td>HIERARCHICAL</td>
<td></td>
<td>NETWORKED ECOSYSTEM</td>
</tr>
<tr>
<td>CENTRALISED</td>
<td></td>
<td>DISTRIBUTED</td>
</tr>
<tr>
<td>CLOSED &amp; PROPRIETARY</td>
<td></td>
<td>OPEN &amp; COLLABORATIVE</td>
</tr>
</tbody>
</table>
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Get inspired by the European Blockchain Service Infrastructure

20’
Governments, and society, need technology to verify the authenticity of information. Having this challenge in mind, DG CNECT and DIGIT are currently developing the EBSI, in close cooperation with the EBP, to accelerate the creation of cross-border services and putting blockchain technology at the service of public administrations for the purpose of verification of information, making the services trustworthy.
EBSI will be the first EU-wide blockchain infrastructure, driven by the public sector, in full respect of European values and rules
(in particular for high-level of data security, data protection, and privacy)

<table>
<thead>
<tr>
<th>Mobility</th>
<th>Sustainable</th>
<th>Compliance</th>
<th>Enabler</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhances Cross Border services provided by Governments to citizens</td>
<td>Sustainable by design. Supports Use Cases that enhances environmental and Green Deal Policies</td>
<td>Complies with GDPR, EAIIDAS, NIS Directive</td>
<td>Reinforces Blockchain capacities In Europe</td>
<td>Based on open standards, market friendly and multi-vendor</td>
</tr>
</tbody>
</table>
EBSI is composed of a layered architecture. The architecture of each node is composed of three main functional areas.
What can you achieve by using EBSI?

- Simplifies Administrative Processes
- Enhances Trust with stakeholders
- Increases Efficiency
- Increases Transparency
- Aligns to European values (e.g. Regulatory Compliance)
- Makes the verification of data authenticity easy and at low cost
In order to understand the potential of blockchain and EBSI, let’s remind ourselves the journey of Eva.

https://www.youtube.com/embed/m2uj7fgb23I
Practically, four use cases have been selected by the EBP and are currently under development.  
(V1 as a sandbox and v2 in production)

**Notarisation** of documents  
**European Self-Sovereign Identity**  
**Diplomas Management**  
**Trusted data sharing**  
(Reserved for TAXUD’s Community at this stage)

+ 3 new use cases  
SME financing, European Social Security Identification Number, Asylum process management
## European Self-Sovereign Identity.

### Features available in EBSI v2.0

<table>
<thead>
<tr>
<th>Feature</th>
<th>Natural Person</th>
<th>Legal Entity</th>
<th>ESSIF On-boarding service (TRA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onboard on ESSIF</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Set up Verifiable ID Authentication</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Authenticate using Verifiable ID</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Request issuance of Verifiable ID</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Request Verifiable Attestation</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Present Verifiable Attestation</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Register a Verifiable ID Issue</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Register a Trusted Registration Authority</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Register a Verifiable ID Data Schema in TSR</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
### Diploma Management

Features available in EBSI v2.0

<table>
<thead>
<tr>
<th>Feature</th>
<th>Natural Person</th>
<th>Education Organisation</th>
<th>Third Party</th>
<th>Accreditation Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onboard</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Request a credential</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Assign a new diploma VC to a Legal Entity</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Register an Educational Organization</td>
<td></td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Register a new diploma VC</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Request to be accredited to issue a diploma</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share credential(s)</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Register a QAA in the TAR</td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Request to be added to the TAR</td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
</tr>
</tbody>
</table>
### Notarization

Features available in EBSI v2.0

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<th>Legal Entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onboard</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>DID Authentication</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Notarize a document (together with its metadata)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Retrieve / browse the notarization history</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Visualize notarization details</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Verify the existence of a notarization with metadata</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Notarize a new version document</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Store notarized document’s metadata on EBSI storage</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Register the data on Smart contract</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Data linkage</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
## Trusted Data Sharing.
### Features available in EBSI v2.0

<table>
<thead>
<tr>
<th>Action</th>
<th>Member State Entity</th>
<th>Consulting Member State Entity</th>
<th>Group Administrator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onboard</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Verify an existing record</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Register a new record</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Update / delete an existing record</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consult the information about a sharing group</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Create / update / delete a sharing group</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Consult the information about a sharing group member</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Add / remove a member to / from a sharing group</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Update rights of a sharing group member</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
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Q&A

10’
Discover EBSI capabilities through scenario example
Let’s imagine, you are looking to integrate your application with EBSI. The first step is to create your Pilot scenario.

<table>
<thead>
<tr>
<th>Audience</th>
<th>Needs</th>
<th>Objectives</th>
<th>EBSI Use Cases</th>
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<td>Apply for a Master study</td>
<td>Simplify Administrative Processes</td>
<td>Self-sovereign Identity</td>
</tr>
<tr>
<td>Businesses</td>
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<td>Diploma management</td>
</tr>
<tr>
<td>Public administrations</td>
<td>Open a business</td>
<td>Increasing Efficiency</td>
<td>Notarization</td>
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<tr>
<td></td>
<td>Apply for EU funding</td>
<td>Increasing Transparency</td>
<td>Trusted data sharing</td>
</tr>
<tr>
<td></td>
<td>Perform an audit check</td>
<td>Aligning to European</td>
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<tr>
<td></td>
<td></td>
<td>Data harmonisation</td>
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</tbody>
</table>

= Pilot
So, based on your scenario, you now know which EBSI use case you can start exploring and the typical features they offer.

- **Notarisation of documents**
- **European Self-Sovereign **Identity**
- **Diplomas Management**
- **Trusted data sharing**

(Reserved for TAXUD Community)
In the story of Eva, she is going through a journey during which she will answer several needs.

To manage her educational credentials, Eva is required to create a Self-Sovereign Identity (SSI). For this she must have an EBSI wallet with valid attestations.

Eva wants to study a double master’s at a Spanish University.

The Spanish University replies with a reference request related to Eva’s request.

Eva wants to apply for an apprenticeship in a Spanish Company.

The Spanish University accepts Eva’s request. Then the university issues a University Record Number as a Verifiable Credential of her internal identification.

Once Eva graduates and finishes her apprenticeship, she obtains new Verifiable Credentials.

Eva decides to start a business in Italy and participates in a call for proposals to get EU funding for her startup.

ESSIF UC

Eva is required to install and configure a wallet (Agent Requester). Doing this, she obtains a DID in EBSI.

DIPLOMAS UC

The Spanish Company reviews her application and the requested information. Once it is accepted, they issue a Verifiable Attestation with enrolment confirmation.

ESSIF UC DIPLOMAS UC

After finishing the program, the Spanish University issues Eva a Verifiable Attestation with her Master’s Diploma. In the same way, after finishing her apprenticeship, Eva can request a certificate from the Spanish company.

NOTARISATION UC

Eva’s proposal is selected, and she is awarded a grant. Eva notarises the documents, justifying the spending of the grant received, which the EU auditors can verify.
For the sake of making the story reasonable in terms of scope, we will take a part of that journey to build our scenario.

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<td></td>
<td>Perform an audit check</td>
<td>Enabling Regulatory Compliance</td>
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<tr>
<td>Businesses</td>
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<td>Data harmonisation</td>
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<td>Public administrations</td>
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<td></td>
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</tbody>
</table>

= Scenario
The following scenario has been identified as the most relevant one

How to help European students and universities facilitate the issuance, sharing and verification of educational credentials across border in order to enhance free mobility of students and make the process more efficient and trust-worthy by using EBSI?
Once you have defined your starting point, you are going to take 3 tasks to design your pilot scenario.

01 Define stakeholders and their benefits

02 Model the pilot scenario and identify pre-requisites

03 Define the EBSI APIs* you need for the pilot

*Application Programming Interfaces (Core services of EBSI)
Eva just finished her Bachelor’s degree at the University of Ghent (BE). She wants to apply for a Master’s degree at the University of Rovira i Virgili (ES). To do so, she has to request the issuance of her Bachelor Diploma from the University of Ghent and then share the Bachelor Diploma with the University of Rovira i Virgili for verification.
In our scenario, the stakeholders and their roles can be described as follows:

**Student**

**Eva**

[The user]
Request the issuance her Verifiable Attestation (Diploma).

**University of Ghent**

**Udo**

[The issuer]
Verifies the request of Eva and issues a Verifiable Attestation (Diploma).

**University of Rovira i Virgili**

**Miguel**

[The verifier]
Verifies the Verifiable Presentation and accepts Eva’s request.

**Belgian government**

**Isabelle**

[Trusted Registration Authority / Trusted Identity Issuer]
Issues the verifiable ID
Registers the DID on the EBSI Ledger.

+ automated systems.
In our scenario, the exchange of information will need to happen between the user, the issuer and the verifier.

Issuer
Udo, University of Ghent

User
Eva, the student

Verifier
Miguel, University of Rovira i Virgili

Blockchain (EBSI)
There are two important concepts to understand in this exchange of information: Verifiable Credential and Verifiable Presentation.
Let’s look at the definitions of these two key concepts (Verifiable Credential and Verifiable Presentation).

**CONCEPT 1**

**Verifiable Credential (VC)**

is an electronic information structured in a standardised way (semantic and format)

**Verifiable ID (V-ID)**

a special form of a Verifiable Credentials used only for identification / authentication (passports or national eIDs),

- Family name
- First name
- Birth date
- Place of birth
- Unique identifier
- Etc.

**Verifiable Attestation (VA)**

a special case of a Verifiable Credentials used as evidence of attributes without identification.

- Diplomas
- Bus tickets
- Membership
- Postal address
- e-mail address
- Bank account
- Etc.

**CONCEPT 2**

**Verifiable Presentation (VP)**

represents the minimum set of data passing from an entity to a relying party for a given purpose.

usually composed of V-ID, VA and the purpose of sharing such data. Verifiable means it can be easily verified following a cryptographic-based standard procedure.

- Driving license
- Work permit
- Access control
- Etc.

**Extract of (V-ID)**

+ **Extract of (VA)**

+ **GIVEN PURPOSE**

- Diplomas
- Bus tickets
- Memberships
- Postal address
- E-mail address
- Bank account
- Etc.

+ **Register for a master course/curriculum**
Another key concept to understand is the Decentralised Identifier (DID)? What does it mean and why is it so important?

A Decentralised identity (DID) is just a permanent (persistent) identifier that can be looked up to retrieve a DID Document, which describes how to interact with the DID owner (mostly cryptographic keys and service endpoints). It does not provide any kind of information about the DID owner.

DIDs leverage on the inherent properties of blockchain or distributed ledgers, by creating a tamper-proof and distributed sequence of events. This allows any DID owner to update and keep track of the changes in the DID document without the need of any central authority.

**Method specific identifier**

```
did:{method}:xwyz123456
```

How to create, read, update and delete information related to a DID (its DID document) on a specific blockchain/distributed ledger.
The Decentralised Identifier (DID) allows for the verification processes associated to a given Party (1).

01 Identify a Party uniquely

Create a Decentralised Identifier (DID). A decentralised identifier can uniquely identify a Party (Issuer, Owner/Holder, Relying Party). It is fully under the Party’s control and used for referring to it.

02 Store on EBSI Ledger to secure it

Store the Decentralised Identifier (DID) on Blockchain (to protect it and make it available for verification). (A Trusted Registration Authority must authorise the user to store the DID on the EBSI Ledger).

03 Activate trustworthy verification process

Parties can check the trustworthiness of information (VC, VP) thanks to Decentralized Identifier (DID) that is stored on the EBSI Ledger.
So, we could summarize it as follows:

- **DID**
  - It is a string
  - Stored on EBSI ledger
  - Its does not contain personal data
  - On time

- **V-IDs**
  - It is a set of data
  - It is stored in the wallet
  - It contains personal data
  - Contextual

= **Verification**
Eva needs to have her (DID) stored on-chain. The Issuer and the Verifier will use the blockchain to check the DID of Eva.

**Issuer**
Udo, University of Ghent

**User**
Eva, the student

**Verifier**
Miguel, University of Rovira i Virgili

**Concept 1**
Verifiable Credentials (VC)

**Concept 2**
Verifiable Presentation (VP)

Blockchain (EBSI)
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For this scenario to work, Eva needs to set up her wallet and request a Verifiable ID from the Trusted Registration Authority.

Eva downloads the wallet

Eva configures the wallet

Eva creates her DID and securely stores it and its associated public/private keys in her wallet.

Eva requests the registration of the DID on the EBSI ledger.

Eva proves her DID ownership.

The Trusted Registration Authority* registers the DID including the public key (but no personal data is recorded) on the EBSI ledger, issues a Verifiable ID and sends it to Eva.

Eva gets the Verifiable ID and stores it in her wallet.

* Different options are currently being analysed.
The University of Ghent and Rovira i Virgili also need to be onboarded and register their diploma on EBSI

The University of Ghent and Rovira i Virgili onboarding on ESSIF:

1. Download Enterprise Wallet
2. Configure Wallet
3. Test Wallet
4. Create DID
5. Store DID
6. DID Registered on EBSI

The University of Ghent and Rovira i Virgili are accredited by an official accreditation authority to issue a specific Diploma:

1. Request Accreditation
2. Become Trusted Issuer
3. Get Accreditation Request
4. Approve Accreditation Request
Eva is a Bachelor student at the University of Ghent (BE) and she registers for a Master’s Degree at the University of Rovira i Virgili (ES)

Eva requests the issuance of her Bachelor's Diploma (VA) from the University of Ghent

Udo (from University of Ghent) issues the Bachelor’s Diploma (VA) and sends it to Eva

Eva receives and accepts the Bachelor’s Diploma (VA). She stores it in her wallet

Eva shares her Bachelor's Diploma (VA) with the University of Rovira i Virgili

Miguel (from the University of Rovira i Virgili) verifies the Bachelor's Diploma (VA) of Eva

Eva enrolls for a Master's Degree at the University of Rovira i Virgili
How this could look like?

Reimagine the way we manage educational credentials across Europe. Together. With EBSI.
First, Eva requests the issuance of her Bachelor’s diploma to the University of Ghent (BE).

1. Connect to University platform
   - Initiate the action

2. Select Verifiable ID
   - Submit the request

3. Check list of students
   - Select the students
   - Submit the credential

4. Get notification
   - Accept the credential
   - Store in the wallet
Then, Eva requests her enrolment at the University of Rovira i Virgili (ES)

Eva initiates the application to the University of Rovira i Virgili

Eva shares her Bachelor’s Diploma (VA) with the University of Rovira i Virgili

The University of Rovira i Virgili verifies the Bachelor’s Diploma (VA) of Eva

Eva enrolls for a Master’s Degree at the University of Rovira i Virgili

- Connect to University platform
- Initiate the action

- Select Verifiable ID
- Select Bachelor’s diploma
- Submit the request

- Get notification
- Check list of requests
- Check details of diploma
Eva is only one example out of the 4 million students graduated in Europe... ...every year...
Trusted diplomas have great potential.

Students’ mobility in Europe is a broad market. EBSI and EuroPass are its enablers.

17 million
students (Bachelor, Master and PhD).

2,465
higher education institutions

27
European countries

1.35 million
teachers

4.0 million
students graduated (diplomas)

1.3 million
students from abroad

700,000
registered users who created Europass profiles.

300,000
are <24 years old

Sources
EBSI does not plan to build a wallet. We expect the wallet to come from the following actors.

- Software vendors from private sector
- Initiatives from Member States
- EU-led initiatives
Of course, in the journey, each step of the scenario is made of atomic steps.

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>ISSUE</th>
<th>STORE</th>
<th>SHARE</th>
<th>VERIFY</th>
<th>ENROL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiate the request</td>
<td>Receive VP</td>
<td>Get VA signature (Diploma signature)</td>
<td>Initiate the request</td>
<td>Get VP containing the VA (Diploma)</td>
<td>Request student ID in form of V-ID</td>
</tr>
<tr>
<td>Create VP request</td>
<td>Validate VP signature and V-ID</td>
<td>Validate VA signature (diploma signature)</td>
<td>Create VP request and V-ID</td>
<td>Validate the VP Signature</td>
<td>Review the V-ID request</td>
</tr>
<tr>
<td>Send VP request</td>
<td>Validate V-ID Schema</td>
<td>Validate V-ID</td>
<td>Send VP request</td>
<td>Validate VA (Diploma)</td>
<td>Issue V-ID</td>
</tr>
<tr>
<td>Validate VP request</td>
<td>Verify Issuer</td>
<td>Store VA (diploma) in the wallet</td>
<td>Validate VP request</td>
<td>Validate VA Schema (Diploma Schema)</td>
<td>Accept V-ID</td>
</tr>
<tr>
<td>Select a V-ID</td>
<td>Get VA template (diploma template)</td>
<td></td>
<td>Validate VA (Diploma)</td>
<td>Verify issuer of the VA (Diploma)</td>
<td>Store V-ID in the wallet</td>
</tr>
<tr>
<td>Create VP</td>
<td>Fill Eva’s data into the VA template</td>
<td></td>
<td>Create VP containing the VA (Diploma)</td>
<td>Get notification on her wallet</td>
<td></td>
</tr>
<tr>
<td>Sign VP</td>
<td>Sign VA (diploma)</td>
<td></td>
<td>Sign VP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Send signed VP</td>
<td>Send signed VA (signed diploma)</td>
<td></td>
<td>Send signed VP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Request the issuance of VA (Diploma)  
= Share my V-ID

Request the enrolment to University  
= Share my VA (Diploma)
For each step of the journey, you can check and understand the EBSI APIs you need to make it happen.

<table>
<thead>
<tr>
<th>Functionality</th>
<th>APIs</th>
<th>Local</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Request</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Eva (student) initiates the request to issue her diploma</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>The University of Ghent creates the Verifiable Presentation (VP) request</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>The University of Ghent sends the Verifiable Presentation (VP) request</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Eva (student) validates the Verifiable Presentation (VP) request</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>Eva (student) selects the Verifiable ID (V-ID)</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>Eva (student) creates the Verifiable Presentation (VP)</td>
<td>Yes</td>
</tr>
<tr>
<td>7</td>
<td>Eva (student) signs the Verifiable Presentation (VP)</td>
<td>Yes</td>
</tr>
<tr>
<td>8</td>
<td>Eva (student) sends the signed Verifiable Presentation (VP) to the University of Ghent</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Issue</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Udo (University of Ghent) receives the Verifiable Presentation (VP) request</td>
<td>Yes</td>
</tr>
<tr>
<td>10</td>
<td>Udo (University of Ghent) validates the VP Signature and the V-ID</td>
<td>Yes</td>
</tr>
<tr>
<td>11</td>
<td>Udo (University of Ghent) validates the Verifiable ID (V-ID) Schema</td>
<td>Yes</td>
</tr>
<tr>
<td>12</td>
<td>Udo (University of Ghent) verifies the issuer of the Verifiable ID (V-ID)</td>
<td>Yes</td>
</tr>
<tr>
<td>13</td>
<td>Udo (University of Ghent) gets the VA template (diploma template)</td>
<td>Yes</td>
</tr>
<tr>
<td>14</td>
<td>Udo (University of Ghent) fills Eva’s data into the VA template (diploma template)</td>
<td>Yes</td>
</tr>
<tr>
<td>15</td>
<td>Udo (University of Ghent) signs the VA (diploma)</td>
<td>Yes</td>
</tr>
<tr>
<td>16</td>
<td>Udo (University of Ghent) sends the signed VA (signed diploma) to Eva</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Store</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Eva (student) receives the signed VA (signed diploma) (via notification)</td>
<td>Yes</td>
</tr>
<tr>
<td>18</td>
<td>Eva (student) validates the VA signature (diploma signature)</td>
<td>Yes</td>
</tr>
<tr>
<td>19</td>
<td>Eva (student) validates the verifiable ID (V-ID) of the University of Ghent</td>
<td>Yes</td>
</tr>
<tr>
<td>20</td>
<td>Eva (student) stores the VA (diploma) on her wallet.</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Share</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Eva (student) initiates the request to apply for a Master Degree</td>
<td>Yes</td>
</tr>
<tr>
<td>22</td>
<td>The University of Rovira i Virgili creates the VP request of Eva’s VA</td>
<td>Yes</td>
</tr>
<tr>
<td>23</td>
<td>The University of Rovira i Virgili sends the VP request to Eva</td>
<td>Yes</td>
</tr>
<tr>
<td>24</td>
<td>Eva (student) validates the Verifiable Presentation (VP) Request</td>
<td>Yes</td>
</tr>
<tr>
<td>25</td>
<td>Eva (student) selects the VA (Diploma)</td>
<td>Yes</td>
</tr>
<tr>
<td>26</td>
<td>Eva (student) creates the VP containing the VA (Diploma)</td>
<td>Yes</td>
</tr>
<tr>
<td>27</td>
<td>Eva (student) signs the Verifiable Presentation (VP)</td>
<td>Yes</td>
</tr>
<tr>
<td>28</td>
<td>Eva (student) sends the signed VP to University of Rovira i Virgili</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Verify</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Miguel (University of Rovira i Virgili) gets the VP containing the Diploma</td>
<td>Yes</td>
</tr>
<tr>
<td>30</td>
<td>The University of Rovira i Virgili validates the VP Signature</td>
<td>Yes</td>
</tr>
<tr>
<td>31</td>
<td>The University of Rovira i Virgili validates Diploma (VA) from Eva</td>
<td>Yes</td>
</tr>
<tr>
<td>32</td>
<td>The University of Rovira i Virgili validates Diploma (VA) Schema</td>
<td>Yes</td>
</tr>
<tr>
<td>33</td>
<td>The University of Rovira i Virgili verifies issuer of Diploma</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Enroll</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Eva (student) requests student ID from the University of Rovira i Virgili (as a V-ID)</td>
<td>Yes</td>
</tr>
<tr>
<td>35</td>
<td>Miguel (University of Rovira i Virgili) issues the Verifiable ID (V-ID) request</td>
<td>Yes</td>
</tr>
<tr>
<td>36</td>
<td>Miguel (University of Rovira i Virgili) issues the Verifiable ID (V-ID)</td>
<td>Yes</td>
</tr>
<tr>
<td>37</td>
<td>Eva (student) receives and accepts the Verifiable ID (V-ID) request</td>
<td>Yes</td>
</tr>
<tr>
<td>38</td>
<td>Eva (student) stores the Verifiable ID (V-ID) in her wallet.</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Go to www.menti.com and use the code 65 90 96 7
05

Get engaged and start with EBSI (CEF Digital and EBSI Community)

10’
We are currently piloting with Member States and conveners following an educative and collaborative approach.

**SEP.**
Raise awareness

- **Learning Package**
  - General public
    - UC-agnostic
      - Discover blockchain and the key concepts

**OCT.**
Create interest

- **Intro Webinar**
  - All EBP Members
    - UC-agnostic
      - Discover more about EBSI and how to get started

**NOV.**
Invite to get started

- **Demo Webinar**
  - EBP Members
    - UC-specific
      - Get a demo on a specific use case

**JAN.**
Identify champions

- **Cluster Meeting(s)**
  - Member States
    - UC-specific
      - Discuss my pilot in more details

**FEB.**
Co-create and start the pilot

- **Workshop**
  - MSs Champions
    - UC-specific
      - Co-create my pilot scenario and roadmap

---

**Co-creation level**
An ecosystem of resources is available for you to get started with EBSI.

01 Learn.

Want to learn about EBSI and stay informed about what we do?

- Watch our episodes
- Read our research paper and articles
- Subscribe to the newsletter and follow us on social media

02 Make.

Want to check specs and services in more details and start playing with EBSI?

- Download our toolkit
- Check the EBSI documentation
- Check the Wallet guidelines (soon)

03 Share.

Want to get involved in EBSI and engage with EBSI stakeholders?

- Ask your questions on the open forum
- Share your ideas on the collaborative space
- Participate to our (demo) webinars

Stay tuned as Member States are piloting and public consultations will soon be launched
Go to www.menti.com and use the code 65 90 96 7
Thank you !