EBSI-NE

How Verifiable Credentials on EBSI enhance Education and Digital Skills

08.12.2023

Lecturer PhD Andrei Ternauciuc

PhD Student Victor Holotescu

Politehnica University of Timisoara, Romania
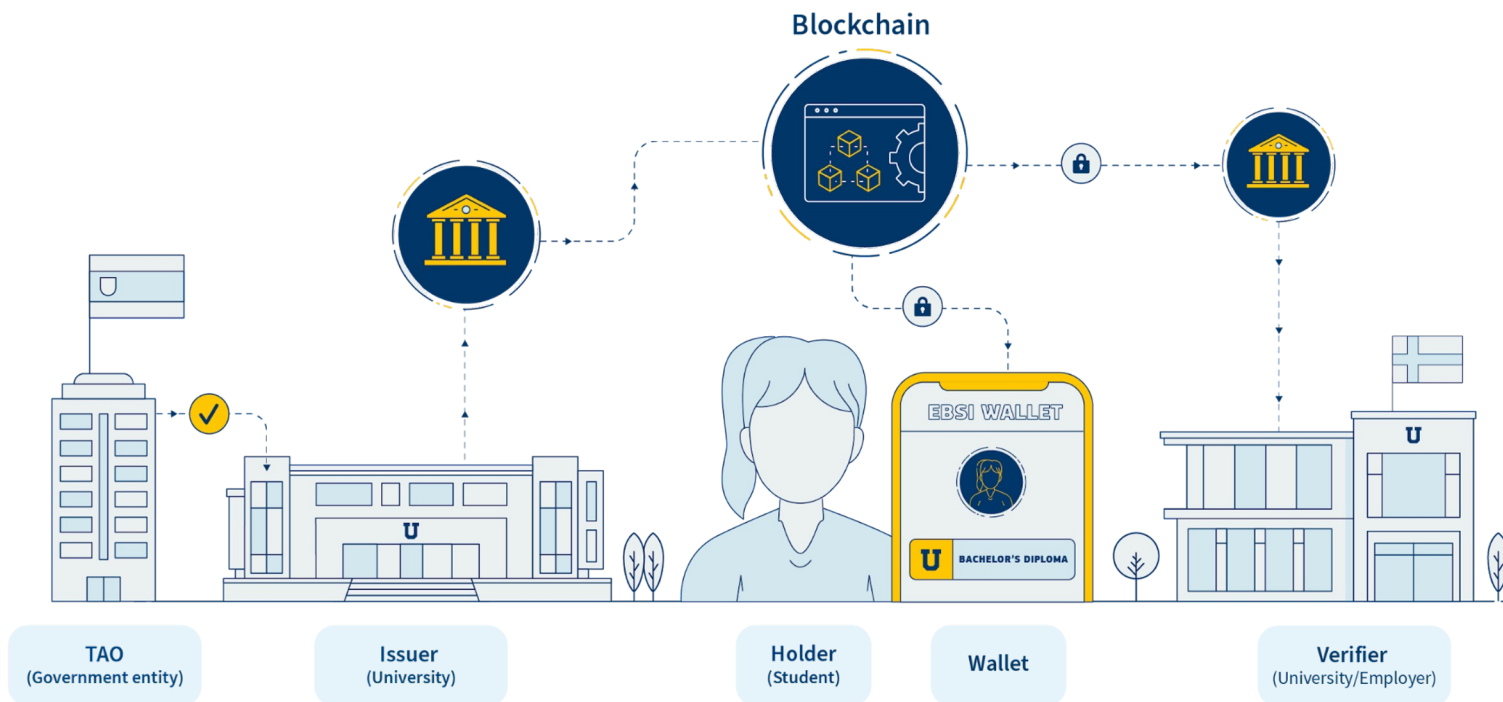
Funded by
the European Union

TABLE OF CONTENTS

EBSI-NE

Verifiable Credentials on EBSI

Blockchain

Verifiable Credential (VC): a tamper-evident and privacy-respecting credential, with specific Metadata and Proofs, requested by the Holder and issued by a Trusted Issuer, and where the authorship can be cryptographically verified.

Through its Diploma use case, the European Blockchain Services Infrastructure (EBSI) represents a cross-border decentralized credentialing ecosystem for issuing Verifiable Credentials.

TAO
(Government entity)

Issuer
(University)

Holder
(Student)

Wallet

Verifier
(University/Employer)

Standards

✓ W3C VCs & DIDs

✓ OpenID Connect

Impossible to fake, easy to verify

✓ High level of certainty that the issuer is trusted alongside the time of issuance

✓ High level of certainty that the holder is the one that the Verifiable Credential was issued to

✓ The holder keeps data control and ownership

Advantages for using Verifiable Credentials

To support student mobility by applying EBSI Use Cases in a cross-border scenario to simplify the process of issuing/verifying Bachelor/Master/PhD Diploma Credentials

Audience		Needs		Objectives		EBSI Use Cases
Citizens (Students)	+	Apply for a PhD study	+	Simplifying Administrative Processes	+	Self-sovereign Identity
		Apply for a Master study		Enhancing Trust		Diploma management
		Apply for a Job		Increasing Efficiency		

Verifiable Credentials workflow

More detailed description of workflow components

GLOSSARY

Verifiable Credentials

Verifiable credentials (VCs) are **an open standard for digital credentials**. They can represent information found in physical credentials, such as ID, passport, diploma, license, as well as new things that have no physical equivalent, such as ownership of a bank account.

They have **numerous advantages over physical credentials**, most notably that they're digitally signed, which makes them tamper-resistant and instantaneously verifiable.

Digital wallets

Stores

Identities
  - *Represented by:*
  Set of asymmetric keys
  DID – Decentralized Identifiers

Verifiable Credentials*
  - Verifiable IDs
  - Verifiable Accreditations
  - Europass etc.

Example of Wallets

Walt.Id
Gataca
Learner Credential Wallet (https://lcw.app)
MetaMask with Snaps
(https://github.com/blockchain-lab-um/ssi-snap)

Trusted Data Registries

Contains

DID Registries
Trusted Issuer Registries
Revocation Lists

In the form of
EBSI Ledger
Any other trusted ledger/blockchain

EBSI Early Adopters: Multi-University Pilot

2 European universities alliances, +20 universities from +15 countries

EBSI4RO participated in the EA Programme Wave 2 – July 2021 – May 2022

https://ec.europa.eu/digital-building-blocks/wikis/display/EBSI/Early+Adopters+Programme

TAO (Trusted Accreditation Organisation)
The ministry

Reduce friction in interactions, increase trust (transparency) and security in shared data.

Ministry of Education, UEFISCDI, Romania
Ministry of Education, Ministry of Digital Governance,GRNET Greece
Ministry of National Education, France

Build a new trust paradigm

Issuer
The university A

Position your university as a pioneer brand, reduce friction in interactions, increase trust (transparency) and security in shared data. At scale, decrease administrative costs.

Politehnica University of Timisoara, Romania
University of Athens, Greece
University of Lille, France

Lead the change

Holder
The student

Take control of their own data in a secure way and easily move with their own credentials across Europe.

Enjoy mobility across borders

Verifier
The company / university B

Reduce mistakes and protect against fraud, effortlessly interact with government agencies as well as reduce friction and reduce verification costs.
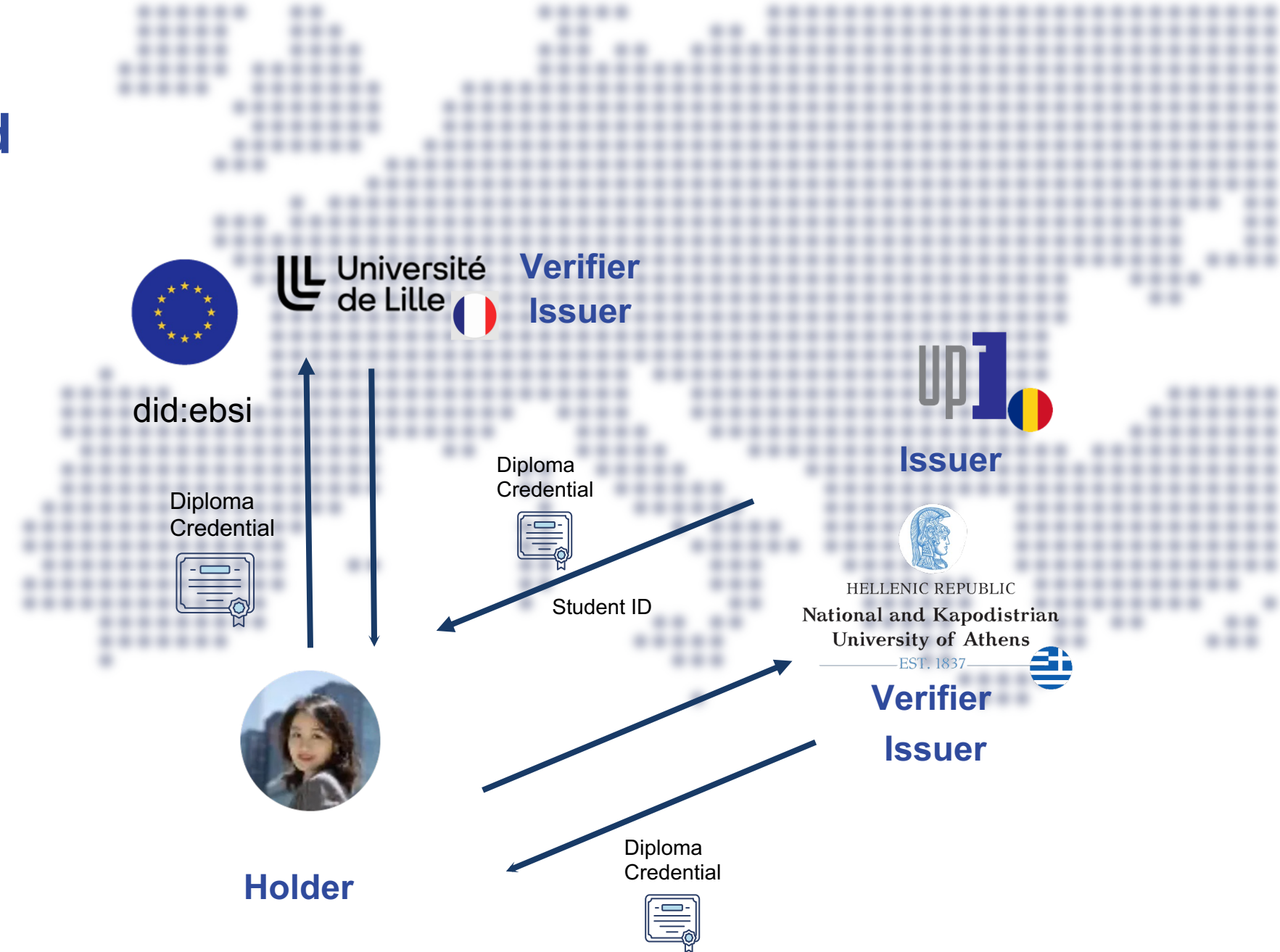
Reduce costs

Verifiable Credentials workflow

Diploma use case

TAO **Issuer**

UEFISCDI Politehnica University of Timisoara, Romania

Holder

Student

walt.id

Verifier

Public and private companies

University of Athens, Greece University of Lille, France

EBSI Services

EBSI

EBSI Trusted registries

- **A** — Request educational credential
- **B** — Issue educational credential
- **C** — Store evidences* of issuance
- **D** — Present educational credential
- **E** — Check attributes of educational credential
- **F** — Onboard on the DID registry

The implemented cross-border scenario

Scenario in details

Anca is a Romanian student who graduated with Bachelor's studies from the Politehnica University of Timisoara (1).
She takes her Master Diploma at University of Athens in Greece (2) and applies for a Ph.D. degree at the University of Lille in France (3).

(1)

- Anca is a Romanian student. She applies for Bachelor Degree in the **Politehnica University of Timisoara**
- She receives her student email account from **Politehnica University of Timisoara**
- Anca signs into the **Politehnica University of Timisoara Issuer Portal** using her student credentials
- The **Politehnica University of Timisoara** issues **a student ID (Verifiable Attestation)**
- Anca becomes official student of the **Politehnica University of Timisoara** and gets her Bachelor Diploma

(2)

- Anca applies for Master Programme at the **University of Athens**
- She requests the **Politehnica University of Timisoara** to issue her **Bachelor Diploma (Verifiable Attestation)**
- The **University of Athens** verifies the **Student ID** and **Bachelor Diploma** and Anca enrols for her Master Degree

(3)

- Anca applies for a Ph.D. degree at the **University of Lille, France**
- She requests the **University of Athens** to issue her **Master Diploma**
- The **University of Lille** verifies it and Anca enrols for a Ph.D. degree
- The **University of Lille** issues Anca's Ph.D. degree in a format that can be shared by email and verified online

Countries

- Romania
- Greece
- France

Actors in the scenario

- Politehnica University of Timisoara
- University of Athens
- University of Lille

Types of credentials

- Student ID (Verifiable Attestation)
- Diploma (Verifiable Attestation)
- Diploma (Verifiable Diploma - EUROPASS)

Wallet

- WaltID

Walk-through - Demo

Walk through the scenario from Anca's point of view

https://youtu.be/g_SbCFqr_zE

Current Scenario for issuing and verifying VCs at UPT (1)
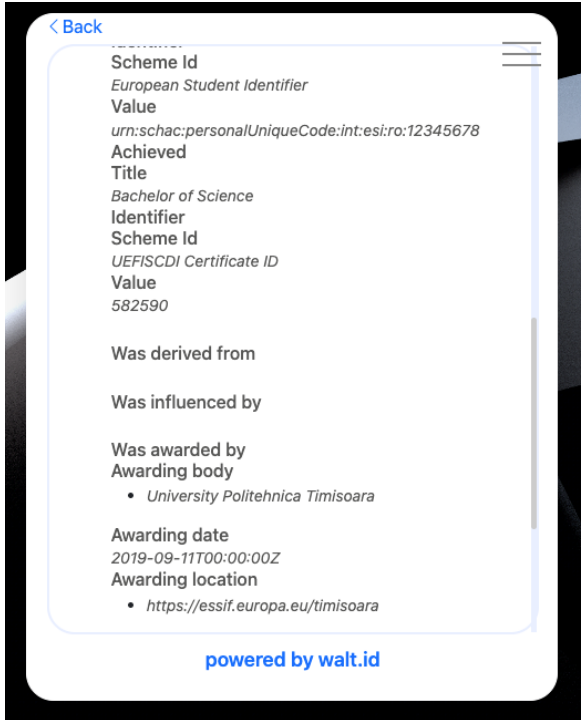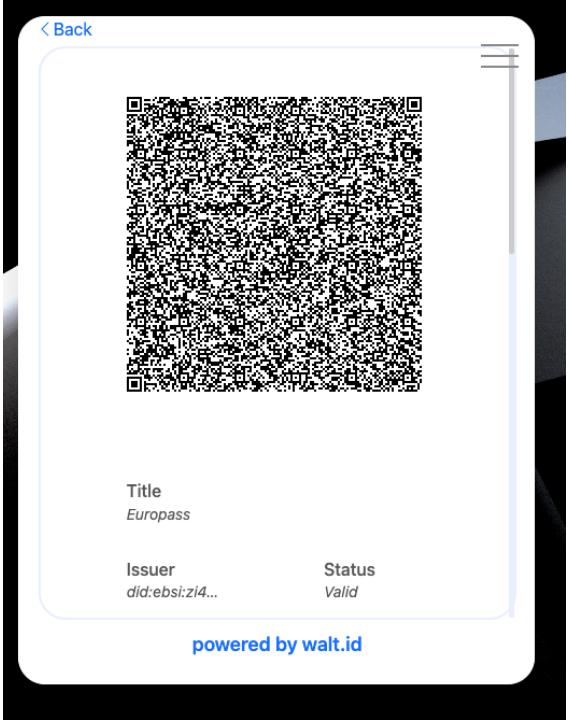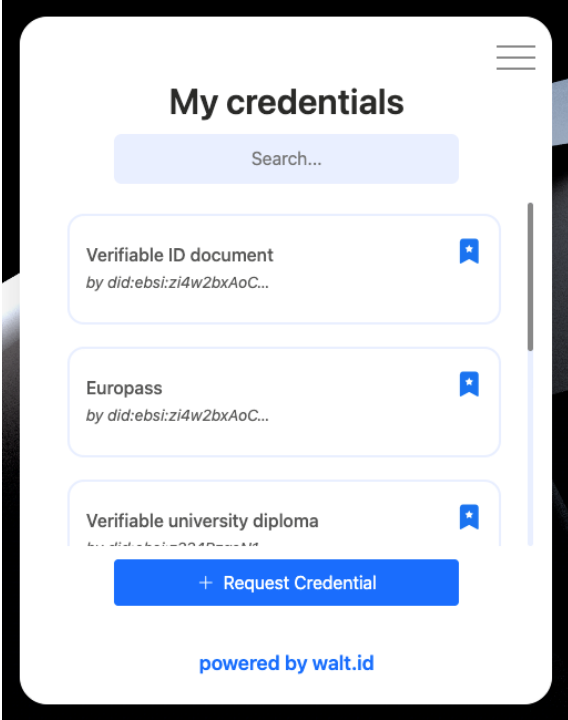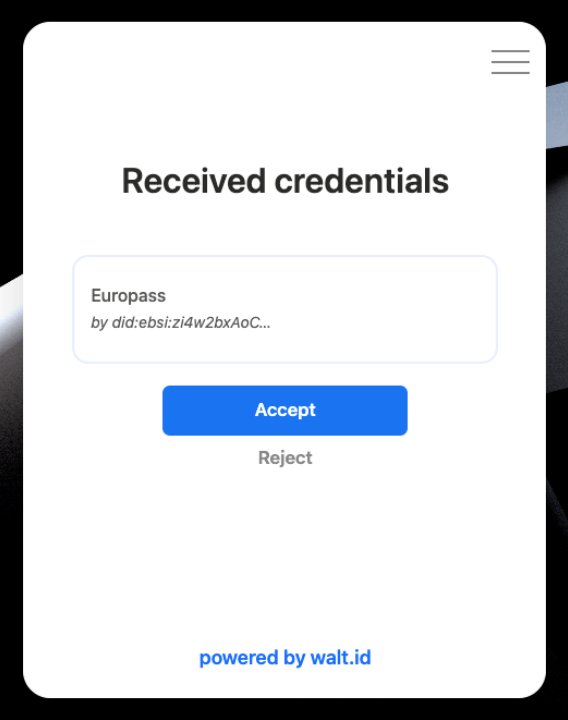Issuing Diploma Credentials on EBSI4RO Demo Issuer

https://issuer.ebsi4ro.ro

Current Scenario for issuing and verifying VCs at UPT (2)

Receiving credentials in an Open-Source Wallet (walt.id)

Current Scenario for issuing and verifying VCs at UPT (3)

Verifying credentials by 3rd party

Thanks, you just
presented credentials.

VerifiableId

The verification was successful
Verification Policies
{ "SignaturePolicy": true, "ChallengePolicy": true,
"VpTokenClaimPolicy": true }

Authenticated session established
• View authenticated DID
• View session token

© 2022 walt.id

YOUR CREDENTIAL IS VALID

✓ Signature
Verify the signature of the credential using the public key resolved with the issuer's identifier .

✓ JSON schema
Verify the data model of the credential's type.

✓ Issuer DID
Verify the issuer's DID was found in EBSI DID registry.

✓ Subject DID
Verify the subject's DID was found in EBSI DID registry.

✓ Issued date
Verify the issued date is before the current date.

✓ Valid from
Verify the date when the credential is valid is before the current date.

✓ Expiration date
Verify the expiration date is after the current date.

Content of your credential
{
    "@context": [
        "https://www.w3.org/2018/credentials/v1"
    ],
    "credentialSchema": {
        "id": "https://api.preprod.ebsi.eu/trusted-schemas-registry/v1/schemas/0x6b304591b86b7e5e4c8a713ddfb84ee5810a56334827adda4e741f80b9aa49ed",
        "type": "FullJsonSchemaValidator2021"
    },
    "credentialSubject": {

The verification was requested successfully

The confirmation code is:
HDJ2123F

The accuracy of the information submitted with this statement can be verified based on the file.

Confirmation code

HDJ2123F

Status

The document was issued

Current Scenario for issuing and verifying VCs at UPT (4)

Verifying credentials by 3rd party

Envisioned Issuance Portal

Aggregating multiple LMS and academic diplomas

EBSI VCs Plugin in UniCampus Moodle LMS

Building wallet support in the Moodle Workplace certificate plugins

The plugin has the features that support traditional viewing/sharing experience and verifications which are further integrated into a VC stored in an EBSI Compliant wallet:

- Generate a PDF certificate for the user
- Save VC to wallet
- Wallet contains VC that is cryptographically signed by the configured DIDs of the emitting entity as well as the PDF certificate that can be verified on the website.

Manage wallet connections to integrate multiple EBSI Compliant Wallets (Walt.ID, Gataca, VIDwallet)

Certificates settings

Issue certificates in user language tool_certificate | issuelang	☐ Default: No

On multi-lingual sites when user language is different from the site language the certificates will be generated in the user's language, otherwise all certificates will be generated in the site default language.

Show share on LinkedIn tool_certificate | show_shareonlinkedin	☑ Default: No

If the "Share on LinkedIn" button should be shown on the my certificates page

LinkedIn organization id tool_certificate | linkedinorganizationid	[_____] Default: Empty

The id of the LinkedIn organization issuing certificates.

Where do I find my LinkedIn organization id?

1. Log in to LinkedIn as the admin for your business' Organisation Page
2. Check the URL used when you are logged in as the admin. (The URL should resemble "https://linkedin.com/company/xxxxxxx/admin")
3. Your LinkedIn organization id will be the seven-digit number in the URL (Shown as "xxxxxxx" in the step above)

Show "Add to Wallet" button tool_certificate | show_addto_ebsi_wallet	☑ Default: No

If the "Add to Wallet" button should be shown on the my certificates page

[Save changes]

Enable "Wallet VC Issuance"

My certificates

These are the certificates you have been issued by either email or downloading manually.

Download table data as [Comma separated values (.csv) ⇕] [Download]

Name	Date issued	Expiry date	Code	File	Share on LinkedIn	Add to wallet
Certificate Test	Monday, 3 April 2023, 10:02 am	Never	2724883383AX	⬇	in	✉

Option to add Certificate to wallet

Thank
YOU!

EBSI-NE

Funded by
the European Union

Lecturer PhD Andrei Ternauciuc
https://cm.upt.ro/en/tutor/andrei-ternauciuc/

PhD Student Victor Holotescu
https://github.com/victorholo

Politehnica University of Timisoara