Verifiable Credentials

as enablers of Open Educational Practices

Carmen Holotescu, Professor PhD
Team member EBSI4RO: Connecting Romania through Blockchain
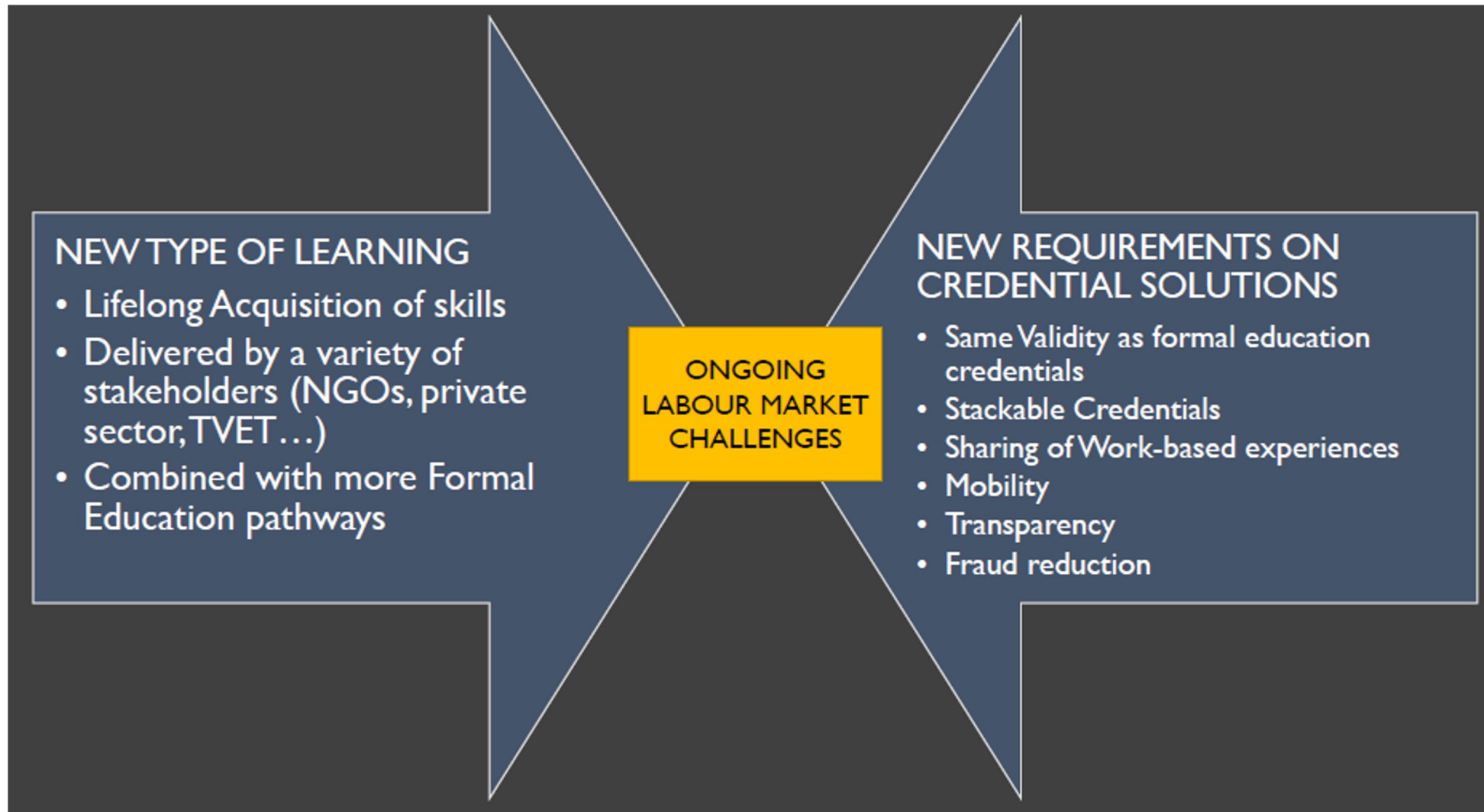Politehnica University of Timisoara, Romania

Content

1. Verifiable Credentials and Open Education
2. Certifying OE Scenarios on EBSI. EBSI4RO project

Opening up Education

From Alex Grech - Blockchain, Self-Sovereign Identity and Credentials, March, 2021 – https://www.slideshare.net/alexgrech/blockchain-selfsovereign-identity-and-credentials

Priorities in Education

- United Nations Sustainable Development 2030 (SDG 4): ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all
- EU Digital Education Action Plan (2021-2027): envisions a high-quality, inclusive, and accessible digital education in Europe
- European Year of Skills 2023: aims to advance lifelong learning and skills shortages, supporting innovation and competitiveness

Why a European Year of Skills?

Having a workforce with the skills that are in demand contributes to sustainable growth, leads to more innovation and improves companies' competitiveness. Skilled workers enjoy better job opportunities as well as broader possibilities to fully engage in society. This is key to ensure that the economic recovery as well as the green and digital transitions are socially fair and just.

The European Year of Skills 2023 puts skills centre-stage. Helping people get the right skills for quality jobs and helping companies, in particular small and medium enterprises, address skills shortages in the EU is what this Year is all about.

How? By showcasing skills development opportunities and activities across Europe, by fostering easier recognition of qualifications across borders, by bringing organisations and people together to share their experiences and insights, and setting out how EU initiatives and funding possibilities can help.

EUROPEAN YEAR OF SKILLS

https://unstats.un.org/sdgs/report/2022
https://education.ec.europa.eu/focus-topics/digital-education/action-plan
https://year-of-skills.europa.eu/

European Digital Credentials for Learning

What are Digital Credentials

Europass Digital Credentials describe a learning achievement. They can describe activities, assessments, and professional entitlements as well as qualifications.

The European Commission is developing the Europass Digital Credentials Infrastructure (EDCI) to support efficiency and security in how credentials such as qualifications and other learning achievements can be recognised across Europe.

Work is ongoing on the development of the Europass Digital Credentials Infrastructure (EDCI). The EDCI will support authentication services for any digital documents or representations of information on skills and qualifications as outlined in Article 4 (8) of the Europass Decision.

A credential is a documented statement containing claims about a person issued by an educational organisation following a learning experience.

Europass Digital Credentials describe a learning achievement. They can describe:

- activities (e.g. classes attended),
- assessments (e.g. projects),
- achievements (e.g. skills developed),
- professional entitlements (e.g. registration as a medical doctor) and
- qualifications.

European Digital Credentials for Learning respond to the need of the citizens to easily share their diplomas, transcripts of records, and other certificates of learning achievements in formal, informal, and non-formal settings, in a secure and digital way, when applying for a job or for further studies and training in any Member State

Oct 25, 2021 - https://europa.eu/europass/en/what-are-digital-credentials

Micro-credentials

A European approach to micro-credentials

Micro-credentials offer more flexible and modular learning opportunities. Having a European approach will help widen learning opportunities and strengthen the role of higher education and vocational education and training institutions in lifelong learning.

Certifying the learning outcomes of short-term learning experiences, the micro-credentials could offer a flexible and targeted way to help people acquire new knowledge, upskill and reskill the competences needed for their personal and professional development.

About education in the EU

European Education Area

About the European Education Area

Education for Climate Coalition

Micro-credentials

Mutual recognition of diplomas

Quality in early childhood education and care

Language learning

What are micro-credentials?

A micro-credential is a proof of the learning outcomes that a learner has acquired following a short, transparently-assessed learning experience. They are awarded upon the completion of short stand-alone courses (or modules) done on-site or online (or in a blended format).

Flexible learning

Micro-credentials open education up to more people because of their flexible, short-term nature. They are open to all types of learners. They can be particularly helpful for people who

- are looking to build on their current knowledge rather than get a full degree
- want to bridge a gap between degrees or their initial formal education and emerging labour market skills
- want to upskill or reskill

Verifiable Credentials and EBSI

- Therefore there is a need to redesign the way educational credentials are issued, stored, displayed, and verified, bringing new opportunities for flexible and open participation in traditional education and in lifelong learning for upskilling and reskilling
- A Verifiable Credential (VC) is a tamper-evident and privacy-respecting credential, with specific Metadata and Proofs, requested by the Holder and issued by a competent authority, called Trusted Issuer, and where the authorship can be cryptographically verified (W3C, DCC, 2020)
- Blockchain technology, with its characteristics of security, transparency, and integrity – is a solution for a trusted, robust, scalable, and flexible decentralized credentialing ecosystem
- Through its Diploma use case, the European Blockchain Services Infrastructure (EBSI) represents a cross-border decentralized credentialing ecosystem for issuing Verifiable Credentials.

https://ec.europa.eu/ebsi

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).
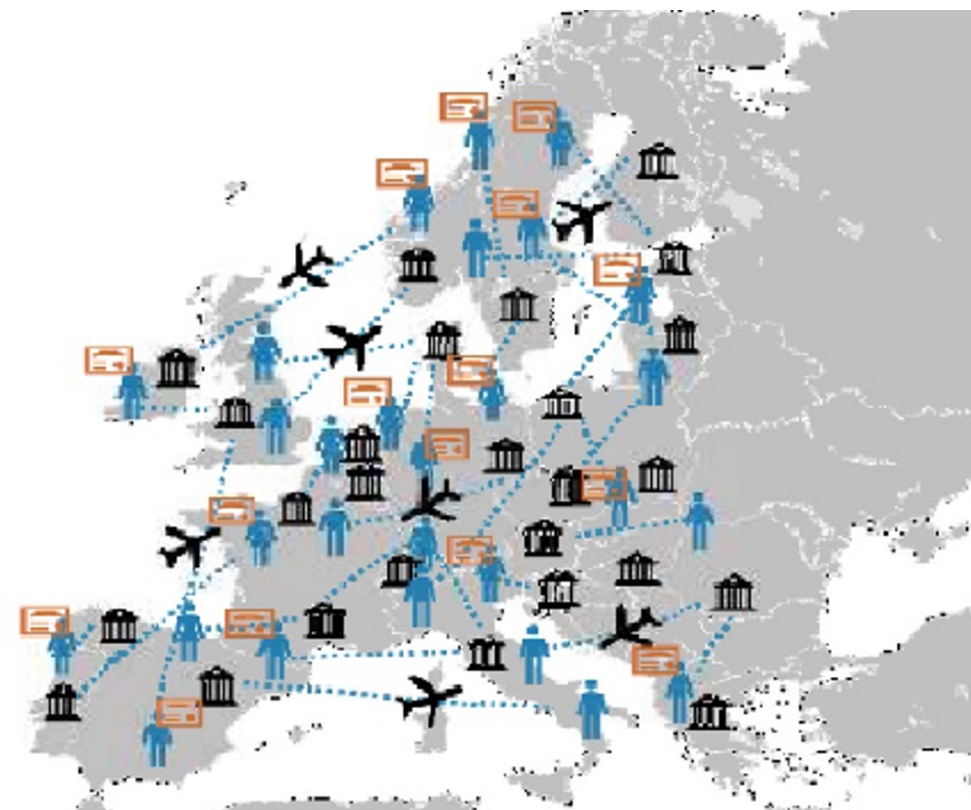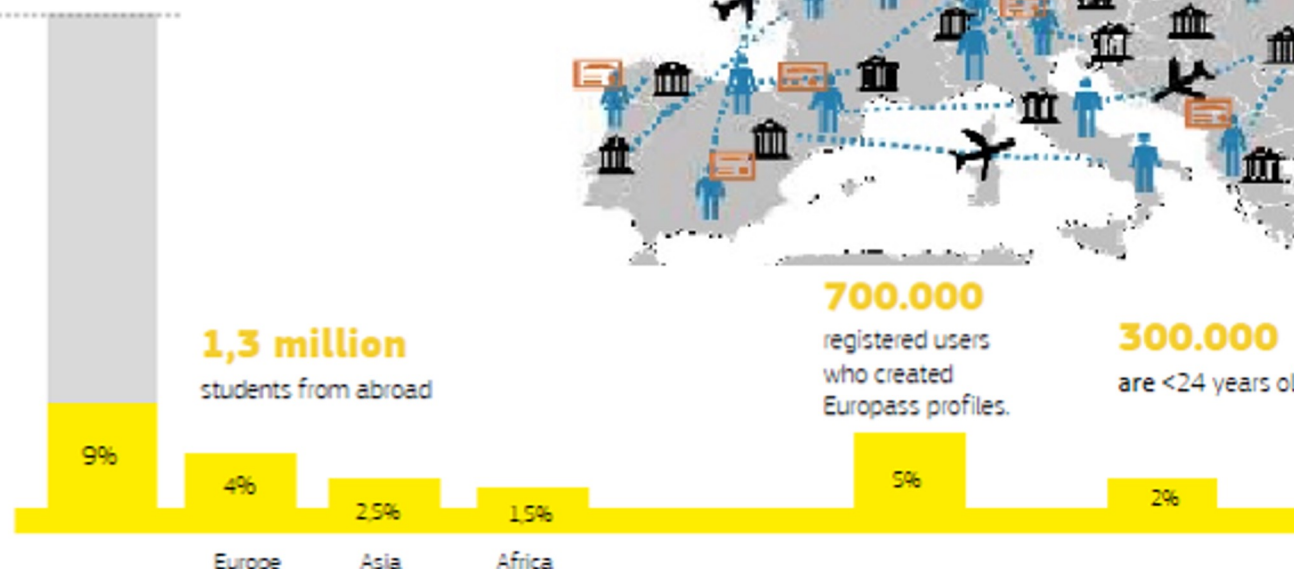
2,465
higher education institutions

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

9%

4%

2,5%

1,5%

5%

2%

Europe

Asia

Africa

From Early Adopters EBSI Programme Webinar - March 2021 -
https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/EBSI+Early+Adopters+programme+kick-off+webinar

EBSI4RO Connecting Romania through Blockchain

Central scope: to create an extendable and sustainable ecosystem to facilitate and accelerate the awareness, knowledge and adoption of the Blockchain technologies and European Blockchain Services Infrastructure (EBSI) by the Romanian citizens, businesses, institutions and administration; proposals for Blockchain policies in education.

Partners:

1. **Executive Unit for Financing Higher Education, Research, Development and Innovation (UEFISCDI)**
   - Dr.Cosmin Cioranu
   - Elena Stefania Nicolaescu

2. **Politehnica University of Timisoara (UPT)**
   - Prof.dr.ing.Radu Vasiu
   - Dr.Diana Andone
   - Prof.dr.ing.Carmen Holotescu
   - Drd.Victor Holotescu
   - S.l.dr.Andrei Ternauciuc
   - Conf.dr. Gabriela Grosseck

April 2021 – March 2023

https://ebsi4ro.ro
https://www.facebook.com/ebsi4ro
https://twitter.com/ebsi4ro

Objectives and Outcomes of the project

EBSI 4 RO

01
Setup and operation of an EBSI node

Node operational from July 2021

02
Credentialing System for issuing Verifiable Credentials on EBSI for university diplomas and micro-credentials

Integrated with the National Student Enrolment Registry (Registrul Matricol Unic RMU) operated by UEFISCDI, and with Virtual Campus UPT & Unicampus

03
5 miniMOOCs on Unicampus.ro

04
Communication and Blockchain community strengthening in Romania, with the aim to raise awareness of Blockchain / EBSI

EBSI4RO **Site**

Latest News

România este una din primele 12 țări din UE care emit diplome pe European Blockchain Services Infrastructure (EBSI)
BY: CARMEN HOLOTESCU / ON: AUGUST 11, 2022

Membrii echipei EBSI4RO: Connecting Romania through Blockchain suntem mândri de realizările din primele 14 luni de implementare, care includ și demonstrarea cu succes a emiterii de diplome universitare pe European Blockchain Services Infrastructure (EBSI), în cadrul evenimentului EBSI Demo Day, din 31 mai. Alături de colegi din Grecia și Franța am colaborat îndeaproape în cadrul EBSI Early Adopters Programme, lansat în 15 iulie 2021, sub coordonarea profesionistei echipe EBSI și

EU Funded Projects
BY: ADMIN@EBSI4RO / ON: JULY 18, 2022

Educational projects
BY: ADMIN@EBSI4RO / ON: JULY 18, 2022

Blockchain academic courses and programs
BY: ADMIN@EBSI4RO / ON: JULY 18, 2022

Blockchain projects from Romania
BY: CARMEN HOLOTESCU / ON: JULY 18, 2022
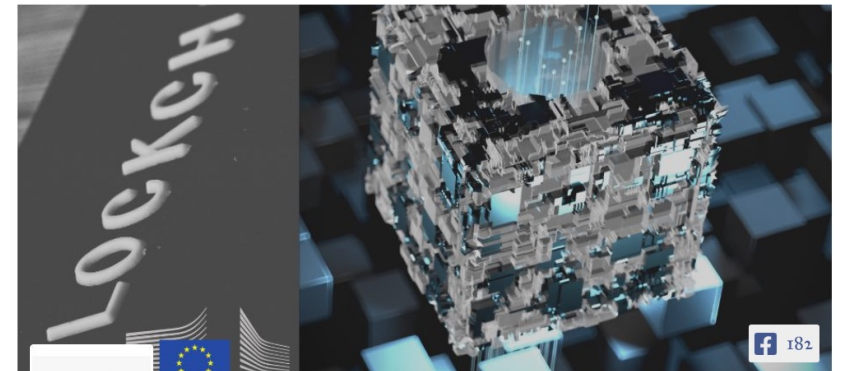
EBSI4RO în raportul DESI pentru România
BY: CARMEN HOLOTESCU / ON: APRIL 11, 2022

Ca o recunoaștere a contribuției la procesul de digitalizare, proiectul "EBSI4RO: Connecting Romania through Blockchain" este menționat în raportul de țară Digital Economy and Society Index – DESI pentru 2021.

VIEW ALL

About the project

Facebook @EBSI4RO

Ebsi4ro
EBSI4RO: Connecting Romania through Blockchain

Ebsi4ro plans to go live.
2 days ago

Open Education Week Workshop 2023

View on Facebook · Share

English

https://ebsi4ro.ro/

Set-up an EBSI node - UEFISCDI

EBSI's State of play – the node network

EBSI's pan-European network of nodes

45 nodes in 23 countries

Nodes per country:

- Austria (1)
- Belgium (2)
- Bulgaria (2)
- Croatia (1)
- Cyprus (1)
- Czechia (2)
- Estonia (1)
- Finland (1)
- France (2)
- Germany (3)
- Greece (2)
- Hungary (3)
- Italy (2)

- Lithuania (1)
- Luxembourg (2)
- Netherlands (4)
- Norway (1)
- Poland (1)
- Romania (3)
- Slovakia (2)
- Slovenia (1)
- Spain (2)
- Sweden (1)

3 EBSI nodes in Romania: ICI (Dec 2020), UEFISCDI (June 2021), STS (Dec 2021); a new node will be installed by UPT

TAO Trusted Accreditation Organisation
The ministry

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

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.

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 on EBSI

02

Blockchain

TAO
(Government entity)

Issuer
(University)

Holder
(Student)

Wallet

Verifier
(University/Employer)

EBSI WALLET

U BACHELOR'S DIPLOMA

Impossible to fake, easy to verify
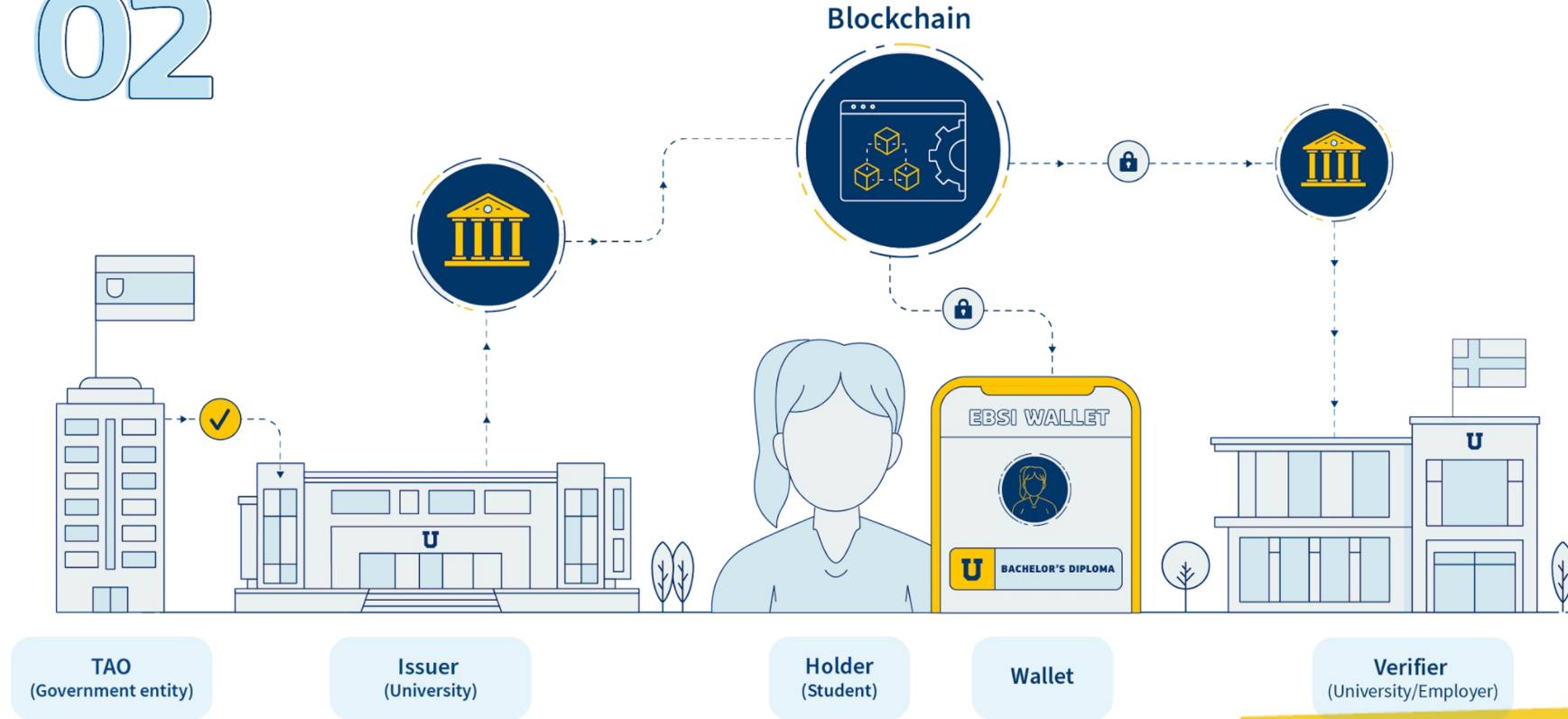
Standards

✓ W3C VCs & DIDs

✓ OpenID Connect

✓ 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

EBSI Early Adopters: Multi-University Pilot

2 European universities alliances, +18 universities from +15 countries

EBSI4RO participates in the EA Programme – July-December 2021

https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/Early+Adopters+Programme

Scenario in practice

Diploma use case

TAO | Issuer | Holder | Verifier

UEFISCDI | Politehnica University of Timisoara, Romania | Student | University of Lille, France | Public and private companies

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

did:ebsi

Verifier
Issuer

Diploma
Credential

Diploma
Credential

Student ID

Issuer

Verifier

Issuer

Diploma
Credential

Holder

17
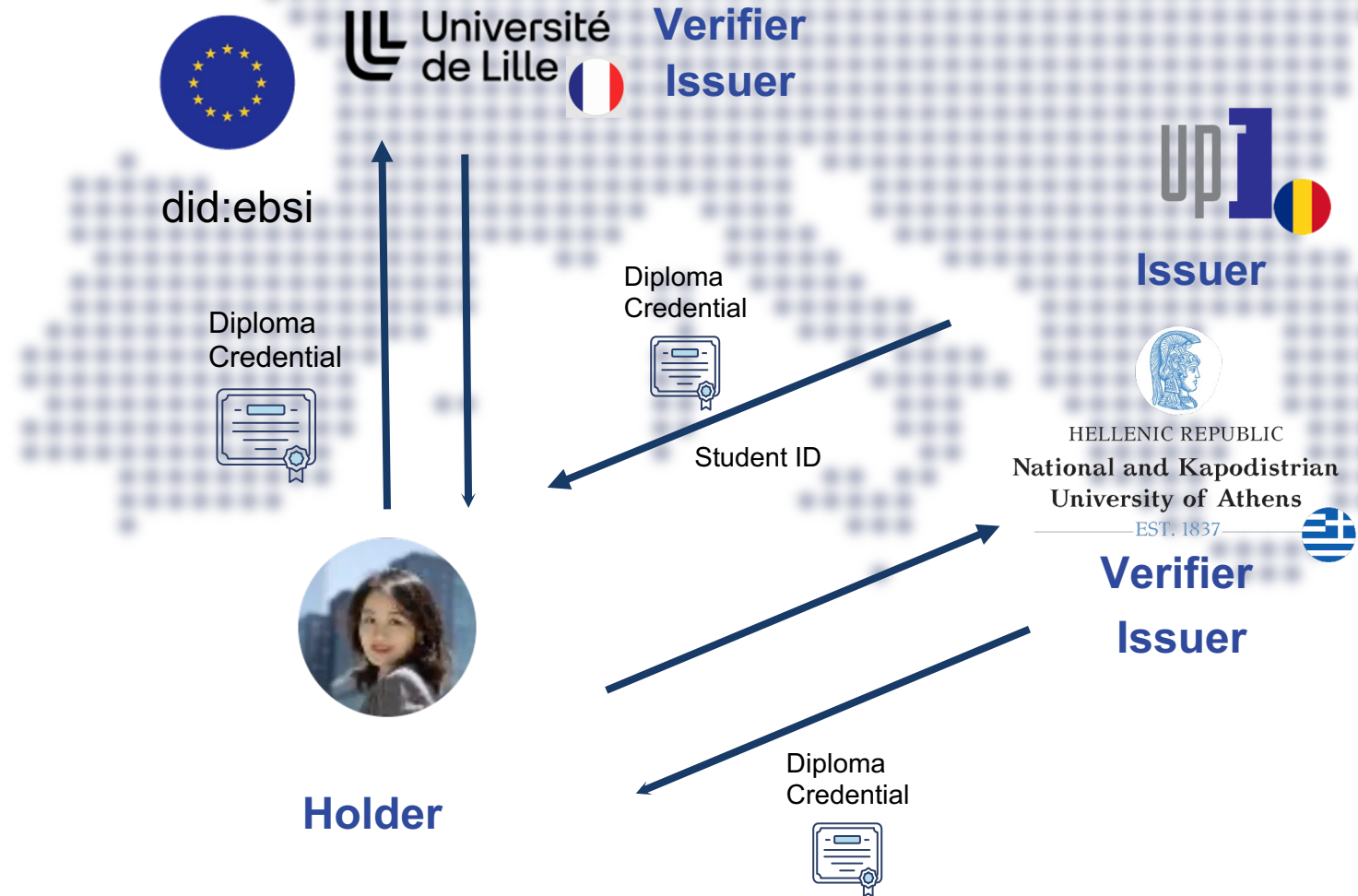
Verifiable Credentials on EBSI Success Stories

Transcript of Records

A student gets a master diploma after receiving a transcript of records validated by Erasmus.

Read the full story →

Bachelor/Master Degree

A student applies for a PhD with a bachelor/master degree from a foreign country.

Read the full story →

Municipality Credentials

A student gets access to local discounts using municipality credentials based on a European student card.

Read the full story →

European Qualification Passport for Refugees

A refugee presents an EQPR to a European University to apply for a Master and find a job in Europe.

Read the full story →

Licence to Practice

A graduated citizen applies for a job with a degree from another foreign country.

Read the full story →

Micro-credentials

A PhD student applies for specific courses in a foreign country.

Read the full story →

https://ec.europa.eu/digital-building-blocks/wikis/display/EBSI/Bachelor+-+Master+Degree+Adopters+Programme
https://ec.europa.eu/digital-building-blocks/wikis/display/EBSI/Verifiable+Credentials+Success+Stories

Tehnologia Blockchain. European Blockchain Services Infrastructure

Acasă / Cursurile mele / Cursuri EBSI4RO / ebsi4ro_bc_tech

Bun venit! Modul de lucru

Due: Friday, 13 October 2023, 3:43 PM

Coffee House

| Tehnologia Blockchain. Aplicații în diferite domenii și în educație | Priorități și programe EU legate de Blockchain. Proiecte Blockchain în ... | Specificații tehnice și use-cases EBSI | Diploma use-case | Dezvoltarea și testarea aplicațiilor EBSI |

Micro-credentials will be issused on EBSi for the participants in the MOOC on Unicampus
5 miniMOOCs integrating OEP/OER/MOOCs, respecting the CHAISE/INATBA recommendations

https://ebsi4ro.ro
https://únicampus.ro

Activitate colaborativă 1.2: Să contribuim la Wikipedia în limba română cu termeni legați de Blockchain

Activitate 2.1: Evaluarea proiectelor de Blockchain din țară și din Europa

Activitate colaborativă 3.1: Traducerea Glosarului EBSI

Activitate 4.1 - Rezolvarea unui puzzle despre facilitățile EBSI

Activitate 5.1: Să analizăm utilitatea emiterii credențialelor verificabile pe EBSI

Piloted with UPT Master students and Bachelor students at UPT and Ioan Slavici University of Timisoara
Over 250 participants
New participants are welcome

https://ebsi4ro.ro
https://únicampus.ro

04

Blockchain and EBSI Dissemination

Romanian Blockchain Ecosystem

https://ebsi4ro.ro/romanian-blockchain-ecosystem/

Report by Carmen, Victor & Tudor Holotescu

Published in January 2022, last updates ◆ on September 23, 2022

Based on an active implication, extensive research, and monitoring of the Romanian Blockchain scene since 2017, this work is a continually u̲ report of the first attempt to map the Romanian Blockchain Ecosystem published in 2018, followed by the report published on Medium in January 2021.

The new report is published under the auspices of the project "EBSI4RO: Connecting Romania through Blockchain", the most important Blockchain educational initiative of the moment in Romania, the first two authors being part of the implementation team.

Without claiming exhaustiveness, the report offers a fresh perspective of the vibrant, diverse and mature initiatives in the field. Romania has a growing number of experienced companies, innovative startups and projects (◆ over 120 are presented below), active accelerators, many communities and events (section 1), and also numerous educational programs, initiatives and policy proposals (section 2).

During the last two years there were registered numerous innovative government projects, including the developing of a Blockchain strategy and initiatives for specific national legislation for crypto-assets and Blockchain, also some pioneering projects in Europe, such as the Blockchain voting reporting tool for the national parliamentary elections in 2020, and a national system and policies for verifiable diplomas and micro-credentials on the European Blockchain Services Infrastructure (EBSI) (sections 1.11, 1.12, 2.6).

◆ Part of the findings of this work are presented in the new EU Blockchain Ecosystem latest developments, a report of the EU Blockchain Observatory, published on September 9, 2022, for which Carmen Holotescu was the Romanian expert.

1.General Initiatives
1.1.Regulations
1.2. Companies and Start-ups ◆
1.3. NFT initiatives
1.4. Mining
1.5. Media and News
1.6. Conferences and Events
1.7. Hackathons
1.8. Payments
1.9. Communities
1.10. Training
1.11. EU Funded Projects
1.12. National projects and policies ◆
1.13. Activities at European Level
1.14. Influencers

2. Educational initiatives and projects
2.1. Academic Courses and Programs
2.2. Research
2.3. Educational Conferences and Workshops
2.4. Educational Blockchain projects
2.5. Other educational initiatives
2.6. Educational Policy Proposals

Participation in EBSI Early Adopters Wave 3

UEFISCDI, UPT, Ioan Slavici University of Timisoara, Lideea Ltd, OncoGen, Vasile Goldis University of Arad, UVT & UNITA

EBSI Early Adopters Programme

An incubator programme to help imagine, build and launch blockchain pilot project(s) to improve the life of European citizens.

Proposals for Digital Education Strategy in Romania - SmartEDU

The first proposals of educational policies related to diplomas/micro-credentials on EBSI made by the EBSI4RO team – December 2020

Măsură	Argumentare
Implementarea unui **sistem descentralizat pe Blockchain**, utilizând *Infrastructura Europeană de Servicii pe Blockchain* (EBSI - European Blockchain Services Infrastructure). Opțional: instalarea unui nod EBSI gestionat de MEC.	Pentru învățământul pre-universitar: Se vor stoca pe Blockchain certificate digitale echivalente unor documente ca: situațiile școlare anuale, (parte a) portofoliile, certificatele/diplomele de finalizare a ciclurilor de învățământ. Beneficii: sporirea integrității certificatelor prin digitalizare, îmbunătățirea confidențialității informațiilor personale, transparență mărită în ceea ce privește procesul de învățământ, recunoașterea studiilor și competențelor la continuarea studiilor, la transferul la altă unitate de învățământ, în țară sau străinătate și la angajare. Măsura vine și în sprijinul sutelor de mii de elevi români, care învață în străinătate pentru anumite perioade de timp și au dificultăți în recunoașterea studiilor în alte țări sau la revenirea în țară.

Se vor stoca pe Blokchain certificate digitale echivalente unor documente ca: diplomele universitare, postuniversitare, de doctorat și microcredențiale (certificând participarea la module/cursuri în alte instituții/țări).
Beneficii: sporirea integrității certificatelor prin digitalizare, îmbunătățirea confidențialității informațiilor personale, transparență mărită în ceea ce privește procesul de învățământ, acuratețe mai precisă în portofoliul de aptitudini și competențe, portabilitate și mobilitate crescute pentru documente la continuarea studiilor sau la angajare, incurajarea personalizării parcursului educațional.

Pentru sistemul educațional:
Registru pe Blockchain cu fondurile investite în educație, pentru monitorizare, transparență, auditabilitate, performanță a proceselor de gestionare financiară, urmărirea rezultatelor.

https://www.smart.edu.ro/

Thank you!

EU Blockchain Ecosystem Developments

EUBlockchain
Observatory and Forum

A Thematic Report Prepared By
The European Union Blockchain Observatory & Forum

An initiative of the European Commission

JRC Technical report

European Landscape on the Use of Blockchain Technology by the Public Sector

2022

interoperable europe