



# EBSI-VECTOR

Education and work reloaded

## D4.2: Deployment and Testing Scenarios Results Library (DTSRL)

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## List of Terms and Abbreviations

Abbreviation	Definition
DC4EU	Digital credential for Europe Project
DID	Decentralized identifiers
Dxx	Deliverable number xx
EBSI	European Blockchain Service Infrastructure
EBSI-NE	European Blockchain Services Infrastructure – Nodes Expansion (EBSI-NE)
EBSI-VECTOR	EBSI enabled Verifiable Credentials & Trusted Organisations Registries
EDIC	European Digital Infrastructure Consortium (EDIC)
eIDAS2	electronic Identification, Authentication and Trust Services v2
eSSIF	European Self Sovereign Identity framework
EU	European Union
GDPR	General Data Protection Regulation
KPI	Key performance indicator
LSP	Large Scale Pilot
TOR	Transcript of Records
Txx	Task number xx
UAT	User Acceptance Testing
VC	Verifiable Credential
WPxx	Work Package number xx

## 1 Executive Summary

The deliverable D4.2 Deployment and Testing Scenarios Results Library aims to showcase the use cases of entities engaged in piloting educational projects utilizing decentralized identity technology, specifically following the EBSI framework. It outlines future validation tests to confirm the successful execution of predefined scenarios.

This deliverable, part of task 4.2 "Test and validation of new provided eSSIF capabilities for the educational domain," is a step towards broader technology adoption. The goal is to get a significant number of educational users to adopt this technology, assess its viability, improve usability, and correct any issues that may arise.

The eIDAS2 regulation has been a game-changer for this ecosystem, making this new paradigm not just a technical possibility, but a mandatory provision for all member state EU citizens. The EBSI-VECTOR project, specifically its WP4 which includes this document, addresses this requirement within the educational sector.

As with any new technology, there are associated risks and challenges, particularly in three areas:

- **Security:** Ensuring the security of citizen identification processes is paramount
- **Privacy:** This technology must enhance the user's privacy by giving the control over their data
- **Usability:** The technology must be easy to use without requiring extensive prior knowledge

These three pillars will be tested in educational entities participating in the project. The outcomes will help improve these features and encourage widespread adoption.

The task is divided into three phases:

**Onboarding:** Identifying educational organizations interested in decentralized identity projects with EBSI.

**Use Case:** Assisting in selecting specific use cases from predefined options and creating a user journey for each.

**Test Plan:** Defining test cases for validation using User Acceptance Testing (UAT), which involves specifying input data and expected outcomes to validate implementations.

To date, the task has yielded the following results:

- **Contacted Organizations:** 37 (expressed interest in the project)



- Confirmed Organizations: 31 (committed to participating in the project)
- Defined User Journeys: 17 (user journeys established)
- Involved Countries: 10 (Poland, France, Italy, Greece, Portugal, Denmark, Belgium, Slovenia, Sweden).

While the objective (50 organizations/20 countries) are not yet met, valuable insights and recommendations have been gathered:

- Educational projects without external funding are generally unattractive to most entities
- Commitment to effort and goals is minimal for non-funded projects
- The technology is still largely unknown to most organizations, requiring prior evangelization efforts

Over the next few months, the task will continue to progress to complete the objective set and towards generating new organization interested in the project.

## 2 Introduction

The new eIDAS2 regulation came into effect, on May 20<sup>th</sup>, 2024, bringing a series of specifications on electronic identity that directly influence how European citizens will be able to share certain personal data. While this update builds on the previous version of the regulation, which offers a framework familiar to those in the field of Decentralized Identity by sharing many technical and procedural specifications, it is not identical. Nonetheless, this implementation has significantly propelled all aspects of decentralized identity forward. The market, though still nascent, is beginning to show signs of activity. Investment is becoming more noticeable, along with an increasing number of news stories related to the new paradigm. In essence, the field is awakening.

When a technology like this begins to awaken, it is crucial to analyze, define, test, and adopt it in the best possible manner. This is the reason behind the inception of the EBSI-VECTOR project. Within this project, this document aims to represent the advancements made in Task 4.2 of Working Group 4. The objective of this task is to engage educational entities to define a use case through user journeys, which will later be implemented. Beyond the goal of adoption, this initial definition of requirements also aims to identify the necessary capabilities that EBSI currently lacks.

Prior to this task, Task 4.1 produced an educational Blueprint document. This document includes the current state of the project (business, technical, legal, etc.) and provides several options to narrow the project's scope. This Blueprint has been used to delineate the scope of each project that educational organizations will integrate into their systems and to provide a comprehensive view of the project's current state, including both its current and future capabilities.

Based on the previously gathered information, this task was executed with the goal of achieving technology adoption by educational organizations, and consequently by end-users (students, teachers, etc.). This document aims to present the progress made in this task (which is still ongoing) and to describe comprehensively all the problems and solutions that have arisen, as well as the insights gained during its execution.

The structure of the deliverable follows a straightforward format:

- **Blueprint:** Delimits the task's scope based on the previously described deliverable

- **Procedure:** Describes the flow and processes incorporated into the task to perform the operations
- **Scenarios:** Describes the different scenarios of various educational organizations. This section includes a description of the general scenario, the user journeys defined by the organizations with their specific objectives, and the required capabilities that are not yet available in EBSI

This introduction provides a comprehensive overview of the context, objectives, and structure of the document, setting a clear stage for the detailed content that follows.

### 3 Blueprint

As previously mentioned, this deliverable, as part of Task T4.2, is part of a process that began in Task T4.1, where the rules of engagement for the work package were defined. In addition to other useful information for the project, a series of generic use cases were defined in that task, which could be exploited in the task we are currently engaged in. These were generic use cases, where the environment, actors, etc., were not detailed, but they have served as the foundation for constructing the scenarios and user journeys developed by each organization.

In most of the scenarios, these use cases have been used and, in some others, small variations of the existing ones have been made, so that they make sense within the specific context of the organization where they were applied, always within the educational domain. Some variations that have been implemented have to do with the types of credentials issued (Diplomas, Transcripts, Certificates, etc.), and in others, with the trusted third party where they are to be presented (Universities, headhunting entities, cafeterias, sports centers, etc.).

The use cases derived from the Blueprint document are:

#### **Transcript and Academic Record Management**

##### Educational to Educational Student Journey

- Seamlessly transition from one educational institution to another
- Maintain access to educational records and achievements
- Begin studies at the new institution without significant delays or duplicated coursework

##### Erasmus+ Programme Participation

- Seamlessly apply, participate, and manage the Erasmus+ Programme with the benefits of EBSI Network
- Ensure the secure storage and transfer of academic records and credentials
- Resume academic studies in home university, with blockchain-verified credentials and academic history

##### PhD Research Collaboration

- Collaborate on research projects securely and transparently
- Ensure the authenticity and integrity of research data and findings
- Streamline communication and data sharing among collaborators

### Diploma Issuance & Revocation Scenarios

- Higher Education Diploma Issuance
- Securely apply for Master courses or job opportunities after graduating
- Streamline the application process and improve efficiency

### Diploma Replacement (Revocation & Re-issuance)

- Securely replace a student's diploma guaranteeing GDPR rights and following national legislative framework

### Employer Verification Scenarios

#### Job Application Post-Graduation

- Securely apply for job opportunities after graduating
- Ensure the authenticity and integrity of application materials
- Streamline the application process and improve transparency

#### Professional Course Certification

- Securely obtain a professional certification for a specific course
- Verify the authenticity and validity of the certification
- Streamline the certification process and improve transparency

#### Recognition of Informal Education

- Securely obtain recognition for informal education
- Verify the authenticity and validity of the recognition
- Enhance the professional or educational opportunities with recognized informal education

### Student Card Verification & Revocation Scenarios

#### Special Discounts from Online Services

- Secure student discounts and special offers from online services
- Verify student status to qualify for discounts
- Simplify the process and ensure transparency and data security

#### Student Card Revocation

- Securely revoke a student's access or student card in a transparent and traceable manner

- Maintain records of the revocation for future reference

### **Publishing & Copyright Protection**

#### Publishing & Copyright Protection

- Publish creative work securely and transparently
- Protect copyright and intellectual property
- Prove ownership and manage distribution using blockchain

## 4 Procedure

As previously explained, Task 4.2 involves recruiting new educational organizations to achieve widespread adoption of the technology. Integrating new entities will drive widespread adoption by streamlining onboarding new users. As technology becomes more prevalent among the population, the recruitment of these new entities will become easier.

Several channels have been used to recruit new educational entities:

- **Educational Organizations Associated with the Project:** When signing the contract to become an associate of the EBSI-VECTOR project, educational entities that wished to be part of it had to accept a series of clauses obligating them to implement a decentralized identity project in their systems, following the framework outlined by EBSI
- **Contacts of the Organizations Associated with the Project:** The entities participating in the project are those that have had or are having relationships with educational entities to work with decentralized identity technology. All these contacts should be approached to confirm their interest in the project and their participation. Most of these entities already have prior knowledge of the technology, making their onboarding relatively simple
- **Contacts with Educational Consortia:** There are many educational consortia in Europe, comprising numerous organizations. These consortia are always at the forefront of technology, establishing contact with them is essential. Communication with these consortia has emerged and continues through related individuals
- **Contacts with DC4EU:** The EBSI-VECTOR project has a direct link with the Large-Scale Pilot (LSP) DC4EU, as they both aim to coordinate the educational domain. Although their focus is not the same—DC4EU focuses on the eIDAS regulation—they share many aspects with EBSI-VECTOR, including a significant portion of the technological framework, leading to obvious synergies between them. Several contacts have been made to initiate the relationship between the projects, but it has yet to come to fruition.

In addition to these ongoing channels, a series of webinars and marketing campaigns will be conducted to attract more entities interested in participating in the project.

## 4.1 Roadmap

To execute the project, a workflow has been constructed, as shown in Figure 4.1 This workflow provides project associates with a general overview of the progress of each opportunity and gives registered entities a perspective on the next steps in the project. This workflow will continue with the upcoming Task T4.3 (Steps: Selecting Solution, Implementing User Journey, Testing, and Piloting).

### Workflow

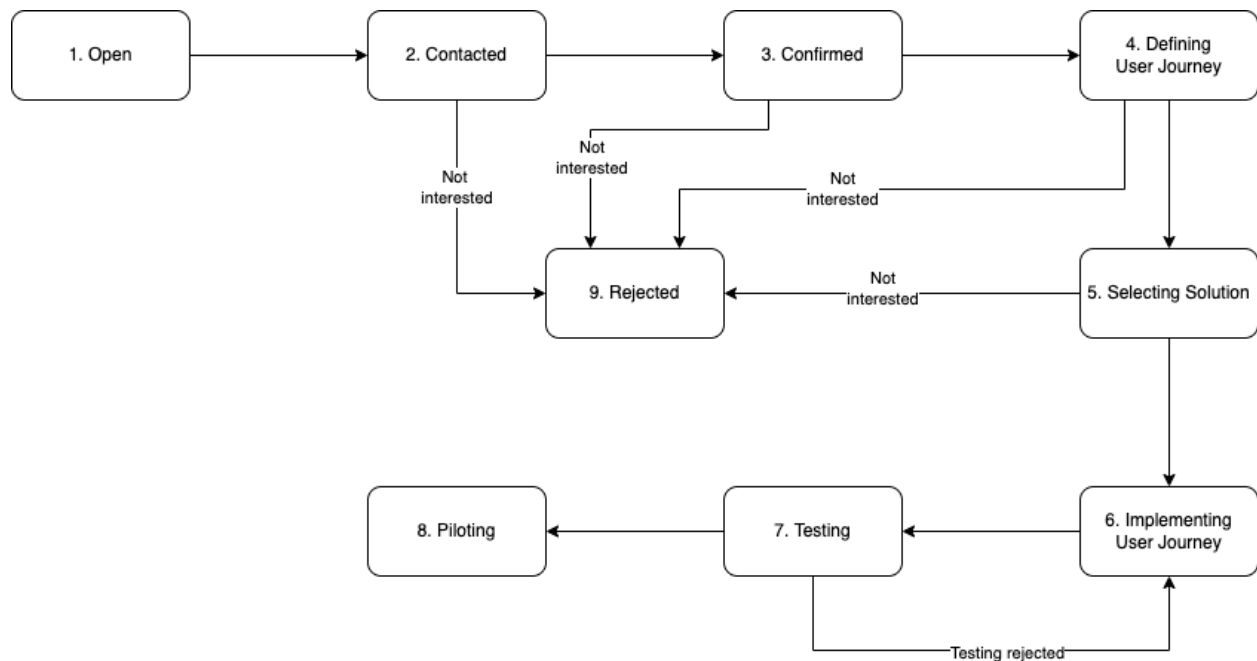


Figure 1 – Execution flow

### 4.1.1 Milestones

#### 1) Open

The educational organization has been contacted but has not yet responded. This represents a completely open opportunity, where the entity's interest in participating in the project is unknown.

#### 2) Contacted



The educational organization has responded to the initial communication and is undecided. At this stage, organizations typically begin requesting more information about the project to make an informed decision.

### **3) Confirmed**

The educational organization has confirmed its interest in being part of the EBSI-VECTOR project and begins its use case design phase. At this stage, the organization usually continues to request information due to its unfamiliarity with the new framework, and the associated organization often uses evangelism sessions to address existing doubts.

### **4) Defining User Journey**

The educational organization defines its scenario and the necessary steps to execute it. This involves selecting one of the previously shared educational use cases (Blueprint) and writing a series of user journeys that define specific business requirements. Additionally, the educational entity must write specific test cases with expected outcomes to verify in the future (after integration) that the requirements have been met.

### **5) Selecting Solution**

The educational organization selects the decentralized identity provider with which it wants to conduct its pilot. There are no business restrictions when choosing the desired provider, as long as it complies with the project requirements (following the EBSI framework). It is important to note, that the educational organization will not receive any funding to hire the services of a decentralized identity provider. If any consultancy or licensing costs are incurred with the provider, the entity itself must bear these costs.

### **6) Implementing User Journey**

The educational organization implements its use case using the previously selected solution. At this stage, organizations will need support from project associates to execute the project.

### **7) Testing**

The educational organization tests the implemented solution to verify that all previously defined requirements and functionalities are correct. In this step, the acceptance tests defined in step 4 (Defining User Journey) will be used. If any of the tests are unsatisfactory, the process will revert to step 6 to continue implementing the project.

### **8) Piloting**

The educational organization makes its new functionality available in its systems for use by its users (students, teachers, etc.). From this phase, information must be collected to improve processes from both a technical and functional perspective.

### **9) Rejected**

The educational organization refuses to work for the EBSI-VECTOR project.

## 5 Insights

Regarding the objectives defined at the beginning of the project, we are still far from the numbers needed to meet the KPIs, but there is still time to continue working.

The KPI for this task is K4.3 and is defined as follows:

- Achieve **50 educational organizations** registered in the project
- Achieve organizations from **20 different European countries** registered in the project

Currently, the numbers are as follows:

- Educational organizations onboarded in the project: **19**
- Countries from which organizations are registered in the project: **10**

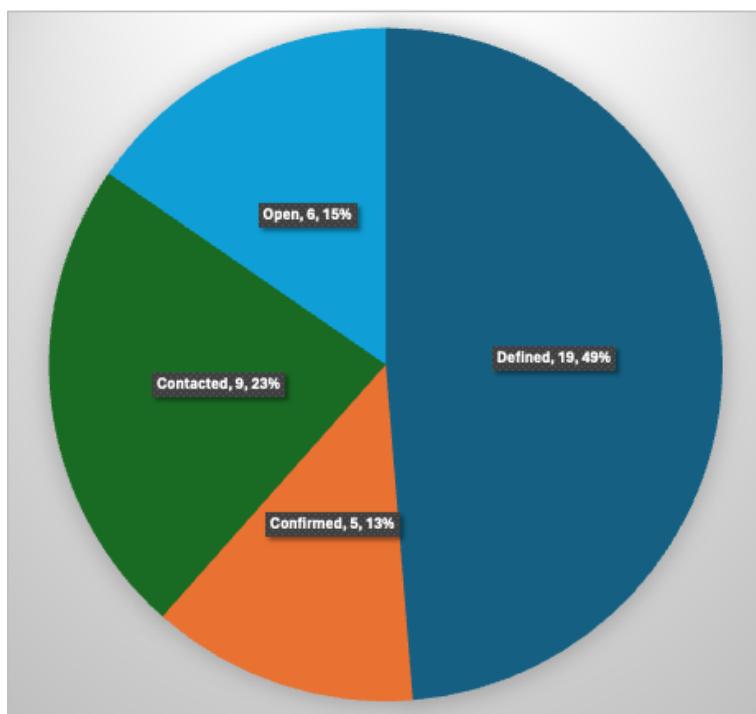


Figure 2 - Status summary of onboarding organizations

Based on the numbers mentioned above and the experiences of speaking with the various organizations that have been contacted, the following are the main reasons why organizations are currently hesitant to join the project:

- **Funding:** The primary reason, stated with complete transparency, is the lack of funding to execute the project. These organizations do not have the resources to carry out a project of this magnitude. While most view technology positively, they do not believe the investment will yield sufficient returns.
- **Knowledge:** In most cases, the educational organizations that have joined the project are those with prior knowledge of the technology, either because they are part of a Large-Scale Pilot (LSP) or because they have previously executed a pilot project. These organizations, using existing knowledge and solutions already deployed, can integrate new functionalities and services easily and with minimal resources and time costs. Most other organizations perceive it as a large-scale project.
- **Environment:** The fact that EBSI is not yet in a production environment, although not the primary reason, does not help organizations decide to join the project. When it is mentioned that they need to integrate solutions with their production systems to work in a pilot (non-production) environment, organizations are not convinced about joining the system, seeing it as a test environment.
- **Speed:** In addition to the reasons described above, the speed of any process in these organizations is very slow. Therefore, making any decision requires a significant amount of time, and each step prolongs the timeline further.

## 6 Scenarios

These are all the scenarios collected to date. In this document, the main data for each of the scenarios will be represented. However, the totality of the data will remain in the documents created for this purpose.

### Consortia

As will be seen in several of the scenarios described below, there are two use cases involving multiple participating entities. One of these is a cross-border use case.

This grouping under university “consortia” or alliances provides the project with the characteristics that this new paradigm aims to address, cross-border use cases and cross-entity processes.

These two alliances are the group of Danish educational organizations and the alliance between cross-border organizations for the Erasmus use case.

### 6.1 University of Maribor

#### 6.1.1 Scenario

The university of Maribor is building a user journey in which the teacher and students have the capability to issue some credentials, and use those credentials to:

- Sign-in into the University platform using his student ID credential
- Issue a credential for accreditation

#### 6.1.2 User Journey

The above scenario includes a series of necessary steps that are a prerequisite for the project to succeed.

These are the steps:

- 1) As a teacher, I want to get a list of students' DIDs
  - a. **Actor:** University of Maribor teacher
  - b. **Action:** Teacher requests students' DIDs for later use. DIDs can be used for issuing some credential to a concrete Student or to check the authentications performed by any user.
  - c. **Pre-Conditions:** None

- d. **Expected Results:** Teacher gets the list of student DIDs
- 2) As a Teacher I want to sign-in into the EduCTX2.0 platform
  - a. **Actor:** University of Maribor teacher
  - b. **Action:** Teacher log-in into the platform
  - c. **Expected Results:** Teacher receives access to the platform
- 3) As a Teacher I want to issue credentials to students
  - a. **Actor:** University of Maribor teacher
  - b. **Action:** Teacher triggers the process to issue a specific credential to a specific user
  - c. **Expected Results:** Student receives the credential sent by the teacher into his wallet
- 4) As a student I want to login using my MetaMask wallet
  - a. **Actor:** University of Maribor student
  - b. **Action:** Student request access to the platform using his user wallet (MetaMask)
  - c. **Expected Results:** Student accesses to the platform
- 5) As a student I want to acquire my DID
  - a. **Actor:** University of Maribor student
  - b. **Action:** Student requests information about his identity (DID)
  - c. **Expected Results:** Student gets his DID
- 6) As a student I want to claim my credentials
  - a. **Actor:** University of Maribor student
  - b. **Action:** Student requests the credentials attached to his profile
  - c. **Expected Results:** Student receives the credentials (claims) into his user wallet
- 7) As a student I want to share my credentials
  - a. **Actor:** University of Maribor student
  - b. **Action:** Student shares with the university his credential (previously issued by the Teacher)
  - c. **Expected Results:** University receives the data sent by the user

### 6.1.3 Required Capabilities

There are no additional requirements.

## 6.2 KU Leuven

### 6.2.1 Scenario

The university KU Leuven is planning to build a scenario in which one of its students goes on a distant mobility project (e.g. Erasmus, or University Alliance, ...).

As part of that distant mobility project, the student visits a new university that has nothing to do with KU Leuven and completes a set of courses. For each completed course, the university must be able to issue a Transcript of Records (TOR) credential to his identity wallet.

Upon returning home (KU Leuven), the student must be able to present the previously obtained credential (TOR) to the university management system so that it automatically imports the data contained in the university's system and in order to validate those courses.

### 6.2.2 User Journey

The above scenario includes a series of necessary steps that are a prerequisite for the project to succeed.

These are the steps:

- 1) As a student I want to receive a Transcript of Records of my complete courses
  - a. **Actor:** KU Leuven University student
  - b. **Action:** Student requests his Transcript of Records to the university to get the information about the courses he has completed previously
  - c. **Pre-Conditions:** Student must have completed some courses
  - d. **Expected Results:** Student receives a transcript of record credential into his user wallet
- 2) As a Student, I want to onboard into a new organization
  - a. **Actor:** KU Leuven University student
  - b. **Action:** Once the student has received the Transcript of Records of the university of origin, he wants to apply for new courses into a new university. To do that, he needs to prove that he comes from another university, and which courses he has completed at the university of origin
  - c. **Pre-Conditions:** Student must have a Transcript of Record credential from the university of origin

- d. **Expected Results:** Student shares successfully his transcript of record and automatically, the new university onboards the new student into its ecosystem.
- 3) As a student, I want to receive a certificate proving a successful completion of courses
  - a. **Actor:** KU Leuven University student
  - b. **Action:** Once the student has finished his studies in the new university, he wants to go back to his university of origin, so he requests a certification to prove he completed the courses. That certification is a Transcript of Records of the courses completed into the new university
  - c. **Pre-Conditions:** Student must complete the courses into the new organization
  - d. **Expected Results:** Student receives a new Transcript of Records issued by the new university with the courses completed by him
- 4) As a student, I want to register my new achievements in my university's academic history
  - a. **Actor:** KU Leuven University student
  - b. **Action:** Student shares the new Transcript of Records credential issued by the external university to the university of origin. Credentials must be received and verified by the university
  - c. **Pre-Conditions:** Student must receive the Transcript of Record credential of the external university
  - d. **Expected Results:** Student register the new achievements stored into the Transcript of Record credential and then Student can check into his academic history

### 6.2.3 Required Capabilities

There are no additional requirements.

## 6.3 Danish Technical University

### 6.3.1 Scenario

The Danish Technical University is implementing a scenario in which a student can request and obtain a digital version of their diploma in the form of a verifiable credential (VC) by using a holder wallet.



### 6.3.2 User Journey

The above scenario includes a series of necessary steps that are a prerequisite for the project to succeed.

These are the steps:

- 1) As a student I want create my DID
  - a. **Actor:** Danish Technical University student
  - b. **Action:** Student opens the holder wallet app for the first time, goes through the “onboarding” process and agrees to the terms and conditions
  - c. **Pre-Conditions:** Student must have the holder wallet app installed
  - d. **Expected Results:** Student has successfully finished the onboarding process and has a DID created
- 2) As a student I want to request my verifiable credential from Danish Technical University
  - a. **Actor:** Danish Technical University student
  - b. **Action:** Student requests a VC with the use of the holder wallet
  - c. **Pre-Conditions:** Student must have the holder wallet app installed and onboarding done (DID created)
  - d. **Expected Results:** Student has successfully requested a verifiable credential
- 3) As a Danish Technical University school administrator, I want to see all requested VCs in the enterprise wallet
  - a. **Actor:** Danish Technical University school administrator
  - b. **Action:** School administrator selects an appropriate menu in the Enterprise wallet and is presented with a list of all requested VCs
  - c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI
  - d. **Expected Results:** The administrator sees a list of all requested VCs
- 4) As a Danish Technical University school administrator, I want to approve/deny a specific request and issue a VC for it in the Enterprise Wallet
  - a. **Actor:** Danish Technical University school administrator
  - b. **Action:** School administrator selects a specific VC from a list of all requested VCs, approves or denies the request. In case of approval the wallet issues the credential

- c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI. The administrator has enough info to be able to decide if the request to issue the VC can be approved or denied.
  - d. **Expected Results:** The request in question is approved and a credential is issued or rejected (in which case no credential is issued)
- 5) As a student I want to receive a VC from Danish Technical University
  - a. **Actor:** Danish Technical University student
  - b. **Action:** Student checks if the requested VC has been approved (needs to refresh the list of credentials if needed) and accepts the issued credential
  - c. **Pre-Conditions:** Student must have had requested a VC from holder Danish Technical University from the holder wallet app.
  - d. **Expected Results:** Student successfully receives the requested verifiable credential
- 6) As a student I want to see details on a verifiable credential I have in my holder wallet
  - a. **Actor:** Danish Technical University student
  - b. **Action:** Student selects a specific VC from the list of all VCs in the Holder wallet
  - c. **Pre-Conditions:** Student already holds at least one verifiable credential in their Holder wallet
  - d. **Expected Results:** Student is presented with the details of a verifiable credential

### 6.3.3 Required Capabilities

There are no additional requirements.

## 6.4 VIA University College

### 6.4.1 Scenario

The VIA University College is implementing a scenario in which a student can request and obtain a digital version of their diploma in the form of a verifiable credential (VC) by using a holder wallet.

## 6.4.2 User Journey

The above scenario includes a series of necessary steps that are a prerequisite for the project to succeed.

These are the steps:

- 1) As a student I want create my DID
  - a. **Actor:** VIA University College student
  - b. **Action:** Student opens the holder wallet app for the first time, goes through the “onboarding” process and agrees to the terms and conditions.
  - c. **Pre-Conditions:** Student must have the holder wallet app installed
  - d. **Expected Results:** Student has successfully finished the onboarding process and has a DID created
- 2) As a student I want to request my verifiable credential from VIA University College
  - a. **Actor:** VIA University College student
  - b. **Action:** Student requests a VC with the use of the holder wallet
  - c. **Pre-Conditions:** Student must have the holder wallet app installed and onboarding completed (DID created).
  - d. **Expected Results:** Student has successfully requested a verifiable credential
- 3) As a VIA University College school administrator, I want to see all requested VCs in the enterprise wallet
  - a. **Actor:** VIA University College school administrator
  - b. **Action:** School administrator selects an appropriate menu in the Enterprise wallet and is presented with a list of all requested VCs
  - c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI
  - d. **Expected Results:** The administrator sees a list of all requested VCs
- 4) As a VIA University College school administrator, I want to approve/deny a specific request and issue a VC for it in the Enterprise Wallet
  - a. **Actor:** VIA University College school administrator
  - b. **Action:** School administrator selects a specific VC from a list of all requested VCs, approves or denies the request. In case of approval the wallet issues the credential.

- c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI. The administrator has enough info to be able to decide if the request to issue the VC can be approved or denied.
  - d. **Expected Results:** The request in question is approved and a credential is issued or rejected (in which case no credential is issued)
- 5) As a student I want to receive a VC from VIA University College
  - a. **Actor:** VIA University College student
  - b. **Action:** Student checks if the requested VC has been approved (needs to refresh the list of credentials if needed) and accepts the issued credential
  - c. **Pre-Conditions:** Student must have requested a VC from holder VIA University College from the holder wallet app.
  - d. **Expected Results:** Student successfully receives the requested verifiable credential
- 6) As a student I want to see details on a verifiable credential I have in my holder wallet
  - a. **Actor:** VIA University College student
  - b. **Action:** Student selects a specific VC from the list of all VCs in the Holder wallet
  - c. **Pre-Conditions:** Student already holds at least one verifiable credential in their Holder wallet
  - d. **Expected Results:** Student is presented with the details of a verifiable credential

### 6.4.3 Required Capabilities

There are no additional requirements.

## 6.5 University College South Denmark

### 6.5.1 Scenario

The University College South Denmark is implementing a scenario in which a student can request and obtain a digital version of their diploma in the form of a verifiable credential (VC) by using a holder wallet.

## 6.5.2 User Journey

The above scenario includes a series of necessary steps that are a prerequisite for the project to succeed.

These are the steps:

- 1) As a student I want create my DID
  - a. **Actor:** University College South Denmark student
  - b. **Action:** Student opens the holder wallet app for the first time, goes through the “onboarding” process and agrees to the terms and conditions.
  - c. **Pre-Conditions:** Student must have the holder wallet app installed
  - d. **Expected Results:** Student has successfully finished the onboarding process and has a DID created
- 2) As a student I want to request my verifiable credential from University College South Denmark
  - a. **Actor:** University College South Denmark student
  - b. **Action:** Student requests a VC with the use of the holder wallet
  - c. **Pre-Conditions:** Student must have the holder wallet app installed and onboarding completed (DID created).
  - d. **Expected Results:** Student has successfully requested a verifiable credential
- 3) As a University College South Denmark school administrator, I want to see all requested VCs in the enterprise wallet
  - a. **Actor:** University College South Denmark school administrator
  - b. **Action:** School administrator selects an appropriate menu in the Enterprise wallet and is presented with a list of all requested VCs
  - c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI
  - d. **Expected Results:** The administrator sees a list of all requested VCs
- 4) As a University College South Denmark school administrator, I want to approve/deny a specific request and issue a VC for it in the Enterprise Wallet
  - a. **Actor:** University College South Denmark school administrator
  - b. **Action:** School administrator selects a specific VC from a list of all requested VCs, approves or denies the request. In case of approval the wallet issues the credential.

- c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI. The administrator has enough info to be able to decide if the request to issue the VC can be approved or denied.
  - d. **Expected Results:** The request in question is approved and a credential is issued or rejected (in which case no credential is issued)
- 5) As a student I want to receive a VC from University College South Denmark
  - a. **Actor:** University College South Denmark student
  - b. **Action:** Student checks if the requested VC has been approved (needs to refresh the list of credentials if needed) and accepts the issued credential
  - c. **Pre-Conditions:** Student must have had requested a VC from holder University College South Denmark from the holder wallet app.
  - d. **Expected Results:** Student successfully receives the requested verifiable credential
- 6) As a student I want to see details on a verifiable credential I have in my holder wallet
  - a. **Actor:** University College South Denmark student
  - b. **Action:** Student selects a specific VC from the list of all VCs in the Holder wallet
  - c. **Pre-Conditions:** Student already holds at least one verifiable credential in their Holder wallet
  - d. **Expected Results:** Student is presented with the details of a verifiable credential

### 6.5.3 Required Capabilities

There are no additional requirements.

## 6.6 UCL University College

### 6.6.1 Scenario

The UCL University College is implementing a scenario in which a student can request and obtain a digital version of their diploma in the form of a verifiable credential (VC) by using a holder wallet.

## 6.6.2 User Journey

The above scenario includes a series of necessary steps that are a prerequisite for the project to succeed.

These are the steps:

- 1) As a student I want create my DID
  - a. **Actor:** UCL University College student
  - b. **Action:** Student opens the holder wallet app for the first time, goes through the “onboarding” process and agrees to the terms and conditions.
  - c. **Pre-Conditions:** Student must have the holder wallet app installed
  - d. **Expected Results:** Student has successfully completed the onboarding process and has a DID created
- 2) As a student I want to request my verifiable credential from University College South Denmark
  - a. **Actor:** UCL University College student
  - b. **Action:** Student requests a VC with the use of the holder wallet
  - c. **Pre-Conditions:** Student must have the holder wallet app installed and onboarding completed (DID created)
  - d. **Expected Results:** Student has successfully requested a verifiable credential
- 3) As a UCL University College school administrator, I want to see all requested VCs in the enterprise wallet
  - a. **Actor:** UCL University College school administrator
  - b. **Action:** School administrator selects an appropriate menu in the Enterprise wallet and is presented with a list of all requested VCs
  - c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI
  - d. **Expected Results:** The administrator sees a list of all requested VCs
- 4) As a UCL University College school administrator, I want to approve/deny a specific request and issue a VC for it in the Enterprise Wallet
  - a. **Actor:** UCL University College school administrator
  - b. **Action:** School administrator selects a specific VC from a list of all requested VCs, approves or denies the request. In case of approval the wallet issues the credential.

- c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI. The administrator has enough info to be able to decide if the request to issue the VC can be approved or denied.
  - d. **Expected Results:** The request in question is approved and a credential is issued or rejected (in which case no credential is issued)
- 5) As a student I want to receive a VC from University College South Denmark
  - a. **Actor:** UCL University College student
  - b. **Action:** Student checks if the requested VC has been approved (needs to refresh the list of credentials if needed) and accepts the issued credential
  - c. **Pre-Conditions:** Student must have the open request of VC from holder UCL University College from the holder wallet app.
  - d. **Expected Results:** Student successfully receives the requested verifiable credential
- 6) As a student I want to see details on a verifiable credential I have in my holder wallet
  - a. **Actor:** UCL University College student
  - b. **Action:** Student selects a specific VC from the list of all VCs in the Holder wallet
  - c. **Pre-Conditions:** Student already holds at least one verifiable credential in their Holder wallet
  - d. **Expected Results:** Student is presented with the details of a verifiable credential

### 6.6.3 Required Capabilities

There are no additional requirements.

## 6.7 University College Copenhagen

### 6.7.1 Scenario

The University College Copenhagen is implementing a scenario in which a student can request and obtain a digital version of their diploma in the form of a verifiable credential (VC) by using a holder wallet.



## 6.7.2 User Journey

The above scenario includes a series of necessary steps that are a prerequisite for the project to succeed.

These are the steps:

- 1) As a student I want create my DID
  - a. **Actor:** University College Copenhagen student
  - b. **Action:** Student opens the holder wallet app for the first time, goes through the “onboarding” process and agrees to the terms and conditions
  - c. **Pre-Conditions:** Student must have the holder wallet app installed
  - d. **Expected Results:** Student has successfully finished the onboarding process and has a DID created
- 2) As a student I want to request my verifiable credential from University College South Denmark
  - a. **Actor:** University College Copenhagen student
  - b. **Action:** Student requests a VC with the use of the holder wallet
  - c. **Pre-Conditions:** Student must have the holder wallet app installed and onboarding done (DID created)
  - d. **Expected Results:** Student has successfully requested a verifiable credential
- 3) As a University College Copenhagen school administrator, I want to see all requested VCs in the enterprise wallet
  - a. **Actor:** University College Copenhagen school administrator
  - b. **Action:** School administrator selects an appropriate menu in the Enterprise wallet and is presented with a list of all requested VCs
  - c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI
  - d. **Expected Results:** The administrator sees a list of all requested VCs
- 4) As a University College Copenhagen school administrator, I want to approve/deny a specific request and issue a VC for it in the Enterprise Wallet
  - a. **Actor:** University College Copenhagen school administrator
  - b. **Action:** School administrator selects a specific VC from a list of all requested VCs, approves or denies the request. In case of approval the wallet issues the credential.

- c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI. The administrator has enough info to be able to decide if the request to issue the VC can be approved or denied.
  - d. **Expected Results:** The request in question is approved and a credential is issued or rejected (in which case no credential is issued)
- 5) As a student I want to receive a VC from University College South Denmark
  - a. **Actor:** University College Copenhagen student
  - b. **Action:** Student checks if the requested VC has been approved (needs to refresh the list of credentials if needed) and accepts the issued credential
  - c. **Pre-Conditions:** Student must have the open request of VC from holder University College Copenhagen from the holder wallet app.
  - d. **Expected Results:** Student successfully receives the requested verifiable credential
- 6) As a student I want to see details on a verifiable credential I have in my holder wallet
  - a. **Actor:** University College Copenhagen student
  - b. **Action:** Student selects a specific VC from the list of all VCs in the Holder wallet
  - c. **Pre-Conditions:** Student already holds at least one verifiable credential in their Holder wallet
  - d. **Expected Results:** Student is presented with the details of a verifiable credential

### 6.7.3 Required Capabilities

There are no additional requirements.

## 6.8 Danish School of Media and Journalism

### 6.8.1 Scenario

The Danish School of Media and Journalism is implementing a scenario in which a student can request and obtain a digital version of their diploma in the form of a verifiable credential (VC) by using a holder wallet.

## 6.8.2 User Journey

The above scenario includes a series of necessary steps that are a prerequisite for the project to succeed.

These are the steps:

- 1) As a student I want create my DID
  - a. **Actor:** Danish School of Media and Journalism student.
  - b. **Action:** Student opens the holder wallet app for the first time, goes through the “onboarding” process and agrees to the terms and conditions
  - c. **Pre-Conditions:** Student must have the holder wallet app installed
  - d. **Expected Results:** Student has successfully finished the onboarding process and has a DID created
- 2) As a student I want to request my verifiable credential from University College South Denmark
  - a. **Actor:** Danish School of Media and Journalism student
  - b. **Action:** Student requests a VC with the use of the holder wallet
  - c. **Pre-Conditions:** Student must have the holder wallet app installed and onboarding done (DID created)
  - d. **Expected Results:** Student has successfully requested a verifiable credential
- 3) As a Danish School of Media and Journalism school administrator, I want to see all requested VCs in the enterprise wallet
  - a. **Actor:** Danish School of Media and Journalism school administrator
  - b. **Action:** School administrator selects an appropriate menu in the Enterprise wallet and is presented with a list of all requested VCs
  - c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI
  - d. **Expected Results:** The administrator sees a list of all requested VCs
- 4) As a Danish School of Media and Journalism school administrator, I want to approve/deny a specific request and issue a VC for it in the Enterprise Wallet
  - a. **Actor:** Danish School of Media and Journalism school administrator
  - b. **Action:** School administrator selects a specific VC from a list of all requested VCs, approves or denies the request. In case of approval the wallet issues the credential.

- c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI. The administrator has enough info to be able to decide if the request to issue the VC can be approved or denied.
  - d. **Expected Results:** The request in question is approved and a credential is issued or rejected (in which case no credential is issued)
- 5) As a student I want to receive a VC from University College South Denmark
  - a. **Actor:** Danish School of Media and Journalism student
  - b. **Action:** Student checks if the requested VC has been approved (needs to refresh the list of credentials if needed) and accepts the issued credential
  - c. **Pre-Conditions:** Student must have the open request of VC from holder Danish School of Media and Journalism from the holder wallet app.
  - d. **Expected Results:** Student successfully receives the requested verifiable credential
- 6) As a student I want to see details on a verifiable credential I have in my holder wallet
  - a. **Actor:** Danish School of Media and Journalism student
  - b. **Action:** Student selects a specific VC from the list of all VCs in the Holder wallet
  - c. **Pre-Conditions:** Student already holds at least one verifiable credential in their Holder wallet
  - d. **Expected Results:** Student is presented with the details of a verifiable credential

### 6.8.3 Required Capabilities

There are no additional requirements.

## 6.9 University College Absalon

### 6.9.1 Scenario

The University College Absalon is implementing a scenario in which a student can request and obtain a digital version of their diploma in the form of a verifiable credential (VC) by using a holder wallet.

## 6.9.2 User Journey

The above scenario includes a series of necessary steps that are a prerequisite for the project to succeed.

These are the steps:

- 1) As a student I want create my DID
  - a. **Actor:** University College Absalon student.
  - b. **Action:** Student opens the holder wallet app for the first time, goes through the “onboarding” process and agrees to the terms and conditions
  - c. **Pre-Conditions:** Student must have the holder wallet app installed
  - d. **Expected Results:** Student has successfully finished the onboarding process and has a DID created
- 2) As a student I want to request my verifiable credential from University College South Denmark
  - a. **Actor:** University College Absalon student
  - b. **Action:** Student requests a VC with the use of the holder wallet
  - c. **Pre-Conditions:** Student must have the holder wallet app installed and onboarding completed (DID created).
  - d. **Expected Results:** Student has successfully requested a verifiable credential
- 3) As a University College Absalon school administrator, I want to see all requested VCs in the enterprise wallet
  - a. **Actor:** University College Absalon school administrator
  - b. **Action:** School administrator selects an appropriate menu in the Enterprise wallet and is presented with a list of all requested VCs
  - c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI
  - d. **Expected Results:** The administrator sees a list of all requested VCs
- 4) As a University College Absalon school administrator, I want to approve/deny a specific request and issue a VC for it in the Enterprise Wallet
  - a. **Actor:** University College Absalon school administrator
  - b. **Action:** School administrator selects a specific VC from a list of all requested VCs, approves or denies the request. In case of approval the wallet issues the credential.

- c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI. The administrator has enough info to be able to decide if the request to issue the VC can be approved or denied.
  - d. **Expected Results:** The request in question is approved and a credential is issued or rejected (in which case no credential is issued)
- 5) As a student I want to receive a VC from University College South Denmark
  - a. **Actor:** University College Absalon student
  - b. **Action:** Student checks if the requested VC has been approved (needs to refresh the list of credentials if needed) and accepts the issued credential
  - c. **Pre-Conditions:** Student must have the open request of VC from holder University College Absalon from the holder wallet app.
  - d. **Expected Results:** Student successfully receives the requested verifiable credential
- 6) As a student I want to see details on a verifiable credential I have in my holder wallet
  - a. **Actor:** University College Absalon student
  - b. **Action:** Student selects a specific VC from the list of all VCs in the Holder wallet
  - c. **Pre-Conditions:** Student already holds at least one verifiable credential in their Holder wallet
  - d. **Expected Results:** Student is presented with the details of a verifiable credential

### 6.9.3 Required Capabilities

There are no additional requirements.

## 6.10 University College of Northern Denmark

### 6.10.1 Scenario

The University College of Northern Denmark is implementing a scenario in which a student can request and obtain a digital version of their diploma in the form of a verifiable credential (VC) by using a holder wallet.

## 6.10.2 User Journey

The above scenario includes a series of necessary steps that are a prerequisite for the project to succeed.

These are the steps:

- 1) As a student I want create my DID
  - a. **Actor:** University College of Northern Denmark student.
  - b. **Action:** Student opens the holder wallet app for the first time, goes through the “onboarding” process and agrees to the terms and conditions.
  - c. **Pre-Conditions:** Student must have the holder wallet app installed
  - d. **Expected Results:** Student has successfully finished the onboarding process and has a DID created
- 2) As a student I want to request my verifiable credential from University College South Denmark
  - a. **Actor:** University College of Northern Denmark student
  - b. **Action:** Student requests a VC with the use of the holder wallet
  - c. **Pre-Conditions:** Student must have the holder wallet app installed and onboarding done (DID created)
  - d. **Expected Results:** Student has successfully requested a verifiable credential
- 3) As a University College of Northern Denmark school administrator, I want to see all requested VCs in the enterprise wallet
  - a. **Actor:** University College of Northern Denmark school administrator
  - b. **Action:** School administrator selects an appropriate menu in the Enterprise wallet and is presented with a list of all requested VCs
  - c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI
  - d. **Expected Results:** The administrator sees a list of all requested VCs
- 4) As a University College of Northern Denmark school administrator, I want to approve/deny a specific request and issue a VC for it in the Enterprise Wallet
  - a. **Actor:** University College of Northern Denmark school administrator
  - b. **Action:** School administrator selects a specific VC from a list of all requested VCs, approves or denies the request. In case of approval the wallet issues the credential.

- c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI. The administrator has enough info to be able to decide if the request to issue the VC can be approved or denied.
  - d. **Expected Results:** The request in question is approved and a credential is issued or rejected (in which case no credential is issued)
- 5) As a student I want to receive a VC from University College South Denmark
  - a. **Actor:** University College of Northern Denmark student
  - b. **Action:** Student checks if the requested VC has been approved (needs to refresh the list of credentials if needed) and accepts the issued credential
  - c. **Pre-Conditions:** Student must have the open request of VC from holder University College of Northern Denmark from the holder wallet app.
  - d. **Expected Results:** Student successfully receives the requested verifiable credential
- 6) As a student I want to see details on a verifiable credential I have in my holder wallet
  - a. **Actor:** University College of Northern Denmark student
  - b. **Action:** Student selects a specific VC from the list of all VCs in the Holder wallet
  - c. **Pre-Conditions:** Student already holds at least one verifiable credential in their Holder wallet
  - d. **Expected Results:** Student is presented with the details of a verifiable credential

### 6.10.3 Required Capabilities

There are no additional requirements.

## 6.11 University of Copenhagen

### 6.11.1 Scenario

The University of Copenhagen is implementing a scenario in which a student can request and obtain a digital version of their diploma in the form of a verifiable credential (VC) by using a holder wallet.



### 6.11.2 User Journey

The above scenario includes a series of necessary steps that are a prerequisite for the project to succeed.

These are the steps:

- 1) As a student I want create my DID
  - a. **Actor:** University of Copenhagen student.
  - b. **Action:** Student opens the holder wallet app for the first time, goes through the “onboarding” process and agrees to the terms and conditions
  - c. **Pre-Conditions:** Student must have the holder wallet app installed
  - d. **Expected Results:** Student has successfully finished the onboarding process and has a DID created
- 2) As a student I want to request my verifiable credential from University College South Denmark
  - a. **Actor:** University of Copenhagen student
  - b. **Action:** Student requests a VC with the use of the holder wallet
  - c. **Pre-Conditions:** Student must have the holder wallet app installed and onboarding completed (DID created).
  - d. **Expected Results:** Student has successfully requested a verifiable credential
- 3) As a University of Copenhagen school administrator, I want to see all requested VCs in the enterprise wallet
  - a. **Actor:** University of Copenhagen school administrator
  - b. **Action:** School administrator selects an appropriate menu in the Enterprise wallet and is presented with a list of all requested VCs
  - c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI
  - d. **Expected Results:** The administrator sees a list of all requested VCs
- 4) As a University of Copenhagen school administrator, I want to approve/deny a specific request and issue a VC for it in the Enterprise Wallet
  - a. **Actor:** University of Copenhagen school administrator
  - b. **Action:** School administrator selects a specific VC from a list of all requested VCs, approves or denies the request. In case of approval the wallet issues the credential.

- c. **Pre-Conditions:** The administrator has a user account in the Enterprise wallet and the school itself is onboarded to EBSI. The administrator has enough info to be able to decide if the request to issue the VC can be approved or denied.
  - d. **Expected Results:** The request in question is approved and a credential is issued or rejected (in which case no credential is issued)
- 5) As a student I want to receive a VC from University College South Denmark
- a. **Actor:** University of Copenhagen student
  - b. **Action:** Student checks if the requested VC has been approved (needs to refresh the list of credentials if needed) and accepts the issued credential
  - c. **Pre-Conditions:** Student must have the open request of VC from holder University of Copenhagen from the holder wallet app.
  - d. **Expected Results:** Student successfully receives the requested verifiable credential
- 6) As a student I want to see details on a verifiable credential I have in my holder wallet
- a. **Actor:** University of Copenhagen student
  - b. **Action:** Student selects a specific VC from the list of all VCs in the Holder wallet
  - c. **Pre-Conditions:** Student already holds at least one verifiable credential in their Holder wallet
  - d. **Expected Results:** Student is presented with the details of a verifiable credential

### 6.11.3 Required Capabilities

There are no additional requirements.

## 6.12 Technical University of Berlin

TU Berlin has defined two possible scenarios that are interesting for them. The first scenario focuses on a typical study enrollment and its related verifications, and second scenario focuses on obtaining a language certification credential. See details below.

### 6.12.1 Scenario 1: Academic Credential Verification for students

Eva, a Spanish citizen, engages in a series of educational experiences across Europe and uses EBSI to facilitate the verification and recognition of her academic credentials.

#### 6.12.2 User Journey

##### Obtaining Verifiable-ID Credential:

- **Action:** Eva visits the Royal Spanish Mint website to obtain a Verifiable-ID credential
- **Mechanism:** The Royal Spanish Mint, acting as a trusted issuer, uses EBSI to issue a Verifiable-ID credential linked to Eva's digital identity (*did:key*)
- **Outcome:** Eva receives a Verifiable-ID credential stored in her EBSI-compliant digital wallet

##### Bachelor's degree Verification:

- **Action:** Eva requests her Bachelor degree credential from the University of Rovira y Virgili
- **Mechanism:** The university issues a Verifiable Credential (VC) for Eva's degree, anchoring it on the EBSI blockchain and associating it with her *did:key* identifier
- **Outcome:** The Verifiable Credential has been added to Eva's digital wallet and is ready for future verifications

##### Master's Degree Enrollment:

- **Action:** Eva applies for a master's program at KU Leuven University
- **Mechanism:** KU Leuven verifies Eva's Bachelor's credentials through the EBSI blockchain, ensuring their authenticity and integrity
- **Outcome:** Eva's enrollment is confirmed, and KU Leuven issues a new Verifiable Credential for her master's program enrollment

##### Erasmus Program Participation:

- **Action:** Eva participates in an Erasmus exchange program at the University of Bologna for six months
- **Mechanism:** The University of Bologna issues Verifiable Credentials for the courses Eva completes during her exchange period, linked to her *did:key* identifier
- **Outcome:** These credentials are added to Eva's digital wallet

##### Course Accreditation:

- **Action:** Eva returns to KU Leuven and needs her courses from the University of Bologna accredited.
- **Mechanism:** KU Leuven uses EBSI to verify the Verifiable Credentials issued by the University of Bologna, ensuring they meet the required academic standards.
- **Outcome:** KU Leuven accredits the courses and issues a Verifiable Presentation (VP) to Eva, confirming the recognition of her completed courses.

#### **Diploma Issuance:**

- **Action:** Eva requests her Master's diploma from KU Leuven.
- **Mechanism:** KU Leuven issues a Verifiable Credential for her master's degree, anchored on the EBSI blockchain.
- **Outcome:** Eva receives her Master's diploma in her digital wallet, completing her academic journey.

### **6.12.3 Required Capabilities**

Issuing, holding, sharing, and verifying verifiable credentials.

### **6.12.4 Scenario 2: Language Certification and Study Abroad for students**

Patrick, a student from Berlin, needs to obtain a language certificate and navigate his educational journey across multiple European institutions using EBSI.

### **6.12.5 User Journey**

#### **Language Certificate Retrieval:**

- **Action:** Patrick enrolls in an e-learning system (e.g., Moodle) to obtain a language certificate required for studying abroad
- **Mechanism:** The e-learning platform, recognized as a trusted issuer by EBSI, issues a Verifiable Credential for Patrick's language proficiency linked to his digital identity (did:key)
- **Outcome:** Patrick stores the language certificate in his EBSI-compatible digital wallet.

#### **Bachelor's Degree Verification:**

- **Action:** Patrick requests verification of his Bachelor's degree from a university in Berlin

- **Mechanism:** The TU Berlin issues a Verifiable Credential for his degree, anchored on the EBSI blockchain, associated with his did:key identifier
- **Outcome:** Patrick's Bachelor's degree credential is added to his digital wallet.

#### **Master's Degree Enrollment:**

- **Action:** Patrick applies for a Master's program at KU Leuven University
- **Mechanism:** KU Leuven verifies Patrick's Bachelor's credentials and language certificate through the EBSI blockchain
- **Outcome:** Patrick's enrollment is confirmed, and KU Leuven issues a new Verifiable Credential for his Master's program enrollment.

#### **Erasmus Program Participation:**

- **Action:** Patrick participates in an Erasmus exchange program at TU Graz
- **Mechanism:** TU Graz issues Verifiable Credentials for the courses Patrick completes during his exchange period, linked to his *did:key* identifier
- **Outcome:** These credentials are added to Patrick's digital wallet.

#### **Course Accreditation:**

- **Action:** Patrick returns to KU Leuven and needs his courses from TU Graz accredited
- **Mechanism:** KU Leuven uses EBSI to verify the Verifiable Credentials issued by TU Graz
- **Outcome:** KU Leuven accredits the courses and issues a Verifiable Presentation to Patrick, confirming the recognition of his completed courses.

#### **Diploma Issuance:**

- **Action:** Patrick requests his Master's diploma from KU Leuven
- **Mechanism:** KU Leuven issues a Verifiable Credential for his Master's degree, anchored on the EBSI blockchain.
- **Outcome:** Patrick receives his Master's diploma in his digital wallet, completing his academic journey.

## **6.12.6 Required Capabilities**

Issuing, holding, sharing, and verifying verifiable credentials.

## 6.13 Universidade Lusofona

### 6.13.1 Scenario

The university Lusofona is planning to build a scenario in which one of its students goes on a mobility project (e.g. Erasmus, or University Alliance, ...).

As part of that mobility project the student visits a university that has nothing to do with University Lusofona and completes a set of courses. For each completed course, the completing university must be able to issue a Transcript of Records (TOR) credential to your identity wallet.

Upon returning home (University Lusofona), the student must be able to present the previously obtained credential (TOR) to their management system so that it automatically imports the data contained in the university's system and those courses are validated.

### 6.13.2 User Journey

The above scenario includes a series of necessary steps that are a prerequisite for the project to succeed.

These are the steps:

- 1) As a student I want to receive a Transcript of Records of my complete courses
  - a. **Actor:** Lusofona University student
  - b. **Action:** Student requests his Transcript of Records to the university to get the information about the courses he has completed previously
  - c. **Pre-Conditions:** Student must complete some courses
  - d. **Expected Results:** Student receives a transcript of record credential into his user wallet.
- 2) As a Student, I want to onboard into a new organization
  - a. **Actor:** Lusofona University student
  - b. **Action:** Once the student has received the Transcript of Records of the university of origin, he wants to apply for new courses into a new university. To do that, he needs to prove that he comes from another university, and the courses he has completed at the university of origin.
  - c. **Pre-Conditions:** Student must have a Transcript of Record credential from the university of origin

- d. **Expected Results:** Student shares successfully his transcript of record and automatically, the new university onboards the new student into its ecosystem.
- 3) As a student, I want to receive the certificate that proves I completed some courses into the new university
- a. **Actor:** Lusofona University student
  - b. **Action:** Once the student has finished his studies in the new university, he wants to go back to his university of origin, so he requests a certification to prove he completed the courses. That certification is a Transcript of Records of the courses completed into the new university
  - c. **Pre-Conditions:** Student must complete the courses into the new organization
  - d. **Expected Results:** Student receives a new Transcript of Records issued by the new university with the courses completed by him.
- 4) As a student, I want to register my new achievements in my university's academic history
- a. **Actor:** Lusofona University student
  - b. **Action:** Student shares the new Transcript of Records credential issued by the external university to the university of origin. Credentials must be received and verified by the university
  - c. **Pre-Conditions:** Student must receive the Transcript of Record credential of the external university
  - d. **Expected Results:** Student register the new achievements stored into the Transcript of Record credential and then Student can check into his academic history.

### 6.13.3 Required Capabilities

There are no additional requirements.

## 6.14 University of the Aegean

### 6.14.1 Scenario

The University of the Aegean is planning to build a scenario in which one of its students goes on a mobility project (e.g. Erasmus, or University Alliance, ...).

As part of that mobility project the student visits a university with which his former university has no connection whatsoever and completes a set of courses. For each completed course, the

completing university must be able to issue a Transcript of Records (TOR) credential to your identity wallet.

Upon returning home (University of the Aegean) the student must be able to present the previously obtained credential (TOR) to their management system so that it automatically imports the data contained in the university's system and those courses are validated.

### 6.14.2 User Journey

The above scenario includes a series of necessary steps that are a prerequisite for the project to succeed.

These are the steps:

- 1) As a student I want to receive a Transcript of Records of my complete courses
  - a. **Actor:** University of the Aegean student
  - b. **Action:** Student requests his Transcript of Records to the university to get the information about the courses he has completed previously
  - c. **Pre-Conditions:** Student must complete some courses
  - d. **Expected Results:** Student receives a transcript of record credential into his user wallet.
- 2) As a Student, I want to onboard into a new organization
  - a. **Actor:** University of the Aegean student
  - b. **Action:** Once the student has received the Transcript of Records of the university of origin, he wants to apply for new courses into a new university. To do that, he needs to prove that he comes from another university, and the courses he has completed at the university of origin.
  - c. **Pre-Conditions:** Student must have a Transcript of Record credential from the university of origin
  - d. **Expected Results:** Student shares successfully his transcript of record and automatically, the new university onboards the new student into its ecosystem.
- 3) As a student, I want to receive the certificate that proves I completed some courses into the new university
  - a. **Actor:** University of the Aegean student
  - b. **Action:** Once the student has finished his studies in the new university, he wants to go back to his university of origin, so he requests a certification to prove he



- completed the courses. That certification is a Transcript of Records of the courses completed into the new university
- c. **Pre-Conditions:** Student must complete the courses into the new organization
  - d. **Expected Results:** Student receives a new Transcript of Records issued by the new university with the courses completed by him.
- 4) As a student, I want to register my new achievements in my university's academic history
- a. **Actor:** University of the Aegean student
  - b. **Action:** Student shares the new Transcript of Records credential issued by the external university to the university of origin. Credentials must be received and verified by the university
  - c. **Pre-Conditions:** Student must receive the Transcript of Record credential of the external university
  - d. **Expected Results:** Student register the new achievements stored into the Transcript of Record credential and then Student can check into his academic history.

### 6.14.3 Required Capabilities

There are no additional requirements.

## 6.15 University of Paris 8

### 6.15.1 Scenario

The University of Paris 8 is planning to build a scenario in which one of its students goes on a mobility project (e.g. Erasmus, or University Alliance, ...).

As part of that mobility project the student visits a university with which his former university has no connection whatsoever and completes a set of courses. For each completed course, the completing university must be able to issue a Transcript of Records (TOR) credential to your identity wallet.

Upon returning home (University of Paris 8) the student must be able to present the previously obtained credential (TOR) to their management system so that it automatically imports the data contained in the university's system and those courses are validated.

## 6.15.2 User Journey

The above scenario includes a series of necessary steps that are a prerequisite for the project to succeed.

These are the steps:

- 1) As a student I want to receive a Transcript of Records of my complete courses
  - a. **Actor:** University of Paris 8 student
  - b. **Action:** Student requests his Transcript of Records to the university to get the information about the courses he has completed previously
  - c. **Pre-Conditions:** Student must complete some courses
  - d. **Expected Results:** Student receives a transcript of record credential into his user wallet.
- 2) As a Student, I want to onboard into a new organization
  - a. **Actor:** University of Paris 8 student
  - b. **Action:** Once the student has received the Transcript of Records of the university of origin, he wants to apply for new courses into a new university. To do that, he needs to prove that he comes from another university, and the courses he has completed at the university of origin.
  - c. **Pre-Conditions:** Student must have a Transcript of Record credential from the university of origin
  - d. **Expected Results:** Student shares successfully his transcript of record and automatically, the new university onboards the new student into its ecosystem.
- 3) As a student, I want to receive the certificate that proves I completed some courses into the new university
  - a. **Actor:** University of Paris 8 student
  - b. **Action:** Once the student has finished his studies in the new university, he wants to go back to his university of origin, so he requests a certification to prove he completed the courses. That certification is a Transcript of Records of the courses completed into the new university
  - c. **Pre-Conditions:** Student must complete the courses into the new organization
  - d. **Expected Results:** Student receives a new Transcript of Records issued by the new university with the courses completed by him.
- 4) As a student, I want to register my new achievements in my university's academic history

- a. **Actor:** University of Paris 8 student
- b. **Action:** Student shares the new Transcript of Records credential issued by the external university to the university of origin. Credentials must be received and verified by the university
- c. **Pre-Conditions:** Student must receive the Transcript of Record credential of the external university
- d. **Expected Results:** Student register the new achievements stored into the Transcript of Record credential and then Student can check into his academic history.

### 6.15.3 Required Capabilities

There are no additional requirements.

## 6.16 Università di Bologna

### 6.16.1 Scenario

The Università di Bologna is planning to build a scenario in which one of its students goes on a mobility project (e.g. Erasmus, or University Alliance, ...).

As part of that mobility project the student visits a university that has nothing to do with Università di Bologna and completes a set of courses. For each completed course, the completing university must be able to issue a Transcript of Records (TOR) credential to your identity wallet.

Upon returning home (Università di Bologna) the student must be able to present the previously obtained credential (TOR) to their management system so that it automatically imports the data contained in the university's system and those courses are validated.

### 6.16.2 User Journey

The above scenario includes a series of necessary steps that are a prerequisite for the project to succeed.

These are the steps:

- 1) As a student I want to receive a Transcript of Records of my complete courses
  - a. **Actor:** University of Bologna student

- b. **Action:** Student requests his Transcript of Records to the university to get the information about the courses he has completed previously
    - c. **Pre-Conditions:** Student must complete some courses
    - d. **Expected Results:** Student receives a transcript of record credential into his user wallet.
  - 2) As a Student, I want to onboard into a new organization
    - a. **Actor:** University of Bologna student
    - b. **Action:** Once the student has received the Transcript of Records of the university of origin, he wants to apply for new courses into a new university. To do that, he needs to prove that he comes from another university, and the courses he has completed at the university of origin.
    - c. **Pre-Conditions:** Student must have a Transcript of Record credential from the university of origin
    - d. **Expected Results:** Student shares successfully his transcript of record and automatically, the new university onboards the new student into its ecosystem.
  - 3) As a student, I want to receive the certificate that proves I completed some courses into the new university
    - a. **Actor:** University of Bologna student
    - b. **Action:** Once the student has finished his studies in the new university, he wants to go back to his university of origin, so he requests a certification to prove he completed the courses. That certification is a Transcript of Records of the courses completed into the new university
    - c. **Pre-Conditions:** Student must complete the courses into the new organization
    - d. **Expected Results:** Student receives a new Transcript of Records issued by the new university with the courses completed by him.
  - 4) As a student, I want to register my new achievements in my university's academic history
    - a. **Actor:** University of Bologna student
    - b. **Action:** Student shares the new Transcript of Records credential issued by the external university to the university of origin. Credentials must be received and verified by the university
    - c. **Pre-Conditions:** Student must receive the Transcript of Record credential of the external university

- d. **Expected Results:** Student register the new achievements stored into the Transcript of Record credential and then Student can check into his academic history.

### 6.16.3 Required Capabilities

There are no additional requirements.

## 6.17 Kozminski University

### 6.17.1 Scenario

Kozminski University as a private entity has an ability to be more flexible, therefore they will support professional qualifications (micro-credentials) user journey as well as verification of credentials (diplomas) in enrollment to second grade studies.

### 6.17.2 User Journey

- 1) As a student, I want to enroll in the course
  - a. **Actor:** Kozminski University student
  - b. **Action:** Students must log in to the university website and select their desired course for enrollment. By following the necessary steps and clicking the appropriate buttons, they will be added to the list of participants
  - c. **Pre-Conditions:** Student needs to set up wallet. There must be a course prepared, which allows students to enroll
  - d. **Expected Results:** Student is assigned to a course.
- 2) As a Teacher I want to issue credentials to students
  - a. **Actor:** Kozminski University teacher
  - b. **Action:** After passing the course, the teacher can select students and issue them micro-credentials, that proves their achievement
  - c. **Pre-Conditions:** Student needs to enroll into course
  - d. **Expected Results:** Students get credentials.
- 3) As a student, I want to present my credential
  - a. **Actor:** Kozminski University student
  - b. **Action:** After graduating in Bachelor degree, I can present my Diploma verifiable credential and it will be accepted at university

- c. **Pre-Conditions:** Student needs a Diploma VC
- d. **Expected Results:** Student's diploma validity is proven, and student is accepted.

### 6.17.3 Required Capabilities

No additional capabilities required

## 6.18 OPI [National Information Processing Institute]

### 6.18.1 Scenario

In Poland, all diplomas are issued by the Ministry of Higher Education. Therefore, an intermediary entity such as OPI must exist between all universities in Poland and the Ministry. OPI is closely involved with all digital processes in education and is capable of providing a service that allows individuals to claim all the diplomas they have earned throughout their lifetime.

### 6.18.2 User Journey

- 1) As a student, I want to receive a credential of diploma, I earned.
  - a. **Actor:** Any university student
  - b. **Action:** After graduating university, I can download verifiable credential of Diploma. I have to login on OPI site, and select credential I am interested in.
  - c. **Pre-Conditions:** Student needs a holder wallet
  - d. **Expected Results:** Student gets his diploma in verifiable credential format.
- 2) As an Administrative entity I want to revoke a credential.
  - a. **Actor:** Someone in charge of diploma cancellation
  - b. **Action:** The person in charge of academic diplomas due to an incident decides to revoke the diploma issued to a specific student
  - c. **Pre-Conditions:** Student has an issued diploma
  - d. **Expected Results:** Student's diploma becomes revoked.

### 6.18.3 Required Capabilities

Capability of Revocation.

## 6.19 Dennis Gabor University

### 6.19.1 Scenario

The Dennis Gabor University (Hungary) wants to build a scenario to provide e-degrees to the students to allow them to use it when they are trying to become an employee. The mechanism is thought for any of the following use cases:

- Companies screening prospective employees
- Companies monitoring existing employees
- Headhunting / employment agencies checking the data of applicants to the partner company

In addition, the university planned some services to avoid problems related to the loss of the e-degree for any of the reasons (loss, theft or destruction).

### 6.19.2 User Journey

The above scenario includes a series of necessary steps that are a prerequisite for the project to succeed.

These are the steps:

- 1) As a student I want to receive my e-degree
  - a. **Actor:** Dennis Gabor University student
  - b. **Action:** Student requests his e-degree after completion of his studies. The student is performing this action through the Student Study Management System
  - c. **Pre-Conditions:** Student must finish his studies
  - d. **Expected Results:** Student receives an e-degree into his user wallet.
- 2) As a Student, I want my e-degree to be verified by an external agent
  - a. **Actor:** Dennis Gabor University student
  - b. **Action:** Once the student has received his e-degree, he wants to apply for some work offers and to do that he needs to verify he has the required certifications (degree). So, he wants to share the e-degree with third parties
  - c. **Pre-Conditions:** Student must have the e-degree
  - d. **Expected Results:** Student shares successfully his e-degree, so it is verified by the third party. Third party receives the e-degree information, and it can validate it.
- 3) As a student, I want to re-receive my e-degree

- a. **Actor:** Dennis Gabor University student
- b. **Action:** Student requests for a second (or more) time the issuance of an e-degree because he has previously lost it
- c. **Pre-Conditions:** Student must finish his studies
- d. **Expected Results:** Student receives an e-degree into his user wallet.

### 6.19.3 Required Capabilities

There are no additional requirements.

## 6.20 GovPart

### 6.20.1 Scenario

GovPart is acting as an entity on behalf of the Ministry of schools in Germany / North Rhine-Westphalia and some example schools / students.

As the North Rhine-Westphalian Education Act does not currently provide for the issuing of digital certificates, these are “digital copies of certificates” and are purely for testing purposes.

As a result, GovPart, together with sample schools and the corresponding school software in the regions, will be exploring the possibility of issuing digital copies of upper secondary school certificates for school pupils.

### 6.20.2 User Journey

The above scenario includes a series of necessary steps that are a prerequisite for the project to succeed.

These are the steps:

- 1) As a student I want to receive my upper secondary school certification
  - a. **Actor:** Student from any secondary school in the region of North Rhine-Westphalia.
  - b. **Action:** Student requests his upper secondary school certification after completion of his studies.
  - c. **Pre-Conditions:** Student must finish his studies
  - d. **Expected Results:** Student receives an “upper secondary school certification” verifiable credential into his user wallet.



### 6.20.3 Required Capabilities

The upper secondary school certification verifiable credential must be specified and published in the EBSI-trusted schema registry.



## 7 Conclusions

The most evident conclusion of this report is that technology based on the Decentralized Identity paradigm is gaining adoption and interest. One of the most important steps, and the reason why most disruptive technologies eventually get discarded, is adoption. No matter how good a technology is or how excellent the results it can achieve through its use, if the end users do not adopt it, that technology will ultimately disappear. Although Digital Identity has been a paradigm in development since the 1980s, the Decentralized Identity paradigm has been continuously worked on since 2017, as evidenced by the creation of EBSI in 2018. Since then, technology has only gained importance and improved to what we have today: a system ready for production (albeit with a few gaps to be filled).

This does not mean that the work is finished, but rather that the first steps have been completed, and now critical steps must be executed successfully for the technology to have the desired impact in the European region. The focus of this task has been on adoption, specifically within the educational sector, due to its innovative nature and because it is one of the sectors where the impact of technology can be seen first and most easily on a global scale. Its cross-border and cross-industry processes make it an ideal candidate to begin with the main objective: adoption.

Currently, the objective is approximately at its midpoint, and in the coming months, we hope to achieve the required milestones to promote and drive the technology across much of the European region. Additionally, we aim to pilot as many use cases and scenarios as possible to refine the technology before its widespread adoption.

However, not all the news is positive. The greatest drawback identified in this task is the question of its necessity. While the Decentralized Identity paradigm significantly improves most processes by making them more efficient and less costly, as well as considerably enhancing user privacy, these processes are currently resolved in a less efficient but secure manner. The uncertainty associated with change has been a significant obstacle in generating greater interest.

In addition to the lack of urgency, there are other uncertainties that have caused reluctance in onboarding new entities:

- **Lack of a stable standard:** Currently, although the regulation has been approved by the European Parliament, the Council, and the European Commission and is in effect today, the technical framework will be delivered during the second half of 2024. Therefore, there is high uncertainty about the protocols, data structures, processes, etc. This uncertainty is so significant that many updates to the specifications have been necessary in recent months to gain approval from all member states, and many more are expected. Naturally, this uncertainty deters most stakeholders from adopting the technology because they believe it will result in a loss of time and resources. Most of these organizations are waiting for the specification to stabilize, and many others are waiting to be mandated to include it in their systems.
- **Lack of a stable production environment:** Additionally, the EBSI environment is still in a PILOT stage, not yet in production. Under these circumstances, organizations prefer not to take risks or lose resources until this environment transitions to a productive state where they can integrate their systems. Although there are advancements in the EBSI network through either European EDIC or EBSI-NE consortium, there is no clear date for going into production, which again hampers the adoption of the solution. Given the situation, organizations have shifted from integrating SSI solutions into their productive systems for real use cases to conducting real pilots with small working groups to minimize associated risks.

If we add to this that the improvements offered by technology are already being covered by other mechanisms today, we find entities reluctant to change.

However, we have found entities that, despite the limitations mentioned above, are betting on the technology and making efforts in this direction to obtain these improvements before anyone else, positioning themselves in a market that, in a few months, will be required to offer this technology to its citizens. Therefore, if the perspective is medium to long term, this is undoubtedly seen as an opportunity.

Among the interested organizations, the most common use case is the issuance of an academic credential for subsequent use by a third party, whether for student synergy or the relationship between the private sector and the educational sector.

In almost all cases, the issues can be applied regardless of the specific use case. Therefore, it is suggested to "fix" the two main problems with the technology: Specifications and the production environment - to find organizations more proactive in facing the risks of adopting new technology. We understand this will happen in the coming months, so soon, all possible educational organizations that agree to pilot the ecosystem will be engaged and with an imminent move to production in sight.