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Glossary

Exploring a new topical area:
Higher Education Interoperability

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The European Digital Education Hub (EDEH) is an online community for practitioners from all sectors of education and training aiming to contribute to improving digital education in Europe. To achieve this goal, EDEH is not only a place for exchange and discussions but also offers a variety of different events and activities. These activities included a dedicated workgroup and a series of squads on higher education interoperability. This document is part of the results of these specific EDEH activities.

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Introduction

This glossary defines concepts and terms used in the Higher Education Interoperability project of the European Digital Education Hub (EDEH). Concepts used in existing frameworks that are relied on, such as, for instance, the European Interoperability Framework are not duplicated in this glossary. This document has two sections, one containing all technical terms in either the education or the architectural sector that need to be explained. The second one contains all abbreviations used in reference to these or other terms.

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Technical terms

Accessibility

Products must be designed and produced in such a way as to maximise their foreseeable use by persons with disabilities and shall be accompanied where possible in or on the product by accessible information on their functioning and on their accessibility features. This concept is part of the overarching principles of the project.

Account

A digital identifier linked to a user, allowing access to systems, resources, or services. Each account is uniquely associated with a person or role.

Affiliation

The relationship between a person and an institution (e.g., student, faculty, or staff), which often determines access permissions.

Agreement

An agreement is a formal understanding between two or more parties, such as educational institutions, governments, or businesses. Examples include:

- Academic mobility agreements: Facilitate the exchange of students and staff between universities (e.g., Erasmus+ programmes).
- Double degree agreements: Allow students to earn degrees from two different institutions.
- Interoperability agreements: Formal arrangements between entities to ensure data and service exchange according to common standards.

Alliances (EUAs)

European Alliances in Higher Education are collaborative networks of universities across Europe that work together to promote academic excellence, enhance mobility, and address shared challenges. These alliances aim to create a more integrated and competitive European Higher Education Area (EHEA) by fostering innovation, inclusivity, and cooperation among institutions.

Archimate

ArchiMate is a standardised **modeling language** developed by **The Open Group**. It is used to describe, analyse, and visualise enterprise architectures in a consistent and structured way. ArchiMate models different layers, such as **business, application, and technology**, and the relationships between them, enabling better alignment between business processes and IT systems.

Assurance

The level of confidence in a user's identity, determined by the strength of the verification process (e.g., single-factor or multi-factor authentication).

Attributes (binded to an identity)

Specific pieces of information about a user, such as name, role, or department, used to identify and authorise them within a system.

Authentication (Vs Digital Identity, Identifier)

Authentication refers to the process of verifying the identity of a user or system entity. In software development, authentication mechanisms are used to ensure that users or systems are who they claim to be before granting access to resources or performing certain actions. Authentication can be achieved through various means such as passwords, biometric verification, two-factor authentication (2FA), or cryptographic keys. The primary goal of authentication is to establish trust in the identity of the entity attempting to access the system. Authentication is the process of verifying the identity of an entity, while digital identity represents the collection of attributes and credentials that uniquely identify the entity in the digital realm.

Building block

Building blocks are foundational units of functionality within an organisation's architecture. They encapsulate specific business requirements and are categorised into types such as actors, business services, applications, or data entities. Each building block has a well-defined boundary and is recognisable as a distinct entity. They often interact with other building blocks, necessitating clear and stable interfaces for interoperability. Building blocks may be composed of another building blocks and may be a part of another building block.

A good building block evolves over time to leverage emerging technologies and standards. It should ideally be reusable, replaceable, and well-specified, with its boundary loosely coupled to its implementation. Building blocks can be defined at various levels of detail, ranging from simple descriptions to comprehensive specifications. (opengroup, n.d.)

Campus Management System

Campus Management Systems are generally web-based IT systems for mapping all processes of the student life cycle and university administration. The systems combine functions from everyday university life with the individual requirements of all university stakeholders - for example from student, course and

examination administration. This ensures an optimal flow of communication between all those involved. Campus management systems store and process personal, event, infrastructure and performance-related data. Universities use the CMS to organise people, functions, organisations, buildings and rooms, courses and examinations. The administration of curricula and the range of courses on offer is also part of the CMS, and some systems can also be used to organise student applications and admissions. Students can manage courses and examinations via their account in the CMS. As a rule, e-mail accounts, learning platforms, the library's user service and many other applications are also available in the portal. Users can also find information on studying, teaching and examinations in the CMS. The campus management system is also used in research and teaching. All functions and processes that contribute to the functioning of an academic organisation are mapped. This includes, for example, research documentation or publications. (Zick, 2020)

Catalogue

A Catalogue is a structured and systematic collection of information about services, data, tools, or resources.

Claim

Statements about a user, such as name or email, used to verify identity and authorise access. Claims are often verified against trusted sources.

Claim issuing service

Given a set of learning achievements and records, a service that generates a certificate with a set of claims. Relies on an identity provider to attach information of the subject obtaining the certificate.

Claim storage service

A system that stores a copy of the issued certificates and a register of their status. Can be used to check the status of a previously issued certificate.

Content Management System

A Content Management System (CMS) is a system application that enables users to create, edit, collaborate on, publish and store digital content. A CMS consists of two components: a content management application (CMA) and a content delivery application (CDA). The CMA is a graphical user interface that allows users to design, create, modify and delete website content without any knowledge of HTML. The CDA component provides the backend services that support the management and delivery of content after it has been created by a user in the CMA. (Churchville, 2021)

Controlled Vocabularies

Controlled vocabularies are clearly defined lists of names and concepts that ensure proper understanding when used for labelling, indexing or categorising. Therefore, controlled vocabularies allow the representation of fundamental features of a concept in a fashion neutral way. (Beaufays, 2021)

Credentials management system

System in charge of issuing and archiving credentials. Relies on the student information system to collect information of the student achievements and grades.

Credentials storage solution

System to store and manage the certificates issued to the user. Is owned by the subject receiving a credential.

Curriculum Management System

A Curriculum Management System (CMS) is a software application that is designed to assist educational institutions in the more effective management and delivery of their academic curricula. It's a comprehensive tool that enables schools, colleges and universities to organise, manage and track their curriculum activities, including curriculum development, lesson planning, content creation and assessment. The CMS provides a user-friendly interface for designing and managing course materials for teachers and trainers. Students can access educational resources and interact with peers and teachers through online platforms. With the CMS, educators can streamline their teaching methods and create a collaborative learning environment for their students. (EdTech.events | Education Technology Conferences and Fairs, n.d.)

Data quality

The accuracy, completeness, and reliability of identity data, which impacts the effectiveness and trustworthiness of identity management.

Defined vocabulary

An agreed-upon set of terms and definitions within an identity management system, ensuring consistent communication and understanding across systems and institutions.

Digital identity (Vs Authentication, Identifier)

Digital identity encompasses the entirety of an entity's online persona, comprising attributes, credentials, and characteristics that uniquely identify them in the digital realm. It serves as the digital representation of

an individual, organisation, or system within various online environments. This collection of information may include personal details, such as name, address, and date of birth, as well as credentials like usernames, passwords, and digital certificates.

Double/multiple degrees

Separate degrees awarded by higher education institutions offering the joint programme attesting the successful completion of this programme (if two degrees are awarded by two institutions, this is a 'double degree'). (Eqar, n.d.)

EIF (European Interoperability Framework)

The European Interoperability Framework (EIF) is a set of guidelines adopted by the European Union to promote interoperability among digital systems and services of public administrations. It ensures that public sector systems can exchange data and cooperate effectively across borders and sectors. EIF is structured around principles, levels of interoperability (legal, organisational, semantic, and technical), and recommendations for implementing interoperable digital public services.

Entitlement

The specific rights or privileges granted to a user, often determined by their role or affiliation, such as access to resources or services.

Erasmus Without Papers

The Erasmus Without Paper (EWP) initiative paves the way for a more efficient management of mobility by enabling higher education institutions to exchange information on the mobility of their students in a fast and secure way. EWP does this through an online exchange network connecting HEIs involved in Erasmus exchanges. Institutions using the network can exchange student data more securely and efficiently than traditional paper-based methods. (erasmus-plus.ec.europa.eu, n.d.)

Higher Education Institution

Refers to an organisation that provides education and academic degrees beyond the secondary school level. These institutions include universities, colleges, and other entities that offer post-secondary education. Higher education typically includes undergraduate and graduate programmes, leading to various degrees such as bachelor's, master's, and doctorate degrees.

Identifier (Vs Authentication, Digital Identity)

Identifiers are unique labels or tokens assigned to entities within a software system to distinguish them from one another and enable their identification and referencing. These identifiers serve as the foundation for organising and managing data within the system, providing a means to uniquely identify and retrieve specific entities. In the context of digital identity and authentication, identifiers play a crucial role in representing users, resources, objects, or entities participating in online interactions. Identifiers are a part of digital identity and are often used in authentication processes.

Identity provider

An identity provider, sometimes abbreviated as IdP, is a system for creating, maintaining, and managing identity information for holders, while providing authentication services to relying party applications within a federation or distributed network (W3, 2024)

Interoperability challenge

Interoperability challenges refer to difficulties encountered when different systems, devices, or components need to work together smoothly and effectively. Interoperability is the ability of various systems or components to exchange and interpret data or perform functions in a coordinated manner, even if they are developed by different High Education Institutions or operate on different platforms.

Joint Degree

With a Joint Degree, the student receives a joint degree certificate from both universities. A Joint Degree is a programme of the cooperating universities with joint study regulations. (Double und Joint Degree Programme, n.d.) (Eqar, n.d.)

Joint Programme

An integrated curriculum coordinated and offered jointly by different higher education institutions, leading to double/multiple degrees or a joint degree. (Eqar, n.d.)

Learner

In the context of Higher Education Institutions (HEIs), a learner refers to an individual who is enrolled in a higher education programme. These learners pursue various degrees, such as bachelor's, master's, or doctoral degrees, and engage in academic studies, research, and skill development.

Learning journey

Chronicles the interactions of a life-long learner (formal, informal, non-formal learning) with educational providers from orientation to enrolment to graduation to continuous learning. In an interoperable system, it ensures the seamless flow of data, tools, and content across various platforms and services used throughout their academic journey.

Learning Management System

A Learning Management System (LMS) is software that helps you create, manage, organise and deliver online learning materials for learners. Learners can be school pupils, vocational students, university students or employees of any type of organisation. In other words, anyone interested in lifelong learning and accessing learning materials via a device, mainly the internet. (Fry, 2022)

Learning Opportunity

A learning opportunity refers to a situation, event, or experience that provides individuals with the chance to acquire new knowledge, skills, or insights. It is a broad term that encompasses various formal and informal activities designed to enhance one's understanding or capabilities in a particular area. This concept may refer to different models like courses, micro-credentials, formative paths...

Legal Compliance

Adherence to laws, regulations, guidelines and specifications relevant to its business processes. This concept is part of the overarching principles of the project.

Level of Assurance

Level of Assurance (LOA) refers to the degree of confidence in the identity of an entity, whether an individual, organisation, or system, based on the authentication process used. It reflects the robustness of the identity verification and authentication mechanisms in place, ranging from basic checks to rigorous procedures.

Medium

The method or channel used for communication or verification in identity management, such as a digital platform, mobile app, or paper-based verification.

Micro-credential

Micro-credentials certify the learning outcomes of short learning experiences, such as a short course or training. They provide a flexible and targeted way of helping people to develop the knowledge, skills and competences that they need for their personal and professional development. (education.ec.europa.eu, n.d.)

Natural person

An individual human being, as opposed to a legal entity, who is the subject of identity and access management processes.

Open Programme

An Open Programme is a flexible academic programme that allows students to customizese their education by selecting courses or modules from different areas of study. Open programmes are often designed to promote lifelong learning and open education, offering students access to content through flexible formats, often using digital platforms and open resources.

Organisational Interoperability

It describes the various forms of interoperability scenarios such as mobility, joint degrees.

Permission

An authorisation that grants a user access to a specific resource or action based on their role or attributes.

Privacy

In the EU, human dignity is recognised as an absolute fundamental right. In this notion of dignity, privacy or the right to a private life, to be autonomous, in control of information about yourself, to be let alone, plays a pivotal role. Privacy is not only an individual right but also a social value. This concept is part of the overarching principles of the project.

Profile

A collection of information related to a specific user that helps to identify them and determine access rights within a system.

Proofs

Evidence or documentation used to verify a user's identity, such as ID verification or credentials.

Rights

Authorised actions or access levels granted to a user, often defined by policies or agreements within the institution.

Role

A defined function or position that a user holds within an institution, such as ‘student’ or ‘staff,’ which determines access levels and permissions.

Seamlessness

Interoperability should allow users to move from one system to another with as little friction as possible - users should not need to enter data multiple times or require multiple approvals to take actions. This concept is part of the overarching principles of the project.

Student information system (SIS)

A SIS, or Student Information System, is a software platform used by educational institutions to manage and track all aspects of student information and school administration. SIS systems are designed to streamline the administrative processes involved in education and provide a centralised, comprehensive database for all student-related information. Manages student data, including grades and records of the student needed to issue a claim about the achievements obtained.

Sustainability (ESG)

Framework or criteria to measure the sustainability and ethical impact of an investment or a company focusing on 3 fields: Environmental, Social and Corporate Governance. This concept is part of the overarching principles of the project.

The European Universities alliances

The European strategy for universities includes the European Universities partnerships as one of its main projects. By mid-2024, the effort hopes to have grown to 60 European University partnerships with over 500 higher education institutions involved. (European Comission, n.d.)

Trust framework

A set of standards, policies, and agreements that establish trust between institutions, enabling secure and consistent identity management across organisations.

Uniform Resource Identifier

URI stands for Uniform Resource Identifier. It is a string of characters that uniquely identifies a particular resource. Resources can be anything that has identity on the internet, such as documents, images, downloadable files, services, and more. URIs are used to locate and retrieve these resources.

Use Case

Actions that outline how different actors (like learners, educators, or support staff) interact with an educational domain. For example, a use case might detail how an educator assigns coursework and how learners submit it.

User Story

In the context of higher education software, a user story might describe a functionality like: “As a [educator], I want to [easily access learner grades] so that I can [provide timely feedback].” It’s a concise narrative focused on value to a specific role (learner, educator, etc.) within the education system.

Glossary of abbreviations

CMS: Content Management System, Curriculum Management System and Campus Management System

EWP: Erasmus Without Paper

HEI: High Education Institution

IdP: Identity Provider

LO/LOP: Learning Opportunity

LOA: Level Of Assurance

LRS: Learning Records System

LMS: Learning Management System

MC: Micro-credential

SIS: Student Information System.

URI: Uniform Resource Identifier

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