Why use a visual language?

To give students more flexibility within and beyond their institutions, products, systems, and organisations need to work together and exchange information seamlessly—this is interoperability. It's a complex concept that can be hard to explain with words alone. That's where visual language comes in.

Visual language helps us explore ways to improve the learner journey. It enables us to analyse processes, discuss them together, and find interoperable solutions. Let's use this tool to strengthen educational interoperability!

COLOFON

Design: Dirma Janse
Content: Team Educational Innovation at SURF, powered by Npuls

The Creative Commons Attribution-ShareAlike 4.0 license applies to this publication. When using this work, please cite the following reference: Bakker, N., Janse, D., Renders, E.A., (2024) Educational interoperability. Utrecht: Npuls.

More info: *interopvisual.eu*

September 2024

For questions/information
interoperability@surf.nl

Who is it for

This visual language is for anyone working on educational digitalisation projects. Whether you're a business analyst, architect, policy advisor, or functional application manager, it helps you conduct in-depth analyses and guide discussions on key decisions. Use it to clarify challenges, visualise processes, and explore solutions.

What's next?

We're constantly developing new tools to help you understand and apply interoperability. Stay updated on the latest developments by visiting our website, interopvisual.eu, or sign up for our newsletter at *interoperability@surf.nl*.

Policy & Legislation

Legislation is produced and implemented on different scopes:

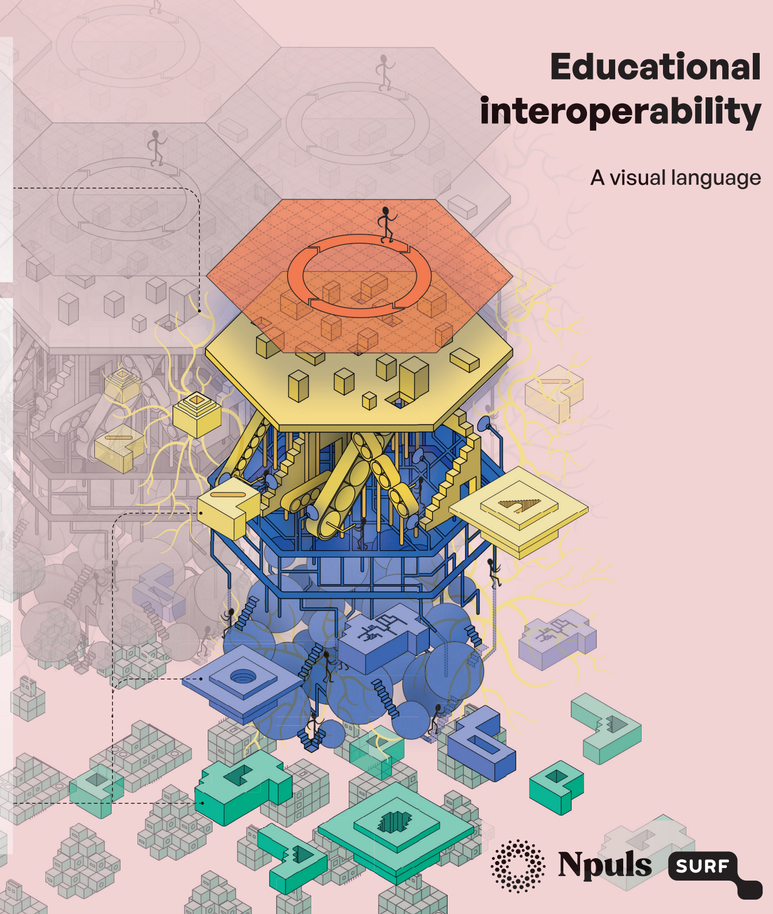
- Local
- National
- International

Example:
GDPR is European legislation that has a global impact. It is translated into national legislation and fuels the local privacy policy of an institution.

Standards

A standard is an agreement on information or a process, which can have various perspectives for consistent digitalisation and data exchange:

- **Semantic standards**: defining terms like 'diploma' or 'teacher'.
- **Personal identifiers**: linking data related to individuals correctly, such as using national ID numbers, education numbers, or ECK-ID.
- **Metadata standards**: enabling data to be placed in the right context.
- **Standards for websites or apps**, such as
  - *Accessibility standards*
  - *Security standards*
  - *Domain names on the internet* to identify the actual owner of a website.
- **Standard processes**, such as:
  - Conducting a *privacy impact assessment* when making decisions about the collection and use of personal data.
  - The *process of data classification* to select an appropriate security standard.
- **Technical standards**, such as IPv6 for network communication.



Educational interoperability

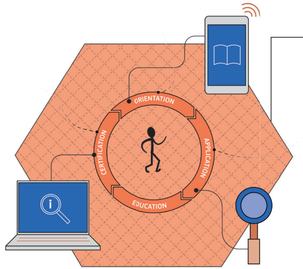
A visual language

Npuls SURF

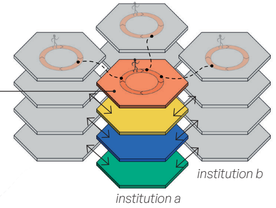
The learner journey

top view

The learner journey is at the centre of our approach. To facilitate this journey, an educational ecosystem of institutions, services, providers, etcetera must work together seamlessly.



*The learner journey consists of **4 phases**.*



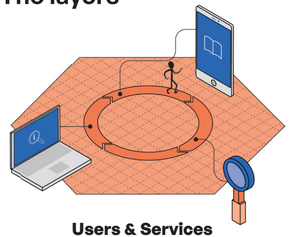
Data traffic occurs at:

- *Local level: for example, between educational departments.*
- *National level: for example, between institutions.*
- *European level: for example, between a Dutch institution and European institutions.*

What is interoperability?

Interoperability enables different systems, organizations, and processes to collaborate, exchange data, and understand information. Interoperability is a prerequisite for collaboration, while maintaining autonomy.

The layers

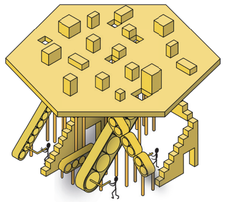


Users & Services

Our approach is platform-based. The top layer outlines the objectives of the users. Learner, teacher and staff want their needs to be fulfilled.

Examples:

- *The learner wants an education path that fits/ satisfies their needs.*
- *The teacher can create courses that fit the learner's need and meet desired educational outcomes.*



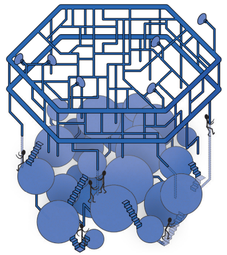
Organisation & Processes

Next, the 'business' layer focuses on designing and managing the education operations to meet the goals set in the top layer. This can include things like curriculum development, exam organisation, or scheduling.

Examples:

- *The program director designs a program in collaboration with the teachers' team.*
- *The CIO, in collaboration with educational experts and IT teams, oversees the procurement and configuration of the most suitable LMS.*

3d view

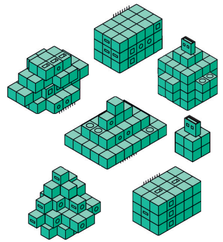


Applications & Information

This layer is about WHAT IT should do.

Examples:

- *Functional application managers find solutions that meet user needs. They define how to execute these within an application, following business processes.*
- *The International Exchange Officer can access student data for current exchanges. This helps them keep information up-to-date to manage and support international programs well.*



Technology

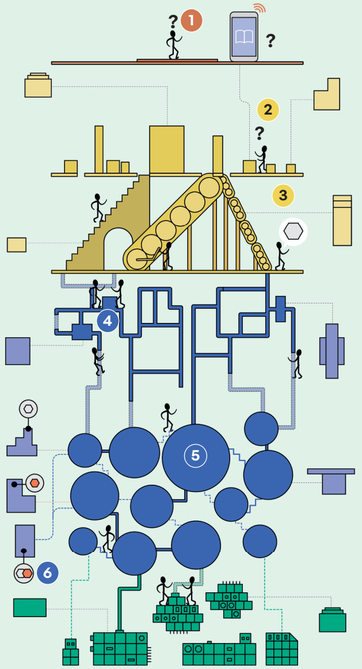
While this layer is about HOW IT is managed. IT staff handle identities, access and databases.

Examples:

- *IT managers and NRENs like SURF ensure secure connections and data exchanges between institutions.*
- *Integration specialists ensure standards for information exchange and storage are agreed upon and implemented (e.g. APIs).*

Use case challenge

side view



1. Learner wants to review courses offered by multiple programs.
2. At the institution's top level, agreements need to be made regarding necessary accreditation, fit in mutual curricula and costing.
3. Educational services liaise with partners to determine which information can be obtained, and what types of applications are in use.
4. Integration architects investigate how the different applications can work together and how information can be obtained through standardised APIs.
5. The system administrator indicates that the information is in the wrong format and therefore cannot be exchanged with other applications.
6. Together, they decide to implement a common data standard for the course information.