qulto
for culture & knowledge

CASE STUDY

Eötvös Loránd University

Developing a teaching materials/ course materials repository

In brief

Customer need:

Previously, learning materials and lecture notes were only accessible within LMS systems, as well as on faculty and departmental servers, which severely limited their reusability.

Solution:

A repository that offers reusable learning materials richly annotated with metadata, in compliance with the FAIR data management principles and the requirements of Open Science.

What was the customer's need that we provided a solution for?

The university's strategic goal was to ensure that the learning materials generated within the institution are as widely accessible as possible and reusable in educational activities. To achieve this, digital learning materials—which are created in many different formats and often kept== in silos or stored in hard-to-access locations (such as LMS platforms, departmental servers, and instructors' personal computers)—must be collected, professionally archived, organized, and made searchable. Fully complying with the principles and recommendations of FAIR data management (Findable, Accessible, Interoperable, Reusable) was also a high priority among the university's strategic objectives.

At the beginning of the planning process, university staff drew inspiration from the MIT and Merlot solutions, gathering ideas from their approaches to formulate the library's specific requirements. The initial goal and vision was to enable data extraction from LMS systems with a single click. However, as further evaluation revealed, this would not have been such a straightforward task due to the lack of metadata associated with the learning materials.

It was at this point that Qulto joined the collaborative thinking process and, by introducing additional professional criteria to support the desired outcome, outlined an alternative solution—proposing the introduction of a new layer (the Instructor Interface) between the LMS systems and the course material repository. Thanks to the university's openness, subsequent planning and development work progressed along the lines of this proposal.

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How does this improve the service?

The course material repository established during the project offers a secure, standardized, and highly searchable central platform for digital learning objects generated at the university, making them directly and easily accessible to all stakeholders. Together with the newly developed Instructor Interface, this system delivers an effective and reliable solution to the university's strategic goals regarding learning material visibility, evaluation, and reusability—all without imposing an unnecessary administrative burden on the faculty.

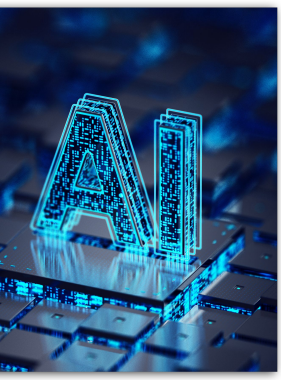
What is the solution?

As a result of the collaboration that began in March 2025, a web application was developed that enables faculty members to quickly and easily annotate learning materials with metadata. The interface is directly integrated with Neptun and the university's LMS platforms (Moodle, Canvas); therefore, a significant portion of the data is populated through automated data transfer, reducing the administrative burden on instructors.

The storage foundation of the system is built on DSpace, which not only offers secure, long-term archiving but also functions as a database compliant with international standards, fully guaranteeing data retrievability and integrity.

Perhaps the most visually striking element of the project is the **Interactive Knowledge Network**, which generates a graph-based data visualization of the knowledge base available in the course material repository along semantic connections. Breaking away from the traditional list view commonly found in repositories, this innovative user interface renders the university's knowledge assets discoverable as a dynamic, transparent network, providing an engaging user experience.

Future development opportunities, plans



At the top of the future development agenda is the integration of capabilities offered by generative artificial intelligence based on Large Language Models (LLMs) into the course material repository.

Furthermore, the knowledge base stored within the repository could serve as an ideal foundation for creating an AI assistant (chatbot) powered by Retrieval-Augmented Generation (RAG) technology. This assistant could effectively support both the students' learning processes and the faculty's course material development efforts.