




# Transmitting ePortfolio Content for (AI) Analysis

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**Abstract:** The world of artificial intelligence (AI) tools is exploding and every day a new tool shows up, but equally, many drop off and are never heard of again. This poses a risk to organisations that want to integrate AI meaningfully into their portfolio work because there could ultimately be a lot of change very rapidly.

Therefore, in this workshop, we want to initiate a discussion what a technical interface may look like between a portfolio platform and systems that can analyse portfolio content such as those powered by AI. The ultimate goal would be to define a standard of a data-space for ePortfolios that could be used by different providers to easily connect their AI platform to their portfolio platform. Please follow the invitation.

**Keywords:** ePortfolio, Analysis, Web, Encoding, Transmission, Standards, Artificial intelligence, Text Analysis, API

## 1 Introduction


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
Therefore, in this workshop, we want to initiate a discussion what a technical interface may look like between a portfolio platform and systems that can analyse portfolio content such as those powered by AI. The ultimate goal would be to define a standard of a data-space for ePortfolios that could be used by different providers to easily connect their AI platform to their portfolio platform.

Thus, we propose that the following questions will be discussed in the workshop session:

- **Purposes:** What purposes are currently known for a portfolio software to interface with another platform to analyse its content?
- **Data:** What data is currently transferred into an analyser tool and what other types of data are envisaged to be transferred in the future?

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- **Structure:** How should the data be structured so it can be meaningfully used in an analyser tool without engaging in a lot of data transformation?
- **Interfaces:** Are there interfaces currently already available that are used to transfer data from a source system into an AI system? What do they look like? What APIs would be needed to establish a secure and privacy preserving connection to the AI tool? What protocol would be preferred?
- **Data privacy and security:** How can the data transfer and data storage be handled transparently so learners and educators can give their informed consent for having the data used but also revoke such consent as needed?
- **Landscape:** What other processes are involved that need to be taken into consideration as part of the workflow, e.g. assessment submission?

We would like to invite developers of portfolio platforms as well as AI tools to join this conversation to bring both sides to the table to start working together in order to support the integration of AI tools that support learning, respect learner and instructor privacy, and thus become suitable educational tools.

We propose to start the conversation before the EPortfolio Evolution Powered by Language Analysis (EPEPLA) workshop to gather information that serves as a basis for the workshop that will take place on 9 September 2024, in a hybrid format, in person in Fulda as well as online. As an appetizer to stimulate responses, here a few initial thoughts and a preliminary reading list.

## 2 Current situation

In the discussion about new analysis methods, the first step should be to examine the possibilities that current portfolio systems already offer for data exchange. However, practice shows that each system handles it differently: While Mahara uses an open format for data exchange (Leap2A, which is based on XML) and few others make sharing simple through sharing a public access link, there are proprietary systems that do not provide any insight into their data export formats or that only offer a PDF export. This leads to the problem that an export from one portfolio platform does not automatically lead to a functional import into an analyser tool.

Even though a couple of standards already exist in the form of Leap2A and the IMS ePortfolio standard, it is necessary to check whether they still meet today's requirements, also against the background of new analysis options offered by artificial intelligence. In addition, it should also be considered whether the creation of an export file, its download, and manual import meet the demands of rapid data exchange between services. Media exports (images, audio, and audio-visuals), PDF, and HTML exports should also be included in the range of considerations.

### **3 Conversation starters**

The following responses to the questions posed above are meant to start the conversation and invite others to contribute their own thoughts. They will form the basis for our discussion during the workshop in September.

#### **3.1 Purposes**

The transmission of portfolios to another system is often made for simple backup and archiving purposes, e.g., to allow authors to keep their data outside of the portfolio platform, or to archive portfolios that were part of an assessment to comply with an institution's assessment data archiving requirements.

In several other cases, the portfolio is sent to obtain another perspective: Through an analysis, one can obtain a visualisation to highlight important aspects and to stimulate writing. Moreover, the analysis can reveal the competencies and knowledge of students. This makes it possible to employ such analysis in exam workflows as a support mechanism for educators or learners. We expect that many other purposes could be offered by AI systems to question, support, enrich, encourage, challenge, or even instill enthusiasm.

#### **3.2 Data**

Currently, the data transferred from ePortfolios into an analyser tool typically includes textual content. It can also encompass multimedia content like images, videos, and audio recordings. It contains metadata, which includes submission dates, author information, tags and categories, as well as license information. Additionally, comments by others who engage with the portfolio should also be considered as they form part of the data.

The inclusion of usage traces may also bring valuable information along: It may reveal information that allows the receiving system to perceive the engagement, the reactions of the network of the portfolios (or its author), the connected learning or implementation activities.

#### **3.3 Structure**

To ensure the data can be meaningfully used in the analyser tool without requiring extensive re-writing, it should be structured in a standardised, interoperable format. One possible approach is to use JSON or XML formats (e.g. Leap2A), which are widely accepted for data interchange and can be easily parsed by various systems. Additionally, employing a standardised metadata schema, such as the education specific Learning Resource Metadata Initiative (LRMI) or the fairly complex Learning Objects Metadata LOM may be relevant.

Segmenting content into separate sections for different types of data, such as text, multimedia, and metadata, may be important. This allows for targeted analysis, more efficient processing of each content type and for addressing individual sections; e.g. by a hyperlink.

### **3.4 Interfaces**

When using an analyser tool, we assume that most transactions should happen automatically once a learner has given their consent rather than needing manual intervention every time the portfolio should be sent to the analyser tool. The content should be transferred automatically instead of requiring an export and an import, for example.

In this area we want to explore which APIs and protocols would be best suited to initiate and conduct a secure transfer as well as allow for the transfer of large files that includes fail saves should the connection be interrupted.

### **3.5 Data privacy and security**

When transferring data from one platform to another, there is a higher risk of that data to be intercepted and thus become exposed. The infrastructure that is put into place needs to consider data privacy and data security from the start to ensure that learners and educators know where their data goes, how much of it, and for what purpose. They should also have the possibility to revoke such access at any point in time. That requires that there are measures in place to support the revocation and deal with the data accordingly, also to be compliant with the legal and information security guidelines by the institution that uses such tools that also includes governmental data regulations in the respective jurisdiction. Questions like data sovereignty also need to be taken into consideration.

Depending on the purpose of the analyser tool, the question of pseudonymisation or anonymisation of data may also come up and how that can be achieved. Should the data already be sent without identifiers from the originating system or be transformed in the resulting tool?

### **3.6 Landscape**

Portfolios are used for many purposes: keeping a reflective log for yourself, submitting a portfolio for assessment purposes, inviting externals to comment on your portfolio as part of work-integrated learning activities, demonstrating skills and competencies, and creating a showcase of achievements, amongst others. These diverse purposes require different workflows and thus may have different requirements for the analyser tools, and some may never be put through to one. Here we sketch a few ideas where analyser tools may be integrated meaningfully to support learners and educators.

- **Assessment submission:** When students submit their portfolio for assessment, it is also transferred to the analyser tool for analysis according to the use case that was identified by the institution.
- **Feedback loop:** An automated feedback mechanism could be employed to provide initial feedback, e.g. based on a rubric or to encourage further reflection.
- **Archiving and retrieval:** Efficient storage solutions and easy retrieval of past portfolios, including based on certain metadata or analyser tool results
- **Data aggregation:** Categorise portfolios across a specified number of students to identify common themes, issues, points for future learning etc.

### **3.7 Educational advantages**

Integrating AI with ePortfolios can enhance student learning by providing personalized, real-time feedback that helps refine their work and develop critical thinking skills. AI tools can prompt deeper reflection, encouraging students to question assumptions and improve their understanding. This supports self-regulated learning, allowing students to track progress, set goals, and make informed improvements.

The current research projects in the area of AI use in ePortfolios indicate that AI tools may provide valuable support in the assessment process. They may offer preliminary analyses, highlight key trends, and flag potential areas where students may need additional support. AI could also uncover patterns in student submissions, helping educators to identify common challenges or misconceptions. By understanding these trends, educators could adjust their instructional strategies to address gaps in knowledge or skills, ultimately enhancing student learning outcomes. This would allow educators to make more informed decisions and tailor their feedback to each student's needs. The results of these research projects will provide insight into the feasibility of integrating AI in portfolio practice.

A data-driven approach can help refine curricula, improve instructional strategies, and ensure that programmes meet educational standards. Furthermore, it can support institutions to demonstrate programme effectiveness and student achievements more clearly.

## **4 Other questions**

There are most likely many other questions that we have not covered with the ones we have posed in the question categories above, e.g.

- How should authorisation be given and revoked? What happens with the content upon revocation?
- How are learners and educators guided through the process of granting and revoking access?

- What ethical considerations should be taken into account when designing systems that exchange portfolio data with AI-powered analysis tools? How can we ensure that these tools do not reduce learners to automated grades, but instead provide meaningful insights while respecting the complexity and individuality of each portfolio?
- Do we need to differentiate between a draft and a final version to the analyser tool?
- How are learners and educators informed about minor and major changes to the analyser tool that may result in them no longer wanting to grant access to their data? How would the data then be extracted, especially if it has already been used in aggregates or been anonymised? What controls do learners and educators have?

## 5 Invitation and future directions

We invite the ePortfolio community to join this conversation and share their experiences, questions, concerns, and ideas to contribute to this discussion to give us as broad a brainstorming basis as possible from which we can then guide the conversation during the workshop. The ideas suggestion should be made:

- on the Fediverse, e.g. here, LinkedIn, or on X/Twitter with tag #EPEPLA
- on the cryptpad document:  
<https://cryptpad.fr/pad/#/2/pad/edit/Kq4SAGUmqiHeEm8-QTCX5xHo/>
- ... on some other means that you will transmit us via email to [libbrecht@md-phw.de](mailto:libbrecht@md-phw.de)

If you have specific examples you'd like to share, please provide as much detail and as many links as possible for context and of course, join the workshop on 9 September 2024.

As part of this workshop, we will explore potential future collaborations between stakeholders aimed at developing a new standard for data exchange in the ePortfolio space. We hope to foster a dialogue that not only addresses immediate technical challenges but also lays the groundwork for a broader initiative. This could lead to the creation of a robust, interoperable framework that supports the seamless integration of AI systems across various portfolio platforms. We encourage all participants to contribute their ideas and expertise to help shape the future of AI-driven portfolio analysis.

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