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# Digital Publications in Culture: Examples and Key Features – Survey Results from the NFDI4Culture Community

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v1.0

Published by: Digital Publications and Data Working Group

Last updated: 2022-11-28

Created: 2022-08-31

Language: English (United States)

Created by: Simon Worthington

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# Report

German translation: *Digitale Publikationen im Kulturbereich: Beispiele und Eigenschaften – Umfrageergebnisse aus der NFDI4Culture Community*

Within the framework of NFDI4Culture, Task Area 4 (TA4), the Digital Publications and Data Working Group is looking into the multiple ways in which initiatives, publishers, researchers, and research projects are digitally enhancing their publications for open scholarship. The aim of the working group is to establish criteria that can function as a guideline for scholars to create publications and their associated research data, with a focus on long-term digital preservation. For this purpose, the working group is comparing and looking at a wide spectrum of publications ranging from conventional academic papers and monographs, to multimodal project outcomes, and enriched databases.

In order to get a full picture of existing enhanced publications in the NFDI4Culture community an online survey was conducted to gather further representative examples, which was its main purpose as opposed to a quantitative survey. The survey was also used to get a better understanding of what the NFDI4Culture community considers to be an enhanced publication and what features they associate with it. Existing literature as well as initial discussions within the working group revealed the challenge to find a consensus on a term to use for this emergent phase of scholarly cultural publishing. As a starting point the term *enhanced publications* (Woutersen-Windhouwer and **Brandsma** 2009) was adopted.

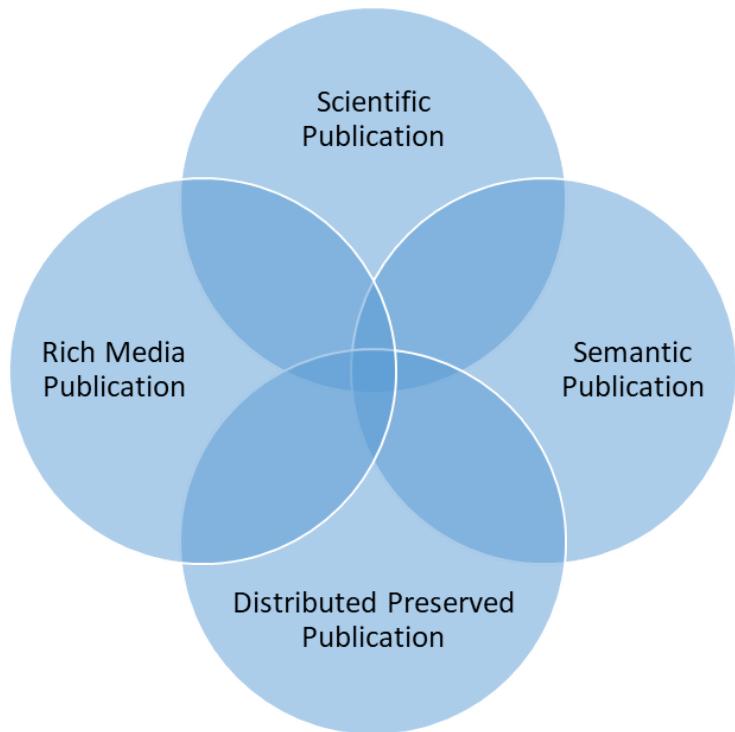
*We define an enhanced publication as a publication that is enhanced with three categories of information: (1) research data (evidence of the research), (2) extra materials (to illustrate or clarify), or (3) post-publication data (commentaries, ranking).*

*Report on Enhanced Publications state-of-the-art, Saskia Woutersen-Windhouwer & Renze Brandsma (UvA), April 2009. (Woutersen-Windhouwer et al. 2009)*

But the survey has shown the variety and contexts which reach far beyond standard research publication or digital collections – as well as being able to plug-into new functioning infrastructures, such as linked

open data – that forces us to look for a different term that can capture this *multimodal-multimedia-multilocal* transformation.

The preliminary literature review (which can be found at the end of the report: '[Literature review reference list](#)') and an email survey among some of our forum participants, however, did reveal commonalities: For example, the majority understands an enhanced publication to be a digital publication, using scientific methods, that consists of different parts, and is openly accessible.



**Figure 1:** Four directions of development of an enhanced publication

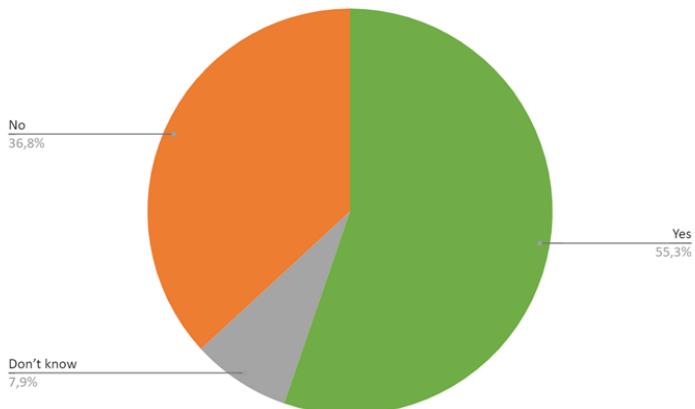
However, different developments also emerged: Either the idea of an enhanced publication went in the direction of *Science Publication*, where research data, thus, support reproducibility; or it went in the direction of *Semantic Publication*, where metadata drive the machine-assisted evaluation and automatic linking of publications; or it went in the direction of *Rich Media Publication*, where interactivity and multimedia promote the understanding of a publication. For the Task Area TA4 'Data Publication and Data Availability' the long-term archiving or the distribution of the components of such a publication at different locations as well as indexing in central catalogues are of course interesting – referred to as *Distributed Preserved Publication* in the above figure.

Based on these findings, the working group created this first survey.

## Results of the Enhanced Publication Survey

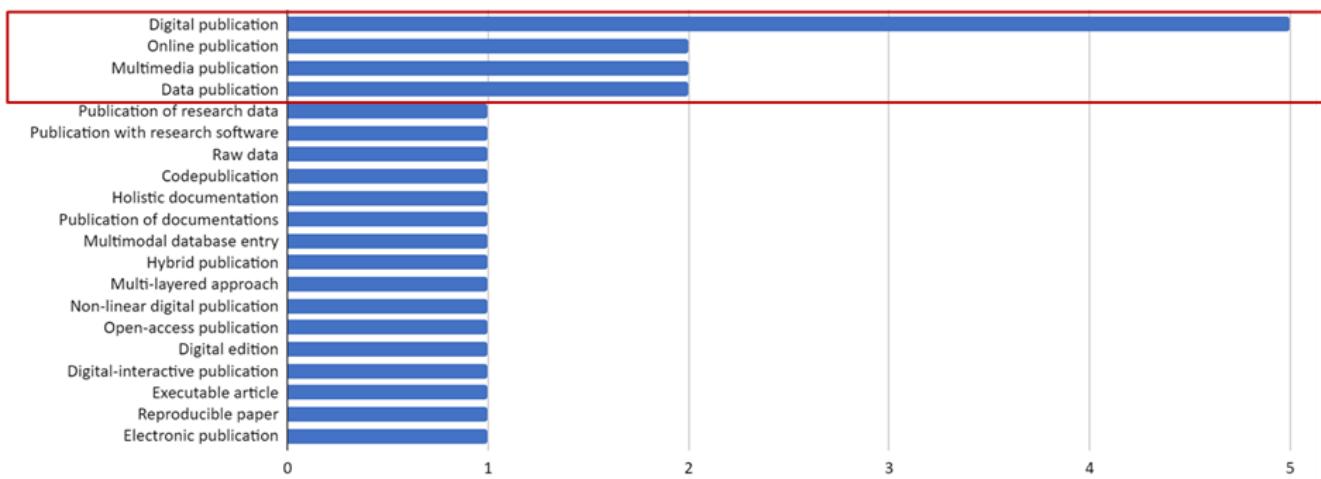
The primary goal of the survey was to get examples of enhanced publications with titles and web addresses from the NFDI4Culture community. The group took the opportunity to ask for terms and characteristics that the community associates with an enhanced publication. This survey was distributed between April and May 2022 via the NFDI4Culture Twitter profile and mailing list. The software used for the survey was LimeSurvey.

Content-wise, a short self-introduction about our working group and previously mentioned survey goals were listed at the beginning. To steer the participants, the group only mentioned that our research focuses on open publications with ‘multimodal presentations’ and ‘enriched historical datasets’, omitting ‘conventional research publications’ of papers and monographs.



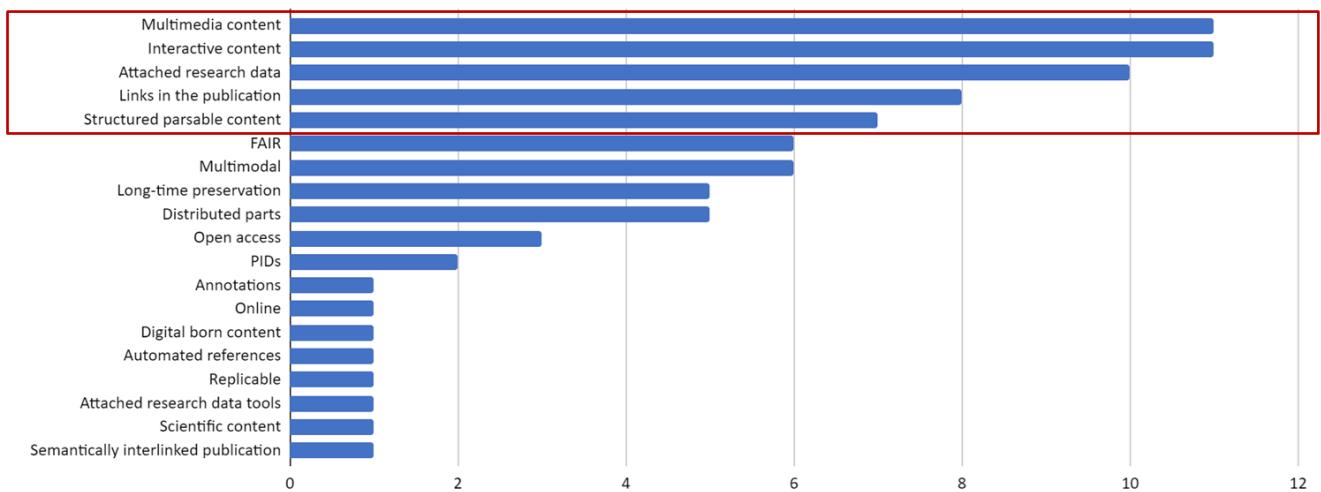
**Figure 2:** Are you familiar with the term Enhanced Publication? (38 answers)

In total, we received 83 submissions. Of these, 25 questionnaires were fully completed. The rest had dropped out of the survey in between. The number of responses is therefore shown in parentheses at the end of each survey question. However, the number decreases over time. Our first question was whether participants were familiar with the term ‘enhanced publication’. Just over half (55%) of the participants said they were familiar with the term.



**Figure 3:** The working group chose the term 'enhanced publication' to describe complex digital publications, but there might be others more commonly used by various community groups. What other terms are you familiar with? (15 answers)

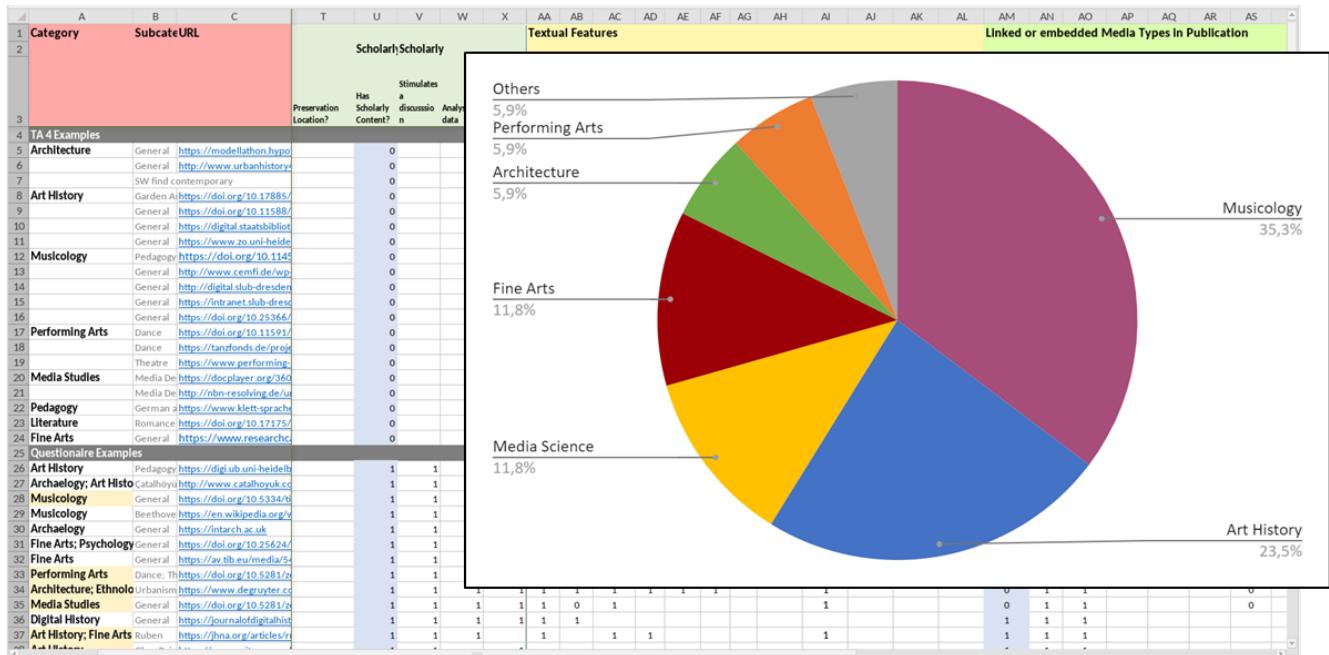
In the 2nd question, the group asked for alternative terms to enhanced publications that describe equally complex, digital releases but are more commonly used in the community. Some participants named several terms. The top 4 include: "Digital publication", "Online publication", "Multimedia publication" and "Data publication".



**Figure 4:** Let us know spontaneously what three terms you associate with an enhanced publication. (25 answers)

In the 3rd question, the participants were asked to spontaneously enter 3 terms that they associate with an enhanced publication. Roughly clustered, the most frequently mentioned 5 were: in 1st and 2nd place (44% each) "multimedia content" and "interactive content", which were almost always mentioned in connection; in 3rd place (40%) "linked

research data", in 4th place (32%) "hyperlinks in the publication" and in 5th place (28%) "structured machine-readable content", although there is room for interpretation of answers here: if a participant stated, for example, "hypertext", did he mean the machine-readability of the content or the interactivity of links within or between several documents?



**Figure 5:** Please provide a title and URL of examples for an enhanced publication you know.  
(13 answers classified by discipline)

In the 4th question the community was asked for examples of enhanced publications with title and URL. Thirteen examples of enhanced publications were given. Most of them came from the field of musicology and art history. The results were collected in a table and are currently being evaluated and clustered according to the criteria determined.

The screenshot shows the homepage of the International Society for Music Information Retrieval (ISMIR). At the top, there are navigation links for Home, About, Contact, Content, and Research Integrity. A search bar and login/register buttons are also at the top. The main header features the text "Transactions of the International Society for Music Information Retrieval" and the acronym "ISMIR". Below the header, there's a banner for a "Special Collection: AI and Musical Creativity". The main content area displays an article titled "Steerable Music Generation which Satisfies Long-Range Dependency Constraints" by authors Paul Bodily and Dan Ventura. The article includes sections for Abstract, Introduction, Generating music with steerable short-range dependencies, Generating music with steerable long-range dependencies, Example compositions with long-range dependencies, Discussion and conclusion, Notes, Competing Interests, and References. There are also share buttons for social media and a download button.

**Figure 6:** Publication from musicology. Bodily, Paul, and Dan Ventura. 'Steerable Music Generation which Satisfies Long-Range Dependency Constraints'. *Transactions of the International Society for Music Information Retrieval* 5, no. 1 (25 March 2022): 71–86. <https://doi.org/10.5334/tismir.97>

The spectrum of examples was very broad. Scientific articles came back, such as about AI-supported musical compositions from the field of musicology, which are reminiscent of publications from the natural sciences (see figure above). This article, for example, is an HTML article with an additional printable PDF. The article has persistent identifiers (DOI and ISSN), even a JATS/XML structuring. In addition, research data is provided in the form of linked Java source code in GitHub even with primary data. The publication is thus composed of partial publications that are published on different platforms, i.e., multilocally. The article itself is also embedded in a very interactive web interface with discussion and annotation functions. Overall, all of the examples provided by the respondents, like this multi-modal and multi-local publication, were open access and open licenced.

This is an old revision of this page, as edited by Michael Bednarek (talk | contribs) at 11:18, 1 May 2022 (Revert to revision 1083263680 dated 2022-04-17 23:53:49 by 24.21.231.142: no Improvement. fix Scherman & Biancolli citation.). The present address (URL) is a permanent link to this revision, which may differ significantly from the current revision.

(diff) ← Previous revision | Latest revision (diff) | Newer revision → (diff)

"Beethoven's Fifth" redirects here. For the movie, see *Beethoven's 5th (film)*. For Beethoven's 5th piano concerto, see *Piano Concerto No. 5 (Beethoven)*.

The **Symphony No. 5** in C minor of Ludwig van Beethoven, Op. 67, was written between 1804 and 1808. It is one of the best-known compositions in classical music and one of the most frequently played symphonies,<sup>[1]</sup> and it is widely considered one of the cornerstones of western music. First performed in Vienna's *Theater an der Wien* in 1808, the work achieved its prodigious reputation soon afterward. E. T. A. Hoffmann described the symphony as "one of the most important works of the time". As is typical of symphonies during the Classical period, Beethoven's Fifth Symphony has four movements.

It begins with a distinctive four-note "short-short-short-long" motif:

**Allegro con brio** (♩ = 108)



The symphony, and the four-note opening motif in particular, are known worldwide, with the motif appearing frequently in popular culture, from *disco versions* to *rock and roll covers*, to uses in film and television.

Like Beethoven's *Heroic* and *Pastoral* (rural), Symphony No. 5 was given an explicit name besides the numbering, though not by Beethoven himself. It became popular under "Schicksals-Sinfonie" (Fate Symphony), and the famous five bar theme was called the "Schicksals-Motiv" (Fate Motif). This name is also used in translations.

**Figure 7:** 'Symphony No. 5 (Beethoven)'. In Wikipedia, 1 May 2022.

[https://en.wikipedia.org/wiki/Symphony\\_No.\\_5\\_\(Beethoven\)](https://en.wikipedia.org/wiki/Symphony_No._5_(Beethoven))

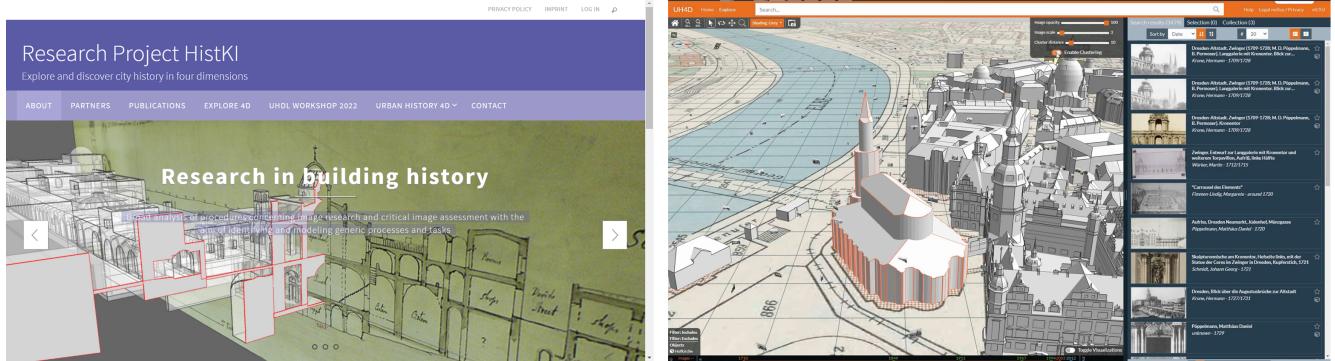
A Wikipedia article on Beethoven's Symphony No. 5 enriched with foreign research data was also included. Wikipedia articles are versioned, but do not have a persistent identifier (PID).

10 The primary discussion of this article considers the evolution of *The Fall of Phaeton* in chronological order, from the original composition through successive revisions. But because technical study begins with close visual examination of the painting's surface, the first approach to a painting necessarily works backward through the artist's process. When studying the painting as it appears today (Stage 3), examination with the naked eye reveals the first evidence of Rubens's thinking: intriguing anomalies in the handling of paint. At the top of the figure group, two Horses are silhouetted against clouds illuminated by golden light (Fig. 9) and look in horror beyond the composition's border toward the unseen Jupiter, who is the source of the abstract wash of light that floods from the upper right. In the spaces between their cloaks is a ruddy color that at first glance could be interpreted as the same warm light. Closer looking, however, reveals brushstrokes of brilliant scarlet and yellow that seem different from the golden light. Other methods of technical investigation go below the surface for further clues to Rubens's earlier revisions (Stage 2) and his original composition (Stage 1).

**Figure 8:** Publication from the field of art history (left) with integrated X-ray tool (right). Source: Gifford, E. Melanie. 'Rubens's Invention and Evolution: Material Evidence in The Fall of Phaeton'. Journal of Historians of Netherlandish Art. Accessed 1 May 2022. <https://jhna.org/articles/rubens-invention-evolution-fall-of-phaeton/>

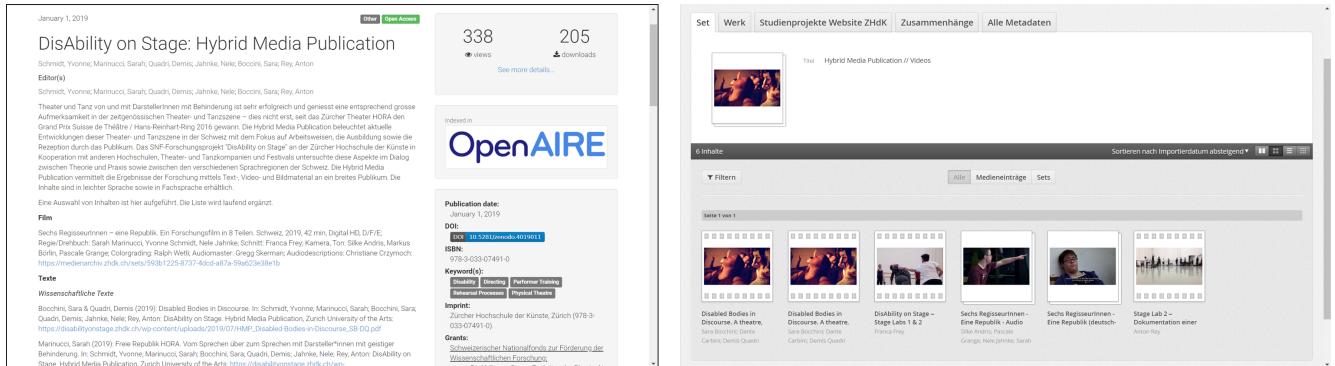
Scientific articles like this one from the field of art history were also listed as examples. This article (see above figure) is about the analysis of a painting by the Flemish artist Peter Paul Rubens. In this publication, an interactive International Image Interoperability Framework (IIIF) painting X-

ray tool was integrated, with which one could view annotated image layers.



**Figure 9:** UrbanHistory4D project website on the left and integrated 3D browser app on the right. Source: Hofmann, Mathias, Sander Münster, and Florian Niebling. 'Research Group Urban History 4D – Explore and Discover City History in Four Dimensions', 2021. <http://www.urbanhistory4d.org/wordpress/>

Likewise, many project websites were named, such as the UrbanHistory4D project with an integrated 3D browser app: the Dresden Altmarkt in 3D with located historical photographs in different time periods.



**Figure 10:** Publication with only a short abstract on the left and links to a picture gallery on the right, among others. Source: Schmidt, Yvonne, Sarah Marinucci, Demis Quadri, Nele Jahnke, Sara Boccini, and Anton Rey. 'DisAbility on Stage: Hybrid Media Publication', 1 January 2019. <https://doi.org/10.5281/zenodo.4019011>

This example "DisAbility on Stage: Hybrid Media Publication" is characterised by the fact that it primarily functions as a kind of landing page. This example provides access to a collection of *multimedia* publications that were published on different platforms, i.e. *multilocally*, and are united here with one persistent identifier (DOI).

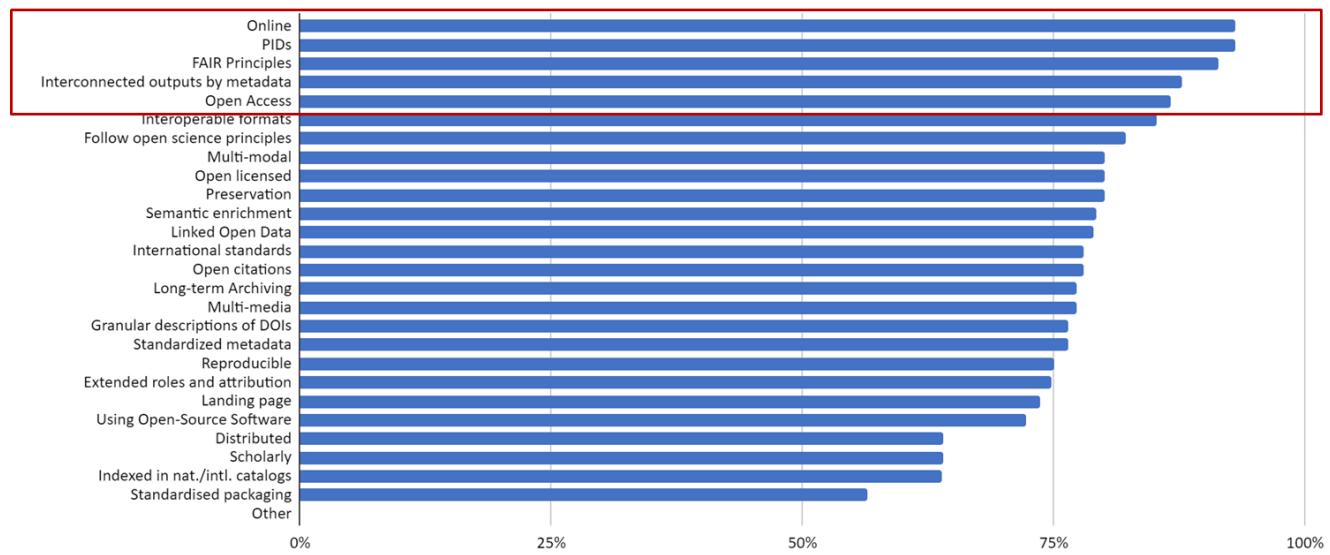
**MoVi** The digital Mozart score Viewer

Work selection EN • DE ?

OVERVIEW • DASHBOARD • MEI CODE

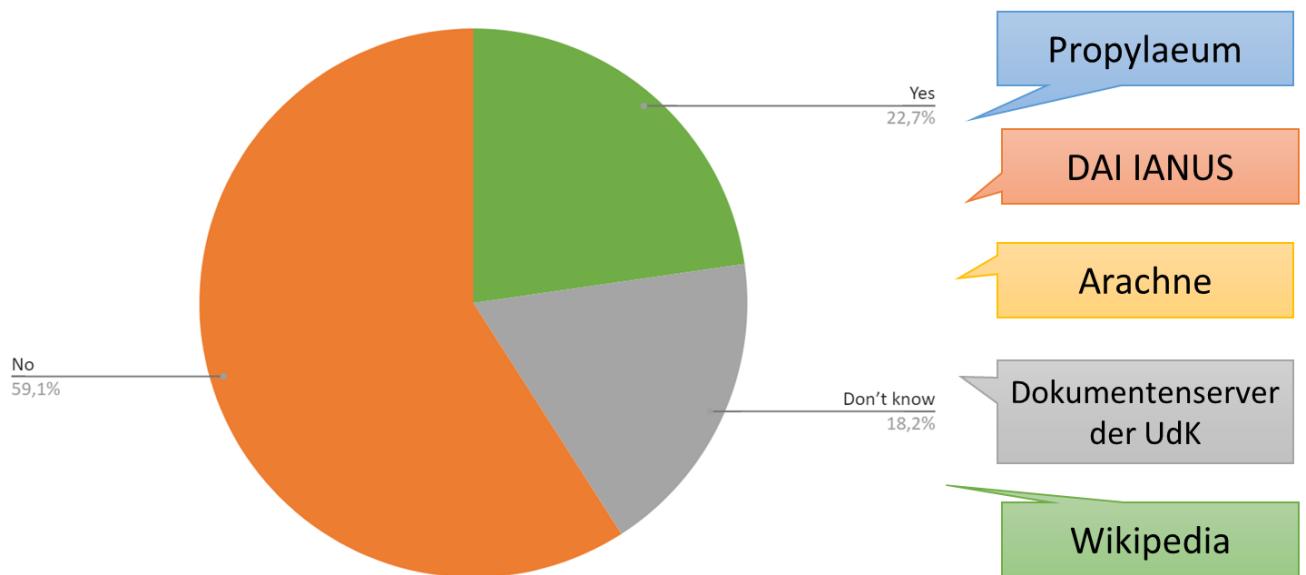
**Figure 11:** Website of the “Digital Mozart Score Viewer” MoVi. Source: <https://dme.mozarteum.at/movi/en>

Project websites with music players of digitised Mozart, Beethoven or jazz works were also indicated. These websites offer interactive sheet music with the addition of Music Encoding Initiative (MEI) code and several audio recordings between which the listener can choose.



**Figure 12:** Which of the following features are characteristic for an enhanced publication? (23 answers, average)

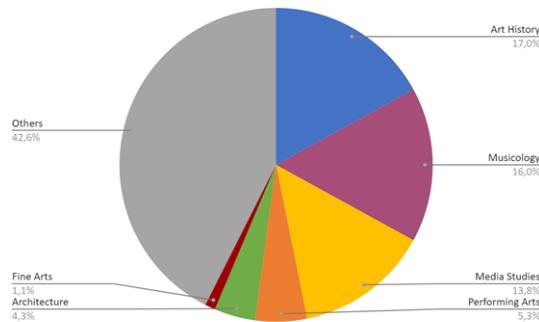
In the 5th question of this survey, the respondents were asked to rate the characteristics from not important to very important. The results are shown here in order of frequency. As the group was more interested in the terms associated with an enhanced publication, no further explanation was given for the characteristics. The 5 most frequently mentioned characteristics are: 1st place: online, 2nd place: persistent identifiers, 3rd place: FAIR principles, 4th place: networked output via metadata, and 5th place: open access.



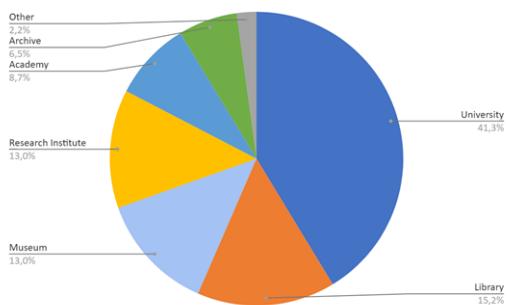
**Figure 13:** Do you know where you can publish an enhanced publication? (22 answers)

The survey also asked about publication possibilities of enhanced publications. Only 5 respondents stated that they know where to publish enhanced publications.

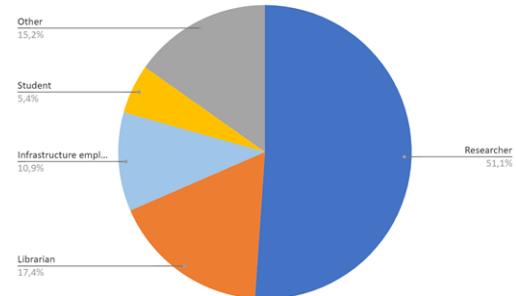
Which **community** do you belong to?



Which type of **institution** do you belong to?



Which role do you have at your **institution**?



**Figure 14:** Personal details: Which community do you belong to? Which type of institution do you belong to? Which role do you have at your institution? (All 23 responses)

At the very end, personal information was also requested. Participants from all NFDI4Culture disciplines were represented. Predominantly from the field of art history, musicology and media studies. The majority of respondents work at a university and are active in research.

## Conclusion and outlook

The team will take forward the results from the survey to produce a *working paper* for further consultation to help clarify the terminology around digital publishing and to provide practical recommendations for improvement, for instance, through the application of processes, adoption of conventions, or use of software platforms. The final goal of the working group is to provide a guideline for the cultural research community at large.

In the survey we saw that more than three-quarters of all submitters do not know where to publish enhanced publications in the NFDI4Culture communities. The NFDI4Culture organisation has already started to respond to such requests by providing an [overview of research data repositories and services for the Culture disciplines](#) which indicates the supported media types for each publication and archiving service.

*Enhanced publications* as a term was the starting point for the group to describe the digital features of a publication. But the complexity and fluidity of the terminology and characteristics of cultural publishing as reflected in the survey responses to the term *enhanced publishing* has left us searching for a different naming and set of terminology that can capture *multimodal-multimedia-multilocal* publications that are now supported by a wider set of services on offer by open science. In the end, it is the current mismatch of publishing practice and available infrastructures, new features, and methods – that makes it challenging, not only to fix a name, but also to encapsulate the practical steps to improve publishing practice – thus, closing the gap between practice and what is offered by the open research community.

## Bibliography

Woutersen-Windhouwer, Saskia, and Renze **Brandsma**. 2009. "Report on Enhanced Publications State-of-the-Art." <https://doi.org/https://hdl.handle.net/11245/1.319787>.

Woutersen-Windhouwer, Saskia, Renze Brandsma, Arjan Hogenaar, Maarten Hoogerwerf, Paul Doorenbosch, Eugène Dürr, Jens Ludwig, Birgit Schmidt, and Barbara Sierman. 2009. *Enhanced Publications : Linking Publications and Research Data in Digital Repositories*. Amsterdam University Press. <https://doi.org/10.5117/9789089641885>.

# Appendix

## Literature review reference list

- Bardi, Alessia, and Paolo Manghi. 'Enhanced Publications: Data Models and Information Systems'. *LIBER Quarterly: The Journal of the Association of European Research Libraries* 23, no. 4 (15 April 2014): 240–73. <https://doi.org/10/gph528>.
- Bodily, Paul, and Dan Ventura. 'Steerable Music Generation Which Satisfies Long-Range Dependency Constraints'. *Transactions of the International Society for Music Information Retrieval* 5, no. 1 (25 March 2022): 71–86. <https://doi.org/10.5334/tismir.97>.
- Effinger, Maria, Leonhard Maylein, and Jakub Šimek. 'Von der elektronischen Bibliothek zur innovativen Forschungsinfrastruktur: Digitale Angebote für die Geisteswissenschaften an der Universitätsbibliothek Heidelberg'. *Bibliothek Forschung und Praxis* 43, no. 2 (27 July 2019): 311–23. <https://doi.org/10.1515/bfp-2019-2067>.
- Gerber, Anna, and Jane Hunter. 'Authoring, Editing and Visualizing Compound Objects for Literary Scholarship'. *Journal of Digital Information* 11, no. 1 (22 March 2010): 1–13.
- Gifford, E. Melanie. 'Rubens's Invention and Evolution: Material Evidence in The Fall of Phaeton'. *Journal of Historians of Netherlandish Art*. Accessed 1 May 2022. <https://jhna.org/articles/rubens-invention-evolution-fall-of-phaeton/>.
- Hofmann, Mathias, Sander Münster, and Florian Niebling. 'Research Group Urban History 4D – Explore and Discover City History in Four Dimensions', 2021. <http://www.urbanhistory4d.org/wordpress/>.
- Kircz, Joost G. 'Modularity: The next Form of Scientific Information Presentation?' *Journal of Documentation* 54, no. 2 (1998): 210–35. <https://doi.org/10/cdss4b>.
- MoVi - The digital Mozart score Viewer. 'MoVi - The Digital Mozart Score Viewer'. Accessed 1 May 2022. <https://dme.mozarteum.at/movi/en>.
- Schmidt, Yvonne, Sarah Marinucci, Demis Quadri, Nele Jahnke, Sara Boccini, and Anton Rey. 'DisAbility on Stage: Hybrid Media Publication', 1 January 2019. <https://doi.org/10.5281/zenodo.4019011>.

Shotton, David. 'Semantic Publishing: The Coming Revolution in Scientific Journal Publishing'. *Learned Publishing* 22, no. 2 (2009): 85–94. <https://doi.org/10/d393vv>.

Simukovic, Elena. 'Enhanced publications—Integration von Forschungsdaten beim wissenschaftlichen Publizieren'. Magisterarbeit, 2012.

'Symphony No. 5 (Beethoven)'. In *Wikipedia*, 1 May 2022. [https://en.wikipedia.org/wiki/Symphony\\_No.\\_5\\_\(Beethoven\)](https://en.wikipedia.org/wiki/Symphony_No._5_(Beethoven)).

Verhaar, P. a. F. 'Report on Object Models and Functionalities', 2008. <https://hdl.handle.net/1887/16018>.

Woutersen-Windhouwer, S., and R. Brandsma. 'Report on Enhanced Publications State-of-the-Art', 2009. <https://hdl.handle.net/11245/1.319787>.

Woutersen-Windhouwer, Saskia, Renze Brandsma, Arjan Hogenaar, Maarten Hoogerwerf, Paul Doorenbosch, Eugène Dürr, Jens Ludwig, Birgit Schmidt, and Barbara Sierman. *Enhanced Publications: Linking Publications and Research Data in Digital Repositories*. Edited by Marjan Vernooy-Gerritsen. Surf / EU-Driver Series - Trends in Research Information Management. Amsterdam: Amsterdam University Press, 2009. <https://hdl.handle.net/11245/1.311760>.

# Imprint

Published in Germany

Date: November 2022



NFDI4Culture – Consortium for Research Data on Material and Immaterial Cultural Heritage – which is a consortium within the German National Research Data Infrastructure (NFDI).

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Cover: Daniela Jakob

## Publication identifiers

EN DOI: [10.5281/zenodo.7107214](https://doi.org/10.5281/zenodo.7107214)

DE DOI: [10.5281/zenodo.7126012](https://doi.org/10.5281/zenodo.7126012)

Wikidata ID (publication): [Q114123116](#)

Publication URLs

English version: <https://tibhannover.github.io/digital-publications-in-culture-survey-results/>

German version: <https://tibhannover.github.io/digitale-publikationen-im-kulturbereich-umfrageergebnisse/>

Keywords: publishing, culture, enhanced publication, open research, FAIR, open access, PID, LOD, archiving, multimedia, multimodal, distributed

## Simple language description

Task Area 4 of the NFDI4Culture is looking at which initiatives are enhancing their publications for open scholarship. Its aim is to establish a guideline for scholars to create publications and their associated data with a focus on long-term digital preservation.

In order to get a full understanding of existing enhanced publications in the NFDI4Culture community an online survey was conducted. Its aim was to gather further representative examples. The survey was also used to get a better understanding of what the NFDI4Culture community considers to be an enhanced publication and what features they associate with it.

The survey has shown a variety of examples and contexts which go beyond standard research publications or digital collections. In addition, it has shown that a term is needed, that can capture multimodal, multimedia and multilocal publications.

## Funding information

NFDI4Culture is funded by the German Research Foundation (DFG) – Project number – 441958017

NFDI4Culture: <https://nfdi4culture.de/>

NFDI: <https://www.nfdi.de/>

Organisation PIDs

German Research Foundation (DFG): <https://ror.org/018mejw64>

NFDI: <https://ror.org/05qj6w324>

## Software and technical information

ADA Semantic Publishing Pipeline: <https://github.com/NFDI4Culture/ADA-semantic-publishing>

Multi-format CSS theming - [Interpunct.dev](https://Interpunct.dev)

## Fonts

Roboto Slab. These fonts are licensed under the Apache License, Version 2.0. Designer Christian Robertson Principal design. <https://github.com/googlefonts/robotoslab>

Inter. These fonts are licensed under the [Open Font License](#). The Inter project is led by Rasmus Andersson, a Swedish maker-of-software living in San Francisco. <https://github.com/rsms/inter/>

## Acknowledgements

Thank you to Dr Janneke Adema and COPIM members for background on Netherlands research in enhanced publications. The authors would also like to thank the following colleagues for their helpful comments (in alphabetical order): Eva Bodenschatz, Franziska Fritzsche, and Peggy Große.