Métopes, multimedia edition and diffusion: The ÉHÉSS publishing house

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Abstract:
Given problems related to digital convergence, the enhancement of research data and their circulation, editorial strategies should be reviewed along with the technical solutions for implementing them. A response to this situation is the tools proposed by Métopes (Methods and Tools for a Structured Edition) and the training for using them. Based on an XML-TEI file, which is open and permanent for archival purposes, this chain of multimedia edition has been designed using a single-source publishing model. It generates digital and paper editions while providing input to platforms in the human and social sciences (by integrating the requisite metadata in ONIX format). A semantics based on controlled specifications and vocabularies enhances contents and adapts them for the purpose of network editions (interoperability). Thanks to Métopes, the editor keeps control over production and the choices made about diffusion. The Métopes unit set up by the Éditions de l'ÉHÉSS has been rolled out on a large scale within this establishment and among its institutional partners; it is an example of close cooperation with project initiators.

Since the start of the 21st century, publishing is undergoing an "electronic convergence" characterized by an orientation toward "everything dematerialized".[1] In 2016, the French "Act for a Digital Republic" envisioned all the possibilities offered by this change in the conditions of production and diffusion that boosts the circulation of knowledge.[2] In this context, the main issue for the public services that publish scientific texts is to deploy the adapted procedures so as to have a coherent business model and strategy of diffusion for the media in question (ROUX 2015): books and journals on paper, whether in traditional bookstores or on bookseller websites, or e-publications for distribution via Internet platforms, whether for free or for pay. Such are the problems of mutimedia production (paper or electronic in all digital forms), for which Métopes intends to find a solution by staking out a position on the technical, organizational, economic and legal aspects of scientific publishing.

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[2] Article 30 of this law " for a digital republic" is part of an international trend toward opening research findings and data. Act n°2016-1321 of 7 October 2016 "pour une République numérique" is available at
https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000033202746. About this law and its scope, see CoSO (2018) *Guide d'application de la loi pour une République numérique – Art. 30*, available at
www.ouvrirlascience.fr/guide-application-loi-republique-numerique-article-30.

The Métopes Project

Métopes, a multichannel chain of publication, was created at Caen University's publishing house (Presses Universitaires de Caen) and developed with the backing of an association of publishers in research and higher education (AEDRES) and of the BSN within the MRSH's digital document pole in Caen. It was declared a "national infrastructure for research" in 2015,[3] and the INSHS has recommended its use for the production and diffusion of journals and publications.[4]

In broad terms, Métopes Project — methods and tools for structured publishing — seeks to develop (initially among public establishments in higher education and research) a standardized working environment for producing a stream of structured editorial contents potentially with a very high degree of interoperability.[5] In other words, it should lead to an open edition that networks contents and eventually data. These structured flows are then reworked for diffusion on the Web or in other, derivative editorial forms (books and journals, whether in print or on line). The strict requirements of including the metadata needed for referencing publications and automatically generating product descriptions guarantee that a product, whether for sale or for open access on platforms or archives, fits into channels of diffusion.

Within a single service or from one editorial service to another, the switch to Métopes has made it possible to organize editorial work using common methods for the purpose of harmonization and exchanges on good practices. Sharing operational standards that are in phase with work simplifies collaboration within a service or outside, whether for questions related to the editorial workflow or to the production of co-editions. Although Métopes is more oriented toward producing new books, journals and contents for the Internet, previously produced documents could eventually be processed once the editor has established operational e-archives (BUARD 2015). This retrospective digitization will give a second life to some works and, thanks to print-on-demand services, make up for their unavailability on paper and for the possible loss of authors' rights (since publishers are contractually bound to the author to never stop a title's production).

By clearly redefining the roles of each partner (author, editor, publisher, distributor) in a publication project, what might be called the "editorial added value" can be clearly grasped. In the current context, this is essential for defining the forms of open access in view of: the state of the text, economic considerations, the objective of diffusing scientific knowledge, and the application of the law for a "digital republic".[6] The editor prepares the copy in close contact with the author and, when this editorial phase ends, provides the techniques via Métopes that will translate the copy into an enhanced structure from which forms can be derived that are adapted to each channel of diffusion.

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[3] In 2015, for reasons of complementary, Numédif (NUMérique pour l'ÉDItion et la DIFFusion de la Production Scientifique), a research infrastructure, was combined with the Métopes Project and FMSH Diffusion, the logistics service of diffusion-distribution for university and institutional publishing houses. Since 2018, only Métopes has been renewed as a full-fledged "infrastructure of research".

[4] See the menu at www.metopes.fr/. Initialisms indicated in French: Association des Éditeurs de la Recherche et de l'Enseignement Supérieur (AEDRES); Bibliothèque Scientifique Numérique (BSN); Maison de la Recherche en Sciences Humaines (MRSH) (PDN: www.unicaen.fr/recherche/mrsh/document_numerique/projets/metopes); Institut des Sciences Humaines et Sociales (INSHS) of the National Center of Scientific Research (CNRS).

[5] In digital technology, interoperability is a system's or product's capacity for communicating with other, existing or future, products or systems.

[6] This law states that researchers may make available for free in an open, e-format the final version of their manuscripts that has been accepted for publication: after a period of six months at most for publications in the sciences, technology and medicine; and a period of twelve months for the human and social sciences (HSS).

As one of their assignments, the leaders of IR Métopes intervene directly to install the requisite software and train future users. In France (and abroad), approximately 100 public publishers in higher education and research (nearly 600 people in all) have thus been introduced to the methods for producing a structured edition. Métopes has been used outside France under agreements between national associations of editors and via the network of French overseas schools[7] and foreign collaborators of OpenEdition. Editors more easily appropriate the technology when all software bricks and the requisite skills match the demanded profiles. When tackling the task of producing structured contents, editors must review their organization and methods, but they do not fundamentally change jobs.

Métopes, a functional description

Métopes is based on single-source publishing, a model for a single flow of text and data from which paper and electronic documents can be derived. Darnton (1999) imagined practical applications for publications in history. The 2010 edition of the *Chicago Manual of Style* described this approach along with its effects on the organization and processes of publication.[8]

From a functional viewpoint, Métopes can be summarized as a process of multichannel (or multimedia) production that — with a single editorial effort based on a nonproprietary, durable, source file in XML — generates at the end of the production chain editorialized forms thanks to an automation of typesetting and layout. The end product is a PDF-file certified in conformity for printed and electronic publications — interactive PDF, ePub or XHMTL for websites or platforms in the human and social sciences (Cairn.info, OpenEdition Journals, OpenEdition Books). A single working environment provides for: the conversion to XML; the validation of the workflow; the editing (typing and corrections); annotations (with the help of metadata, specifications and an index); and, at the end, the production of the forms of the product to be distributed. The structured flow in the XML-TEI format contains the metadata likely to be produced by conversion to the ONIX format.[9] Depending on the finality imagined, these metadata are available as a product description or are selected as a function of the requirements of the form of the product for distribution. They are directly embedded in the file or data stream. Figure 1 separates the stages in this process ranging from the initial document produced with a word-processing program to various editorial forms.
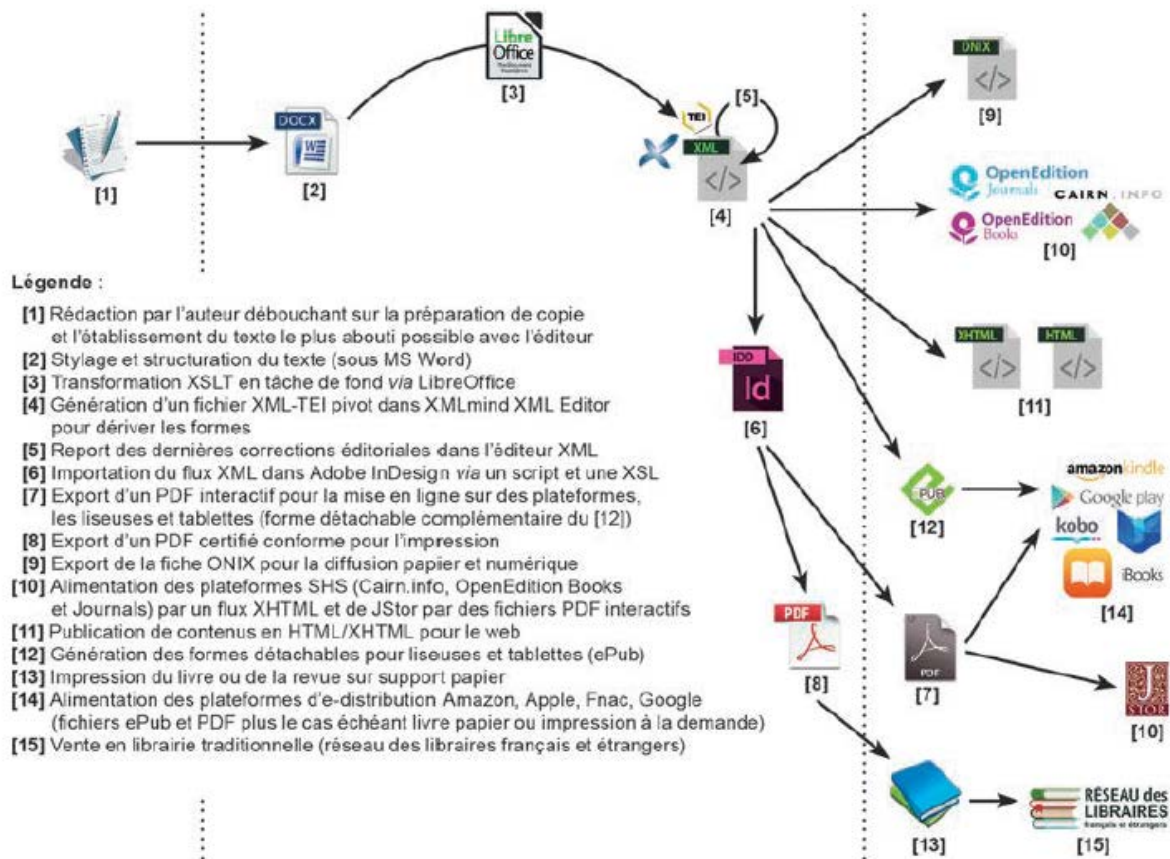
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[7] Unités Mixtes des Instituts Français de Recherche à l'Étranger (UMIFRE).

[8] In particular, "Appendix A: Production and Digital Technology" and Figure A.5 in the 16th edition of *The Chicago Manual Of Style* (2010)*.

[9] XML (Extensible Markup Language), which is used to structure contents, relies on data schema: TEI for Métopes. The Text Encoding Initiative (TEI), an international community in the digital humanities, has made recommendations for coding texts, thus adapting its theoretical model to technology, at first DTD SGML, then XML (*cf*. BURNARD 2014).
ONIX is a metadata format in XML developed by EDItEUR for use in the book trade. By using a set of tags, this standard fully describes a book: bibliographical data (title, author, place and date of publication, publisher, ISBN, ISSN, etc.), material data (medium, format, number of pages, weight, etc.), sales and distribution data (price, market, distribution method, etc.).

Figure 1: Métopes: the stages in this single-source publishing process ranging from the initial document produced with a word-processing program to various editorial forms.
Source: © Cellule Métopes ÉHÉSS.

Légende :

[1] Rédaction par l'auteur débouchant sur la préparation de copie et l'établissement du texte le plus abouti possible avec l'éditeur
[2] Stylage et structuration du texte (sous MS Word)
[3] Transformation XSLT en tâche de fond via LibreOffice
[4] Génération d'un fichier XML-TEI pivot dans XMLmind XML Editor pour dériver les formes
[5] Report des dernières corrections éditoriales dans l'éditeur XML
[6] Importation du flux XML dans Adobe InDesign via un script et une XSL
[7] Export d'un PDF interactif pour la mise en ligne sur des plateformes, les liseuses et tablettes (forme détachable complémentaire du [12])
[8] Export d'un PDF certifié conforme pour l'impression
[9] Export de la fiche ONIX pour la diffusion papier et numérique
[10] Alimentation des plateformes SHS (Cairn.info, OpenEdition Books et Journals) par un flux XHTML et de JStor par des fichiers PDF interactifs
[11] Publication de contenus en HTML/XHTML pour le web
[12] Génération des formes détachables pour liseuses et tablettes (ePub)
[13] Impression du livre ou de la revue sur support papier
[14] Alimentation des plateformes d'e-distribution Amazon, Apple, Fnac, Google (fichiers ePub et PDF plus le cas échéant livre papier ou impression à la demande)
[15] Vente en librairie traditionnelle (réseau des libraires français et étrangers)

Changing a file's format (from MSWord to XML and from XML to HMTL/XHTML or to ePub) is done by XSLT formatted with cascading stylesheets (CSS) for graphic enhancements.[10] The XML file from InDesign (formatting software for producing pdf-files) is imported by using a script and a set of XSL[11]. Since Métopes relies on standards, like XML, TEI and ONIX, users simply have to apply a style in MSWord so that the tagging operations for structuring the contents be accomplished. They then need but fill in the metadata in the XML editor (many of these data having been inferred from the structure) and finalize the form(s) of diffusion/distribution.

I must admit, however, that there is a trend toward a consolidation, and thus toward a more frequent manual input, of the metadata (*e.g.*, tagging bibliographical data for referencing) and, too, toward the enhancement of contents and a "semantization" that entails making annotations. The objective of all this is to integrate the contents in information systems that are ever more organized, demanding and interoperable. Métopes offers, in effect, a feature for adding a set of data to validate

[10] Based on XML, ePub (for "electronic publication") is a standardized open format for e-books. This type of e-book was designed to adjust the page layout by redistributing the text as a function of its eventual display and of the reader's choices. It is made up of HTML files and CSS for ePub 2, and of HTML 5 files and CSS 3, metadata and JavaScript for greater interactivity with enhanced contents (graphics, layout, multimedia) for ePub 3.

Cascading Style Sheets (CSS) form a computer language describing the presentation of HTML and XML documents for enhancing them graphically.

Extensible Stylesheet Language Transformations (XSLT) is a language for transforming XML documents into other formats.

[11] Extensible Stylesheet Language (XSL) is used to describe the stylesheets associated with XML. An XSL stylesheet is a file that indicates how the XML documents based on the same DTD or schema are to be changed.
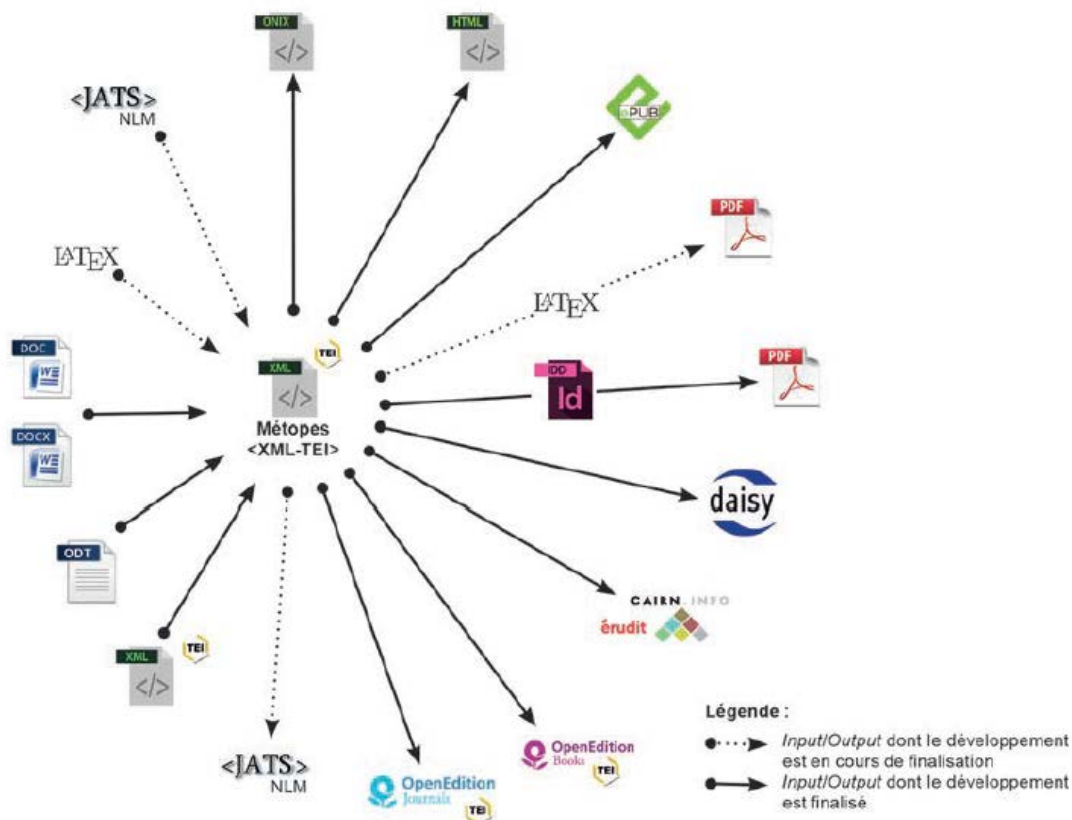
authorities, *i.e.*, to handle homonyms of authors' names via idRef, which can also retrieve other identifications from ORCID, HAL, BnF, ISNI, etc.[12] The contents are thus semantically enriched with references and specifications. Recent developments propose interconnections with databases like GeoNames (for geographical place-names) or the indexing of documents via controlled vocabularies (thesaurus, taxonomies, etc.).[13]

In the end, the information system transmits scientific contents that have been structured, standardized and enhanced. It creates a point of convergence with other uses and users of digital technology: researchers (in HSS who frequently use TEI), research assistants, archivists, librarians, etc. Figure 2 lists the in- and outputs of Métopes and indicates which of them are already fully operational.

Figure 2: In- and out-put formats for Métope:
OpenDocument (.odt) is the open format of the word-processing software programs OpenOffice and LibreOffice. Journal Article Tag Suite (JATS) is a type of XML for describing and publishing scientific articles. Cambridge University Press and the peer-reviewing portal Open Journal Systems use it. LaTex is a language and layout system with, in particular, mathematical features that make it easier to work on complicated formulas. It is mainly used in scientific and technical fields for layout work. Digital Accessible Information System (Daisy) is a standard and format for audio books designed for persons who are unable to read printed documents.
Source: © Cellule Métopes ÉHÉSS, adaptation of the online schema.

Formats d'entrée et de sortie pour Métopes [20]
© Cellule Métopes EHESS, adaptation du schéma publié en ligne par les porteurs du projet (PDN, 2020).

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[12] IdRef is a Web application developed and supported by ABES (Agence Bibliographique de l'Enseignement Supérieur). Any author of a text in the ABES catalog (Sudoc) has an IdRef ID that can be looked up on the platform (www.idref.fr).
Open Researcher and Contributor ID (ORCID) is a nonproprietary alphanumerical code that serves as a unique identification for researchers and the authors of academic and scientific studies.

[13] Some developments for adapting the Métopes environment have been made as part of the program "Savoirs" headed by Christian Jacob (ÉHÉSS). This program intends building a platform with a "smart library" will that suggest heuristic procedures, whence recourse to the Semantic Web.

When Métopes handles data flows, the basic descriptive unit is the article or chapter. The full set of metadata specific to this unit produces the issue of a journal or of a book. The set of metadata adapts to the scale of its implementation, thus describing either editorial units or the volume they make up. As a consequence, the stock of XML files stored by the publisher (at the level of the editorial unit) can be consulted for texts on the same themes but from various volumes so as to make new publications with less investment since the texts have already been reread and structured. It might suffice to enhance them with a preface or postface for attracting new readers. This is, obviously, an advantage of digital technology: it bears new strategies for re-editions. This type of use in the form of a compilation seems similar to a frequently observed phenomenon closely linked to dematerialization, namely: the physical units represented by books and journals are handled separately when search engines look up keywords for chapters, articles or even series of texts, in particular when readers create *ad hoc* their own collection of texts independently of the initial editor's intention (ANHEIM 2015).

Owing to its features, Métopes rationalizes the costs of multimedia publishing. It helps the editor step around the problems that, related to reusing contents, are time-consuming and require human interventions, as happens when the products at the end of the chain are not produced via a single-source approach. On account of the relatively lower human costs, editors can make real savings by internalizing all production processes (apart from printing), whereas pre-press operations used to be farmed out to service-providers and then there were the costs of converting files to be uploaded to platforms. There are additional benefits stemming from the possibilities for new forms of diffusion or distribution. Owing to the independence of the production process and thanks to the open formats underlying Métopes, editors become the full owners (who abide by copyright laws) of their files and models. The XML files resulting from Métopes do not just represent the definitive version of a text; they are also a vector of plural forms of it. They are not proprietary (nor the derived ePub files). They are in a stable, durable, open format ready for the archives,[14] since they have been produced by an ecosystem that relies on documented standards (XML and TEI) and on Unicode for coding characters.

Métopes at the ÉHÉSS

As of 2014, Métopes was set up in the publication service of the Éditions de l'ÉHÉSS to process authored books. This experiment put single-source publishing to the test and then served as an "incubator" for deploying this solution in successive phases. Since 2016, a Métopes unit with two multimedia editors assigned to the École des Hautes Études en Sciences Sociales (Graduate School for Advanced Studies in the Social Sciences) has been in operation. A convention is being drafted between Caen University, IR Métopes and the ÉHÉSS to set the conditions for this unit's interventions. Its roadmap is established in close coordination between the ÉHÉSS and its publishing house. Since 2019, Métopes has been designated as a priority for the ÉHÉSS. The journals published by the ÉHÉSS have joined this project, which will gradually be extended to cover all collections published by the Éditions.

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[14] In house or in the CiNEs (Centres Informatique National de l'Enseignement Supérieur) located in Montpellier. CiNEs is a computer service in higher education used for public research. One assignment of this public establishment is to archive electronic documents in a durable form. The archiving of the files produced by Métopes is subject to validation of the data schema and to the acceptance of the conditions of service.

To date, three quarters of the periodicals published by the Éditions de l'ÉHÉSS have been brought into Métopes. With few exceptions, prepress operations now occur in house. The editors thus regain control over both the files of the journals produced through the Métopes chain and of the layout models used. Significant savings have been made, since the layout for printed versions is no longer subcontracted; the only invoice for production now comes from the printing press. Furthermore, some journals no long present on OpenEdition Journals for several years now are back on line, the gaps in their series having been stopped. Thanks to Métopes and the agreements made with HSS platforms, the Éditions no longer owes residual costs and pays no fees for converting back issues for uploading to Cairn.info, OpenEdition Journals and Books. A final point about funding: the Métopes unit has taken charge of the graduate school's editorial information system in collaboration with the DSI. Investments have been centralized and rationalized, thus allowing for the procurement in large quantities of equipment and software licenses so as to be best equipped to apply this solution for single-source, multichannel publishing.[15]

For the Éditions de l'ÉHÉSS, most forms of diffusion have been worked out via Métopes: publications uploaded to online platforms; publications in print; several interactive ePub and PDF files have been made for distribution by the Eden Livres platform. For the integration of graphics in ePub, a generic CSS that can be adapted to a series (a journal or collection of books) has been created that respects the identities of the series and of the publisher. The gradual extension to other editorial entities in the ÉHÉSS (journals or collections on the premisses but not belonging to the Éditions) started in 2019, along with the integration of research projects such as Savoirs[13] for expanding the editorial chain to cover the needs of researchers who need specific developments.

At the end of 2016, under an agreement with IR Métopes, the unit at the ÉHÉSS became a "referent" on multimedia publishers.[16] Since 2019, new relations have taken shape on the same basis with publishing services (*e.g.*, INED Éditions) at Campus Condorcet, where the ÉHÉSS is present along with ten other HSS establishments.

Within its scope of activity, the Métopes unit at the ÉHÉSS has the task of facilitating in practical ways single-source publishing. As a technical service for installing and updating applications, it provides training (for InDesign, Métopes or the integration of graphics), either full training for newcomers or followup training. This unit has trained approximately 90 colleagues on location (at the ÉHÉSS, PSL and Condorcet), a training that attends closely to the preoccupations of editorial boards.

The Métopes unit documents its work in a handbook that is, step by step, updated as the unit oversees the software programs, formats and vocabularies related to electronic publishing. It proposes an assistance (the transmission of bug reports to IR Métopes' developers and operational support in the field) that is both reassuring and well perceived, ranging from temporary help in person for meeting the deadline for an issue (including for online publication) to the "autonomization of structures". On the human scale, there is a followup of employees whose jobs are changing or being reorganized so that they feel less isolated than in the past, since they now belong to a community of users. An ever denser network has taken shape around Métopes with exchanges on single-source publishing and related aspects (business models, skills and qualifications, the process for evaluating a text…).

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[15] The procurement of licenses for editorial software for corrections (Antidote and Prolexis) and office suites for word processing and desktop publishing (Office MSWord and Adobe CC: InDesign, Photoshop, Illustrator and Acrobate Pro). In contrast, Métopes provides XMLMind XMLEditor with a specific working environment, the XSLT routines, the script for importing XML into InDesign.

[16] In ComUE PSL (Communauté d'Établissements Paris Sciences et Lettres PSL University), to which the ÉHÉSS has belonged since 2014. It thus shares its experience with editorial boards at Collège de France, École Nationale des Chartes, École Pratique des Hautes Études and École Nationale Supérieure des Mines de Paris (Mines ParisTech).

In conclusion, although Métopes might, for the uninformed public, seem rather rigid in its implementation, the solution it offers is very flexible, robust and productive for the diffusion of scientific knowledge. Thanks to it, all aspects of editorial policy can be handled: diffusion (multichannel and multiform: in print or electronic), sales and Open Access. These aspects differ depending on the editorial board even within a single institution like the ÉHÉSS.

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