

Digitizing the materiality[-ies] of books

☞ The [potential] role of the conservator ☞

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IADA Executive Board Member

Editor-in-Chief: Journal of Paper Conservation

 @acampagnolo

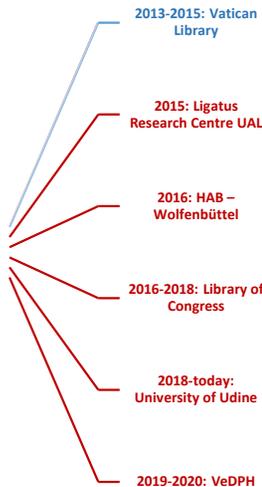
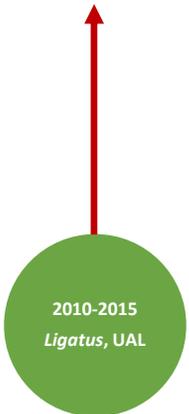
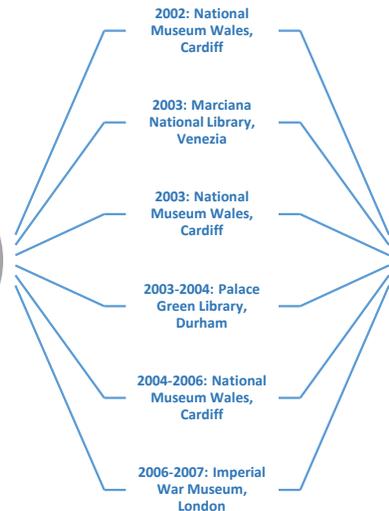
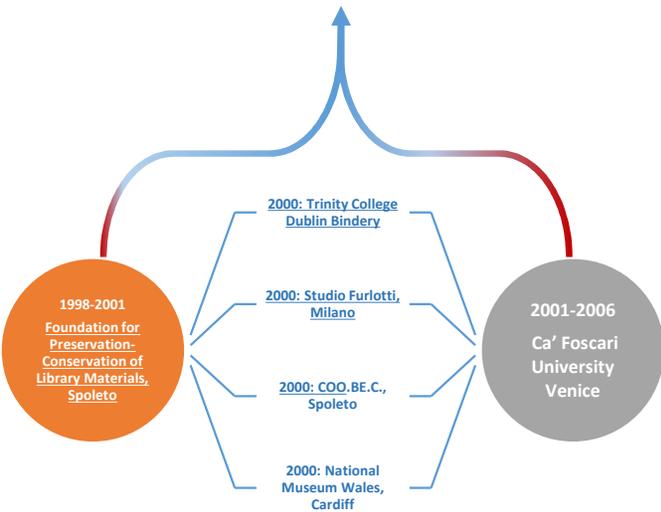
alberto.campagnolo@gmail.com

 orcid.org/0000-0002-8672-8400

Conservation Insights 2020

12th October 2020

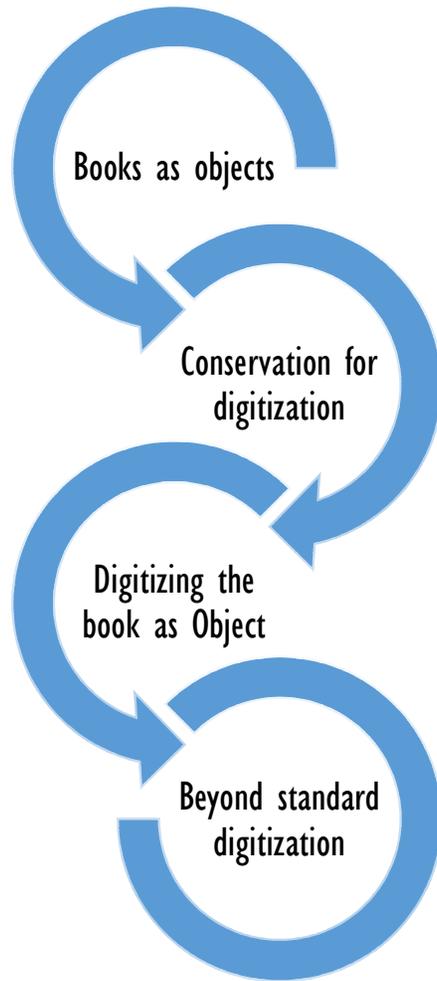
**DipHE – BA (Hons.):
Conservation of
Library & Archive
Materials**



PhD:
*Transforming structured descriptions
to visual representations.
An automated visualization of
historical bookbinding structures.*

**MA: Digital Culture
and Technology**

- CONSERVATION
- DIGITAL HUMANITIES



Books as Objects

Books as objects



Photo: © Bodleian Libraries, University of Oxford

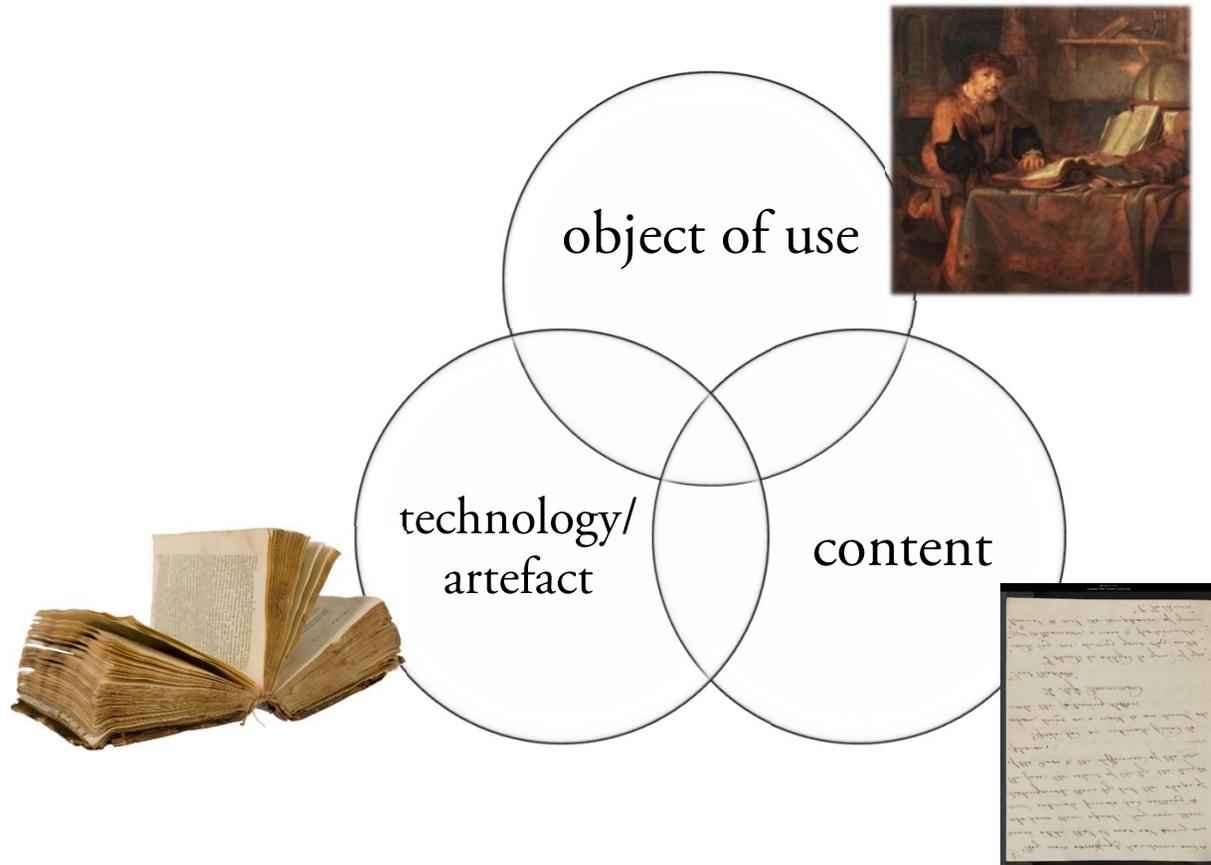
Books as objects — **Material Culture**



Photo: © Bodleian Libraries, University of Oxford

Books, as cultural objects, are **complex entities** that preserve, on top of their content and decorative features, **technological** and **material data** from another time and place.

Book seen as...



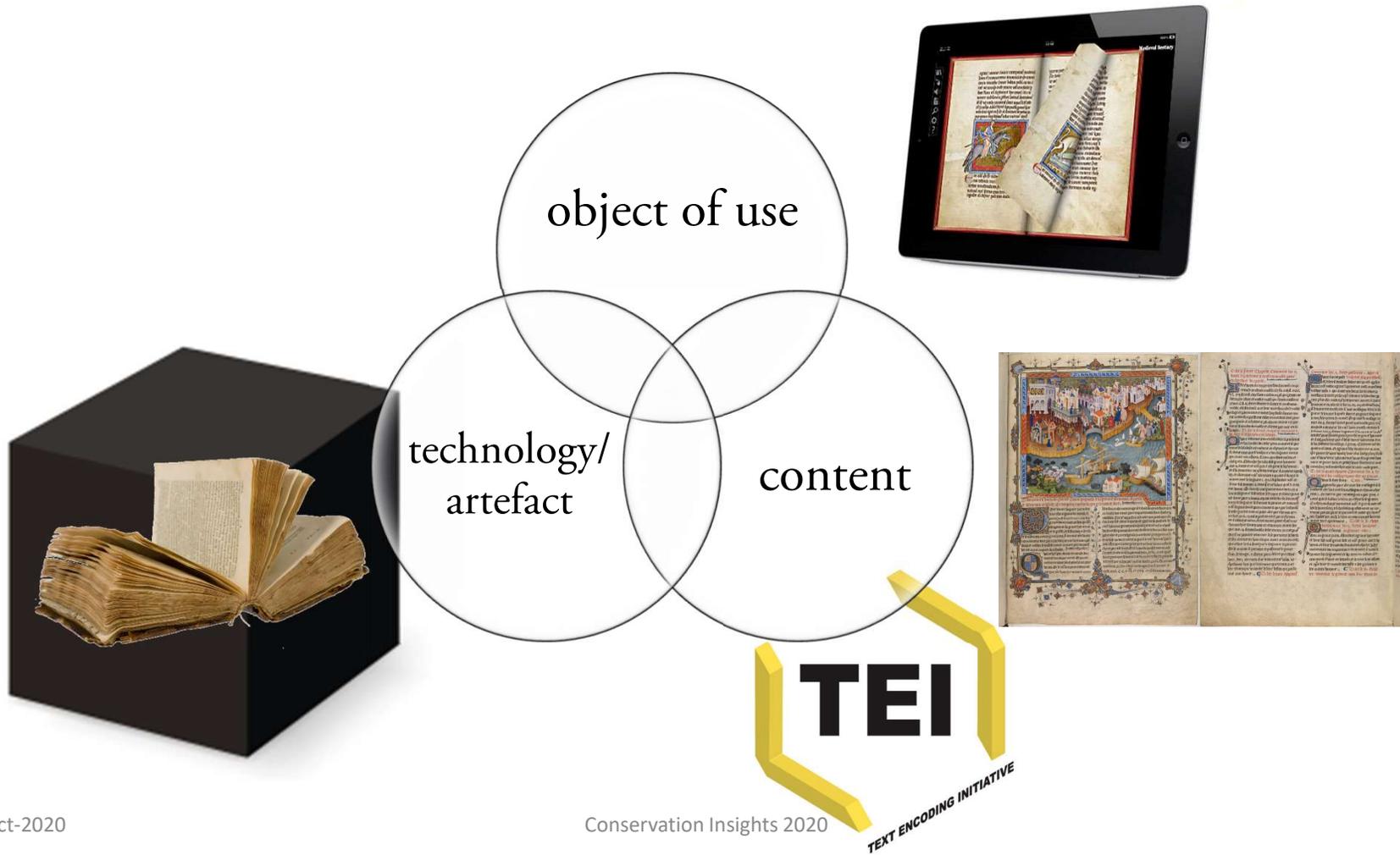
Books as containers



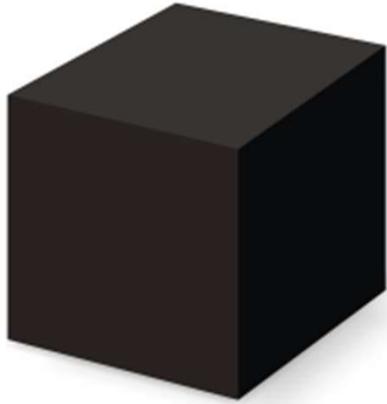
Photo: © Bodleian Libraries, University of Oxford

Books, as cultural objects, are complex entities that preserve, on top of their content and decorative features, technological and material data from another time and place.

Book seen as... **TURNING THE PAGES™**

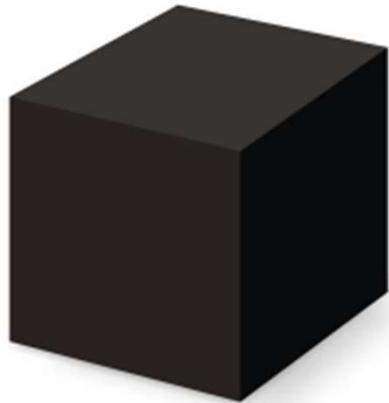


Books as black boxes



Books, as cultural objects, are **complex entities** that preserve, on top of their content and decorative features, **technological** and **material data** from another time and place.

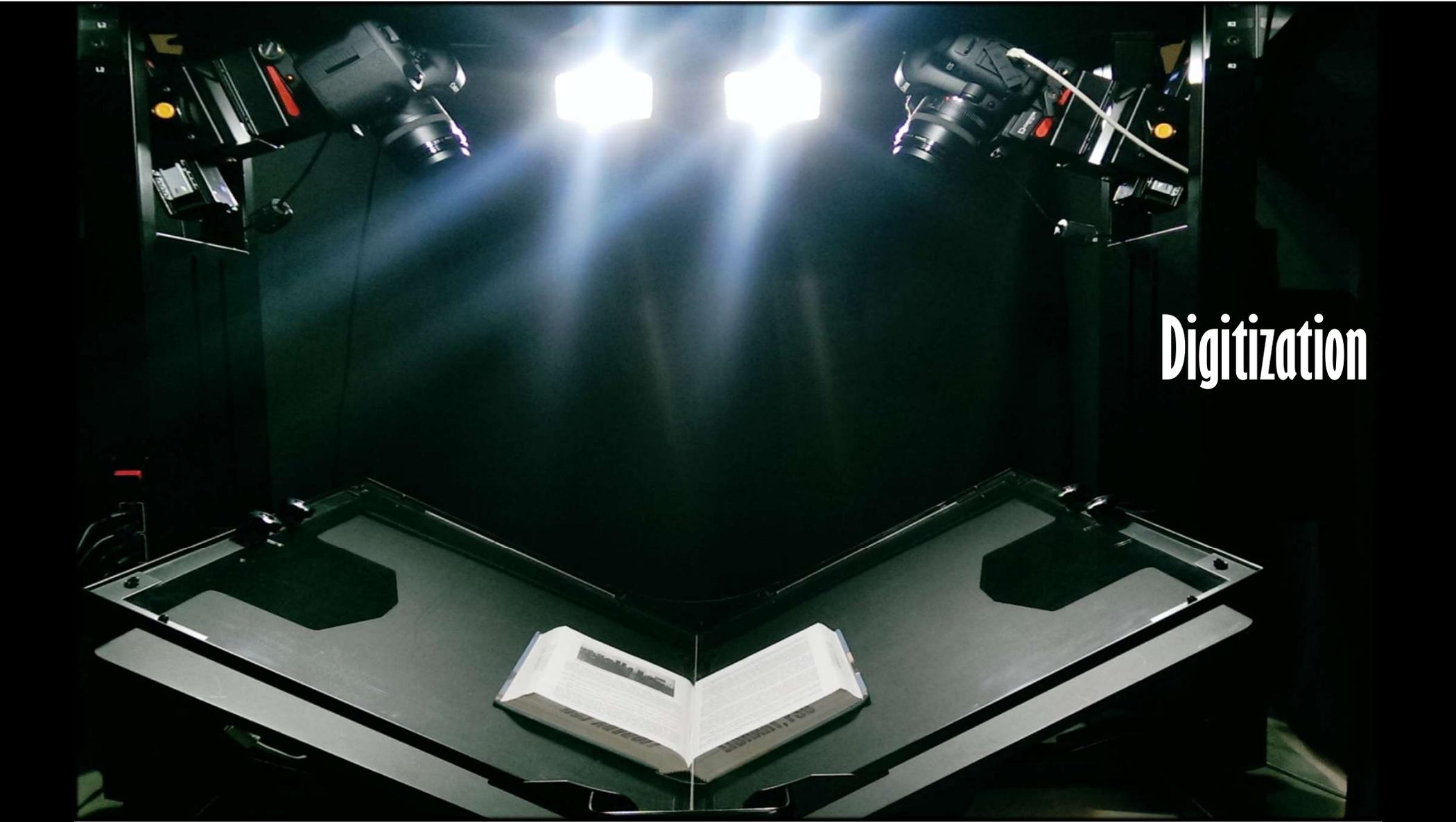
Black boxes



BlackBox:

(Information Science & Actor–Network Theories)

a technological artefact that, while appearing obvious to the ordinary observer, can also be regarded as a complex entity, the essence of which depends on a diverse system of techniques, materials, processes, and actions.



Digitization

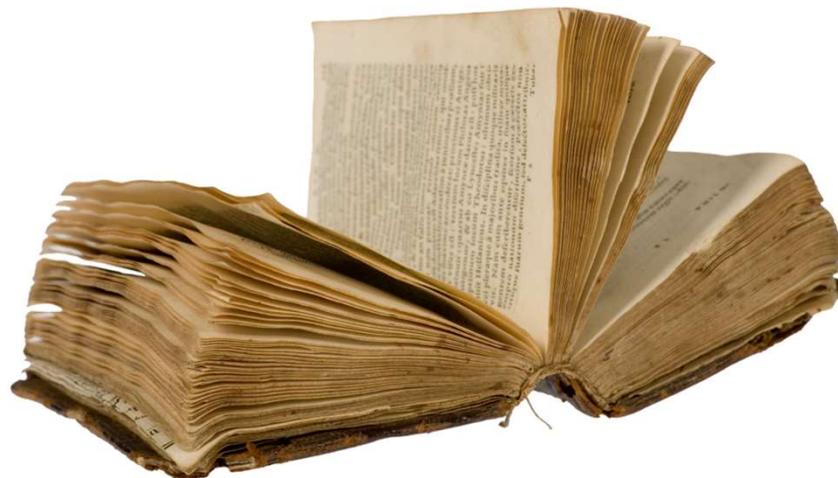
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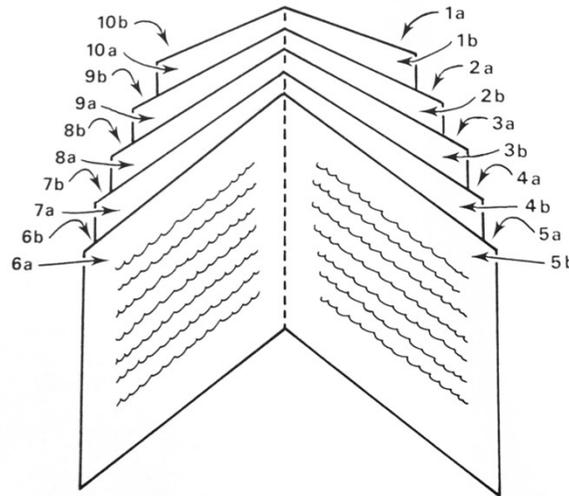
Book in Codex Format

‘a collection of sheets of any material, folded double and fastened together at the back or spine, and usually protected by covers’.¹



¹ Roberts, Colin H., and T. C. Skeat. 1983. *The Birth of the Codex*. London; New York: Published for the British Academy by the Oxford University Press, p. 1.

GATHERING / QUIRE



A group of folded or single leaves which can be used either singly or with other gatherings to create a textblock. <http://w3id.org/lob/concept/2286>



The gathering is the ultimate working unit of the codex.

(Andrist, Patrick, Paul Canart, and Marilena Maniaci. 2013. *La syntaxe du codex: essai de codicologie structurale*. Bibliologia 34. Turnhout: Brepols, p. 50)

Floating pages



Book Conservation for Digitization

Filter buttons: yasmeen khan, katie wagner, caroline bendix, restoration, mary french, preservation, nedcc, marianne kelsey, job interview, rita udina, library, manuscripts, bookbinding, binding, repair, udina paper



What does a Rare Book Conservator Do ... yourfreecareertest.com



book conservation | Books, Health and ... nyamcenterforhistory.org



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Library of Congress ... blogs.loc.gov



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About Book Conservation at NEDCC - NEDCC nedcc.org



Book Conservator Christina Amato ... nyamcenterforhistory.org



Library conservation: the art of saving ... ft.com



Book Conservation Laboratory St... nedcc.org



book conservator in Nevada | Las Vegas ... reviewjournal.com



Book Conservator Christina Amato ... nyamcenterforhistory.org



White Iris Books whiteirisbooks.com



Book and Paper Conservation ... libguides.brooklyn.cuny.edu



Conservation and restoration of books ... en.wikipedia.org



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Book Conservation Lab ... pinterest.com



About Marianne Kelsey - Book and Paper ... mariannekelsey.com



Conservators | Pros You Should Know... archivalmethods.com



Parks Library Preservati... parklibrarypreservation.w...



An Interview with Yasmeen K... blogs.loc.gov



Paper Conservator - Con... paperconservator.com



THE PAPER CONSERV... amazon.com



Rita Udina, paper & book conservator ... ritaudina.com



FAQs - Marianne Kelsey Book and Paper ... mariannekelsey.com



Thekla Ahrens Bookbinder ... facebook.com



Rare Book Conservator - Career ... br.pinterest.com



West Dean College of Arts and Conser... westdean.org.uk



Paper Conservator: Pap... amazon.com



Rita Udina, Paper & Book Conservation ritaudina.com



Mary French '09, Book Conservator ... wellesley.edu



Alessandro Scola preserves, protects ... hub.jhu.edu



Book & Paper Conservat... qest.org.uk



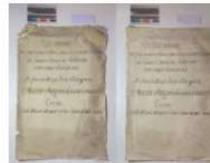
92 Book Conservator Photos and Premi... gettyimages.com



Australian National Maritime Museum sea.museum



Book Conservator at the Thaw ... bgc.bard.edu



I am humbly beginning my training as a ... reddit.com



Ask Our Book Conserva... blog.library.si.edu



Book Conservator Manise Marston ... flickr.com



Conservation and rest... en.wikipedia.org



Book Conservator David Brock to ... library.stanford.edu



Park City Mining Map from 1908 ... newsletter.lib.utah.edu



Book Conservator Repair (before ... mariannekelsey.com



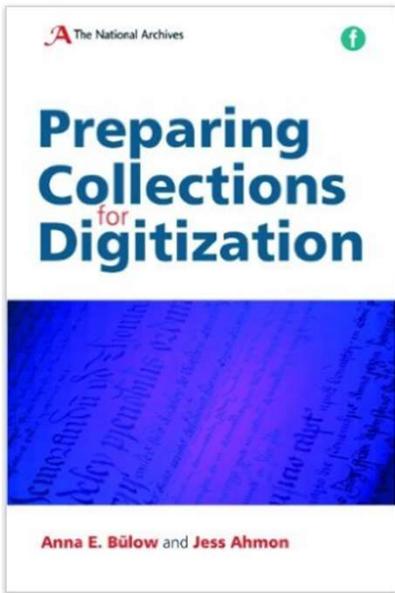
Book Conservator Holly Smith looks at ... alamy.com



A new method of board re-attachment for ... special-collections.wp.st-andrews.ac.uk



Preservation Arts - Art Conservation ... preservation-arts.com



Bülow, Anna, and Jess Ahmon. 2011.
Preparing Collections for Digitization.
London: Facet Publishing, in association
with the National Archives, p. 11.

>digiprep>

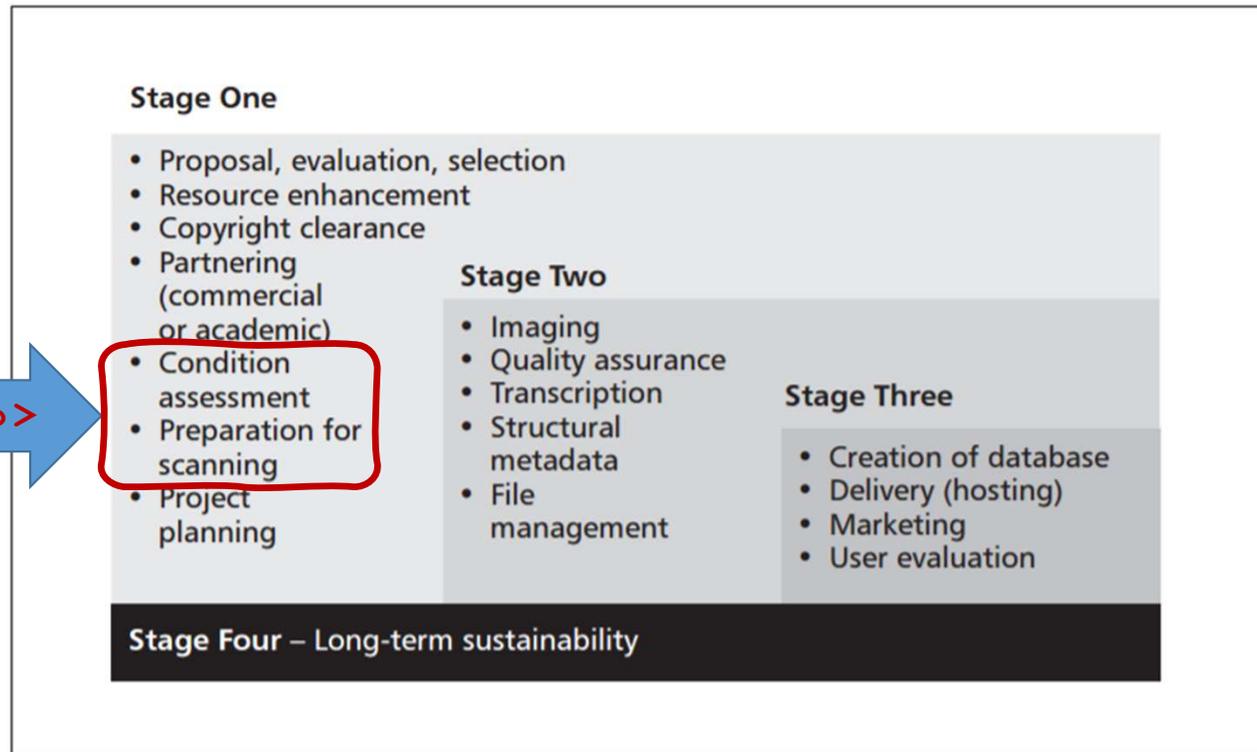


Figure 1.2 *The four phases of digitization*



UNESCO Sub-Committee on Technology. 2015. 'Fundamental Principles of Digitization of Documentary Heritage'. UNESCO.

http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/mow/digitization_guidelines_for_web.pdf.

Fundamental principles of digitization of documentary heritage
(information drawn from the non-exhaustive list of sources in the endnote)

Objective

The purpose of this text is to collate in one document, the basic information needed to understand the requirements of digitization. By no means intended to be exhaustive, it seeks simply to provide a primer, especially for developing countries, to guide or inform on digitization. It sets out the most basic elements to be taken into consideration before embarking on the process of digitizing national documentary heritage. The bibliography lists some of the international source documents that are currently available online. These may disappear over time. The sources cited should not necessarily be interpreted as having been endorsed by UNESCO or reflecting the Organization's views.

Definition

Digitization is the creation of digital objects from physical, analogue originals by means of a scanner, camera or other electronic device. It is undertaken as part of a process that includes:

- Selection
- Assessment, including of needs
- **Preparation of originals for digitization**
- Metadata collection and creation
- Digitization and creation of data collections
- Submission of digital resources to delivery systems and repositories.



This process is accompanied along the way by management, including intellectual property rights management and quality control, and evaluation at the end. These steps are essential to ensure that the digital object remains accessible in the long-term.

Fundamentals

Generally, digitization in itself is not a method of preservation of documentary heritage although it does help to protect

List 4. Conservation Involvement in Digitization Projects

I PROJECT PLANNING AND BUDGETING PHASE

- Internal communication and management:
 - Contributing to the management system setup (fields and metadata)
 - Set up a common language system (technical phrasebooks, guidelines, training, etc.)
- Equipment:
 - Contribute to the selection and adaptation of the digitization equipment
- Environment:
 - Contribute to the selection of the scanning setup and environment
- Information management:
 - Set up/adapt database for record keeping and documentation

II BEFORE DIGITIZATION

- Object assessment:
 - Assessing conservation fitness of object: fragility and risks
 - Assessing opening characteristics (and maximum safe opening angle)
 - Assess need for digiprep
 - Assess special handling requirements
- Object treatment:
 - Prepare objects for digitization: securing pages and elements at risk
- Object safety:
 - Offer safe handling guidelines and training
 - Check adequacy of scanning equipment and availability of special equipment (book cradles, etc.)
 - Check environmental conditions (temperature, humidity, light) in all locations
- Object documentation:
 - Documentation of the state of conservation
 - Documentation of the treatments

III DURING DIGITIZATION

- Object safety:
 - Assure safe handling (in presence or with previous training sessions)
 - Assure use of special equipment to minimize damage (such as humidifiers, book cradles, etc.)
 - Monitor adequacy of environmental conditions (temperature, humidity, light)
- Object treatment:
 - Repair objects that are flagged up as in need of pre-scanning conservation treatment by the digitization team

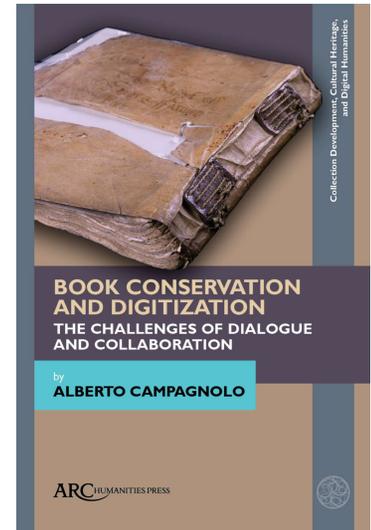
Campagnolo, Alberto, ed. 2020. *Book Conservation and Digitization. The Challenges of Dialogue and Collaboration*. Collection Development, Cultural Heritage, and Digital Humanities. Leeds: Arc Humanities Press, pp. 61-62.

IV AFTER DIGITIZATION

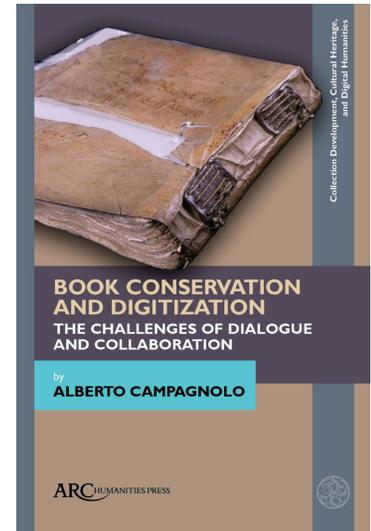
- Object assessment:
 - Check state of conservation of objects (against pre-scanning documentation)
- Object treatment:
 - Repair objects if damage has incurred during digitization, or if treatment had been postponed assuring a better information capture at the digitization stage
- Object safety:
 - Eventual re-housing: conservation envelopes, boxes, etc.
- Object documentation:
 - Documentation of eventual post-digitization conservation treatments

V OUTREACH AND RESEARCH

- Outreach avenues:
 - Contribute contextual information (blogs, videos, websites)
- Research avenues:
 - Consider potential research value within the objects (during survey, treatment phase)
 - Seek collaborations to address research questions (heritage science, digital humanities)
 - Publish contextual information (technical and academic)



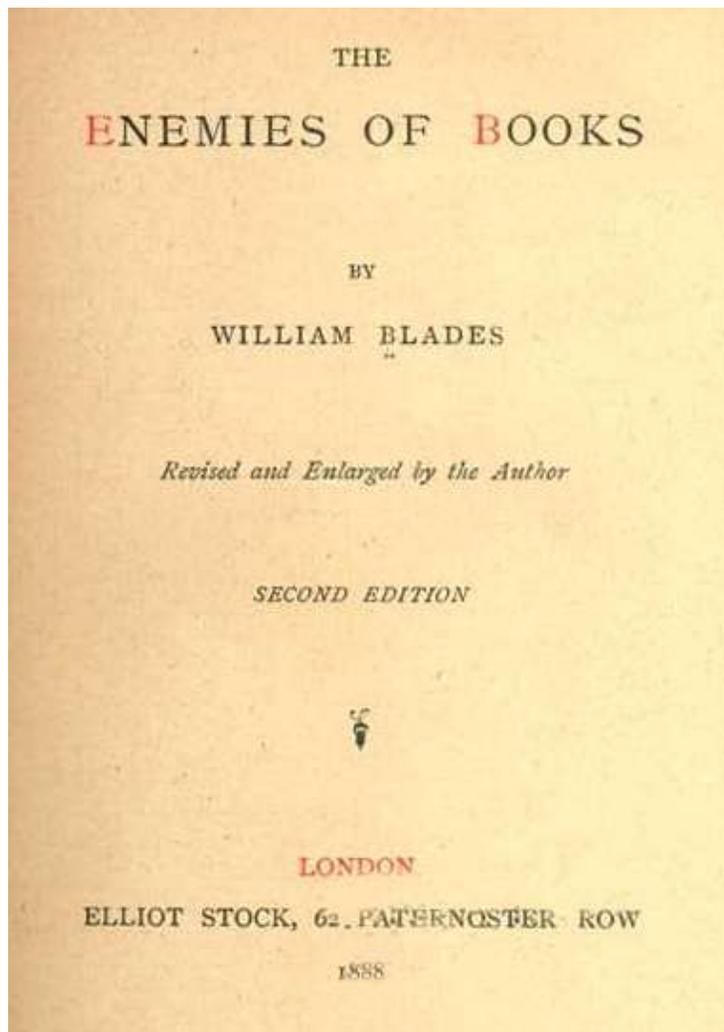
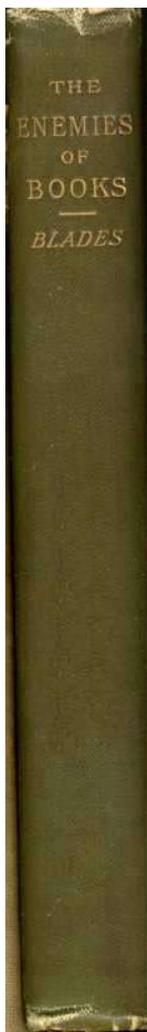
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Not routine yet



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 - IV. DUST AND NEGLECT.
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 - VII. OTHER VERMIN.
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 - IX. **COLLECTORS.**
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X. SERVANTS AND CHILDREN.

Library invaded for the purpose of dusting. — Spring clean. — Dust to be got rid of. — Ways of doing so. — Carefulness praised. — Bad nature of certain books — Metal clasps and rivets. — How to dust. — Children often injure books. — Examples. — Story of boys in a country library.

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©INSTITUTE FOR ANTIQUITY AND CHRISTIANITY IN CLAREMONT, CA, USA

The Nag Hammadi Codices. 13 leather-bound single-quire papyrus volumes discovered by Egyptian farmers in 1945. Dated mid-fourth century A.D.

Are we Digitizing the Book as an Object?





Watteeuw, Lieve, and Mel Collier, eds. 2016.
What Do We Lose When We Lose a Library?
Leuven: KU Leuven University Library.

<https://www.goethe.de/resources/files/pdf94/streamgate.pdf>.

**What
do we lose
when we lose
a library?**

Proceedings of the conference
held at the KU Leuven 9-11 September 2015

Conference organized by
KU Leuven · UC Louvain
the Goethe Institut · the British Council



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Search Wikipedia

List of destroyed libraries https://en.wikipedia.org/wiki/List_of_destroyed_libraries

From Wikipedia, the free encyclopedia

Libraries have been deliberately or accidentally destroyed or badly damaged. Sometimes a **library** is purposely destroyed as a form of **cultural cleansing**.^[1]

There are examples of accidentally destroyed libraries by human actions. Other times they are damaged by natural disasters like earthquakes, floods or accidental fires.

Library fires have happened sporadically through the centuries: notable examples are the destruction of the **Library of Alexandria**, destruction of Library of Nalanda in India and the accidental burning of the **Duchess Anna Amalia Library** in Weimar. Causes vary from arson to the sun's rays setting fire to leaflets through the action of a magnifying lens, as happened to a library in **Northam, Devon**.^{[2][3]}

Contents [hide]

- Causes and prevention
- Human action
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- Fire
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Causes and prevention

In earlier times **mildew** was considered a major problem in many libraries and so the emphasis on library design was to increase air flow by, for example, leaving openings under the shelves in adjoining floors. In a fire the flames will be drawn floor to floor by the air flow thus ensuring the relatively easy destruction of a whole library rather than a small section.

Advances in technology have reduced the possibility of a library collection being destroyed by fire. These include water sprinklers, **fire doors**, freezers, alarms, smoke detectors, suppression systems, and emergency generators. Older libraries are usually converted by closing up air flow openings and installing fire doors, alarms and sprinklers. Air conditioning reduces the mold problems. These are all essential parts of new library *design*.

There is no recovery possible if a book is burnt so it is accepted that a better solution is to put out the fire with water and then dry out the books. As mold destroys paper the books are frozen until they can be dried. This process will damage the book but not destroy it and the information will be intact.

In order to minimize the possibility of damage from fire, or other causes, and decrease the time needed for recovery after a destructive event, all libraries need a disaster management and recovery plan. This can be an ongoing process which will include professional development following updates in technology for key staff, training for the remaining staff, checking and maintaining disaster kits, and review of the disaster plan.

In addition, fire-safety investigations are periodically carried out, especially regarding historical libraries. The **Library of Congress**, for example, experienced a year-long inspection in 2000. Before the **Congressional Accountability Act of 1995**, the Library of Congress and all Capitol Hill buildings were exempt from safety regulations.^[4] Balancing historical preservation and contemporary safety standards proves to be a difficult task for "even a 12-year rehabilitation of LC completed in 1997 did not address many fire hazards".^[5] After the Compliance Office inspection, however, the LC announced their wholehearted commitment "to achieving the highest



Birmingham Central Library destroyed by fire, 1879

	Institute of Scientific Information on Social Sciences (INION)	Moscow	Russia	2015-01-31	
	Mzuzu University Library	Mzuzu	Malawi	2015-12-18 ^[92]	In the very early hours of December 18, 2015, the Mzuzu University library caught fire. Although the library's wooden structure and carpeting spread the flames rapidly, students, staff, and firefighters on the scene attempted to rescue resources by carrying them outside of the building and away from the flames. By 5:00 A.M., however, the library collapsed, resulting in the loss of 45,000 volumes. Following the collapse, a sudden rainstorm heightened the damage by soaking materials that had been previously carried out of the burning building. ^[93]
	National Museum of Brazil	Quinta da Boa Vista in Rio de Janeiro	Brazil	2018-09-02	Not yet investigated. See National Museum of Brazil fire . Museum library was also destroyed.

See also

- [Book burning](#)
- [List of book-burning incidents](#)
- *The Enemies of Books*
- [Rongorongo § Destruction](#)
- [Library damage resulting from the 2004 Indian Ocean earthquake](#)
- [List of libraries damaged during World War II](#)
- [Planned destruction of Warsaw](#)
- [Siege of Sarajevo \(1992–1996\)](#)
- [List of destroyed heritage](#)

Further reading

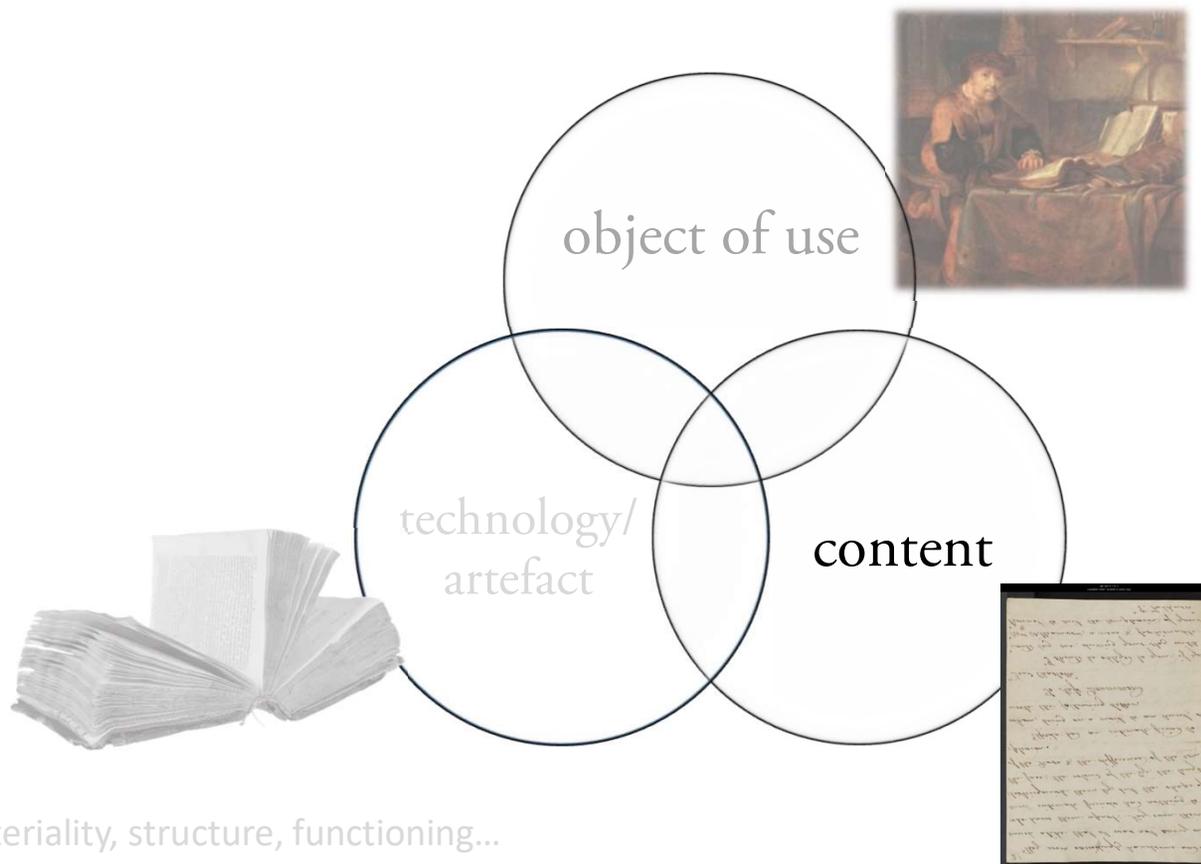
- [The Bosnian Manuscript Ingathering Project](#) – A call for Bosnian manuscripts ingathering
- Polastron, Lucien X. (2007) *Libros en Llamas: historia de la interminable destrucción de bibliotecas*. Libraria, ISBN 968-16-8398-6.^[1]
- Knuth, Rebecca. *Libricide : the regime-sponsored destruction of books and libraries in the twentieth century*. ISBN 0-275-98088-X
- Polastron, Lucien X. *Books on fire: the destruction of libraries throughout history*. ISBN 978-1-59477-167-5
- Civaliero, Edgardo. *When Memory Turns into Ashes... Memoricide During the XX Century*. DOI.
- UNESCO. [Lost Memory – Libraries and archives destroyed in the twentieth century](#)
- [Bosnian Fire: The Destruction of Books, Manuscripts, and Libraries](#). *Journal of Library Studies*. 2018. ISBN 978-1-50477-167-5. ISBN 1-50477-167-7

Dreyfuss, Emily. 2018. 'Brazil's Museum Fire Proves Cultural Memory Needs a Digital Backup'. *Wired*, 7 September 2018. <https://www.wired.com/story/brazil-museum-fire-digital-archives/>.

ON THE NIGHT of September 2, 2018, the National Museum of Brazil was destroyed by a tragic fire.¹ *Wired Magazine* commented on the fact stating that “all those artifacts could have been systematically backed up over the years with photographs, scans” and continued stating that “the academic community has not yet fully embraced the importance of archiving,”² causing an uproar on the Twittersphere because of the naïvety of such an accusation.³ The costs of mass digitization of all human culture are naturally prohibitive, given the time that would take, the funds needed for the reformatting process, and the maintenance of the digital data. Moreover, this also assumes that digitization is the creation of sorts of virtual clones of the original items that can be backed up on the cloud, like the photographs taken on mobile phones. To digitize is not to replicate an artifact in all its nature, and, as well understood by most today, digitization does not equal preservation.

Digitization does, however, capture information and create additional data sources

Campagnolo, Alberto, ed. 2020. *Book Conservation and Digitization. The Challenges of Dialogue and Collaboration.* Collection Development, Cultural Heritage, and Digital Humanities. Leeds: Arc Humanities Press, p.233.



materiality, structure, functioning...

PHYSICALITY

Physicality and Materiality

Physicality

the infinite set of physical attributes that make up the reality of the object.



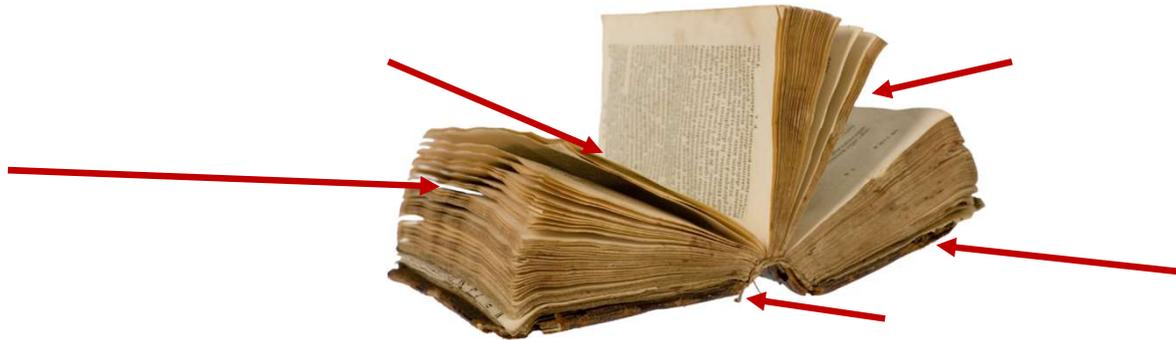
Hayles, N. Katherine. 2012. *How We Think: Digital Media and Contemporary Technogenesis*. Chicago (IL); London: University of Chicago Press.

Physicality and Materiality

Materiality

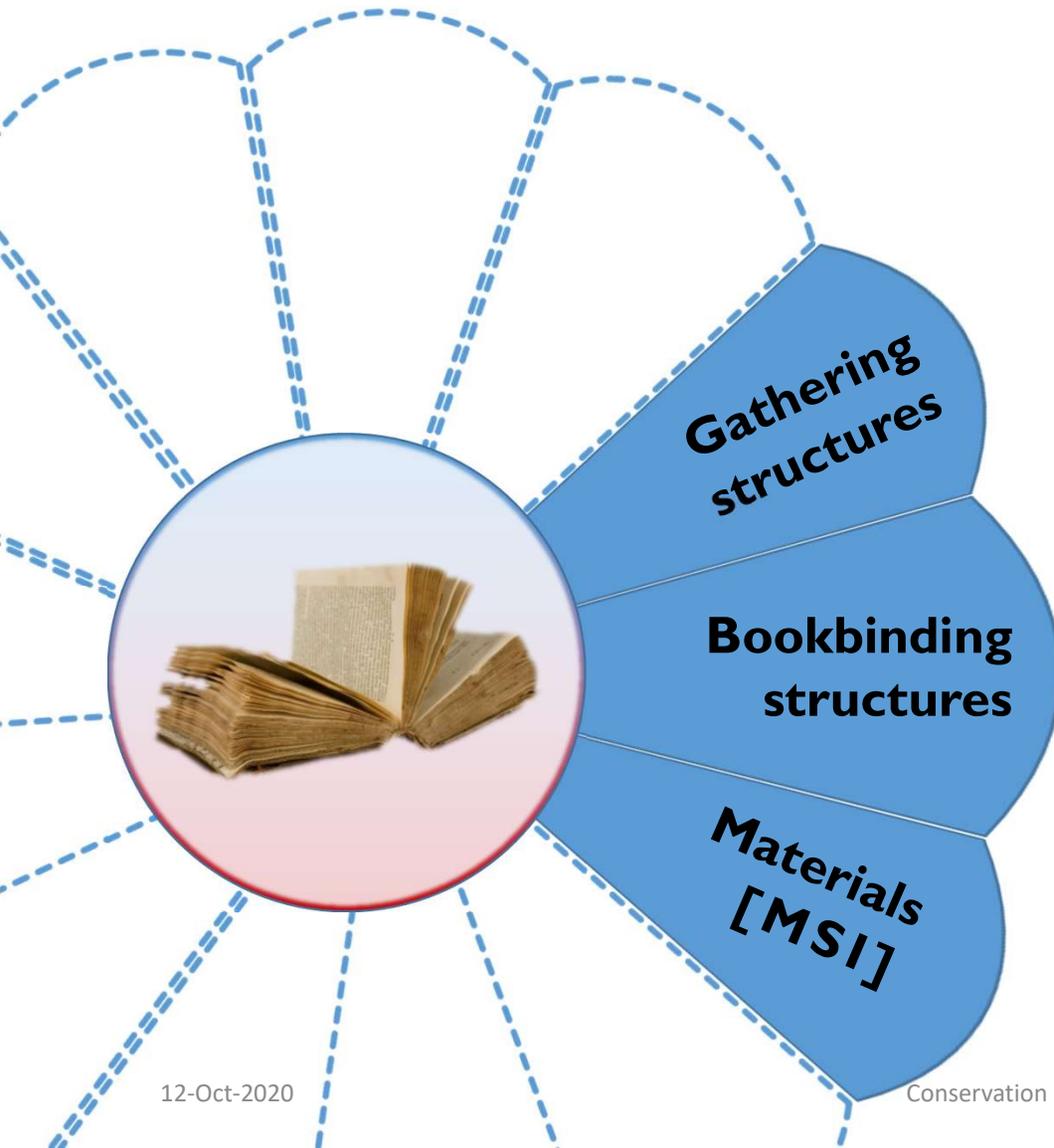
an **emergent property**

that depends on the attention of some observer who isolates as meaningful some particular attributes, setting them aside from the continuum of physicality.



Hayles, N. Katherine. 2012. *How We Think: Digital Media and Contemporary Technogenesis*. Chicago (IL); London: University of Chicago Press.

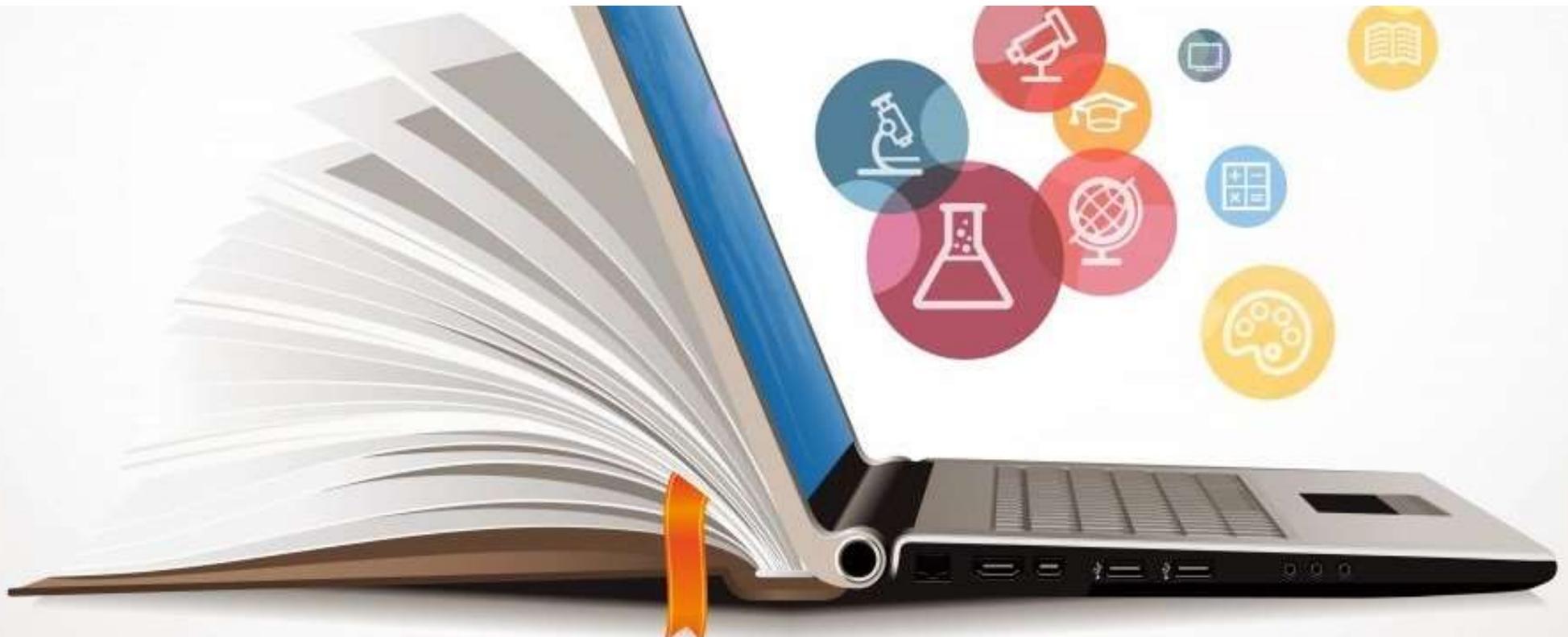
Materiality



A professional book digitization setup. Two cameras are mounted on tripods, positioned to capture the pages of an open book. Two bright lights illuminate the scene from above. The book is placed on a dark, flat surface, likely a scanning table. The background is dark, emphasizing the equipment and the book.

The digitization of books is generally understood as the capture of the page contents through photography and imaging.

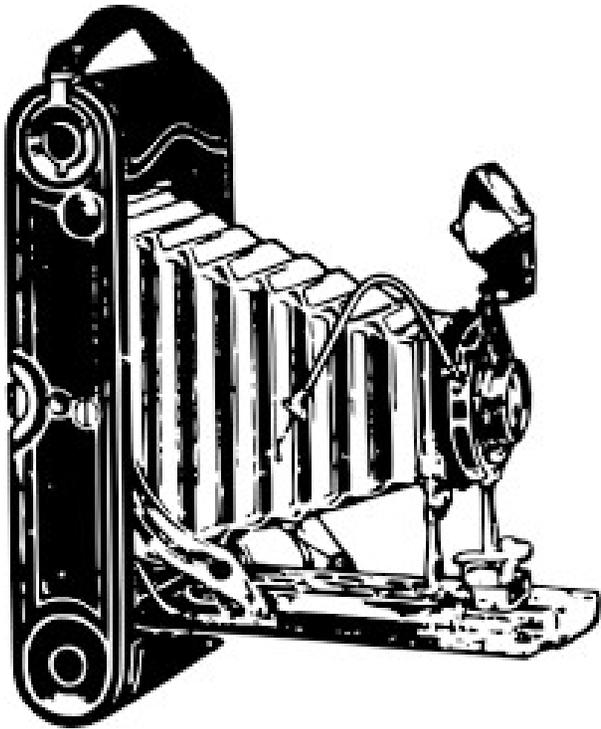
Digitization



Digitization

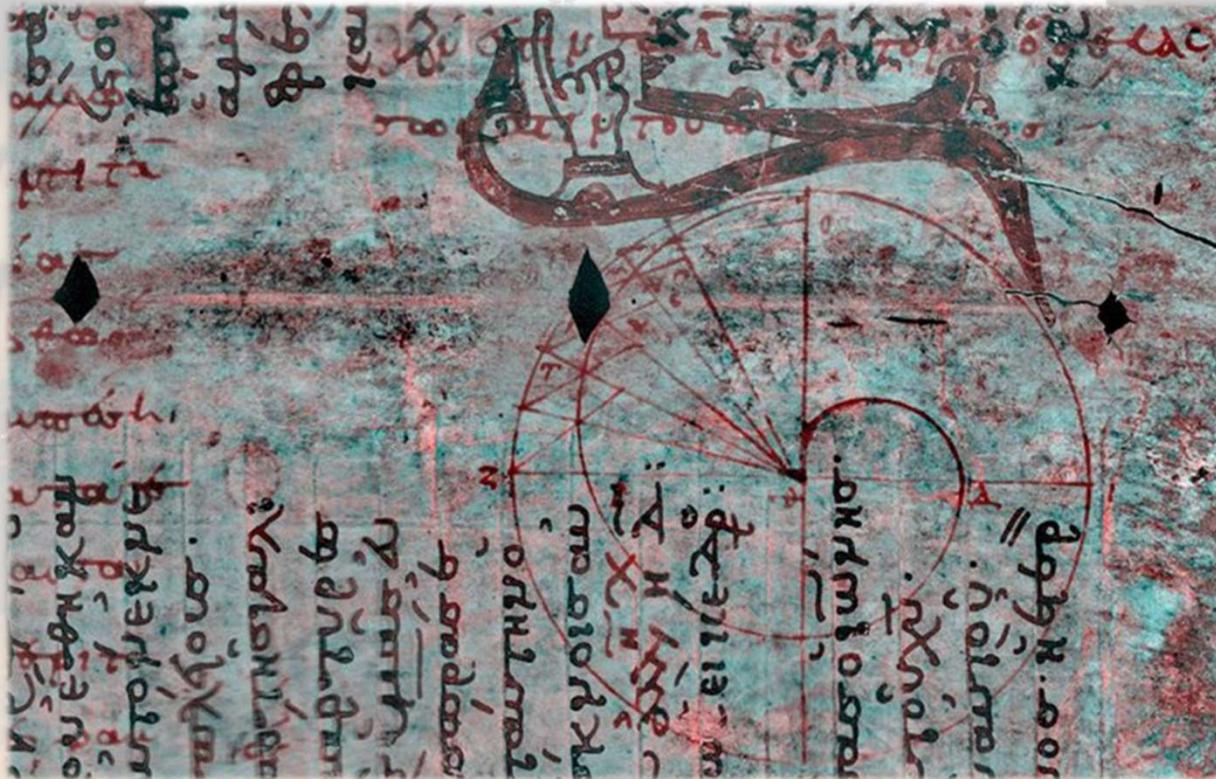
Any action directed at the computerization and transmediation of books and their features, materiality included, into digital media, and the use of such data.

Digitization: photography & imaging

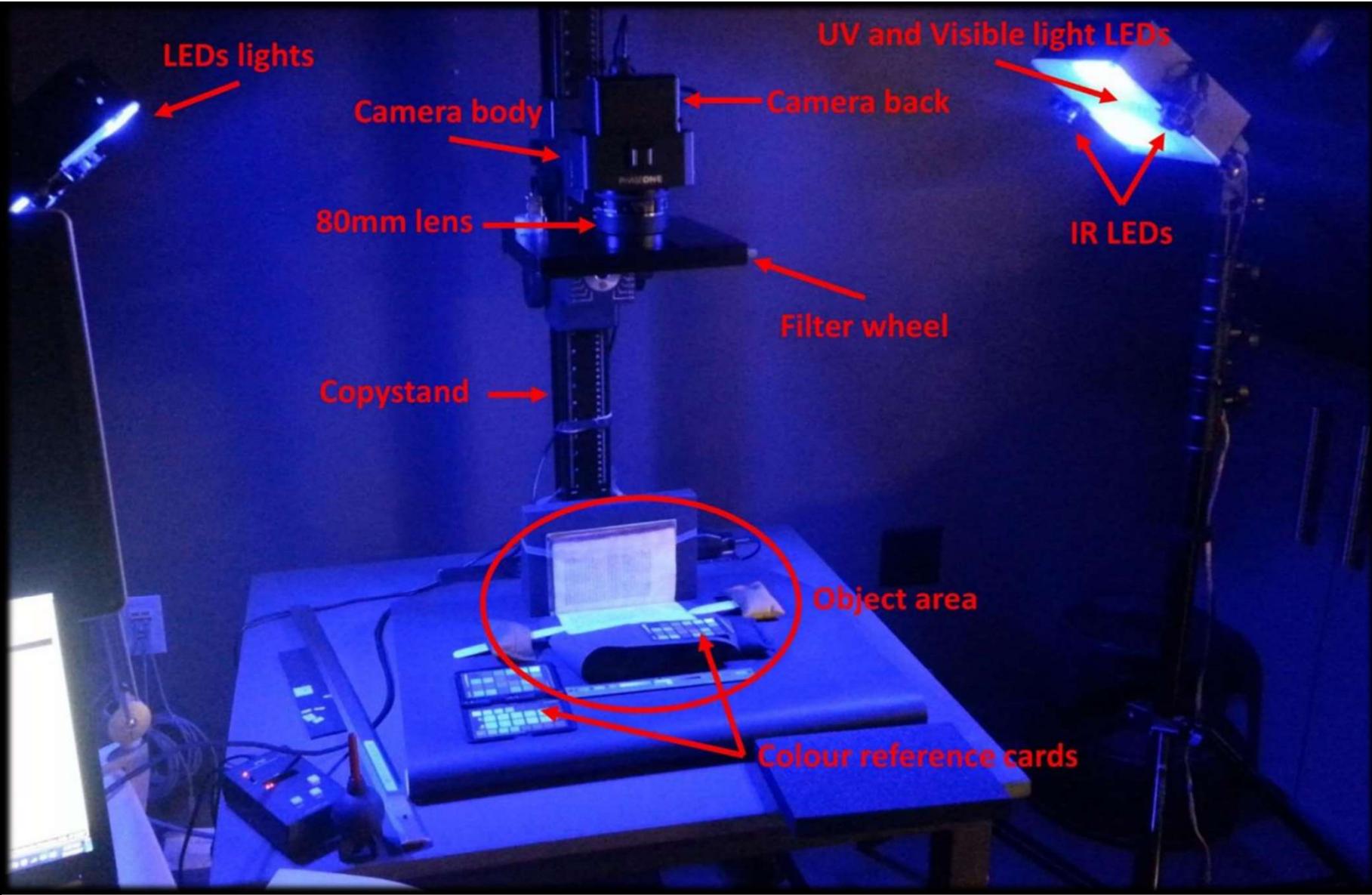


Capturing, representing and/or reproducing form and features of an object through **visual means**

Multispectral Imaging



Not just for **palimpsests**



LEDs lights

UV and Visible light LEDs

Camera body

Camera back

80mm lens

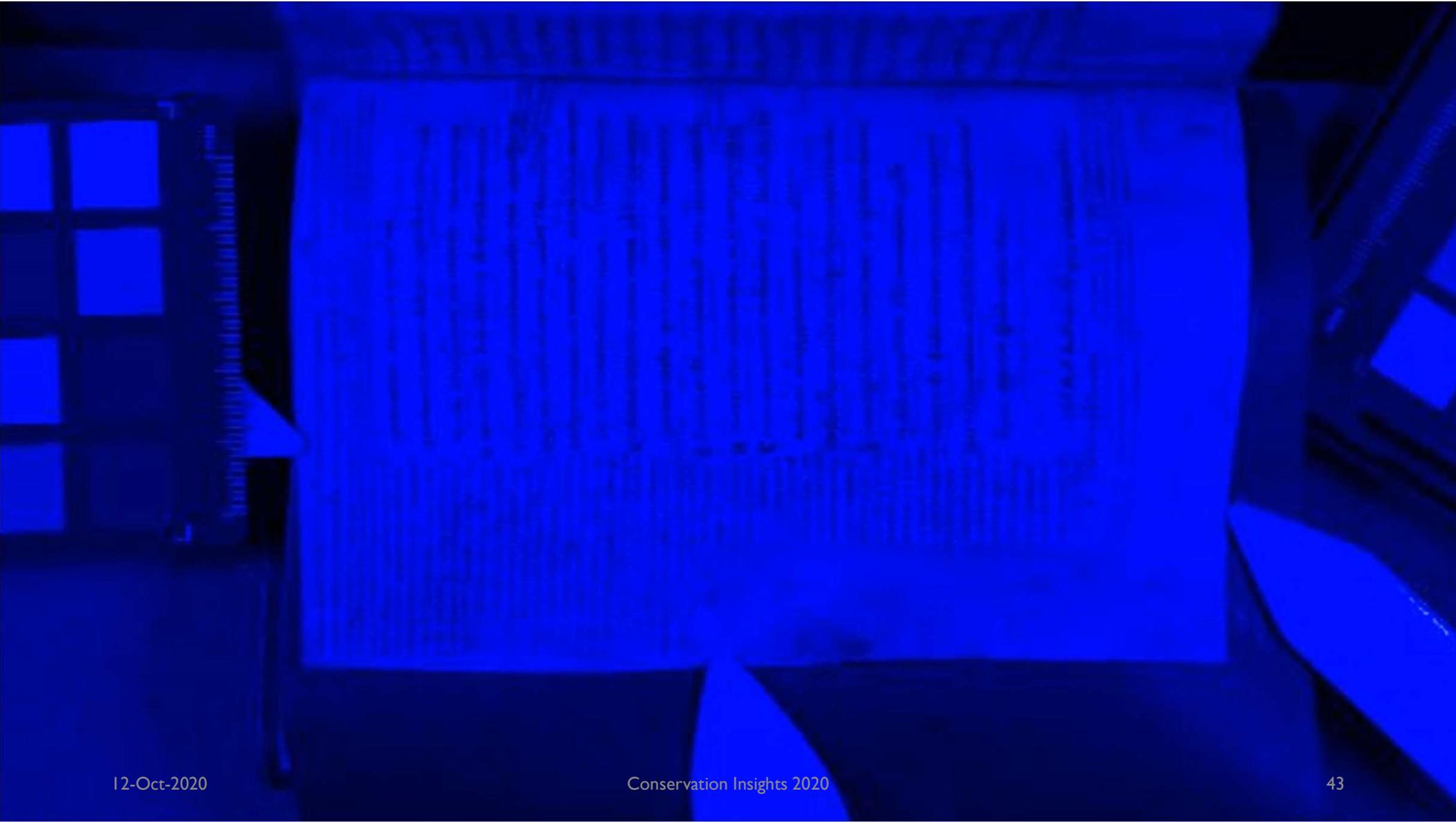
IR LEDs

Filter wheel

Copystand

Object area

Colour reference cards



In nomine dñi nři ihu xpi filij dei uiui
Incipimus p̄no lucidariū artis transmu-
tacionis metallorū formalit̄ et substantiē
Misericordias dñi i eternū cantabo i gene-
racione et generacionē annūciabo uerita-
tam tuam in ore meo.

A poꝝ multa consideracio lucidissi-
mamente ho compo: et senza alcu
uelame uerū: ch̄ questa sublime et celeste
parte de phia p̄ nři phi mossi et stimolati
del pestifero et abhominuole uicio: sing
olarte ipio de tutti uicij: danato dela sacro
matre ecc̄. zoe inuidia. confortē de spi-
ritū ifernali: ha lassato memoria di que-
sta famosa scētia. nely soy obscurissimj
et tenebrosj libri: nō secōdo ordine nāle
de amore et x̄tate: ma secōdo filo diab-
olico pieno di i finiti uelameti et i ganni.
i tanto ch̄ da quello tempo i giuſſo p̄ spa-
cio di 900 annj stetti p̄sa questa arte et scētia
intanto: ch̄ nel tempo del triūphate ipio
romano: il quale p̄ li sauij fece inuestiga-
re onq̄ secreta faculto et scētia. et
quelle forno lucidate et trouate: et i q̄l
tempo fiorere onq̄ scētia. como testifi-
cario et demonstrano tutti li autōrij: ch̄
hāno scripto dele glorie et grādeza di

et scētia di dñi
talla creatura
taoia

Japōn Bp̄ſſo Bep̄ſſo 1626 compo

In nomine dñi nři ihu xpi fili dei uiui
In primis p̄b̄s lucidatū actū rari p̄m
tationis metallica formaliter substantiatz
M̄ificordias dñi exercitū cantabo i gene.
ratione et generatione amittabo ueritatē
tam tuam in ore meo.

A por multa confiteratur lucidissī
manete ho confiso: et sergo alia
uelamē uerit: cō quiffo sublimē et celestē
pates de p̄na p̄ r̄m p̄m moisi et similit
del p̄siffo et abhominabile uicio: s̄m
olare i p̄o de r̄m uerū digno de la s̄m
marca ecc̄e: que iuitudo confite de p̄i
r̄m i f̄mali: s̄m la s̄m memoria di que
f̄m: f̄mosen iustia: neli s̄m obliuiscim
et tenebrosi libri: nō s̄m de ordina r̄m
de omare et d̄erete: ma seculo orlone r̄m
olare p̄mo di f̄mali uelamē et i ḡm
f̄mosen B̄: d̄m q̄ uellū tempo i s̄m p̄ f̄m
cau di ḡm p̄m f̄m p̄m que f̄m ore et f̄m
interuio: cō h̄m tempo s̄m t̄m p̄m p̄m
romani: il quib̄m p̄m s̄m p̄m f̄m iustia
re om̄i: secreta: facta: et f̄m f̄m
quella: seruo lucidat et t̄m: et r̄m
tempo: f̄m om̄i f̄m: cōm r̄m f̄m
cario et dem̄: r̄m: n̄m: i: h̄m: s̄m
h̄m: s̄m: d̄m: p̄m: et r̄m: d̄m: d̄m

capo Bp̄sso Pop̄tillo 1626 compio

capo Bp̄sso Pop̄tillo 1626 compio

capo Bp̄sso Pop̄tillo 1626 compio

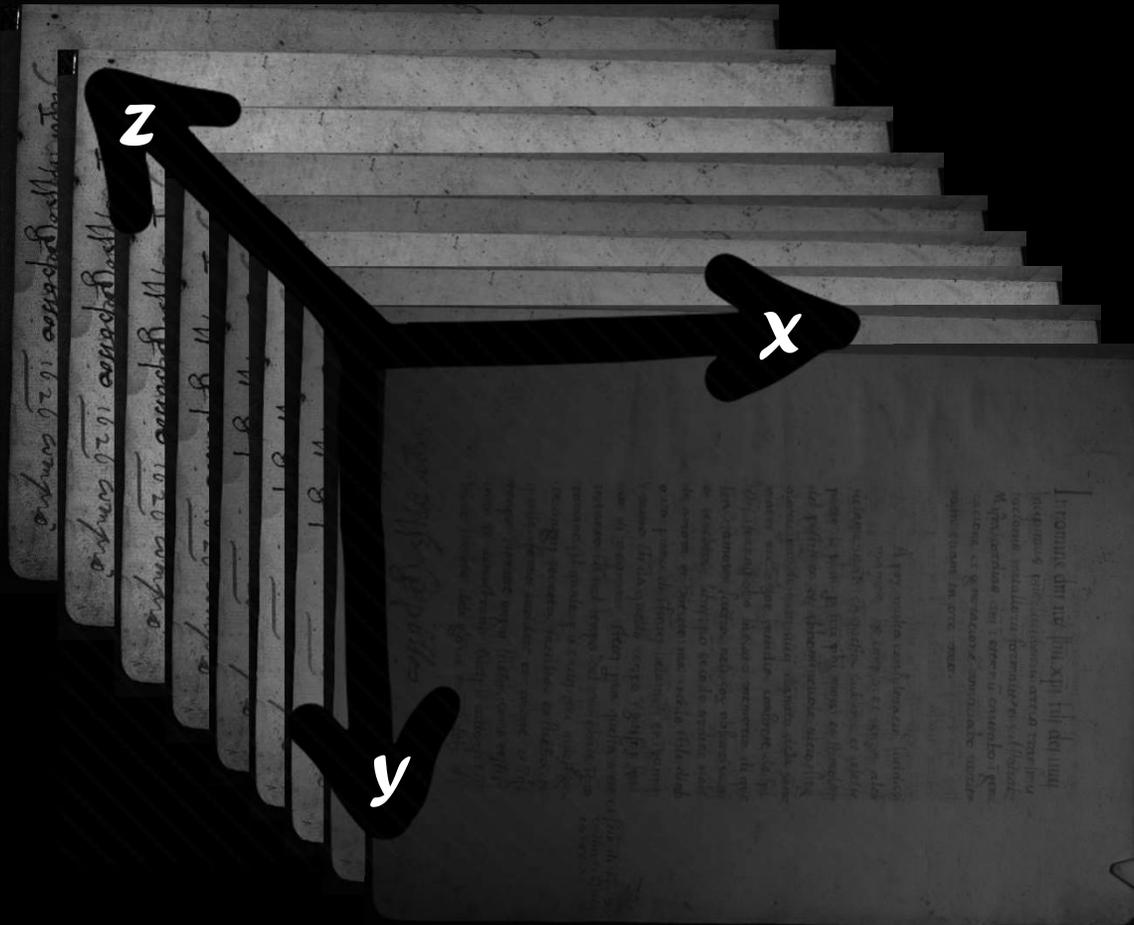
In nomine dñi nři ihu xpi filij dei uiui
inopimus pbr̄ iudicatus acta transpu
tacionis metallica formaliter substatiz
M. p̄torcalaa dñi eterna caritatis i gen
tatione et generatione amicalabo uerita
tam tuam in ore meo.

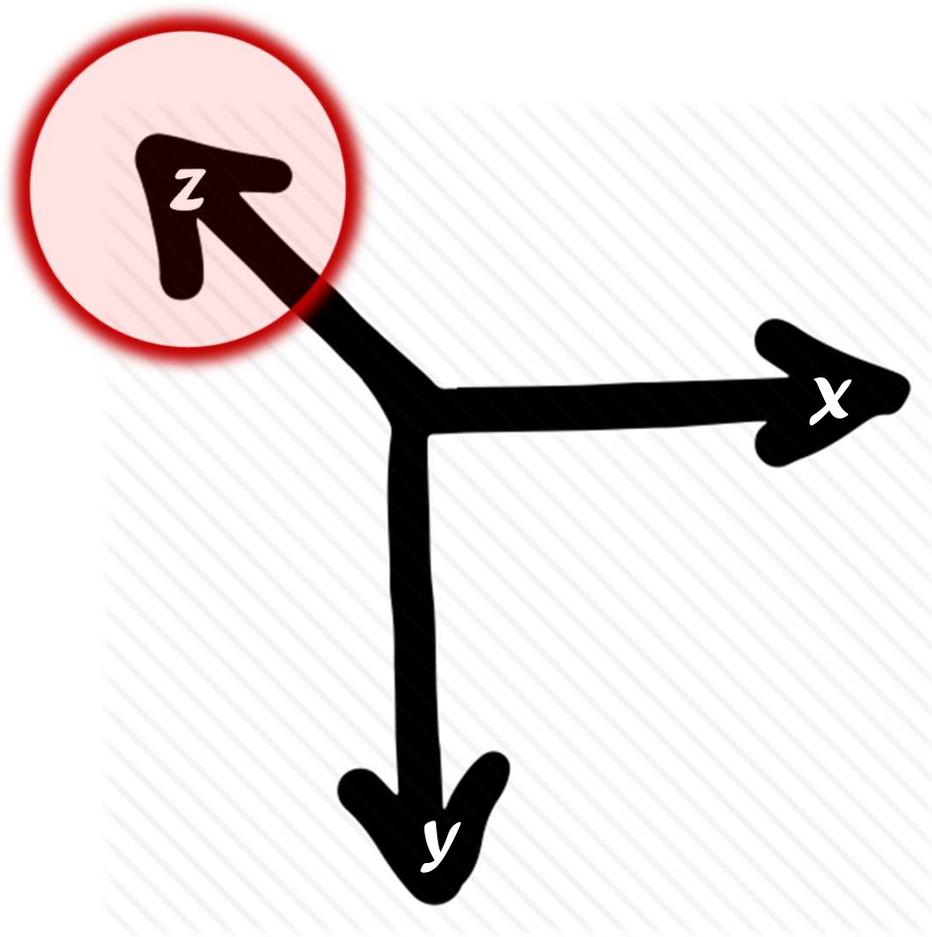
A por multa confiteraz iudiciss
manete. ho compo: et semo alit
uelamē: uerbis: et quaffo subline et adelfe
podee de p̄na p̄ tra p̄ti mossi et simolati
del p̄ffileto et abhominabile uita: sing
olara que dei uati uia: aduato adla gēn
maire eccl̄e. goe iudicia confere de pi
eti iherusal: ha lactato memoria di que
fex. famoso. factio: nati soy obfcurissimi
et tenebrosi. libri: no seculo ordina nate
de amore et dicitur: ma. saculo. fido ad ad
olam p̄mo: de finitij uelamēti et. Regni
i. xmo: ad da. quells tempo. ḡp̄p̄ p̄ p̄u
ctui di 900. anni. facti q̄na quaffa uere et
ictantio: Et nel tempo del trauiphatē iose
phano: il quallano il saui feci. inuagfice
re ongu secreta. factio: et factio. et
quells p̄mo iudicaz et troncate et. et. et
tempo. ferente ongu factio: com̄ testifi
cans et demonstratio: natiq̄ il dicitur: 57
hano i scripto de la gloria et ḡdāda: di

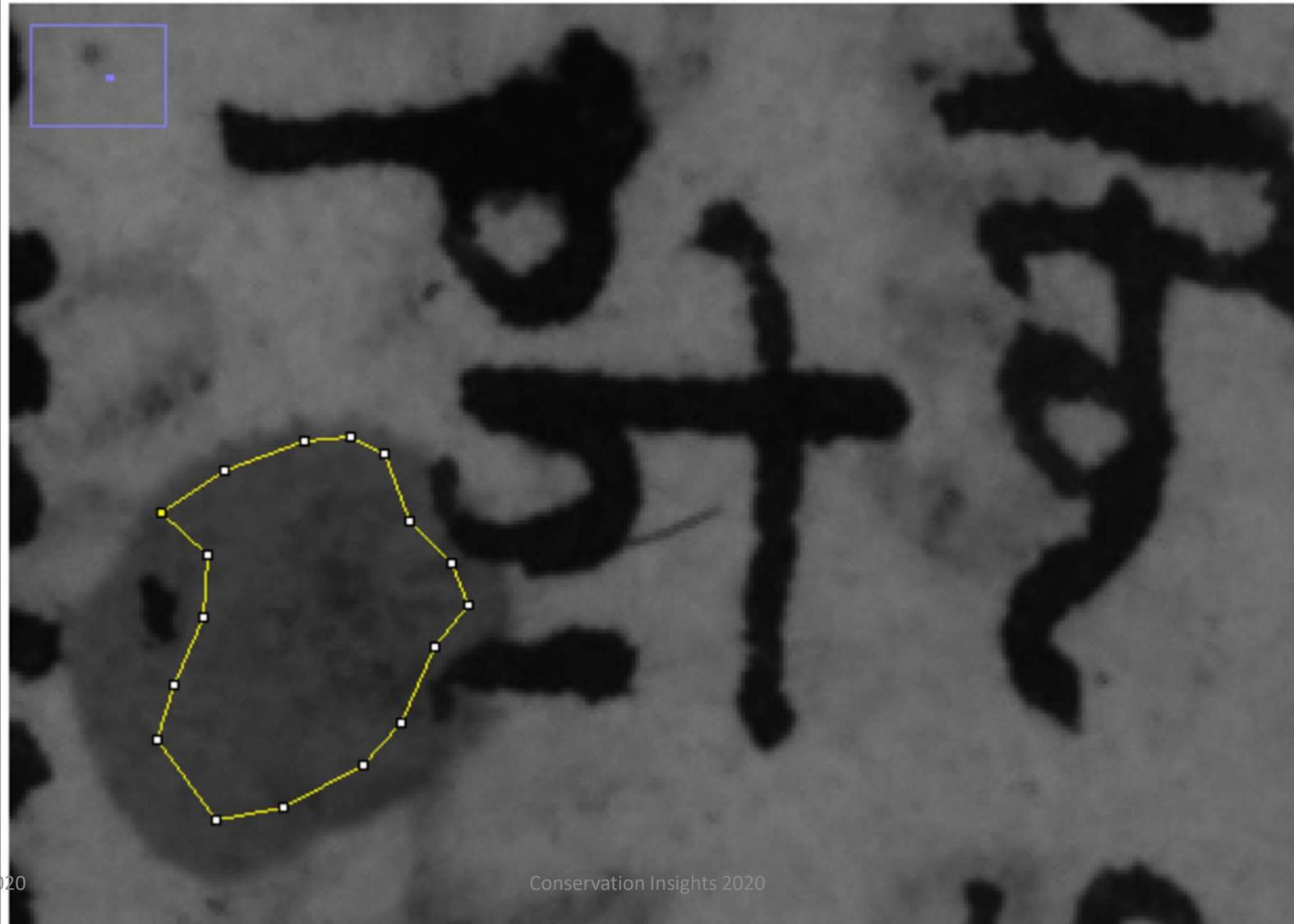
capo Bp̄sso Pp̄billo 1626 compo

capo Bp̄sso Pp̄billo 1626 compo
capo Bp̄sso Pp̄billo 1626 compo
capo Bp̄sso Pp̄billo 1626 compo
capo Bp̄sso Pp̄billo 1626 compo
capo Bp̄sso Pp̄billo 1626 compo

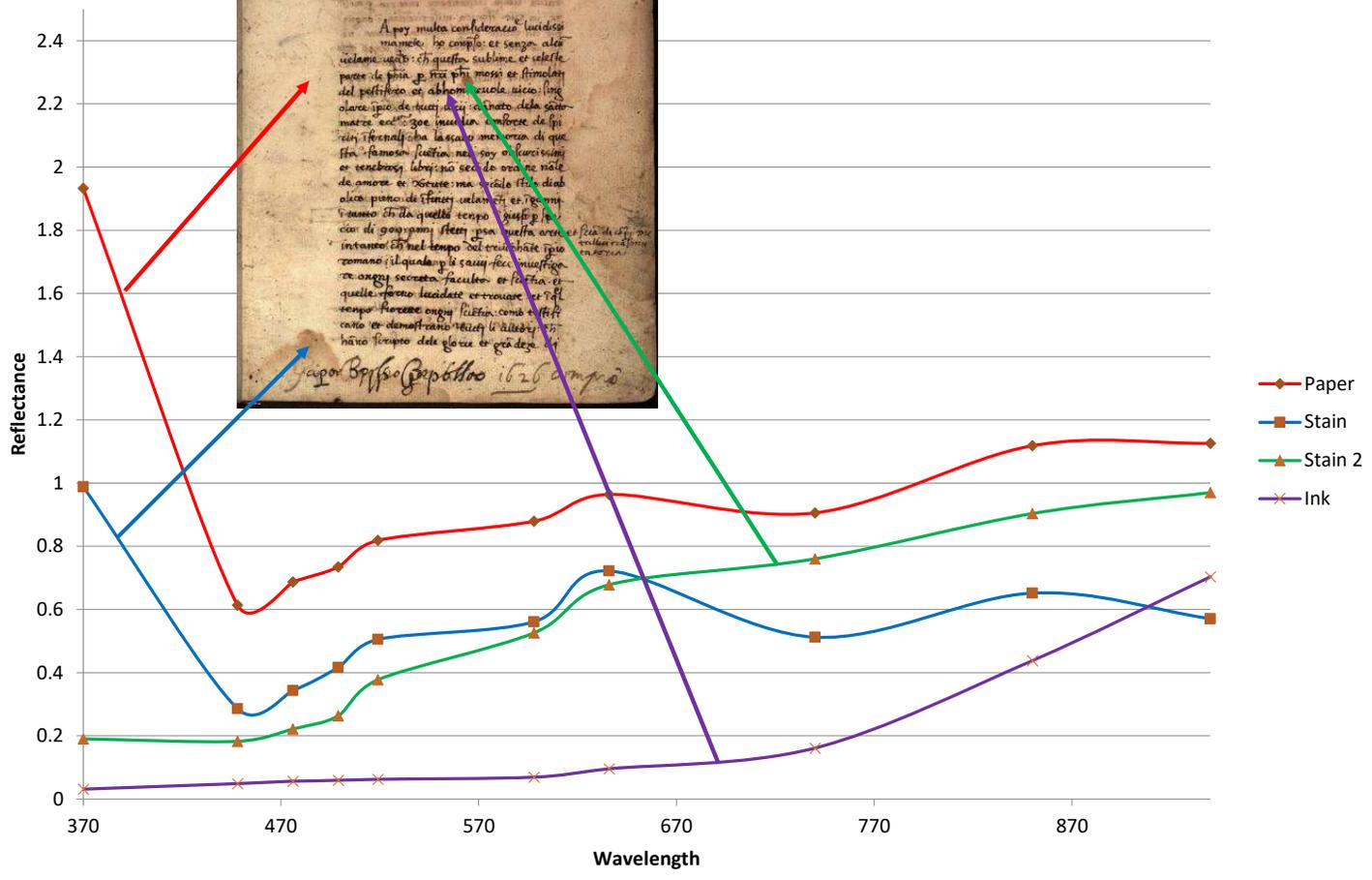
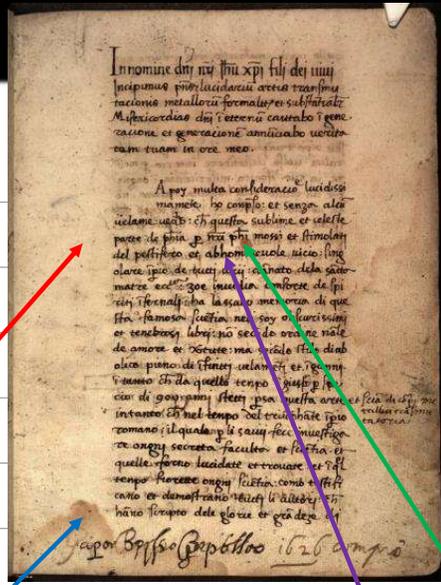






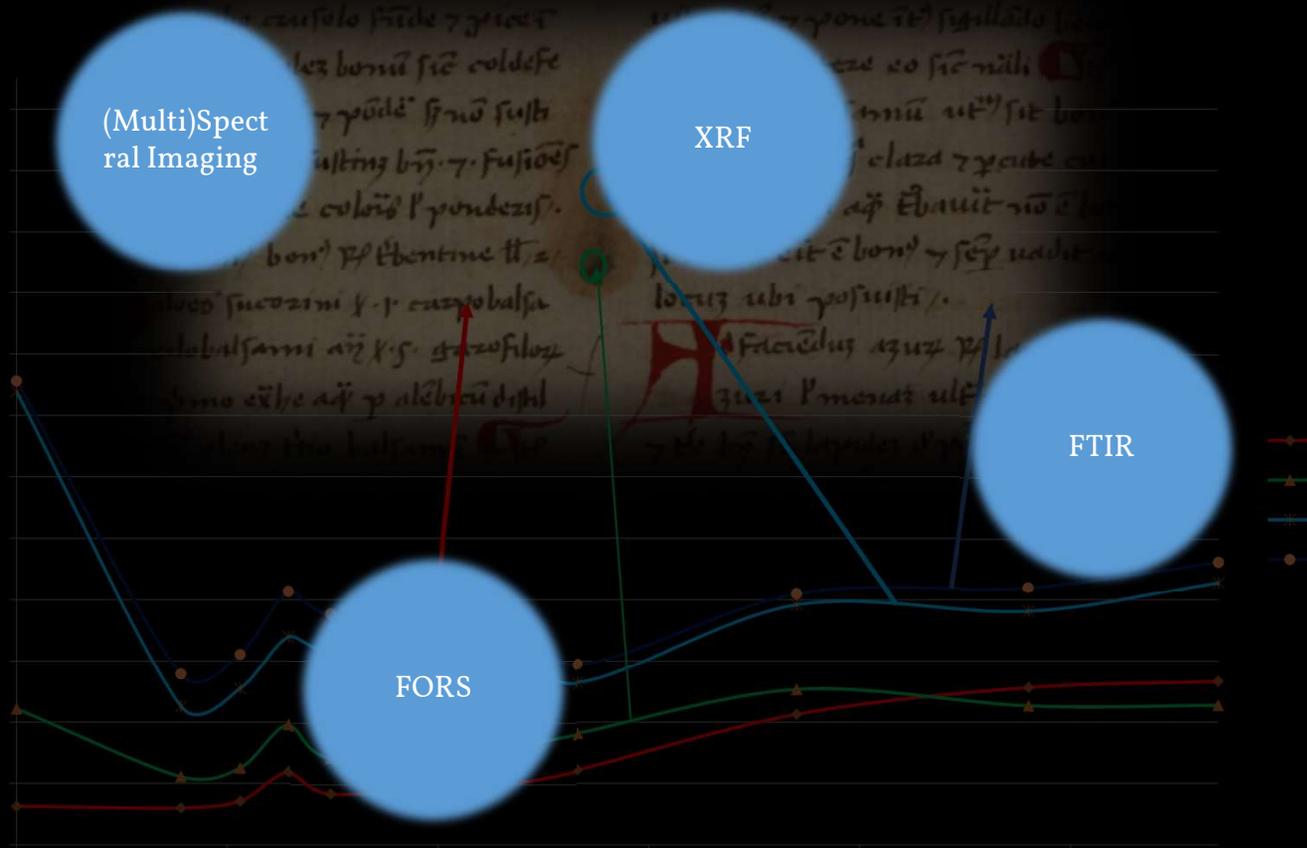


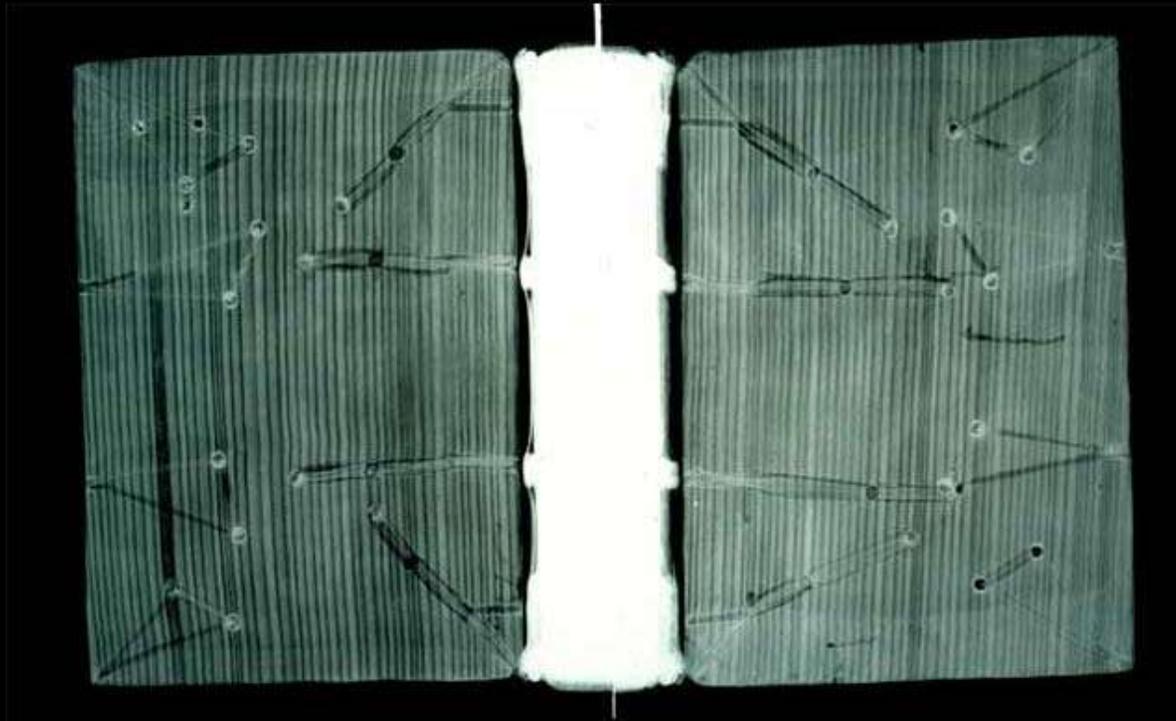
Mer 8 - 1r





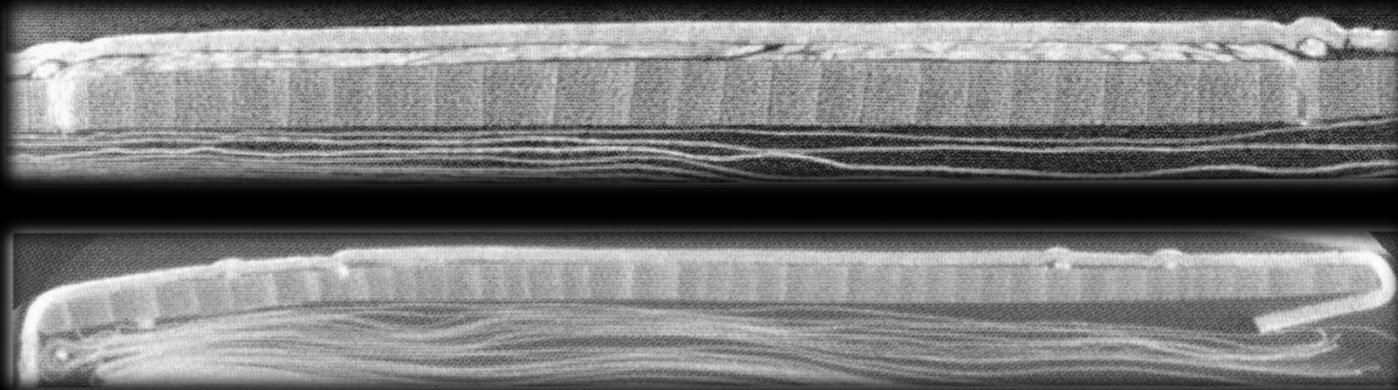
Campagnolo, Alberto, Erin Connelly, and Heather Wacha. 'Labeculae Vivae: Building a Reference Library of Stains for Medieval and Early Modern Manuscripts'. *Manuscript Studies: A Journal of the Schoenberg Institute for Manuscript Studies* 4, no. 2 (5 November 2019): 401–16.





An x-ray of a pair of Anglo-Saxon book boards reversed & reused by the Normans, note the different lacing paths
(Clarkson, Christopher. 1996. 'Further Studies in Anglos-Saxon and Norman Bookbinding: Board Attachment Methods Re-Examined'. In *Roger Powell, the Compleat Binder: Liber Amicorum*, edited by John L Sharpe, 14:154–214. Bibliologia. Turnhout: Brepols).

CT-Scans



CT-scan, left board, St. Cuthbert Gospel,
(Pickwood, Nicholas. 2015. 'Binding'. In *The St Cuthbert Gospel: Studies on the Insular Manuscript of the Gospel of John (BL, Additional MS 89000)*, edited by Claire Breay and Bernard Meehan, 41–63. London: The British Library, pp. 50-51.)

Beyond direct-acquisition digitization

Digitization: Untransferable features

Some features cannot be digitized through direct acquisition.

Campagnolo, Alberto. *Book Conservation and Digitization. The Challenges of Dialogue and Collaboration*. Collection Development, Cultural Heritage, and Digital Humanities. Leeds: Arc Humanities Press, 2020, pp.2, 33, 74-82.

Examples of advanced digitization of traditionally *untransferable* features

Feature	Digitization methods
Waviness of parchment/paper	Raking light photography, RTI, photogrammetry, 3D scanning
Indentations and protuberances (pen, scoring tool, stamps, etc.)	Raking light photography, RTI, photogrammetry, 3D scanning, high-resolution digital microscopy. Manual rubbings (then scanned).
Watermarks, chain and laid lines	Gravell's contact method: light-sensitive Dupont Dylux® Proofing Paper and ultraviolet light; beta radiography; electron transmission radiography; transmitted light (traditional and multispectral photography). Hand tracing (then scanned).
Scratching marks on parchment	Transmitted light photography.
Inks and pigments	Multispectral imaging. Scientific analyses (XRF, FTIR, FORS, etc.). Metadata.
Stains and surface dirt	Densitometer, multispectral imaging. Scientific analyses (XRF, FTIR, FORS, etc.). Metadata.
Paper odor	Scientific analyses (gas chromatography, mass spectrometer, etc.). Metadata.
Material origin (parchment species, DNA, ect.)	Biomolecular techniques of proteomics and genomics. Scientific analyses. Metadata.
Blotting sand	Mineralogy and geological analyses. Metadata.
Book boards and lacing patterns	X-ray photography. Metadata.
Sewing patterns, gathering and binding structures	Micro CT scans (experimental applications). Metadata.
Sewing threads	RTI (microdome). Metadata.

Campagnolo, Alberto. 'Conservation and Digitization: A Difficult Balance?' In *Book Conservation and Digitization. The Challenges of Dialogue and Collaboration*, edited by Alberto Campagnolo, 49–82. Collection Development, Cultural Heritage, and Digital Humanities. Leeds: Arc Humanities Press, 2020, table 5, p.77.

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Inks and pigments	Multispectral imaging. Scientific analyses (XRF, FTIR, FORS, etc.). Metadata.
Stains and surface dirt	Densitometer, multispectral imaging. Scientific analyses (XRF, FTIR, FORS, etc.). Metadata.
Paper odor	Scientific analyses (gas chromatography, mass spectrometer, etc.). Metadata.
Material origin (parchment species, DNA, ect.)	Biomolecular techniques of proteomics and genomics. Scientific analyses. Metadata.
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Campagnolo, Alberto. 'Conservation and Digitization: A Difficult Balance?' In *Book Conservation and Digitization. The Challenges of Dialogue and Collaboration*, edited by Alberto Campagnolo, 49–82. Collection Development, Cultural Heritage, and Digital Humanities. Leeds: Arc Humanities Press, 2020, table 5, p.77.

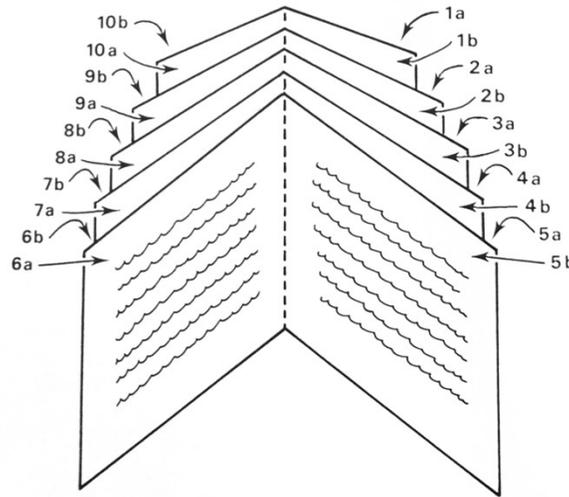
Digitization: Untransferable features

Some features cannot be digitized through direct acquisition.

Models and **descriptive metadata** are necessary steps to computerize these “**untransferable**” features.

Campagnolo, Alberto. *Book Conservation and Digitization. The Challenges of Dialogue and Collaboration*. Collection Development, Cultural Heritage, and Digital Humanities. Leeds: Arc Humanities Press, 2020, pp.2, 33, 74-82.

GATHERING / QUIRE



A group of folded or single leaves which can be used either singly or with other gatherings to create a textblock. <http://w3id.org/lob/concept/2286>



The gathering is the ultimate working unit of the codex.

(Andrist, Patrick, Paul Canart, and Marilena Maniaci. 2013. *La syntaxe du codex: essai de codicologie structurale*. Bibliologia 34. Turnhout: Brepols, p. 50)

Floating pages



collation formulas

- **i, 1-9 (8), 10 (6), 11-20 (8), 21 (7), i**
- **I-III⁸, IV¹⁰, V-IX⁸**
- **III⁶ + 4 IV³⁸ + (IV+1)⁴⁷**
- **₁III^{f.6}, ₂₋₅4.IV^{f.38}, ₆(IV+[1]^{f.43})^{f.4}**
- **IV(32), IV-1(40), 9 IV(120), IV-4**
- **1⁶, 2-5⁸, 6⁸+4***
- **6 (6), 4 × 8 (38), 9 (8+1: 1 leaf [=f.43]:47)**
- **1-4⁸, 5², 6⁴⁻¹, 7-10¹⁰**
- **₁₋₇7.IV^{f.1-23,23bis,24-55}+₈(IV[+1^{f.58}])^{f.64}+
₉₋₁₁3.IV^{f.88}+₁₂(IV-pos.4^{=f.92}[+1^{f.92}])^{f.96}
+₁₃₋₂₂10.IV^{f.176}+₂₃(4/3)^{f.183}**



VIS@OLL

the manuscript collation project

Dot Porter

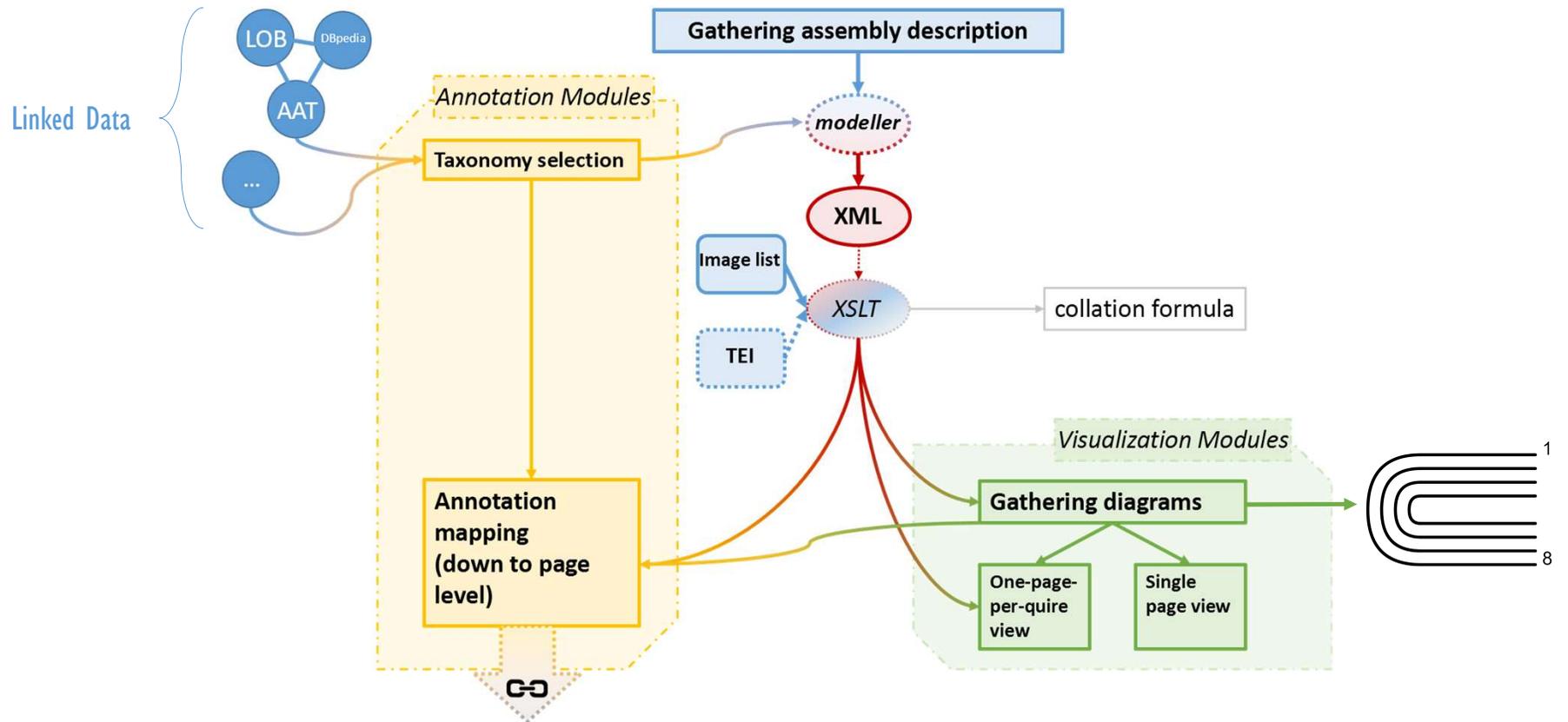


The Schoenberg Institute
for Manuscript Studies

UNIVERSITY of PENNSYLVANIA LIBRARIES

Conservation Insights 2020

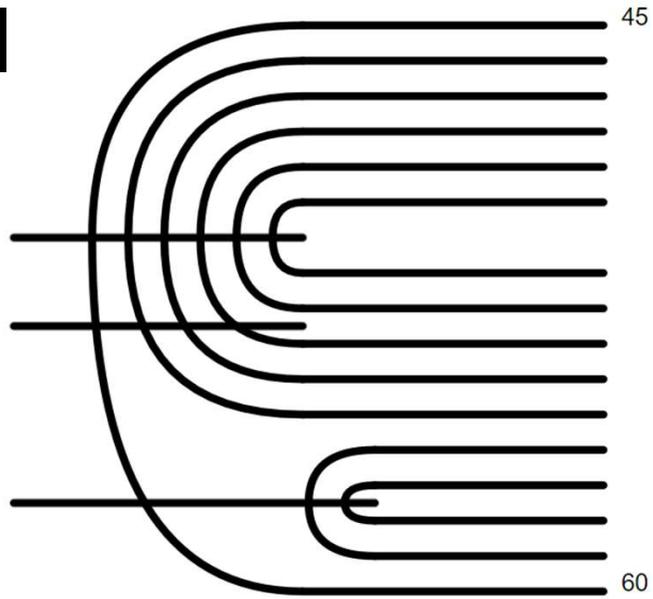
VisColl Data Ecosystem



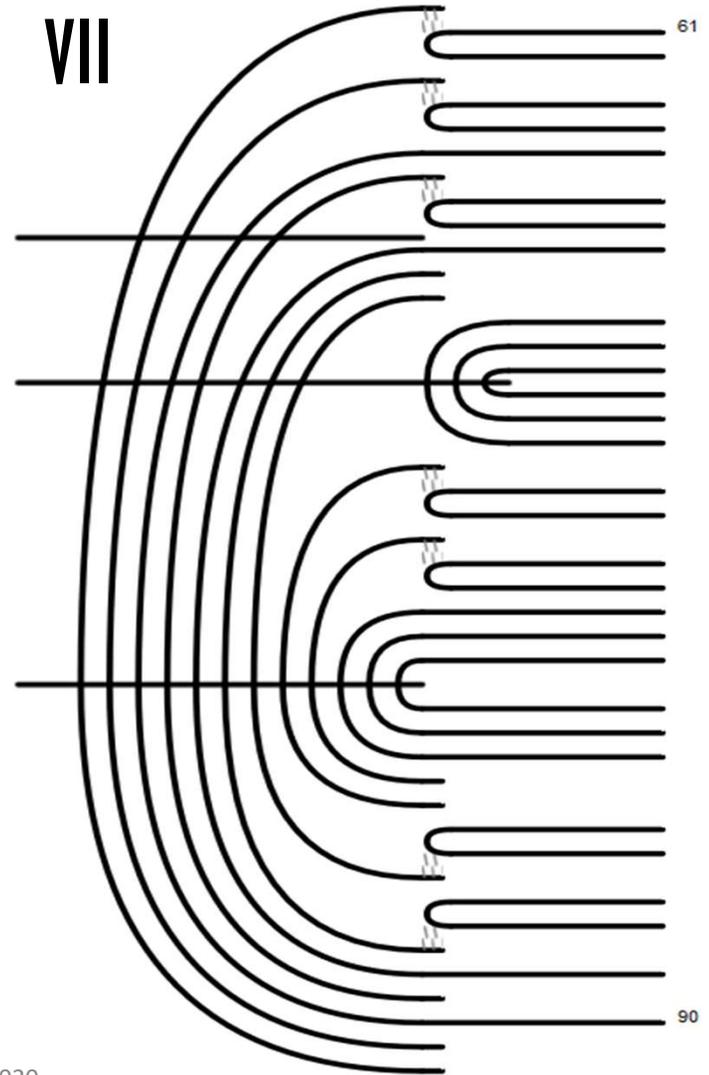
viscoll textblock leaf folioNumber

```
39 <quire xml:id="id-BNFFrançais2810_q32" certainty="1" n="32">32</quire>
40 <quire xml:id="id-BNFFrançais2810_q33" certainty="1" n="33">33</quire>
41 <quire xml:id="id-BNFFrançais2810_q34" certainty="1" n="34">34</quire>
42 <quire xml:id="id-BNFFrançais2810_q35" certainty="1" n="35">35</quire>
43 <quire xml:id="id-BNFFrançais2810_q36" certainty="1" n="36">36</quire>
44 <quire xml:id="id-BNFFrançais2810_q37" certainty="1" n="37">37</quire>
45 <quire xml:id="id-BNFFrançais2810_q38" certainty="1" n="38">38</quire>
46 <quire xml:id="id-BNFFrançais2810_q39" certainty="1" n="39">39</quire>
47 <quire xml:id="id-BNFFrançais2810_q40" certainty="1" n="40">40</quire>
48 <quire xml:id="id-BNFFrançais2810_q41" certainty="1" n="41">41</quire>
49 </quires>
50 <!-- Gathering 1-->
51 ▾ <leaf xml:id="id-BNFFrançais2810_q1-1">
52   <folioNumber certainty="1" val="1">pd(1)</folioNumber>
53   <mode certainty="1" val="original"/>
54 ▾ <q target="#id-BNFFrançais2810_q1" position="1" n="1">
55   <conjoin certainty="1" target="#id-BNFFrançais2810_q1-4"/>
56 </q>
57 </leaf>
58 ▾ <leaf xml:id="id-BNFFrançais2810_q1-2">
59   <folioNumber certainty="1" val="2">i(1)</folioNumber>
60   <mode certainty="1" val="original"/>
61 ▾ <q target="#id-BNFFrançais2810_q1" position="2" n="1">
62   <conjoin certainty="1" target="#id-BNFFrançais2810_q1-3"/>
63 </q>
```

VI



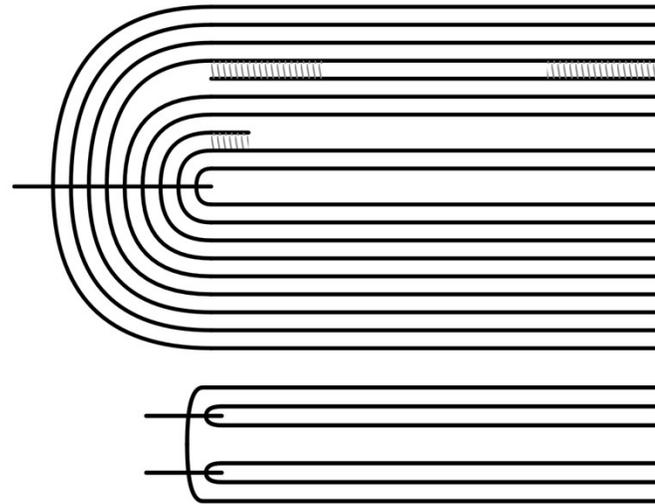
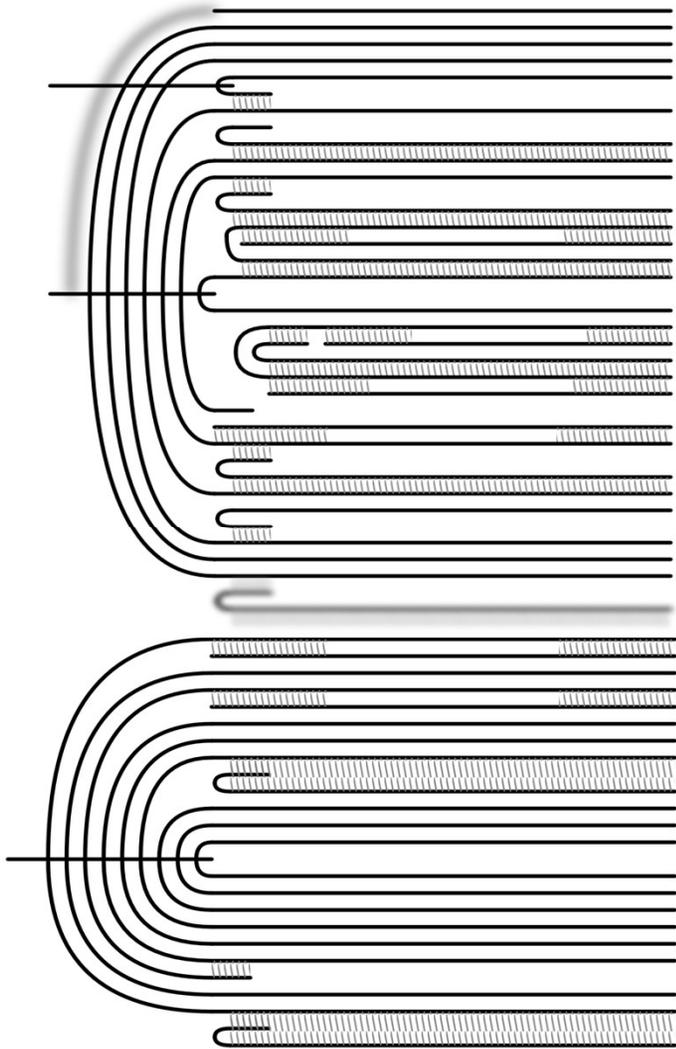
VII



AUTOMATED DIAGRAMS



Marciana, Gr.VII, 22 (=1466)



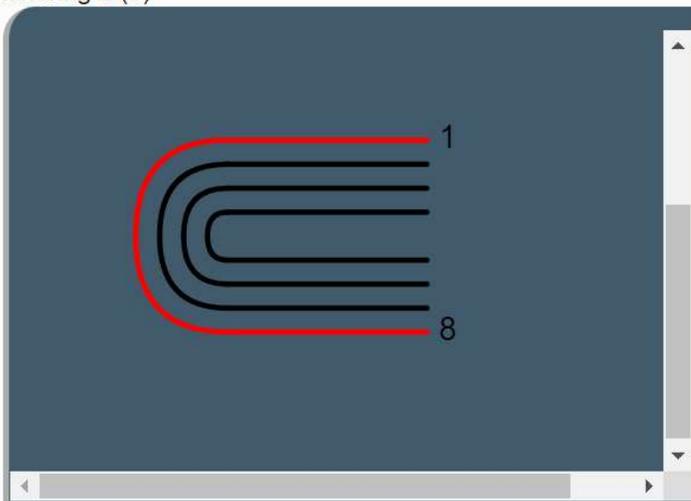
AUTOMATED DIAGRAMS



(BAV, Ferr.208)



Gathering 2 (8)



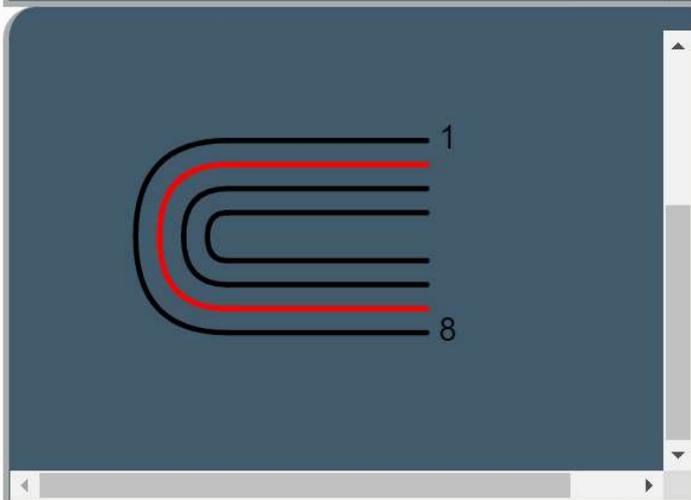
1v

8r



8v

1r



2v

7r



7v

2r

digital Galen Syriac palimpsest

<http://digitalgalen.net/>

Quire 1 (8) Show All Hide All

Quire 1, Bifolium Vat.sir. 647, f. 38, 6

Quire 1, Bifolium Vat.sir. 647, f. 38, 6
Vat.sir. 647, f. 38



6



Vat.sir. 647, f. 38r(v) 6r v Vat.sir. 647, f. 38v(r)

Quire 1, Bifolium Vat.sir. 647, f. 39, 5



VISCOLL

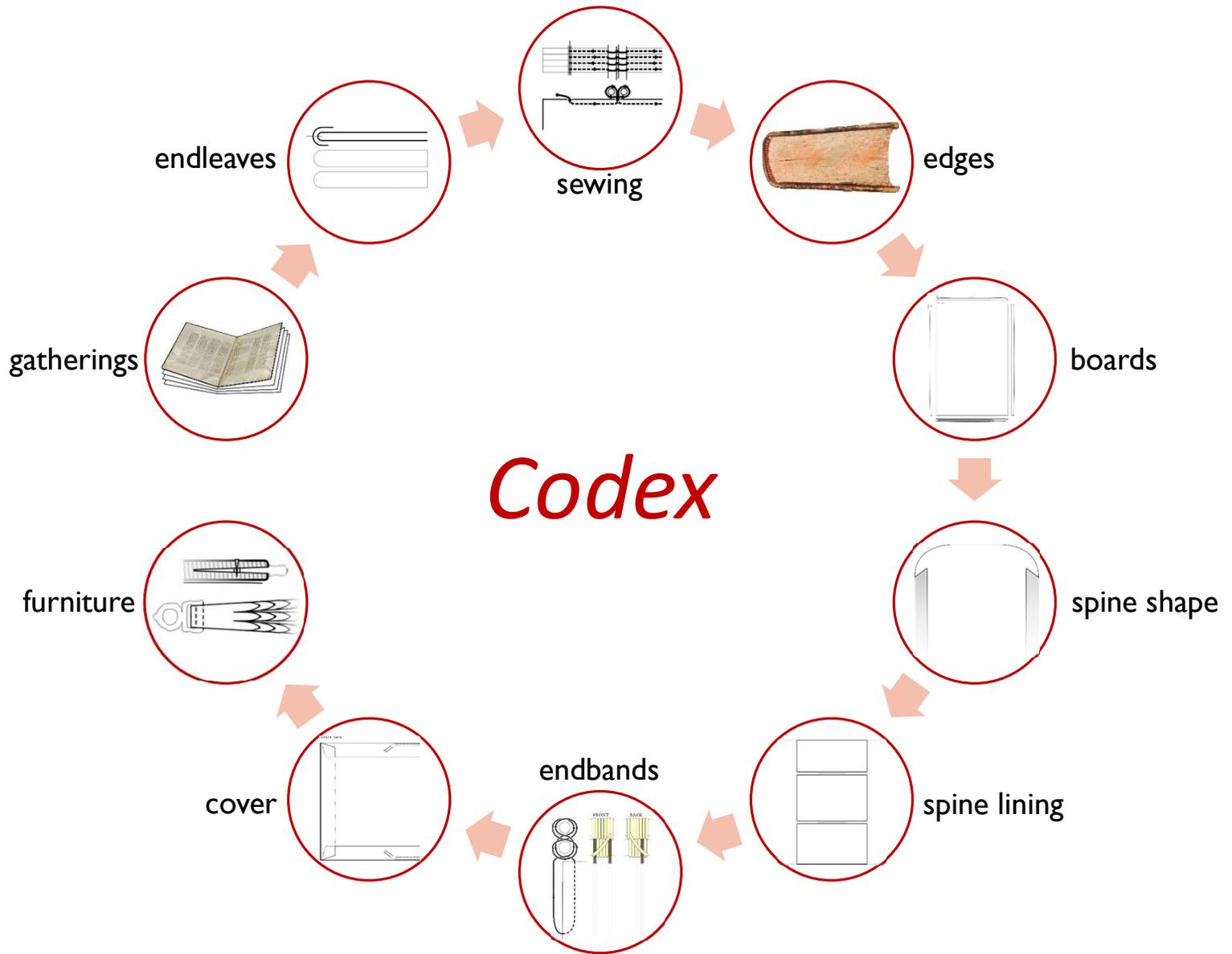
VisColl: Modeling and Visualizing the Physical Construction of Codex Manuscripts

Home About Collation How To Publications/Presentations

VisColl (**Collation Visualization**) is a system for modeling and visualizing the physical collation of medieval manuscript codices. The VisColl development team is centered at the [Schoenberg Institute for Manuscript Studies \(SIMS\)](#) at the University of Pennsylvania Libraries and is made possible through the support of SIMS. We are currently working on VisColl 2.0, to launch in Fall 2020.



<https://viscoll.org/>



LIGATUS

“...in which the study of the **history of bookbinding** and the **conservation of books** is combined with research into modern **digital data analysis** and **collection management tools...**”

<http://www.ligatus.org.uk/>



St. Catherine's Monastery Library on Mount Sinai, Egypt Manuscript and Printed book Survey

Ligatus Research Centre Printed book Survey

Electronic forms

```
<book>
  ...
  <sewing>
    <numberOfStations>6</numberOfStations>
    <status>
      <firstSewing/>
    </status>
    <type>
      <bypass/>
    </type>
    <stations>
      <station>
        <measurement>12</measurement>
        <group>
          <current/>
        </group>
      </station>
    </stations>
  </sewing>
  ...
</book>
```

eXtensible Markup Language
(XML) schema



Survey schemas

We have chosen to use a free software utility for the printed books assessment. This is called JAXFront and can be downloaded from [here](#) (Java-renderer, requires registration and login). JAXFront uses two files: one to find out the information we need to record (.xsd file, the schema) and another one to find out how the fields are to be presented on the screen (.xui file). So when you run JAXFront, click on the "open" button and choose both. JAXFront requires Java, which your computer might have installed already. If not, you can download it from the Sun Microsystems website (www.sun.com).

The third file (.nls) in the list below holds the labels of the fields in English (the system allows multilingual labels through multiple such files). Download it and keep it next to the other two.

A good academic reference to use for the work which produced these files is [here](#).



Bookbinding documentation schema and form by [Ligatus](#) is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License](#).

Attachment	Size
basic-1.8.xui	1.16 MB
basic-1.8_en.nls	131.01 KB
basic-1.8.xsd	432.73 KB
drawings-form.pdf	290.41 KB

Project:

[Printed books assessment](#)

<http://www.ligatus.org.uk/stcatherines/node/1052>

Language of Bindings



This project grew out of our work in the [monastery of Saint Catherine](#), as it became increasingly evident that the existing terms used to describe bindings were not adequate for our purposes. We subsequently received AHRC funding to create a [glossary of bookbinding terms](#), which was to appear first in English and Greek, with the intention of adding other languages whenever this might be possible. Its origin in a Greek library limited its usefulness for books from other areas of the world, and the Language of Bindings project was initiated to extend its range across Europe with a new data structure based on Semantic Web technologies and a much more ambitious aim of creating a reference tool holding details and pictures of bindings from 19 European countries, dating from the ninth to the nineteenth century. While we continue to seek funding for this project, we received a further AHRC grant to pursue the thesaurus element of the Language of Bindings project and the creation of a set of guidelines for the description of historic bookbindings (in preparation, under the title Coming to Terms).

[Visit project website](#)



Language of bindings - Thesaurus

<https://www.ligatus.org.uk/lob/>



Alphabetical Hierarchy Search Help Log in

cases

Preferred label:
cases

Alternative label:
wrappers

Hierarchy:

JSON , XML

The Language of Bindings Thesaurus is made available under the Open Data Commons Attribution License:
<http://opendatacommons.org/licenses/by/1.0>

Covers which are complete in themselves before they are attached to bookblocks. They may or may not have boards and other components in addition to a cover but no part of them can have been attached to the bookblock separately before the cover was attached. In almost all recorded examples, the spine of the case is not adhered to the spine of the bookblock, but is left instead with a natural hollow back. Cases can be attached to the bookblock by adhesive only, primary or secondary tackets, longstitch bindings and bindings with external sewing supports. In one instance, a case made of cartonnage has been recorded adhered to the boards of an inboard binding. This as yet unique example should therefore be described as a primary cover on an inboard binding.

Broader concept:
covers

Top concept:
objects

Concept uri:
<http://w3id.org/lob/concept/1242>

Concept uri:
<http://w3id.org/lob/concept/1242>



Linked Conservation Data

Home	Resources >	Meetings >	Consortium	Introduction to Linked Data >	Updates	
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Linked Conservation Data

Linked Conservation Data is a Network of partners working on improving access of conservation documentation records. The aim of the Network is to discuss and report on ways that conservation documentation can be disseminated and re-used more effectively through Linked Data.

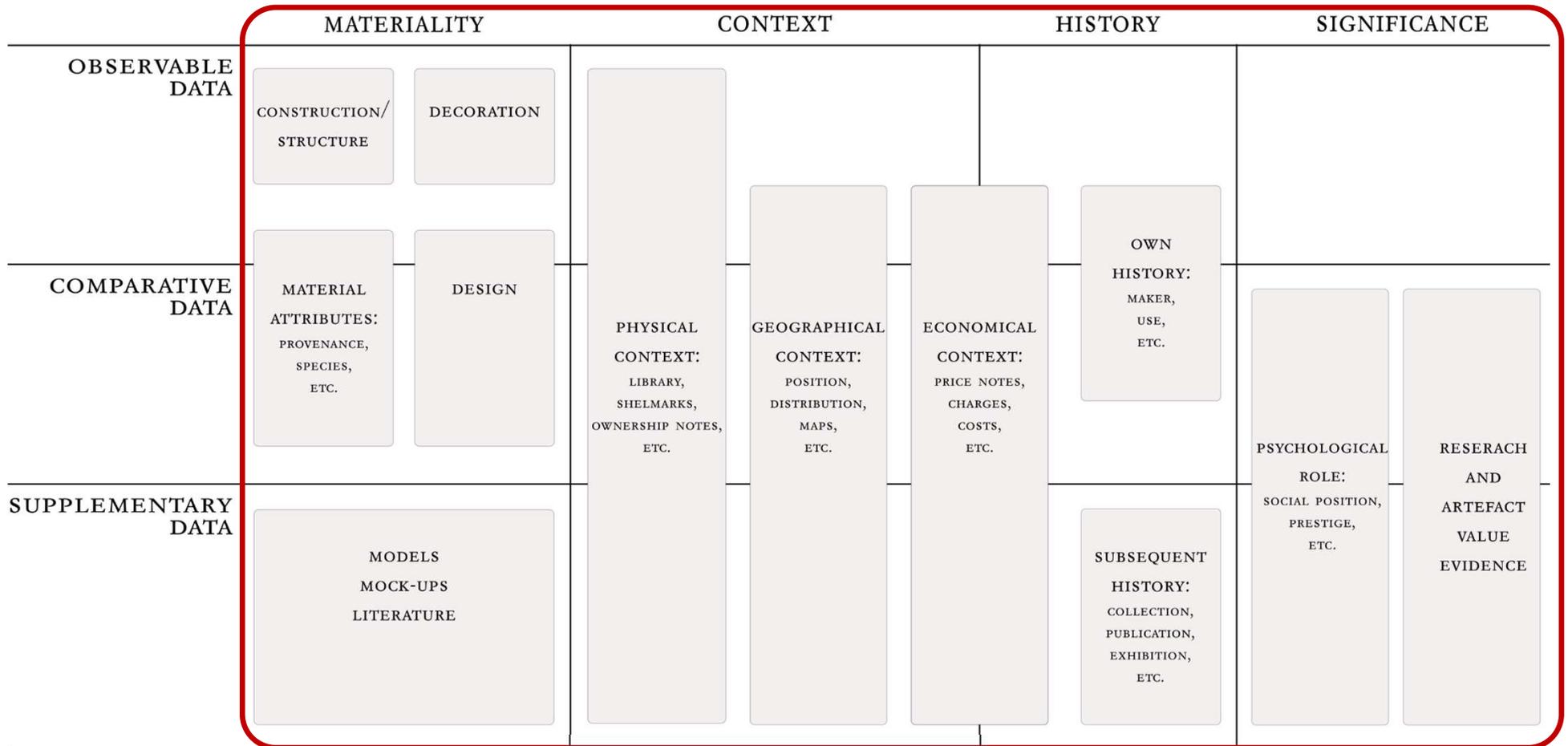
Project objectives

We have identified three areas of development for the network's attention: Terminology, Modelling, and Dissemination.

- **Terminology:** In the Semantic Web, communicating by using a variety of terminology traditions is important for disambiguation. The Network will assess the suitability of existing vocabularies in conservation and identify the amount of work needed both in terms of coverage and in terms of formatting to improve them for use in Linked Data applications. The relevant Linked Data standard for vocabularies is [SKOS](#).
- **Modelling:** In the Semantic Web, the type of each published record needs to be explicitly declared. For example, machines need to be able to handle records of type *condition assessment* and records of type *treatment proposal* differently. A standard which provides different types of records (classes) is the [CIDOC-CRM](#). The Network will assess the suitability of the CRM and its extensions for conservation.
- **Dissemination:** The Network will share best practices for producing Linked Data from conservation documentation and report on the readiness and capacity of existing software to host and share Linked Data.

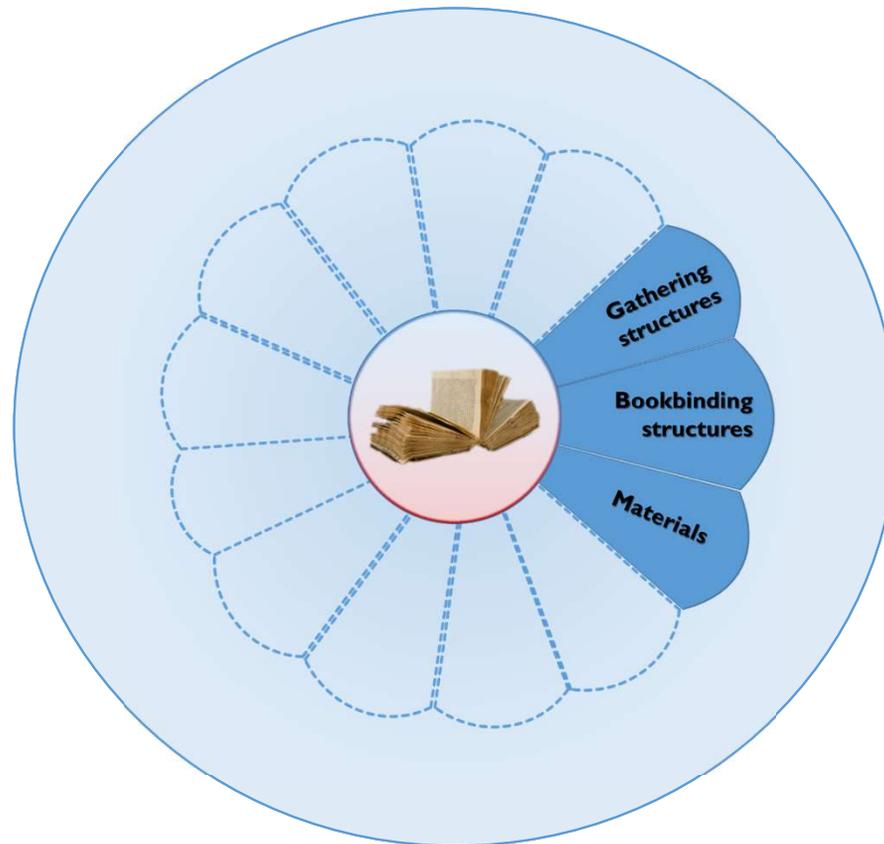
<https://www.ligatus.org.uk/lcd/>

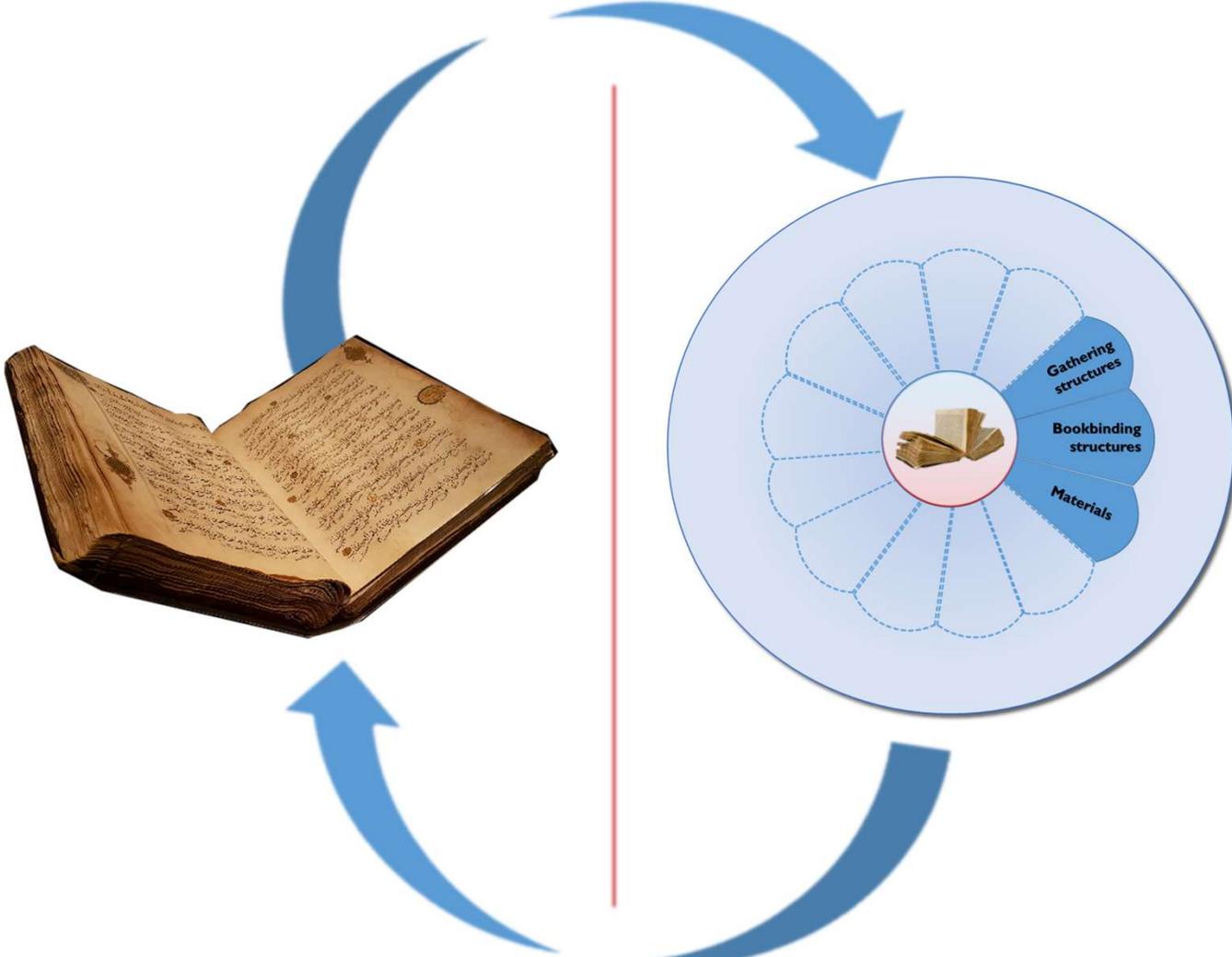
Model for the History of the Book (as an object)



INTERPRETATION

Digital Codicology & Digital Cultural Objects





Use your book conservators...



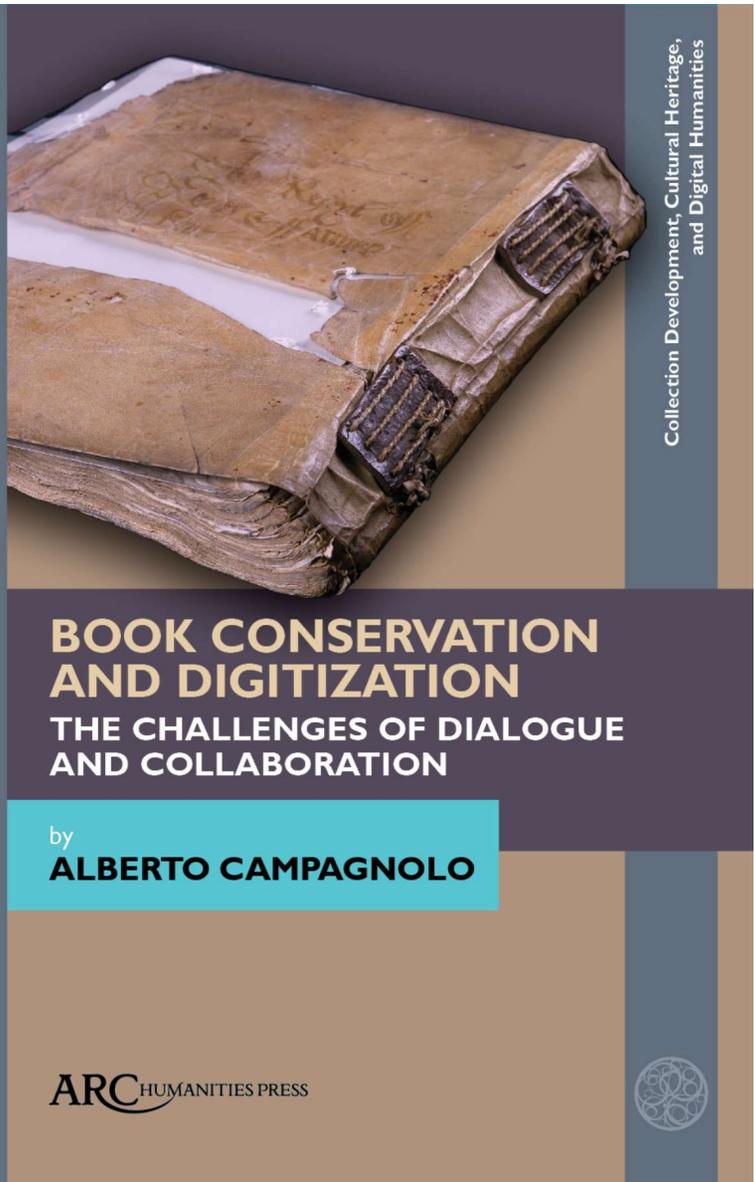
...and let your children play with the books!



THE BOOKBINDER'S.

The children have called in to see the bookbinder's shop, and are looking at a map, which he has varnished for them. Arthur is telling his little sister he thinks he should like to be a bookbinder, it seems such a nice business.

(Oscar Pletsch, *Child-Land: Picture-Pages For The Little Ones*, London: S. W. Partridge & Co., 1873)



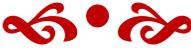
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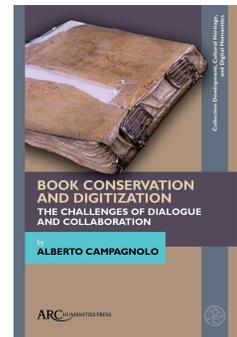
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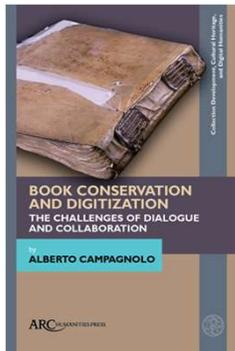
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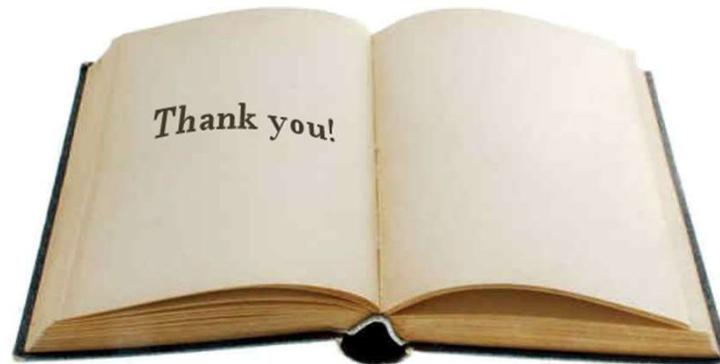
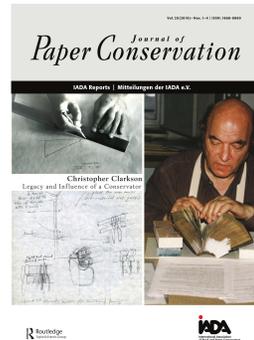
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