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level of precision. Further insights will certainly come as more scholars make use of DASH.

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Cramer, Tom, Michael A. Keller, Paola Manoni, Cesare Pasini, and Ambrogio M. Piazzoni, project leads.  
Thematic Pathways on the Web: IIIF Annotations of Manuscripts from the Vatican Collections. Other.  

Thematic Pathways on the Web is a web platform, interface, and resource developed by a Mellon-funded, three-year collaboration between the Vatican Library (BAV – Italian, Biblioteca Apostolica Vatican) and Stanford University Libraries. The online resource is freely accessible and capitalizes on the immense manuscript heritage preserved in the Vatican Library’s collections. At its technological core, the project relies on the sophisticated features of the International Image Interoperability Framework (IIIF), a set of open standards devised to help memory institutions share their digitized collections through a reliable framework that provides important features, such as, among others, high-resolution deep zoom and annotation capabilities. In particular, the Vatican project relies on the Mirador Image Viewer functionalities and IIIF’s annotation level. This resource is innovative in its scope and use of the technology and establishes a new standard in the employment of the IIIF framework and tools for the creation of articulated resources for the perusal and study of manuscripts.

The Vatican Library’s collections comprise more than eighty thousand manuscripts, of which, also thanks to the support of NTT Data, almost a fourth has, to date, already been digitized and published online on the BAV’s Digital Library service using native IIIF infrastructures. The Vatican Library is, in fact, one of the founding partners of the IIIF Consortium (IIIF-C). The project aimed at pushing the boundaries of IIIF standards and technologies for the benefit of scholars of humanities in the digital age, promoting new perspectives
to manuscript studies employing original web communication practices. It strives to do so by enriching the delivery of the Library’s digitized materials with the insertion and supplement of exemplary series of scholarly analysis through curated narrations and annotations developed by those who know the material best: BAV’s staff members. Among BAV’s digitized treasures, a selection of about 250 manuscripts constituted the basis for the development of the new web platform and its digital pathways, resulting in the production of more than twenty-six thousand annotations over the three years of the project.

To date, the project has developed five distinct narratives, or, indeed, pathways through—but also leading to—the original materials of the Vatican Library. Two illustrate the evolution of Greek and Latin scripts from antiquity to the Renaissance, constituting a valuable resource for palaeographic studies. Another, Latin Classics, showcases the evolution and transmission of classical works through examples of “illustrated” manuscripts containing classical Latin texts from the Library’s collections. Twenty-four manuscripts from the rich collection of more than 550 Vatican palimpsests are the focus of the fourth pathway. The fifth, The Library of a “Humanist Prince,” brings the reader to the magnificent manuscripts of the library of the Duke of Urbino, Federico da Montefeltro (1422–82), almost entirely preserved by the Vatican Library since 1657. Finally, through the Mellon Project Overview pages, all the digitized manuscripts selected as part of the thematic pathways are presented to the readers. The interface also provides keyword and faceted search capabilities to browse through the manuscripts and their related content (metadata and annotations), and pre-categorized galleries that permit browsing the collections by time, space, or subject groupings.

The Greek and Latin palaeographic resources present an introduction to the reading of ancient texts and what it means to study them. The Latin Palaeography pathway is particularly didascalic in its settings and useful as an introduction to palaeography for complete beginners, explaining and defining new or unusual terms in detail, and guiding the reader in learning palaeographic methods of looking at texts and their features to read, but also to place and date them. The pathway takes the reader from the Roman book capital to humanistic scripts and the setting of the first movable types for printing books. One can also choose to browse the selected manuscripts based on their scripts, going straight to their digitized pages and skipping the introductory essays. These pathways thus provide valuable materials for students of Latin palaeography
in general who can try their hand at reading directly from the sources, still guided by the script classification. The browsing filter by annotations also offers a useful way to access texts with particular features or scripts directly, providing help for unsupervised study settings. The essays of the Greek Palaeography pathway offer a more classical, but well-developed, introduction to the subject from majuscule to sixteenth-century bookhands. The resource flows from example to example, presenting the reader with a quasi-book-like experience (yet enhanced by the digital tools and perusal of the high-definition images of the manuscripts); this is particularly evident in the presentation of the link to the following section at the end of the text, not present in other pathways. The essays also offer information on book structures and on how manuscripts are referred to in the literature. Browsing by annotations, once again, provides direct access to transcriptions and highlighted features of interest, essential study tools for the more advanced reader.

The digital doorway offered to the superb collection of the Vatican Palimpsests results in a unique resource as it presents us with rich and mostly unexplored materials. This pathway, more than any other, will likely impact scholarship in the future, opening the way to more research on such a remarkable collection of ancient materials. In addition, as clearly stated in the introduction to the section, it is expected and encouraged that future collaborative projects may stem from this to reconnect digitally the palimpsests scattered throughout libraries worldwide—a task that is well suited to the IIIF technologies at the core of this project. The section, nonetheless, is enjoyable also for the uninitiated, as it begins with the basics, introducing what palimpsests are and how they are created from recycled materials, their impact on textual studies, and the means, both traditional and modern, that have been and are employed to recover the undertext, with particular focus on multispectral imaging (and how the Mirador viewer could be employed to improve reading of the layered texts). Also significant are the essays on Angelo Mai, Father Franz Ehrle, and the conservation issues brought to light by the use of harsh chemicals to recover the precious undertexts.

The digital presentation of Federico da Montefeltro’s library presents itself as a walk in a museum gallery, offering visitors a detailed tour of these luxuriously illuminated manuscripts (and, not insignificantly, incunabula, as revealed in one of the essays) with contextual information and a close look at meaningful details. The annotations here focus prominently on the illuminations
and other figurative themes, offering a stunning view of the splendour of the collection, but the sections that are particularly interesting and unique to an outreach resource such as this are those devoted to the bookbindings. The essays take the reader along the unusual path of reading the material evidence on the cover of these books to reconstruct their histories and the succession of repair and rebinding for restoration, but also as a celebration of one’s status as the owner of such a fine collection of manuscripts. Indeed, the discourse concentrates mostly on decoration patterns, tools, and techniques, rather than on covering structures and binding techniques, but this approach, as clearly stated, is justified by the state of conservation of volumes that, in the past, have been subjected to invasive treatments and rebindings, as well as by the lack of meaningful and statistically significant information on the structural aspects of binding production at the court of the duke.

Thematic Pathways on the Web is undoubtedly an innovative and essential resource that, along with IIIF resources in general, is creating a paradigm shift, changing the landscape of digital libraries. The choice of technology, however, seems also to bring some constraints that, to some extent, limit the possibilities of the resource. Metadata, for example, is limited to the essential, as provided by the IIIF Presentation standard, which can make navigating the annotations a little cumbersome. Due to this, the annotation tag list (part of the faceted search interface) is at times challenging to traverse due to the very long and strictly alphabetical list that is presented to the reader. Also, the annotation texts are often presented in Italian even if the rest of the navigation is in English, which will probably prove to be more of a problem for the uninitiated reader than for the scholar. The Vatican Library watermarks on the digital images present one other issue, as they can prove distracting when superimposed on the letters that one is trying to read, even more so for palimpsested manuscripts. The palaeographic pathways could be improved by the provision, alongside the excellent introductory materials, of more accessible complete transcriptions of pages for each writing and, possibly, a set of exercises at the end of each session to test the reader on what was covered—thus making them even more valuable learning tools. All of these issues are, for the most part, teething problems that will likely be addressed as the resources (and technology) mature.

It is remarkable that all the examples that appear in these resources come from the collections of just one library. The preciousness of the Vatican Library collections is once more exposed through these resources; indeed, through
the digital medium, the Library is actively striving to keep true to its core mandate of preserving its written heritage for the common advantage of all scholars (and not as a precious hoard, possessed and maintained in secret). If there is one point of regret it is that, as highlighted above, the images are heavily impacted by the presence of the Library’s digital watermark signalling the strict copyright and reuse policy for both text and images; this, inevitably, has an impact on scholars’ work and thwarts IIIF’s native sharing and reuse capabilities. Nonetheless, these groundbreaking pathways through the Library’s collections offer a lot to scholars and the general public, and the novel use of already game-changing technologies is certainly notable, as they make available tools and functionalities that are not possible when working with the original manuscripts.

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Scribes of the Cairo Geniza is a crowd-sourced project supported by Zooniverse and the five leading centres of Geniza research. First, a word about the Cairo Geniza and the documents found there. “Geniza” is the Hebrew term for “storeroom, storehouse,” which in this case refers to the storage facility located in the upper gallery of the Ben Ezra Synagogue, Fustat (Old Cairo), built ca. 890 CE. For centuries, though especially during the Middle Ages, the Jews of Cairo placed all of their no-longer-needed, no-longer-usable, and no-longer-legible documents in the storeroom—and there they sat for more than half a millennium.

During the 1860s–90s, documents from the Geniza began to appear on the antiquities market in Egypt, with major collectors purchasing them and bringing them to European centres (Oxford, London, Budapest, etc.). Finally,