



ETH Zurich's University Collections and Archives in the Digital Age: Innovative Indexing, Digitisation and Publication of Unique Materials

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Abstract

ETH Zurich's university collections and archives encompass around twenty facilities with unique holdings. Their diversity reflects the historic development of collections at the university and its modern potential for research and teaching. ETH Zurich makes its collections and archives available for research and teaching in a form that befits the digital age. To this end, it combines ETH Library's skills in information science with the expertise of the collection owners in the departments in accordance with the *Strategy 2015–2020*, which was passed by the Executive Board in 2014. This paper presents the strategic approach of ETH Zurich's Executive Board and focuses on the role of ETH Library in the current line of action.

Key Words: ETH Zurich; ETH Library; collections; archives; digital age

1. Introduction

ETH Zurich is one of the leading international universities for technology and the natural sciences. Founded in 1855, its collections and archives include around 20 facilities today. Their diversity reflects the historic development of collections at the university, not to mention its modern potential for research and teaching (Habel & Wiederkehr, 2017). The range includes:

- scientific and art history collections dating back to the founding era of ETH Zurich
- archives and cultural-historical collections founded in the second half of the 20th century, which document the history of ETH Zurich and scientific, social and economic developments up to the present day
- the literary legacies of Nobel Prize Winner for Literature Thomas Mann and the renowned author, architect and ETH Zurich alumnus Max Frisch
- exhibition facilities as venues for the public mediation of art and the dialogue between science and society
- cooperative new foundations in accordance with the need for concrete visual material in university teaching

Table 1 shows the official list of ETH Zurich's Collections and Archives in 2017. What holds together these facilities and distinguishes them from libraries that provide access to mass-produced books and journals is the fact that they deal with originals and unique materials.

Table 1: ETH Zurich's Collections and Archives in 2017 (ETH Zurich, 2017a).

1.	Anatomy of Domestic Animals Collection
2.	Archives of Contemporary History
3.	Chemical and Pharmacognostic Collection
4.	Collection of Astronomical Instruments
5.	Collection of Prints and Drawings
6.	Earth Science Collections
7.	Entomological Collection
8.	ETH Zurich's Art Inventory
9.	ETH Zurich University Archives
10.	Forestry Collection and Xylotheque
11.	<i>focusTerra</i> : the Earth Science Research and Information Centre of ETH Zurich
12.	gta Archives (Archives of the Institute for History and Theory of Architecture)
13.	Image Archive
14.	Maps Collection
15.	Material Collection
16.	Max Frisch Archive at ETH Library
17.	Rare Books Collection
18.	Thomas Mann Archives
19.	Werner Oechslin Library Foundation
20.	Combined Herbaria of the University of Zurich and ETH Zurich
21.	Zoological Collection

ETH Zurich aims to seize the opportunities of the digital age and provide its collections and archives for research, teaching and the public with an

eye to the future. With this goal in mind, the Executive Board approved the *Strategy 2015–2020* for ETH Zurich’s collections and archives in November 2014 (ETH Zurich, 2014). The *Strategy 2015–2020* combines ETH Library’s information science skills with the expertise of the collection owners in the departments. The *Strategy 2015–2020* is based on the view that the duties of libraries, archives and scientific collections are converging in the digital age. The hallmark of user-oriented services is the spatially and temporally unlimited availability of digital objects with high-quality metadata. The scientific community is currently re-discovering analogue research data in university collections. Its transformation into the digital age supports both research and teaching and paves the way for innovative questions (Wiederkehr, 2015a).

This paper presents the strategic approach of ETH Zurich’s Executive Board, focusing on the role of ETH Library in the digital transformation of ETH Zurich’s collections and archives. After a short overview on the expansion of existing services, it describes new services and fields of action.

2. Expanding Existing Services

The first field of action involves expanding existing services by addressing new customers. The Digitisation Centre at ETH Library is a service provider and ETH Zurich’s competence centre in the fields of digitisation and handling metadata. In cooperation with various partners, it conducts large-scale and high-quality digitisation projects (ETH Library, 2017a). Recently, this service has been expanded by addressing additional scientific collections and archives run by ETH Zurich’s departments.

The institutional repository was renamed the Research Collection and reconceptualised in 2017. Since then, it has included the opportunity of publishing research data (ETH Library, 2017b). Together with the ETH Data Archive, it also offers solutions for the medium or long-term storage of digital information regardless of whether this information is a digital copy of originally analogue material or born digital (Sesartić & Töwe, 2016; Sesartić & Wullschleger, 2017). Both the Research Collection and the ETH Data Archive are managed by ETH Library, which also runs the official DOI registration office for Switzerland’s universities and research facilities (ETH Library, 2017c).

The Knowledge Portal provides central access to the data and metadata collections, as well as to all other ETH Library services in one presentation interface. It makes use of modern search engine technology and continuously adds further scientific collections and archives run by ETH Zurich's departments and other partners (ETH Library, 2017d; Neubauer & Piguet, 2014).

3. New Services

After the adoption of the *Strategy 2015–2020* by the Executive Board, however, ETH Library did not just expand its existing services; it also launched several new services and projects.

3.1. Establishing a Digital Infrastructure for Scientific Object Collections

The focal project is the establishment of a digital infrastructure for the scientific object collections at ETH Zurich as a central service provided by ETH Library. Whereas the collections and archives run by ETH Library already had long-term solutions (Wiederkehr, 2015b), most of the collections at the departments were still in need of a professional database and an up-to-date presentation tool for their assets on the internet once the *Strategy 2015–2020* was adopted. In June 2017 a tender in accordance with the World Trade Organisation Regime on Government Procurement was published (ETH Zurich, 2017b). After evaluating the requirements, a digital infrastructure for collection management, digital asset management and the publication of and search for object information in the form of a web portal is to be established for the natural science collections at ETH Zurich. The aim is to manage digitised contents more effectively and guarantee permanent technical support for this digital infrastructure by ETH Library. After the implementation phase, the data from older stand-alone systems such as the Earth Science Collections Database (ETH Zurich, 2017c) will be migrated into the new system.

3.2. Indexing and Digitisation Projects

ETH Library has started broad-based indexing and digitisation projects in cooperation with the collection owners with a view to improving accessibility

significantly for research and teaching. The most important projects of this kind are run in the Xylotheque (Wood Collection), the Entomological Collection, the Mycological Herbarium (Fungi Collection) and the Plant Collection. These collections boast more than 7 million specimens. Therefore, only a selection of types and important sub-collections are part of these current projects.

In ETH Zurich's Xylotheque, wood patterns and their microscopic specimens (thin sections) are catalogued, digitised and scientifically indexed with a focus on teaching. In the Entomological Collection, 150,000 specimens from the Palearctic macrolepidoptera collection (butterflies and moths) with an emphasis on Switzerland are to be photographed and indexed. So far, there have only been labels on the insects bearing information on the collector, location, collection date and scientific name. These specimens constitute key primary data for biodiversity research with a view to analysing the distribution and migration of species, for instance. In order to render this research data easy to use again, one of the project's explicit aims is to make them freely accessible online (Eastwood, 2017).

The current research in the Mycological Herbarium focuses on rust fungi, a group of microfungi that are of major economic importance as plant parasites. These specimens are being recorded digitally and photographs of the microscopic type specimens taken. The Combined Herbaria of the University of Zurich and ETH Zurich are digitising and publishing 100,000 vascular plant specimens, including all type specimens and the unique Hans Hess Angola Collection.

Both ETH Library and the collection curators at the departments benefit from the cooperation on these projects as each partner can concentrate on its specific knowledge and rely on the other's skills.

3.3. Platforms and Interaction with Users

ETH Library co-founded the sister platforms e-rara.ch (ETH Library, 2017e) and e-manuscripta.ch (Zentralbibliothek Zurich, 2017), and has been hosting these platforms as a service provider from the outset.

e-rara.ch is the co-operative portal for digitised printed works from Swiss libraries. These works range from books and maps to illustrated

materials – from the earliest days of book printing to the 20th century. ETH Library is also the administrative coordinator of e-rara.ch (Geisser, 2011; Rivier, 2014). The co-operative presentation platform e-manuscripta.ch provides Swiss libraries and archives with a presentation tool for all manner of digitised manuscripts. The spectrum ranges from text manuscripts (single and collective) and correspondence by individuals and institutions to music, manuscript maps and graphic material. This platform is managed by Zentralbibliothek Zurich (Hanke & Gasser, 2014).

The partners of both platforms have adopted an Open Data policy. Wherever possible, they make their digital documents available for download free of charge. The type of licence and the terms and conditions of use are stated individually for each document. In two parallel projects the partners plan to expand the platforms to a full-text service. e-rara.ch is introducing optical character recognition (as a first step for printed works with the Antiqua typeface from the publication period 1830–1920) and e-manuscripta.ch is implementing a transcribing tool and looking to integrate transcriptions performed by users in the platform. In summary, this will pave the way for the contents to be re-used by researchers from the digital humanities and related disciplines (ETH Library, 2017f; Swissuniversities, 2016).

ETH Library also offers services for visual material. It runs E-Pics, ETH Zurich's platform for images, photographs and illustrations (ETH Library, 2017g). E-Pics encompasses various catalogues, which comprise photo archives and photographers' personal papers, as well as images on university life, from the natural sciences, the history of science and technology, scientific photography and many other topics. The majority of the digitised images can be downloaded in high resolution; the licensing type and conditions of use are indicated individually for each image (Foulger, 2017; Graf, 2015). The Image Archive, which owns the largest catalogue, was the first unit to consequently implement an open data policy on E-Pics and simultaneously publishing its images on Wikimedia Commons (Gasser, 2017). This went hand in hand with a very successful crowdsourcing campaign in order to improve metadata. Citizen scientists were able to locate places, date photographs, and identify people and artefacts such as locomotives, ships or airplanes (Graf, 2016a). In 2016 a blog was established to interact with the crowd. Every Monday the Image Archive publishes a small collection of images it would like to know more about, every Friday it reports what the crowd has found out. This gamification approach proved highly successful. The publication

of statistics boosts friendly competition among the crowd even further (ETH Library, 2017h; Graf, 2016b).

Finally, ETHorama offers map-based access to digitised documents from the platforms mentioned above. Selected materials are linked to an interactive map with georeferenced locations (ETH Library, 2017i). It also includes journal articles from e-periodica, ETH Library's platform for digitised Swiss journals (ETH Library, 2017j; Wanger & Ehrismann, 2016). There are plans to extend ETHorama's innovative visual approach to pictures, manuscripts, rare books and journal articles in such a way that users are able to comment and add information (Hotea, 2015).

3.4. Science Communication and Marketing

Finally, ETH Library offers advice and platforms for those interested in using collections and archives for outreach, science communication and marketing.

The ETHHeritage blog (ETH Zurich, 2017d) is much older than the Crowdsourcing blog mentioned above. It started in 2008 as an innovative means to present outstanding documents from ETH Library's Collections and Archives by telling a short story about them. Today, more than a dozen Collections and Archives from the whole university participate in this blog. Regular new postings appear every Friday and occasionally additional postings are published during the week as invitations to tours, exhibition openings or to remember some kind of anniversary. The number of readers has increased over the years, especially after ETHHeritage was given a modernised layout and responsive design in 2015. In 2016 there were almost 290,000 visits; the number of comments and discussions is still not as high as was hoped for at the beginning. Since 2015 selected postings have been translated into English (Gasser, 2016).

Whereas these two blogs are specifically run by the Collections and Archives, ETH Library uses many more social media channels and regularly provides information on the activities of collections and archives (ETH Library, 2017k; Kyburz, 2015; Okonnek, 2013).

The most recent channel to address the public is Explora, ETH Library's multi-media story-telling platform (ETH Library, 2017l). Since 2017, serialised stories based on the holdings and services of ETH Library have been

told on Explora. In doing so, contents spanning collections and archives have been recombined and presented as a story. Visual communication is a crucial element of Explora's concept: images from the holdings are used and made freely accessible and downloadable in high-resolution. New graphics and maps are produced in order to make complex issues understandable. Explanatory films are shot, interviews recorded as videos (Kyburz, 2017).

With the novel presentation of ETH Library's services, Explora is geared towards people who are interested in art and culture, but also members of ETH Zurich. The first stories on scientific illustration and plant images over the centuries, on marble, architecture and power, on data loss and recovery, and on open data provoked very positive reactions among the broader public.

4. Conclusion

This article focused on how ETH Library transforms ETH Zurich's collections and archives into the digital age and how it uses a wide range of new communication channels and social media to address researchers and the broader public. Of course, ETH Library does more than that. It cares for the analogue objects and original documents and invests a lot in preventive conservation by improving buildings and storage facilities. ETH Zurich and ETH Library also work hard on improving effective organisational structures and efficient administrative procedures. However, ETH Zurich has a strong orientation towards the future (Gugerli, Kupper, & Speich, 2010). Tradition is not a key element of its self-definition. ETH Zurich therefore sees its mission in preparing for and shaping the digital future of university collections and archives.

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