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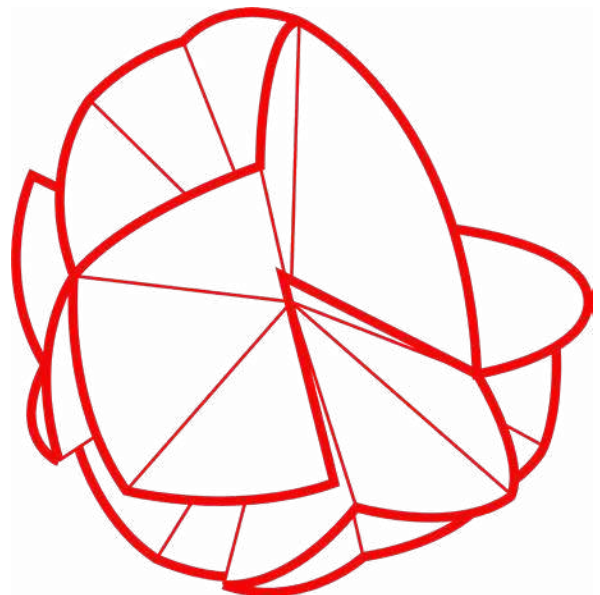
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## Disrupting Geographies in the Design World

Proceedings of the 8<sup>th</sup> International  
Forum of Design as a Process

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# The Digital Archive as An Inclusive Tool for Knowledge Construction Through Design Practices

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## Abstract

The paper offers a multi-focused reflection on the relationship between the evolution of the archive and the issues of access and knowledge acquisition. The authors recognize the digital archive as a resource that, from accessibility to information, through the empowerment of individuals, makes people autonomous in their own construction of knowledge. Briefly reconstructing the evolutionary events of the archive – from a private repository of documents to a platform for online content sharing – the research, through the presentation of some case studies, highlights the main factors that have characterized the process of the progressive opening of the archive towards inclusion: the *opening process on contents*, collected and organized to reach extended audiences by increasing social, political and cultural impact, and the *opening process on user experience* on which the design discipline works through interaction and experience practices.

## Keywords

Digital archive  
Knowledge accessibility  
Design for inclusion  
Interconnected systems  
Empowerment



## The archival impulse

From its origins, split between the roles of institution of power and custodian of memory, the archive boasts a thousand-year history (Giannachi, 2016, ch. 1). Established for administrative and political control, and non-research purposes, this ordered collection of documents is kept in a defined location to be reviewed and consulted when required. It became of public access only after the French Revolution, especially during the nineteenth century its spatio-temporal uniqueness is questioned and to the archive is given a value outside the *current* stage of verification of materials and beyond the place designated for collection, highlighting its characteristics as an object of historical and scientific investigation.

A further step toward the enhancement comes with the Hague Convention of 1954 thanks to which they are recognized and protected as an asset of cultural interest at the international level, regardless of their origins and owners. Therefore, archives are consolidated as *global relational places* for the construction and reconstruction of historical events, starting from the analysis and the interpretation of texts, images, correspondence, objects, artifacts, photographs and much more, that is, a composite set of materials that, since the 1930s, are defined as documents.

From being a container of documents preserving an identity (national, local, individual) it is increasingly transformed into a tool to be investigated in order to generate and circulate further knowledge as well as a medium for realizing new visions and reconstructions of the world (Baldacci, 2016), understandable only if it is studied from a broad perspective across different fields (Manoff, 2004).

With such and many other theoretical and practical facets, the archive in recent years, especially due to the development of digital technologies, has experienced a kind of globalization that made both the boundaries of its structure and the roles and functions associated with it more fluid (Clement, Hagenmaier & Knies, 2013), due to the progressive overlap with those of library or museum accentuating the aspects of content dissemination and production (Lupano, 2013; Zuliani, 2014). For those involved in interpreting documents, the development of digital technologies and the Internet has transformed research methods and tools by involving the humanities and promoting the specific field of study of digital history (Weller, 2013).

This epochal change has produced digitized and digital archives and it has allowed many collections to be uploaded, shared or enriched by other users of the internet (Schnapp, 2008). Each user thus simultaneously assumes the role of producer, consumer, and transmitter of one of the “fundamental devices for describing and tracking everyday reality” (Giannachi, 2016, p. XVII), and archives progressively become the *interfaces* through which to interact with the world on a social, political, economic, and cultural level. At the same time, thanks to the ongoing digitization of documents and the application of machine learning processes, the forms that the archive has taken – from atlas to album-diary, from *wunderkammer* to filing cabinet, from inventory to catalog – have been augmented and expanded through the construction of multidimensional relationships between texts and images in platforms, also enhancing the experiences within physical spaces.

The archive – digitized or digital – has thus become a potentially open and accessible tool, a resource for structuring projects and, at the same time, a dynamic support for collective memory.

Useful for sharing and constructing knowledge, it includes as authoritative sources those coming “from the bottom” such as oral testimonies, personal photographs and videos or private documents.

The new ways of producing contents and the diffusion of digital technologies ensure to simplify the acquisition and sharing of materials and to provide a greater accessibility to information by fostering a culture oriented towards the common good (Hussain, 2018) and social equity (Dombrowski et. al, 2016).

From these premises, the paper interprets the theme *Intersectional Design for an Accessible and Empowering World* through a reflection on the archive as a tool for deconstruction of the conventional process of learning, questioning the linear path where learners have access to information selected by those who, in different ways, impart it.

Pursuing this goal, the authors have developed a multi-focused reflection on the relationship between the evolution of the archive and the issues of access.

The authors recognized the archive as a resource capable to testify the history and culture of a society through the records preserved, a real tool that, from accessibility to information, through the empowerment of individuals, makes people autonomous in their own construction of knowledge.

## Methodology

Having briefly reconstructed the evolutionary events of the archive – from a private repository of documents to a platform for sharing online content the research – the analysis of some case studies, identified the main factors that have determined and characterized the process of the progressive opening of the archive toward inclusion.

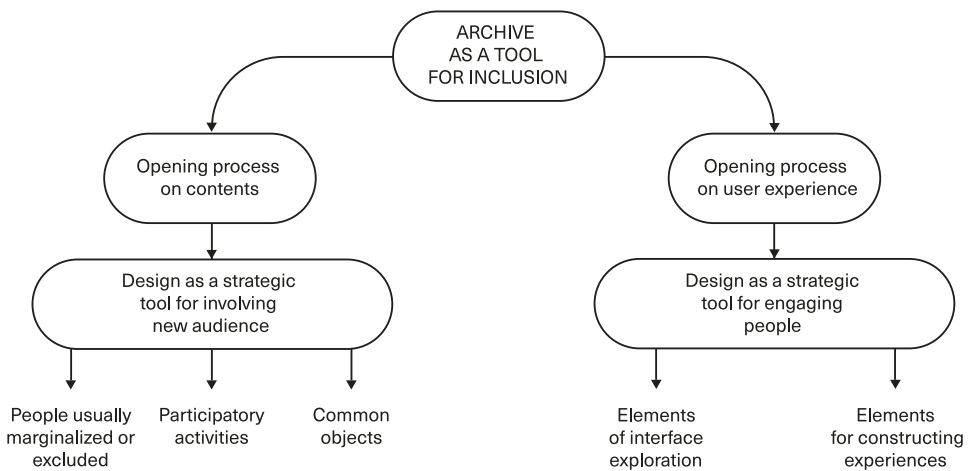
Case studies were identified through preliminary research of keywords– digital archive, knowledge construction, learning accessibility, openness and inclusion, empowerment of marginalized people, archive's interface, digital tools for engagement and enhancement of memory – on the principal's online search engines – Google and DuckDuckGo –, in scientific journals or thanks to referrals from members of the academic community.

Within a collection of 40 case studies, 26 of them were considered inherent to the research, based on the following parameters: partially or fully digital or digitized archives, inclusive topic, ease of interface navigation, engagement of the community, UX-UI innovation.

Based on the selected case studies, two prevalent actions have been identified by the design perspective [Fig. 01]: the *opening process on contents*, on which design can be considered a strategic tool for reaching and involving extended audiences; and the *opening process on user experience* on which the design discipline works through interaction and experience practices. For each action, other sub-categories – supported by the description of a paradigmatic case study – emerged, and converged, finally, in a closing framework. Each case study included within the text has been listed in a summary table together with its web page (Bosco et. al, 2023).

The *opening process on contents*, identifies: the collection of documents on previously little-covered topics involving ordinary people and usually marginalized minorities; the direct involvement of curious people and enthusiasts in participatory activities aimed at the implementation and dissemination of the collection; and the cataloging of common objects, produced to accompany people in their daily lives, elevated for this reason to traces to be preserved and enhanced.

The *opening process on user experience* is supported by the digital transition and more specifically by the digitization of documents that has made preserved collections at least partially accessible online. In this regard, design stands as a tool capable of enhancing content and the user's visit experience. *Elements of interface exploration* appropriately designed simplify the search phase, articulate the reading of content and enable guided navigation of complexity. The integration of *elements for constructing experiences* such as likes, feedback, call to action makes user participation active and direct.



### “Opening process” on contents

The goal of inclusion finds in digital tools the possibility of extending the dissemination of the archive to a wider audience (Schnapp, 2008; Granieri, 2011; Floridi, 2020). The action is aided and augmented by the expansion of the type of content collected by the archives. This “process of opening” (Gasparotto, 2019) triggers dynamics of inclusion that are articulated in several actions and concern the implementation of the collections held, the target audience addressed, the type of classified assets, the mode of collection, and the dissemination of the collections.

Document collections related to ordinary people and cultures who are typically marginalized or excluded propose a new focus on subjects and issues not previously covered. The *Archivio Diaristico Nazionale* in Pieve Santo Stefano, for example, has collected since 1984 more than 9,000 diaries, autobiographical memoirs capable of bearing witness to the history of a country through

Fig. 1  
Archive as a tool for inclusion, 2023. Credits: Bosco A., Gasparotto S.

the narration of testimonies, enriched since 2013 by the creation of the *Piccolo Museo del Diario*: a multisensory and interactive path.

Works on reconstructing the memory of 9/11 through the collection of documents from the grassroots – both from people who experienced the event firsthand and through outside testimony – *The September 11 Digital Archive*. The archive, through interviews, photos, video, audio, correspondence, newspaper articles, and other types of documents intends to reconstruct the memory of the event for present and future generations and is an example of how a historical fact can be documented and preserved in the 21st century. The extent of the documents preserved concerns both the origin of the sources – testimonies are collected that come from all over the world – and the variety of document types, digital formats that are not always usable due to the obsolescence of the technology in use. User engagement, in the specific case, occurs by placing the history of the person at the center and by seeking the self-recognition of the audience.

It works on the same goals the *LGBTQ Community Center National History Archive*. Of particular interest for the variety of different media, their time span – the earliest records are from 1878 – and the number of items collected, this community-based archive collects, preserves, and makes available to the public the documentation of LGBTQ lives and organizations centered in and around New York.

By considering common sources and resources usually excluded from traditional temporary exhibitions and museum heritage the ephemera archives collect and catalog common objects, produced and designed to accompany people's lives on a daily basis, elevated in this case to traces to be preserved and enhanced, useful for reconstructing political, economic, social and environmental histories from multiple points of view. The *American Left Ephemera Collection*, for example, collects documents from the 1890s to the present. The materials were produced by the Socialist Party USA, Communist Party USA, Students for a Democratic Society or their affiliated organizations, as well as unaffiliated activists and radical intellectuals. The *Digital Archive of Latin American and Caribbean Ephemera*, powered by Princeton University Library, collects from 2015 “pamphlets, flyers, leaflets, brochures, posters, stickers, and postcards originally created by a wide array of social activists, non-governmental organizations, government agencies, political parties, public policy think tanks, and other types of organizations in order to publicize their views, positions, agendas, policies, events, and activities.” (Princeton University Library). The bottom-up contribution contemplated by the digital archive structure can therefore include both the sharing of private documents suitable for the implementation of the collection, and the direct involvement of curious people and enthusiasts in participatory activities aimed at the storage experience and dissemination of the same.

Aimed at implementing the collection by proposing to its users to collaborate actively *Lettere di Casa Ricordi* involves scholars and enthusiasts in the transcription of handwritten letters which, thanks to this operation, become documents that can be consulted and easier to read. Furthermore, the archive, relying on a network of volunteers, can enrich the consultable heritage while having limited resources.

## “Opening process” on user experience

The processes of inclusion also concern its use and usability. Within this field, the designer, together with a multidisciplinary team, can make a significant contribution.

The issues faced by the historian – such as the study, preservation and historicization of “native” digital documents –, together with the definition of web-based navigation platforms developed to describe, connect and compare data – through Linked Open Data (Listo, 2019), algorithms and artificial intelligence systems (Kaplan & di Lenardo, 2020) –, involved the skills of the designer who, as a hybrid figure among theoretical, practical, humanistic and technical-scientific knowledge, can contribute to make it accessible and more usable.

Through the design of interfaces and experiences the team can organize and visualize contents (Windhager et. al, 2018) in order to facilitate the research, supports navigation paths defined by the curator, and guides the narration maintaining a balance between synoptic vision and storytelling (Mauri & Ciuccarelli, 2014).

If the care and attention used in the design of navigation path and the definition of orientation systems guide users within the complexity of the collected content, the study of behavior patterns, user research, human factors analysis, and the development of participatory systems enable them to direct actions performed autonomously.

On the one hand, design can work on the inclusion of new audiences defining the *elements of interface exploration* through the design of easily navigable interfaces and informative narrative systems – thanks to visual expedients, a clear structure of the information architecture and tools that help to amplify the possibilities of sharing –. Elements of interface exploration can be: interactive maps, interactive timelines, galleries, thematic path, interactive data visualizations, 3d visualization.

On the other hand, design can make the archive more inclusive and engaging through the project of digital, physical or hybrid experiences that can enhance the collection and encourage the creation of networks and the bottom-up participation of users. *Elements for constructing experiences* can be: like, personal feedback, private or public galleries, call to actions. The articulation of building elements of *interface* and *experience* Tab. I are neither exclusive nor unique, in fact, they are modifiable and implementable according to the project and heritage characteristics.

ELEMENTS OF INTERFACE EXPLORATION	ELEMENTS FOR CONSTRUCTING EXPERIENCES
Interactive Maps	Like
Interactive Timelines	Privet/Public Gallery
Galleries	Call to Action
Thematic Paths	Persona Feedbacks
Interactive Data Visualization	
3d Reconstruction	

Tab. I  
Elements of interface exploration and Elements for constructing experiences, 2023. Credits: Gasparotto, S., Bosco A., Bulegato F.

Among *elements of interface exploration*, those aimed at orienting the user into the spatio-temporal dimension of the preserved heritage are the *timeline* and the *map*.

If the *Baldessari archive* proposes an overall view by organizing all the projects labeled with its name, on several *timelines* in a single horizontal scrolling stream, *Fashion Exhibition Making* works on a timeline that scrolls vertically, displaying projects through galleries of images, articles and products that give the user an immediate idea of the documents included.

If the Renzo Piano Foundation's archive georeferences the firm's projects on an *interactive map* in which a click on the pin corresponds to the opening of a meaningful image that directs to a more in-depth look at the project, in *MilanoAttraverso* – project focused on the exploration of the territory of Milan, promoted by *ASP - Azienda di Servizi alla Persona* and Golgi Redaelli – many local private and public archives and institutions are displayed through different types of icons that identify and georeference institutions and classified document categories (Bollini, 2021).

Aimed at creating visual systems for orienting the user within the heritage, the *gallery* is one of the most common tools used by designers to implement digital archives. The *Bauhaus Archiv's photographs* is, for example, clustered by curators into categories, and immediately visualized by *galleries*.

A more articulate and immersive reading of the heritage is the one of the *Magistretti Archive*, which combines the *gallery* and the *timeline* with *thematic paths* capable of connecting heritage elements in a cross-sectional way, introducing original curatorial narratives. At a different scale but with the same aim, the multiple *thematic paths* proposed by the extensive online image collection of *Google Arts & Culture* are predominantly based on images and metadata attributed to them by the Cultural Heritage professionals.

With a different level of complexity, the tool of *interactive data visualization* offers a systematized visualization of the data collected within the digital archives using algorithms. For example, in the *Historical archives of Italian psychology (ASPI)* the tool of *interactive data visualization* put on evidence the individual's relationships through reshaping the network view, and to access the respective biographical record.

Introduces a *third-dimension visualization*, *Venice Time Machine*, a project based on the digitization of personal and administrative documents, floor plans, works of art and photographs, which, thanks to machine learning processes, contributes to the reconstruction of the map of Venice in relation to the specific period. The user by navigating the timeline can watch the evolution of the building of the city over time.

Another *3d visualization interface* is *Chronogram*, the project developed by EPFL+ ECAL Lab and the Digital Humanities Lab of the EPFL in order to explore the documents of *Vacheron Constantin archive* through a VR viewer.

The most popular practices of engagement, among the *elements for constructing experiences* are the assignment of the *like* and the selection of documents for structuring public or private galleries. *Europeana*, from this point of view, is one of the most comprehensive digital archives by including a specific section where the user, by logging in, can put the like, build personal galleries, or even participate in writing blog's articles.

The tool of *personal feedback* often found in platforms such as blogs or social networks to promote public and critical participation is also implemented in some archives, such as the *British newspaper archive*, which integrates daily comments from Twitter's users within its homepage.

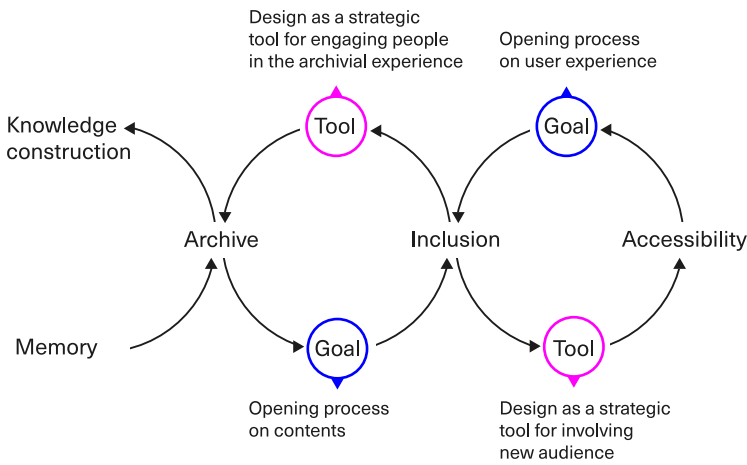
Another engagement experience is the *call to action*, which, in the specific case of archives, is often useful for collecting personal materials. Examples are: the *Youth Club Archive*, which offers the possibility to submit photos, flyers, tickets or other memories about subculture or counterculture mainly belonging to British people, and *Design in quarantine* that "collects in an online and open source platform, the multiple design responses to the pandemic through the construction of an archive updated in real time." Posters, infographics, custom-made or *hacked* furniture and other design projects were collected through an open call.

Finally, *Europeana* proposes another practice for engaging and nurturing its community: the organization of online events. An example is *The Digital Storytelling Festival 2022*, organized in May together with *the heritage lab*.

## Conclusion

Systems based on inclusive archiving are important for preserving individual views, practices, and contexts that generate them, documenting the histories as well as the social needs of those they represent (Giannachi, 2016, p. XIX).

Design emerges as a doubly strategic tool in the process of opening-up the archive toward an inclusive knowledge construction increasingly aimed at life-long learning. Through storytelling practices design can enhance and bring out the classified heritage. Working on identifying cross-cutting pathways among the collected items it can renew the collection's narrative over time. By promoting call-to-action and participatory activities it attracts and engages new and broader audiences. Using appropriate languages and visual media facilitates an immersive experience. By making content clearer, readable, and usable, it ensures a learning experience that is at once accessible, in-depth, and entertaining Fig. 2.



**Fig. 2**  
The digital archive as an inclusive tool for knowledge construction through design practices, 2023. Credits: Bosco A., Gasparotto, S.

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Content collection and digital nature of the archive are prerequisites, but not sufficient to define its inclusiveness. In this regard it should be premised that a source is never “objective” but is the result of voluntary or involuntary processing by the epoch and society that produced it. Furthermore, it is conditioned by the knowledge, skills and values as well as the cultural and technical tools of the context that designs and implements it. It follows that the archive can never be completely inclusive since it cannot represent those who do not have the ability to use tools for the fruition and sharing of content.

Further critical to inclusion is the non-linear distribution over time of the materials stored in many digital archives. In fact, a large part is made up of digitized items that refer to documents from the last few decades, and only a tiny amount relates to records from more than thirty years ago (Time Machine).

Regardless of the completeness and historical consistency of the preserved elements, for which the designer’s contribution may be only marginal, the inclusion-oriented design activity must devote itself to carefully representing the complexity of the archive while providing insight, original points of view, and stimulating active user through design proposals that can empower individuals by making them autonomous in their own knowledge construction, toward sharing a common good with an ever-extending community both academic and public.

### Authors’ Notes

The contribution is the result of a common reflection of the authors. Nevertheless, Chapter 1 was written by Fiorella Bulegato, Chapter 2 was written jointly by Alessandra Bosco and Silvia Gasparotto. Chapter 3 “Opening process” on contents” and subchapter “4.2 Elements for constructing experiences” are to be attributed to Alessandra Bosco. Chapter 4. “Opening process” on user experience” and “4.1 Elements of interface exploration” are to be attributed to Silvia Gasparotto. The Conclusions were jointly written by the three authors.



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