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# PAD

# FUTURE HERITAGES

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# EDITORIAL #24

# Future Heritages

## Digital as New Doc-Humanity and In-Tangible Materiality

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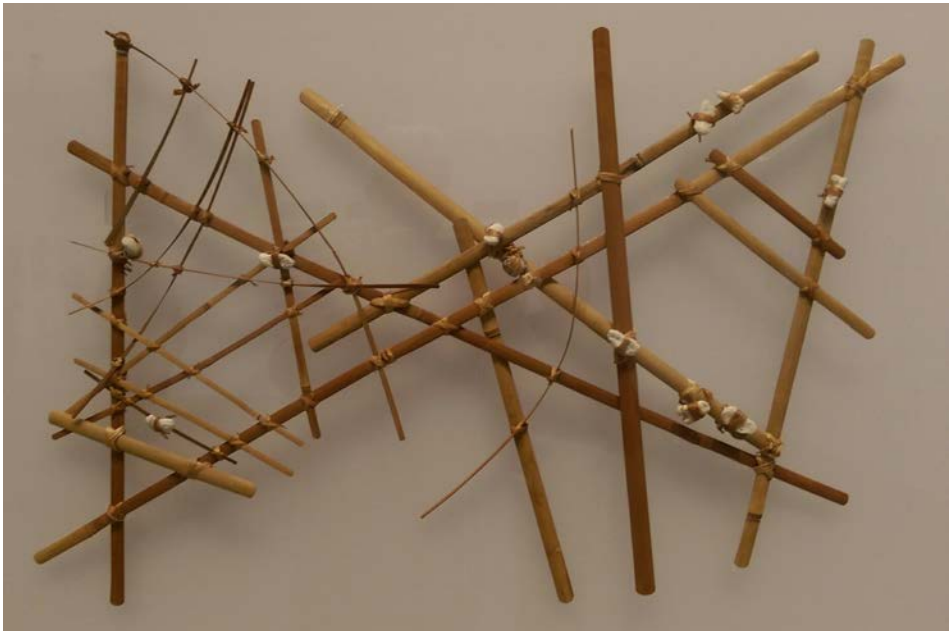

> If at the centre of the industrial revolution, made of materiality, was production, at the centre of the *documedia* revolution, made of memory, is consumption.[1]
> (Ferraris, 2021, p. VIII)

In this second issue devoted to memory and its relationship with the digital, we have chosen the image of an object, a Micronesian navigation chart.[2] It originates within a tradition of implicit and empirical knowledge of a territory made experiential and handed down through an actual artefact. Unlike an ancient *portulanus* (pilot book), the map is physical and tactile and does not realistically reproduce or represent the morphology of the territory but rather a model of it. However, like Western nautical cartographies, this orientation tool embeds different levels of knowledge of a territory, or rather, of a context within which it is necessary to orient oneself in order to interact. Oriented thanks to the stellar compass, they include quantitative and qualitative information on ocean currents, flows, winds and *betia* or time-varying environment-based seamarks.
From our point of view, it represents a different way of transmitting and sharing "data" (intended as information) and knowledge to whom can interpret them. At the same time, it emphasises the path necessary to obtain that knowledge.

1 Translation by the authors. The original text in Italian is: "Se al centro della rivoluzione industriale, fatta di materia, c'era la produzione, al centro della rivoluzione documediale, fatta di memoria, c'è il consumo."

2 The opening photo represents precisely a stick chart from the Marshall Islands, on display at the Berkeley Art Museum and Pacific Film Archive. From the collection of the Phoebe A. Hearst Museum of Anthropology at the University of California, Berkeley. Date not known. Photo by Jim Heaphy. CC-BY-SA-3.0. Source: https://en.wikipedia.org/wiki/Marshall_Islands_stick_chart.

A path built through a visual and tactile, material and immaterial, original code.

As mentioned in the previous monograph issue of PAD 23/2022, *Digital Memories* introduces two axes according to which it is possible to read the relationship between past and present and present and future. In this further exploration of the topic of *memories* mediated by technologies, the focus is on the connection between past and future, where the present is the mediation zone where to build bridges to cross this temporal gap.

The institutions traditionally devoted to the collection, preservation, curation and communication of Cultural Heritage, both material as well as intangible, such as Galleries, Libraries, Archives and Museums (GLAMs), has been joining and benefiting from the access to Information and Communication Technologies (ICT) since the very beginning of the "fourth revolution" (Floridi, 2014), i.e. the internet era.
From the Paris-based Louvre to the Cooper Hewitt Smithsonian Design Museum in the US, from the Italian Uffizi Galleries to the Rijksmuseum in Amsterdam, cultural institutions have always used the digital, augmented, virtual space of the web to propagate their message, to offer different, richer, enhanced experiences to their visitors, to make documents and primary sources available to scholars and researchers, to democratise access to culture, history, art and science *in situ* and *onlife*. World Wide platforms – such as the Google Art & Culture project – social media, mobile applications and websites of small heritages are the entry doors to past heritage, human culture, and history.

Archives, on the other hand, are the main players in the process of digitisation and digitalisation of past documents, sources and artefacts to be then studied, preserved and transmitted to future generations as cultural and human heritages in a *virtual* form as an alternative, duplicate or substitute of the original ones. Fragments potentially dispersed, even if not almost lost, perishable, hidden to be preserved or otherwise forgotten, are *translated* in a new paradigm of existence to be further passed down, discovered again, and brought to new lives. Alternatively, vice versa, entire collections are progressively *remastered* through digital formats, devices and tools and reconfigured thank the opportunities – in terms of languages and interactions – offered by the technology revolutions in a planned and progressive process of transmission, transduction and migration, to complex communication ecosystems aimed to translate information into experience, communication into storytelling and implicit knowledge in accessible understanding.

Digitisation, considered as an opportunity to indefinitely preserve documents and artefacts otherwise ephemeral, perishable, fading or missed – surviving just through indirect sources – is facing a possible questioning phase (Ferraris, 2009) if not an actual crisis according to Vincent Cerf's statement referred to the morality of contemporary digital photographic heritage (Sample, 2015).

The concept of heritage itself is deeply connected, on the one hand, to the idea of the past, i.e. memory, and on the other hand, to the idea of unknown, foreseeable, possible, probable or desirable future experiences, which is still in a potential and developing dimension of human exploration/time.

According to Suddendorf, Redshaw and Bulley, authors of the book *The Invention of Tomorrow: A Natural History of Foresight* (2022), humankind is the only species, among all living creatures, able to figure out the idea of the future. Furthermore, the capability to imagine hypothetical situations, i.e. something not happening *hic et nunc* – is at the very basis of every possible innovation. Besides, it is also the common ground of the social interactions where people accept to give up something now, in favour of someone else or of the collectivity, to forgo the benefit of it in a subsequent time/situation because of being part of the same community.

At a neural level, recalling a memory and prefiguring a future are similar and based on the capacity to assemble, link and *index* fragments of previous experiences as building blocks. Where the imagination fails is the ability to prefigure the scenario, the different context to interpret/understand the future because of the failure of our memory not being suitable to prefigure situations not jet lived.

As stated by Tomás Maldonado (1992), to recognise something, the subject must be aware of what is represented – mentioning the "affordance" of cultural artefacts in different cultural contexts and/as a metaphor for the transition caused by the digitisation – i.e. previous experiences at cognitive as well as a perceptive level are the ground of the future knowledge. The memory process is hench much more similar to the *way we may think*, i.e. in an associative process based on meaningful correlations and lived past, namely the hypertext/media notation system, rather than the linearity of the se-

quence of the straightforward notation, the exhibition flow or the closed structure of an archive.

This is indeed the *way we will think* proposed already in 1968 by Ted Nelson (1972), on which he also shaped and developed the Xanadu project. Nelson had foreseen that it could be possible to "store and display documents, together with the ability to perform edits" based on the key concepts of *intercomparison* – the possibility of comparing the versioning of the document – and *transclusion,* i.e. the way to include and cite sources and contributions keeping them recognisable inside the overall mashup of sources and information. If Nelson's imagination explored the hypertext notation system even before decades of Internet development, the founding and fundamental elements of a utopian world archive of knowledge were already identified and established.

In the current transition between a two-dimensional and often single-channel system (predominantly notational/textual and visual) and a much more articulated communicative environment, potentially moving towards hybrid and multimodal spaces (aural/audio, video, moving images, tactile, tangible, haptic, proxemic and so on), the potential for a different and more articulated and integrated memory construction could be the real possibility offered *a priori* by technologies and the digital nature of artefacts themselves.

Being halfway across this *migration* between analogue and digital-native traces and artefacts gives the opportunity to open a meta-design reflection to develop original and full potential models where technologies are mediators of interactions, access and informal learning rather than just an extension of analogue or physical environments.

Nevertheless, the utopic trust in an endless possibility of archiving data (storage) and their forever durability and accessibility must be mitigated by the awareness of the different faces of digital obsolescence. On the one hand, the last decades have already shown that the "graceful degradation" (Gustafson, 2008), versioning, and divestment of platforms, software, and plugins (for instance, Flash Player in 2020) have made entire generations of data and documents, which still exist, no longer operable and accessible. On the other hand, the purely digital nature reproducible indefinitely, however, risks erasing the concept of the primary source in terms of originality, content and antecedence in an indistinguishable mash-up of routes, reports, rather than reproductions, superfetations, stratification and appropriations.
In this sense, meta-museums of technology – such as the Museo Piemontese dell'Informatica (Piedmont Museum of Computing)[3] – itself are beginning to emerge, which by crystallising and preserving systems, hardware and software in their original condition allow the consultation of documents, materials and operations that would otherwise be effectively lost.

This second PAD's issue dedicated to the topic of *Digital Memories* and entitled *Future Heritages* collects 11 essays, organised into three chapters: *Digital Knowledge. Memories as an Interpretation Key*; *Digital Spaces. Technologies as Experience and Narrative Enhancers*; *Digital Archives. New Materiality and Intangible Heritage*. We intended to organise the selected contributions to emphasise different levels of interpretation of the

3 https://www.mupin.it/.

main topic, from more reflexive to case studies description. All essays argue and discuss the connection between past and future, human heritage and enhancement tools.

*Interpreting Digital References. The Contribution of "Designerly Knowledge in the Connection between Percepts and Concepts* by Vincenzo Cristallo and Miriam Mariani opens the first chapter. The two authors deeply investigate the connection between *percepts* and *concepts* relating to the use of digital storage in the disciplinary context of Design, integrating the observation of the phenomenon with multidisciplinary points of view. Citing various authors, they intended to discuss the organisation of digital references for the design of complex content and of a critical framework within which to understand the characteristics of "designerly knowledge". The vast amount of online data in the design field is fragmented. There is a need for models of interpretation on the subject that help to understand the organising and systemic modalities of design for managing uncertainty as a permanent condition of contemporary data. They support and argue the hypothesis of the advancement of a type of knowledge (and memory) characterised mainly by a spontaneous and disordered growth of information and non-linear narratives, as well as a different way of searching and using references in the field.

*Visual Workspace. Towards a Systemic Organizational Model for the Definition of New Digital Spaces for Sharing, Collaboration and Corporate Memory* by Chiara L. Remondino and Paolo Tamborrini propose a new model of a corporate intranet. It aims to be a heterarchical model that is not original

in its outward appearance as much as in terms of content to qualify and amplify the organisational memory. Their essay offers an interesting point of view on a functional and operational tool in response to contemporary changes in corporate dynamics by enabling an open, shared, and collaborative environment. Discussing the role of data visualisation inside companies, they emphasise the essential role of such kind of tool to generate long-term tangible change and memory.

In the second chapter, *Digital Spaces. Technologies as Experience and Narrative Enhancers*, the three selected contributions investigate the role of digital and interaction design from different perspectives. The common point is the experiential dimension in museums and exhibition contexts to (re)activate memories related to cultural heritage.

The first essay, signed by Marco Borsotti and Marco Mason, entitled *Immersive Narratives and Memories. The Design of Digital-Enhanced Visitor Experience*, discusses narrative strategies in exhibition design and the use of digital tools. The authors, introducing us to the term narrative, critically review the immersive concept. Then they discuss the concept of the post-digital museum and its theoretical context, presenting some reflections and illustrative examples. They mark the development of the museum's concept and practice, which cannot ignore the paradigm shift in Digital Cultural Heritage and the need to use digital technologies to design immersive and integrated experiences. Thus, considering the relevant interplay of different elements – story(ies), visitors' needs and expectations, digital and physical spaces, digital content, and objects on display.

Yi Zhang, Raffaella Trocchianesi and Mansu Wang, in their essay entitled *Interpreting with Sound. The House Museum as a "Reactivated" Site of Memory in the Digital Age* discuss the valuable role of sound in the reactivation of memories in the space of museums. They intensely focus on sound design, sonic strategies with digital means and the relationship between sound and memory in European house museums through the lens of exhibition design. Sound is becoming increasingly central in experience and communication design and encourages visitors to concentrate on the aspects that most deeply resonate with their interests, stories and memories. The authors support their analysis with a unique typology framework dividing sonic strategies into three distinct areas: hidden sound, diffuse sound, and interactive sound. Thanks to that, they identify innovative sonic strategies that embrace new rituals, enhance omnichannel narratives and achieve immersive engagement.

In the third essay of the second chapter, Giulia Cordin presents us *Bodies of Knowledge. Experiencing the Archive: A Case Study to Re-Activate Memory through Digital Interaction*. The paper presents a smart interactive environment case study for the Temporary Slovene Dance Archive of the Metelkova Museum of Contemporary Art in Ljubljana. The project proposes a physical experience to stimulate public use and understanding of archives. Through it, she critically discusses the role of design in reinterpreting the digital heritage beyond the simple search of metadata on digital platforms.

Finally, in the third chapter, entitled *Digital Archives. New Materiality and Intangible Heritage*, we collected six essays

which focus on various roles, opportunities and functions of Archives in the digital realm.

This closing chapter opens with Roberta Angari's essay, emphatically entitled *Born Digital, Die Digital. Potentials and Risks of Digital Archives*. The contribution deals with the theme of preservation and access to knowledge, with particular attention to the approaches and methodologies employed in the design of digital platforms useful for preserving culture and memory, guaranteeing access for future generations. Specifically, she discusses, through context analysis and a case study of a digital archive, the relationship between society and culture, people and memory. Moreover, she argues the need to think about how people interact with platforms to valorise cultural heritage and about a new category of artefacts, the digital natives, which risk dispersion and deterioration because of the limits of digital systems, which do not guarantee democratisation and access to culture.

In his contribution entitled *The Materials Library as an Interactive Device of Tangible Memory. How to Convey Design Potential in the Metamorphosis of Resources*, Michele De Chirico investigates the potential of an interactive materials library service to transmit the meaning of tangible memory.
The author discusses the role of design in preserving, organising and transmitting material culture through a digital platform, making evident the unexpressed opportunities of materials. It is a valuable contribution to understanding the switch of materials libraries from cataloguing systems to physical and digital places aimed at conveying material cultures in-

tended as transitions of society's intangible and semantic values onto the tangible reality.

From material culture, we switch to immaterial Cultural Heritage with Giuseppe Amoruso, Mariana Ciancia, Eloisa Casadei and Alessandro Ianniello's contribution, entitled *Preserving Memory, Safeguarding Heritage. Designing the Digital Library of Living Traditions of Jordanian Handicraft*. The authors present and discuss an ongoing research project. In their paper, they envision the role of storytelling and audio-visual archives in the realm of design for Immaterial Cultural Heritage. Then, they describe the Digital Library's case study, which will collect visual documentation and information about techniques, raw materials, and fabrication tools for the leading traditional Jordanian handicrafts. It is an interesting and well-informed example of the roles of a digital platform, which aims at making content accessible to museums, enhancing the on-site experience and creating interactive touchpoints for a broad audience.

The paper *Learn Through Memories. A Didactic Way to Learn and Teach with the Use of a Digital Knitwear Archive* by Martina Motta, Giovannni Maria Conti, and Elisa Rossi reports a research case study. In this case, the project concerns a material archive of knitted samples and its digital traduction to bring innovation to teaching and learning methods, combining the physical and digital dimensions. It represents another intriguing case study through which the authors investigate the needs of knit design students, researchers, and professional designers. Moreover, they argue the advantages and

barriers of a digital archive related to material heritage and the potential of such a resource in learning contexts.

The second to last paper presents another case study of a digital archive in design education. Vincenzo Maselli, Diana Ciufo and Daniela Dispoto, with their contribution entitled *Maranola Digital Memories. Narrating Multimedia Archives as Didactic Outcomes for Communicating the Memories and Traditions of the Town of Maranola*, propose an experimental didactic experience in the fields of design and performing arts. The teaching's main objective was to enhance the memories of the place by designing a narrating multimedia archive to communicate the collective identity through interactive and multimedia narrative mechanisms. Visual storytelling and multimedia communication languages and tools become a means to build an emotional and educational physical experience and a digital archive to narrate the local reality and allow users to participate. The developed and collected projects exploit interactive and audiovisual tools, work with forms ranging from physical to virtual, and create narratives that metaphorically explore the traditions and memories of the place.

Finally, Raissa D'Uffizi discusses the roles, limits, opportunities and models of digital platforms which collect artefacts related to Italian Graphic Design. In her essay, *Memories of Italian Graphic Design History. Digital Dissemination and Immaterial Circulation of Visual Communication Heritage*, she highlights the difficulty in creating a single place to physically preserve graphic design projects and the critical issue of official or copyrighted digital conversions. Through a series

of case studies, she analyses the emergence of independent entities and consequential difficulties for historical research supported by sources. Although visionary, her aim for a new digital archive for the Italian graphic design heritage emphasises the need, if not the urgency, for supporting enhancement projects in the field.

We are well aware that the themes addressed in these two *PAD. Pages on Arts and Design* issues regarding the topics of Digital Memories cannot be considered exhausted. This area will inevitably be increasingly at the core of the discussion on various levels in the next future. In just the past few months, the topic of the apparent boundlessness of space on digital platforms and services has resurfaced on multiple occasions. Consider the "mass extinction events" of digital content caused by the decisions of managers and owners of hosting services and platforms like Twitter (now X), Picturelife, or Imgur (il Post, 2023).

Different but in the same vein is the recent case, entirely Italian, of the dispute between the State television, RAI, and the production company (Officina) of a well-known evening program – "Che Tempo che Fa" – hosted by the renowned Fabio Fazio. Following changes in the Government and the management of national networks, the television program was "cut" from the schedules (then moved to another private channel, i.e. Discovery). However, the issue primarily concerns social media platforms, notably Facebook and Twitter, which RAI executives have obscured. The channels have 591,000 followers and, most importantly, 17,900 posts featuring excerpts

from Sunday evening interviews with prominent figures in entertainment, politics, sports, and general entertainment, both national and international (lo Conte, 2023).

Beyond the evident economic or opportunistic concerns, it is clear that these are incidents erasing pieces of memory. Whether they are individual testimonies or collections of images or videos, posts and related comments, these portions of *documedia* are lost.
Can the culture of design still contribute, going beyond the design of supports, platforms, or digital systems scattered (and at risk of extinction) on the web? From the contributions published in this issue of PAD, it is evident how a certain degree of materiality can still be at the centre of reflection and design practice.
The critical issue is more than the return to materiality. Beyond the design of dissemination, enhancement, and visualisation devices for resources, sources, and physical documents, there are still potential development areas. However, concerning the past and its media, the question remains: are we frightened by a future without memory? And, in all of this, what will be the role of design culture?
Nevertheless, the matter remains unsettled, leaving room for other potential discussions.

Just after the closure of this issue, the social platform known as Twitter and now X was officially renamed and rebranded, starting from the end of July 2023 (Barbera, 2023). Along with other massive changes to the microblogging social platform active since 2006, at least as of the 20th of August, under

Musk's management, images posted up to 2014 became untraceable (Coats, 2023) (Fig. 1). Therefore, we decided to update this introduction with further evidence of what was discussed in the preceding paragraphs. The platform has stated that these images are still stored on Twitter/X servers, but the t.co links are now broken. The famous Ellen Degeneres selfie taken during the 2014 Oscars ceremony is among the removed images. While media related to some significant events may be traceable through other means, it is uncertain whether the same can be said for thousands of other ones. We are facing a form of deletion as unexpected as it is *predictable* within social platforms' policies of monetising our data.
As a paradox or a *falsification*, the digital nature of this publication allows us to include this further consideration of the perishability, or at least ephemerality, of digital documentary sources.

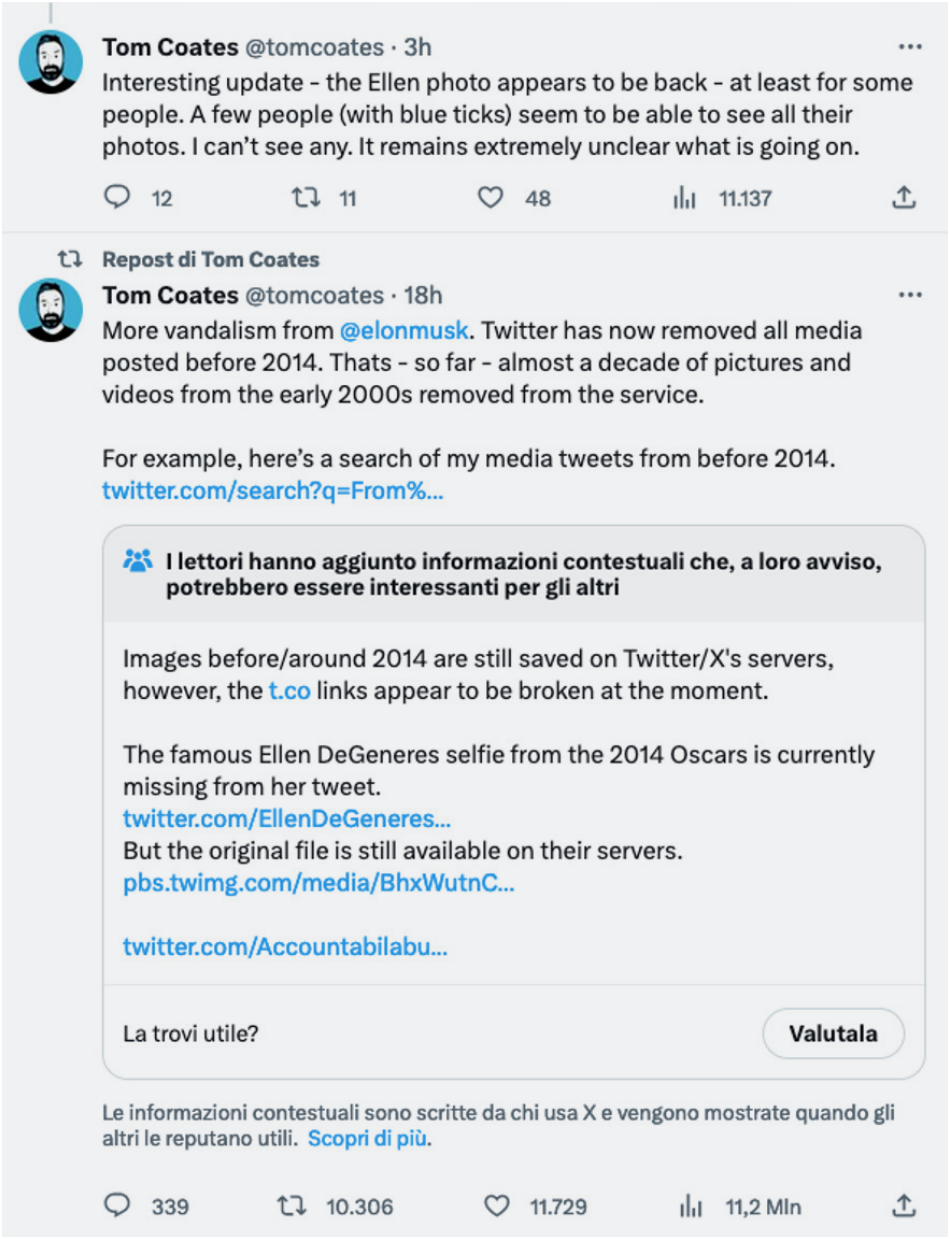


**Figure 1.** Tom Coates (2023) tweets related to the removal of all media posted before 2014 on Twitter (now X).

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I

# DIGITAL KNOWLEDGE

## MEMORIES AS AN INTERPRETATION KEY

# Interpreting Digital References
## The Contribution of "Designerly Knowledge" in the Connection between *Percepts* and *Concepts*

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**Keywords**
Cognitive Offloading, Uncertainty, Complexity, Visualisation, Mapping.

**Abstract**
In the digital age, the democratisation of a series of actions inherent to data management has, in fact, allowed digitisation to be interpreted as an operation to extend and relieve human memory (*cognitive offloading*, Storm et al., 2016). In the design field, the availability of data contained in the web in a wide but fragmented way would lead to the hypothesis of the advancement of a type of knowledge (and memory) characterised mainly by a spontaneous and disordered growth of information and *non-linear narratives* (Sendra & Sennet, 2022), as well as a different way of searching and using *references* in the project field.
Referring to this background, with this paper, we aim to investigate the connection between *percepts* and *concepts* (Horn, 1998) relating to the use of digital storage in the disciplinary context of Design, integrating the observation of the phenomenon with multi-disciplinary points of view.
More specifically, it is intended to compose a critical framework within which to understand the characteristics of "designerly knowledge" (Dorst & Lawson, 2009) for the collection and archiving of digital visual material for design use, supporting the discussion through integration with various critical contributions from complexity science, psycholinguistics and perception studies. The aim here is to propose some models of interpretation on the subject that help to understand the organising and systemic modalities of Design for the management of uncertainty as a permanent condition of "contemporary data" (Sendra & Sennet, 2022). In particular, the variety of authors cited contributes to composing the picture that is intended to be returned on the subject of the organisation of digital *references* for the design of complex content.

## 1. Pervasive 'Cognitive Offloading': from *Precedence* to *References* in the Digital Revolution

Vinton Cerf, one of "Internet's fathers" (Treccani, 2012), warns about the computer obsolescence's issue, predicting possible problems about preservation and availability of current cloud-stored materials considering a forthcoming technological evolution (Sample, 2015). The exponential development of information and digital technologies has affected every aspect of daily life, where the pervasiveness of certain tools has definitely changed the approach to information and communication. Looking at the phenomenon from the point of view of information's accessibility, the advent and democratisation of the Internet has led to a potentially infinite extension of the amount of material that can be shared and enjoyed through web connections. This is certainly positive for the advancement of knowledge, at least to a potential extent. If, in fact, on the one hand, the availability of tools for sharing and accessing information seems to be a benefit without consequences, on the other hand, the constant recourse to web tools or information technologies to support everyday activities seems to influence cognitive and mnemonic capabilities to a not inconsiderable extent. According to some research: "Using the Internet as an information source influences the extent to which a person uses the Internet as an information source in the future" (Storm et al., 2016, p. 5) according to a kind of 'cognitive offloading', as the use of a physical action (in this case, the use of the web to search for or store information) to reduce cognitive demand, relieve mental effort and achieve results that would otherwise be unattainable or achievable in a significantly longer time (Risko & Gilbert, 2016).

The study of *cognitive offloading* is still a very open field of research, however, there are some considerations explicitly related to the use of transactive memory systems (as in the relationship between humans and technology): according to Risko and Gilbert, some consequences of cognitive offloading through digital technologies can be found in the impairment of human memory (as in the case of using Google to search for information, using GPS for driving or relying on automated systems for various everyday tasks) and partly to the decrease in confidence in terms of metacognitive evaluations (Risko & Gilbert, 2016, p. 683).

It is no coincidence, therefore, that the awareness of the complex nature of society and its processes (social, cultural, educational, economic), and the inevitable thinking on the mutation that invests every scientific field, also involves the discipline of Design, which by its very nature is transversal in the issues it deals with, embracing a plurality of objectives, as well as processes and tools, sometimes specifically its own, sometimes sharing those of other disciplines. Design is therefore faced with new interpretative and design challenges, and more deeply, with reinterpreting and updating its methods and tools to adapt them to the contexts in which it operates. Richard Sennett and Pablo Sendra outline the contours of this necessary reversal that the disciplines of design must pursue, specifically aimed at: “develop the capability to deal with ambiguity, difficulty and the unknown in order to explore the unexpected event, rather than to defend against it” (Sendra & Sennett, 2022, p. 25). Sendra and Sennett identify the concept of “uncertainty” as the discriminating factor with regard to

projects that respect and are in line with contemporary complexity, emphasising that uncertainty is currently still seen as a risk rather than an opportunity (p. 138). Since logical openness is the necessary conceptual condition for the realisation of complexity, we can state that the fundamental characteristic of a complex system is its conceptual uncertainty and incompleteness, also referred to as "quasiness". A *quasi-system* is, in fact, a system that is chronically incomplete, non-procedural and non-linear (Minati, 2021), where the impossibility of acting according to procedures obliges one to approach the complex through strategies, models and theories that are compatible with the observed phenomenon or system.

For example, for the design disciplines, the democratisation of information technology has brought about a radical change especially in terms of *visualisation*, understood as the main mode for knowledge in the design field and as a tool for managing complex processes. As Alexander Koutamanis points out, human interaction with the surrounding environment, be it natural or built, is predominantly visual and is diriment not only to understanding but also to planning and organising complexity: "Visualisation has been a significant aid to the understanding and controlling of complex processes" (Koutamanis, 2000, p. 347). Referring to the themes of technological transformations and the availability of information on the web, Gabriela Goldschmidt addressed the issue of data computerisation in relation to "design creativity" as early as 1998, pointing out how this is promoted and nurtured by the combination of elements from a variety of sources (Goldschmidt, 1998). In detail, analysing the ways in which images are collected, chosen and used for design

purposes through the use of technology, she argues and promotes a design approach that is supported by systems that allow rapid access to large collections of visualisation- and knowledge-oriented data (Goldschmidt, 1998).
Goldschmidt further states that the selection of images for design purposes usually takes place by favouring previously known works, which are familiar and established, or found by chance by catching one's eye. What was initially referred to as "precedent" is changed to "reference" because, as Bryan Lawson also confirms a few years later: "The designer is not trying to demonstrate a close parallel with the precedent, but rather is using something that is similar enough in some respects to become a useful starting point" (Lawson, 2004, p. 96). In this sense, the difference between an image-project that constitutes a *precedent* and one that constitutes a *reference* is not to be found in being a total image of a work, but rather a partial element, fragment, part of the system, model, diagram, each coming from different categories or domains. In fact, Lawson takes up the concept of "precedent" describing its centrality in the sphere of design education, promoting modes of enjoyment of images and experiences that, in large quantities, contribute to the construction of real luggage of knowledge from which designers can, if necessary, draw. Given the interconnected nature of the project and communication, as well as the large number of sources from which data is available through the web, one can think of reading the process of collecting these images by considering the multiple variables that come into play in a process of *Data Collect* and interpretation of information, i.e. in the translation process from *what is perceived* and *what is conceptualised*.

## 2. Organising Digital References: from *Percepts* to *Concepts*

Today, from the point of view of visual references, the web is increasingly the main source of research by designers and students, due to its obvious cost-benefit convenience compared to analogue modes prior to the digital revolution (paper-based bibliographic research, journals, archives). Considering what Goldschmidt and Lawson expressed, it would thus seem that the vastness of the virtual world with the fragmentary nature of its information offers a benefit for knowledge for design purposes. Joining these contributions is also Valeria Burgio's one: citing the Shannon-Weaver model, she argues for the "heuristic value of uncertainty", recalling the paradoxical relationship between the amount of information and the level of uncertainty derived from it, that is "The greater the information, the greater the uncertainty" (Burgio, 2021, p. 70), emphasising the positive value of breaking away from the predictability of certain overly rigid canons. The rejection of redundancy in favour of novelty is a concept that is also widely shared in the work of Albert-Lázló Barabási who in "Link.
The New Science of Networks" (2002), citing Mark Granovetter's study ("The Strength of Weak Ties", 1973), reports the theory that by accessing our "weak ties" we gain access to new information and opportunities, rather than by accessing our "strong ties" from which we would only get the information we already have access to (Barabási, 2002, p. 42).

Therefore, Barabási's theory also supports the approach of a collection, albeit disordered, of images available on the web, especially considering the potentially infinite increase of the system.

In order to clarify how such a collection can be used in the design field, it is first necessary to think about how "what is perceived" become effectively "conceptualised". Robert Horn distinguishes between the two categories *percepts* and *concepts*, defining the first ones as "impressions of objects received through the sense" and the second ones as: "mental ideas, possibly connected, but sometimes not connected to percepts" (Horn, 1998, p. 95). The process that allows the integration of *percepts* and *concepts* is defined by Horn as "semantic fusion", which amounts to perceiving and interpreting both the specific aspects of verbal concepts, such as words and typographical content, as well as those of visual elements. About the topic of semantic fusion, Jorg Von Engelhardt also proposes the simultaneous reading of the two components of the graphic representation: the type of syntactic structure that the representation presents (*percepts*) and the type of information that is expressed in the representation (*concepts*) (Von Engelhardt, 2002).

In terms of psycholinguistics, the production of conceptualisations derives from certain basic cognitive operations such as categorisation, inference and representation, which in turn produce complex operations such as perception, memory and language (Barsalou, 2012). Laurence Barsalou argues that: "To achieve interpretation, the conceptual system links the specific individuals of perception to the knowledge of the components of experience in memory. This is essentially the process of categorisation" (Barsalou, 2012, p. 239). The relationship between *percepts* and *concepts* can be read in parallel with the relationship between digital memory and human memory.

If, in fact, we consider images and information as "elements of perception", we can think about which cognitive processes, from a design perspective, allow these elements to be transformed into knowledge (thus going beyond mere perceptual input), through comparison with pre-existing memory. Barsalou again responds to this question from a psycholinguistic perspective, stating that the two representations (perceptual and cognitive) "work together to realise cognitive processing" (Barsalou, 2012, p. 239) and that the operation of categorisation takes place as much in vision as in experience. It is no coincidence that in the field of project education, collections of images (as well as photographs, reproductions, drawings, previously referred to as *references*) are categorised under the term 'experiential drawings' (Lawson, 2004). Furthermore, with regard to the cognitive structures applied to design and which come into play in the use of references, Lawson argues for the existence of "guiding principles", as a set of ideas, values and beliefs that the designer uses in the context of his or her own experience, which develop as the level of competence (expertise) increases.

## 3. Designerly Knowledge: Interpretative Models for Organising References' Complexity

Considering, therefore, the Design's point of view in the relationship between human memory and digital memory, it is necessary to introduce a particular and specific approach to knowledge, defined as 'designerly knowledge'. By this expression we mean a complex store of information that is stored in the designer's mind during his or her training (and, as anticipated by 'continuous' learning, also subsequently dur-

ing professional practice) in the form of a system of personal constructs. This form of cognition, peculiar to designers, is defined as "visual thinking", as a mode of thought that directly manipulates information in graphic form through three planes: a direct perceptual plane through one's own drawings, an indirect perceptual plane through the study of references and a plane of the imagination ("Much of design thinking must therefore be based on relating these three types of information", Dorst & Lawson, 2009, p. 104). Given this definition of *designerly knowledge*, the "precedent" (Lawson, 2004), or "reference" (Goldschmidt, 1998) assumes a fundamental role in learning as it allows the designer to create his or her own constructs, both logically and emotionally derived, to interpret the previous design (his own and/or others'), to question the design he observes, to break it down in order to understand it and, finally, to develop completely new concepts. In particular, the so-called 'episodic knowledge' (consisting of specific, experiential, occasional memories) represented by *references*, turns out to be more useful and effective for designers, compared to 'semantic knowledge' (based on rules, structures, relations) which is nevertheless necessary, but which is used almost unconsciously.

If we consider the great digital archive of the web as an inexhaustible dataset, the interpretative procedure recalled by Lawson and Goldschmidt is what, in the opening of the paper, was introduced as a translative process between what is perceived and what is conceptualised. In this case, the tools that intervene in the process of understanding information, are those ascribable to the coding of languages and the elaboration of mappings:

> As soon as we use [a] new, purely conceptual code (or language), it seems possible to consider intelligible, even simple, that phenomenon which yesterday was inextricably complex [...]. If constructed, the most inextricable complexity becomes literally designable. (Le Moigne, 2007, p. 65-67)

This last statement is the key: the encoding of a language makes apparently unintelligible phenomena and concepts intelligible. Similarly, in information mapping (Information Design), the person who collects, interprets and re-processes data becomes part of the communicative system itself through the encoding of a language (thus encoding a communication model). With reference to the translation issue, Nigel Cross also states:

> Designerly ways of knowing are embodied in these "codes". The details of the codes will vary from one design profession to another, but perhaps there is a "deep structure" to design codes. We shall not know this until more effort has been made in externalising the codes. (Cross, 1982)

Externalising the codes is, therefore, an attempt to articulate content and methods as much as possible, since the mechanisms of knowledge and skills are difficult to explain, but can be learnt by example, apprenticeship and study. The ways in which these codes are expressed, unlike the other disciplines that apply verbal or numerical modalities, are non-verbal: modelling, graphic images, drawings, diagrams, sketches, which serve both as a design tool and for communicating the design to others (Cross introduces terms such as "graphicacy",

"object languages", "cognitive mapping", associating these cognitive modalities typical of design activity with the right side of the brain). According to Jonathan Fish, in the "internal representation" phase, in the designer's mind certain temporary structures allow certain representations to be prefigured through reaction with drawings in a translation-type operation in which implicit knowledge is drawn upon to generate new images, or in which images are manipulated to extrapolate new concepts. Fish argues that: "Both of these mental translation processes need visual support" (Fish, 2004, p. 169).

## 4. Conclusions

As in all areas of research, also in the design disciplines the relationship with information technologies has led to the radical change of many habits, such as the search for sources and the study of theoretical and visual contributions, or the elaboration of projects and communicative artifacts from analogue to digital. In conclusion to what has been said so far, with a view to a completely revolutionised approach to sources and based on a disorderly, random and constantly evolving information dimension, we can argue for the importance of the strategies of approaching data and images that are peculiar to the discipline of Design. In particular, the role of the researcher-designer, who becomes the interpreter of changes and adapts to them even within his own discipline, within which he evolves his cognitive and organisational capabilities in a complex perspective, is crucial. Margaret Boden defines human memory as a "system of associative (or *semantic*) networks" from which both relevant and irrelevant ideas are generated (Boden, 1990); if this is equally valid

for digital memory, we observe how, in the case of both, the transition from exclusively *perceived* representations to actually *conceptualised* ones (Barsalou, 2012) remains, in fact, an act of connection within the (direct or indirect) competence of the human being. Due, therefore, to the need to interpret and manage the rules of operation of constantly evolving complex scenarios, Giorgio Giallocosta writes, citing Ernst von Glasersfeld's radical constructivism, that the rules of complexity itself, which we observe as 'external', are actually generated by our experience and our conceptualisation activity (Giallocosta, 2006).

Considering, therefore, design thinking as a process of an extremely complex nature, and above all of a reflective and conversational nature (Lawson, 2004), the phases of research, interpretation and choice of *references* for project use constitute the steps of a process, first of translation and then of attribution of meaning which, correctly structured, becomes a founding tool for design activity.

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# Visual Workspace

## Towards a Systemic Organizational Model for the Definition of New Digital Spaces for Sharing, Collaboration and Corporate Memory

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**Abstract**
The role of data visualization inside companies today, and with increasing emphasis in the near future, will play an essential role not only for the management of discrete and/or isolated events, not only for the achievement of a better reputational positioning on an aesthetic level, but for generating long-term tangible change. The role of visualization in the corporate system of the near future will shape – through the critical lens of design – the organization as a whole and its results, determining its success in terms of sustainable innovation.
This contribution explores a new model of intranet, as a functional and operational tool in response to contemporary changes in company dynamics, in individual as well as collective contributions. A tool in response to the need to understand the complexity of the company system, and in response to the need to define, redefine and communicate one's culture in a more fluid dimension and aimed at exploration by enabling an open, shared, and collaborative environment (Mercanti, 2020). Again, a concrete functional/operational expression of a new business model. A heterarchical model that is not original in its outward appearance as much as in terms of content to qualify and amplify the organizational memory.

## 1. Introduction

The theme of participatory and circular organization, in a broader vision aimed at a strategy for the resizing of hierarchical and role differences, is a potential trend despite not yet fully understood. Among the decisive factors that could contribute to shape this type of organization are: knowledge, sharing, and collaboration, greater and widespread trust among all employees, the presence of a resilient management strategy aimed at change, greater organizational and consequently working flexibility. Following: the importance of fluid and fast communication, the need to create and use useful tools for sharing and collaboration, the importance of continuous training for employees, and the ability to foster and enable creativity, and motivation. Factors that, however, clash with companies and realities in which still lack the times and places to manage information, horizontal communication, and original planning with a view to innovation and sustainability.

Thus, tools, applications and processes more visual and more contextualized can become a valid aid to the stimulation of interpretable insights in such a way as to trigger behavioral reaction mechanisms and activate a process of collective resilience. The openness and accessibility to data and to business relationships thus become the first step towards the creation of real organizational memory, on the one hand, capable of enabling resilience processes in a constantly changing context, from another useful to encourage new projects and new visions that can be shared. Shareable – in fact – only if made visible.

## 2. Experimenting with New Hierarchical Articulations: Knowing the Components

The big data applied to the internal management of the company are contextualized in a broader panorama which sees a reinterpretation of the past and present of companies in terms of structure and strategy with the aim of motivating management as well as workers for continuous change. By placing the individual at the center, the visualization of the corporate structure can become on the one hand, a valid aid for investigation and reading of the dynamics within the company, on the other hand a powerful tool useful for enabling projects with a view to innovation and sustainability with strong repercussions on the territory of belonging (Germak, 2008). In other words, it must necessarily take into consideration human, relational, and functional factors and at the same time maintain the simplicity that allows an intuitive and logical use. It must be alive: stable in principle, but changeable in form.

From these premises, the company is defined as a real organism, as a coherent set of people gathered under a single authority, with the aim of regularly and constantly performing certain functions (Simeray, 1972). The basic principles, operation, criteria according to which it is organized, and how these can be practically translated as demonstrating the intrinsic cultural quality of the company must therefore be determined and clarified. Be it elementary, complex or auxiliary, the establishment of a structure is mainly based on the sequence of relationships between people, creating a series of connections that represent the communication channels between the members of the company. The links can be formal if established *a*

*priori* and often of authoritarian nature, or informal or factual, as they are ascertained *a posteriori*, links that are established between different bodies to establish a collaboration. Again, the links also change depending on the form of the messages as well as the number of recipients and the return movements they trigger: unilateral, bilateral, and multilateral.

Then there are the main functional activities by which we mean all the essential uses for achieving the permanent objectives of a company and the auxiliary activities, necessary for carrying out the main ones. Again, a fundamental component is the staff and its management, whose value is dictated by the professional competence of each person and their ability to integrate into the structure. From this point of view, the organization chart becomes a strategic tool for planning the staff's general management of personnel through, for example, advancement policies to keep staff motivation alive, training policies to keep the system efficient and updated, hiring and selection policies to avoid gaps or redundancies by optimizing the distribution of personnel in the structure, balance the members of a hierarchical line avoiding conflicts or overlaps.
In recent years, many researchers have questioned the future of companies and their structures due to the upheavals that have occurred in the economic, digital sphere or in the speed of change in society in general (Floridi, 2012). A context characterized by hyper-connection, plurality, and fluidity.
In these terms, given the complexity and variety of forms that companies are taking today, the generalization of the main elements for the constitution of the correct visual model becomes essential. The main distinction is thus reduced to two

models: the concept of a mechanistic model tends to be applied to all large structures that are characterized by the need to represent the concentration of dependency relationships between the different members. The organic model, on the other hand, is best suited to all those companies and startups that are characterized by characteristics such as: cross-functional teams, cross-hierarchical teams, fast information at every level, wide span of control and low formalization, companies whose goals are the result of a group effort making sharing and collaboration their strong point. Generally, the list of components of the company system could go on indefinitely, just think of the logistics, the suppliers, and the location of the offices, to name a few. It follows that each structure is a unique representation of the company, both as an intrinsically peculiar feature of itself, and referred to a specific time phase, to a particular place, to internal relations and more generally to the characteristic reference context. The organization chart, therefore, becomes in effect a *business card* with which to present oneself to the outside, influencing the judgment of what everyone expects from the company itself.

## 3. Experimenting with New Hierarchical Articulations: Some Examples

Matrices, sets, trees, networks, the formalization of organizational charts is a topic that is more relevant than ever (Lima, 2014). Many experts, detaching themselves from the past, tend to try to define methods and approaches for the constitution of the visualization rather than the visualization itself, thus defining general guidelines. In fact, a visual/functional representation of an organized structure must be clear in the expres-

sion of objectives, tasks, reports of responsibility and sources, effective and immediately readable, stable in principle and in the graphic/functional organization, resilient to natural corporate and contextual changes and open, going beyond the classic control schemes and increasing the procedural capacity at all hierarchical levels and beyond the corporate walls, becoming in effect an *informed system* (Zuboff, 1988).

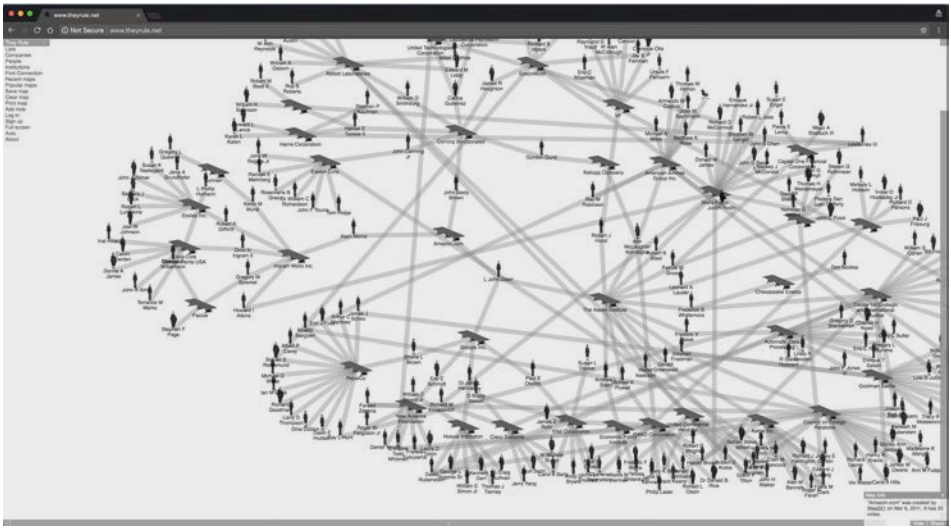

**Figure 1.** Josh On, They Rule: making visible the relationships of the U.S. ruling class. 2005-present.

There are many experiments carried out in this regard. The corporate organization chart of *Walt Disney Studios*, for example, is characterized by the fact that it is based not on the hierarchy of roles, but on the process (Fig. 1). In fact, if the state of contemporary art still sees a silos-centric representation of the different functional areas of a company, the case in question instead places every single role along the entire work process, from conception to implementation.

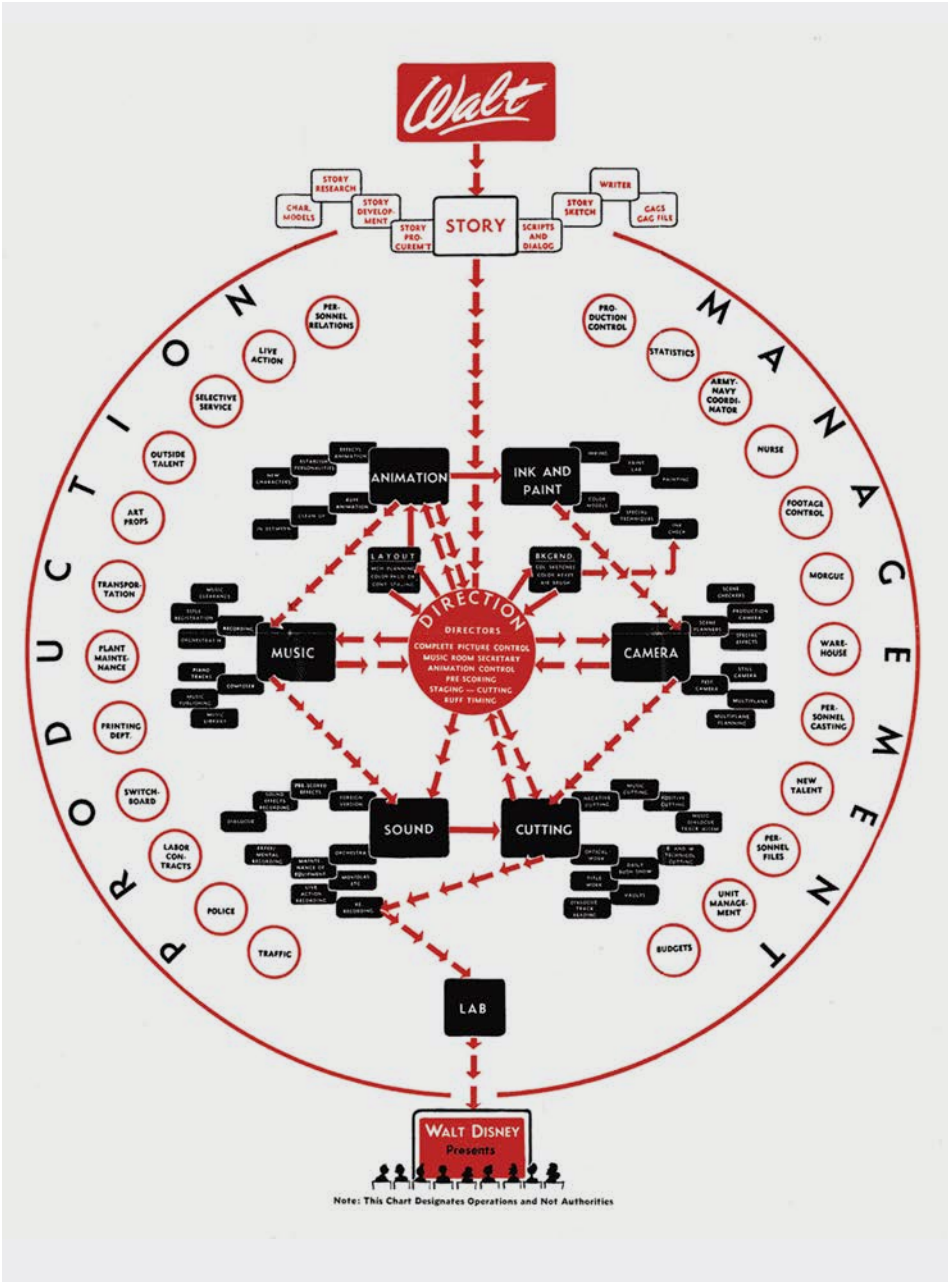


**Figure 2.** Disney Operations, Walt Disney Organizational Chart.

The experiment conducted within the *HubSpot* company instead saw the direct involvement of employees in the creation of a particular organization chart, not so much hierarchical as it is operational, functional, and social. An organization chart based on the report of each employee of two types of relationships: direct manager (black line), network of people who daily and really influence and help their work (blue line). Again *Theyrule.com* (Fig. 2), a project that allows readers to examine the connections between all the members of the board of directors of the top 1,000 US companies, or *Org Org Chart*, an animation showing the evolution of the Autodesk organizational structure over time (1498 days, from May 2007 to June 2011).

Thanks to the potential offered by video animation and the metaphorical use of fireworks, it is possible to follow the various internal dynamics in an extremely easy way: the birth of new structures and substructures such as the closure of some sectors or entire areas. Interaction and gestures, the intersection between technology, culture and education, are some fundamental aspects to enable more immersive and customizable experiences as in the case of *Convene - Organizational Behavior*. By placing the individual at the center, the company organization chart becomes a real tool for investigation, reading, and re-reading of corporate and social interpersonal relationships, offering original and unusual points of view thanks to the intertwining and correlation with data of different nature: mobility, training and personal data of employees, distribution of offices in the area, communications, meetings and much more.

The future challenges, therefore, concern the management of an increasing amount of data available for storage and display, data that are heterogeneous and complex in their nature, but also dynamic as they are linked to a temporal dimension. Again, they concern the – urgent – need for planning actions aimed at preserving the past, at the qualification of the organizational memory in order to strategically manage future challenges.

## 4. Towards New Digital Spaces for Sharing

The *HR Trends and Salary Report* produced by Randstad Professionals with the Alta Scuola di psicologia Agostino Gemelli of the Università Cattolica di Milano, aims each year to explore the current trends within the Italian business landscape. Visionary trends, sometimes disruptive – in the case in question, reference is made to the *Report 2018* – which on the one hand have seen the examination of historical issues such as strategies for human capital and salaries, but which from the others have enhanced new feelings on very contemporary scenarios: the participatory and circular company, the approach to error and emotions in the company (Randstad Professionals, 2018). According to what emerged, 74% of the realities taken into consideration as a sample felt the need for a more or less radical change at the organizational level. Change that hopefully should concern in 65% of cases new styles and models of leadership, and to follow new ways of working, approach to the market and training strategies for individual workers. The most common models among contemporary companies are the divisional one (34%) or a model that sees the company divided and subdivided on the basis of the production lines of the products or according to the geographical logic; the hierar-

chical model (24%) closely followed by the functional one (22%) characterized by the fact that each organizational unit focuses its activities on a particular function, issuing specific directives to the other functional units. Again, the matrix model (16%) as a hybridization between the advantages of functional division and those of the divisional model by product, project or geographical area, and finally the circular model (4%). Only 4% have a circular and participatory model, a model characterized by present but less rigid hierarchies, a model with a marked propensity for autonomy and empowerment of the individual employee as well as of the individual work team. In fact, only 4% who renounce the rigid approach to favor a horizontal comparison. A comparison based on trust, on empathy.

The theme of participatory and circular organization, in a broader vision and aimed at a strategy for the resizing of hierarchical and role differences, is today – in the New Normality – a potential trend despite not yet fully understood. This is due to the fact that real internal organizational challenges are common among companies regardless of their size, sector or geography. Bureaucracy, hierarchy, silos-centric approach, lack of collaboration, aversion to risk and failure, accumulation of information are the elements that have the greatest impact on the way people work, collaborate and achieve their goals, thus also influencing the organizational performance and the ability to innovate and change. Some are the specific axes of possible and plausible action, which characterize the aforementioned challenges today: the importance of collaboration between departments and company functions, the shift of the decision-making axis from the top to the periphery, the contamination and the multidisci-

plinary approach based on project during the team structuring phase, the accessibility of information, the opening of the company system in favor of greater involvement of suppliers and customers, as well as the replacement of a vertical and validation methodology based on annual measurements and monitoring in favor of one based on continuous feedback.

The work to follow is proposed as a pragmatic restitution of the concepts that emerged, as a concrete model of shared corporate space-oriented by a circular approach (Rusconi, 2018). Restitution that is revealed through the tool that characterizes the medium-large company's daily work: the *intranet*.

### 4.1. Focus

Since the mid-nineties, a new telematic paradigm has radically transformed the corporate culture, the methods of communication, questioning habits, and established customs. The innovative telematic network – or intranet – has suddenly become a fundamental tool for a corporate/organizational restructuring with the aim of optimizing work, speeding up internal communications, sharing information, etc. From a more technical point of view, the so-called *Corporate Portal* is the real access point for defined applications and functions:

- *publishing*, as a useful function to convey content and one-way communications to staff;
- *document management*, for the acquisition and management of explicit knowledge through archiving, indexing, and search functions;
- *community*, to support horizontal and non-horizontal in-

teractions and communications between employees, including forums, e-mails, instant messaging, chats, etc.;
- *collaborative work*, for the support and management of teams (videoconferencing, e-room, and more);
- *legacy integration*, i.e. applications for accessing the company's information and management systems, and applications for accessing data and procedures;
- *self-service*, all the activities enabled to provide interactive services to employees: e-learning, help desk, forms, etc.

These activities, can also vary considerably according to the company and its needs. Variations that investigate different functions, activities, connections with other systems, technologies used, and much more.

## 5. Visual Workspace: a Systemic Model

From the systematization of the overview on display, the contribution proposes a new intranet model, as an operational tool in response to the contemporary needs: a visual intranet.
A visual model as a tool to create shared spaces where people can learn from others, share successes and/or failures as well as a common vision of their work (Simon, 2014). An intranet based and powered by company data, and therefore a dynamic, and circular digital tool. A tool capable of restoring the intrinsic complexity of a medium-large company. Because the effects of a technology occur on several levels, just think of the car and the influence it exerts, for example, on the market, on the world economy, on the production of components and materials, on the oil extraction, on the mindset, on the habits and behavior of citizens and much more. Derrick De Kerckhove in

this regard speaks of *psychotechnologies*, as tools capable of extending the human mind. An extension of thought based on the power of information (De Kerckhove, 2014).

We said a visual intranet. A model, the one proposed, able to feed itself from data relating to relational and communicative flows (email and chat for example), from daily information relating to the productivity of the individual worker, but also from external data, such as the weather as a variable able to influence behaviors and moods. Two digital spaces are thus operationally structured: a space of emotions, as an investigation of the mood that can positively or negatively influence daily productivity, as attention paid to personnel by the HR function and by the top management, and a space for relationships, that is the operational and functional heart of the portal.

### 5.1. Space for Emotions

*How do you feel today?* A simple question, a clear intention. An intention that can fall within the broader strand of the *Quantified Organization*. To all intents and purposes, the demonstration and commitment of a company in knowing the sentiment of the individual, visually returning it to the community.
In detail and by way of example of the model, the access screen of the intranet in question, once the worker has logged in, is proposed as a collector of the company's sentiment and mood starting from a simple and direct question: *How you feel today?* Thanks to a predefined coded system of keywords as a database, the background of the home will take on different colors and shades based on the responses of users, defining the real mood of the day.


**Figure 3.** Chiara Remondino, Visual workspace model, *How do you feel today?* The emotional space of the intranet in shades of purple and light blue.

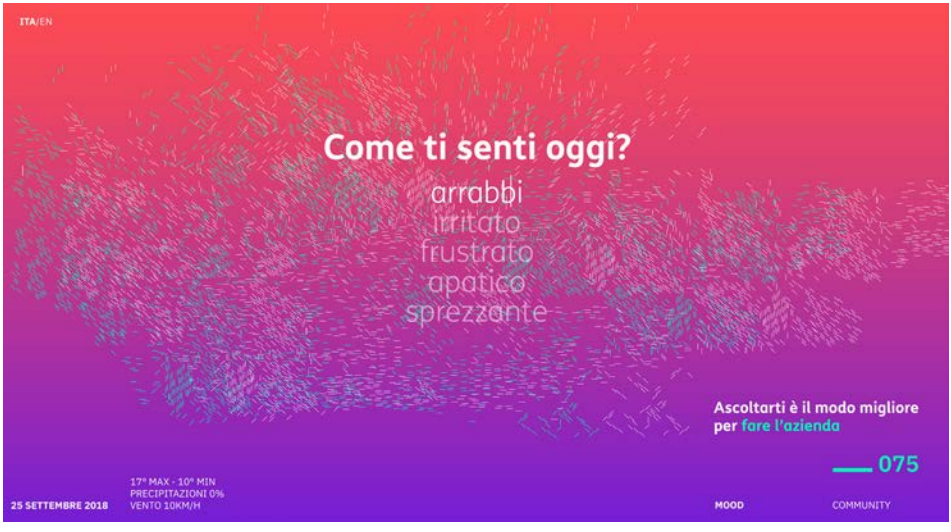


**Figure 4.** Chiara Remondino, Visual workspace model, *How do you feel today?* The emotional space of the intranet in shades of purple and red.

Thus, with responses such as calm, relaxed, sad, and melancholy, the nuance will take on shades of purple/blue (Fig. 3), with responses such as angry, frustrated, apathetic, and contemptuous the nuance will take on purple/red tones (Fig. 4), with responses such as anxious, nervous, and worried, the nuance will take on shades of red/orange, and with responses such as happy, satisfied, and enthusiastic, the nuance will take on shades of green/blue.
The dynamic display, updated in real time based on the feedback received, displays and reports the details, also in real time, of the weather conditions of the day: temperature, precipitation and wind. Once the answer has been entered, you will be directly addressed within the platform, however, before sending it will be possible, thanks to the functions provided, to view the progress of the corporate mood of the day, week and month. Finally, a counter will monitor the active people at that precise moment within the company.

### 5.2. Space for Relationships

Assuming that the entire portal would continue to guarantee the fundamental functions and operations for the proper performance of everyone's work, this concept completely overturns the paradigm of the traditional hierarchical model. Starting from the concept of the network, the challenge is to give up the rigid setting by levels, to encourage comparison and horizontal collaboration. Benefiting from the processing of the communication data of the individual (email, meeting, calendar, etc.), to assist in a real re-organization of time, space and corporate culture. A time, a space and a culture based on the importance of the concept of influence and the need for

comparison with the other. The other, which does not necessarily place itself above the defined hierarchical line. The message must be sought exactly in this reorganization: the success of a job, of a project, or more generally the well-being of the company of the future will largely depend on the recognition by the top management of the importance of horizontal influence, of trustworthy dialogue from below will largely depend on the degree of flexibility and transparency that will be guaranteed. Again, it will depend on the degree of downsizing of hierarchical differences achieved in favor of greater participation and therefore circularity of internal communication, in favor of a holistic vision of shared strategies.

By way of example, some views, functions and actions of the proposed model. The central body of the screen is proposed as a visual rendering and representation of the company organization chart (Fig. 5). A different network for everyone, personal, unique.

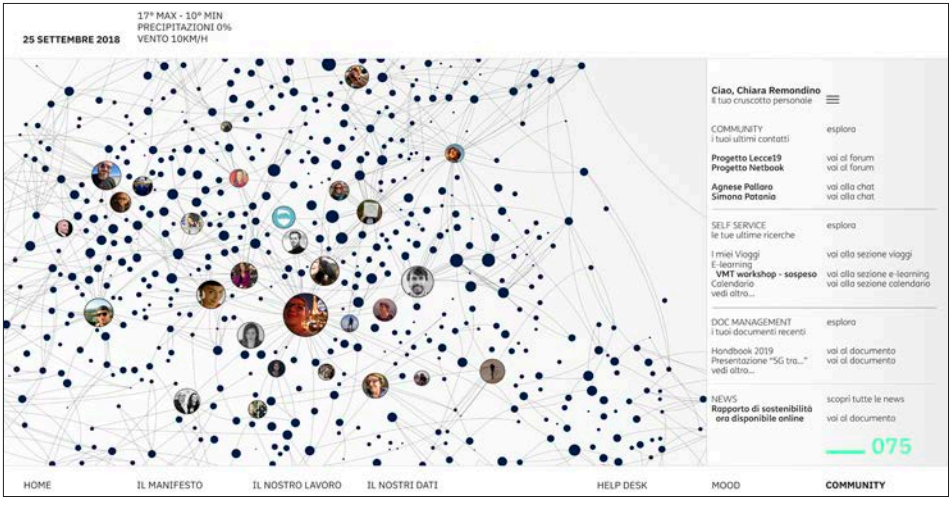


**Figure 5.** Chiara Remondino, Visual workspace model, The relationship space of the intranet: *Homepage*.

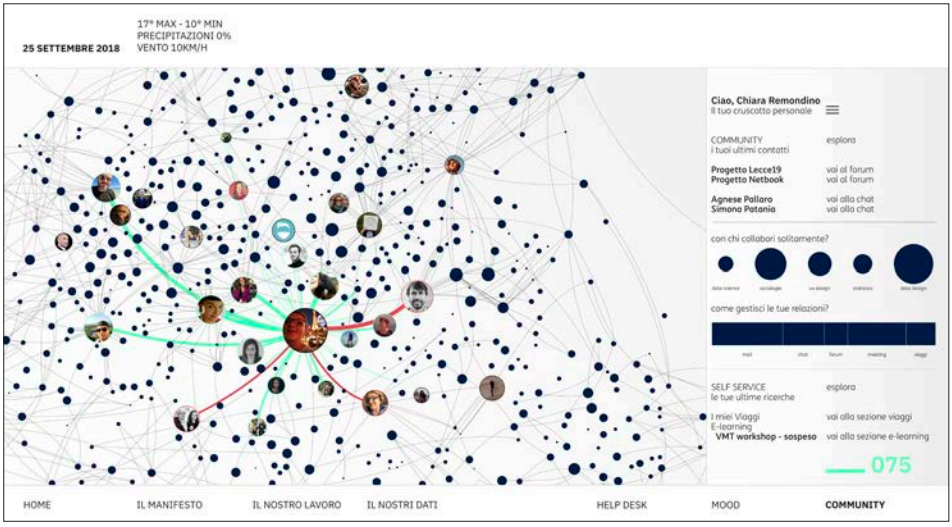


**Figure 6.** Chiara Remondino, Visual workspace model, The relationship space of the intranet: personal connections.

With the aim of giving everyone the opportunity to view and immerse themselves in their own relational system, representation qualifies horizontal connections (Fig. 6). The conformation of the network is based on the concepts of proximity and frequency; each node (person) of the network will in fact be more or less close to the main node (logged-in worker) based on work affinity and therefore on competence, and the node will be more or less large based on the frequency of communications. For clarity, it should be specified that when the system detects a communication, the node and therefore the connection are automatically created. In detail, the hierarchical dependencies will take on a red color and the influence connections in green, and the lines will be more or less thick to underline the frequency of connection and communication between the two nodes. By activating the *over* function on the nodes, a curtain will open directly containing the details of the person

on whom you have focused (name, e-mail, sector of belonging within the company system, coded tags, etc.).

It should be specified that all interactions on the network automatically enable changes in the side area. In fact, the selection of your network will correspond to the display of some detailed data about, the professionals with whom you are in greater contact. If useful functions do not appear in the side area at that time, you can open the drop-down menu and then select the desired section.
Precisely with the aim of creating a collaborative space, collecting and sharing the company's information assets, there are two fundamental sections/functions to ensure company memory and work optimization. Within *Our work* it will in fact be possible to view the entire digital archive of works ordered chronologically and have immediate confirmation of the name of the project and the work team, and then view the file showing: upload date, team, a brief description, the data used, the reference link(s), etc. (Fig.7). While the *Our data* section will contain all the datasets used in the various works. Dataset that can be filtered and organized by year, category, format and rating, dataset that can be viewed, updated and/or downloaded at any time (Fig. 8).

## 6. Conclusions

"We especially love projects that make our life simple" says J. Maeda (2006, p. 5), whose continuous research-action aims to pursue simplicity on a continuum in what we can now define the digital transition, an era in which technologies will be increasingly elaborate, complex and pervasive.


**Figure 7.** Chiara Remondino, Visual workspace model, The relationship space of the intranet: *Our works* section.

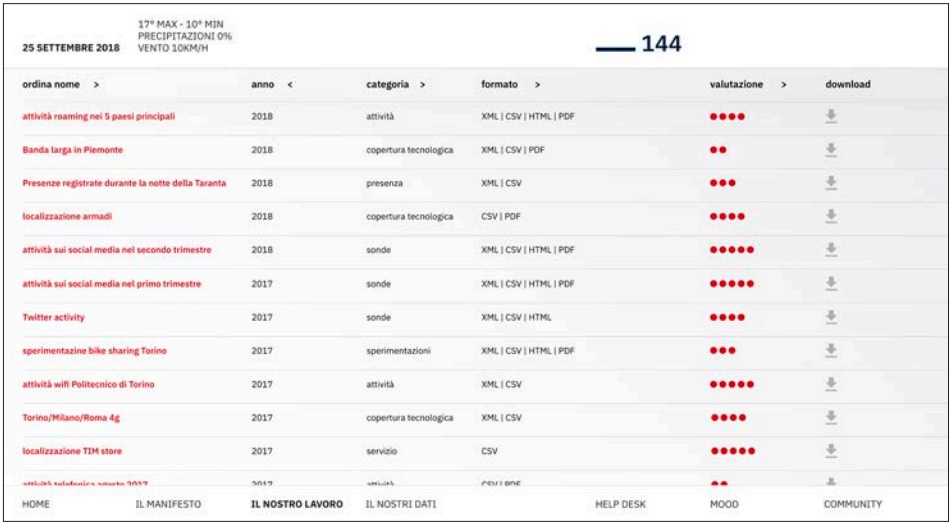


**Figure 8.** Chiara Remondino, Visual workspace model, The relationship space of the intranet: *Our data* section.

A simplicity of thought intended as a strategic tool with which companies can first compare their intrinsic functional and managerial complexities. Collecting, managing, organizing, and keeping track of data in the right form and with the right tools requires very specific technical, and design, knowledge (Masud et al., 2010).

The proposed model and future possible interactive implementations, thus aims to pursue the assumption that "the network is the message", as a combination of flexibility and adaptability with respect to the objectives of decision-making and execution, of individual expression and horizontal communication. With the aim of minimizing the concept of hierarchy as a top down coordination mechanism, the proposed model manifests itself in the quality of a system based on the importance of collective intelligence, based on often horizontal and interdependent relationships between the different parts. To all intents and purposes a *cognitive multiplier* (Rullani, 2002) which takes the name of *heterarchy* (Hedlund, 1986).

A narrative of openness and knowledge, however, only occasionally follows one inclusive practice, capable of satisfying administrative/bureaucratic aspects on the one hand and operating at the level of the imagination, culture and widespread and shared responsibility on the other. In this complex informational landscape, citing Victor Margolin's thought, democratic nature should not be understood and pursued in its most traditional sense but as a process. A process that is articulated in the planning of democracy as a basic condition that arises from the contribution and collaboration of dif-

ferent actors. A process aimed at democracy with a view to transparency and preservation of memory (Margolin, 2012). A process rooted in a broader democratic system capable of highlighting and activating, through design, initiatives aimed at shaping realities that are no longer exclusive but collective, inclusive, plural.

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II

# DIGITAL SPACES

## TECHNOLOGIES AS EXPERIENCE AND NARRATIVE ENHANCERS

# Immersive Narratives and Memories

## The Design of Digital-Enhanced Visitor Experience

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Immersive, Narrative, Post-Digital Museum, Narrative Environments, Visitor Experience Design.

**Abstract**
In 2015 the conference *Between the Discursive and the Immersive: Research in the 21st Century Art Museum* by Louisiana and Stedelijk Museum, identified these two terms, discussed mainly concerning exhibitions, as indicators of a shift in the contemporary method of offering culture. *Discoursive* refers to a new curatorial form of interdisciplinary and synesthetic programming, while *immersive* looks at the spectacularization of the exhibition.
This article, in the first part, introduces the term *narrative*, in between them. Through a narrative system, exhibitions relate themself to the visitor no longer only in terms of appropriate reproduction of knowledge, but rather in terms of generation of knowledge.
*Narrative* amplifies the meaning of *discoursive* and declines it as the communicative capacity of the complex relational system "collection-significance-visitor", opening up to a critical review of the concept of *immersive*, which often, operatively, it is interpreted in a purely filmic way.
The second part introduces the concept of the Post-digital Museum (Parry, 2013) as a construct that contextualizes the "narrative" instance within the recent discourse of museum digital transformation. Any reading of design practices (Mason & Vavoula, 2021) within contemporary museums cannot ignore a paradigm shift in Digital Cultural Heritage, in which digital has become naturalized in museums' "way of thinking." This integration "marks a continued development of the museum's concept and practice" (Arvanities, 2015). The post-digitally discourse will allow us to set the theoretical context and conclude with some reflections and illustrative examples on the practice of visitor experience design (Mason, 2017) in post-digital museums, which is particularly associated with the "design of narrative environments" (Austin, 2020).

# 1. Discoursive Vs Immersive + Narrative Part 1.

## 1.1. Discoursive Vs Immersive + Narrative

In 2015 the conference "Between the Discursive and the Immersive: Research in the 21st Century Art Museum" by Louisiana Museum, University of Aarhus and Stedelijk Museum,[1] identified these two terms, discussed mainly concerning exhibitions, as indicators of a shift in the contemporary method of offering culture. *Discoursive* refers to a new curatorial form of interdisciplinary and synesthetic programming, while *immersive* looks at the spectacularization of the exhibition (Laurberg & Schavemaker, 2016). Mark Wingley (2016) addresses this dualism in terms of space design, where, the logic of reading, which privileges the language of vision, is counterposed to the logic of experience, which uses the language of multisensoriality, affirming that they are intrinsically intertwined.
Laurberg and Schavemaker (2016, p. 1) take their cue from what they call the "academic turn taking place in the world of museums" to emphasize how museums are increasingly involved in speculative and research-based activities, often interdisciplinary, which are now largely integrated into the entire process of their institutional programming. Furthermore, they observe how knowledge production increasingly passes through experiential and synesthetic models of exhibitions and collection displays, where curatorship and design converge on scenographic and emotional languages. Finally, they note the growing presence of new media technologies and so-

1 A selection of the papers introduced at the conference is available in issue 4 of *Stedelijk Studies* (2016). See: https://stedelijkstudies.com/issue-4-between-discursive-and-immersive/.

cial media. Hence the statement that "knowledge production in modern and contemporary art museums oscillates between the discursive and the immersive, giving rise to a wide range of curatorial and research models" (Laurberg & Schavemaker, 2016, p. 2). Both terms seem to refer mainly to a condition, where the exhibited collections are the consequence of critical issues and operative options, referable to theoretical choice of field: the exhibition and the museum as a place of research in terms of contents and languages, with a certain inclination to meet the public in a communicative level that is easier and more attractive to them, in terms of understanding and sharing culture.

### 1.2. The Narrative Factor

In the first part of this article, I would like to illustrate how the *discursive/immersive* binomial finds its most intense interpretative logic when it is accompanied by the *narrative factor*, which represents the capability to decode and transmit meanings by making them comprehensible. A vocation that is intrinsically human and that is structured around memory, as well as the actions principally connected to it: remembering and processing. The exhibition set up becomes a sort of catalyst that encourages one to seek new information and initiate connections between different media contents (Borsotti, 2017, p. 12). The exhibition design is an

> act of research as an experience of acquiring knowledge gives the scenographer an insight into the narrative potential of an object as well as its historical and cultural relevance, its function, and its symbolism. Things are witnesses that are able to provide infor-

> mation about the past. They are, as Krzysztof Pomian calls them, *semiophores* which mediate between the past and present. (Atelier Brückner, 2011, p. 61)

This mediation also involves digital memory, both in terms of technologies capable of expanding the availability of virtual memory space, while compressing/dematerializing its physical encumbrance, and, above all, in terms of enhancing the conditions of activating mnemonic *stimuli*, as well as the extent of the range of references and solicitations that can be easily and synchronically involved and offered to visitors. The digital ecosystem finds in its application to exhibitions and collection displays a place where it can actively place itself at the service of memory, both short-term and long-term. It is called on not to invent an uncritical, *on-demand*, and immediately obsolescent dialectical world, as is the case with the more widespread mechanism of social media, but rather a set of innovative and easily assimilated experiences, where technology acts as a *facilitator* of information, whose accessibility can be easily dislocated in time and space.
In the essay "Discursive versus Immersive: The Museum is the Massage", Mark Wigley argues that "We live in an age in which everyday life is suspended within countless overlapping flows of information. Each of these overlapping flows operates as an immersive environment and as a discursive system of detection, analysis, and visualization" (Wigley, 2016, p. 1). Wigley points out, therefore, how the discursive and immersive apparatuses are already overlapping and synergetic, a condition that nullifies the expository distinction between words and wordlessness, between vision as opposed to multisensoriality.

The narrative factor defines and structures cognitive sequences that allow a simultaneous exploration of the contents of what is exhibited, whether they are explicit or implicit. Through the development of a narrative display system, exhibitions relate themself to the visitor no longer only in terms of reproduction of knowledge, but rather in terms of generation of knowledge. (Atelier Brückner, 2011, 2018; Den Oudsten, 2012; Kossmann et al., 2012; Borsotti, 2013, 2017; Migliore, 2019). Narrative exhibition design, therefore, not only shows but above all evokes, reveals, involves, excites, and stimulates. All this both intellectually and perceptually.

*Narrative* amplifies the meaning of *discoursive* and declines it as the communicative capacity of the relational system *collection-significance-visitor* to propose multiple ways of accessing and deepening. Also, it opens to a critical review of the very concept of *immersive*, often interpreted in a purely filmic way, with no opportunity to boost the exhibition contents through interactions that enhance its meanings.

### 1.3. The Society of *Iconographic Bulimia*

The technological power to create scenarios that enhance our perception of the world, holds a destabilizing capacity, both in terms of distortion of reality and in terms of addiction to a redundancy of information that, being human, we can only minimally assimilate. Paradoxically, this involves the risk of a *receptive fragility*, the consequence of which could be the very annihilation of the preservation of the mnemonic perception of the past and present. A fragility that is already in action today, when, in a museum, the average time spent in front of a work of art is estimated at only eight seconds! (Tate

gallery, n.d.; Iotti, 2020, p. 61).[2] Today, due the simplicity by which images can be produced and disseminated generates a widespread perceptive blindness: the image as an instantaneous and volatile icon. Through social media, more than 3.2 billion images and 720,000 hours of video have been shared daily in 2020 (Thomson et al., 2020); actually, according to Photutorial data "1.81 trillion photos are taken worldwide every year, which equals 57,000 per second, or 5.0 billion per day" (Broz, 2023). If, as Guy Debord warned us in 1992, "the spectacle is not a collection of images, but a social relationship between individuals, mediated by images" (Debord, 2006, p. 54), today we are witnessing the very dissolution of the spectacularisation of the image, which persists for the duration of a handful of seconds, giving way to the society of *iconographic bulimia*. It is not surprising, then, if a major cultural institution like the Tate Gallery in London, has launched the initiative *A guide to slow looking*, a best practice manual for museum visitors (bulimics, in fact) in which it is suggested to select, for one's visit, only a few works to which one should devote at least ten minutes of attention…

2 "A visit to a museum or art gallery can sometimes be an overwhelming experience. With so many works on display, trying to see everything can feel like a race against the clock. Studies have found that visitors to art galleries spend an average of eight seconds looking at each work on display. But what happens when we spend five minutes, fifteen minutes, an hour or an afternoon really looking in detail at an artwork? This is 'slow looking'. It is an approach based on the idea that, if we really want to get to know a work of art, we need to spend time with it. (…) Of course, slow looking means being selective. If you spent 15 minutes looking at all 78,000 artworks in our collection, it would take you 12 hours a day for over four years to look at everything. The important thing is that you select a work that you are drawn to, that intrigues, attracts or frustrates you". Tate gallery. (n.d.) *A guide to slow looking. Be amazed by the discoveries you can make when you look for longer at art*. https://www.tate.org.uk/art/guide-slow-looking

### 1.4. From Gestures to Playful and Exploratory Involvement

The development of exhibitions structured in terms of narrative design enables the role and modalities of the technological presence to be reviewed to coordinate it in a defined script Uwe R. Brückner calls it *partitura* (Atelier Brückner, 2011, 2018) so that the times and modes of discovery, perception, comprehension, and assimilation can be managed simply and rhythmically. The visitor's attention span is so designed in a sequence of interactions between concentration, interactive involvement, and contemplation. The exhibition allows itself to be experienced according to different stages of discursiveness and immersiveness, in which the digital intervention becomes an experience aimed at the consolidation of a memory of the present capable of settling easily, thanks also to *humanized enabling modalities*.

### 1.5. Studio Azzurro: Drawn on Digital Memory with Everyday Gestures

Studio Azzurro is a Milan-based multidisciplinary design group committed to the creation of sensitive environments and narrative habitats. They use multimedia solutions that transform the digital presence into opportunities for gestural and sensory expression of the visitor, constantly invited to act as a trigger for the technology. Studio Azzurro aims at the use of gestures taken from everyday life, to make accessible information stored in that natural memories repository that is the people themselves. Here, then, in the rooms of the *Fellini Museum* (Rimini, Italy, 2021), visitors are called upon to confront the same language of the famous Italian director whose work is intrinsically linked to the memory and sensoriality of personal

experiences, filtered and revisited in dream worlds by gaining access to spontaneous and shared rituals.
Inside fragments of film sets, visitors give themselves up on listening to narrative voices or open trapdoors to discover in-depth videos. One of the most iconographic presences is the *confessionals*, reminiscent of those in the "8½" movie and establishing an individual relationship between the visitor and the various testimonials who share their memories as collaborators of the director. Here, information is made accessible in a condition of intimate complicity: in this way, the exhibition becomes a memory of that human condition of knowledge transmission defined by a personal relationship (Fig. 1).

### 1.6. *ReBlink*. Memories Meet Through the Lens

The power of digital technologies and augmented reality to modify the perception of our everyday life was the subject, in 2017, of the *ReBlink project*, realized by artist Alex Mayhew

**Figure 1.** Studio Azzurro, Fellini Museum, Rimini, Italy, 2021. Rooms *filza di fogli - pontile del porto - confessionali* (photo ©Marco Borsotti).

on behalf of the Art Gallery of Ontario.[3] The particularly interesting aspect of the exhibition concept is the intention to provide visitors with a kind of system update on some of the works of art on display. Thus, on the one hand, with their augmented version, the subjects of the paintings amaze by coming to life, in a disorienting and ironic way, within their frames, but above all, they establish new, actualized forms of relationship with visitors, subverting the uncanny ability of digital tools to generate streams of a-temporality, where everything merges into an uncritical temporal *continuum*.

**Figure 2.** Alex Mayhew, *ReBlink*, Art Gallery of Ontario, Canada, 2017. Source: https://www.alexmayhew.com/portfolio-item/reblink/.

The exhibition (Fig. 2) stabilizes past and present by linking the memory of what is represented in the painting to the experiential reality of the visitor, thus generating a reworking that "comments on the changing nature of the human condition. [...] This initial seduction paves the way for a deeper engagement, in which more serious questions are explored, the intellect is stimulated, and a range of emotions are un-

3 The *ReBlink* project is still ongoing, thanks to a lot of experimental spin-off like Location Specific, *ReBlink Fashion* or *ReBlink Cards*. See: https://www.alexmayhew.com/portfolio-item/reblink-plus/

leashed" (Impossible Things, n.d.). Visitors use an app for smartphones and tablets and with their device's camera can discover Mayhew's interventions in some of the artworks in the AGO's permanent collection. The act of taking a photo, now so commonplace as to have taken on a ritual dimension that almost cancels out the value of the immortalized subject, here activates the discovery of the work itself and the memory of its content.

### 1.7. I Left the House to Go to the Cinema and I Found Myself into a Museum

When an exhibition space gives its narrative character only to the digital tool, neglecting any kind of interaction with the visitor and relying on the total preponderance of the visual aspect, an important problem of field definition arises. Are we still within an exhibition space? Or are we faced with a cultural declination based on cinematic spectacularisation? And what concept of immersive nature do these places express? Paraphrasing Roy Ascott (1996), we can say that immersive exhibitions are often a "kind of digital carousel projector", a condition that implies an exclusively passive vision of images. Thus, the exhibition understood as a space that interacts with the collection and the visitor becomes a pure *environmental retrofit* that does not require any interpretative action. The container assumes a neutral role determined by the total absence of any formal and perceptual relationship with its surroundings. The exhibition environment simply becomes a hypertrophic, three-dimensional extension of the screen, on which images flow, assembled according to digitally manipulated montages.

The lack of intermediation implies the abolition of any mediating instance (Han, 2015). This absence circumscribes the narrative potential to the filmic script alone, whose temporal field of action is the pure present, the immediate. "Yet, sometimes, in what are bad examples of exhibitions labelled as immersive, immersiveness has become a kind of visual image, representing immersion without being immersive or multi-sensory. Immersion is the object framed by the logic of vision" (Wigley, 2016, p. 2). It is, therefore, a different idea of immersion, which does not involve space in its formal nature, nor the collection as a narrating subject, nor the visitor as an active and participating actor. Rather, is proposed a *pixel-based* immersive condition, where the potential of the digital is exploited for its capability to reproduce in high-definition objects physically absent, making them fascinating, through evocative image editing. As Boris Groys (2018) states,

> the exhibition should be understood not as a pure act of presentation, but as the presentation of presenting, as the unveiling of one's framing strategy (...) When we visit an exhibition, we do not only look at the images and objects on display, but we also reflect on the spatial and temporal relationships between them the hierarchies, the curatorial choices the strategies that produced the exhibition and so on. The exhibition shows itself before it shows anything else. It shows its own technology and ideology. In fact, framing is nothing more than a mixture of technology and ideology. (Groys, 2018, p. 170-171)

Discursive and Immersive without Narration risk abdicating a technology without ideology, that is, an absence of visitor

experience design practice. The latter is, instead, the focus of the post-digital museum concept.

## 2. Narrative + Digital Part 2 (Towards the Post-Digital)

### 2.1. The Post-Digital Museum: an Introduction

In this second part of the article, I would like to introduce the concept of post-digital museum (Parry, 2013) as a construct that contextualizes the "narrative" instance within the recent discourse of museum digital transformation, as well as trace main relationships. The post-digitally discourse set the theoretical context for the main contribution to this second part of the article – i.e. to provide some reflections and illustrative examples (from my previous research projects) on the practice of *visitor experience design* (Mason, 2017; Scott et al., 2017) in post-digital museums.

Any reading of Digital Cultural Heritage design practices (Mason & Vavoula, 2021) – including "design of narrative environments" (Austin, 2020) – within contemporary museums cannot ignore a paradigm shift in the museum sector, in which digital has become naturalized in museums' "way of thinking." This integration is much more than a simple "juxtaposition of material and digital [technology] but it marks a continued development of the museum's concept and practice" (Arvanities, 2015). Parry (2013) defined the term "post-digital museum" as an emerging condition that is explained as a transformation that sees digitality acquiring a normative presence and penetrating into museums' missions, structures, and practices. Museums are not just adopting new technology, but rather they are embedding digital thinking, practices, and

tools in their vision and strategy, and ways of thinking and designing to engage with their visitors.

### 2.2. Digital Experience vs Visitor Experience

This shift reflects the tendency of *digital* to become normalized and embedded into many (if not all) aspects of museum practices, including collection, curation, education, interpretation, and marketing (Pierroux, 2019). A shift that is driven by the new post digital paradigm as digital and physical dimensions are intertwining in digital cultural heritage museum design. In the last decade, museums have increasingly shifted toward practices that aim to enhance museum visits through hybrid digital/physical information spaces. Museum post digitally allows us to see the design of immersive spaces within a new paradigm that does not separate the digital experience into something different from the overall museum experience (Kelly, 2016; Mason, 2017).

I would like to point out that, for this reason, in this article, I do not distinguish "digital experience" as something separate from the visitor experience. Digital interactive *technology* has been the subject of extensive research on the form and configuration of technology within human-centered computing (e.g. Bannon et al., 2005), human-computer interaction (e.g. Bolter et al., 2013), engineering (e.g. Kalay, 2008), and digital heritage (e.g. Mason, 2009). However, in the last decade, the interest has increasingly shifted toward studies investigating engaging and meaningful ways to enhance the museum visit – i.e. visitor experience; Hornecker and Ciolfi (2019) offer different examples of projects that consider central the de-

sign of visitor experiences. Other works in human-centered computing have proposed an embodied view of interaction – through hybrid digital/physical experiences – in which the visitor experience is situated in a rich physical environment (e.g. Zancanaro, 2015). According to Ciolfi (2015), "combining a more holistic and rich view of people and practices with the consideration of body and place is key for developing innovative technologies and interactions in heritage contexts".
The knowledge generated has enhanced how digital media mediates the visitor's interactions and experience, "evolving from point-and-click modalities to include a consideration for the body and the senses, the physical environment, and the social world" (Ciolfi, 2015, p. 424), echoing Alexenberg (2011) who describes post-digital as a new age in which digital technologies are becoming "humanized" thanks to (also) an intertwining of the digital world and physical space, and embodied media and mixed reality.
Therefore, the integration of digital (technologies, practices, and thinking) is impacting the nature of collections, learning, the audience behavior, and expectations, and what is more significant for this article: the *visitor experience*.

### 2.3. The Contribution of Visitor Experience Design (VX) to the "Design of Narrative Environments"

Visitor Experience Design (VX) is particularly associated with the "design of narrative environments" (Austin, 2020), given its concern with networked relationships among people (visitors), digital and physical space(s)/place(s), digital content and object(s) on display, and story(ies), as shown in Austin's tripartite framework (Fig. 3).

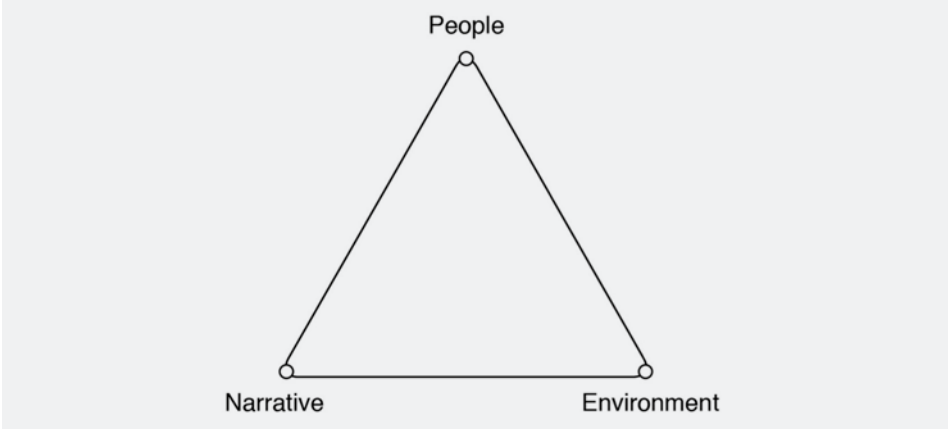


**Figure 3.** Tripartite network model of narrative environments. Austin, 2020.

Austin describes a narrative environment as a "site of action and interaction among people, narratives, and places" (Austin, 2020, p. 4). This concept is in line with what Marco Borsotti discussed in the first part of the article, who defined "narrative environments" as immersive, multisensorial, and interactive, which are all attributes that are shaped by the logic of (visitor) experience. By referring to Ellen Lupton's (2017) book *Design is Storytelling*, Austin (2020, p. 6) pointed out how storytelling techniques are particularly effective for designing narrative environments. In particular, the author underlined that the practice of designing for narrative environments is "particularly associated with the principles of User Experience Design" (Austin, 2020, p. 7), which in our case becomes Visitor Experience Design (VX). User Journey map, Experience Map, Scenarios; storyboards, Experience Flowcharts, and other methods are part of the toolbox made available to visitor experience designers (Hanington & Martin, 2019).

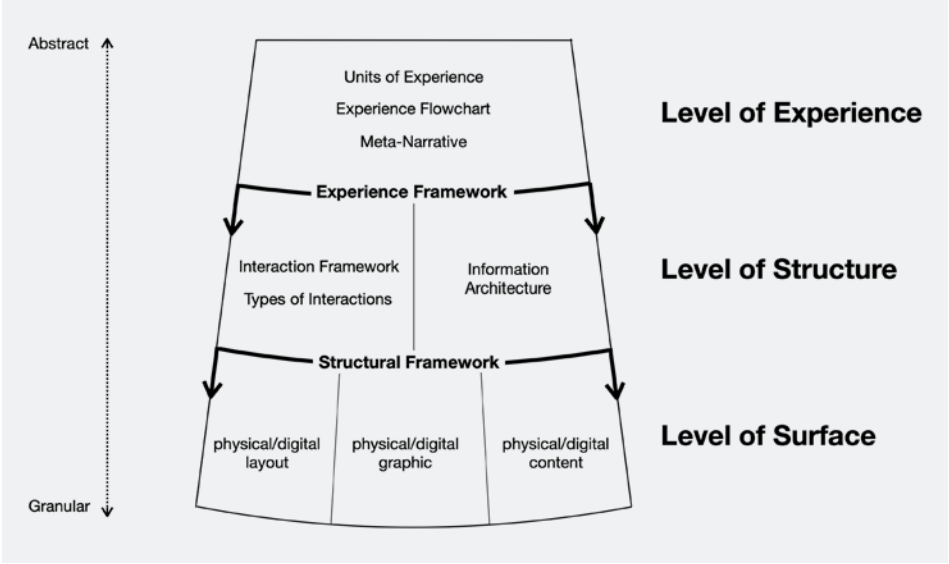


**Figure 4.** The *Three Levels Conceptual Framework*. Source: Marco Mason.

Visitor Experience Design is a human-centered design approach to design for a visitor experience that works across Experience, Interactions, and Visual levels of design as articulated in Mason's (2020) framework (Fig. 4). For this article, I want to focus on the first level of Experience as it incorporates design practices and methods suitable to design the experiential structure underlying narrative environments. It is out of the scope of this paper to delve into more specific interaction design methods and techniques that work at the Level of Structure and Level of Surface.

### 2.4. Designing the Underlying Experience Framework: The Emerging Issues Commons as an Illustrative Example

I use the Emerging Issues Commons gallery at the Institute for Emerging Issues as an illustrative example to show how

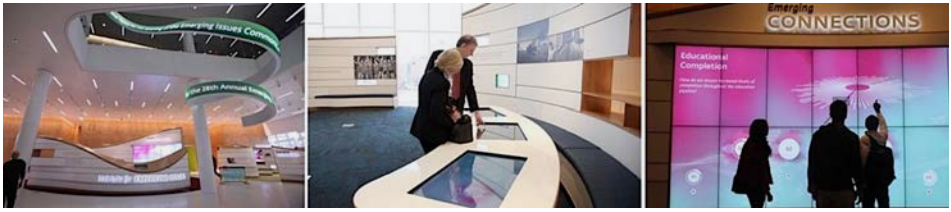


**Figure 5.** The *Emerging Issues Commons* exhibition at the Institute for Emerging Issues. Courtesy: Second Story.

some experience design methods can be applied to the design of narrative, immersive environments.

The North Carolina State University's Hunt Library secured funding to support a major redevelopment program. The project resulted in an iconic building (designed by Snøhetta architects) to foster innovation across disciplinary boundaries, as well as experimentation, creation, and research. In addition to a range of collections and services, the new library would house the Institute for Emerging Issues (IEI) to engage citizens willing to contribute to civic issues Aiming to break down barriers to participation and grassroots collaboration, the IEI matched the Hunt Library's mission and aimed to become North Carolina's premier public policy hub. The result was Emerging Issues Commons (EIC), an immersive, interactive exhibition space within the library with a fully integrated website that focuses on public policy in North Carolina. The gallery is a highly interactive environment comprising digital interactives and physical graphical components through which visitors can explore statistical data-driven interactives, the personal stories of prominent North Carolina figures, and relevant social media (Fig. 5).

The exhibition was the result of more than two years of collaborative effort between the Institute, a digital design studio

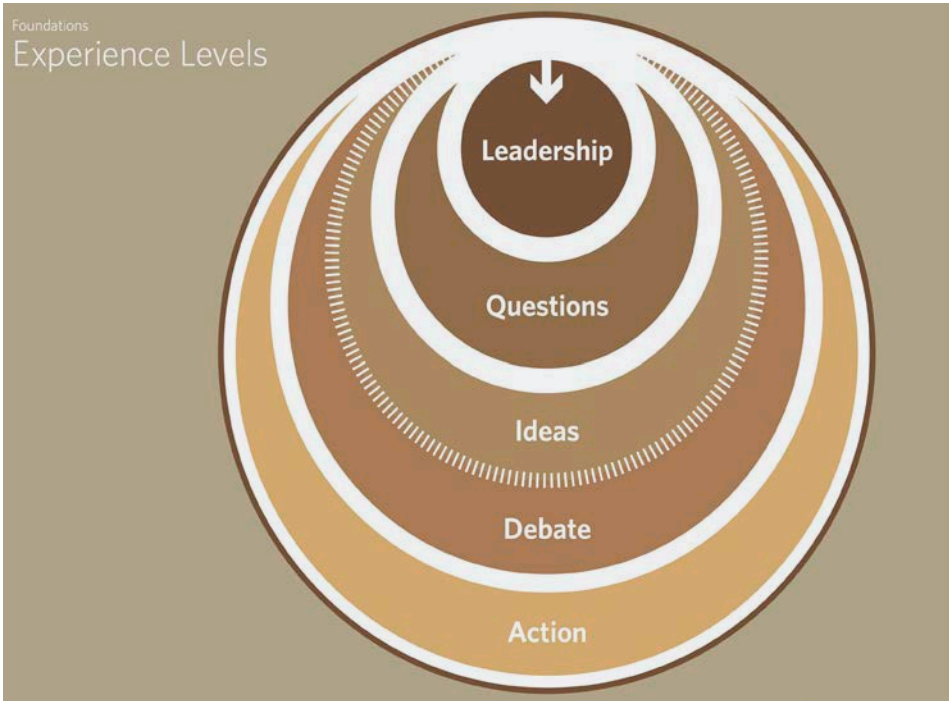


**Figure 6.** The *Units of Experience and Figure*. The *Emerging Issues Commons* Exhibition at the Institute for Emerging Issues. Source: Courtesy Second Story.

(Second Story digital studio), and a museum planning and design firm (Gallagher Associated). In particular, for this article, I want to focus on the three methods – *Unit of Experience Diagram* (Fig. 6), *Experience Flowchart* (Fig. 7), and *Meta-Narrative* (Fig. 8) – that were combined to define the Experience Framework (Fig. 4) underlying the whole experience structure of this narrative environment.

The *Units of Experience* were a diagram representing "the five levels of experience": Leadership, Questions, Ideas, Debate, and Action (Fig. 6). Each unit of experience established a boundary around a specific type of experience that forms the different sections of the interactive gallery.

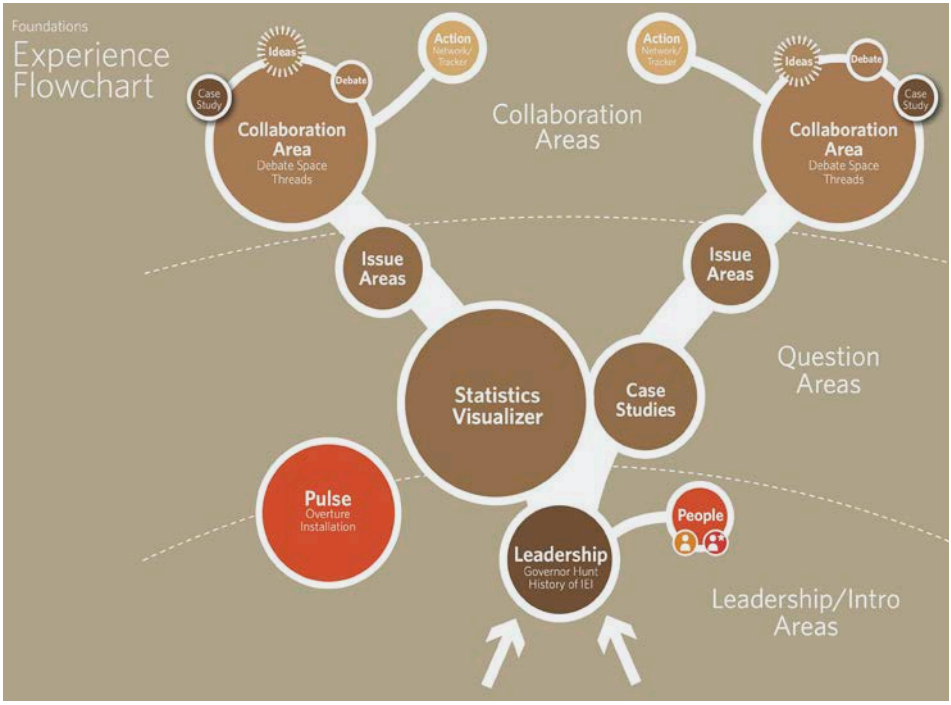


**Figure 7.** The *Experience Flowchart*. The *Emerging Issues Commons* Exhibition at the Institute for Emerging Issues. Source: Courtesy Second Story.

These experiences possess unitary boundaries as, borrowing the words from Dewey (1934), each "experience has a unity that gives it its name [e.g. *that* "Leadership" experience", *that* "Questions" experience]. The existence of this unity is constituted by a single quality that pervades the entire experience despite the variation of its constituent [internal] parts" (Dewey, 1934, p. 38). These *Units* form the "what" of the Experience Flowchart by defining the different types of experiences that were combined within a logic, coherent structure, i.e. the Experience Flowchart. The *Experience Flowchart* (Fig. 7) can be seen as a sort of outline of the narrative or, in other words, as the structure of the units of experience.

It suggested three areas of activities (Introduction, Questions, Collaborations) as a further abstraction that grouped together the different "units." The Experience Flowchart defined "how" different units of experience were logically related. Relationships amongst these areas were traced to determine the "flow" of the visitor experience. The Experience Flowchart can be seen as the definition of a "visitor experience walkthrough" in the gallery space that suggests a general experience narrative. The "Introduction Area" experience explores the issues facing North Carolina and the personal stories of real North Carolinians. Then, in the "Question Area" experience, visitors move deeper into the gallery space, engaging with intermediate "questions" that address the history, values, demographics, and people that affect policy in the state. Finally, in the "Collaboration Areas" experience visitors are invited to debate and participate in the discussion around current issues faced by North Carolina.

But is the *Meta-Narrative* (Fig. 8) that actually gives foundation to the whole narrative. It is the third design method that consists of a metaphor that grounds the narrative into the culture and history of North Carolina. Drawing on North Carolina's textile industry heritage, this metaphor provided something familiar and, therefore, recognizable and understandable (Carroll & Mack, 1985) for North Carolinians to hook their emerging understanding of the IEI. This metaphor triggered a connection with the socio-economic culture (and historical identity of North Carolina) as textiles help drive innovation in the state, just as the Gallery is helping drive a new era of innovation.

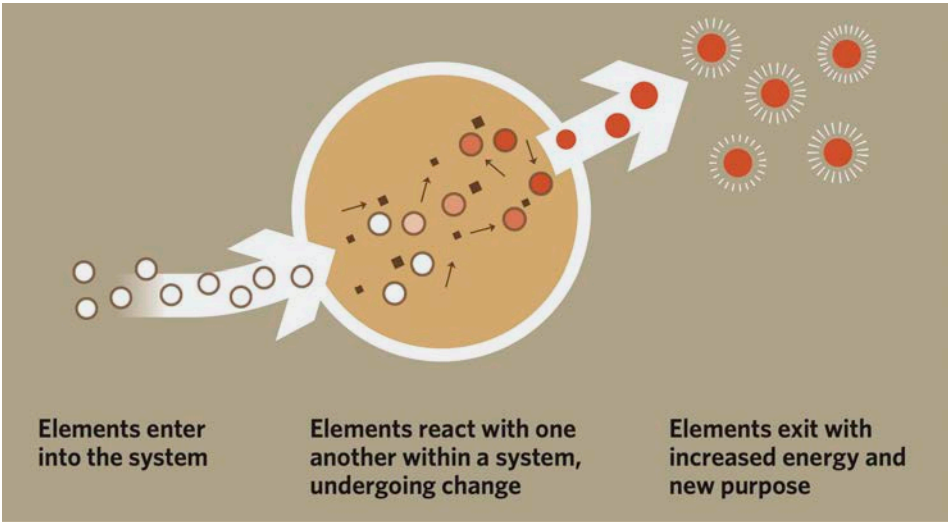


**Figure 8.** The *Meta-narrative Diagram*. The *Emerging Issues Commons* Exhibition at the Institute for Emerging Issues. Source: Courtesy Second Story.

For example, the "Leadership/Intro Area" that was defined in the Experience Flowchart corresponds to the metaphor "Elements enter into the system" and clearly refers to the current issues facing North Carolina and the stories of North Carolinians. The "Meta-Narrative" is the "why" of the narrative, it is the essential, fundamental story.

The three (experience design) methods were intertwined and combined – each focused on a particular aspect of the design – they were instrumental to the design of the whole narrative and offered the basis for the design of the digital interactions (Fig. 9), as well as (digital) graphic elements (for more details on the interactive and visual design for IEI, Vavoula & Mason, 2017; Mason, 2020).

What I have shared is just one of several possible examples of the application of design methods for designing for experience, which draws on storytelling.

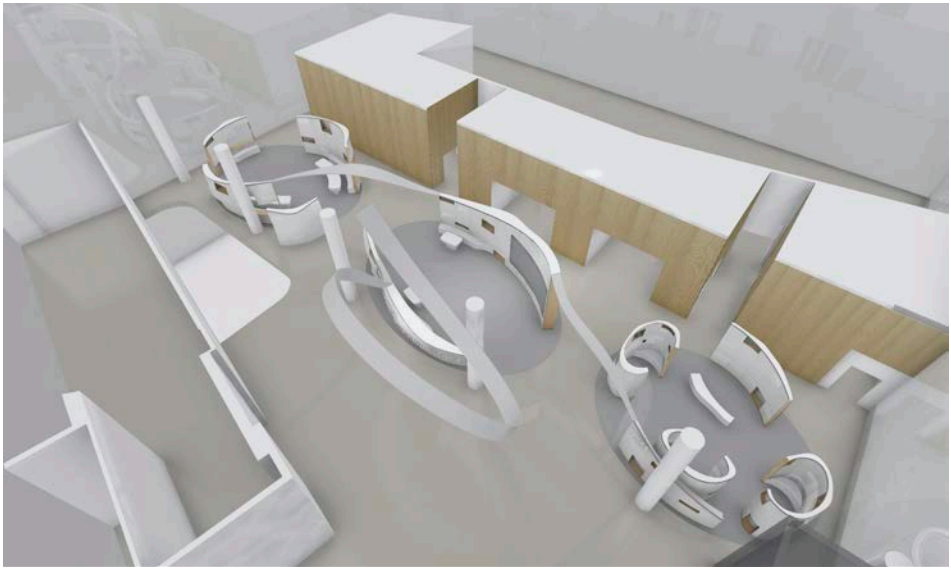

**Figure 9.** Second Story and Gallagher Associated, North Carolina State University, 2010. The 3D view of the interactive gallery.

Far from being a universal formula for designing all immersive species, the combination of these VX methods wants to show how the design of narrative environments does not start at all, from technology and its functional capabilities, but from framing the human (visitor) experience.

## 3. Conclusion Remark

The narrative element of an exhibition project introduces interesting potentiality for investigation, especially in seeking the relationship between theoretical implications and design practices – which considers the interplay of the "discursive" and "immersive" components toward the design of digital-enhanced visitor experiences. Working within this intersection allows (i) a better understanding of the mechanisms of the visitor's experience when the visitors engage with the cultural

contents and, also, (ii) enhances visitors' proactive involvement within hybrid physical/digital landscapes. Digital experiences can achieve a more complete structural value thanks to the narrative contribution, opening up innovative scenarios within which developing the concept of the post-digital museum – which is a novel paradigm that normalized "digital" into the overall visitor experience.

Indeed, museum post digitality sets the theoretical paradigm in which the narrative elements can be operationalized into the "design of narrative [digital-enhanced] environments" (Austin, 2020). Visitor Experience Design (Mason, 2017; 2020) offers a valuable methodology to intertwine story(ies), visitors, digital and physical spaces, digital content, and objects on display. What emerges from our reflections and illustrative examples of immersive digital projects is that designing for these digital "spaces" is more than an exercise that simply combines physical and digital components but, rather, it offers the tools to conceive the immersive narrative environment (i.e. the immersive exhibition) as "a cohesive, integrated set of experiences" (Norman, 2010, p. 54) that holistically consider the interplay of different elements – story(ies), visitors' needs and expectations, digital and physical spaces, digital content, and objects on display.

## Acknowledgment

Although the paper is a result of the joint work of all the authors. Marco Borsotti is in particular responsible for Part 1 – paragraphs 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, and Marco Mason is the author of Part 2 – paragraphs 2.1, 2.2, 2.3, 2.4, 2.5.

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# Interpreting with Sound
## The House Museum as a "Reactivated" Site of Memory in the Digital Age

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**Keywords**
Sound, Memory, House Museum, Design, Exhibition.

**Abstract**
Thanks to the development of digital technology, sound has been one of the most valuable contributors to the reactivation of memories in the space of museums. This article mainly focuses on sound design, sonic strategies with digital means and the relationship between sound and memory in European house museums through the lens of exhibition design. The research stated that it became apparent that many museums offer a multi-dimensional sound or musical experience, encouraging visitors to concentrate on the aspects that most deeply resonate with their interests, stories and memories. The foundations of academic literature, case studies, and an analytical tool called *Exhibition Sound Score/Partitura sonoro-allestitiva* support us in generating a unique typology framework that divides the sonic strategies into three distinct attitudes: *the hidden sound, the diffuse sound, and the interactive sound.* It analyses how house museums deploy sound elements in an effective way through different aspects, including contents, exhibit artefacts, sound equipment, interaction, the typology of cultural assets shown, and strategy, and identifies innovative sonic strategies that embrace new rituals, enhance omnichannel narratives and achieve immersive engagement.

## 1. Introduction

Postmodernism, the democratisation of knowledge, nostalgia, and a collective argument about a mediatised turn in museums can all be deemed responsible for the recent surge of interest in museums' memories and digital memories. Likewise, it demonstrates that memories are increasingly becoming regarded as a valuable resource and national asset, continuing to shape today's lifestyle, community, and culture. Traditionally, museums have been regarded as repositories of memories. Today, however, the remit of museums goes beyond merely the collection, which extends to interpretation and representation, while also providing opportunities for encounters with the memories of previous generations. Further to this point, the study spotlights the lens on the house museum, where the re-evocation of the memory is the crucial soul of the place. Dialogues, music, and soundscapes are all sealed within these memories and incarnated as "beautiful corpses" (Brooks et al., 2021, p. 33). These sounds are supposed to reveal the essence of the house museum, which is a living archive that plays witness to the changing times. Stocker (1995, p. 2) stated, "Once a sound is made, it can completely disappear in just moments, but it can leave an impression that may last for generations." Sound is an informative, interpretive, or immersive tool depending on various contributing factors, its multiple incarnations, as a narrative means or heritage, possesses an invasive strength to trigger memory and a sense of belonging for museum visitors. Through the lens of exhibition design, this article explores digital approaches related to sound and memory among sound-themed house museums in Europe.

| List of selected house museums with sound strategies | | | | | |
|---|---|---|---|---|---|
| Museum name | Location | keywords 1 | keywords 2 | keywords 3 | keyword 4 |
| | | house museum | sound | digital means | Memory-related content |
| Casa del Suono | Parma,Italy | √ | √ | √ | √ |
| Casa Natale di Giuseppe Verdi | Parma,Italy | √ | √ | √ | √ |
| Casa natale di Arturo Toscanini | Parma,Italy | √ | √ | √ | √ |
| Casa della Musica | Parma,Italy | √ | √ | √ | √ |
| Casa Museo di Antonio Gramsci Ghilarza | Ghilarza,Italy | √ | √ | √ | √ |
| Casa Rossini | Pesaro,Italy | √ | √ | √ | √ |
| Museo del Paesaggio Sonoro e Palazzo Grosso | Torino,Italy | √ | √ | √ | √ |
| Haus der Musik | Vienna, Austria | √ | √ | √ | √ |
| Beethoven Museum | Vienna, Austria | √ | √ | √ | √ |
| Mozarthaus Vienna | Vienna, Austria | √ | √ | √ | √ |
| Wien Museum Haydnhaus | Vienna, Austria | √ | √ | √ | √ |
| Johann Strauss museum | Vienna, Austria | √ | √ | √ | √ |
| Mozart's Birthplace | Salzburg, Austria | √ | √ | √ | √ |
| Das Richard Wagner Museum | Bayreuth, Germany | √ | √ | √ | √ |
| Gustav mahler museum | Hamburg-Neustadt, Germany | √ | √ | √ | √ |
| Mendelssohn House | Leipzig, Germany | √ | √ | √ | √ |
| Bach museum | Leipzig, Germany | √ | √ | √ | √ |
| Schumann House | Leipzig, Germany | √ | √ | √ | √ |
| Heinrich Schütz House | Bad Köstritz, Germany | √ | √ | √ | √ |
| Fryderyk Chopin Museum | Warsaw, Poland | √ | √ | √ | √ |
| The Beatles Story | Liverpool, United Kingdom | √ | √ | √ | √ |
| Beethovenhaus Baden | Baden, Austria | √ | √ | √ | √ |
| Franz Liszt Memorial Museum | Budapest, Hungary | √ | √ | √ | √ |
| Museum About Liszt | Weimar,Germany | √ | √ | √ | √ |
| Schiller Residence | Weimar,Germany | √ | √ | √ | √ |

**Figure 1.** Yi Zhang and Raffaella Trocchianesi, The museum cases for Selection, 2022.

| Data collection for cases | | | | | | | |
|---|---|---|---|---|---|---|---|
| Museum name | pre-visit | | | | | on-site visit | |
| | Photos | Videos | offical website | social media | literature | Observations | Brief Interviews |
| Casa del Suono | √ | √ | √ | √ | | √ | √ |
| Casa Natale di Giuseppe Verdi | √ | √ | √ | √ | | | |
| Casa natale di Arturo Toscanini | √ | √ | √ | √ | | √ | √ |
| Casa della Musica | √ | √ | √ | √ | | √ | √ |
| Casa Museo Luciano Pavarotti | √ | √ | √ | √ | | | |
| Casa Museo di Antonio Gramsci Ghilarza | √ | | √ | √ | | | |
| Casa Rossini | √ | | √ | √ | | | |
| Museo del Paesaggio Sonoro e Palazzo Grosso | √ | | √ | | √ | | |
| Haus der Musik | √ | √ | √ | √ | | √ | √ |
| Beethoven Museum | √ | √ | √ | √ | | √ | √ |
| Mozarthaus Vienna | √ | | √ | √ | √ | √ | √ |
| Wien Museum Haydnhaus | √ | | √ | √ | | √ | √ |
| Johann Strauss museum | √ | √ | √ | √ | | √ | √ |
| Mozart's Birthplace | √ | | √ | √ | √ | | |
| Das Richard Wagner Museum | √ | √ | √ | √ | | | |
| Gustav mahler museum | √ | √ | √ | √ | | | |
| Mendelssohn House | √ | √ | √ | √ | | √ | √ |
| Bach museum | √ | √ | √ | √ | √ | √ | √ |
| Schumann House | √ | √ | √ | √ | | √ | √ |
| Heinrich Schütz House | √ | √ | √ | √ | | | |
| Fryderyk Chopin Museum | √ | | √ | √ | | √ | √ |
| The Beatles Story | √ | √ | √ | √ | | | |
| Beethovenhaus Baden | √ | √ | √ | √ | | | |
| Franz Liszt Memorial Museum | √ | √ | √ | √ | | | |
| Museum About Liszt | √ | | √ | √ | | √ | √ |
| Schiller Residence | √ | | √ | √ | | √ | √ |

**Figure 2.** Yi Zhang and Raffaella Trocchianesi, Data collection for cases, 2022.

## 2. Literature Review

Digital memories and sensory experiences travel back and forth between museology and exhibition design studies as the digital has transformed the past mode. It manifests that the concept of memory is extended and may be afforded a more vague, complex meaning (Arnold-de-Simine & Simine, 2013). To some extent, it is critical to recognise "digital memories as digital treasures" (Garde-Hansen, 2011, p.78). This raises intriguing questions about how to let memories operate within the context of cultural memories as valuable resources. For Maj and Riha (2009), communication is the core element, and it also hints that memories must contain time-tested transmissibility in a legible, understandable form and mediation.

If we observe the transmissions of memories in the broader historical context, we can detect a constant striving that humans try to expand memory's capacity, media, and scope while improving its intelligibility, accessibility and understandability matched by corresponding social, cultural and technological developments. In ancient times, the reliance on oral tradition to preserve memories was an interaction between storytellers and audiences (Hoskins, 2017). In this case, perhaps vivid descriptions and passionate voices were the decisive factors in the process. Later, the advent of the letter unsettled the oral culture, brought humans into the written culture and transformed the way people perceived the world into a visual epistemology as a dominant approach. In contrast, the profound importance of oral/aural rationales seems to have been neglected since the literate era (Ihde, 2007; Cortez, 2021). This situation was in a state of constant flux until the inven-

tion of electronic communication (Parry, 2013; Drotner et al., 2018), and the ensuing rapid spread of sound devices enabled the preservation and repetition of sounds in the last century. In recent years, there has been a spectacular levelling up of digital means and communication tools as well as the emergence of sound studies as a renewed scholarly research field (Kelman, 2010), supported by the aural and multisensorial approaches on the strength of various media and creative cultural experiences to re-shape the museums' environment which can reflect memory and its diversity comprehensively (Hutchinson et al., 2020). Since Schafer introduced the concept of "soundscape", the academic community has gradually been interested in discussing the relationship between sound, environment, people and noise. This concept has also been applied to museology, and Zisiou (2011) advocated that museums should involve professional soundscape designers. Schafer divided soundscapes into three categories according to the features of sonic environments: "keynote sounds, signals, and soundmarks", and he argued that "soundmarks make the acoustic life of the community unique" (Schafer, 1993, pp. 239-240) and that soundmarks are the representations and memories of a certain place considering it cannot be found anywhere (Yelmi, 2016).

It is fundamental to introduce the concepts of *mediated memories* and *mnemonic imagination* when it comes to the nature of digital memories. Mediated memories could be interpreted as memories triggered by a collection of objects that reflect the past, including the memories hidden in photos and letters belonging to individuals. The mediated memories in objects

represent a person's identity and mindset at a particular moment and open up a perspective on observing and perceiving individual consciousness to connect meaningfully to the past, even community and generations (Van Dijck, 2007).
The aforementioned section indicated a shift in mediated memories, the abundance of digital items partially displaced the physical objects and the more distant traditional oral forms as carriers of memories. Yet, more importantly, the digital means here become a front-end tool to entice the viewer into the world of memory and offer a multi-layered, multi-sensory approach to convey memories, the medium of which is not external but are brought from within (Hoskins, 2017). Digital means include multi-layered and multi-sensorial approaches that can give the audience visibility and expression of memory authentically. In the company of friends and family, what the audience perceives in the museum is no longer a past memory belonging only to a particular person or family. Instead, it is the present, collective memories that contain social experiences dedicated to sharing and communication, which is considered a prominent type of the most satisfying experiences in museums (Pekarik et al., 1999).

Meanwhile, *mnemonic imagination* is a central topic in memory studies (Keightley & Pickering, 2012). Frederic Bartlett (1932), a psychologist who has significant achievements, claimed that remembering, for the most part, is reliant on recalling the past into the present to create a reactivated site of consciousness. In his opinion, remembering is not a formalized, fixed and directed re-motivation or simple repetition, it often relies on imagination to enable people to reshape and

create their world of memory. Neither memory nor imagination is a logical process, full of randomness and chance that varies from individual to individual, which is a severe challenge for designers (Sabiescu, 2020). In addition, *placeless i*s an iconic characteristic of digital memory that is often regarded with fluidity, fragmentation and ubiquity (Mandolessi, 2021). However, spatiality is essential to refer to memory because it always takes place in a "specific site, a social context and a cultural location" (Chrzová, 2019, p. 6).

Many museums are conceived as a container for memories, in other words, they offer a platform for these memories to be encountered. Sound with its rich and subtle auditory dimensions, including surroundability and directionality (Ihde, 2007), also intrinsically interrelates to time (della Dora, 2021), when sound as an expressive tool can facilitate intellectual or emotional engagement. Moreover, sound is not only a tool for activating memories and imagination but also as content for memories that belong to a particular period in the past. In terms of sound as exhibition content, it is a meaningful way to experience historical sound that has been put in an authentic place (Baker et al., 2016; della Dora, 2021). Sound is an inherent dimension of museums (Stocker, 1995), and through clever arrangements by designers, can be harnessed to create new museum approaches, stories and effects that bring audiences multi-sensory, emotionally driven and empathetic experiences (Bubaris, 2014; Everrett, 2019). In conclusion, the museum and sound with digital means under the comprehensive plan of the designers can provide audiences with a new spatial and temporal matrix that contributes to communica-

tion, reflection, and imagination among generations for enhancing memories' value.

## 3. Materials and Methods

The methodology is based on four orders of action.

*Searching, Selecting and Analysing*:

- Carrying out desk research about house museums in Europe and then highlighting these museums that claimed that they are usually sound-themed or have sonic strategies with digital means. Social networks and web platforms have been considered informal sources in the cases chosen to assess whether this museum contains innovative sound design with digital means.
- Selecting 24 house museums as paradigmatic cases according to the following criteria:
    a. The museum is a house museum.
    b. The museum is sound-themed or with sound content.
    c. The museum is with digital means.
    d. The museum is with memory-related content.

*On-site visiting*:

- Carrying out field research through on-site visits to verify whether the case fits the selection criteria and to gain further insight into the design content.

*In-depth analysis and Envisioning*:

- Verifying how the sonic strategies were adopted through a methodological tool called *Exhibition Sound Score/Partitura sonoro-allestitiva* that was previously created.

- Identifying innovative sound design scenarios and solutions in order to empower the cultural experience in terms of sound atmosphere.

Focus on *Exhibition Sound Score /Partitura sonoro-allestitiva:* This tool aims to analyse how museums deal with sound through different parameters in terms of the typology of cultural assets shown, contents, exhibit artefacts, sound equipment, interaction, and strategy, and how to generate sonic strategies for various contents.

*Synthesizing and Framing*:

- Seeking the digital technologies and corresponding narrative strategies that have effectively improved visitor experiences in the selected cases.
- Creating a design framework able to systematize potentialities, scenarios and solutions. On the one hand, this tool illustrates the diversity of sound practices while, on the other, supporting subsequent inquiry about how these practices are perceived and experienced by audiences. It can also support the meta-design approach to new ways of facilitating sound design in museums and temporary exhibitions.

## 4. A Framework for how Sound Reactivates Memory in House Museums

### 4.1. The Hidden Sound

The museum has long since been considered a silent place to prevent disturbing the journey of visual exhibits.

| Museum Name | Sections | Strategy | Typology of cultural assets shown | Contents | Exhibit artefacts | Sound equipment | Interaction |
|---|---|---|---|---|---|---|---|
| Mozarthaus Vienn | / | Audio guide | Historical stories, celebrity anecdotes | Extensive information on the life and work of the Mozarthaus | / | Hand-held listening devices | Audiences enter the numbers to listen to the corresponding content |
| Museum About Liszt | / | Audio guide | Historical stories, celebrity anecdotes | Stories of what happened in this room, and the origins of the objects | / | Hand-held listening devices | Audiences enter the numbers to listen to the corresponding content |
| The Beatles Story | / | Audio guide | information, video interviews, celebrity anecdotes | Extensive information on the life and work of the Beatles | / | Smart touchscreen devices and headsets | Audiences tap the screen to select the appropriate content to listen to |
| Wien Museum Haydnhaus | / | Audio guide | Historical stories, celebrity anecdotes | Extensive information on the life and work of the Haydnhaus | / | Smart touchscreen devices and headsets | Audiences tap the screen to select the appropriate content to listen to |
| Casa Natale di Giuseppe Verdi | / | Audio guide | Historical stories, celebrity anecdotes | Anecdotes and facts about the Master's childhood | / | An iPad and a pair of headphones with an interactive map | Audiences tap the screen to select the appropriate content to watch and listen |
| The Bach Museum | Listening Studio | Listening room | Music | All composition by Bach | Sofa, table lamp, the media stations and headset | The media stations and headset | Audiences can choose Bach's compositions from various criteria, such as the title and opening words, and then immerse themselves in the music |
| Johann Strauss Museum | / | Listening station | Music | Ten classic compositions by Johann Strauss of each station | Operating panels with ten buttion and chair | Headset | Audience can press the button to listen to the composition |
| The Beethoven Museum | Section 6: bequeathing | Listening station | Music | Classic compositions by Beethoven | Vintage letters, chairs and headphones | Headset | The music in the headphones is played all the time and the audience can hear it with the headset on |
| Schumann House | Listening Cabinet | Listening room | Music and literature | The works Clara and Robert composed in Leipzig and the selected literature about the Schumanns. | Sofa, exhibition panel, the media stations and headset | The media stations and headset | Audiences tap the screen to select the appropriate content to watch and listen |
| Schumann House | / | Listening room | Music and literature | Classic compositions by Mendelssohn | Chair with upholstery, table, iPad and headset | iPad and headset | Audiences tap the screen to select the appropriate content to watch and listen |

**Figure 3.** Yi Zhang and Raffaella Trocchianesi, The Hidden Sound, 2022.

Meanwhile, some studies have claimed that musical objects in museums have dead and believed the collection of sound objects in museums from the perspective of preservation, aesthetic and symbolic considerations rather than their practical history, "operational state" (Cliffe et al., 2019, p. 2) and functionality, even though audiences argued their eagerness to listen to the original sound of the past (Sterne & De Luca, 2019; Rossi Rognoni, 2019). All serve to potentially convey a typical

impression about museums, a soundless, silent spiritual sanctuary within "a highly devotional and quasireligious" model (Wiens & de Visscher, 2019, p. 2). Until this point, museums have typically insisted on this silent and inanimate stereotype despite the fact that they were sometimes eager to incorporate sound into their settings and experiences (Bubaris, 2014), and this perspective also draws out the following type, *the hidden sound*. This type contains a cautious attitude that maintains the silent museum stereotype by hiding sound in museums to let audiences discover the entrances of sound in person, then put on headphones and listen to it, often without any feedback.

The diverse typologies of cultural assets shown by sound: the information, the music, the original file or the combination of sounds have conveyed a variety of content and information as visitors journey through exhibits and installations. In particular, the informative sound often occurs as the audio guide that mixes the audio description, oral testimony, and voice-over in the form of a mobile device or application, which is generally followed throughout the exhibition. One of the most strident examples is the audio guide of informative sound represented by *Mozarthaus Vienna*, *Museum About Liszt* and *The Beatles Story*. The audio guide in *Mozarthaus Vienna* is an ordered supplement that museums use to attempt to direct the audience's gaze towards visual exhibits and attract them in a more dynamic and vivid narration, considering that the exhibition room has been refurbished so that the historical furniture and objects of the past rooms are no longer in existence, the historical atmosphere in the room has been somewhat diminished and has transformed into a more modern one.


**Figure 4.** Mozarthaus Vienna, the audio guide device. Photo by Yi Zhang, 2022.

In comparison to *Mozarthaus Vienna*, which has a larger space and a wide range of sound devices, *Wien Museum Haydnhaus* and *Museum About Liszt* are common in that there are fewer tourist crowds and less space. Through the audio guide, the audience gravitated into this calm and personal journey and immersed themselves in the atmospheric houses that had the composer's traces, manuscripts and personalities with a renewed sense of perspective and empathy. *Casa Natale di Giuseppe Verdi* offers each audience member an iPad and earphones with an interactive map and uses the audio sections to portray the composer's anecdotes.

The museum claimed that they applied a unique recording technique to create three-dimensional audio effects called binaural sound, interfused projections and historical video reconstructions in the original house into an audiovisual experience to support the narrations and it indeed gained potency.

The audiences' expectation of hearing the authentic sound and perceiving the soul of the master drove house museums to collect a series of original music and set listening areas. *The Bach Museum* offers multiple choices that include all of Bach's music classified by the title, year, and criteria into a menu for audiences of various backgrounds, from musical experts to people with only a limited understanding of music. Meanwhile, some museums do not have a wealth of sound collections and mature digital archives like the *Bach Museum*, *Johann Strauss Museum* and the *Beethoven Museum* set a tiny listening station that has an operating panel with either six or ten buttons, with each button representing a piece of music, this provides less choice, but guarantees that every piece is a classic.

This non-open approach that is played through the earphone drew some criticism as being conservative or outdated. However, the sound that creates an atmospheric background that belongs to the historical period is valuable enough to hit some audiences and offer them an opportunity to perceive the memory with an "authentic aura" (Meehan, 2020). According to some designers, particularly those in the house of the master, the design exhibits are supposed to drive the audience to hold their breath with a sense of reverence and respect during their visit. On the other hand, the designers do not expect too

much sound, crowd noise and its reverberation in a tiny space to ruin the solemn atmosphere.

It is probably a compromise for most museums that consider the constrained space and excessive sound source in one room may affect guests, but it does not indicate that design methods lose their potency here. The listening room in the *Bach Museum*, *Mendelssohn House* and *Schumann House* set comfortable sofas and soft lights to encourage people to lay back and enjoy music in a relaxed manner. Moreover, Mortensen (2012) suggested that sound artefacts slowed down audiences, because the activity of listening demands attention and time, unlike the audiences who could simply skim-read the visual information in a quick space. More frequently, museums set a specific sound area that offers *the hidden sound*, which both contributes to the concentrated audio experience for audiences and low-technical communication approaches for sonic memory archives.

### 4.2. The Diffuse Sound

The following sound approach is described as *the diffuse sound,* which is still bound to the inherent impression of the museum as a quiet learning place mentioned above.
It embraces a cautious attitude toward the sound and avoids making the room become a noisy playground at the design level. Nevertheless, sound has already sought opportunities to break the pure silence in museums and positively create a dialogue with the audience to express its narrative qualities. The sonic transmission has not only been confined to within the headphones, but from the headphones to the audience, the

sound diffused to the whole exhibition room, which led the room to become a showground for sound to unleash its potential charms.

Similar to the common practice in *Casa Natale di Arturo Toscanini* and *Haus der Musik*. Several house museums attempt to set up a listening room, then playback videos about historical documents or clips on a loop to gather people together and immerse them in a collective and memorial emotion. Simultaneously, sound is not the only element that plays a role.

| Museum Name | Sections | Strategy | Typology of cultural assets shown | Contents | Exhibit artefacts | Sound equipment | Interaction |
|---|---|---|---|---|---|---|---|
| Casa Natale di Arturo Toscanini | Audio-video room | Listening room | The period movies and recordings | The private and artistic life of Toscanini | TV and seats | Loudspeaker box | / |
| Haus der Musik | 1st Floor – Museum of the Vienna Philharmonic | Listening room | Performance Video | Classic compositions by Vienna's great composers. | TV and seats | Loudspeaker box | / |
| Mendelssohn House | The Belétage&Fanny's World | Audio-visual art installation | Music | Classic compositions by Mendelssohn | The lounge chair, the loudspeaker hidden under the cloud-shaped luminair, watercolour illustrations, installation | Loudspeaker | When the audience recline in the lounge chair, the loudspeaker will be triggered and play the music |
| The Bach Museum | Bach's orchestra | Sound installation | Historical musical instruments and the sound of each individual instrument | Historical instruments sound, three orchestra pieces, and the way Bach composed music | Installation | Sound button | Audience can press the button with a light signal, the sound of the instrument will be amplified |
| The Bach Museum | Bach's organ/sound tubes | Touchable musical instruments | Instruments and its sound | Historical instruments sound | A group of pipes | Instruments | Audiences can experience the music by touching a group of pipes with their partners |
| Beethoven Museum | Section 2: rejuvenating | Installation | Music | A classic compositions by Beethoven | Installation | Loudspeaker box | Audience can shake or push and pull a lever to activate the sound |
| Casa della Musica | Ercole e Anteo | App and interactive calls | Historical stories | The origins and story of the creation of the sculpture | Sculptures and exhibition panel | Mobile phone | Audiences can scan the QR code near to sculpture and then receive a call from "Ercole e Anteo" |

**Figure 5.** Yi Zhang and Raffaella Trocchianesi, The Diffuse Sound, 2022.

The embodiment of objects, videos or holographic images is supplementary in fostering a scene, drawing a familiar concept in the exhibition field – Scenography. Scenography is viewed as relating to light, sound, media, space, exhibits and their composition to create a scene with lived experience, narration and emotion (Brückner, 2010). In the context of house museums that were frequently houses of family or historic buildings with plenty of life slices, which are also considered to be an innate strength in designing a scene, in other words, it is to retrace or restore a scene that brings the scene in past moments back to the present by design approaches.

In the *Mendelssohn House*, the exhibition room is converted into an audio-visual art installation that has watercolour illustrations of the house or an installation wall with leaflets pinned up, era-specific pianos and tables, softly veiled curtains and light. A sense of atmospheric aesthetic exists throughout the room with a relatively abstract design language for visual contents and little to no information to read carefully. When the audience is attracted to recline in the lounge chair, the sound device hidden under the cloud-shaped luminaire will automatically be triggered and play the music of *Mendelssohn*. These settings intend to let the audience resonate better with the exhibition's content, and the sound serves as the primary contributor to bringing audiences towards empathy. A vivid illustration that depicts the conductor's enthusiasm at the concert, tree trunk shapes and specially treated coarse ground in the room of *Haus der Musik*, emphasizes the characteristics of the impassioned and vibrant music.

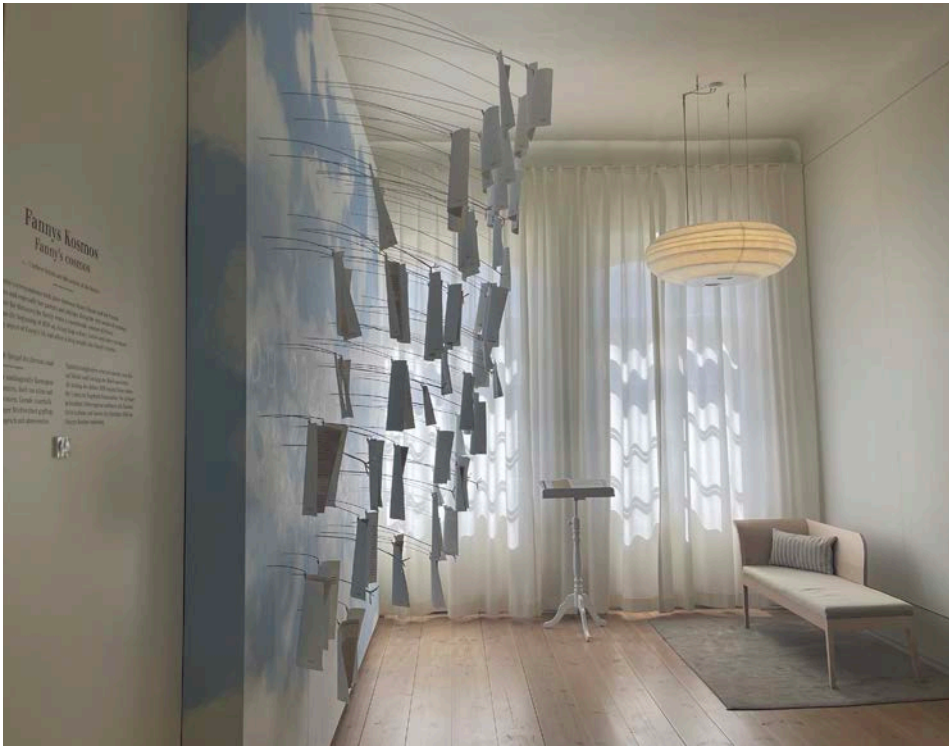


**Figure 6.** Mendelssohn House, an exhibit room with an audio-visual art installation. Photo by Yi Zhang, 2022.

Furthermore, the conversation between *diffuse sound* and audiences is broadened among audiences with simple feedback through installations, which have been given more diverse meanings. In the "Bach's orchestra" section of the *Bach Museum*, audiences can press buttons to activate the sound played by each instrument. In Bach's organ/sound tubes section, audiences can experience the music by touching a group of pipes with their partners. According to designers, these settings are expected to connect audiences to establish an impressive, playful, social experience, which is also conducive to engaging visually impaired guests and promoting accessibility.

Several installations in *Beethoven Museum* surprise the audience by requiring them to shake or push and pull a lever to activate the sound, which adds a sense of playfulness and exploration.

### 4.3. The Interactive Sound

The experience of interactivity is evoked by the coproduction of experience between audiences and exhibits that are in a constant state of flux (Roppola, 2012). *The interactive sound* intersects multiple forms of media, or interactive games expect to immerse audiences in the exhibition room. This attitude of sound tends to be reshaped and released in a dynamic flow rather than playback the original sound without any processing that belongs to the famous figures, then perforate the boundaries of museum stereotypes to arouse the audiences' passion and enlightenment. This approach drives audiences to understand, reflect and explore relatively sophisticated content with a positive attitude, and audiences receive diverse feedback based on the responses to promote a more profound introspective and educational experience (Pekarik et al., 1999). However, due to its penetration and radiation that often require a certain amount of space, it is not often seen in home museums.

The *Haus der Musik* claimed to aim to create a new style of experience that fosters a dialogue between tradition and innovation and offered several interactive programmes targeted at the demands of children's education. In the section of *Kundt's tube* and interactive musical adventure journey for children dedicated to the process of sound production and phenomena and to experience first-hand the sonic characteristics of a range of instruments.

| Museum Name | Sections | Strategy | Typology of cultural assets shown | Contents | Exhibit artefacts | Sound equipment | Interaction |
|---|---|---|---|---|---|---|---|
| **Haus der Musik** | 2nd Floor: Kundt's tube and interactive musical adventure journey | Interactive musical instruments and installations | Music, techniques, sonic phenomena and knowledge of instruments | Knowledge about how to perform the instrument and its history and characteristics | Musical instruments, sound installations | Instruments | Audiences can experience the process of sound production and phenomena and first-hand the sonic characteristics of a range of instruments |
| **Haus der Musik** | 2nd Floor: Sonotopia universe and lab | Interactive game | Sonic phenomena and knowledge | Interactive games including creative, colourful sound beings | Laboratory, blackboard and Interactive stations | Interactive stations | Audiences can create sound creatures with a personalised appearance, personality, and sound gather in the Sonotopia universe and become a long-lasting memory |
| **Haus der Musik** | 4th floor: The Virtual Conductor | Virtual conductor | Music, conducting techniques and the way the orchestra works | Knowledge about conducting orchestras and classic compositions | TV and operating station | Loudspeaker | This installation responds accordingly to the audience's performances, audiences need to engage with active thinking to master correct conducting method |
| **Mendelssohn House** | Effektorium | Virtual conductor | Music, conducting techniques and the way the orchestra works | Knowledge about conducting orchestras and music | 13 digital steles | 13 digital steles with loudspeaker | 13 digital steles that transform into instrument groups or voice registers can show the acoustics and colours depending on audience choice |

**Figure 7.** Yi Zhang and Raffaella Trocchianesi, The Interactive Sound, 2022.

Another exciting area set in the *Sonotopia* universe and lab encourages the audience to create sound creatures with a personalised appearance, personality, and sound gather in the *Sonotopia* universe and become a long-lasting memory. The virtual conductor is also one of the museum's most appreciated projects, attributable to a specially tailored time-stretching algorithm and audio channel mixing strategy, which offers the opportunity for the audience to determine the volume, rhythm and beat of the orchestra in a special music room. The virtual *Vienna philharmonic orchestra* responds

accordingly to the audience's performances, audiences need to engage with active thinking to master correct conducting method. Similar practices in *Mendelssohn House* called *Effektorium* also test the audience's knowledge about conducting orchestras, each digital pillar represents one instrument with gradient colours, continuously changing as the show progresses to reflect the level of performance.

**Figure 8.** Haus der Musik, Vienna philharmonic orchestra , Photo by Yi Zhang, 2022.

## 5. Discussion

It is noticeable that the acoustics environment of house museums is generally constrained by the house scale and is typically limited to three to five metres in height, which affects the sound transmission and causes problems such as sound spill and reverberation. It may be one of the considerations responsible for the cautious use of sound in house museums. Several studies claimed the contribution of acoustics technology and techniques is essential to enhance the exhibition experiences (Rudi, 2021). Based on these cases, however, a noteworthy view is that sometimes the sound experience supported by comfortable service and the intimate atmosphere significantly improves the museum journey rather than in terms of sound functionality (Stocker, 1994). Sound in digital devices as a sensory artefact may become a reversal of the traditional relationship between museums' senses that are primarily visual (Mortensen, 2012). Therefore, it is urgent to recognise the possibility of sound and the balance of the overall arrangement that combines the sensorial elements in a way unlike the visual elements dominant the exhibit to portray a touching rhythm.

As was mentioned initially, these house museums hold various memory kinds, memories of people, traditional techniques or knowledge related to sound. The diversity in the memory attitudes indicates that the sonic strategies in these house museums have particular orientations considering the various emphases. Cultivating atmosphere is the keyword in house museums that concentrate on people's memories. Such house museums often provide opportunities for audiences

to retrace famous artists in their past glories through the attitudes of *the hidden sounds* and *the diffuse sounds*, which create an intimate atmosphere in which audiences sense that they can be so near to the life of a master. Education and interaction are the dominant themes in traditional technology or knowledge related to sound. A specific knowledge base is required to understand this memory in-depth. *The interactive sound* with a more challenging exhibit setting and sound interaction can increase the audience's awareness and engagement. A meaningful question is posed in response to this phenomenon, is it possible that sound can contribute to narration through cross-platform for broader sharing? The answer may be yes. The statue of *Theodor Van der* struck, called *Ercole e Anteo* is placed in the museum courtyard. Audiences are able to scan the QR code near to sculpture and then receive a call from *Ercole e Anteo*, who are the characters of this statue. If audiences answer this call, they can listen to the quarrel of *Ercole e Anteo* that may have happened more than three hundred years ago. This creative conversation in *diffuse sound* beyond time interweaves the real and virtual worlds and interprets the memories through digital media.

## 6. Conclusion

This paper presented an analytical tool called *Exhibition Sound Score/Partitura sonoro-allestitiva* to analyse and describes that multi-layered sonic strategies were presented accompanying several digital approaches in some house museums. Digital methods reshape the interpretative strategy of sound and offer opportunities for sound into more complex forms and diverse combinations to communicate with

audiences. The findings thus serve as a basis for future work in realising the typology of sound in museum contexts and in studies of how design methods and digital sound devices affect the holistic museum experience.
Furthermore, the acknowledgement of sound design and digital memory as emerging themes in exhibition design studies may have considerable consequences and warrant further interdisciplinary efforts in the future.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Memorial Contents | Memories of people | Museum Name | Mozarthaus Vienn | Museum About Liszt | The Beatles Story | Wien Museum Haydnhaus | Casa Natale di Giuseppe Verdi | Casa Natale di Arturo Toscanini | Casa della Musica | |
| | | Sections | / | / | / | / | / | Audio-video room | Ercole e Anteo | |
| | | Strategy | Audio guide | Audio guide | Audio guide | Audio guide | Audio guide | Listening room | App and interactive calls | |
| | | Contents | Extensive information on the life and work of the Mozarthaus | Stories of what happened in this room, and the origins of the objects | Extensive information on the life and work of the Beatles | Extensive information on the life and work of the Haydnhaus | Anecdotes and facts about the Master's childhood | The private and artistic life of Toscanini | The origins and story of the creation of the sculpture | |
| | Music | Museum Name | The Bach Museum | Johann Strauss Museum | the Beethoven Museum | Schumann House | Mendelssohn House | Haus der Musik | Mendelssohn House | Beethoven Museum |
| | | Sections | Listening Studio | / | Section 6: bequeathing | Listening Cabinet | / | 1st Floor – Museum of the Vienna Philharmonic | The Belle tage&Fanny's World | Section 2: rejuvenating |
| | | Strategy | Listening room | Listening station | Listening station | Listening room | Listening room | Listening room | Audio-visual art installation | Installation |
| | | Contents | Every composition by Bach | Ten classic compositions by Johann Strauss of each station | Classic compositions by Beethoven | The works Clara and Robert composed in Leipzig and the selected literature about the Schumanns. | Classic compositions by Mendelssohn | Classic compositions by Vienna's great composers. | Classic compositions by Mendelssohn | A classic compositions by Beethoven |
| | Traditional techniques or knowledge related to sound | Museum Name | The Bach Museum | The Bach Museum | Haus der Musik | Haus der Musik | Haus der Musik | Mendelssohn House | | |
| | | Sections | Bach's orchestra | Bach's organ/sound tubes | 2nd Floor: Kundt's tube and interactive musical adventure journey | 2nd Floor: Sonotopia universe and lab | 4th floor: The Virtual Conductor | Effektorium | | |
| | | Strategy | sound installation | Touchable musical instruments | Interactive musical instruments and installations | Interactive game | Virtual conductor | Virtual conductor | | |
| | | Contents | Historical instruments sound, three orchestra pieces, and the way Bach composed music | Historical instruments sound | Knowledge about how to perform the instrument and its history and characteristics | Interactive games including creative, colourful sound beings | Knowledge about conducting orchestras and classic compositions | Knowledge about conducting orchestras and music | | |

**Figure 9.** Yi Zhang and Raffaella Trocchianesi, Memorial Contents, 2022.


**Figure 10.** Casa della Musica, "Ercole e Anteo", Photo by Yi Zhang, 2022.

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# Bodies of Knowledge

## Experiencing the Archive: A Case Study to Re-Activate Memory through Digital Interaction

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**Keywords**
Digital Archive, Smart Environment, Interaction, Memory, Activation.

**Abstract**
From the early 2000s, archives and cultural institutions have been confronted with the repercussions of an unprecedented digital revolution. Web 2.0 technologies have accelerated management and organisational processes that were already in place, enabling the digitisation of huge amounts of data. A process that has undoubtedly facilitated the preservation and use of these materials, but which has nevertheless brought to light new problems. These include the oblivion and non-use of digitised materials, which often remain unknown and unnecessarily processed if not supported by promotion and enhancement policies. Furthermore, new digital ways of engaging visitors are challenging traditional models of power and negotiation of meaning, but cultural institutions are not always ready to respond and support such practices effectively.
The paper presents the case study of a smart interactive environment created in 2019 for the Temporary Slovene Dance Archive of the Metelkova Museum of Contemporary Art in Ljubljana. Through this work I critically discuss the role of design in respect to actions of retrieval and reinterpretation of digital heritage beyond the simple search of metadata on digital platforms. In addition the project proposes a physical experience to stimulate public use and understanding of archives.

## 1. Introduction

"Is a Museum a Database?" provocatively asked Mike Pepi on *e-flux* in December 2014 (Pepi, 2014). Although raised almost a decade ago, his question stimulates a reflection that is still relevant today with respect to the technological context we refer to when talking about archives. Pepi's text portrays museums in the Western world facing an unprecedented technological turn that, in a short time, has led them to a rapid and progressive digitisation of their archives and collections. A shift that has engaged cultural institutions (and not only) changing their methods missions and access. If these processes have simplified many procedures, at the same time institutions are not always prepared for such structural changes and are forced to reshape their offer and role just in order to remain relevant.

In the paper I retrace some of the stages of this ongoing digitisation process and look at the role that design can play in rethinking and reactivating the memory and narrative of these digitised materials, making them productive materials again. If facilitating access to materials was the priority, today the challenge is to find ways to use these collections beyond simply searching on online platforms. Furthermore it is relevant to understand how digital data can be opened up not only as research information, but also to stimulate a different use and understanding by the public.

I will refer in particular to a case study of a smart interactive environment, within which the visitors were invited to actively interact with the materials on display. The project was developed in collaboration with the Temporary Archive of Slovenian Dance at the Metelkova Museum of Contemporary

Art in Ljubljana, on the occasion of the BIO 26 Design Biennial. The work provided an opportunity to interrogate the types of knowledge that archives embody and enact and how these relate – or could relate – to design. The presentation of this project is an attempt to offer a practical example of interdisciplinary practice in response to these questions.

## 2. Identification of the Research Field

From the early 2000s, cultural institutions – museums, archives, libraries – have been confronted with the repercussions of the innovative pressures of Web 2.0 technologies. Powerful digital tools have made available and encouraged simplified and open archiving and sharing of materials and information beyond the physical on-site visit. The experiences of the last decade by some of the world's most important museums and libraries work as an example, such as the practice of the Met or the Cooper Hewitt in New York, or the V&A Museum in London, or the Rijks Studio project of the Rijks Museum in Amsterdam, or the open policies adopted by the Staatsbibliothek Berlin and the New York Public Library. Entire collections with hundreds of thousands of materials in 2-D and 3-D have been photographed or scanned and rendered in very high resolution and made accessible to the entire audience of digital visitors.

Although by their nature, museums and archives have different approaches to the accessibility of their holdings – the former are oriented towards a broad use by a wide public with different purposes, while the latter are mainly aimed at purpose-driven users –, both face similar challenges today. These new digital archives undoubtedly facilitate the work

of specialised audiences whose research is supported with very high-resolution materials accessible without temporal or spatial limitations. But the radical element of these operations lies in the access and sharing extended to a much wider public. A potential that invests the archives of the present towards the future, offering them new possibilities for sharing, fruition, and activation, especially where these practices are facilitated and supported by policies of free access and replication without copyright. This approach is implemented with varying degrees of openness, ranging from permission for personal or non-commercial use, to availability under Creative Commons licences, to complete freedom of use.

These have been – and still are – intense and enthusiastic operations, but in many cases they prove to be inadequate in respect to long-term project planning and uncritical to their manyfold consequences. On a functional level, they lack in respect to access, use and reuse of these materials that often remain unused. But these operations are problematic as well with respect to the consequences on an economic, political and ethical level. Especially when it comes to collaborations with private companies, the decision to digitise collections opens up the traditional functions and missions of the museum to the neo-capitalist logic of the economic market.

There are currently huge data centres scattered all over the world containing billions of digitised images, texts and materials. Although these data seem to be without matter, instead they occupy physical space. After initially providing the public with access to previously inaccessible materials, the challenge today for institutions seems to find new ways to revive and constructively use these vast digital data collection.

As written by Lev Manovich (Manovich, 2001), databases do not create narratives per se, but provide the rules and structures upon which information can be transformed into a narrative. While museums are physical repositories that create worlds by framing objects and structuring possible narratives, archives are technologies that reproduce rigid logics of categorization and separation in an attempt to index and order materials. They format what is knowable, what can become history, what of the past can be preserved and possibly experienced in the future. But, as Manovich says, if the museum requires and produces narrative, database logic eschews narrative in favor of orderly and efficient retrieval for the end user. Additional human planning and mediation is therefore always necessary in order to make sense of and produce tangible narratives around the archived materials.

In the move to systematically digitise and make images accessible, not everyone starts on equal terms. Although Rick Prelinger defines access as the main feature of the 21st century archive (Prelinger, 2007), without practical and economic support it is an uphill climb. Various platforms have offered to make their services available to institutions and universities over time, from Shared Shelf Commons, Flickr's The Commons, to the better-known Google Arts and Culture to name but a few. Operations orchestrated, sponsored and supported in most cases by private companies, with which museums enter into collaboration contracts, but which bring with them legitimate questions regarding the transfer of collections, commodification effects of the works involved, as well as in most cases the complete decontextualization of works with respect to their initial meaning and physical or digital context.

As also pointed out by Daniel Palmer (2014), these images and the modes of digital participation they promote "lack the original object's material conditions and the contemplative possibilities offered by the heterotopia of a gallery space." However, technology has not only facilitated the digitisation of materials, it has opened up unforeseen venues for participation. New ways of engaging visitors challenge the traditional power relations that have sustained archives and collections from the Enlightenment to the present. The way in which visitor participation is mediated is radically changed by digital culture. Visiting a digital archive today not only results in the enjoyment of content, but potentially also in its reworking and replication in real time. The digital reproduction of reference materials has changed the way we produce culture. We mix, remix, republish content in a constant flow of data that redefines the experience of the archive on digital platforms, producing new materials.

As described by Fabio Viola (2022), museums and cultural institutions in the last decade have seen their role transform from that of *cultural attractors* – physical places where visitors go in person to consult or view works – to that of *cultural activators* – hybrid spaces of sharing and interaction for actions of reappropriation and free circulation of preserved materials. This is a historic change in the mission of cultural institutions, with a revolutionary potential to horizontalize the processes taking place within them, opening up towards a dialogue made up of a heterogeneity of voices. This change sees the works in the collection regenerate and evolve outside the original medium, through the communities that arise around that content and no longer simply around the container.

This phenomenon recontextualises the gallery space and creates alternative modes of interpretation that exist alongside the official museum narrative. Visitor appropriation is a significant and challenging phenomenon: there is a shift from a traditional visiting model to one in which visitors are invited to become creative and active members of a cultural community. Although one may find self-directed participation irreverent, many visitors and non-visitors can relate to these images and stories more easily than with traditional institutional narratives. The creative content produced by visitors often has a vernacular or viral quality that encourages sharing.
In this regard, Bradburne (2001, p. 79) states how archives and museums must offer "facilities which can be used, rather than just visited".

Nowadays, however, the interfaces of these digital archives are often still very technical and repulsive to the non-experts in terms of design and usability. They are digitised collections of data and information that tend to meet the needs of a researcher audience, often interested in consulting specific materials, not so much in having an unexpected or discoverable experience of the preserved heritage. Even in the most virtuous cases, there is no real interaction with the user, who is mostly invited to a mere chronological or thematic reading. As Mitchel Whitelaw, who has worked with museums and libraries to digitise and visualise their collections, writes, "[…] search, as the dominant interface to our cultural collections, is inadequate. Keyword search is ungenerous: it demands a query, discourages exploration, and withholds more than it provides" (Whitelaw, 2015).

## 3. References to Case Studies

In most cases, therefore, there seems to be no correspondence between the needs of a digital, participative user and the interfaces provided by cultural heritage institutions. And even in the most successful cases these are often operations that only large museums or those with large financial resources can afford.

Analysing the attempts to make vast amounts of data findable, Google Arts and Culture project[1] is impressive. For years Google has been engaged in an operation to "organise the world's information and make it universally accessible and useful".[2] There are so many ways that the various catalogued collections can be reorganized and visualized for users. Google has not only committed itself to making digital tours of the world's most famous museums available, but also collaborates with artists and creative programmers in interpreting new systems of access to archived materials. There is a whole section called *experiments* where one can find proposals and interpretations of filed visual data. These are often experiential and immersive solutions, sometimes even overwhelming. An operation that is not without its problems: Pepi's analysis accurately (2019) critiques how cultural institutions voluntarily transform their cultural capital into the preferred formats of digital platforms. "[…] the institution – tasked with holding cultural objects in the public trust – moves the aesthetic experience into a hardware apparatus whose proprietary format is dictated by a private company".

1 https://artsandculture.google.com

2 https://about.google

This challenge was faced by the Metropolitan Museum in New York to interrogate its collection, which includes more than 492,000 images of public-domain artworks, available for free and unrestricted use. To bring its collection closer to the public, in December 2019 the museum, in collaboration with Microsoft and Massachusetts Institute of Technology (MIT), explored new ways to access the collections through artificial intelligence in a hackathon session. Among other results, *Artwork of the Day* creates a tailormade and individual experience for each user by analysing open datasets, geo-localising whereabouts, weather, news and historical data related to the user and proposing an image from its archive. Another project developed, *Storyteller*, uses Microsoft's artificial intelligence to choose artworks from the Met's collection that illustrate whatever story is being told or whatever conversation is being held. Through voice recognition, a discussion can be translated into images using the collection's archive. These projects manifest the intention to bring the public closer to the vastness of a collection, but once again open up questions regarding collaboration with companies that respond to a private economic agenda, speculation, commodification of the works, surveillance, privacy and use of the personal data of the users involved.

A small-scale example is the archive of the Het Nieuwe Instituut in Rotterdam. The HNI represents an interesting model and is constantly looking for solutions for the use of its digitised heritage. The museum hosts an important collection of drawings, photographs and models from the archives of Dutch architects and planners which, once digitised, have been made available for online viewing on the museum's website.

The search portal, developed in collaboration with Studio Moniker, provides a random and surprising discovery experience of the materials in the collection.[3] By following the lines on archived drawings and images, individual materials are opened and made searchable by matching the movements of the mouse cursor on the screen, thus offering the possibility of an unexpected fruition of the museum's digital catalogue.

*5 eyes / Hyperstacks*, curated by James Bridle for the V&A Museum in London, an exhibition project born in an artistic research context, is another work that interprets and critiques the conventional archival format. A part of the museum's extremely rich collection was filmed and interpreted through artificial intelligence, used to explore the connections between objects and collections, thus creating new possible narratives. The project was presented on the occasion of the exhibition *All of This Belongs to You,* with the stated aim of exploring the role of contemporary public institutions responsible for a national collection. Opened in April 2015, the exhibition was also fully available as an online archive.[4] Part of the work attempted to address the violent and colonial history of a significant part of the collection, using the algorithm as a deliberate ploy to circumvent issues of institutional guilt and shame. This example shows how interdisciplinary solutions might lead to more complex and articulated results in respect to the use of data and the application of new technologies.

3 http://collectie.hetnieuweinstituut.nl/

4 http://hyper-stacks.com

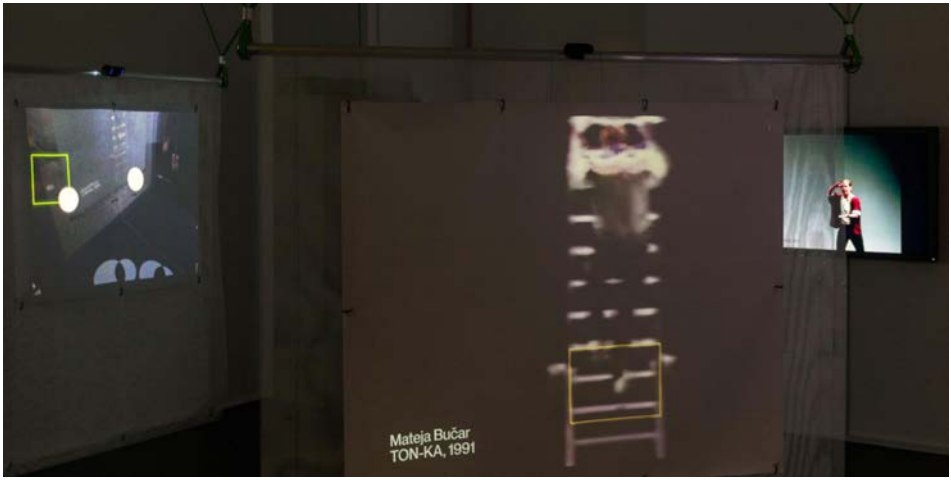



**Figure 1.** *Bodies of Knowledge*: exhibition view of the spatial installation.

## 4. Bodies of Knowledge: The Context of an Experimental Project

Within this context of reference, I would like to present and critically discuss a design installation which, through a smart interactive environment, has attempted to address and propose a possible approach to reactivate a digital archive and the historical memory of the materials stored in it through the physical interaction of visitors.

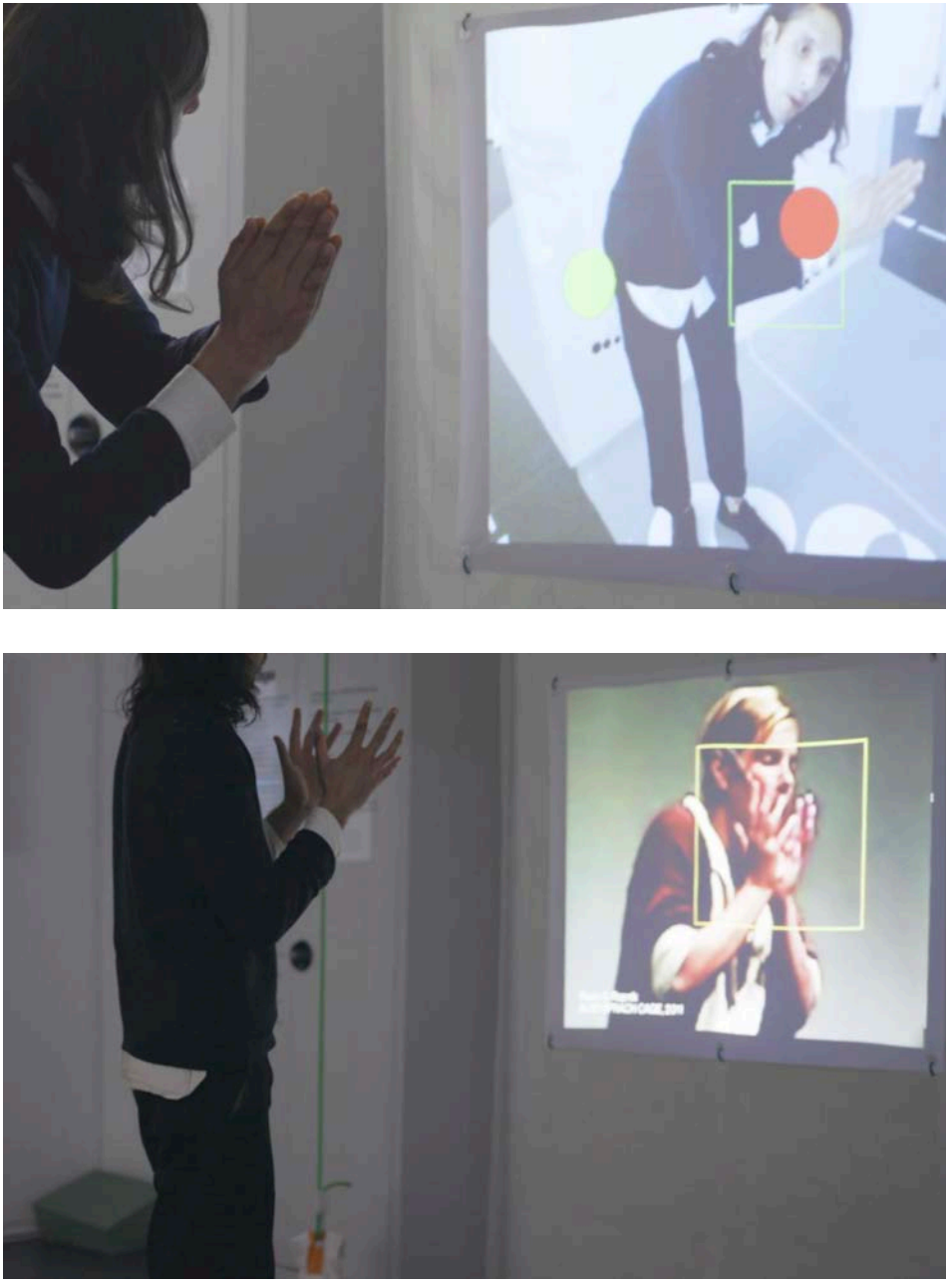
The *Bodies of Knowledge* project – developed by an interdisciplinary team of designers[5] during the last edition of the Ljubljana Design Biennial (November 2019 - February 2020) – questioned the contemporary role of museums and archives as custodian and producer institutions of culture in a digitised society. The work aimed in particular to stimulate a different

5 Design Mentors: Paolo Patelli; Knowledge Mentor: Ida Hiršenfelder; Project Manager: Matevž Straus; Team: Cyrus Clarke, Giulia Cordin, Juliana Lewis, Luigi Savio, Monika Seyfried.

use and understanding of archives and collections by museum communities. What kinds of knowledge do archives and collections embody and enact? How do they relate, or could they relate, to design? How can design engage these archives and their heritage?

For the practical development of the project, two national institutions, Moderna Galerija | Museum of Modern Art and +MSUM | Museum of Contemporary Art Metelkova, opened their physical and digital archives to the working team for collaboration. In the first museum, the spatial installation was realized.[6] For the development of the project the team focused in particular on the Temporary Archive of Slovenian Dance, which is part of the Museum of Contemporary Art Metelkova. Today, visitors to dance archives are generally considered spectators, invited to sit and look at screens or at pages of text. Cultural memory is preserved in time capsules of videos, images, props and historical newspapers with which visitors are confronted through static acts of witnessing, remembering and annotating, but without moving. The historical memory of dance is thus experienced outside the body, frozen in time, encapsulated in publications or in digital data and pixels on screens. In contrast, we wanted to ensure that visitors could reconnect with the essential physicality of dance in its archive. With these considerations in mind, the *Bodies of Knowledge* project proposed to supplement the current static archives of dance with a living archive, exploring embodied alternatives to the current archival paradigm.

6 A video of the installation is available at this link: https://vimeo.com/394189416?embedded=true&source=vimeo_logo&owner=5819722



**Figures 2–3.** *Bodies of Knowledge*: visitor interacting with the interactive environment.

## 5. Bodies of Knowledge: Experimentation and Results

The Temporary Archive of Slovenian Dance in Ljubljana is a growing collection of materials from the field of contemporary dance, established by Slovenian dance historian, curator and activist Rok Vervar. The archive was opened to the public in 2012 and in 2018 the entire collection was moved to the Metelkova Museum of Contemporary Art in Ljubljana as a temporal installation. Most of the material concerns contemporary performing arts, dance and theatre from the Slovenian non-institutional scene of the last 20 years.
We set out to present the digital data not just as research information, but to open it up to a physical experience, to stimulate the public's use and understanding of the archive and collection. In the spirit of modern dance, we wanted to break the internal logic of the archive by releasing the emancipatory power of movement. In this way, *Bodies of Knowledge* seamlessly integrates physical and digital space: Historiographical structures dissolve, allowing alternative narratives generated by the visitor him or herself to emerge.

In the exhibition set up, three screens focused each on a specific body part, in detail: hands, legs, head. Appropriating the digital surveillance tools of Computer Vision and Pattern Recognition technologies, images of visitors' bodies were captured by three cameras. These recordings were analysed, categorised and sectioned by the programs for inclusion in the spatial visualisation. Once the movements mapped by the software were recognised as sufficiently similar, they activated matching archival video footage of original performances on the screens within the exhibition. For example, the rec-

ognition of a visitor's hand activated a selection of archival material in which other hands appear; a downward movement of the visitor brings falls, failures and releases into the space. In this way, the archival content accessible within the space merges existing archive footage of local choreographers with user-generated footage in real time. The archive is transformed from a site of knowledge retrieval to a site of knowledge production, disassembling and mobilising its documents, technologies and institutional frameworks into new compositions. The physical and digital space is seamlessly integrated, including the visitors, their bodies and their movements within the architecture of the archive, conceptually and spatially.

## 6. Conclusions

Although in this case the project focuses specifically on a dance archive, the work opens up interesting possibilities for exploring the potential of design to interpret, (re-)organise, transmit and revive the information digitised in archives in participatory and active ways. The experience of the *Bodies of Knowledge* project offered the opportunity to renegotiate the way materials are accessed, retrieved, digitised and activated, reducing the gap between the end user and the institution producing culture. In this way, stored materials are freed from digital oblivion. The challenge is to imagine, support and facilitate emerging modes of digital participation in a way that protects but at the same time emancipates collections.
The Ljubljana experience highlights how an interdisciplinary dialogue can lead to effective solutions through interlinking transdisciplinary practices and perspectives. Such operations are still rare, but in specific contexts have led to virtuous

results. The hope is that with the help of a critical and ethical use of new technologies such practices will be increasingly implemented. These choices would allow to critically investigate the construction and use of archives as well as to question hierarchies of user and provider with the aim to stimulate a civic agency.

This is, on the one hand, to rethink up-to-date and contemporary methods of making archives accessible in response to contemporary challenges. On the other hand, a porosity of the institutions in leaving space for the activities of the public can create new dialogues and uses of the materials in the collection, fostering physical, cognitive and emotional interaction.

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III

# DIGITAL ARCHIVES

## NEW MATERIALITY AND INTANGIBLE HERITAGE

# **Born Digital, Die Digital**
# Potentials and Risks of Digital Archives

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**Keywords**
Digital Archive, Digital Memories, Born-Digital, Digital Humanities, Data Visualization.

**Abstract**
The contribution deals with the theme of preservation and access to knowledge, with particular attention to the approaches and methodologies employed in the design of digital platforms useful for preserving culture and memory, guaranteeing access for future generations. An analysis of the relevant scientific literature and state of the art shows how, especially in the face of the pandemic emergency, experiences have been consolidated and centered on the design of platforms, such as digital archives, which, while preserving culture and memory, also make them accessible, regardless of the possibility of access to physical structures. The change generated by the digital has redefined the relationship between society and culture, and between people and memory and has led to the need to think about how people access to memory and cultural heritage, in particular to a new category of artifacts, the born-digital ones, which risk dispersion and deterioration due to technological obsolescence.
The contribution, therefore, addresses these issues to identify, through context analysis, a methodology useful for the creation of a digital archive, attempting to overcome those limits dictated by self-referential systems, which do not guarantee democratization and access to culture for a non-specialist audience.

## 1. Introduction

The spread of digital technology and its influence on everyday life are established aspects, which have transformed – among other things – the way knowledge is accessed (Levy, 1998; Greengard, 2015).

The pandemic emergency, which has had a disruptive effect on the digital transition, has also further accelerated both the debate and the succession of experiences related to the design and adoption of digital approaches and tools, also in the field of culture, which are of particular interest for the present contribution, since digital tools and environments allow democratic and heterogeneous access to any kind of information available online.

To preserve digital memory and information (Cerf, 2014), it becomes necessary to study methods and approaches that can protect the expression of contemporary culture, which is embodied in digitized or born-digital artifacts, by rethinking how this heritage is made accessible online.

This area of research belongs to the domain of the Digital Humanities, a hybrid discipline born from the intersection of information technology and humanities (Burdick et al., 2012), and studies themes such as the open access to culture through digital.

It is therefore possible to deduce the relevance of the project of digital platforms and archives for the reference scenario, a relevance underlined by the diffusion of numerous experiences undertaken by organizations and institutions, and whose aim is to protect memory and guarantee democratic access to culture and knowledge, favoring the process of investigation

aimed at constructing one's narrative or opinion, through logical-relational tools (Rebuffo & Sisto, 2019).

It is in this context that the research activity, described in this contribution, is set, through the study of the emerging issues in the field, and the analysis of the scientific literature and the state of the art on the subject, aimed to identify an approach in the design of a digital archive that could consolidate the relationship between digital and human memory, guaranteeing the protection, preservation, and valorization of those archived units, that by their nature risk dispersion and obsolescence (La Guardia, 2013) predetermining the possibility of future access to digital data, through strategies and techniques useful for the cataloging and visualization of heterogeneous digital media, without depriving them of the multidimensionality that characterizes them (Burdick et al., 2012).

## 2. Background

Archiving is concerned with identifying useful standards that enable the management and care of hardware, software, and formats of digital documents, preserving them from their fragility and obsolescence (Ries & Palkó, 2019), to disseminate culture, through online consultation services (Bulegato, 2013). Identifying approaches and methodologies, useful for preserving digital memories and guaranteeing their access for future generations, is an open question, both from a technological point of view – i.e. related to the preservation of the computer data that constitute the genetic heritage of digital artifacts – and from a visual/usable point of view – i.e. the visualization of the archived asset. Necessary skills, in order to

meet these needs, are digital archival and curatorship and IT skills (Aprea, 2018), interface and experience design (Bollini, 2020), as well as diagrammatic data representation, which can play a strategic role in the visual presentation of cultural information (Windhager et al., 2018; Manchia, 2014).

In a study dedicated to the convergence of digital archiving and information technology, Giovanni Aprea highlights the need to study databases to reduce the redundancy of data and make logical and physical connections that optimize the representation of data through hierarchical relationships that link the general to the particular and the single to the whole (Aprea, 2018). Making the ordering, and thus the management and access to resources, more functional are actions that change the concept of the database, from a technical and technological tool to a means of cultural appropriation, useful for making the archive a tool for collective knowledge (Angari, 2023). This issue also presents a twofold challenge, since while on the one hand, it is necessary to determine a structure that allows us to define the cultural object, it is also necessary to be able to collect and catalogue its metadata (Windhager et al., 2018), which are the element that allows any information available online to be analyzed and made accessible (Pomerantz, 2015). A further relevant aspect, related to databases, is that they can also be used as a documentary basis for the realization of data mappings and visualizations, whose filtering categories coincide with those of the database itself.

From the design point of view, the aspects described so far participate in modifying how one approaches the conception

and realization of a digital archive since it is necessary to start from the archived data and then structure the database, an activity that is considered fundamental and preparatory to the project itself.

About the aspects more strictly related to the use of the archive, to allow navigation and research to different types of users, it is important to conceive the project in ecosystemic terms, to realize an "interconnected system in which the elements that are part of it interact with each other and with the environment" (Bollini, 2016, p.12). This approach is particularly useful, as it offers the possibility of understanding the archived object as part of a dynamic and interactive system, capable of changing based on the relationship that the user establishes with the platform.
Defining the archive as a mediating tool between user and culture allows for overcoming its traditional limits, linked to its use by a specific type of user, characterized by a certain level of expertise on a given subject, who can easily navigate through the archived resources (Huvila, 2008). On the other hand, the change in the structure and architecture of archival platforms allows an increase in the target, thanks to the simplification and facilitation of navigation through a non-linear model that enables interactions creating connections and autonomous discoveries (Angari, 2023).

To increase the potential of what Ayers defines as the hypertextual nature of the digital archive (2001), and to offer the user flexible navigation and interaction, facilitating access to heterogeneous information and media linked by multiple

paths that constitute what Landow defines as open research (1997), it is possible to make use of different navigational models and diagrammatic representation techniques, which are becoming increasingly popular in the field of digital culture and archiving (Manovich, 2012), as they activate the cognitive and analytical capacity of the user who, through interaction with visualizations with spatial properties (Shiffrin & Börner, 2004), can dynamically gather information in a process that increases his or her capacity for knowledge appropriation (Macdonald-Ross & Waller, 2000) through the experiential dimension (Masud et al., 2010).

## 3. Methodology and State of the Art

Designing digital platforms, enriched by the use of mappings that become a critical and interpretative filter of culture, is an open issue that, although it has its recent tradition, requires further investigation, especially from the methodological point of view and the analysis of experiences in the field, in which the need to identify new ways of representing culture, going beyond the common keyword approach, is emphasized, to ensure greater access to cultural collections (Windhager et al., 2018), transferring archival and curatorial approaches to new information spaces (Ruecker, Radzikowska & Sinclair, 2011; Whitelaw, 2015), characterized by logical-relational representations.

Two main models emerge from the analysis of this scenario (Bollini, 2004; Rosenfeld, Morville & Arango, 2015; Resmini & Rosati, 2011; Bollini, 2016). The first, known as the hierarchical or cascading model, is particularly suitable for users

who are familiar with the subject, and therefore, through lists or directories, can quickly access data or information. The second model, which is defined as exploratory or hub-based, reproduces the logic of hypertext through mappings in which all data are visible, and through horizontal navigation, which differs from the vertical approach of the first model, allows users with different levels of knowledge to move easily between data, creating associations and/or unpredictable connections.

Although both models are widespread, an open question is related to the evaluation of effectiveness from the perspective of user interaction, as - in both cases - the risk lies in introducing additional complexity that is counterproductive for the user's experience and understanding (Karjaluoto, 2015).

In this perspective, the state-of-the-art analysis took into account different models of navigation and information access to analyze their strengths and weaknesses. An interesting case is the *Letterform Archive*, whose aim is to identify a specific terminology for the design domain to be applied for the cataloguing of artifacts in the sector, thus freeing them from the specific terminologies of the art and architecture sectors (The Letterform Archive, 2019). This operation, which starts with an in-depth study of the context of reference and the archived object, is instrumental in adapting metadata standards to the more circumscribed sphere of graphic design, and for this reason, the relevance of the *Letterform Archive* lies in its move away from standard cataloguing methods, favouring instead information relevant to designers. In this case, the

navigation model is hierarchical, since, although there are filters that allow customization of the search, it requires a known-item input.
Different from the first case, at least as far as aspects related to the navigation model are concerned, is the *Australian Prints & Printmaking* platform, which is equipped with various sections and survey tools, including diagrammatic ones, that combine text and images, to make navigation and end-user search more intuitive (Butler, 2013).

At least, we mention the case of the *People's Graphic Design Archive*, which relevance lies in the interaction and participation of users, to create an "archive built from the bottom up" by expanding the history of graphic design also thanks to the active collaboration of the community. Thanks to the *Submit* section any user can upload any type of material to the platform, as long as it dates back to a given period and is inserted in the prescribed format, an operation which allows the platform to be enriched day by day, and has the purpose of making the archive a point of reference for scientific research, for those in search of inspiration, for students and teachers, or society (Sbarbati, 2021). In this case, the navigation model follows a grid system, which can be modified through different filters or sorting.

In conclusion, the analysis of the methods and experiences reported, highlights - for the realization of the applied research case - the need to study both the archived object and the cultural domain of reference, to identify useful cataloguing terms to define and enhance the units in the archive.

Subsequently, from the point of view of interface design, the relevance of images, as a protagonist visual element, is to be taken into consideration whatever navigational model is chosen. In this regard, the possibility of jointly employing both navigational models – hierarchical and explorative – is considered to represent an advancement concerning the reference state of the art, to guarantee use to different types of users, reducing barriers determined by asymmetrical knowledge and specialized knowledge.

## 4. Results

The case of applied research described in this contribution is the result of a research doctorate carried out at the IUAV of Venice, which led to the realization in prototype form of a digital archive, dedicated to visual communication artifacts. The project aims to identify a methodology useful for the realization of archival platforms that, on the one hand, seek to respond in advance to the need to protect and preserve contemporary digital memories – in particular relating to the domain of graphic design – on the other hand, intend to achieve a greater level of dialogue with users, facilitating them in their research, and overcoming the limits dictated by asymmetrical knowledge.

To do this, the project made use of the study of the scientific literature of reference and the state of the art, and for this reason, the first aspect ventured was the analysis of the archived object and the construction of a database that could be used as a documentary, registry and descriptive base, but also for data visualizations.

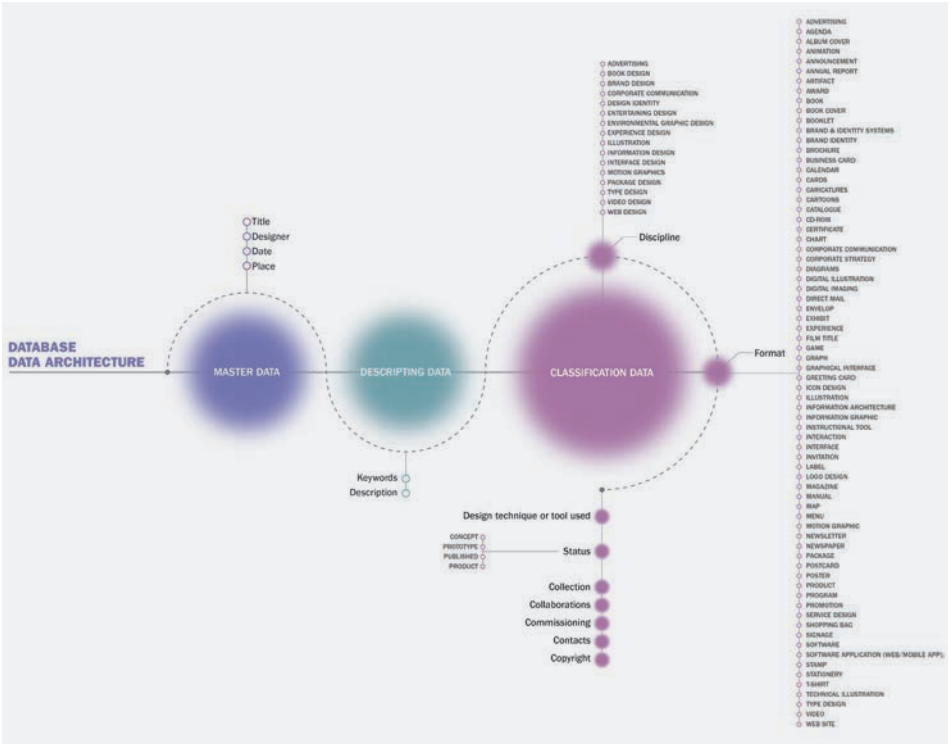



**Figure 1.** Diagram of the database architecture. Roberta Angari, 2022.

The database is structured in several parts, the first of which aims to collect the master data of the archived unit, i.e. title of the work, designer, date of design or publication, and location. The second block of information gathers descriptive information, such as keywords and a brief description of the archived object. The third section of the database has the purpose of classifying the units, and consists of disciplines – e.g. design identity, experience design, information design, interface design, etc. –, format – i.e. the type of project such as ADV, animation, digital information, graphical interface, software application, web site –, design technique or tools

used, the status of the project – concept, prototype, published and/or product –, collection, collaborations, commissioning, and at least contacts and copyright.
The individual data obtained, in addition to providing the documentary basis of the existing database, can then be used, as well as for mapping, for the creation of a format that can be filled in by the user, as will be seen below, for uploading materials or projects onto the platform (Fig. 1).

Once the cataloguing phase of the archived units was completed, we moved on to the design and prototyping of the platform.
In order to be used by different kind of users, the archive has been designed by integrating both the hierarchical and exploratory models, through which various survey tools were created. The first section is the *Overview,* which is configured as an interactive timeline populated by images, ordered through the time parameter – x-axis – and the brightness and saturation parameter – y-axis. For the realization of this visualization, a specific dataset was confirmed, the parameters of which allow the visual media to be ordered, generating the mapping described.
From the point of view of interaction, once the user selects an object from the *Overview,* it is possible to access the *Unit Data Sheet*, where the master and technical information obtained from the archive database is displayed. From the *Unit Data Sheet*, the user accesses the *Network*, an interactive dendrogram that through user exploration allows the visualization of the relationships between the archived elements that emerge from the classification and categories of the database.

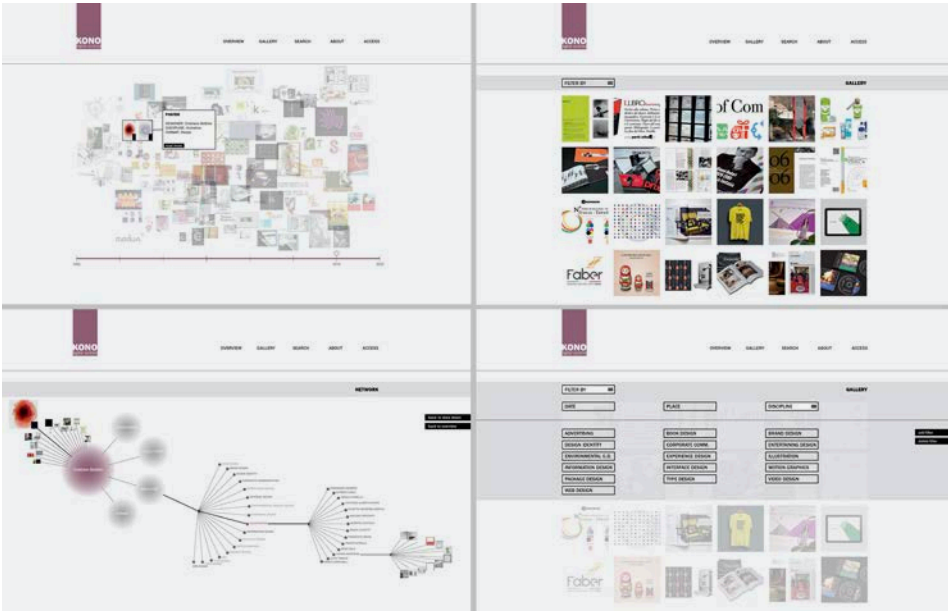
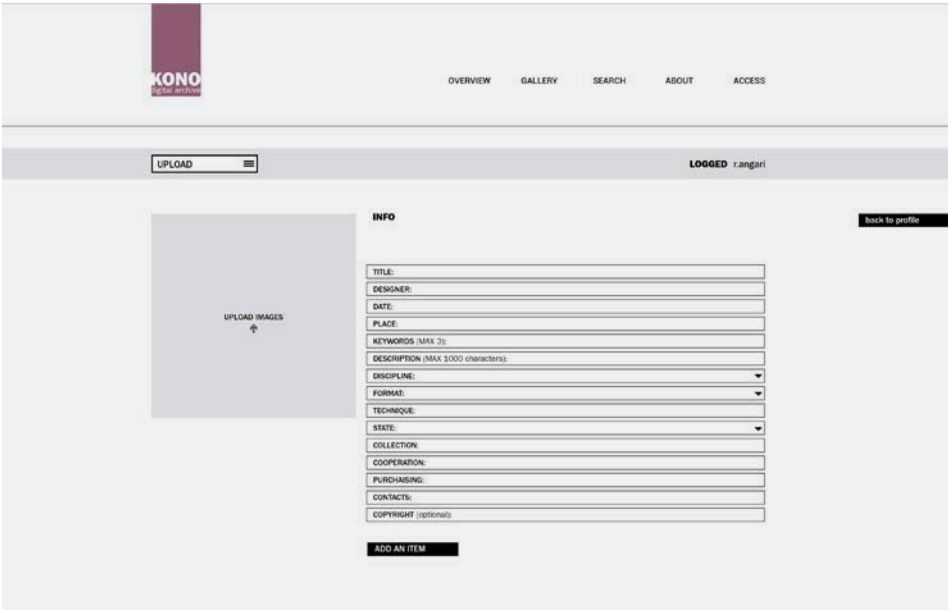


**Figure 2.** Some interfaces of the digital archive designed. Roberta Angari, 2020.

As mentioned above, the platform provides for the use of different navigational models: while the *Overview* and the *Network* follow the explorative model, the *Gallery* and the *Search* section follow the hierarchical model. The latter sections allow the user – respectively – to view the archived units according to a gallery, which can be filtered through the cataloguing parameters or to perform a free search through the known-item method (Fig. 2).

To increase how the archived units can be viewed and used (Manovich, 2012), the doctoral research project, therefore, aimed to create a useful database for the archive's population and to create various survey tools, the purpose of which is to broaden the project's target audience.



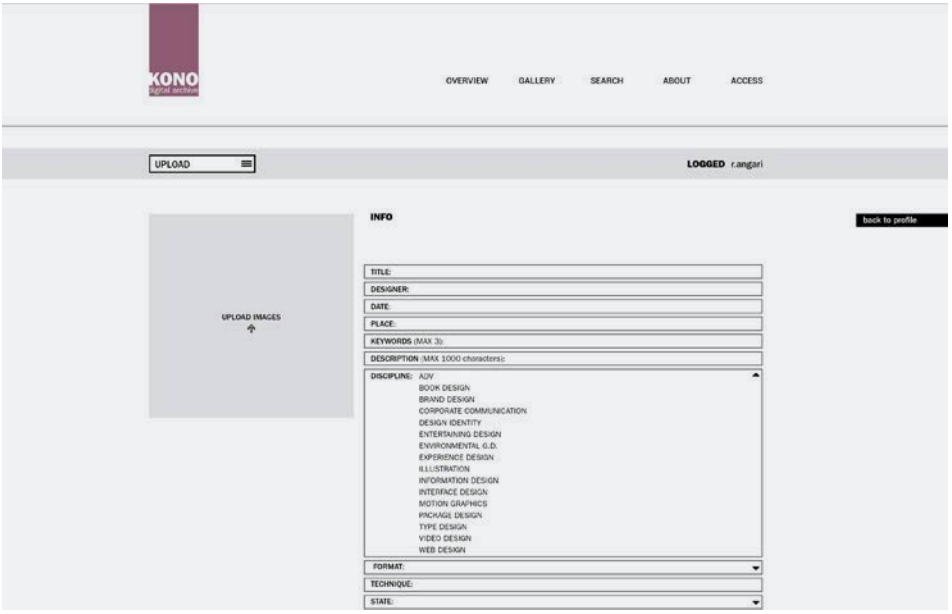




**Figure 3.** Interfaces of the section of the digital archive designed, dedicated to the upload of a new project through the form based on the facets classification. Roberta Angari, 2020.

About this last aspect, and based on the analysis of the state of the art, it was decided to implement the platform with a section for accessing and uploading content. The *Access* section is dedicated to designers, researchers, and students of visual communication design, who can upload digital or digitized projects to the archive, thanks to the compilation of a format, also deduced from the research activity on filing and cataloguing (Fig. 3).

## 5. Discussion

The case of applied research described in this contribution aimed to address the issues of cultural heritage valorization and memory protection by creating an investigation tool that could overcome the specific and/or asymmetrical competencies of the cultural domain of reference, expanding history – even the current one – through the active participation of the community.

To meet these needs, the project made use of the convergence of different approaches, deduced from the analysis of the scientific literature and the state of the art of reference, which led to the outlining of the project methodology, which is divided into several phases, namely: the analysis of the cultural domain of reference and of the object to be archived; the construction of a database that could serve as the documentary, registry and descriptive basis of the archived units; the design of the survey tools, based on the convergence between different navigational, hierarchical and exploratory models; the definition of a format, based on the database, that could be used to allow users to submit their material or projects; the design of the interfaces and user experience, based on the

standards related to the *Human Interface Guidelines* deduced from *developer.apple.come* and *developer.android.com*, useful for both mobile and web interfaces; the usability testing. Concerning this last aspect, it is specified that this is part of the future developments of the project, and for this reason, requires subsequent and further in-depth studies. Nonetheless, concerning the project described, it is believed that the relevance of the latter is linked not only to the focus on the construction of a database that can allow the valorization of different types of archived units, even uploaded by the end-user but above all to the integration of different navigational models that, as specified above, allow a more extended use to different types of users.

## 6. Conclusions

When confronted with the current scenario, both from the point of view of artifact design and fruition, the need to reflect on the subject of personal and digital memory emerges. In this perspective, the design of digital archives is a relevant field for the project culture, and needs further investigation from a methodological, technical, and fruition point of view, overcoming the limits of the known-item research and enhancing the cultural heritage by offering a research experience that enriches and broadens the user's knowledge.
In this perspective, the case of applied research allowed us to deepen the themes and approaches that emerged from the study conducted, leading to the definition of a methodology that, through a meta-design/preparatory and design/realization process, centres  the activities themselves on the valorization of culture and individual artifacts, on the experience

and interaction of the end-user – to facilitate the appropriation of knowledge – and on their active participation.

In this perspective, we consider the project described to be relevant because it is based on different transversal knowledge for the reference sectors, such as digital humanities, information technology, digital archiving, and – as well – communication design, which focuses on aspects such as the study of the cultural domain of reference, the enhancement of cultural heritage, usability, interface and experience design, methods of presentation and visualization of information and materials. It is hybrid and multi-level research aimed at developing a cataloguing system whose terminologies, specific to the field of visual communication, pay particular attention to design aspects and techniques specific to the field of born-digital projects.

Finally, although a usability review is still to be carried out, the project is considered to be responsive to the set objectives and the needs of the sector, outlining a useful methodology to increase the opportunities for access to knowledge, to consolidate the relationship between society and culture and, more specifically, between people and digital memories.

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# The Materials Library as an Interactive Device of Tangible Memory

## How to Convey Design Potential in the Metamorphosis of Resources

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**Keywords**
Materials Library, Genius Loci, Material Culture Heritage, Tangible Memory, Generative Knowledge.

**Abstract**
Today there is a multitude of devices and tools to share technologically mediated memory practices that can be understood as agents collaborating in the "production of the world". In the field of design of materials, materials libraries started out as cataloguing systems and then became the physical and digital place aimed at conveying material cultures intended as transitions of the intangible and semantic values of a society onto the tangible reality. By configuring repositories of *tangible memory*, as physical documentary heritage of a territorial and material culture, the role of design emerges in preserving, organising and transmitting the knowledge of the reality that surrounds us. This means transforming the current cultural spaces of the materials libraries to determine design trajectories aimed at making evident the unexpressed opportunities of the materials.
The contribution is aimed at investigating the potential of a renewed service as a place of tangible memory, a generative device for conveying identity and valorisation of know-how, the *genius loci*, and the sense of materials as a potential and source of further design insights, by placing cultural heritage at the centre of the design approach. On the basis of the cataloguing of material samples as "materialised data", a renewed interactive materials library service can convey the meaning of tangible memory to outline criteria for their knowledge, valorisation and use.

## 1. Design and Material Cultural Heritage

Today there is a multitude of devices and tools to convey technologically mediated memory practices (Aasman et al., 2018) whose understanding requires an approach that brings out their physical and infrastructural role in shaping culture, space, time, cognition and life itself (Attfield, 2020). Contemporary conditions also demonstrate the potential of using data for the production of shared knowledge through digital technologies that structurally transform the production, transmission and storage of data, information and knowledge. The connectivity between data, shared knowledge, spaces and individuals is driving a profound transformation, expanding the processes and design fields in which designers operate (Bollati, 2021).

As our society accelerates towards a profoundly pervasive digital culture, characterised by new forms of literacy, education, practice and expression, memory media can be understood as agents that collaborate in the "production of the world" (Bollmer, 2019) also through a strategic use of the digital that can be useful in defining new forms of public culture. The contribution focuses on issues of preservation and valorisation of cultural heritage in the intersection with the research topic concerning the design of materials, starting from a double level of interpretation of "tangible memory": on the one hand we refer to resources as memory capsules of a material culture, on the other hand we refer specifically to production by-products as the materialised inheritance of a know-how, as well as tangible outcome of the metamorphoses of matter (Paoletti, 2021) that can generate knowledge and growth (Coccia, 2020).

## 2. Contextual Memory Capsules

"Material objects represent the visible and tactile traces of the expressions of different cultures" (Dei & Meloni, 2015, p. 23). Culture, by contrast, is traditionally meant as something intangible: a set of social values and feelings, psychological patterns, structures of the human spirit, semiotic and communicative codes (Tylor, 1987). Then, objects "incorporate and can make visible these values, these meanings, as vehicles of an intangible essence" (Dei & Meloni, 2015, p. 36).

The *Convention for the Safeguarding of the Intangible Cultural Heritage* (Unesco, 2003) seems to assume the classic anthropological concept of culture as "dematerialised", in other words intangible (Dei & Meloni, 2015). Such an interpretation suggests that a spiritual essence is involved, but it is clear that the sphere of the tangible as source of a sense of identity and continuity is largely implicated in the Unesco definition (Unesco, 2003). Therefore, the whole concept of preservation, applied to assets that are alive and constantly changing, should not be interpreted as a form of capitalisation of an authentic tradition being constantly eroded by mass culture and therefore in need of protection and enhancement. On the contrary, when considering heritage as understood by Unesco, the focus shifts to the circulation of the good and its transformations. Then the meaning of "memory" also changes, which is not to be understood as a static mapping of what has existed, but as embedded in the physical things that surround us as "specific and individual agents with which to be in resonance" (Dei & Meloni, 2015, p. 53).

In the literature related to design of materials, two main approaches to materials knowledge are identified: one concerns the technical-functional aspects, the other the expressive-sensorial ones (Ashby & Johnson, 2010). While on the one hand, the performance of materials is investigated, on the other hand, one can explore what materials communicate and evoke in the relationship with users (Karana et al., 2015).

A further interpretative dimension for the sustainable design of materials is provided by what we refer here to as "contextual attributes", by which we mean the dense network of multidimensional relationships that a material conveys and which makes it necessary to explore a material by analysing it in relation to its context (Solanki, 2018; Bak-Andersen, 2018). When one seeks to understand the value of materials, the analysis of the flow of resources within a system defined in space and time must be considered (Brunner et al., 2002) and this demonstrates that sustainable development always relates to context (Bak-Andersen, 2021), as "no good has its own independent meaning" (Douglas & Isherwood, 1984, p. 80).

Each material resource has its own history, characterises a place, transforms a territory in geological as well as socio-economic terms, influencing the set of people in that context and acting on the resulting employment possibilities, even before it is used as a material for the design of a product. The investigation of the applications and uses to which materials are assigned, also provides further insight into the perception and value that users attribute to those materials. Such an investigation is possible by gathering information

that describes material resources in multidimensional terms: geo-historical, cultural, functional, technical, economic and ecological (Bak-Andersen, 2021; Brunner, 2021), thus it involves both quantitative data – available on technical datasets – and qualitative data – as the result of ethnographic research. In the transformation of matter, then, "a form of time emerges, a visible portrait of collective identity is outlined" (Kubler, 1976, p. 18) in which "object and subject – matter and culture – are two polarities that are simultaneously constituted, one in relation to the other" (Dei & Meloni, 2015, p. 56).

## 3. Materials Libraries as Places of Memory Repository

The research concerning the history of a material and the traditions related to its use in different cultures is an approach to learn about the meaning of a material (Bak-Andersen, 2018; Carullo & Labalestra, 2018). Another sort of information that can be inferred from tangible memory is technical knowledge: cultures where a type of material has been dominant for centuries, and where it is still used, can store a wealth of relevant information (Bak-Andersen, 2018).

When designers study, explore and experiment with a material, they discover details about its origin and history, learn about its composition and compatibility with other materials, appreciate its experiential values and reach an understanding of how to manipulate it for production. All this is aimed at recognising the as yet unexpressed design potential of a material.
In the field of design of materials, materials libraries started out as cataloguing systems to facilitate the selection of materials (Ashby & Johnson, 2010; Wilkes & Miodownik, 2018), and then

became the physical and digital place (Wilkes, 2011; Rognoli & Levi, 2011) which can convey material cultures meant as transitions of the intangible and semantic values of a society onto the tangible reality (Woodward, 2013; Paoletti, 2021). Walsh and Ungson (1991) suggest that organisational memory refers to information stored in the past that can be used for decision-making in the present. A materials library fits well into this description, as "its basic function is to store samples of materials and information about them" (Anders & Luise, 2013, p. 2).

The contribution investigates the potential of a renewed materials library-system as a place of tangible memory, thus a generative device aimed at conveying identity and valorisation of a know-how, the *genius loci*, and the sense of materials as a potential and source of further design insights, by setting territory and material culture at the centre of the design approach (Bassi et al., 2021). This takes on significance when considering the current design scenarios, which call for a rethinking of the use of material resources (Solanki, 2018; Brunner, 2021; Pellizzari & Genovesi, 2021; Bak-Andersen, 2021), from which it follows the need to reinterpret the services available to the designer to "imagine a point of intersection between surface and depth" (Mantellini, 2018, p. 118).

## 4. Case Study: Design Potential in the Metamorphoses of Resources

Starting from the collection, organisation, processing and translation of data and information about material resources, that is their tangible memory, services designed for specific territorial cultures can take place.

These services are intended with a twofold mission: on the one hand to convey the sense of materials as sources of cultural meanings, and on the other to enable design trajectories implementing principles of sustainability and paradigms of circular economy, through knowledge, valorisation and use. This means transforming the current cultural spaces of materials libraries through an operation enabled by a renewal of the physical exhibition of material resources and by interventions of digital expansion of the physical spaces, in order to determine design trajectories enabling the unexpressed opportunities of matter to be made evident.

The configuration of tangible memory repositories, understood as the physical documentary heritage of a cultural heritage, also makes it possible to decline the role of design in preserving, organising and transmitting knowledge of the reality that surrounds us. Therefore, the process of creating and sharing knowledge can take place through the valorisation of memory meant not as static and concluded, but as the tangible becoming of the material itself from raw material to semi-finished product.

As a consequence of the cataloguing of material samples perceived as "materialised data" (Gwilt, 2022), and if – as mentioned – we mean tangible memory as a metamorphoses to be mapped and elaborated, "we can know time indirectly, through what happens in it: that is, by observing change and permanence, marking the succession of events with reference to fixed points and noting the contrast of the various rhythms of change" (Kubler, 1976, pp. 22-23) typical of a know-how that takes its shape in the succession of creative and productive processes.

### 4.1. Digital Multi-level Talking Map

To demonstrate how the contextual and multidimensional interpretation of resources can generate sustainable design actions (Bak-Andersen, 2018), a prototype of a multilevel sensory-contextual-temporal map is presented, in which each of the deconstructed phases of the production processes, identified by the acknowledgement of a specific know-how, constitutes "the intersection point of the meshes of a network in which the generic notion of identity of territories is intended to be captured and deposited in individual artefacts" (Carullo & Labalestra, 2018, p. 100), as well as in the evidence of the metamorphoses of material resources (Paoletti, 2021).

The pilot case was developed within a research project at the Università Iuav di Venezia and financed by the Veneto Region's ESF fund between 2020 and 2021. It concerns the tanning supply chain and is focused on the sustainable management of production residues. It led the author to the framing of a methodology related to the modalities of both organisation and design interpretation of material resources by putting in place trajectories of practical and design experience as an act of enabling knowledge of materials (Bak-Andersen, 2021). The development of this methodology is aimed at the formulation of a tool to overcome the notion of residues as waste, in support of their valorisation as a subject of design. The integration of residues within experimental design processes has been mediated by their expressive-sensorial qualification, an interpretative filter drawn from the studies of the materials experience research field (Karana, 2010; Del Curto et al., 2010; Rognoli & Levi, 2011; Carullo et al., 2017) inherent to the meaning of materials

**Figure 1.** Michele De Chirico, cataloguing material resources and material concepts resulting from macro-actions: adding, subtracting, moulding, Università Iuav di Venezia. 2021.

as enablers of experiences mediated by the senses and vehicles of cultural meanings. This explains the decision to explore the meaning of materials through the analysis of the experiential qualities that are then conveyed in a product: these aspects may be difficult to measure, but they are fundamental to sustainable design of materials as they set the stage for assessing the perception people will have of that material and the connotations that will be attributed to it (Karana et al., 2015). Through the definition of categories of design macro-actions and technological transfers, we first came to the creation of material concepts (Fig. 1) and then to the implementation of the prototype of a

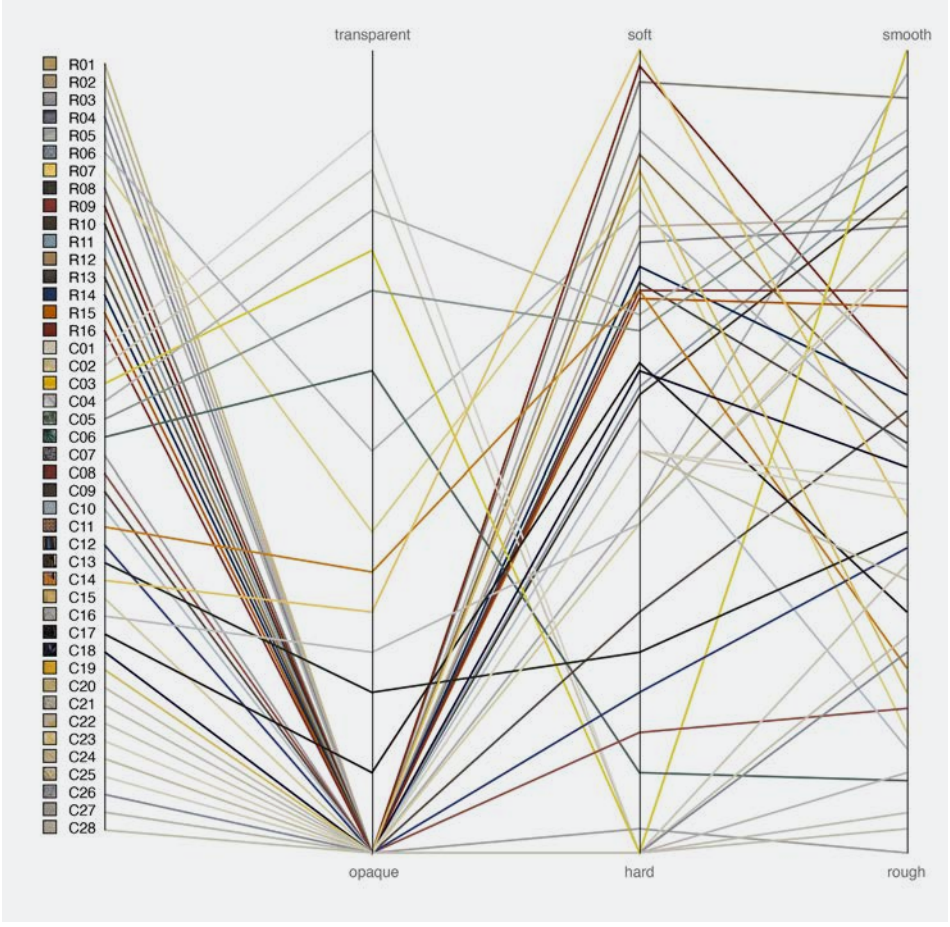


**Figure 2.** Michele De Chirico, The sensory map. An organisation of mutations of matter. Università Iuav di Venezia. 2021. Data visualisation support: Jacopo Poletto.

visual cataloguing system, which can convey the valorisation of production by-products in the shape of a multi-level *talking* map (Bruno, 2015): it is a sensory map as it gives back the paths and perceptive mutations of the material obtained through design actions (Fig. 2), a temporal map as it bears the trace of the succession of process phases of which production residues are the material outcome as well as tangible memory (Fig. 3), and a

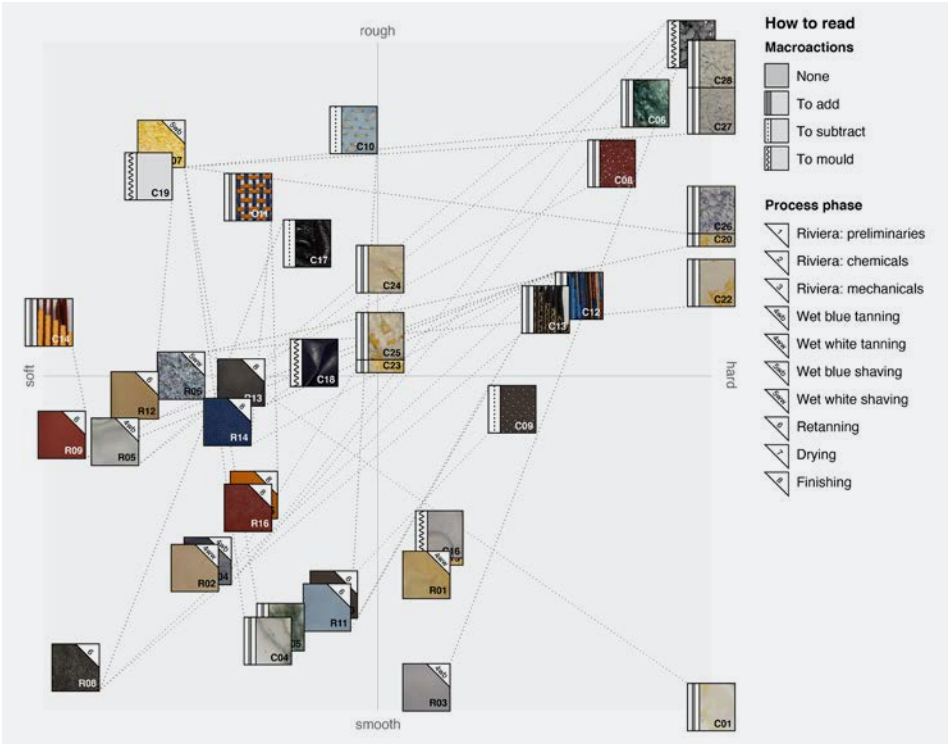


**Figure 3.** Michele De Chirico, The temporal map. A trace of the metamorphosis. Università Iuav di Venezia. 2021. Data visualisation support: Jacopo Poletto.

generative matrix-map that provides a number of suggestions – beyond what has already been exhibited and experimented – intended as possibilities for the design of materials or sustainable applications starting from by-products (Fig. 4).

## 4.2. Material Residues as Memory of a Know-how

The study allowed us to explore the material as a complex system of relationships, data, information, in which "each material residue is like a memory of the forgotten causes whose only recollection is that they succeeded among many simultaneous sequences" (Kubler, 1976, p. 159).

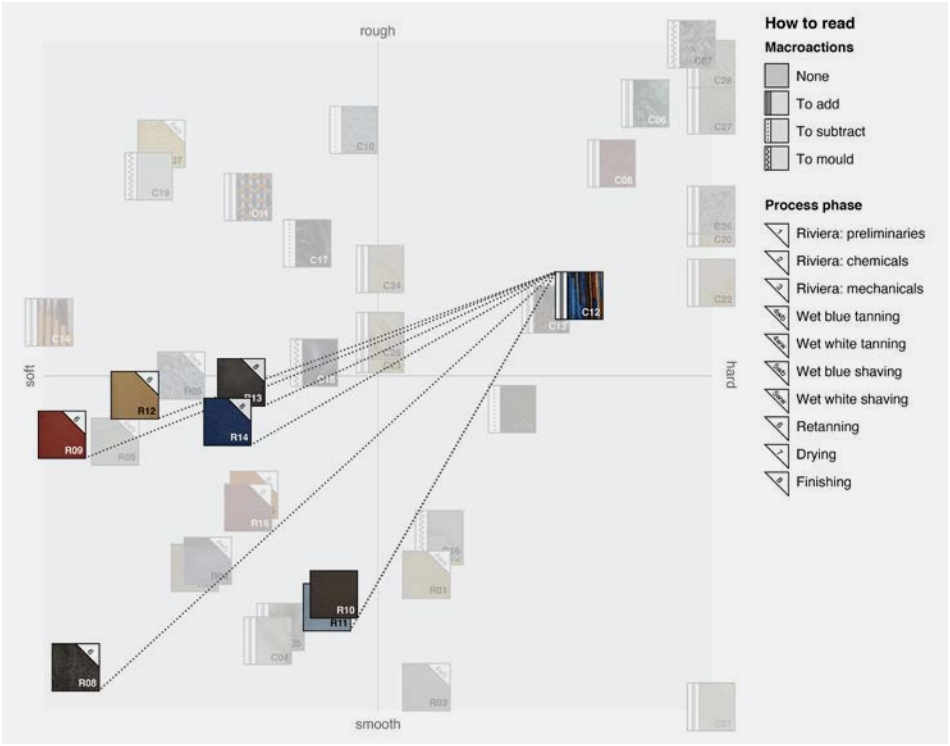


**Figure 4.** Michele De Chirico, Matrix map. Design possibilities generated by actions and contaminations. Università Iuav di Venezia. 2021. Data visualisation support: Jacopo Poletto.

In order to allow us to access the relationship between us and the world in design terms, the map acts as an interface and becomes a place of reciprocity, both physical and cultural: an "in-between", a mutable and sensuous surface as "an active mechanism for reorganising the space" (Wigley, 1995, p. 25) of knowledge and design possibilities in which the material is not constrained within fixed patterns, and is not aimed at its preservation. It is not a collection that seeks to exhaust its subject and is not meant to be all-encompassing: it is an open map, the "document of a transit" (Bruno, 2015, p. 252) that does not provide a defined form to knowledge.

It is not a static structure, in fact it is defined while being manipulated by the designer, constantly negotiated by the sensations resulting from the potential sensory transitions.
The richness of this output lies in making it possible to read and interpret the direct relationship between materials, production systems and territories, enabling an analysis of materials not only on the basis of their performance and aesthetic qualification, but as part of a complex system.
By allowing what has been said, the tool offers itself as an interceptor of values such as identity and sustainability of a know-how of a territorial and material culture, whose production residues becomes evidence and matters of design. As a legacy of the metamorphoses of a material through the processes of a specific know-how, they emerge as resources embodying a form of knowledge (Coccia, 2020; Paoletti, 2021).

## 5. Further Developments

The research, carried out as part of the research fellowship also through a workshop for students of the Materials for Design course, held at the Università Iuav di Venezia by Alessandro Mason (2020-21) and Riccardo Berrone (2021-22), has provided final outputs in the form of booklets and information sheets collecting multidimensional information about raw materials and their transformations as they become finished materials.
The results of the study presented in this contribution represent the first step towards a broader research work that aims at the creation of a multi-level database – on which specific exploration filters can be applied – that will flow into a geographically-based materials library in response to design

students' need to materials experiences, through which they can develop the required knowledge for sustainable design and circular use of resources.
The prototype of such a tool, aimed at organising tangible memory, represents the first step in framing the methodology and tools to be brought together in such a system-service designed to convey knowledge in an augmented space that allows experiences as an interactive condition, which is both active and interpersonal (Stogner, 2011), in order to investigate materials and receive design input from them in the form of "information on demand". On the basis of these considerations, we envision a place as a fluid space-organism that provides new access thresholds by communicating with the designer who will experience and choose which contents to activate.

### 5.1. Generative Knowledge through Tangible Memory

The further development of the study conducted so far, which is currently a research topic of the author's doctoral research at the Università Iuav di Venezia in the field of Design Sciences, has as its long-term goal the setting up of a platform understood as an augmented space in which the so-called "interaction" with materials – traditionally interpreted by a static exhibition of materials in which designers act on and with samples – would really allow material resources and concepts to interact with the designers who use the materials library service.
Therefore, the materials, embodying the memory of a material culture, rise themselves to the role of a source of information and sustainable design stimuli: at each " vibration" (Eliasson, 2006), the designer-visitor is not a passive receiver who merely absorbs knowledge, but emerges as a sophisticated

and active subject of the encounter, as a cognitive movement, a "going towards" aimed at reaching the content. He goes beyond the exposition, "in a dynamic exploration, he is an interlocutor taking part in a bilateral communicative exchange by participating individually and actively" (Bollati, 2021, p. 67)
A materials library system-service, renewed in its interactive-digital organisation and fruition as an enhancement of its physical-spatial configuration and fruition, can convey the meaning of tangible memory in order to facilitate the recognisability of the peculiar qualities of the materials and outline criteria for their knowledge, valorisation and use.
By deploying a multiplicity of linguistic, communicative and informational tools to stage the narrative, we intend a place that becomes an activator of imaginaries, in the sense of "conveying cognitive operations that do not merely show the reality, but analyse its underlying structures" (Dei & Meloni, 2015, p. 51).
Every interaction is a relationship between entities: as they communicate with each other, they transfer emotions and information, and in this relationship, multimedia technologies can introduce new dimensions to the dialogue. The possibility of conveying information of the materials to which that information refers, in the form of digital data, opens the way to possibilities of augmenting these materials into "data-objects", such as intelligent surfaces, augmented realities and interfaces that integrate the physical and digital components (Gwilt, 2022) through the very physicality of the material. Then it is about designing a platform that uses data to drive generative design processes (Bassi, 2020). Such a platform is an "expanded" materials library, in its being a tool

for generating shared knowledge, and at the same time it is a workshop, in its being a place of tangible memory as a design resource. The result is a place of design making in which the restitution of tangible cultural heritage, in the form of narrative representations that systematically focus on materials, emerges as a creative principle of design intuitions beyond what is effectively exhibited in the physical space, as an expansion of the traditional materials library.
If material resources are the "reacting devices" (Rosa, 2004) that have the ability to activate, transform and store tangible and intangible cultural transformations, then the proposed place is to be understood as a generative, public and cultural space, configuring a service for shared use between networks of designers and companies, based on a multidimensional mapping and storytelling of materials, both from a performance and contextual point of view.

## 6. Conclusions

The thesis supported in the contribution states that by investigating the relationship between tangible memory, digital technologies and cultures and sustainability criteria, the complexity of the material as a contextual system can be brought to light. Furthermore, this relationship brings into play the meaning of the preservation of material cultural heritage as transformation, becoming and circulation of the heritage itself.
Specifically in the design discipline, this means evoking the invisible that constitutes the cultural substratum of a material resource and making its cultural value transparent, visible.
For this purpose, we prefigure a materials library system-service, which is also a workshop as understood in the contribu-

tion, requiring an intellectual and design attitude in looking at the transformations of the material itself.
In such a place of materials organisation, through a generative approach of tangible knowledge of the by-products resulting from metamorphoses that occur between one production process and another, a change in their very status of existence is made possible, leading them to become designed or designable material entities.
This makes possible the interpretation of materials into complex resources and the understanding of the transfer of this complexity onto the material world around us, enabling the recognition of the cultural meanings of those resources, as well as the conferral of an identity that can give them a proper position in the artificial universe.

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# Preserving Memory, Safeguarding Heritage

## Designing the Digital Library of Living Traditions of Jordanian Handicraft

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**Abstract**
The research addresses the valorisation of Jordanian intangible cultural heritage (ICH), developing the concept of a *Digital Library of Living Traditions*, a web-based tool to document the Jordanian cultural landscape through its handicraft production. The research aim is to extend the understanding of the collections exhibited at the Folklore and Popular Traditions Museums, part of the Roman theatre archaeological site. This work reports on creating a research and dissemination tool, the DL, to include in the valorisation process of the living culture and folklore of Jordan about objects, places, and techniques beyond the physical collections displayed at the museums.
The first part of the paper envisions the role of storytelling and audiovisual archives in the realm of design for ICH, ideating, producing, and representing digital memories with and on digital media, including different genres and formats. The second part describes the DL, which is a multimedia archive that will make accessible a digital repository in which curators and scholars can get visual documentation and information about techniques, raw materials, and fabrication tools for the leading traditional Jordanian handicrafts.
The contents will be partially accessible within the museums, enhancing the on-site experience and creating interactive touchpoints for a broad audience. The project also promotes workshop activities and capacity building on digital heritage and multimedia communication strategy.

## 1. Enhancing Intangible Cultural Heritage through Storytelling and Audiovisual Repositories

During the 20th century, the concept of cultural heritage developed from a tangible manifestation of the past to a representation of the cultural landscape (Amoruso & Salerno, 2019) and cultural values that can interact with memory. In this sense, memory has to be considered the pivotal point on which the community's identity is built (Amoruso, 2017). As well expressed by Marilena Vecco (2010, p. 324), this conceptual development has led people and international institutions to gradually concentrate on "the capacity of the object to arouse certain values that led the society in question to consider it as heritage". In this framework, the need to protect intangible cultural elements as an expression of human memory and identity is of primary importance.

In 2003, UNESCO released the *Convention for the Safeguarding of the Intangible Cultural Heritage* (henceforth Convention), feeling the urgency to protect oral traditions and living heritage given their intrinsic intangible heritage elements. Indeed, given the rapid speed of contemporary life, technological and economic advancement, and globalisation, the world's cultural expression – as portrayed through traditions, rituals, and events – is in danger (Alivizatou, 2011; Podara et al., 2021).

*Living heritage* is defined as "performing arts, oral expressions, social practices, rituals, festive events and traditional knowledge", a crucial aspect of human existence "handed down from parents to children, from masters to apprentices,

from teachers to pupils, it is safeguarded through transmission" (UNESCO, 2020, p. v). Article 14 of the Convention states that *education, awareness-raising and capacity-building* are necessary to guarantee the safeguarding of intangible cultural heritage (ICH) within societies and at the international level (UNESCO, 2020, p. 10). Multiple researchers have observed and demonstrated how storytelling is an inherent skill in human beings. For this reason, storytelling has been recognised as having a dual function. On the one hand, storytelling makes it possible to shape and share life experiences (Reinsborough & Canning, 2010), forming the collective sentiment of society. On the other hand, storytelling is an actual cognition act (Salerno, 2014) since this is how human beings process information (Fisher, 1989).

*Narrating heritage* can be the real challenge for ICH. The challenge is understanding how to promote the development of narrative content and story-based processes to preserve and share memories through people's personal stories and experiences, giving a voice to a living culture that should not die or disappear (Salerno, 2014). Stories that can be transmitted in different forms and linked to processes, objects, and real-life stories can represent the tradition of a culture. Using storytelling for cultural promotion allows an emotional connection between cultural institutions and people, making cultural heritage attractive (Bonacini & Marangon, 2020). Moreover, improving access to content through digital media and digital storytelling can contribute to the further pluralisation and democratisation of historical narratives and dialogues (Bonacini & Marangon, 2020; Ibrus & Ojamaa, 2020).

The research is grounded on the idea that narrative can be the driving force for audience engagement, and digital media can be a straightforward but effective instrument for archiving and building a repository of cultural artefacts and testimonies for the transmission of memories (Podara et al., 2021). The archive is a space that contains elements of the past that can be reinserted into the given society. In this sense, audiovisual storytelling expressions have played an essential role within the media and cultural field since the nineteenth century (Harrison, 1997). The ability of audiovisual language to document physical, social, and cultural reality, generate awareness, and provide alternative ways of knowing has led to its rising prominence in transmission processes. As a result, audiovisual storytelling and digital archives have become an efficient and effective way to document, preserve, and enhance ICH.

## 2. The Digital Library of Living Traditions

According to the *Faro Convention* (Council of Europe, 2005), cultural heritage is a group of resources inherited from the past that people identify, independently of ownership, as a reflection and expression of their constantly evolving values, beliefs, knowledge, and traditions. It includes all aspects of the environment resulting from the interaction between people and places through time. Folklore and popular traditions are living heritage and should be shared with and accessible to young generations through the regeneration and practice of memory. Connecting communities to heritage and designing storytelling strategies for intangible heritage understanding is valuable. In a society where learning is the new trend, knowledge is a new form of capital, and experiential design is a new form of economy.

The *Digital Library of Living Traditions* (henceforth DL) is a knowledge-based repository and digital platform for collecting, preserving, and sharing cultural practices and promoting traditional Jordanian handicrafts as part of the country's intangible heritage. The enhancement strategy produces advanced visualisations, informative multimedia, and multiscale modelling, privileging immersive value, direct comparison, and interaction as well as creating new methodologies of simulation and imagination through technologies.

Precisely, the DL visualises handicrafts and objects crafted by artisans and Bedouins as well as describes rituals and symbolism, home environments, local habits, and tent-building techniques to provide new (ways of) interaction between the visitor and the experience of visiting the museum, supported by audiovisual storytelling contents. The lives of the artisans, their techniques and tools, and practices and glossaries are documented by audiovisual storytelling, experimenting with languages and format, bringing oral history (OH) to life and making it accessible.

Thus, the DL has a twofold aim. On one side, it should enhance and preserve, in a digital dimension, the collections of the Folklore and Popular Traditions Museums, clustering them accordingly to different categories related to the various types of heritage they represent. On the other side, the DL should help connect and highlight where and by whom cultural products and goods are crafted to create links among territory, artisans, and cultural practices. For this purpose, the DL comprises three clusters: rituals, traditional dresses, and

Bedouin tents. The contents are delivered according to the formula "Products, Techniques, and Stories from Artisans and Bedouin Communities."

Moreover, the DL will be accessible through a phygital experience (Ballina et al., 2019), not addressed by this contribution. Ideally, specific digital content will be physically displayed on site without compromising the visitors' experience while helping them imagine and approach the lived experiences of the original artefact's users so that they can comprehend their meaning in its provenance (Chu & Mazalek, 2019). For example, the multimedia content will be available through the new installations under design for the two museums: the Digital Library of Living Traditions (online), the Digital Tent (Folklore Museum), and the *Dress Studio* (Popular Traditions Museum). These installations will be the places of interaction to experience liveable stories directly from the women and the men that regenerate this outstanding everyday knowledge. Furthermore, being a product strongly linked to the cultural tourism sector, the DL can be regarded as an additional digital attractor, thus capable of intriguing visitors with the magic and mystery of the people's stories.

### 2.1. Dataset and Repository Layout

As previously stated, the first function of the DL is to archive a part of Jordan's cultural heritage digitally. Through the application of digital technologies, the archive is transformed from a mechanism of addressability into a generative, algorithmic, protocol-like, and programmatic *arché* (Ernst, 2004), thus providing personalisation and contextualisation of the

information delivered to the users, laying out advantages such as a personalised way of learning (Danks et al., 2007).

The archive will be accessible from the platform's homepage, from which the users can also reach an *About* section, where the project and its mission, vision, and values are described, with a section highlighting the network of actors involved in the project. Once the users have accessed the archive section, they can freely browse the list of products included or filter the results according to several parameters: the types of products they fall under, the territories in which they are made, the clusters to which they refer, the museums in which the products are exhibited, and, finally, the techniques by which they were made.

After selecting the search parameters, users can access the product sheets, where each artefact is described. The description provides the following:

1. The ID by which it is catalogued in the museum
2. The museum where it can be found
3. The cluster
4. The name in the Jordanian language
5. The reference concepts from a list proposed by UNESCO regarding cultural heritage (UNESCO, 2020)
6. The reference production sites
7. The techniques, tools, and materials used to make it, with a list of similar products
8. A list of artisans in the area who make similar products

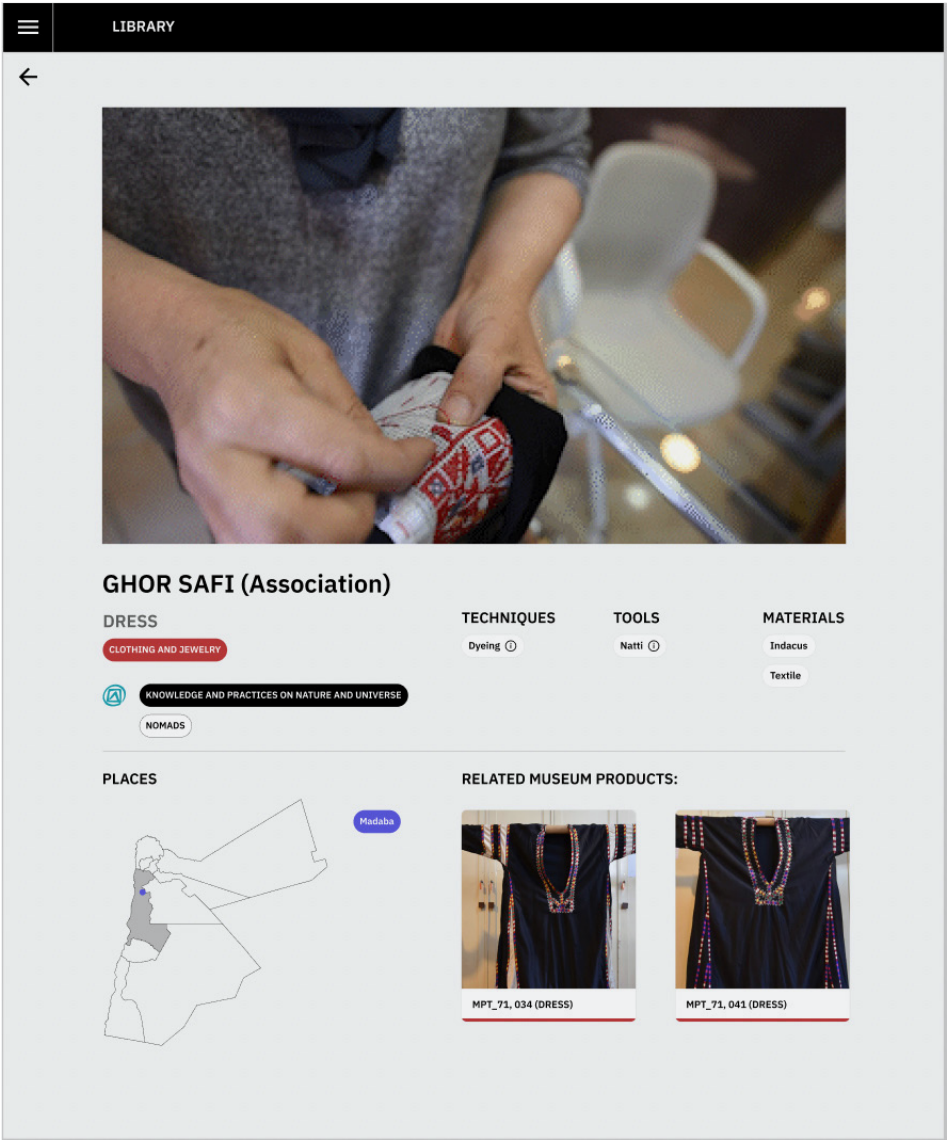


**Figure 1.** Alessandro Ianniello, *Digital Library of Living Traditions*, Sheet dedicated to artisans or craft associations, 2022.

Similarly and through the selection of the same parameters, the sheets dedicated to artisans or craft associations will also be searchable, highlighting the following (Fig. 1):

1. The types of products made
2. The clusters they belong to
3. The UNESCO concepts they refer to
4. The techniques, tools, and materials used to make the different products
5. The regions in which the artisans (or associations) reside and work
6. A list of other products made by them

Furthermore, from each sheet, one can access multimedia contents (videos). One of the aims of the platform is to create a user experience that is intuitive and that allows users to obtain a series of information about Jordanian cultural heritage. As pointed out by UNESCO, intangible heritage is a constellation of interconnection, and for a proper understanding of its complexity, it is important to dive into it. Having this purpose in mind, the DL project also includes a data visualisation section to return a graphic overview of the existing relationships among all the data in the archive, inspired by the so-called *UNESCO Constellation*. It will also be possible to use visualisation as a filtering system to select the information of interest, returning the search result in the listing section. Finally, the users can access the glossary section both from the product sheets and from those related to artisans, in which the various Jordanian terms used in the archive are listed, providing their definitions or explanations of the terms.

This section is helpful for non-Jordanian users who can, in this way, further deepen their knowledge of the nation's cultural heritage.

As of writing this contribution, the platform's development is in the prototyping stage regarding the archive and glossary sections. At the same time, the data visualisation system is currently being optimised to be embedded in the platform and to make it responsive and usable as an additional filtering system for the information in the archive.

### 2.2. Bringing Oral History Alive: Audiovisual Interviews for Documenting Stories and Practices

As previously introduced, the DL is designed as a multimedia archive to preserve and transmit knowledge about traditional Jordanian handicrafts and Bedouin cultural practices. This paragraph focuses on the involvement of audiovisual storytelling practice in documenting the collective historical memory of the Jordanian communities, collecting, recording, and producing content starting from the personal and cultural memories of members of heritage communities (Salerno, 2014).

Alongside the digital documentation of the physical objects displayed in the two museums, the traditional artefacts and the handicrafts practices for producing them are documented using audiovisual storytelling and the experience of stories, practices, and techniques. As stated by the UNESCO guidelines (2020), on traditional handicrafts, both the object itself and the world around it need to be preserved and enhanced.

In light of such premises, the short movies are thought to be a tool for enhancing the intangible cultural practices of Jordanian heritage, such as the people and the communities who participate in the intangible heritage.

These preliminary reflections on handicrafts lead the idea that the artisans' role in Jordanian society must be highlighted through some central topics in the interviews:

- The meaning (functional and symbolic) of the object produced for society in which artisans perform their work
- The traditional production processes
- The relationships among the selected raw materials, the object produced, the social context in which it will be used, and the surroundings
- The knowledge transmission from generation to generation

Starting from the idea that oral histories (OHs), "as primary sources of information, are used as evidences of the past and inculcate human memory" (Yap & Barsaga, 2018), the project deals with local community engagement and the people who have made and used these objects since the beginning of the process. Artisans are not just the main characters of the stories; they also have an essential role in defining what to tell and how, what to show, and, most importantly, the main memories that help to regenerate their identity.

Different Jordanian towns and districts were chosen for the interviews to collect information from different Jordanian contexts and create the occasion to highlight and enhance cul-

tural diversity positively. We selected six topics following the parameters of the digital archive, starting from the literature review and the case study analysis. After this preliminary research, the priority products selected for the interviews were derived from a participatory workshop with the communities.

After the presentation of the whole project, people were asked to select the objects that, according to them, better symbolised their traditional lifestyle. This step was fundamental to break the ice and create a connection with the people, make them comfortable with the team, and, above all, include them and make them the protagonists of the enhancement process. The role of the network promoted by the Department of Antiquities in Jordan and the mediation of the local cooperatives and village people were relevant for selecting the groups to be interviewed. They all worked with our team to mediate the relationships among all the stakeholders (researchers, practitioners, and artisans/Bedouins).

The topics and Jordanian artisans and Bedouin communities selected are the following:

- Tent weaving, making, and transportation; rugs: Udhruh, Wadi Rum, Mukaver
- Textile production: Udhruh and Ghor Safi (Petra), Bani Hamida (Madaba)
- Food and drink: Udhruh (Petra), Mukaver
- Music instruments: Udhruh (Petra)
- Embroidery: Mary al Hamam (Amman), Jerash
- Jewellery: Jerash

The Bedouin tent is the type of dwelling typical of the desertic nomadic lifestyle because of its adaptation to the habitat and the materials it is made of (Amoruso & Conte, 2022). Rugs and carpets are part of the tent environment and are produced by weaving hairs directly available from their animals (such as goats, sheep, and camels). Food and drink consumption as well as music and storytelling are part of the hospitality rituals of the Bedouin culture, in which nomadism and the harsh climatic condition of the desert constantly guide the people's choices and habits. Finally, embroidery and jewellery are the primary expressions of the women's identity in the community (Jabbur et al., 1995).

**Figure 2.** Eloisa Casadei, *Digital Library of Living Traditions*, Set for the interview with the Rababa maker inside the Bedouin tent for the ceremonies, Udhruh community, 2022.

As of writing this contribution, the interviews have been done thanks to the involvement of a local video maker (to overcome the language barrier) (Fig. 2).
The average length of the footage collected for each topic is between 2 and 3 hours of recording. According to the preliminary reflections mentioned above, each interview focuses on the personal *biography* of the artisan or the Bedouin and the *technique* (Fig. 3), mapping the interaction between tangible and intangible culture. The local video maker is now in the editing phase of audiovisual artefacts that should be inserted in the DL and into the museums.

**Figure 3.** Eloisa Casadei, *Digital Library of Living Traditions*, Set for the interview with the Rababa maker inside the Bedouin tent for the ceremonies, Udhruh community, 2022.

### 2.3. Workshop: *A Portrait of the Living Human Treasures* – A Dialogue with/between People and the Intangible Knowledge

The workshop presents a process for designing compelling stories for empowering communication. From audiovisual storytelling to defining the promise and values as drivers for constructing content, the workshop aims to convey the fundamental skills for enhancing communication through narrative

skills. The workshop intends to explore digital and audiovisual storytelling in the ICH's design, ideating, producing, and representing narratives with and on digital media, including different genres and formats. We propose a workshop-based methodology, relying on the digital storytelling practice (Hartley & McWilliam, 2009; Lambert & Hessler, 2018) to support the cultural expression of people through the creation and dissemination of personal autobiographical stories (i.e. non-fiction) (Venditti, 2017).

The expected outcomes of the workshop have two main perspectives. From the point of view of the content produced, the outputs are a group of digital stories about traditional craftsmanship and intangible knowledge, which embed short narratives from personal experiences and digital archive material. From the point of view of knowledge sharing, the aim is to empower people in the design of digital stories, strategically exploiting the potentialities of storytelling.

The workshop has a hybrid form and is structured as follows:

1. A series of four online lectures aimed at giving the participant the foundations of ICH, narrative, and audiovisual storytelling
2. A two-day workshop on site for designing story-based content which follows a three-phase process of *collecting*, *crafting*, and *reframing* (Ciancia et al., 2021) supported by narrative tools developed and tested through didactic and research experiences (Ciancia et al., 2018; Mariani & Ciancia, 2019; Piredda et al., 2015)

The online lectures introduce the contemporary use of audiovisual storytelling within the realm of design for ICH. In doing so, the four lectures will tackle the following: (1) the fundamentals of narrative (concepts, glossary, and practice); (2) the processes and tools to design audiovisual content; and (3) examples of narrative strategies to preserve and promote oral tradition and ICH. The 40-minute lectures are designed to be experienced synchronously, with a final Q&A portion.

During a two-day workshop held on site, the participants will be asked to collect stories, testimonies, and memories from the past about traditional craftsmanship, starting from personal archive material. They will translate them into story-based content as tools for giving a voice to and amplifying the dissemination and understanding of the specific expression of the Jordan ICH.

After the online theoretical lectures, the participants will be involved in a preliminary activity covering the first phase of the three-step process adopted. The *collecting* phase involves the collection of fragments, gathered individually, to produce an archive of raw material and begin the creation of narrative artefacts. During this hands-on activity, the participants are asked to collect stories, testimonies, and memories from the past about traditional craftsmanship, starting from personal archive material. This activity aims at collecting visual documentation, audiovisual content, and OHs to create a repository of stories according to three main clusters: rituals (rites and ceremonies), clothing and jewellery (personal ornaments), and house environments and decoration. They will then trans-

late them into story-based content during the *Crafting Stories* and *Reframing Fragments* phases held on site in Jordan.

The first day will be devoted to the *Crafting Stories* step. The crafting phase represents the moment in which the participants work on building stories. They will build story-based content, starting with identifying the narratological element by putting into practice the notions learned during the online lectures. The definition of the object(s), character(s), place(s), and action(s) will then be translated into a narrative form. The output will be scripts and storyboards delivered in a free form (such as analogical sketches or digital video(s)). Finally, the second and last day of the workshop will be devoted to the production of audiovisual content. The output will be short video content, between 30 seconds and 1 minute, feeding the digital archive of stories and practices.
The intended audiences for this workshop are practitioners, academics, and students interested in designing digital stories for promotion and communication. Moreover, the workshop – conducted in a hybrid form, online and on site – aims to involve local facilitators, produce a dialogue between field experts and citizens, and promote a more profound knowledge of the living heritage spread in the Jordanian landscape.

## 3. Final Reflection: Preserving Memory, Safeguarding Heritage (Digital Memory and Digital Traces)

*Narrating heritage* is a real challenge for ICH, and stories can drive audience engagement. For this purpose, digital media can be a straightforward but effective tool for preserving and transmitting memories.

The DL has been designed as a knowledge-based repository for gathering (workshop), maintaining (digital platform), and disseminating (augmented experience on site) the knowledge of the artisans and promoting Jordanian traditional handicraft as a component of national intangible heritage. Specifically, it was designed to recreate a narrative experience in the paths of memory and target its regeneration among young people. The digital platform represents the *fabula*, the chronological order of events, meant as organisational memory to store data preserved for future transmission (Ernst, 2004).

Moreover, collecting the untold and personal stories of people/artisans, bonding objects, and physical traces with OHs overcomes "the silence of discrete archival files" (Ernst, 2004, p. 48). The DL is designed as a digital toolkit where handicraft activities are described accurately through documentation and surveys about traditional Jordanian handicrafts, based on the 2002 national regulation for the protection of handicrafts made in Jordan and the involvement of local facilitators. Artisans' lives, their handicraft techniques, and knowledge transmission are documented by interviews addressing the habitat, the domestic and folklore dimension, and the personal background of people, villagers, and Bedouin communities.

Thus, the design of an augmented experience on site (ongoing) represents the narrative discourse and the organisation of the temporary (and spatial) experience provoking reflections, entertainment, and learning at every level of engagement. Critical issues are related to the technical review of contents for specific thematic areas (dresses, jewellery, Bedouins, folk-

lore) and particularly for glossaries and transliteration from the Arabic language and local dialect.
Finally, while the DL is a way to preserve memory, workshop activity aims at empowering people in digital and audiovisual storytelling, promoting capacity building for the generation of knowledge and the activation of new meanings in the ongoing interaction between the representation of memories and their interpretation within society. This research also aims to produce a more vital awareness of the items exposed in the two museums and the link between them and the Jordanian landscape. As a virtuous circle, the final goal of the DL is to generate continuous development of awareness of Jordan's immense living heritage.

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# Learn Through Memories

## A Didactic Way to Learn and Teach with the Use of a Digital Knitwear Archive

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**Abstract**
Born with a very artisanal and manual connotation, knitwear design has evolved into a highly technological industrial practice supported by digital tools and advanced machinery. For this reason, teaching in the field is a constant challenge requiring innovation and updated information, together with a memory of the more traditional aspects. The article reports a research work born at Politecnico di Milano upon the acquisition of the material archive of knitted samples donated to the School of Design by Marina Spadafora, a designer with a long-standing career in the knitwear field. Given the archive as a rich physical resource, collected and classified by the knitwear professional along her creative career as a daily-basis working tool, academic researchers questioned how they could extend its purpose to bring innovation to teaching and learning methods, combining the physical and the digital dimension. The research investigated the needs of knit design students, researchers, and professional designers to identify the advantages and the barriers in consulting the archive and connected the more theoretical notions about knit structures and the increasingly digital practices with the material heritage of the archive to result in a resource that stimulates students' creativity and increases the learning experience.

## 1. Introduction: From Hand Knitting to the Contemporary Knitwear Industry

Knitwear is one of the most ancient handwork practiced by humans to make clothes and accessories. With time, utility evolved into a hobby, and in the last century, the hobby has experienced the transition into project and the transposition of a purely manual process into a discipline that brings together craftsmanship, design, and technological evolution (Annichiarico, 2009). Nowadays, knitwear design is a highly technological industrial practice supported by digital tools and advanced machinery. For this reason, teaching in the field is a constant challenge requiring innovation and updated information, together with a memory of the more traditional aspects.
The contemporary process of designing, and thus of teaching and learning knitwear is two-fold: on the one hand, the complexity and variety of the techniques. On the other, the infinite creative possibilities it allows. In this dualism, the technical notions become, for designers, the solid knowledge that is the foundation of free and creative design.

At Politecnico di Milano, the research group in Knitwear Design has been working on tools and methods to structure a path for knowledge transfer and the generation of updated skills for designers in the field.
The literature reports diverse teaching methods and approaches, some more focused on creativity and some more related to the industry and the production chain. Often the various approaches are related to the presence or absence of an industrial territory around fashion schools. As reported by McRobbie (1998), British art schools include knitwear as a

purely creative art refusing the more commercial aspects of fashion that could negatively affect the aspiration and quality of one's work, while Volontè (2010; 2012) compare the British approach with the Italian one, stating the latter as more oriented towards the diversity of positions within a fashion system and towards the industrial side of the product. This is also the approach taken at Politecnico di Milano, where Knitwear Design is rooted among the disciplines of Industrial Design and therefore is taught to students by combining theoretical knowledge with creative exercises and practical implementation. The discipline combines theoretical and technical knowledge with the material and manual creation of real test swatches and projects realized through hands-on experimentations on manual knitting machines and through the practice of software programming for electronic machines. Working with the technicians in the laboratory, students learn how to master the almost infinite possibilities of this production technology, and they understand theoretically and practically the functioning and peculiarity of knitwear: the yarns, the fits, the elasticity of the fabric, etc. (Affinito et al., 2017).

Given the evolution of technologies, both concerning machinery and digital tools, teaching knitwear design requires, together with a present memory of the more traditional aspects, innovation and updated information. The article reports a research work born at Politecnico di Milano upon the acquisition of the material archive of knitted samples donated to the School of Design by Marina Spadafora, a designer with a long-standing career in the knitwear field. The archive is a rich physical resource collected and classified by the designer

along with her creative career as a daily-basis working tool. With the donation, the archive changed its location and amplified its potential public, adding new typologies of users and gaining unprecedented functions.
Today (Wright, 2002), students, researchers, information professionals, and the general public can directly access many of the world's rarest artifacts right at the desktop or other web-enabled device, at any time and from any location. Academic researchers questioned how they could combine the physical dimension of Archivio Spadafora with digital tools to extend its purpose and innovate teaching and learning methods.

Could digital tools improve and expand the consultation of the archive, making it not just easily accessible and readable but also an augmented source of information to learn from? How would the archive have been able to transmit to students the ability to observe, get new knowledge and be creatively inspired? How to make it as contemporary as possible, in step with technological evolution?
To answer these questions, researchers carried out a field research, trying to understand the needs of the students and how to help them, increasing the teaching method in progress.

## 2. Methodology

The research has been structured with a preliminary phase on three parallel tracks:

- First, analysis of best practices in using archives, with a literature review and case studies on fashion archives related to the macro-themes of education and digitalization.

- Second, given the technical complexity and uniqueness of knitwear, the identification of parameters to define the coordinates for an updated organization of the archive content. This investigation has been made by comparing the specialized literature with the direct technical expertise of the authors in the field, considering technical notions and how this specific knowledge is transferred to students-designers.
- Third, understanding of the Spadafora archive's current state, its structure, and its users.

The preliminary research has been followed by a qualitative investigation made with open interviews with current and potential users to analyze limits and problems in the existing and open space to meet the emerged needs. The interviews were made to knit design students, researchers, and designers to identify the advantages and the barriers in consulting the archive. In addition, a quantitative survey was carried out to understand the importance of digital tools in the current evolution of the teaching and learning processes. The collected information has been the starting point for developing updated solutions and the project's future direction, resulting in a pilot of 10 technical sheets to be tested and implemented throughout the archive.

## 3. Preliminary Research

### 3.1. The Use of Digital Archives as Teaching and Learning Resources: Possible Perspectives

Archives were created as a management tool to meet the contingent needs of producing and storing entities, institutions, and people documents. With time, archival documentation

(Centro Studi Assolombarda, 2002) added to the exquisitely practical use as a management tool the cultural use as a trace for the reconstruction of the past, where every single document is part of a mosaic and inserted in a network of relationships determined by needs (Masciariello, 2020). Also, the records of an archive changed status over time: they passed from a character of the current use (needed for a here and now) to their freezing in a dimension of historical testimony (Masciariello, 2020). The archive is, for this reason, something not currently in the present, but it becomes in the moment is used for contemporary reasons. This is a very common practice in fashion: the idea to redesign, re-evaluate something old and transform it under a modern way of seeing makes the archives a fundamental resource for professionals, as a source of creative inspiration or a more technical reference. But professionals are not the only audience possible. Consulting an archive can assume various purposes for diverse users – students, institutions, researchers, teachers, wider public – and all of them can get "the chance to get to know the daily going-on of Italian knitwear, hidden away from the extravagantly staged fashion shows at each change of season" (Motta, 2018). However, to be triggered, this process needs specific conditions: the archive cannot be a random accumulation of documents; these documents must be in a relationship, arranged according to a particular order (Feyles, 2013), and obviously accessible. In the last two decades, the evolution of digital technologies favored their application to the archives. Many of them, either corporate or public, have been made digital to facilitate consultation, expand the reachable public, and improve the classification and organization of documents.

By its nature (Centro Studi Assolombarda, 2002), digital collection development requires extensive use of technological resources. If in the early days of digital libraries' development, collections were typically small and experimental, today's technologies allow us to put substantial collections online, and the dimension and complexity of archives are not a limit anymore. Digital archives have become quite diffused also in the textile and fashion field. The present study identified some relevant cases, here briefly resumed in Figure 1, and investigated their accessibility and potential use in education.

| NAME | WEBSITE LINK | LOCATION | TYPOLOGY | CONTENT | DIGITALIZATION | DIGITAL LOCATION | ACCESSIBILITY | OPEN TO STUDENTS |
|---|---|---|---|---|---|---|---|---|
| TEXMEDIN | TEXMEDIN | ONLINE | DIGITAL | T F K | COMPLETE | WEBSITE | EVERYONE | YES |
| TEXTILE LIBRARY | TEXTILE LIBRARY | PRATO | PHYSICAL + DIGITAL | T F K | PARTIAL | OPAC | EVERYONE prior authorization | YES |
| EUROPEANA | EUROPEANA | ONLINE | DIGITAL | T F K P | COMPLETE | WEBSITE | EVERYONE | YES |
| RATTI | ARCHIVIO RATTI | GUANZATE (CO) | PHYSICAL | T P | NOT PLANNED | NOT PLANNED | EVERYONE | YES |
| MANTERO | ARCHIVIO MANTERO | GRANDATE (CO) | PHYSICAL | T P | NOT PLANNED | NOT PLANNED | just internal | NO |
| LINEAPIÙ | ARCHIVIO STORICO LINEAPIÙ | CAMPI BISENZIO (FI) | PHYSICAL + DIGITAL | K Y | PARTIAL | ONSITE DEVICES | Fashion operators | YES |
| A.N.G.E.L.O. | ARCHIVIO A.N.G.E.L.O. | LUGO (RA) | PHYSICAL + DIGITAL | F | PARTIAL | WEBSITE | Fashion operators prior authorization | YES |
| MF1 | ARCHIVIO MF1 | VALEGGIO S/M (VR) | PHYSICAL + DIGITAL | T F K | PARTIAL | ONLINE PLATFORM | Fashion operators prior authorization | YES |
| ARMANI | ARCHIVIO ARMANI SILOS | MILANO | DIGITAL | F P R A | COMPLETE | ONSITE DEVICES | EVERYONE prior authorization | YES |
| FERRÉ | ARCHIVIO FERRÉ | MILANO | DIGITAL | F P R A | COMPLETE | WEBSITE | EVERYONE | YES |
| MANTECO | ARCHIVIO MANTECO | MONTEMURLO (PO) | PHYSICAL | T K | NOT PLANNED | NOT PLANNED | Fashion operators prior authorization | YES |
| CENTRO RETE BIELLESE ARCHIVI TESSILI E MODA | ARCHIVIO BIELLESE | PROVINCIA DI BIELLA | DIGITAL | T F K | COMPLETE | WEBSITE | EVERYONE | YES |
| FONDAZIONE FASHION RESEARCH | ARCHIVIO FFR | BOLOGNA | PHYSICAL + DIGITAL | F P R A | PARTIAL | WEBSITE | EVERYONE | YES |
| FONDAZIONE FERRAGAMO | ARCHIVIO FERRAGAMO | FIRENZE | PHYSICAL + DIGITAL | F A | PARTIAL | SOFTWARE SAMIRA | Fashion operators | YES |
| ARCHIVIO MISSONI | ARCHIVIO MISSONI | ALBUSCIAGO (VA) | PHYSICAL + DIGITAL | T F K R A | PARTIAL | WEBSITE | Fashion operators prior authorization | YES (theses support) |

**Figure 1.** Case studies of fashion and textile archives. Content legend: T=textile, F=fashion, K=knitwear, P=prints, Y=yarns, R=runway, A=ads, authors, 2022.

The several case studies analyzed showed that archives are used above all by designers inside companies or by specialists in the sector. Seven archives out of 15 are accessible just by fashion operators, 14 out of 15 are open to students, but six require authorization, which students perceive as a barrier.

Despite being digital, physical, or both, most cases appear organized for professionals rather than for educational purposes. 19 out of the 12 digital archives (except for Europeana, Archivio Ferrè, and Archivio MF1) present digitized pictures of the physical but very poor or total absence of additional information: this means that students can't rely on tools to orient themselves during a consultation and the archive does not acquire educational features. To Innocenti (2006), corporate documentation centers are added value centers that cannot limit themselves to offering services but should proactively meet users' needs, changing their role as information distributors to knowledge partners who define a link between external and internal information. According to Conti, Motta, and Rech (2020), an archive can be a learning resource to expand the knowledge and mentalities of the students, applying what they learn theoretically by touching finished products that could be usually seen only in books and at the same time to be active in replicating, re-studying, redesigning the old elements according to their creative vision. It recalls the words of Innocenti (2006) again when she declares that in a document organization system, the most important feature of information is that it can be used out of context, creating networks of relationships and contexts and, thus, new knowledge. This has been the purpose of the present research for Archivio Spadafora.

### 3.2. Finding Classification Parameters for Complex Knit Structures

Given the immense variety of knitted structures that can be obtained by changing one or more of the elements –i.e., yarn, stitch size, machine gauge, color, material– that constitute a

knitted fabric, the work of researchers in this phase identified guidelines for the archive organization,
The owned technical expertise and previous research on knit design teaching allowed the authors to identify the 4 knitwear structures that are the basis of any possible evolution or variation of a knit fabric (Single jersey, Ribs, Double jersey, Tubular knit) and 8 basic stitches. From these 12 elements, combining structures and stitches, designers can generate all the possible existing knitted fabrics.
This means that stitches in the archive can be easily and effectively classified with these two parameters that concern both the aesthetic aspect of the fabric and the technical construction and realization of the structure.

### 3.3. Current Analysis of Archivio Spadafora

The archive is located inside the Politecnico di Milano material library based in Milan Bovisa Campus and is accessible during the library's opening hours. It comprises 5000 knit stitches stored in folders and is currently divided into 22 categories based on how Marina Spadafora delivered it. The categories refer to the type of stitch or technique used (e.g., ribs, hand stitches, braids) but also to the function (e.g., edges and collars) or other general features (e.g., stretch, light textures). Each category includes a variable number of samples with no additional material, structure, or application information. All the samples have been scanned and digitally uploaded on the website of the university archival system of the Politecnico di Milano (https://www.biblio.polimi.it/) as part of the university library and material library called Materioteca. The digital version of the archive so far reports the front and back scans

of each sample and is divided according to the categories of the physical archive. Although a good starting point, the archive still needed intervention to become a useful educational resource.

## 4. Qualitative Interviews and Quantitative Surveys

To understand the current situation and propose solutions to innovate and improve the use of the archive, qualitative interviews were carried out during the academic year 2021/2022 with two designers and teaching assistants (Beatrice Zagatto and Enola Cappellari) and three students of the same course (Pietro Lo Presti, Alberto Melli and Michele Fumagalli). All five interviewees have been using the archive for design and learning purposes.

Here reported are the most relevant extracts from the interviews:

> "I used it for design projects, particularly in the initial phase to find inspiration." (BZ)
> "It must be more connected to the courses and the knitting lab." (EC)
> "I would love more explanations on the knitting stitch that I observe, even if only a general indication, a nomenclature." (BZ)

Both found the archive division clear and effective but still incomplete. They underlined the need to make this archive even more a valuable tool within the university. Both welcome a possible digital version, underlining the importance of having a source to consult quickly, anywhere and at any time.

> The first impression on knitwear was very positive, I immediately liked the blend between technique and creativity, but I find that a great degree of technical competence is needed. […] the level of creativity stops only where the technique ends, whether it is the worker's competence or the limits imposed by the machine. (PLP)

Pietro's words clarified how creativity in knitwear is always accompanied by great theoretical and practical knowledge. Speaking directly of the archive, the three students agree that it is very useful, especially in the project's initial phase, to find inspiration and get even more in contact with knitwear through knit stitches. The students found the division of the archive functional and comprehensive but not sufficient, especially if approached with no guidance or indication:

> I think it can still be useful even in the intermediate/advanced phases in this case, however, it is easier to search on the internet because it is possible to find a more detailed explanation with diagrams and how to make a given sheet which is often (rightly) missing. (AM)

> A problem is certainly the search filter limited to relevance, title, author and year. To accompany each swatch there are still keywords that can be used to further filter the search as, for example, lines, hand, braids, texture, openwork, etc., but in my opinion, you could make the search even easier by adding these keywords directly in the filter panel. […] The categories are clear, but the problem is the ability to understand what I observe. I found very interesting things in all categories, especially in heavy textures. The main gap is between theoretical and practical notions. (MF)

The reported words prove that the archive is used and appreciated by students, but limits and gaps prevent it from being effectively usable to the maximum. In particular, what was encountered by the students was the inability to find a scheme and a guide capable of identifying and helping in the observation of the swatches within the archive.

The quantitative surveys got 42 responses from students who attend or attended the knitwear design specialization course at the School of Design at Politecnico di Milano. The results showed that students favor a digital version of the archive, but they consider it as a way to anticipate and expand the access in-presence to the physical samples and the additional information provided.
The pandemic, indeed, forced design teachers and learners to work remotely on physical artifacts, exploiting digital tools and equipment in innovative ways. Today, with a slow but progressive return to physical and in-presence, the digital solutions found during difficult times are not anymore "replacing" the physical ones but are opening opportunities. Digital environments are becoming a support in the rapid change of approach we are experiencing: after a decade of Industry 4.0, we are now approaching Industry 5.0, which focuses on a symbiosis between humans and machines (Longo, Padovano, Umbrello, 2020; Xu et al., 2021). The surveys report how difficult it was to follow design classes at a distance but also demonstrate the will to pursue a hybrid form that grasps both physical and digital realities' strengths. Emerged clearly the need for digital material to freely consult without the restrictions of university hours to optimize project timing.

Distance learning and digital platforms are still perceived as poor by the majority of students but are recognized as a starting point to create innovative and highly functional teaching of the future (Fig. 2). By working on the updating of the archive, a way should be found to organize it in the best way possible for educational purposes, without ignoring the opportunity given by the digitization of tools, as the archive can potentially be a primary example.

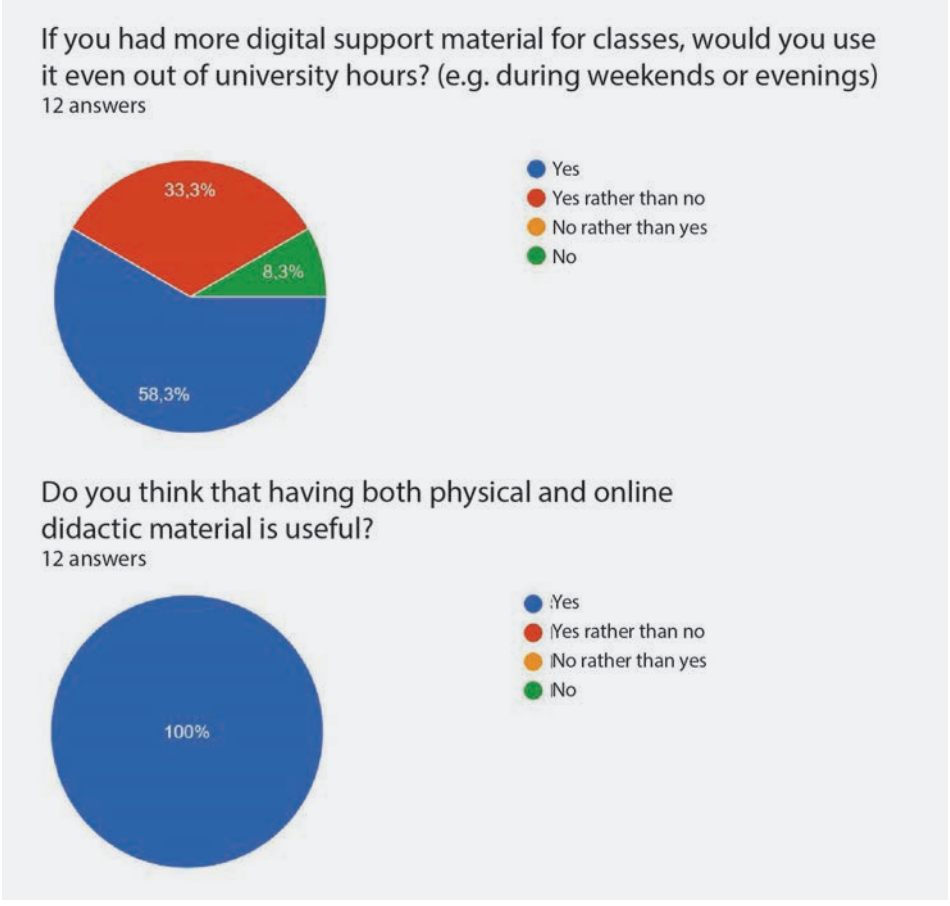


**Figure 2.** Quantitative evidence from the survey, authors, 2022.

## 5. Results and Discussion

From these findings, the authors designed solutions for the archive to make it a tool to support knowledge transfer for future knitwear designers, able to adapt to rapidly changing contexts, both in the teaching-in-presence and in more autonomous learning moments.
The design process followed 3 consequent steps and multiple reiterative cycles of verification of each step.

### Step 1: Codes for Clarity in Consultation

Step 1 was based on the previously formulated guidelines and consisted of designing an effective system to represent knitting structures and their variable parameters. The system consists of color codes and symbols and is correlated by an introductory guide to make the consultation easy and facilitate the workflow.
Each stitch is represented by a symbol and a color (Fig. 3) that resemble the code used by the Shima Seiki SDS Apex3 software for industrial knitting machines that students are familiar with.[1] Despite the associated color, the symbols are universal among knitwear professionals and thus recognizable by people familiar with machine knitting, regardless of their familiarity with Apex3 software.

1 This system of codes has been used in the professional environments since the 80s, when the first computer-controlled knitting machines were released by Shima Seiki. Even with the updates of technologies, the basic symbols remain the same. As Shima Seiki is one of the two main players for power knitting machines together with Stoll, this language is one of the two globally diffused and recognized among professionals.


**Figure 3.** The 8 basic stitches with colors and symbols, extract from the introductory guide for consultation, authors, 2022.

## Step 2: The User Journey for Digital and Physical Access

The second step concerned the design of the user journey, based on the user and the fruition typology, with particular attention to the physical dimension counterposed to the digital one. The support material has been organized as a digital platform that contains and expands the knowledge about the physical catalogue. Users can consult the archive entirely virtually or visit the Materioteca and access the digital contents by scanning the QR code next to each knit swatch.

## Step 3: Knowledge Implementation

The third step regarded the additional information to implement the knowledge related to each sample. The research work focused here on the definition of the content structure, on the selection of useful specific information, and on its organization that could address both educational purposes and support professional research.
The additional knowledge has multiple aims:

- to give a guide and explanation of the knit stitches that can be found in the archive;

- to demonstrate the different applications and variations;
- to spark creativity that can take the existing and expand future solutions by showing the different changes that can be made starting from the same structure, stitch or material.

Based on these premises and the researchers' technical expertise in knitting, the research led to the first set of 10 pilot technical sheets (Fig. 4) to be tested during A.Y. 2022-2023. After the test and the possible modifications, the sheets will be progressively implemented throughout the archive.


**Figure 4.** One of the 10 pilot technical sheets that contain: references to the consultation guidelines; color codes and symbols to identify the main features of the sample; detailed information on how the sample is made and could be replicated; possible variations with reference pictures that show what could happen when changing yarns, tension, machine gauge, pattern. Authors, 2022.

The 10 pilot sheets gave a solid basic structure to the additional contents. The future work will progressively create new sheets, following several directions suggested by the field analysis and the literature, to exploit the digital as a tool to extend the physical and create new knowledge.

Future actions envisioned, both on the research side and the educational one, are:

- implementation of the platform with the chance to create personal lists to save favorites or samples you consider more interesting and inspirational;
- implementation of the relations and links between the sheets to enrich the consultation experience;
- study of the possible implementation of sheets with video tutorials;
- analysis of the technological evolution and updates of the digital resource;
- experimentation of new ways of using the archive for teaching, not just leaving students consulting it on their own but including class hours spent with the archive (both physical and digital) in different moments of the learning process, using its multiple levels of knowledge with new-learners and more expert students.

## 6. Conclusions. The Future of the Project

The research results show how digital tools and environments can improve and expand the consultation of a physical resource giving easy access to augmented knowledge. Making the archive not just a catalogue but an evolving resource

that responds flexibly to different users' needs is possible. The research connected the more theoretical notions about knit structures and the increasingly digital practices with the material heritage of the archive to result in a resource that stimulates students' creativity and increases the learning experience. Whatever the level of experience of the ones approaching the archive, from earlier learners to expert professionals, resources are now organized for optimized workflows, and additional contents are designed not to give notions but to open perspectives and suggest experiments with technical and creative solutions.

The choice of making it digital makes the future of these research results much broader and expanding. The digital connotation makes it easy to continue creating additional knowledge by generating new technical sheets, updating old ones, and connecting them with each other.

Future research will use the developed tools to experiment with diverse possibilities to improve teaching and encourage more contemporary and compelling learning. Along the path of digitalization, the archive is becoming more interactive and allows students themselves to participate in adding new content by inserting their projects born from the structures learned through the archive. The archive thus becomes an evolving resource that nurtures itself with the knowledge it generates.

During the upcoming Academic Years, teachers of the Final Synthesis Studio in Knitwear Design and the Course in Digital Modelling for Knitwear at Politecnico di Milano will adopt Archivio Spadafora as a structural and fundamental learning tool alongside the theory learned on books and knitting machines.

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# Maranola Digital Memories

## Narrating Multimedia Archives as Didactic Outcomes for Communicating the Memories and Traditions of the Town of Maranola

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**Abstract**
The article describes the objectives, the approach, and the results of an experimental didactic experience that engaged design and performing arts students in recovering and restoring the memories of the medieval town of Maranola. The teaching's main objective was to enhance the memories of the place by designing a *narrating multimedia archive* that tells and transmits feelings, emotions, and values and strengthens and communicates the collective identity through interactive and multimedia narrative mechanisms. The use of visual storytelling and multimedia communication languages and tools becomes a means to build an emotional and educational physical experience and a digital archive with artistic and historical value since it evokes, narrates, and reconstructs the local reality and allows users to participate in it. Students' path adds a design component to the historiographical dimension of the traditional archives and contributes to the spread of knowledge of the community, its traditions, and of Maranola's artistic richness. In fact, since 2011, the town has hosted five editions of the *Environmental Art Festival Seminaria Sogninterra*. The database of the works created during the past editions of the festival provided inspiration and suggestions for the students. The developed projects exploit interactive and audiovisual tools, work with forms ranging from physical to virtual, and create narratives that metaphorically explore the traditions and memories of the place.

## 1. Introduction

Spatial reference points "enable us to anchor and order our memories" (Truc, 2011, p. 148). According to the philosopher Maurice Halbwachs (1992, 2008), the material quality of places, buildings, and streets affects collective and personal memories and sometimes defines them. Places treasure memories of different people, objects and events that can seem unrelated. However, as they are rooted in the same spatial substance, they share a "coherent system of collective images, [and are] innervated by the thought and feeling of the people" who crossed them (Bastide, 1970, p.81). Hence, the relationship between memories and places needs to be preserved and enhanced to contribute to building and strengthening a community's identity.

Starting from these premises, the article illustrates the creative brief, the methodology and the results of an experimental teaching experience that engaged design and performing arts students of the *MA in Design and Visual Communication* from the Sapienza University of Rome in recovering and restoring the rituals and memories of the medieval town of Maranola. Since 2011, the town has hosted five editions of the *Environmental Art Festival Seminaria Sogninterra* (meaning seeds in the air and dreams on the ground), an opportunity for national and international artists to spread knowledge of the community and its traditions (Ciufo, 2020). Students had the chance to imagine, design and prototype a multimedia project within a possible scenario: *Seminaria Sogninterra* special edition, called *XY,* promoting innovation in multimedia technologies applied to artistic and cultural projects. The teaching's main objective was to enhance the memories of a place that feeds on the

territory and in which historical events and individual stories are inscribed. The globalized and technologically oriented framework of contemporaneity acts as background but also stimulates actions aimed at reconfiguring a local community in which memories, connections, documents, people, and the territorial context itself participate to communicate and preserve a social, artistic and cultural dimension. The developed projects place themselves as new tools for archiving and narrating these memories through the design of multisensory, multimedia and interactive paths. This multimedia archive, defined as *narrating*, invades a specific place, the town of Maranola, amplifies the space and establishes new connections with a site that is – and has been – the setting for stories collected and narrated by the archive itself.

## 2. Narrating Multimedia Archives

Archives are the oldest human attempt to gather sociocultural data and create a framework for social memories and cultural histories (Peters & Besley, 2018; Jo & Gebru, 2020) by collecting and conserving physical and intangible heritages and recognizing them "as a vital factor for the promotion of cultural identity" (UNESCO, 2021).

In the digital world, technology has made access to this knowledge widely available (Peters & Besley, 2018) and has also altered the identity of the texts hosted in the archives and the modalities of interaction with the embedded memories. Digital memories and digital archives, more than any other form of mediation, have weakened the distinction between archival memory and lived memory by combining the function of storage and ordering on the one hand and of presence

and interactivity on the other (Haskins, 2018). In this evolving scenario, multimedia communication languages and tools for collecting and displaying the traces of the past have been applied especially for preserving intangible cultural heritage expressions, mostly through participatory exhibitions and audiovisual documentary artefacts (Bertini et al., 2020; Boiano et al., 2018, 2019). Therefore, the heritage's modality of fruition has evolved, embracing the idea of dynamic and participatory experience (Fonti & Caruso, 2012; Dal Falco, 2018) and getting interactive by taking advantage of VR digital technologies to enjoy spaces that are virtually reconstructed. Technological media, furthermore, allow to add other dimensions to the storage of the traces of the past. Digital archives open up possibilities to create multimedia experiences and visual performances to be interactive and convey narratives (Damiani, 2018). The new archive model aims at increasing emotional involvement, arousing curiosity, and facilitating the learning of the narrated history and contents. To create experiences capable of meeting these requirements, the design of communication strategies and the use of interactive experiences and technological devices have taken on a decisive role in the formulation of a new idea of the digital archive, not just made of digitized data and information, but also dynamic, visually appealing and with a multimedia narrative (Jenkins, 2010; Mandelli, 2017; Salvetti & Scuderi, 2019).

The focus on the cultural, anthropological, aesthetic and material features can be preserved and expressed by constructing *narrating multimedia archives* as the main means of communication (Damiani, 2018). Concetta Damiani formu-

lates the idea of *narrating archive* by addressing an archive capable of telling stories and transmitting feelings, emotions and values and strengthening and communicating a collective identity through narrative mechanisms (Cirifino et al., 2011). In a *multimedia narrating archive,* the visitor, the citizen, and the person are the protagonists of a multimedia and interactive journey and pass through an identification process in which stories, documents, people, places, and social and cultural contexts contribute to the construction of a new collection of memories (Damiani, 2018). A narrating multimedia archive defines a new series of advantages by depicting personal stories and collective history and mixing interactive installations, virtual devices, and fictional media. It makes the narrated heritage widely and easier accessible and understandable also for non-insiders. Eun Seo Jo and Timnit Gebru (2020) state that a digital archive has to be inclusive in terms of accessibility for the public and the quality of collected information. "Rather than starting with datasets by availability, – according to them – data collection in archives starts with a statement of commitment to collecting the cultural remains of certain concepts, topics, or demographic groups" (Jo & Gebru, p. 310). *Furthermore, narrating multimedia archives* need to gather different media to follow a transmedia strategy and, in doing so, to stage also the premises, the characteristics and the process of construction of the archive itself, from the collection of data to the design of the multimedia outputs. The recording and sharing of archival strategy "will eventually serve future generations" and witness the "many layers of supervision by archivists, curators, records creators, and records managers" (Jo & Gebru, p. 312).

A further requirement treasured by narrating archives concerns the ethical questions. Archives must "ensure accountability and transparency, preserve a diverse set of materials, select materials responsibly, and keep records for the sake of future generations" (SAA, 2011). Oral and intangible heritage have a sensitive nature and are often demanded with privacy or even closed to outsiders of the explored community, making their preservation complex and even impossible. The use of multimedia approaches and visual narratives in explaining the roots and the connections between different forms of traditions provides an unprecedented integrated perspective in reading, displaying and narrating cultural heritage and re-designing the experience of archives.

The archive concept has evolved over the years and has incorporated new parameters such as emotional engagement and narrative mechanisms to tell the past, capture the present and reinforce and communicate a collective identity. The educational experience described in the following sections uses multimedia interactive projects as new tools to store and narrate the memories of the town of Maranola. The experimental journey driven within this University course emphasizes the active role of design in preserving, organizing, transmitting and presenting the heritage to future generations.

## 3. Maranola and *Seminaria Sogninterra*

Building a *narrating multimedia archive* has been the challenge at the basis of the *Seminaria Sogninterra XY edition*. In order to reach this objective, students accessed the traditional archive of the past editions of the festival, where most of the material produced has been collected, such as texts,

interviews, digital compositions, contemporary pictures, old photographs, and videos (Fazzi, Indolfi & Pizzuto, 2015; Fazzi & Indolfi, 2020). Furthermore, they have been invited to visit the location and to meet and talk both to people from the town and the curators and artists of the festival.

*Environmental Art Festival Seminaria Sogninterra* was founded in 2011 in Maranola, a small medieval town geographically set between Rome and Naples, a few minutes away from Formia. The town is an enclosed terrace overlooking the Gulf of Gaeta, protected by the Aurunci Mountains at its back. Surrounded by medieval walls, accessible only through two portals, and impossible to drive around in except through very short alleyways, the town is a microcosm that contributes uniquely to human and historical knowledge. Fifteen hundred residents, a school, a pharmacy, three churches and a small market are all left in this town suffering from a heavy wave of depopulation. The cultural program of this town depends entirely on ten non-profit associations, one of which is *Seminaria Sogninterra*. Considering the value of this historical site means considering it as a whole, a sum of different factors that new cities have never achieved: a vibrant mix of urban density, functional variety, high social engagement, and symbolic and figurative references. Direct experience in the context is the only possible way to really understand its entire complex of function and form, its social and existential values, typical of a medieval town (Pandakovic, 1978). Designers and artists come from all over Italy and abroad to participate in *Seminaria's* residency project: they are invited to breathe the local air, live temporarily in the hamlet, and conceive and realize projects for and with the community.

The results are usually site-specific works developed in relational art, performance, sculpture, and temporary installations. The Biennale events occur every two years, usually for three days in late summer. During these days, Maranola is transformed into a place where art, the environment and the local community become a unique mix of life experiences, a kind of open-air theatre piece. The town's alleys, public spaces and private houses host the exhibition, temporarily transforming into a unique art trail for seven hundred or more visitors every night. Artists-in-residence are challenged to research and highlight the set of little things that make this community so unique. The community's demands constitute a new level of engagement for them, but the focus of their work is usually more in the process than in the result. The community and the visitors might get involved in this process, becoming collaborators, spectators, or actors (Birchall, 2017). This whole experience of external perspective helps the community to recognize its own identity, to put it back on stage, and finally to open the village to the outside world.

As Francesca Guerisoli explains in *Arte nei borghi. Brevi note storiche a margine di Seminaria* (2015), in the main Italian cultural events that have placed contemporary art in urban settings, it is possible to distinguish a few kinds of relationships developed between the artworks and the context: the city used as mere set and background for independent artworks; the city as an experimental space for happenings, actions, performances, and installations; the city as a place of relationships with the active participation of citizens to elaborate collective issues. *Seminaria Sogninterra XY* goes over the three categories listed above and adds a layer to the relationship between

city, community, and design process: the city becomes a stage for its *narrating archive* that gets multimedia as its main tool. The need to rethink the artistic and design experience that invades the village by giving it an archival, multimedia and multimodal connotation stems from observing the rapid obsolescence to which those actions are subjected. Except for a few works, conceived from the very first moment as permanent interventions and still present in the alleys, and the particular case of *Apocrypha*,[1] most of the artistic interventions that have occurred over the years now live only in social memory or, at best, as beautiful images printed in Festival catalogues.

## 4. Performing Arts and New Media Studio

The second-year students of the *MA in Design and Visual Communication* from the Sapienza University of Rome were challenged to expand the archive's typical documentary and historiographic dimension, making it take on a new form and applying visual storytelling and multimedia narrative paradigm. They designed both a technological and performance-oriented collection of experiences and storage of personal and collective memories that enhance the identity of the place and its inhabitants and return it to the public. Using a *learning-by-doing* approach (Bruner, 1966; Dale, 1969), the *Performing arts and new media Studio* required students to work by setting up a team and dealing with the concept, design and communication of a multimedia project within a possible scenario: the *Biennale Seminaria*

1 Art piece from Christian Ghisellini presented in *Seminaria 2012*, bought from the community at the end of the Festival. The art piece is related to the tradition of *Madonna Lactans*, and the special Cripta discovered under San Luca Church in 1997 during the restoration of the building.

*Sogninterra Edition XY*. The course provided the tools for designing a multimedia archive according to the following phases: to consult a database of design works created in past editions of the festival; to meet the protagonists of the festival involved as local ambassadors; to define main keywords and topics; to elaborate concepts; to design; to fulfil budget and schedule for carrying out the project; to communicate the project through the production of audiovisual material.

The initial anthropological research and direct experience on the field allowed students to exploit the stimuli and contradictions that emerged from the interaction with the inhabitants. The following design phase engaged students in suggesting a new vision capable of exploring and acting in the town and enhancing and preserving its tangible and intangible cultural heritage through digital technologies and different languages. Developed multimedia design projects range from physical or virtual interactive installations to the creation of audiovisual artefacts that provide a metaphorical narrative of the traditions and memories of the place through promotional video trailers suitable for *Youtube* and *Instagram* platforms.

The multimedia (re)construction of stories and habits has amplified the traditionally adopted paradigm for enhancing cultural heritage. Students' design experience ended with a public presentation open to the residents' community, which took place in Maranola's documentation centre. Moving images and interactive installation projects performed an imaginary invasion of the town with a multitude of sound and visual stories, shadows and archive fragments, a task for centuries entrusted to objects, environmental reconstructions and theatrical performances (Cataldo & Paraventi, 2007; Mandelli, 2017).

## 5. Students' *Narrating Multimedia Archives*

Students' projects offer a structured and digital form of memory communication, which sides and integrates the tested specialist communication of the traditional archives. In this archive of memories, it is possible to encounter physical and virtual interactive experiences and moving images. Starting from the keywords *stories/connections/sense of belonging*, students designed different outputs: interactive, immersive and participatory installations that recall the town's history and audiovisual artefacts that document this path and the concept's genesis with the methodologies and structures of visual storytelling. Selected projects investigated memory in relation to the following criteria: objects that hold documented memories, habits and rituals; materials linked with gestures and traditional activities; places that reveal the passage of time and that evoke events and remind characters linked to a past that asks to be remembered.

### 5.1. The Memory of Places

The *Mo Studio team* with the project *Altrove* questions the stories of places and the bond that connects people to them. Each place has a story to tell, and certain places have or have had in the past value for the inhabitants. The project answers the question: how many lives have passed and inhabited a certain physical place? The group collected the stories of a small unused room that had been a tailor's shop in the past. Through video mapping and interaction design technologies, students reconstructed the room on the threshold as it appeared in the past, inviting viewers to cross the door and enter an augmented space where a sensorial experience evokes the feeling of ancient tailoring through sound and lights.

**Figure 1.** Mo Studio, *Altrove*, still frame from the animated video © Gabriella D'Aniello, Roberta Favia, Pasquale Micelli.

The associated audiovisual artefact traces the same story and, through digital cut-out animation, allows the user to cross the tailor's environment, made up of two-dimensional silhouettes of objects, fabrics, wallpapers and people (Fig. 1).

With the project *Maranola. Memorie di un paese,* the *ELSE Design Studio team* celebrates the daily and past stories in which the town is immersed by designing an installation that allows reviving a photograph taken 60 years ago.[2] The installation consists of 5 historical photographs, projected in the specific place where they were taken and set in motion through animation software (Fig. 2).

2 A professional Photographer provided historical pictures from Maranola, Luigi Simione, who made his published works accessible to the students.

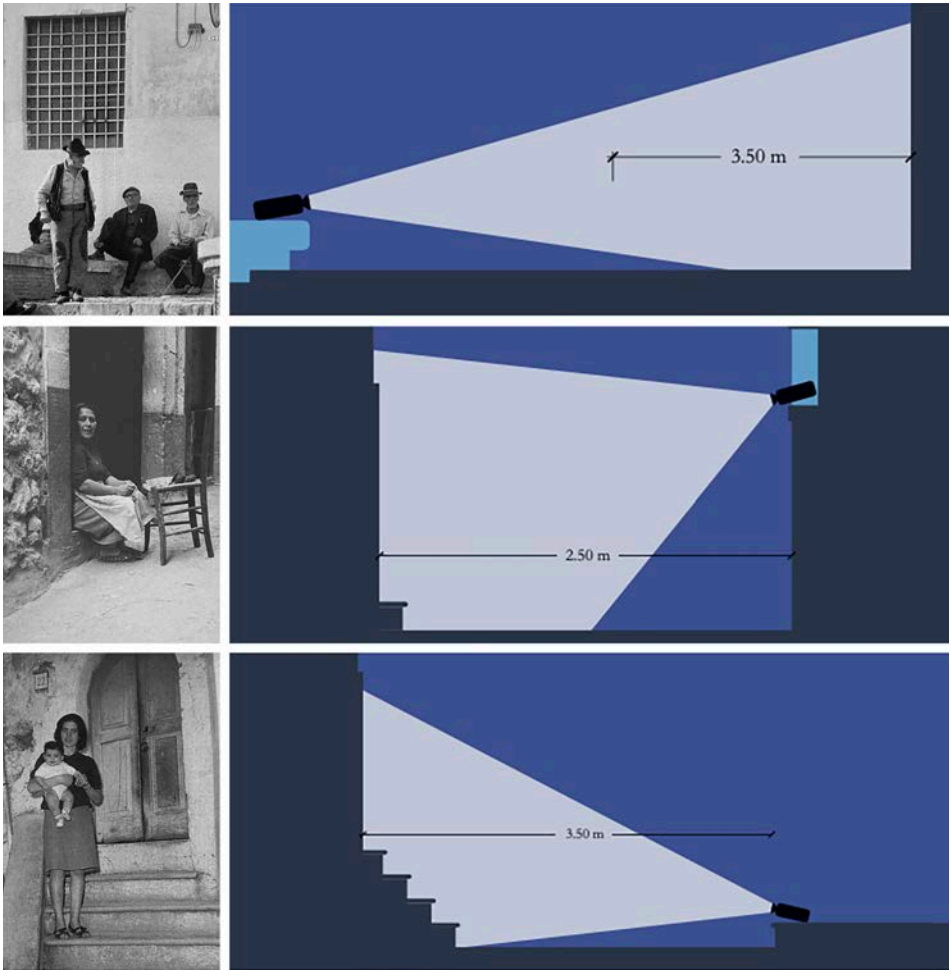


**Figure 2.** ELSE Design Studio, *Maranola. Memorie di un paese*, projected photographs and projectors' position © Silvia Cucurru, Licia Maraziti, Elena Micacchi.

A slight change in facial expression, the hint of a smile, a small movement of the head or eyes allow that moment to be relieved for a few seconds (Fig. 3). Next to the projections there is also an electronic device, made using the *Arduino* hardware platform, which plays some sound recordings relating to the people depicted in the photos.

**Figure 3.** ELSE Design Studio, *Maranola. Memorie di un paese*, example of animated sequence © Silvia Cucurru, Licia Maraziti, Elena Micacchi.

The project brings to life a crystallized time and stories related to private and intimate experiences that bind people to the places of their daily lives. The created animations are then collected in a video that virtually crosses the places with live-action footage.

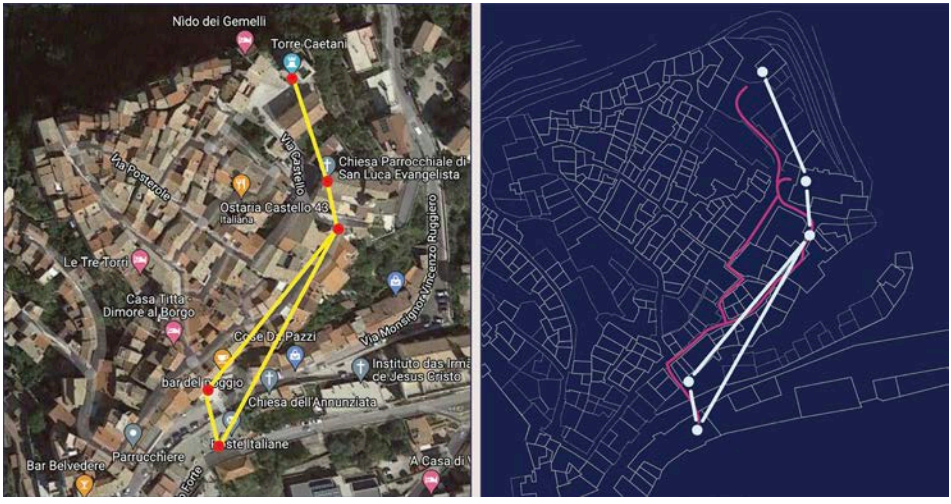


**Figure 4.** SVG Studios, *Astrum Maranulae*, the constellation of Maranola based on the geographic location of each identified place © Elisa Buonadonna, Florencia D. Medina, Margherita Merola.

The *SVG Studios team* worked on the historical memory of places by metaphorically reinterpreting the constellation theme as a representation of the connections between the inhabitants and the stories of the places. A constellation is a group of stars that form an imaginary line or figure on the celestial sphere. The project stems from creating a new constellation, the *Astrum Maranulae*, which identifies the five most representative places in the village. Each point (star) evokes a historical episode or represents a place necessary for the inhabitants (Fig. 4). In the five places identified, a particular binocular allows the viewing of animated videos (Fig. 5).

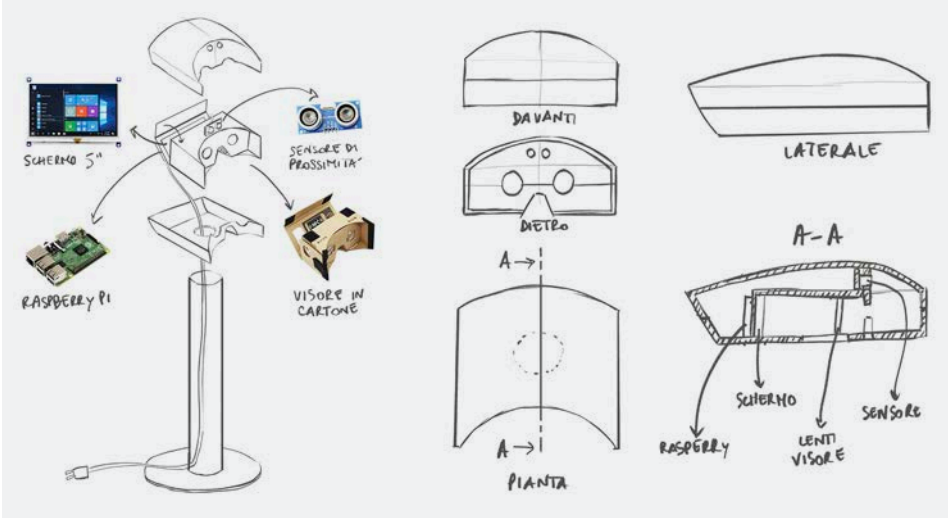


**Figure 5.** SVG Studios, *Astrum Maranulae*, the design of the binoculars for viewing the animated videos © Elisa Buonadonna, Florencia D. Medina, Margherita Merola.

**Figure 6.** SVG Studios, *Astrum Maranulae*, still frame from the animated video © Elisa Buonadonna, Florencia D. Medina, Margherita Merola.

These technological tools, with an evocative and captivating aspect, act on physical spaces making them meaningful, capable of telling stories and events of a community, and of discovering what is not visible. The audiovisual narrative used to present and explain the project uses the language of 3D animation. It builds an evocative story in which two generations, a grandfather and a grandson, looking at the sky, specifically at the constellation of Maranola, find themselves connected to each other and the urban fabric made of stories, memories, anecdotes, dreams and realities (Fig. 6).

### 5.2. The Memory of Objects

*Nucleus team* well-defined its artistic line starting from the name itself. The group's name can be divided into *nucle+us*, highlighting the ending *us,* which stands for the will of binding people together to reach something bigger. The narrative project combines tradition and innovation with particular attention towards inclusivity. From the first site visit, the group has been inspired by the warm welcome from the inhabitants and their comfort in being involved in the creative process. That is why their proposal asks people to lend an object, their *cucchiara*, and tell a story about their family. Every family in this village owns at least a wooden spoon (*cucchiara*), so *Nucleus*' proposal is to collect many of them and set them in an old empty shop in the village, on a temporary wall (Fig. 7). Each *cucchiara* owner has also been interviewed, and via *Arduino* programming and proximity sensors visitors could activate a narration and light up each *cucchiara* just by standing next to them. Each visitor could create a unique sound atmosphere based on the number of spoons activated (Fig. 8).

**Figure 7.** Nucleus, *Essenza*, 3D models of wooden spoons (cucchiara) © Rebecca Faccani, Sofia Leone.

The evocative functioning of the project is then communicated by a 3D animated video in which candles, warm colours, sounds and *cucchiara* reveal the personal narratives provided by interviews and pre-recorded voices from the Festival Archive (Fig. 9).

Margherita Magnani's project *Tessuto Connettivo* is an interactive and immersive installation that combines analogue solutions and technology to reveal the hidden relationships between people in Maranola. The goal of the project is to explore the invisible net of relationships between the inhabitants of Maranola using as a metaphor the areolar connective tissues of a living organism, as a bunch of different parts which can all work together. The project is set in a medieval tower in the village and proposes to place a crochet workstation where people can join the building of a giant net, which could grow day by day during the festival.

**Figure 8.** Nucleus, *Essenza*, interactive installation using light and sound © Rebecca Faccani, Sofia Leone.

**Figure 9.** Nucleus, *Essenza*, still frame from the animated video © Rebecca Faccani, Sofia Leone.

The project aims to deal with the effort you need every day to build relationships and how much this is a process rather than just a result. During the night, a moving headlight in the room could show the same place from a different point of view, highlighting the elaborated and tangled net of wires and shadows. The net is also the protagonist of the audiovisual project, during which it grows and gets lighter and stronger.

## 6. Conclusions

The article describes an experimental design process that engaged students in creating *narrating multimedia archives* that stimulate the following thoughts and reactions. From the point of view of the inhabitants and the curators, projects have received positive reviews in their attempt to give voice to the memories and the history of Maranola, and the festival curators have made themselves available to develop and implement

some of the concepts for future editions. From the designers' point of view, the students, the approach with which many of them have found the helpful information to collect, preserve and communicate reveals, on the one hand, great attention to the intimate and private dimension of this information, but on the other hand, a joint effort towards the universalization of the evoked emotions. Even personal memories have been manipulated to tell something that interests the community. Places and objects have, therefore, become the storage of personal and collective memories. Marcel Proust's, by formulating the idea of *involuntary memory* (1954, p. 160), suggested that the past, the present and every hour of our life are embodied and hidden in something else, a material object, a photograph, a place, a gesture, and it remains prisoner forever, unless we come across that object, that image and that place.

Therefore, described projects evoke past and traditions and unlock epistemological horizons on the meaning of memory. The interpretation of the meaning of memory, the forms in which it reveals itself and the dimensions in which it is reflected – the community and the intimacy of the individual – constitute a natural thought for deeply understanding the projects designed by students in response to the described brief. Apart from their laying in places and objects, memories are also recognized in relation to two spheres of belonging and expression: the intimate one of personal stories and the shared one of collective history. The sensorial, autobiographical, often unconscious and involuntary memory (Proust, 1954) differs from the historical memory, linked to a collective and shared narrative dimension. However, both contribute to preserving a place's cultural identity and community (Halbwachs, 1992).

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# Memories of Italian Graphic Design History

## Digital Dissemination and Immaterial Circulation of Visual Communication Heritage

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**Keywords**
Italian Graphic Design History, Digital Archiving, Cultural Heritage, Visual Communication.

**Abstract**
Posters, brochures, advertisements, catalogs, and magazines constitute a fascinating cultural heritage to retrace the history of Italian graphic design. From the 1930s to the 1970s, graphic design enriched Italian communication with a revolutionary visual language. Various societies, foundations, associations, and public or private archives preserve graphic materials today. The result is the difficulty in creating a single place to preserve graphic design projects physically. This condition also reflects the digital archiving process of graphic materials. The absence of official digital conversion has facilitated the emergence of independent entities that make graphic artifacts accessible online. Sometimes online dissemination does not provide historical sources, and it is not primary digitisation. The contribution analyses the online diffusion and immaterial circulation of graphic artifacts. The research presents some emblematic cases to define original and no-original archiving processes. *Archivio Storico del Progetto Grafico* by Centro di Documentazione sul Progetto Grafico (CDPG), the digitalisation of magazines like *Campo Grafico* and *Stile Industria*, or independent projects such as *Archivio della Grafica Italiana*, are only some examples. The purpose is to identify critical and strong points of these archives and digital platforms, imagining a new digital archive for the Italian graphic design heritage.

## 1. Preliminary Considerations

"Is graphic design part of design?" is the question Gillo Dorfles reflected on in 1963. The critic answers, associating graphic design with the vast universe of industrial design. For Dorfles (1963, p. 43), graphic design is:

> Any project destined for a complex graphic operation, such as the creation of a trademark, a logotype, or a coordinated image referring to a company or a business, and in general, any form of design that may be two-dimensional or three-dimensional (in the case of packaging) even if this design will be essentially graphic rather than objective in nature.

Anty Pansera has defined communication design as "the first misunderstood object produced by design culture" (2020, p. 17). Communication design has gained value in the sociological and cultural evolution in Italy. Graphic artefact signal "ubiquitous, many and unstable characters", revealing that their "cultural-historical value does not live in the original pieces" (Vinti, 2019, p. 122). If an advertisement in a magazine is reproduced on many printed copies, it is not a "unique piece". In contemporary studies, Catherine de Smet investigated graphic design as an exclusive object (2017; 2020). Considering its material history, she analysed relational factors such as function and context. Italy's graphic design heritage has been re-evaluated as a cultural asset in recent decades. It is a patrimony to preserve and enhance. Even albeit with obvious difficulties due to the geographic dispersion of materials. Simona De Iulio and Carlo Vinti (2019, p. 8) state that graphic design projects, such as posters or advertising mate-

rials, are "ephemeral devices". Graphic designers create their artefacts with limited action in time. These are no prospects of use in the future and are not at all intended for intentional historical archiving (p. 10). The difficulty of finding and grouping materials and producing a complete historical review is obvious. Nevertheless, "a complete systematic survey of the industrial visual communication sector" (Iliprandi et al., 1984, p. 9) was carried out in Italy in 1983. It followed the exhibition held in Milan in the same year on the occasion of the International Council of the Societies of Industrial Design (ICSID) congress.[1] The project defined a "Caso Italiano" of visual communication. It represented a multitude of graphic design works by well-known designers from 1933 to 1983. The need for an Italian graphic design history led to an awareness of preserving this heritage. However, only in 2011 were graphic design and design archives included in the project cataloguing the architecture archives of Lombardy. The cataloguing project began in 1998 as a census dedicated to architecture archives and was published for the first time in 2003. In 2012 the updated catalogue was published, including design and graphic design archives. The research resulted in an initial survey with 178 archives (Ciagà, 2012), then updated in 2021 with thirty-six new archives (Ciagà, 2021).[2]

Fiorella Bulegato investigated the relationship between Italian graphic design and archives (2013). She founds the physical

1 The review and the editorial project were curated by Giancarlo Iliprandi, Alberto Marangoni, Franco Origoni and Anty Pansera.

2 The work was the result of a joint effort between the Soprintendenza Archivistica and Politecnico di Milano (Area Servizi Bibliotecari di Ateneo, Archivi storici) and with the collaboration of Centro di Alti Studi sulle Arti Visive –CASVA. The census was online updated in 2016 by Maria Teresa Faraboli, https://lombardiarchivi.servizirl.it/projects/256.

lack of a specific national archive for communication and visual design. Bulegato highlights the need for digital preservation operations using "digital media" as the "sole custodians of memory" (p. 102).

To date, the Associazione italiana design della comunicazione visiva (AIAP, the Italian Association of Visual Communication Design) manages the Centro di Documentazione sul Progetto Grafico (AIAP Graphic Design Documentation Center, CDPG), the University of Parma curates the Centro Studi e Archiviazione della Comunicazione (CSAC).[3] Other institutions also play a central role in physically preserving materials. Politecnico di Milano preserves the Historical Archive of Albe and Lica Steiner.[4] Then, others enhance the heritage of design archives and museums, like the Circuito Lombardo Musei Design (Lombardy Design Museums Circuit).[5] For graphic design, in addition to the AIAP Graphic Design Documentation Center, the Giancarlo Iliprandi Association and the Origoni Steiner Archive are part of the network.
Furthermore, a part of Italian graphic design is linked to corporate identities. Many materials are now preserved in the historical archives of companies such as Olivetti, Kartell and Artemide.

3 The CSAC, among over five hundred funds related to art, architecture, design, photography, fashion, media and entertainment sectors, is also in possession of relevant documents in the field of Italian graphic design, such as the collections entitled to Silvio Coppola, Giancarlo Iliprandi, Bob Noorda, Michele Provinciali and Ettore Vitale. https://www.csacparma.it.

4 https://www.biblio.polimi.it/sedi-e-orari/archivio-steiner.

5 https://museidesign.it/.

The lack of a single national archive for graphic design and the division into smaller collections implied slow digitisation of materials. This absence is not optimal for virtually archiving such a conspicuous and multiform graphic design heritage. There have been some attempts that have led to the circulation and online use of graphic design artefacts. This condition had an ambivalent result. On the one hand, the accelerated usability led to a devaluation of the materials. On the other hand, their digitisation led to enhanced visibility, albeit to different degrees. This granted, partially their preservation from possible material and geographical dispersal. However, it is necessary to distinguish between digital archives and web platforms. Original contents are for the digital archive, while non-original ones are for the digital platform. These examples have different retrieval methods, structures, organisations, purposes, and objectives.

The first part of the present contribution analyses some examples of digital dissemination. Original graphic design materials come from associations, institutions, and private and company archives. First of all, the *Archivio Storico del Progetto Grafico* is a choral example. It shows several items from graphic designers and archives and preserves artefacts. Graphic designers Ilio Negri and Pino Tovaglia's digital platforms are individual archiving. The management is to heirs, and the approach is more circumscribed in a personal tale. Examples of digital magazine archives are also included. *Campo Grafico*, *Stile Industria* and *Domus* are entirely digitalised and consulted online. They are significant for the visualisation of graphic artefacts published in them.

There are also some examples of corporate archives, such as Pirelli, Barilla and Rinascente. It is self-preservation and documentation to safeguard the corporate's heritage.
In the second part, two digital realities are described. These are dissimilar from the previous ones. *Sitographic* and *Archivio Grafica Italiana* have a non-original content retrieval. They allow a digital circulation of graphic design artefacts through a more "democratic" modality. They have a synthetic cataloguing, no primary sources and are irrelevant to scientific research. Through case studies, the analysis presents a typological status trace. Digital archives and digital platforms have been crucial in disseminating the Italian graphic design heritage. Each archive showcases its unique approaches and structural configurations. The contribution emphasises the strengths and weaknesses of the studied models, intending to contribute to constructing a digital archive for Italian graphic design heritage.

## 2. Original Archiving and Circulation

The Centro di Documentazione sul Progetto Grafico (CDPG) manages the *Archivio Storico del Profetto Grafico*, curated by AIAP, guardian of the "history of Italian graphic design" (https://aiap.it/2000-2020/cdpg/index.html). As Guida stated, the Centre is "a place, but more than that, it is an idea, where the collected materials provide evidence of a specific, though diversified, activity [...]. The Centre is not a collection or a mere repository; it is rather (or aspires to be) a dynamic place, where the findings preserved may become key points for the construction of historical pathways and inspirations for new projects" (2022a, p. 24).

There are more than 70,000 graphic design artefacts. They were acquired through progressive donations and bequests from heirs or professionals or through direct purchase. It maintains 89 Funds (AIAP, 2023). The goal is to activate studies, lines of research and enhancement projects through exhibitions or publications (Guida, 2022b).

Despite its physical nature, the CDPG highlights the first steps toward a digitised materials perspective. In support of scientific research, the centre supports users "by making the materials available, asking if these have not been digitised and, if this is a necessity, to make digital reproductions available to us" (Guida, 2022a, p. 26).

The CDPG website also features a visual showcase of graphic design artefacts. The operation includes a visual reconnaissance to view the Centre's materials. An index allows one to select each fund and collection. Configuring some of the archive's graphic design artefacts in detail is also possible. Each fund or collection has one page. Each graphic design object is represented with a small "sticker", a brief introduction, and some other information such as the title, the subject, the company, and the year (Fig. 1). By clicking on each object, it is possible to open a summary list of the product and view the image in a larger format.

Cataloguing is a digital filing of materials in the Milan archive. It provides an excellent tool for the visual archiving of Italian graphic designs and a helpful tool for the online enjoyment of the materials. The operation is to be appreciated and valuable for public study and research. It is a rich presentation of Italian graphic heritage but is limited to the materials preserved by the association.


**Figure 1.** Mosaic for some projects belonging to the Fondo Dante Bighi on the Archivio Storico del Progetto Grafico, 2021 (credits © AIAP. All rights reserved).

There are also more personal archives as opposed to collective projects. The archives of Ilio Negri (1926-1974) and Pino Tovaglia (1923-1977) are examples. Ilio Negri's platform is an official website to show a selection of his works (https://www.ilionegri.it). It is to say that the before-mentioned AIAP CDPG keeps the material archive. Luca Negri, Ilio's son, maintains the site, also presenting biographic and bibliography sections. Navigation is divided into four categories (Publishing, Brands, Advertising, and Video). When one opens each image, one finds a summary with the year of production, category, and client name (Fig. 2).

The Pino Tovaglia's platform is a digital archive (http://pinotovaglia.it) designed and maintained by the daughter Irene Tovaglia. It presents navigation around the graphic designs of Pino Tovaglia (Fig. 3).


**Figure 2.** Summary of the advertising project created by Ilio Negri for Superga on Ilio Negri's website, 2021 (credits © Luca Negri. All rights reserved).

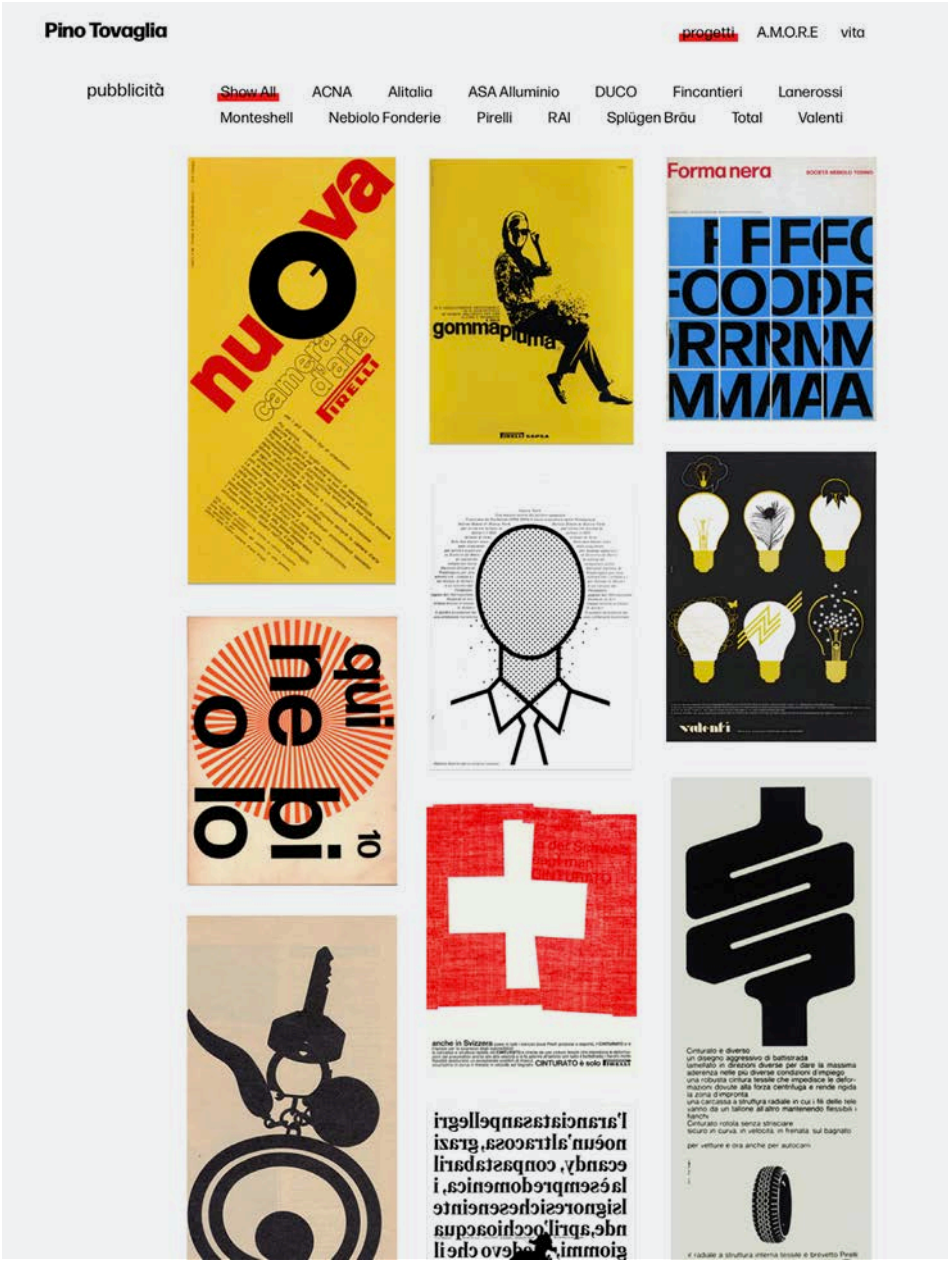


**Figure 3.** Visual grouping of Pino Tovaglia's advertising projects on the site dedicated, 2022 (credits © Irene Tovaglia 2022. All rights reserved).

Users can choose from nine subcategories in the "Projects" sections: layouts, publishing, posters, brands and identities, objects, advertising, typographic studies, drawings or sketches and studies.
Each section presents an arrangement of the most important projects with a concise caption and the possibility of an in-depth photographic display.
In both cases, the visual archiving effort by the heirs represents a revitalisation of these graphic design artefacts with a conversion from "material" to "digital".

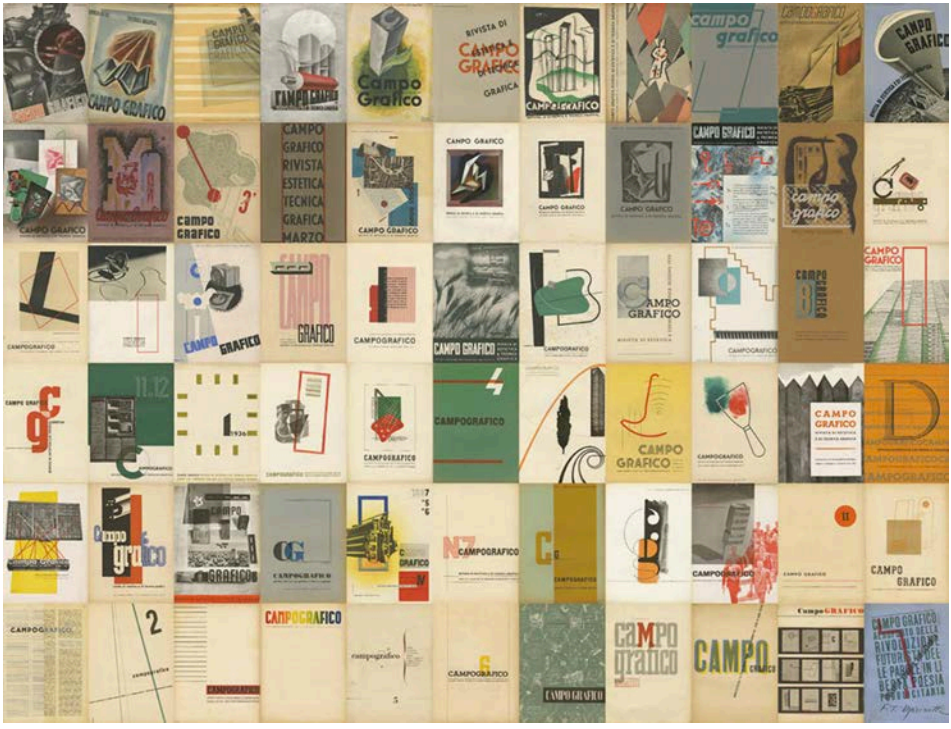


**Figure 4.** Overview of *Campo Grafico* covers in the magazine's digital archive, 2021 (credits © Associazione Culturale Campo Grafico. All rights reserved).

The usability of graphic design on digital platforms becomes interesting in the case of Italian design magazines. Italian design magazines are communicative artefacts and primary historical sources. They are useful for reconstructing a parallel narration of the history of Italian graphic design. For example, *Campo Grafico* (1933-1939), an expression of experimentation in the 1930s, underwent a complete digital scanning process (Fig. 4). The official website (https://www.campografico.org) collects 66 issues and 1650 pages. It concretises the goal of "popularising and preserving the historical memory of a collective cultural phenomenon unique in its atypicality and recognised worldwide" (*Campo Grafico Welcome,* n.d). At the same time, the operation also shows the intention of the promoters to revitalise and enhance a niche and elitist magazine.

Also, the forty-three issues of *Stile Industria* (1954-1963), edited by Alberto Rosselli, can be consulted at the digital archive of the Biblioteca Lombarda (https://www.bdl.servizirl.it). The journal has been scanned and made available online to various audiences at no cost.

A very similar result was offered by the digitisation of *Domus* (https://www.domusweb.it) starting with its first issue (January 15, 1928), but consultation is limited to a periodic subscription. In contrast, *Casabella* (https://casabellaweb.eu/the-magazine/) makes free-of-charge covers of all issues (from 1928 to the present day) and some historical issues. About twenty-five historical issues are available. Most of the digitised content belongs to the 1941 issues.

In 2015, Tecno acquired the brand and historical archive of the magazine *Ottagono*. Tecno intended to create a digital archive for the dissemination of all content. The archive is not yet open.

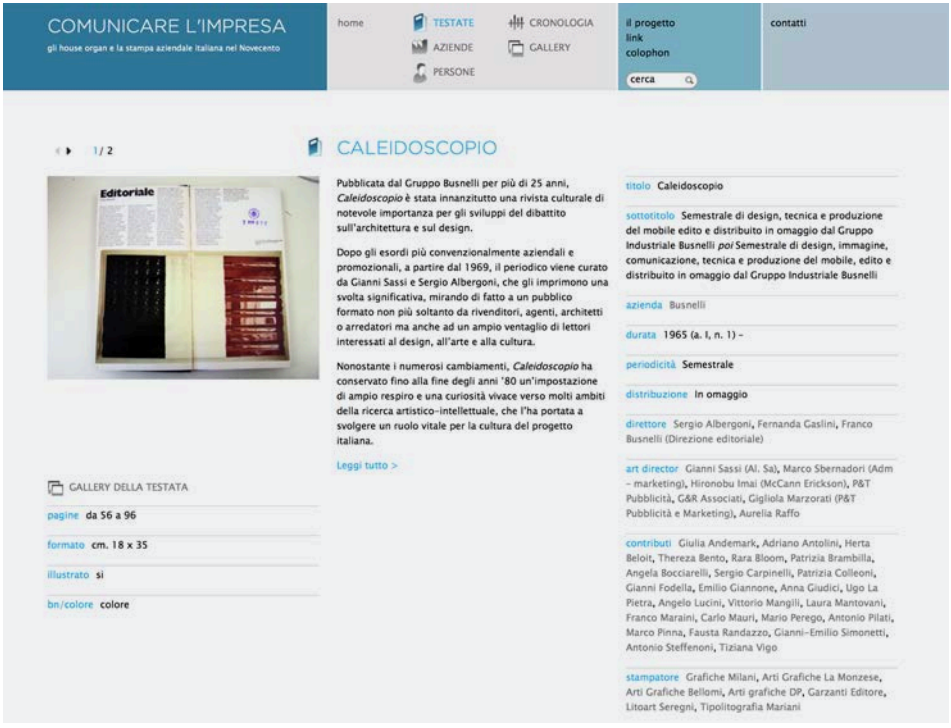


**Figure 5.** *Caleidoscopio* tab on "Comunicare l'impresa. Gli house organ e la stampa aziendale italiana nel Novecento", 2010-2022 (credits © Fondazione Isec e Islec. All rights reserved).

Finally, it is necessary to mention the research project "Comunicare l'impresa. Gli house-organ e la stampa aziendale italiana nel Novecento". The project was supported in 2009 by Fondazione ISEC and in collaboration with the Istituto Lombardo per la Storia Contemporanea (http://www.houseorgan.net). The research systematises all house organs and company periodicals, such as *Caleidoscopio* from Busnelli Group, edited by Gianni Sassi and Sergio Albergoni (Fig. 5), or Kartell's magazine *Qualità* edited by Giulio Castelli. These magazines were published in Italy between 1939 and 2000. They are "textual and iconographic documents that constitute a histor-

ical source of primary importance" (*Il Progetto. Comunicare l'impresa. Gli house organs e la stampa aziendale italiana nel Novecento*, n.d). It is a review of individual magazines and a repertoire of articles, images, photographs, and cover designs. The goal is to enhance the magazines as a tool of interest for the historical formation of corporate memory. It is also possible to filter the titles by region or view a chronological mapping of *house organs*.

The relationship between Italian graphic designers and companies has been crucial in creating corporate identities. Their collaboration blended the different skills to shape the new Italian industrial reality. The role of the graphic designer, starting after World War II, gave "an aesthetic face to industry" (Vinti, 2007, p. 14). The creation of graphic designs was fundamental to business culture through the "spirit and novelty of a style" (Piazza, 2011, p. 324). Skilful graphic designers were able to shape and enrich corporate identities.
Today, some companies such as Pirelli, Barilla, and Rinascente have shared historical archives to attest to the decisive role of graphic design in their history. Their memory is tangible by transferring their material to a digital platform.

The Pirelli Foundation has created an online archive to explore sources and materials. The setup allows the user to select the type of documentary medium (documents, photographs, drawings and posters, audiovisuals, or publications and journals) or search by keyword.
The archive contains all the corporate communication materials, such as many posters designed by Albe Steiner, Studio

Boggeri, Bob Noorda, Bruno Munari, Pino Tovaglia and Massimo Vignelli, among many others.

Also, in 2018, the Barilla company established its website with the Barilla Historical Archive (https://www.archiviostoricobarilla.com). The mission is to "preserve the testimonies of life, projects, strategies, products, and people who have worked in Barilla" as an updated living reality (*Storia dell'Archivio storico Barilla*, n.d).
Through the web pages, it is possible to explore the platform by search criteria, choosing a category, subject or year. Among the 50,000 units, it is possible to find, for example, Telecom Italia's phone card in collaboration with Barilla, with "farfalla" pasta and the motto "W la pasta" (Fig. 6).

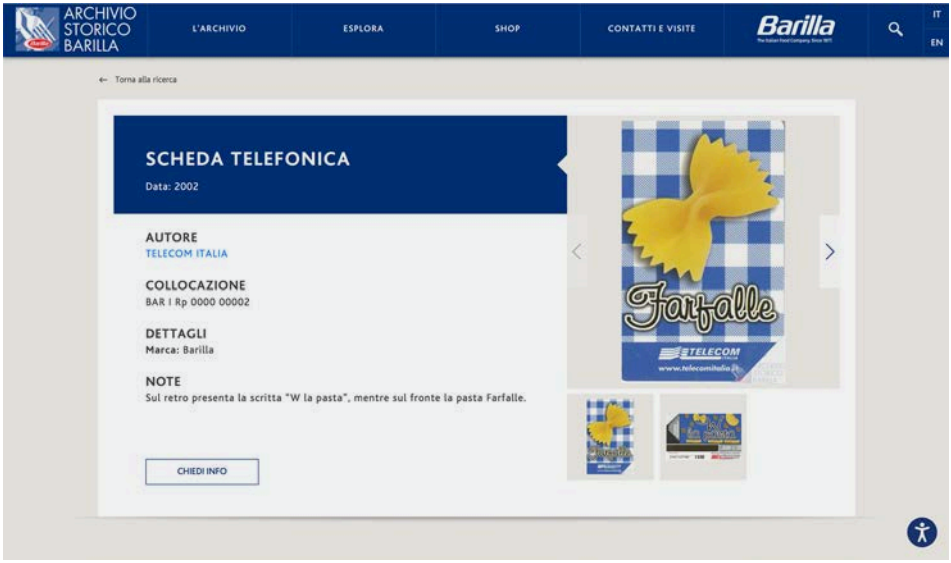


**Figure 6.** Telecom Italia's phone card in cooperation with Barilla, Archivio Storico Barilla, 2002 (credits © 2018 Barilla G. e R. Fratelli S.p.A & Materiale Archivio Storico Barilla).

Rinascente Archives (https://archives.rinascente.it) is an interesting project born in 2015 and directed by Maria Canella and Elena Puccinelli.
The main purpose is the digital reconstruction of the corporate archive. Many events have compromised the original archive (*Rinascente Archives. The project*, n.d). The online archive results from digital donations from numerous foundations, archives and collections and creates a unique collection (Vinti, 2017). Reconnaissance is not concluded but is a continuous growth of materials and knowledge. The online reconstruction of the archive has also made it possible to tell the visual story of La Rinascente. The platform offers many digitalised artefacts: catalogues, brochures, posters, photographs, advertisements, flyers, and gift cards. Their digital version can be accessed free of charge in an open-format document. La Rinascente expresses the significant contributions that graphic designers such as Albe Steiner, Max Huber, Roberto Sambonet, and Giancarlo Iliprandi have made to the company's design.
A rich deposit, accessible and consultable by users on the web through different paths (graphic design and visual communication lR; Rinascente posters; la Rinascente è donna!), themes (people, places, events, fashion, design, communication) or in the archive and library contents.
Through the digital windows, it is possible to see varied and curious materials, such as the catalogue of the "Summer Festival, la Rinascente" designed by Lora Lamm in 1956, or the 1966 advertisement for "Casa 66. lR" by Salvatore Gregorietti with a photograph by Aldo Ballo (Fig. 7). Each article can be opened in a larger view with a summary tab. In some cases, publications or catalogues can be viewed in Portable Document Format (PDF).

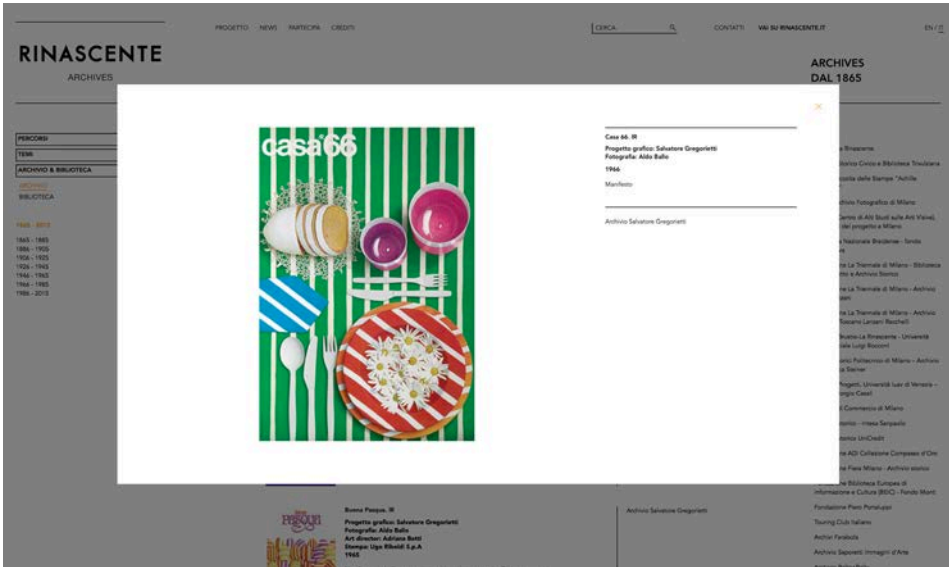


**Figure 7.** Poster "Casa 66. lR" directed by Salvatore Gregorietti with photography by Aldo Ballo, Rinascente Archives, 2022 (credits © Rinascente Archives & Archivio Salvatore Gregorietti).

## 3. Non-original Circulation

Finally, two cases are relevant for the free circulation of graphic design artefacts on the web when there is no mandatory credit mention of the graphic design's source.

The first one is the *Archivio Grafica Italiana* (http://www.archiviograficaitaliana.com/), a project born from the idea of Nicola-Matteo Munari to promote and disseminate Italian graphic design from the 1930s to the contemporary, showing designs examples by seventy-five graphic designers.
The project is "a complete overview of the Italian graphic design heritage", supporting "Italian graphic design as a national cultural heritage and as a collective cultural asset" (Munari, 2016). Among the aims, as declared in the manifesto on the

site, is to disseminate "'culture of quality' that is typical to the Italian design tradition by allowing to explore the fundamental aesthetic and cultural contribution brought by Italian graphics all over the world".
The archive's visual identity and layout is well organised and developed. On the opening page, the user finds a visual mosaic with many projects of different authors, years, and types (Fig. 8). Clicking on each box, the user goes to the in-depth project page, where images with an analytical sheet presenting the work are available (Fig. 9). There are eight sections: Title, Designer, Studio, Year, Client, Medium, Notes and Tag).
One can advance the search through different choices:

- the type of project in the "Project" section, through seventeen medium categories (advertising, book, brochure, calendar, catalogue, flyer, leaflet, logotype, manual, mark, packaging, periodical, poster, signage, specimen, stationery and typeface);
- the nine decades from 1930 to 2010, which are in turn divided into individual years in the internal subdivision pages;
- in relation to graphic designer, in the "Designer" category, where each profile is introduced, with black-and-white photographs and a biography;
- by "Firm" when the project is signed by a specific working group, as in the case of Studio Boggeri or Unimark;
- and finally, by "Client" with respect to the company for which the graphic artefact was produced. It is also possible to search for materials by entering a free-choice keyword.

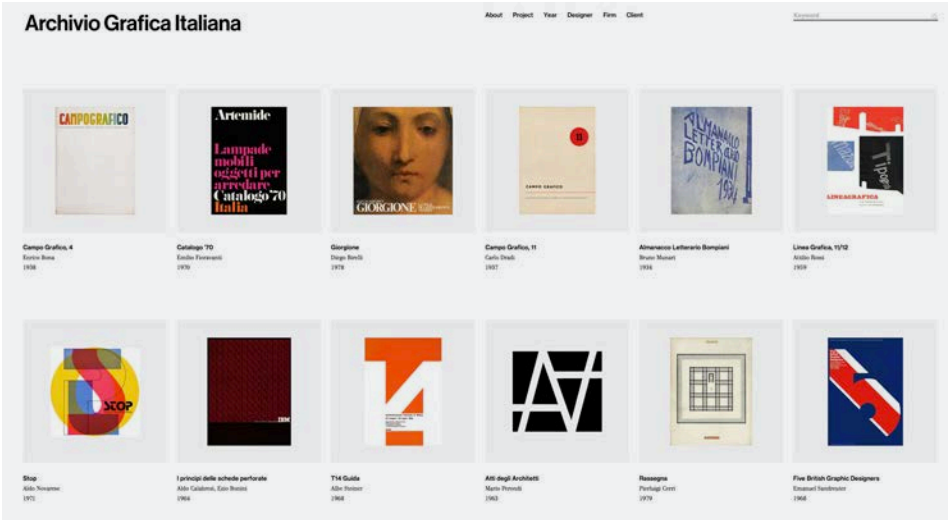


**Figure 8.** The landing page of the platform *Archivio della Grafica Italiana* by Nicola-Matteo Munari, 2021 (credits © 2015-21 N.M. Munari. All rights reserved).

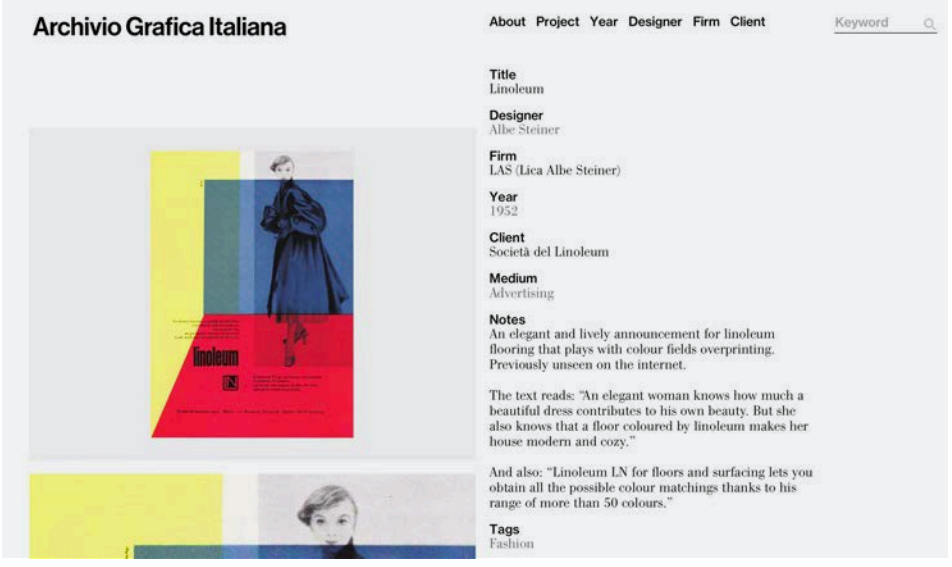


**Figure 9.** Configuration of the project board for Linoleum company advertising by Albe Steiner, *Archivio della Grafica Italiana*, 2021 (credits © 2015-21 N.M. Munari. All rights reserved).

*Archivio Grafica Italiana* was born in January 2016 and is essential for the partial usability of the Italian graphic design heritage. It is constantly updated, and anyone can propose a design that is evaluated and published if it meets the proper requirements. However, the archive offers an arbitrary selection of materials. The choice of graphic design artefacts does not reflect explicit selection criteria. Finally, the lack of direct reference to historical sources and the non-referentiality of the materials limit the platform's value. The project is not useful for historical research but is directed to a more generalist audience.

The second case is *Sitographic* (http://www.sitographics.it/), a digital platform launched in May 2012. The content focuses on the great masters of graphic design. The site is "an in-depth tool for those interested in graphic design" in which one can view extensive galleries with ninety-nine graphic designers (only thirty names are Italian or worked in Italy) and their works. The homepage displays five macro themes: Famous Graphic Designers; Graphic; Printing; Art; Photography. The "Famous Graphic Designers" section is the most interesting, listed alphabetically.
Users clicking on each name are linked to a personal section with a photo portrait. More or less comprehensive biographies of the designer are presented, correlated with some historical images that enrich the narrative. A rich gallery of image projects is available for each designer (Fig. 10). A small caption accompanies each project indicating the year and the item's format. Visual galleries provide a general overview of the designer's work. The description does not allow in-depth exploration of the project's content, and interaction with the image is limited.


**Figure 10.** A typical display of Giovanni Pintori's project board on the *Sitographic* site, 2022 (credits Sitographic by Aldo Gorla. All rights reserved).

For example, the images have low quality, and they are not interactive. It is not possible to select the image and enlarge it. A grid of five columns arranges the images, and the number of elements is variable. The length and size of the gallery are proportional to the popularity of the designers. Some graphic designers, such as Max Huber, Albe Steiner, Bruno Munari, and Bob Noorda, have a more significant number of projects.

The project is incomplete, and the website also shows some international authors. Images show graphic artefacts without any reference to design with sketches or drawings. The impossibility of independent research is a negative aspect. Overall, the project is very immature and underdeveloped in its structure. It is also weak in graphic design but commendable for the visual cataloguing work. *Sitographic* represents the effort to create a collection of graphic design artefacts for a non-professional audience.

From the perspective of a non-original circulation of artefacts, it is necessary to mention *The People's Graphic Design Archive* (https://peoplesgdarchive.org). *The People's Graphic Design Archive* is a platform with the aim to "create a virtual archive that recognises and preserves the broad and inclusive history of design and graphic culture" (Archive of Graphics of the People, 2023). The most relevant difference between the *Archivio Grafica Italiana* and *Sitographic* consists in citing the credits and indicating the sources of the web links with the authors.

## 4. Final Considerations

Following the analysis, it is necessary to highlight some recurring characteristics. The cases mentioned above, differing in typology, tend to approach the materials' communication differently. Common elements include the absence of in-depth analysis, credits, and contextualisation. The images always appear to lack a detailed description of the graphic design artefact. Information on the design process or cultural context is also omitted.

Another common problem is the poor image quality and the inability to zoom in. Also, the digitisation of graphic design artefacts entails the loss of three-dimensionality. In fact, in the digital version, the materiality of the product is annihilated. The interesting properties such as size, paper weight or brightness are neglected.

Brochures, flyers, posters, or book covers appear the same. The digitisation increments the two-dimensionalises of the artefact. Each one is more or less the same in its visualisation. Moreover, digital archiving implies converting graphic design artefacts from a tool to a product. The artefact is revitalised and re-presented to a different audience. It is necessary to consider the social and cultural parameters of the new target users. From the study, two problems emerge. Firstly, different realities were born. The cause is the nonexistence of an official digital archive for graphic design. Online platforms such as *Sitographic* are not a tool for scientific research.
Diversification has also reached a variety of users. Thus, the public's spectrum is broadened outside the scientific community. Indeed, material dispersion also reflects arbitrary dissemination on digital platforms. Independent projects and arbitrariness of digital use increased the process of image dissemination.
Today, seeing an advertising poster online means tearing it away from its material dimension. The artefact is devoid of its real, tangible configuration. It means converting it into a perfect, untouchable and timeless representation. The digital use of materials allows for the circulation of images. The circulation increases the knowledge of the Italian graphic heritage.

On the other hand, the hyper-digital exposure of artefacts may lead to media overexposure on the web. Considerations related more to the protection of image privacy could be stimulated. The online circulation of Italian graphic design projects previously documented has led to the sharing of a heritage's "digital memory". However, it implies a diffusion not always suitable for scientific research without sources. The dematerialisation of the product also implies the loss of direct contact with the user. It causes an arbitrary replication through capturing or saving. Also, the accessibility of graphic design works accelerates spontaneous processes of sharing. Instagram and Pinterest are some examples of social networks. Recurring structures characterise the configuration of online platforms. Dario Scodeller has defined this mode as a "window dressing conception of content" (2017, p. 29): visual galleries create contemporary libraries of images without official sharing. Visual heritage becomes accessible, but its value diminishes due to the fusion within a digital universe of an infinite number of images daily.

Some considerations from this study could be instrumental in creating a new digital platform to preserve the heritage of Italian graphic design. The digital platform should provide a hyperconnection between all materials. It would recreate the complex connections network between graphic designers, companies, photographers, and social and cultural contexts. It would be necessary to contextualise the content and avoid using only short captions. It would also seem useful to render the three-dimensionality of the artefacts by showing multiple images from different viewpoints. An implementation of

linking tools would lead back to the primary sources, with an additional, in-depth focus on archival documents.
In addition, it would be helpful to use high-quality images and a less window dressing mode of visual configuration. The choice allows the different types and three-dimensional nature of materials to be appreciated.
The platform must indicate the artefact's origin and historical and archival provenance. Active collaboration with archives, libraries, funds and associations is a fundamental requirement. Thus, the content will be exhaustive and organic, building a complex but integral archive of Italian graphic design heritage. This is not an easy operation. Nevertheless, it is necessary to officially preserve and disseminate Italy's graphic design with dynamic and contemporary knowledge.

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IV

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She has been a visiting researcher and teacher at Birmingham City University, at the Swedish School of Textile and the Faculty of Architecture in Lisbon, and taught in several other international workshops.
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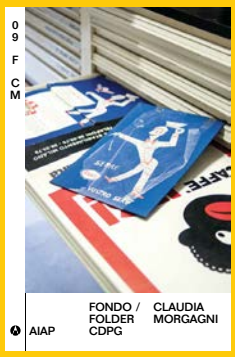



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