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From Data to Design
AI, Blockchain, and New Frontiers in Digital Archives

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Abstract
The digital transformation is reshaping the role of corporate archives, expanding the possibilities for preserving, managing, and enhancing companies' historical heritage.
This study stems from the following research question: how are emerging technologies such as Artificial Intelligence (AI) and blockchain altering the practices, meanings, and potential of corporate digital archives for design and communication? Through an interdisciplinary analysis and three significant case studies (Fondazione Fiera Milano, Museimpresa/Google Arts & Culture, and the Riva Historical Archive), the paper examines how AI and blockchain introduce new tools for automatic indexing, multimodal search, metadata generation, document certification, and authenticity safeguarding. The findings show that digitalization not only improves the efficiency of archival processes but also expands the ways materials can be accessed and interpreted, transforming archives into true laboratories of innovation for design, brand storytelling, and heritage communication strategies. The contribution of this research lies in proposing a theoretical-applied framework that demonstrates how the integration of digital archives, AI, and blockchain opens new perspectives for the study of design culture, for the enhancement of Made in Italy excellence, and for the development of more transparent, accessible, and future-oriented archival ecosystems.

Keywords
Business digital archives
Artificial intelligence
Blockchain

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The Digital Revolution in Corporate Archives: New Frontiers for Design and Communication

In the current context, digitalization is revolutionizing the way information is preserved and made accessible, profoundly shaping historical research as well as the enhancement of design and communication. Emerging technologies such as blockchain and Artificial Intelligence (AI) are redefining the very concept of the digital archive, ensuring authenticity, transparency, and more efficient data management. These technological innovations open new frontiers for preservation, security, and accessibility of sources, enhancing corporate cultural heritage and making it available to a global audience.

Corporate historical archives, custodians of unique memories and testimonies, comprise highly heterogeneous materials such as advertising campaigns, photographic shootings, and past-season products. These elements serve not only as stimulating resources for creativity but also as valuable historical assets for research into the history of design.

These archives preserve precious documents that bear witness to the evolution of advertising design, graphic design, and communication, offering a window into the visual culture of the past and inspiring new generations of designers and communicators. Historical advertising campaigns, for instance, represent a significant source of inspiration for understanding how communication strategies have evolved over time, while the products themselves become objects of study for analysing the development of industrial design and material culture.

The digital transition, accelerated by AI and blockchain, is democratizing access to this heritage, overcoming physical and temporal barriers. AI, with its analytical and automatic indexing capabilities, makes documents searchable and remotely accessible in a fast and efficient manner. Blockchain, in turn, guarantees the integrity and authenticity of information, creating an environment of trust and transparency that is essential for research and scientific dissemination.

Moreover, data visualization, when integrated with AI, provides new ways of exploring and representing data, enabling the dynamic display of connections and improving the comprehension of archival information. This approach allows for a graphical representation of the evolution of communication and design strategies, facilitating the analysis of patterns and historical trends that may inspire new ideas and projects in the field of advertising design and visual communication.

Through emblematic case studies — such as the collaboration between Museimpresa (the Italian Association bringing together more than one hundred and thirty historic brands owning a corporate museum and/or archive) and the Google Arts & Culture platform, the application of AI within the historical archive of Fondazione Fiera Milano, and the historical documents of Riva Yacht deposited on blockchain — this article explores the potential of these technologies to enhance design and data visualization. These examples demonstrate how new digital applications are transforming the accessibility of corporate archival heritage, opening new perspectives for knowledge and innovation in the fields of design and communication, as well as for the enhancement of historical heritage in the domain of heritage communication.

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Corporate Archives as Instruments of Memory and Enhancement of the Made in Italy Brand

The ability of a company to transmit emotions and memories linked to its own history through storytelling emerges via different channels and communicative methods, which can be identified within heritage communication strategies (Bonfiglio-Dosio et al., 2020).

This phenomenon is defined by Balmer (2011) precisely as the way of celebrating the past through the lens of the present. It consists in the enhancement of history and brands that evoke and represent a particular era and/or place.

According to Italian research (Garofano et al., 2020), heritage communication is defined as the strategic choice of companies wishing to preserve organizational memory from oblivion by sharing the history and values underpinning the organization, with the aim of creating a strong and lasting emotional bond with relevant categories of stakeholders.

At the cultural level, the goal of diversifying, enhancing, and commercializing a product or service of a heritage brand requires recognition of the intrinsic value of its brand identity. For Italian companies, the concept of Made in Italy plays a fundamental role in this regard: a theoretical construct that nevertheless functions as a powerful driver in international markets. It positions Italian products within the mid-to-high market segments and, most importantly, associates them with tourism, luxury, traditional craftsmanship, fashion, yachting, and food and wine.

> Cultural heritage, therefore, must be combined with Italian entrepreneurial knowledge, with the ability to merge aesthetic sensibility with a sense of productive reliability. This very strong combination has been achieved, for example, by Italian design: artisans have been able — and are still able — to combine their savoir-faire with the experience of living in contexts of beauty, transferring these qualities into products that evoke dreams and elements of attractiveness. These qualities define the concept of Made in Italy, which encompasses the cultural heritage that Italy is richly endowed with (pp. 59, 91, 123, 153) (Cioppi et al., p. 328).

From this passage, it becomes evident how the two aspects — cultural heritage and Made in Italy — are perfectly complementary and highly competitive assets for an Italian brand capable of valorising them. Moreover, the term ‘design’ itself is complementary to the formula of Made in Italy, both representing an “additional qualitative surplus” to everyday objects, fashion, furniture, and means of transport (Vercelloni, 2014).

Museums, archives, and foundations are not only included within marketing strategies but serve as their very a priori. Above all, the archive is the instrument that enables companies to valorise their heritage.

Indeed, it is worth emphasizing that the concept of the archive predates and exists independently of that of heritage communication. According to the International Council of Archives,

archives are: “The documentary by-product of human activity retained for their long-term value. The records created during the everyday lives and actions of individuals and organisations offer direct insights into past events” (International Council of Archives, 2010).

An archive — an organic body of documents that implies a producing subject, a practical purpose, and interrelations among these documents as they are formed — necessarily entails the presence of records. Their nature is heterogeneous, and under this single term fall different categories of material. For this reason, the statement that “an archive is a collection of documents” is highly accurate: the nature of archives, particularly private and corporate ones, is extremely varied. As defined in the journal *Culture e Impresa*, a corporate archive:

> [...] should refer to an entity that concentrates within it any document produced by an economic unit organized outside the public sphere of state, regional, or local administration. The concept of an archive should therefore include, for example, any element containing a comprehensible trace of that activity, regardless of form, format, or material. Consequently, in an archive repository one may find loose or bound paper documents, photographs, videos, films, drawings, maps, CD-ROMs, data stored in various ways, and even invoices whose letterhead depicts industrial sites, factories, and products (Næss, 2005).

Depending on the specific activity of a company, documents may include those required by law, such as product safety data sheets, as well as those reflecting production needs — such as technical drawings, sketches, or statistical data — or promotional needs, such as posters, photographic shootings, and press reviews, among many others. Precisely because of the wide differences between companies and their production cycles, it is difficult to establish ‘standard’ archival series: every corporate archive has its own specific physiognomy (Bonfiglio-Dosio et al., 2020).

Concerning company products, it is worth noting that only in the last two decades have they been fully acknowledged by archival practice. Traditionally, only paper documents — and more recently digital records — were considered as ‘documents’, often stored separately for preservation reasons. References to these ‘new’ documents particularly concern oral sources, treated as documentary products created to testify to activities sometimes concluded decades earlier but revived through the production of these records, which are not contemporaneous with the activities but useful for reconstructing their memory.

The product archive — namely, one not fixed on traditional supports — is nonetheless fundamental for companies, as it allows them to retrieve the ‘traces’ and testimonies of their production activity. Furthermore, as stated in the Italian translation of ISAD(G) (General International Standard Archival Description), an archival fonds should always be understood as a “set of documents, irrespective of form or medium, automatically and organically created and/or

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accumulated [...] in the course of activities and functions" (International Council On Archives, 2000).

Depending on the company, these products (or services) may take different forms. Broadly, they may materialize as:

- 'traditional' supports, meaning written documents, iconographic images, etc., as recognized in archival practice;
- other documentary forms acknowledged by disciplines such as librarianship or art history;
- manufactured objects, i.e., tangible artifacts.

This distinction highlights, at times, profound differences between the perspective of archivists and that of companies when considering products. The case of manufactured objects is particularly interesting, since archival practice traditionally excluded them, regarding them either as 'supporting material' for documentation or as items destined for museum collections. It is therefore necessary to reconsider the product as a document, linked to other documents regardless of form and material support, situated logically within the archive to respect its inherent archival bond within the series of which it forms part. The authenticity of the document is thus tied not to its 'formal' characteristics (which may be absent) but to its relationship with the producing institution, which itself becomes guarantor and certifier of authenticity.

Robotti (2012) considers the product archive essential for companies, as it serves as a tool capable of returning memory in terms of identity. He distinguishes it from the corporate museum, which is created explicitly for cultural communication. By contrast, the product archive arises in ways that may be defined as spontaneous and practical, by virtue of its archival nature. The product included in such an archival structure constitutes the primary function of the company and is therefore the element most capable of reflecting its entrepreneurial and historical trajectories. Robotti further argues that the product-object is an archival document in the true sense of the term, even if it appears in unusual forms such as samples, prototypes, or technical drawings. It is the archivist's task to recognize these different 'materializations' and to interpret them within the technological and commercial context in which they originated, thereby enabling the reconstruction of company history according to archival criteria and guaranteeing its reliability.

Material products are, therefore, archival series. Describing an object — whether a parchment, a technical drawing, or a photograph — requires specific expertise. The archivist's role is central in identifying the internal links among documents, and only those who have worked with the archive can grasp them. Hence, given that no separation can exist within a corporate archive regarding the materiality of its documents, the approach must be based on an integrated system of competencies capable of collaborating and establishing connections (Bilotto, 2002).

Corporate archives, as the term suggests, are formed in places dedicated to the production of a specific product or service by private entities. Their archives originate from practical intents and contingent needs during their formation. With the exception of short term legal obligations defined by the Civil Code (a few decades), there is no requirement for long-term preservation; consequently,

the safeguarding of what later becomes the so called “documentary sources” depends on a voluntary act by the entrepreneur or by those within the company responsible for governance of this matter.

Corporate historical archives generally emerge when three substantial conditions are met:

- the identity or strong overlap between the history of the company and the personal or family history of the entrepreneur (founder or successor);
- the growth of company size, the complexity of management processes, and thus the importance of documentation;
- a duration of the company that entails an implicit or explicit recognition of the added value that its history represents for both the company and the community of reference.

These three factors, combined over time, demonstrate how a company can become a strong social and cultural institution. In some cases, cultural capital otherwise unrecognized is valorised, not only for the company itself but also for the protection of collective identity and memory (Bilotto & Perondi, 2008).

There are numerous examples of Italian corporate archives that, over the new millennium, have made remarkable progress, becoming more than a ‘simple’ storage system and being transformed instead into a mechanism for valorising the material they contain.

The Digital Transition of Archives Between Memory and Innovation

Archives, when considered within the context of product and graphic design, play a crucial role as instruments of preservation and as sources of inspiration for new creations. These spaces are not merely repositories of past documents, but rather dynamic environments that narrate stories and provide tools for orientation, innovation, and evolution, oriented toward the future.

The digital preservation of archives has become fundamental in contemporary society, where digital information is a key element. The debate on digital preservation began some time ago, with 1995 marking a key milestone with the release of the first official document on functional requirements for electronic records management: the *Design Criteria Standard for Electronic Records Management Software Application, Doc 5015.2-std*, commissioned by the United States Department of Defense (the latest revision dates back to 2007). In Europe, the IDA program (Interchange of Data Between Administrations) and subsequently IDABC (Interoperable Delivery of Pan-European eGovernment Services to Public Administrations, Business and Citizens) defined MOREQ (Model Requirements for the Management of Electronic Records) in 2001 and in its updated 2008 version, providing guidelines for the use of information technologies and electronic records management (Guercio, 2019).

Projects such as InterPARES, an international American Canadian initiative active from 1999 to 2018, have provided methodologies for the preservation, authenticity, and reliability of electronic records, ensuring their long-term availability within a perspective of increasing dissemination. These documents, often generated in

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interactive and dynamic digital environments such as the artistic, scientific, and eGovernment sectors, were examined primarily regarding their production and preservation within databases and document management systems (Bilotto & Perondi, 2008).

In design archives, whether analog or digital, it is essential to establish rules for the management, classification, and preservation of documents. This includes the use of open standards to ensure file readability over time and the selective appraisal of records to be preserved. Archives thus become a structural unicum, even if distributed across different supports, and represent a potential site of memory and innovation for companies and design professionals. In recent years, new technological scenarios have been emerging as possible solutions for managing archival systems in a more accessible and democratic way, ensuring usability for an increasingly broad audience.

Methodological Approach

The study adopts a qualitative and interpretive methodology grounded in design research and archival studies. The analysis is structured around two complementary components: conceptual investigation, combining international archival theory, digital preservation frameworks, and recent literature on AI-driven document management and ethical data infrastructures; and comparative case study analysis, focusing on Fondazione Fiera Milano and Archivio Storico Riva as exemplary cases of technological innovation in corporate heritage. The case studies were selected according to three criteria:

- the presence of a structured historical archive with heterogeneous materials;
- the implementation of at least one emerging technology (AI or blockchain);
- the strategic relevance of the archive for brand identity and design-driven innovation.

Sources include institutional documentation, project reports, and interviews with heritage professionals involved in digital transformation processes. This combined approach enables an interpretive reading of how technological transformations interact with design practice, visual communication, and corporate cultural identity.

AI in Archives: Innovation and Ethical Data Management

Within the archival domain, AI provides advanced algorithms that can simplify and automate the management of archival information (Messina, 2020). At the international level, the use of big data, algorithms, and AI applications is transforming archival processes, making them faster and more efficient. Technologies such as Robotic Process Automation (RPA) and Machine Learning (ML) enable the automated creation of thematic dossiers and the intelligent management of data, significantly reducing time and human error. The consultation of digital archives can thus become an algorithmic process based on search keys, tags, and data relationships, improving the efficiency of navigation and retrieval (Ciandrini, 2021).

A concrete example is represented using algorithms for the automatic extraction of metadata. These systems analyze textual content, images, or multimedia to generate accurate and consistent metadata, thereby facilitating the search and retrieval of information in vast digital archives. Algorithms based on neural networks or deep learning models are revolutionizing archival management, ensuring greater precision in the classification of documents (TechGig, 2024). Furthermore, advanced techniques such as self-organizing feature mapping networks allow the extraction of key information from digital documents with accuracy rates reaching 98% (PMC, 2022).

For the application of AI in archives, it is essential to follow an ethical and informed design approach. According to the *Piano Nazionale di Digitalizzazione* of the Italian Ministry of Culture, cultural heritage must be treated as a generator of social value. The correct use of digital technologies and AI can strengthen the relationships between people and cultural heritage, creating new value frameworks and innovative forms of access (Ministero della Cultura, 2022).

A key element in ensuring transparency in the use of AI is Explainable Artificial Intelligence (XAI), which makes algorithmic functioning understandable through intrinsically explainable models (such as decision trees) or post hoc explanations (as in the case of neural networks). This approach fosters greater trust among end-users and enables more conscious management of archival data (Cameron et al., 2023).

The application of AI in archives also extends to advanced technologies such as deep learning. Models such as Long Short-Term Memory (LSTM) networks are employed to extract granular informational elements from complex textual corpora. In addition, systems based on bootstrapping technology and AlexNet networks provide innovative solutions for the categorization and systematic management of digital archives (Sciendo, 2023).

Finally, the integration of AI into archival systems not only enhances operational efficiency but also addresses challenges related to the long-term preservation of digital data. Through tools such as Natural Language Processing (NLP) and predictive analytics, archives can adapt to technological evolution and ensure information accessibility for future generations (CLIR, 2020). The adoption of these technologies by libraries, museums, and institutions demonstrates how AI is redefining the global archival landscape (Spina, 2020).

Recent international research expands the debate on the ethical, social, and design-oriented implications of AI in cultural heritage. Studies on digital heritage highlight the need for human-centred systems that integrate computational efficiency with curatorial expertise and participatory access models (Champion, 2021). Research in human-machine interaction emphasises that algorithmic systems used for cultural preservation must support transparency, explainability, and co-decision with archivists and designers (Dourish, 2016). In the field of AI ethics, scholars argue that cultural datasets require critical scrutiny to avoid reproducing bias, misclassification, or uncontextualized interpretations (Floridi & Cowls, 2019). These perspectives reinforce the idea that AI-enhanced archives are not merely technical infrastructures, but hybrid knowledge environments that demand collaborative governance and design-driven supervision.

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Archival Innovation and the Enhancement of Historical Heritage through AI: The Case of Fondazione Fiera Milano

The application of AI to photographic archives represents a significant innovation in the management and enhancement of historical heritage. This study presents the results of an experiment carried out at the Historical Archive of Fondazione Fiera Milano, in collaboration with Promemoria Group, aimed at implementing AI techniques for multimodal search, automatic object recognition, and automated description generation.

Fondazione Fiera Milano is an emblematic case of using emerging technologies to enhance the historical heritage of corporate archives. The Historical Archive of Fondazione Fiera Milano, covering the period from 1906 to the present, is a treasure trove of documents that testify to the evolution of design and communication in Italy. This archive holds over 500,000 images, 100 historical posters, 30,000 volumes, and 5,000 catalogues, offering a unique window into the history of the Italian economy and the visual culture of the twentieth century.

The photographs preserved in the archive not only document the exhibitions and events of the Milan Fair but also illustrate the evolution of industrial products, communication strategies, and advertising campaigns of Italian companies. These images show how the Fair served as a crucial venue for the launch of new products and for the presentation of technological and design innovations.

Photographic archives are a fundamental resource for the study of history and visual culture, but manual cataloguing and searching within large collections pose a complex challenge. The use of AI, through both discriminative and generative models, offers innovative solutions to improve the accessibility and analysis of such archives. The experiments focused on three main areas: multimodal search, developed through a prototype based on vector representations of images for queries using keywords or image inputs; object detection, which enabled the automatic identification of subjects and objects with a focus on generic content as well as fashion-specific materials; and automated description generation for images of industrial machinery and fashion photo shoots, with the aim of improving cataloguing and lexical search. The results show that similarity based and keyword searches provide an effective alternative to manual description, although current models still present linguistic limitations. Object detection facilitated the creation of structured metadata, while automatic description generation provided generally accurate outputs, albeit with occasional incorrect inferences. The implementation of AI in photographic archives highlights significant potential for optimizing cataloguing and search processes, suggesting the need to refine models with domain-specific datasets. Among future developments, the integration of facial recognition for identifying historical figures is foreseen. The project was carried out with the support of Fondazione Fiera Milano and in collaboration with Promemoria Group, using photographs from the Franco Bottino and Gastel collections preserved in the Historical Archive of Fondazione Fiera Milano.

The partnership with Google Arts & Culture further expanded the visibility of this heritage, offering thematic pathways and online galleries that narrate the history of the Fair and of Italian industry. This project demonstrates how the use of innovative technologies can transform the use of corporate archives, turning them into dynamic tools for research and inspiration in the fields of design and communication.

Furthermore, participation in initiatives such as *Archivi Aperti* underlines Fondazione Fiera Milano's commitment to the preservation and promotion of cultural heritage, fostering broader and more inclusive access to these historical treasures.

This project represents a significant example of how emerging technologies can be employed to enhance the cultural and historical heritage of corporate archives, opening new perspectives for research and innovation in design and communication[1].

[1] For more information, see: Fondazione Fiera Milano. *(2023). Fondazione Fiera Milano apre le porte del suo archivio storico in occasione di archivi aperti 2023*; Fondazione Fiera Milano. (2025). *Archivio storico*; Fondazione Fiera Milano. (2025). *Pubblicazioni della Fiera di Milano fra realtà e pubblicità*.

Blockchain for Document Certification: Notarization and Security in Digital Archives

The management of digital archives represents a significant challenge for companies, which must ensure the integrity, authenticity, and security of documents over time, as well as their safe transmission (Vacchio et al., 2022). In this context, blockchain emerges as an innovative technology, originally developed in the cryptocurrency domain, that addresses many issues related to the certification of corporate data and documents (Gervais et al., 2014). Thanks to its features of decentralization, immutability, and transparency, blockchain enables the digital notarization of documents, a process that allows each archived piece of data to be securely and verifiably certified without the need for intermediaries (Tapscott & Tapscott, 2016).

Blockchain notarization is based on an advanced technical principle: each digital document is transformed into a unique cryptographic fingerprint, called a hash, which is then recorded in a block of the chain. This hash serves as an immutable identifier of the document, and any subsequent modification to the file would alter the hash, making any attempt at tampering evident. Since the blockchain is distributed across multiple nodes in the network, it ensures that the transaction ledger is accessible and verifiable by all authorized users, providing a high level of transparency and security (Kalendzhian, 2021).

The notarization process involves several technical steps. First, a digital fingerprint is created by generating the document's hash using the SHA-256 function, a robust cryptographic algorithm that produces a unique 256-bit code (Antonopoulos, 2022). The hash is then included in a transaction sent to the blockchain network. This transaction is recorded in a new block together with other data, such as the timestamp and the sender's address. Once the block is validated by the network nodes through consensus mechanisms like Proof of Work or Proof of Stake, the document is definitively and immutably certified (Deirmentzoglou et al., 2019).

Another fundamental aspect of blockchain notarization is the possibility of verifying a document's authenticity at any time. To do this, it is sufficient to recalculate the hash of the original file and com-

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pare it with the one recorded on the blockchain. If the two hashes match, it means that the document has not been altered and the certification remains valid. The evolution of this process involves the use of smart contracts, self-executing programs on the blockchain that can automate the notarization process. Smart contracts can also be programmed to grant access to documents only to authorized users, further enhancing security and permission management using authentication protocols such as OAuth or JWT (Bhargavan, 2016).

To implement document certification on blockchain, companies can use different platforms and protocols. Among the most common solutions are: Ethereum, which leverages smart contracts to automate document verification and management, and OriginStamp, a business oriented intermediary platform with advanced notarization management functionalities (Kshetri, 2017). The benefits of using blockchain for the certification of archival documents are multiple. First, security: data recorded on the blockchain is immutable and protected by advanced cryptographic mechanisms, making it practically invulnerable to cyberattacks and tampering attempts. Furthermore, the decentralization of the network eliminates dependence on a central authority, ensuring that information is always available and verifiable. Another crucial aspect is operational efficiency: digital notarization eliminates the need for paper-based certification and verification processes, reducing both time and management costs (Maupin, 2017).

Riva Case Study: Innovation in Digital Preservation of Historical Heritage

Riva, a historic Italian company in the luxury yacht sector, has developed an innovative project in the field of digital archive management with the Riva Historical Archive, launched in 2003 and fully operational the following year. This project was conceived to strengthen the identity of the Riva brand by using the values, characteristics, and distinctive features of the past to enhance the company's current identity. The archive consists of various types of physical materials, each with specific characteristics, which were then digitized.

Among these assets is a section called the *phototeca*, which is a significant component, as it consists of 52 folders containing about 3,650 photographs and slides from the 1960s, 1970s, 1980s, and 1990s. This collection documents events, products, and iconic figures related to the history of Riva. Among these images, seven were selected, taken in the early 1960s, depicting the *Aquarama*, the iconic Riva boat. Even today, in films, commercials, and on social media, when one wants to convey the unparallelled art of navigation that most embodies the design culture of Made in Italy, this is the boat that is chosen. Not only is it a symbol of an unrepeatable era in the world of boating, but also a marvel of inventive craftsmanship.

The application of blockchain technology to a selection of historical photographs from the 1960s of the iconic *Aquarama* boat allows for the association of a verification Digest and two-factor authentication to the thematic package. This system, implemented through open-source platforms, includes a 'digital certification' that

guarantees the origin, creation date, and content of the selected images (Hughes et al., 2019). This information remains immutable over time, providing security against counterfeiting and serving as an active preservation tool to safeguard the authenticity of the artifacts Fig. 1 Fig. 2.

NOTARIZATION 7 PHOTOS AQUARAMA

1962
AQUARAMA

Illustration

In 1962 the Aquarama was born, which for its charm and elegance is often compared to Rolls Royce or Ferrari. Over the years this model will undergo several enhancements. Even today, in films, commercials, on social media, when one wants to communicate inimitable sailing, the one that expresses more than any other the style and glamour of "Made in Italy", this is the boat that is used. Not only a symbol of an unrepeatable era in the world of sailing, but a prodigy of inventiveness and expert craftsmanship, a spectacle of mahogany and aquamarine, sinuous shapes and legendary splendor.

Fig. 1
Cover of the notarized document (Source: Archivio Storico Riva, 2025).

Fig. 2
Certified timestamps on (Source: Ethereum, 2025).

Discussion: Implications for Design Practice and Archival Innovation

The case studies reveal that technological transformation does not simply improve the efficiency of archival processes but reshapes the role of corporate archives within design ecosystems. AI-driven classification and multimodal search reconfigure how designers engage with historical sources, enabling new interpretive routes and accelerating processes of inspiration, trend analysis and visual research. Blockchain-based certification introduces a new layer of trust and provenance that strengthens the cultural, legal, and communicative value of archival objects, particularly for companies whose identity is deeply rooted in material artifacts and brand heritage. However, these opportunities highlight several tensions:

- the risk of over-automation and the reduction of curatorial judgement;
- the dependence on datasets whose biases or gaps may misrepresent historical narratives;
- the growing need for interdisciplinary teams combining archivists, designers, technologists, and ethicists.

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These aspects show that innovation in corporate archives should be understood not only as a technological transition but as a cultural and organizational shift that requires long-term governance, ethical oversight, and design-driven strategies for meaningful user engagement.

Final Consideration

The digitalization of corporate archives, integrated with advanced technologies such as blockchain and AI, is transforming the way in which cultural and historical heritage is preserved, managed and valorised. Significant case studies, such as the Archivio Storico Riva and the Fondazione Fiera Milano, have shown how these innovations not only improve operational efficiency, but also democratize access to data, favouring the creation of new connections between past and present. Corporate archives are increasingly configured as strategic tools for the construction of brand identity and for the promotion of cultural heritage through design and visual communication.

Design Limitations

Despite the benefits offered by digital technologies, it is important to consider the environmental impact resulting from the intensive use of advanced computing systems. The infrastructure required to support blockchain and AI, including data centers and distributed networks, involves high energy consumption and a significant environmental impact. For example, consensus mechanisms such as Proof of Work used in blockchain can require enormous amounts of energy to validate transactions. To mitigate these effects, it is essential to adopt more sustainable technological solutions, such as alternative consensus algorithms (e.g. Proof of Stake) and the optimization of computation processes. Furthermore, companies that decide to invest in archiving should integrate green computing strategies to reduce the carbon footprint of their digital operations. Beyond environmental considerations, sustainable archival digitalization also involves ethical sustainability. Scholars argue that the long-term preservation of cultural records requires governance models that ensure algorithmic fairness, responsible data stewardship, and low-impact technological infrastructures (Drotner et. Al., 2018). For corporate archives, this means adopting transparent AI pipelines, reducing energy-intensive computation, and promoting hybrid digital-physical strategies that minimize dependency on short-lived technologies. Ethical sustainability thus becomes a crucial dimension of design practice, shaping how companies construct, communicate, and preserve their cultural memory.

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Future Project Objectives

Looking to the future, an innovative step could be the creation of a shared metaverse dedicated to corporate digital archives. This virtual environment would allow users to explore archival data in an immersive and interactive way, creating new opportunities for the enhancement of historical heritage. The three-dimensional visualization of documents and archival products could facilitate a deeper understanding of historical and cultural connections, improving the user experience. Furthermore, the integration of AI in the metaverse would allow personalized navigation based on individual preferences and predictive analysis. This approach could represent a turning point in the use of archival heritage, making it more accessible in an innovative and engaging way.

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