New Perspectives for Drawings in Italian Architecture Archives: Reflections and Experiments

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Abstract

The value of Italian architecture is linked not only to the built work, but also to the apparatus of its representations, a complex world of information often scattered in different places of conservation and treated in a non-homogeneous way. The paper aims to present some reflections on the contributions that the discipline of drawing can provide in the different areas –knowledge, preservation, use and accessibility– of architectural drawing conservation and enhancement process. The research highlights the need for a unitary conceptual model of management that includes: the descriptive data, through a uniform path of cataloguing; the realisation of digital analysis and reconstructions, through methodologies that allow the evaluation and visualisation of their degree of reliability; the definition of strategies and products to implement different forms of accessibility according to the type of recipient and interaction desired.

Keywords: drawings archive, 3D modelling, virtual reality, augmented reality, accessibility.

Introduction

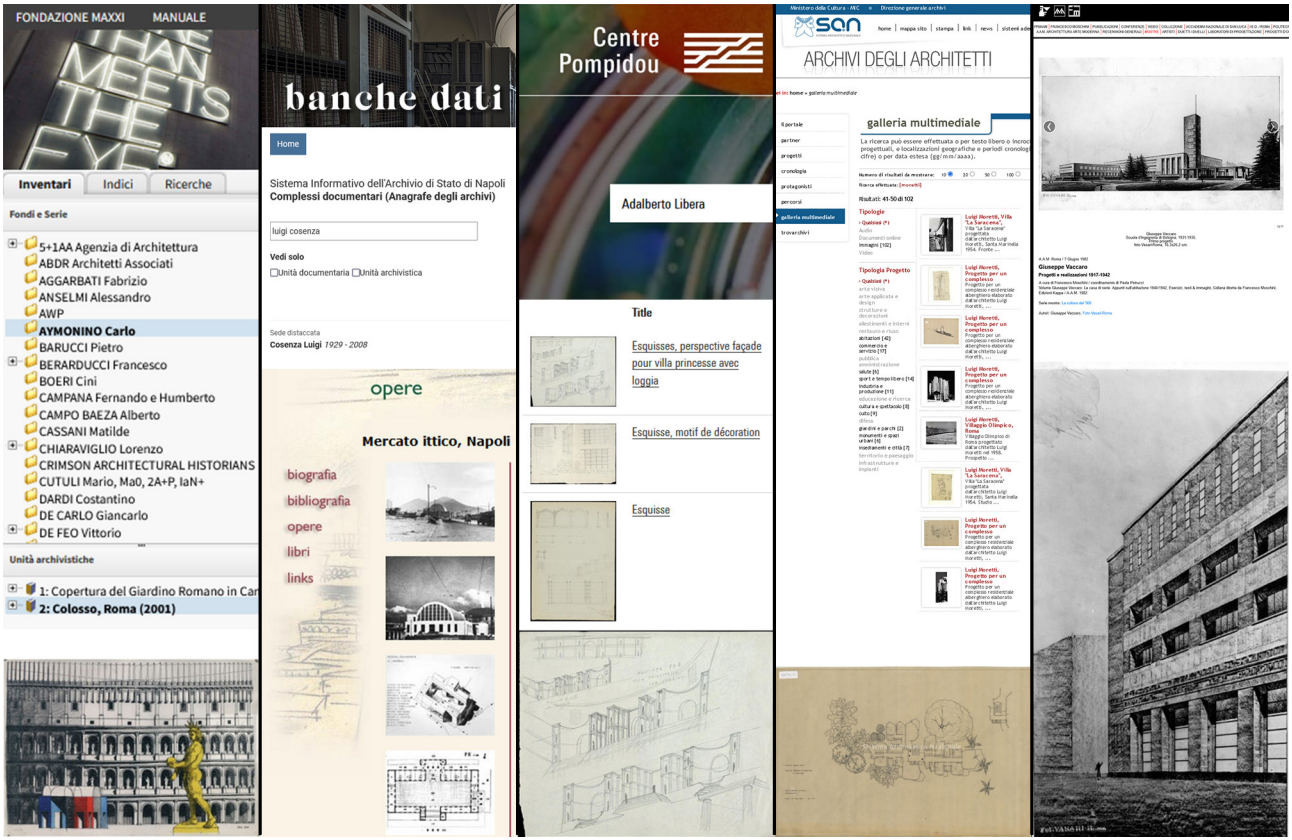
This essay aims to show a methodological framework and experiments to clarify the role and contribution of drawing, in the context of already established architecture archives. Drawing can contribute to developing new knowledge scenarios, for its different theoretical, speculative, analytical and applicative declinations and its ability to take a holistic approach to the issues under investigation [Farroni 2012].
It can interpret the variety of information in the architectural image, since its specificity is the knowledge of drawing evolution, both as an instrument for tracing signs and as a graphic expression for the project communication as a result of reflections and operative verification practices. The discipline is distinguished by the proposition of two-dimensional analyses and three-dimensional digital reconstructions.
The reflection on specimens collected in archival collections becomes an opportunity to experiment with different digital techniques in order to explore the architectural characteristics, and spatial configurations proposed, creating new content that enhances accessibility and understanding for different audiences. The research has considered two areas. On the one hand, it has taken note of the technical-scientific elaborations produced in institutional contexts – in particular, the studies and regulations produced by the Central Institute for Catalogue and Documentation (ICCD) and the archival sector of the Ministry of Culture (MiC), concerning the

contexts of origin and representation of documentary production, the latter seen as the hierarchical structure of information. At the same time, it surveyed the experiments conducted in scientific research projects in the interpretation and enhancement of drawings. From the former, it emerged that legislation and practices define standardised description models shared at national and international level. In particular, standards for cataloguing, archival description, metadata and interoperability of systems and digital content have been implemented at the European level and globally, thanks to a long process of research involving public institutions, the academic world, and industry. The second one, on the other hand, revealed many examples that cannot be ascribed to shared procedures. It is, therefore, necessary to understand where and how the contribution of drawing can implement such a complex system.

From the state of the art to the proposal of a unitary model for the description, interpretation and valorisation of architectural drawing

The analysis started from the survey of architectural archives [Guccione et al. 1999; Bruschi 2007] and required an in-depth study of theoretical assumptions, cataloguing and archival tools and practices. This first activity highlighted the complexity of the scenario and of the research work necessary to experiment with a unitary conceptual model, that includes the contribution of drawing and is characterised by scientific rigour, innovation and usability. The first phase of the research aimed at defining thematic surveys: the fonds of architects preserved in private or public institutions and bodies, for which the data accessible on the main institutional platforms such as SAN (Sistema Archivistico Nazionale), SIUSA (Sistema Informativo Unificato per le Soprintendenze Archivistiche), SIAS (Sistema Informativo degli Archivi di Stato) and the main research bodies in the field of architecture such as Accademia Nazionale di San Luca, Centro Archivi di Architettura del MAXXI, Archivio Progetti Iuav, Archivio del Moderno were analysed; thematic, monographic and experimental projects on architects' archives promoted by public and private institutions to guarantee easier accessibility to this documentation, but carried out with different methodologies, often in multidisciplinary contexts, and therefore characterised by a significant lack of homogeneity. These include the *Portale degli Archivi degli architetti*, promoted by the Direzione Generale per gli Archivi, *Architetture del secondo '900* by the Direzione Generale Creatività Urbana, *Lineamenta* by the Bibliotheca Hertziana, and *Il Disegno negli Archivi di Architettura* by the UID Unione Italiana per il Disegno. In addition, three-dimensional digita reconstruction projects starting from traditional project drawings were investigated, which aim to offer new readings through graphic contributions, analysis and digital reconfigurations through a dynamic and interactive use. These include *Il Disegno negli Archivi di Architettura* (UID), and some studies by the DIDA Department of Architecture of the University of Florence. In addition, of course, to the individual actions of scholars and researchers, but which do not fall within the case histories identified, and which highlight the need to provide a reference model in which to convey in-depth studies [Vernizzi 2011; Maggio 2021; Ippoliti, Calvano 2021].
The survey work led to a reflection on the proposed cataloguing models. In order to verify the data actually in use, such as traditional and computerised inventories, catalogues and databases of architectural drawings and related documentation, it was decided to analyse the fonds of some masters of the second half of the 20th century and some contemporary architects. The studied fonds, all divided between different conservators, were: Aymonino (1926-2010), Luigi Cosenza (1905-1984), Adalberto Libera (1903-1963), Luigi Moretti (1907-1973), Giuseppe Vaccaro (1896-1970), Francesco Cellini (1944) and Studio ABDR (1982) (1982) (fig. 1) [Guccione, Terenzoni 2002; OAR 2019].
The analysis of the data allowed the elaboration of a Virtual Fund record, based on the ISAD (International Standard Archival Description) [1] and ISAAR (International Standard Archival Authority Records) [2] standards, in which standardised information was collected on: consistency, content description, archival/legal history, conditions governing access, conservator, qualification and personal data (tab. 1).
In addition, an analysis of the data exposure models (front end) was also deemed necessary, looking at platforms and databases that can be consulted on the web to analyse the type and quality of descriptive data exposed.
State of the art revealed the complex and heterogeneous nature of the documentation and the implications

Fig. 1. Front-end screenshots of some of the funds related to Carlo Aymonino, Luigi Cosenza, Adalberto Libera, Luigi Moretti and Giuseppe Vaccaro (graphic elaboration by the authors).



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File Type	Name of the Archival Fund	Consistency	Description Content	Archival/ legal history	Conditions governing the access	Producer (own name)	Producer (collective body)	Qualification	Anagraphic data
A	**Accademia Nazionale di San Luca - CARLO AYMONINO**	drawings in various media ca. 500; documentation files 100; photographs ca. 300.	The Carlo Aymonino's Fund, donated shortly before his death by the architect, who served as president of Accademia Nazionale di San Luca from 1995-1996, collects extensive and exhaustive documentation (drawings, photographs, documents) on much of the design activity carried out since the fifties of the twentieth century	Donation before 2010	Since October 2020, the fund has been on loan for use at the Università IUAV di Venezia	Carlo Aymonino		Architect	1926 - 2010
A	**Archivi Digitali Olivetti - Fondo: Collezioni Olivetti - Carlo Aymonino**	29 drawings and texts - Olivetti Emeroteca (15) Olivetti Photo Library (14)	The Collezioni Olivetti collected uniform documentation by type, as was requested at the time by the Olivetti Company for easier access to the materials. The structure, where possible, has maintained indications of the provenance of the original archival collection (e.g., the Photo Library holds the Photo series of the Lodovichi Fund, etc.).	Since 1986	Viewable upon request, but present online descriptive sheet		Olivetti S.p.A.	Company	Since 1908 (fund 1986-2009)
	Archivi Digitali Olivetti - Fondo: Società Olivetti - Carlo Aymonino	"8 texts - Indexes Emeroteca (7) Centro Culturale Olivetti Milano (1)"	Consisting of documents and other materials related to the activities carried out over more than a century by the companies of the Olivetti Group, it represents the main component of the documentary heritage preserved by the Association. The records consist of over 70 archival series representing the corporate entities or the People who worked in them, responsible for producing that given documentary collection.	Since 1986	Viewable upon request, but present online descriptive sheet		Olivetti S.p.A.	Company	Since 1908 (fund 1986-2009)
A	**Archivi Digitali Olivetti - Fondo: Personalità della storia Olivetti - Adriano Olivetti**	1 mail	Includes holdings related to the great personalities in Olivetti history, starting with the Olivetti Family: Camillo, Adriano, Massimo, Arrigo, Roberto, Dino, Silvia Olivetti, and other family members, totalling 152.9 linear meters, and a chronological span from 1806-1986	Since 1986	Viewable upon request, but present online descriptive sheet		Olivetti S.p.A.	Company	Since 1908 (fund 1986-2009)
A	**Archivio Progetti IUAV - Collezione Archivio Progetti**	About 75 archival and documentary units (of 480 archival units)	The collection contains architectural documentation collected or produced by the Archivio Progetti: primarily photographic reproductions or heliographic, xerographic, etc., copies, but also original documents received in isolation at the archive and models made by the archive itself.	Since 1949	Viewable in digital format descriptive sheet and in some cases digital object (attached to the sheet)		Istituto Universitario di Architettura di Venezia. Centro di Servizi Interdipartimentali Archivio Progetti	University	Since 1987
A	**Archivio Progetti IUAV - Carlo Aymonino and Gabriella Barbini's Venetian study**		In the records of the Venetian firm's archives, one can find the plans for the Ristrutturazione del Campo di Marte, Venice-Giudecca (1984), the IMA project in Ferrara (1982), competition project for the arrangement of the Largo Firenze, Ravenna (1986), as well as the unrealized plans for the renovation and rehabilitation of the area of the former Royal Gardens at St. Mark's, Venice (1997) and the competitions for the Italian Pavilion and the Palazzo del Cinema on the Lido of La Biennale di Venezia	Purchase	Pending sorting		Studio veneziano di Carlo Aymonino e Gabriella Barbini	Architecture studio	
A	**Centre Pompidou - Architecture Collection - Architecture Drawings -Carlo Aymonino**	347 drawings, 4 models	With more than 13,000 works, the Musée National d'Art Moderne's collection of architecture is one of the largest in the world. Created in 1992 by Dominique Bozo, President of the Centre Pompidou, its purpose is to demonstrate the profoundly interdisciplinary dimension of modernity through its exhibitions and publications. The notion of the architectural project gives the collection all its cohesion, developed from planning to realization through all its forms, models, drawings, prototypes and written.	Donation 1996, Donation 2007, Purchase 2007	Available digitally at: https://www.centrepompidou.fr/en/recherche/oeuvres?secteurCollection%5B%5D=Architecture&artiste%5B%5D=-Carlo%20 Aymonino&display=Grid		Centre Pompidou	Museum	Since 1992
A	**Centro Archivi MAXXI - CARLO AYMONINO**	2 archival units	The collection consists of 10 plates depicting the Colosseum and the arrangement of the Roman Garden housing the Marcus Aurelius at the Musei Capitolini, a project carried out by Carlo Aymonino in 1993. The fund was kept by Carlo Aymonino in Rome and was acquired by the Ministero per i Beni e le Attività Culturali in 2009 for the collections of MAXXI Architecture	Purchase 03/03/2009	Available at the office by appointment or in digital format at: http://inventari.fondazionemaxxi.it/AriannaWeb/main.htm#128779_archivio	Carlo Aymonino		Architect	1926 - 2010
A	**FFMAAM - Collezione Francesco Moschini - Carlo Aymonino**	110 drawings	FFMAAM is the new acronym that brings together and presents the outcomes of Francesco Moschini's intellectual and cultural work from the mid-1970s to the present. Through the numerous relationships woven with multiple authors in different disciplinary fields, an extraordinary Collection has thus been formed, resulting from shared life excerpts and paths in common. Numerous works, including Art, Photography, Drawings and Architecture Projects, constitute the Francesco Moschini and Gabriel Vaduva A.A.M. Architettura Arte Moderna Permanent Collection. A corpus of medium- and large-format drawings and projects along with oils, letters and numerous notebooks and journals		Available digitally at: http://ffmaam.it/collezione/carlo-aymonino#carlo-aymonino		FFMAAM - Fondo Francesco Moschini A.A.M. Architettura Arte Moderna		Since 1970

Tab. 1. Virtual Fund record of the fonds related to C. Aymonino held in various conservatories (graphic elaboration by the authors).

related to its preservation, management, cataloguing and digitisation, as well as numerous critical issues that limit the search and identification of the contents, but also the information potential of these documents and their historical and professional connections.
In the field of content and the unity of the reconstruction of the professional production of the individual architect, the frequent fragmentation of the documentation of a single producer among various conservators and the absence of informative and operational relationships between the different partitions makes descriptive intervention complex. This is part of a context where the different types of documentation preserved in the fonds (from preparatory sketches to executive drawings, from textual documentation related to the definition levels of the project to correspondence, photographs, etc.), as well as the different physical analogue and digital supports, require specific and diversified descriptive models.
In the field of fruition, several factors highlight the lack of a standardised exposition model: the inhomogeneity of the data displayed and of the description languages, the absence, in some cases, of necessary data (such as author, title) and the absence and/or lack of technical data. It also emerges, following a further analysis that compared the data on use (front end) with the actual cataloguing data (back end), the need to deepen the relationship between the two areas to understand the methods of selection of the published data.
In summary, it turns out that for a better valorisation of architectural drawings, a standardised model for collecting descriptive data and a uniform cataloguing layout (already initiated by archivists) is necessary. However, it must be supplemented by the contribution of digital analyses and reconstructions and links with the built work.
It was therefore considered valuable to analyse in-depth the existing layouts developed in the institutional context of the ICCD, starting from the OA form (Scheda opera d'arte of the disciplinary sector of historical and artistic heritage) and the D form (Scheda disegno). According to these analyses, a proposal is elaborated that can integrate the existing OA sheet and defines a conceptual model for new accessibility (in terms of content and use) of drawings of architectural works.
This model places the drawing as the primary source, endowed with specific characteristics and susceptible to

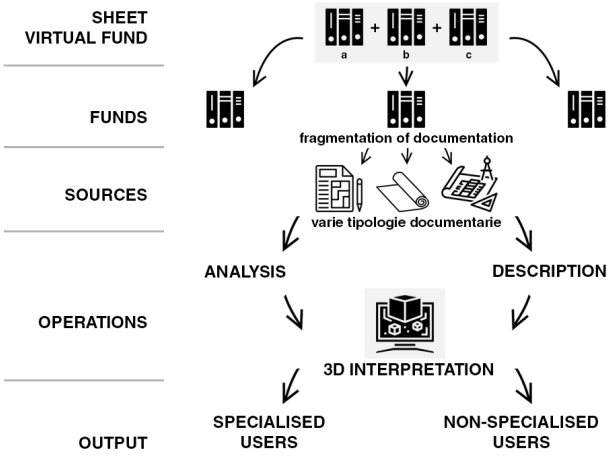
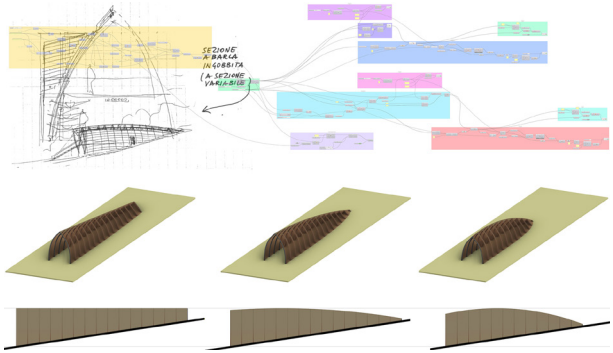


Fig. 2. Diagram of the scientific process from the analysis of the fonds of architectural drawings to the creation of new contents for different users (graphic elaboration by the authors).

reproducibility. It is linked to the OA form, where the scientific quality of the drawing itself is defined through informative data that integrate the descriptive contents regarding the signs present, the graphic codes used, the different graphic weights, the representation methods, the graphic composition, the semantics of the signs and elements, and the recognised graphic strategies. This model provides the connection between the drawings, fragmented in the documentation of the fonds, and the information present in the different documentary typologies, both to be subjected to analysis and description, which will be helpful for the 3D reconstructions diversified in the outputs for the considered users. The aim is to highlight all the potential that an architectural drawing offers, to multiply the contents with respect to an original, depending on the time and the way it is read, and to reveal the architects' poetics and design intentions. The overall objective of the model is to reinforce actions aimed at contrasting the dispersion and fragmentation of contents and to promote awareness about the preservation and valorisation practices of architectural archives (fig. 2).

Experiments in three-dimensional digital reconstruction of architectural drawings and visualisation of interpretation reliability

The practice of reconstructions of significantly altered, lost [Trizio 2021] or never realised architectural contexts and artefacts and their analysis has always been pursued by scholars and has received a strong impetus from the advent of digital techniques [Muenster 2022].
In the context of current research, the results of three-dimensional digital interpretations of projects by architect Francesco Cellini [Cellini 2016] and the Roman studio ABDR [Costi 2015] are presented. The former were an opportunity to experiment with modelling and visualisation techniques, addressed to the analysis and interpretation of the projects. At the same time, the latter were also an opportunity to experiment with different outputs aimed at implementing accessibility and valorisation.
In the case, for example, of the Rowing Club (TR) designed by Francesco Cellini, the parametric modelling tools offered by the Visual Programming Language (VPL) [3] were used to understand and reveal the parameters on which the author intended to imprint his design strategies and thus the formal, functional and constructive characteristics of the project, exploring the possible variations hypothesised by the author dynamically and interactively. The experimentation was inspired by the preliminary sketches where the architect hypothesises the adoption of a curved line for the ridge of the pavilion, a hypothesis that differs from the rectilinear solution that was later definitively adopted. The developed algorithm enabled us to experiment, on a synthesised model, with the dynamic transformation of the pavilion's shape as the ridgeline curvature changes and the transformation of the cross-sections to the slope of the land on which it stands. Thus, the intuition of the sketch was translated into the unambiguousness of an interactive 3D model with controlled geometric properties (fig. 3).
The high standardisation of architectural drawings and the different uses those architects make of them in their design process, even with expressive intentions, has also led to reflection on how to represent the connection between graphic drawing, 3D model and architectural spatiality.
For this reason, the projects for an indoor swimming pool in Baschi (1995) and the Pentecost church in Milan (2001) were opportunities for augmented reality (AR) [4] experiences. They are aimed at the perceptive investigation of the figurative three-dimensionality expressed in the two-dimensional codes and, therefore, to establish a closer link between the



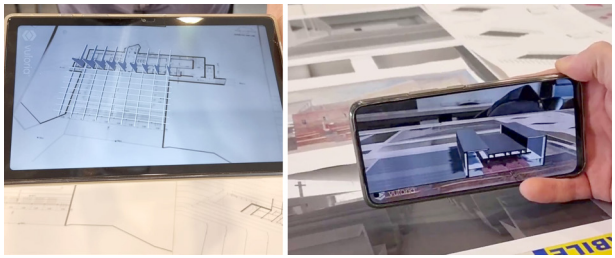
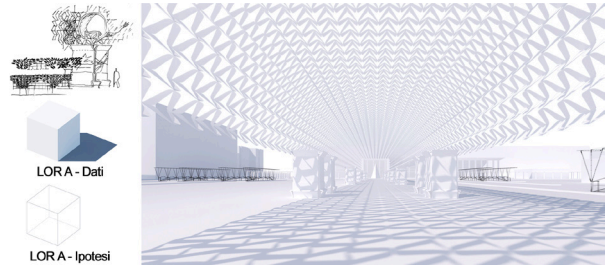
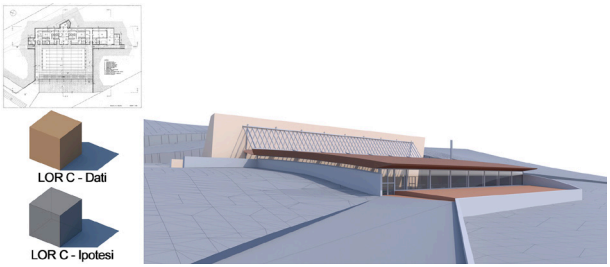


Fig. 3. Experimentation on project drawings by Francesco Cellini, Iuav Drawing Archive, realized by Lorenzo Pinti, Giulio Solito, and Francesco Tomei.

Fig. 4. Augmented reality applications on project by Francesco Cellini. Experiments conducted by Federico Lo Re, Daniele Marcotulli, Luca Pellegrini and Riccardo Scisciola.

sources, their redrawing and the 3D reconstruction, which, in the hybrid augmented space, find a clear continuity of the interpretative process. The relationship between sources and reconstructions led to a reflection on the scientific foundations on which to elaborate critical choices. The technical process of producing the AR is accompanied by a critical process of choosing the drawing to which the 3D visualisation is to be entrusted and matching it with models developed to highlight the main qualities of the analysed projects (fig. 4).
The *London Charter* and the *Seville Principles* references to the sources and procedures transparency have led scholars to search for methods to assess the reliability of the proposed reconstructions and their visualisation. A research line has been directed toward the definition and representation of the ontological link between sources and 3D reconstructions [Demetrescu 2015; Apollonio et al. 2021], while an autonomous but converging path has been started in the field of Heritage Building Information Modeling (HBIM) with the emergence of the need to define the level of approximation and knowledge of the model compared to the actual artefact [Bianchini, Nicastro 2018]. Researches that emphasise the qualitative process of interpretation, and data extraction from sources used to create models that can, with reason, be defined as «source-based» [Demetrescu 2015], belong to the first strand. An intermediate position between these main strands exploits the possibilities of assigning qualitative textual attributes to parts of 3D models in modelling environments other than purely BIM ones [Campofiorito, Santagati 2020].
Concerning the visualisation through the model of the previously defined accuracy/reliability levels, the general orientation shared by researches is to adopt a symbolic language through the characterisation of the model with a chromatic scale in false colours.





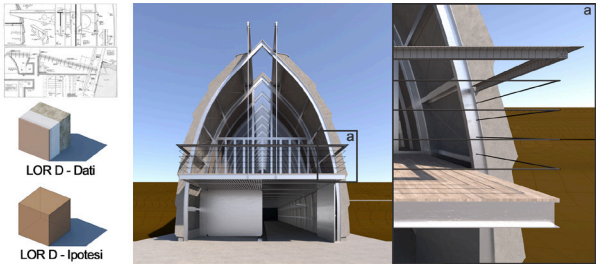


Fig. 5. Application of LOR A to the project for Piazza dei Cinquecento in Rome by Francesco Cellini (1982), Iuav Drawing Archive (graphic elaboration by the authors).

Fig. 6. Application of LOR B to the project for the Accademia Bridge in Venice by Francesco Cellini (1985), Iuav Drawing Archive (graphic elaboration by the authors).

Fig. 7. Application of LOR C to the project for a covered swimming pool in Baschi by Francesco Cellini (1995), Iuav Drawing Archive (graphic elaboration by the authors).

Fig. 8. Application of LOR D to the project for the Rowing Club in Baschi by Francesco Cellini (1995), Iuav Drawing Archive (graphic elaboration by the authors).

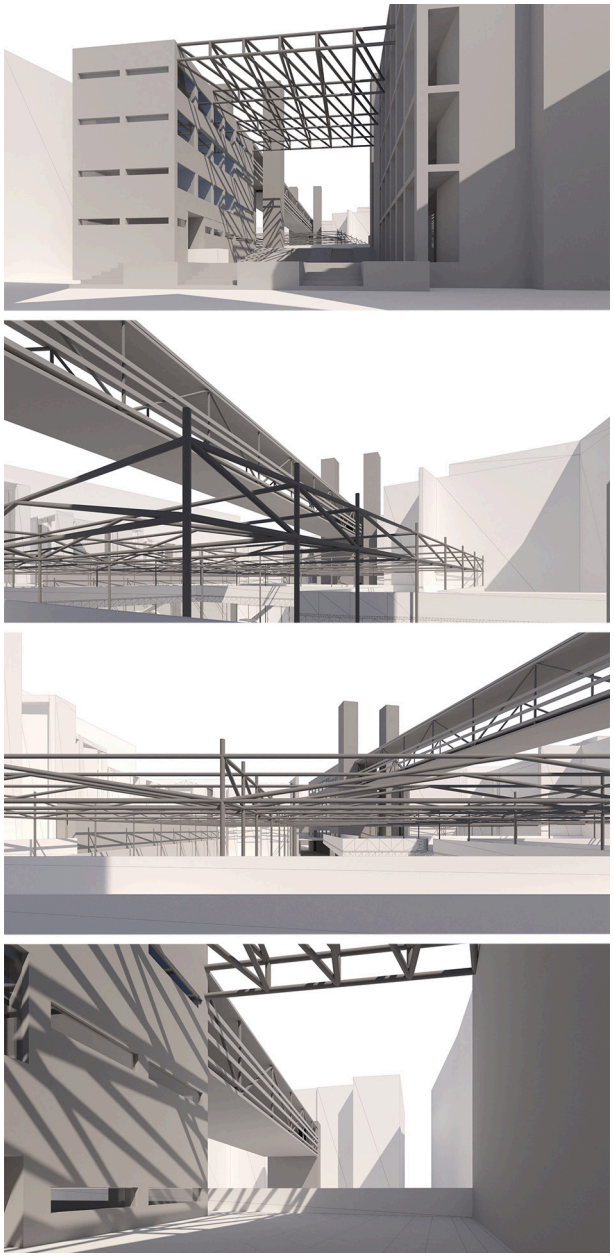


Fig. 9. Application of LOR B to the project for the redevelopment of the Crypta Balbi in Rome by ABDR (1985), MAXXI Archive (graphic elaboration by the authors).

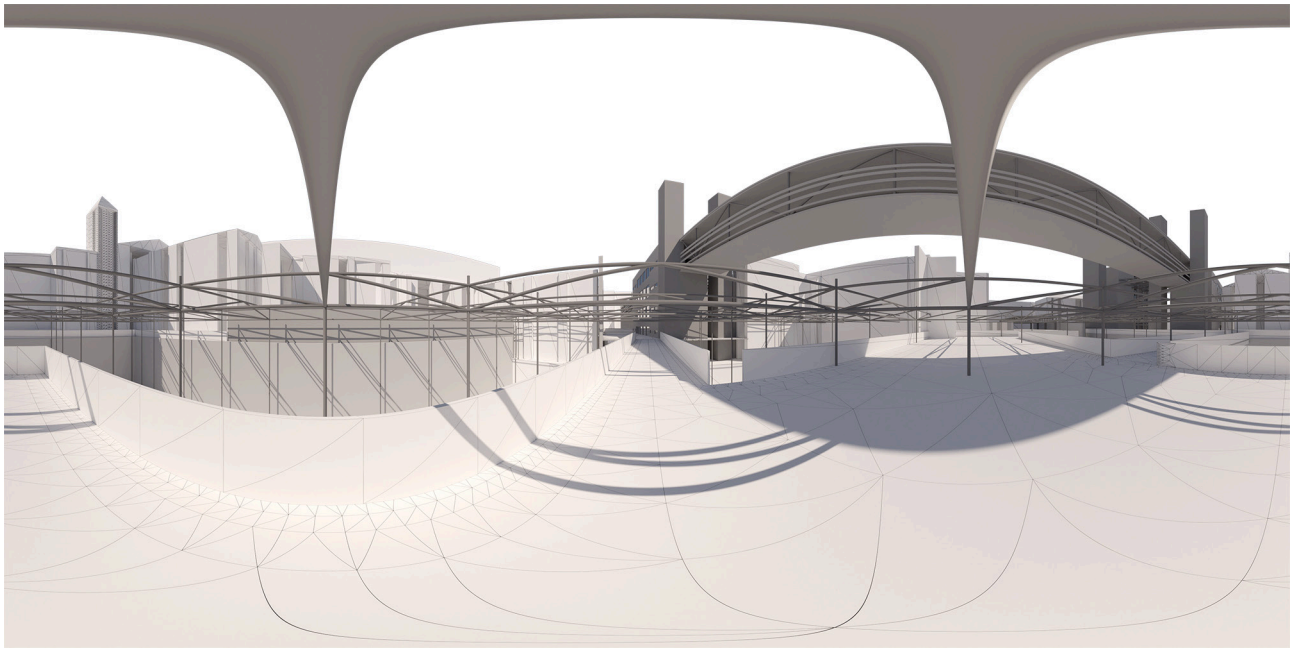
It is precisely the aspect of graphic visualization of the classification that appears to be the possible ground for further study and research.
In the latter direction, we have already proposed the use of graphic codes characterized by variable levels of iconicity according to the accuracy of the reconstruction [Farroni, Mancini 2019]. In particular, the proposed Level of Reconstruction (LOR) synthetic parameter is directly related to the different phases of the design process - preparatory, preliminary, final, executive - and their different characterization in terms of metric accuracy and completeness of information developed in the drawings. The proposed LOR identifies four possible reconstruction levels (LOR A, B, C, D), each defined by a double graphic code: the first to be assigned to the parts of the reconstruction directly based on the drawings and the second dedicated to characterize the parts deduced on hypotheses (figs. 5-8).
The hypothesis of not exceeding, in the three-dimensional modelling, the level of reconstruction permitted by the considered drawings and, therefore, of adopting a visualization style characterized by a level of verisimilitude commensurate with the amount of information contained in the archive drawings, lies at the basis of the definition and application of this parameter and the relative graphic codes.

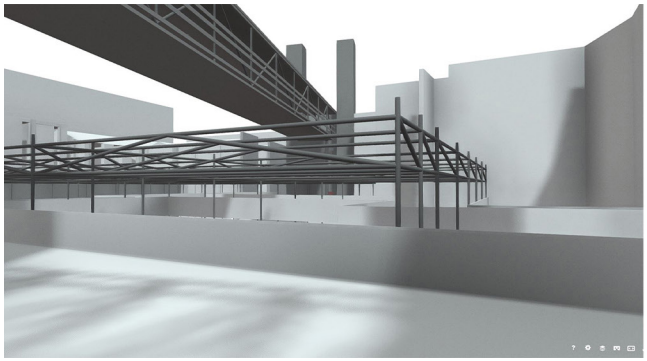
On the accessibility and use of digital products

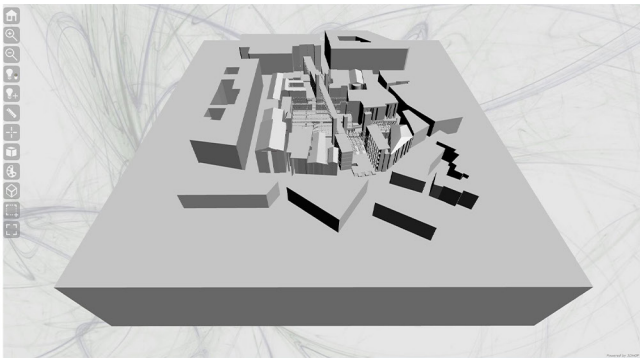
Numerous pilot projects have been implemented in recent years with "Universal Accessibility" [Cetorelli 2018], and the different degrees and types of accessibility are the subjects of continuous experimentation (e.g., the online portal *Cultura Italia* of the Mic, Europeana). Within this theme, experts in drawing are continuously experiencing scientific studies for the fruition of different types of audiences through the production of digitised physical data and the design of cultural experiences that can also predispose new ways of using physical spaces. Unwittingly, an "economy of accessibility" of cultural heritage has been launched, which projects from the local scale to the networked dimension and vice versa, and is

Fig. 10. Spherical panorama with LOR B of the project for the requalification of the Crypta Balbi in Rome, Studio ABDR (1985), MAXXI Archive (graphic elaboration by the authors).

Fig. 11. 3D reconstruction on Sketchfab and 3DHOP platform of the project for the Crypta Balbi in Rome, Studio ABDR (1985), MAXXI Archive (graphic elaboration by the authors).







Output	Simplicity of implementation	Quality of the visualisation	Level of user interaction	Available tools	Main target user
Rendering	•••••	•••••	•	-	Generic
Animation	•••••	•••••	•	-	Generic
360° Panoramas	•••••	•••••	•••	••	Generic
3D - 3DHOP	•••	•••	••••	•••••	Specialized
3D - Sketchfab	•••••	••••	•••••	•••	Generic

Tab. 2. Table summarising the evaluations of the different technologies tested: the higher the grade, the better the result.

declined on two fronts, a real one, on-site, and a virtual one, remotely [Farroni, Tarei 2021].
The creative aspect of content production concerns the concept of reproducibility. The digital product of a physical asset can be understood as an original content of a digital transformation process of the primary source in which, in a dynamic flow, references, memories and cultural contaminations that originated the source coexist. For this reason, a phase of the research was dedicated to the experimentation of technologies that would allow obtaining from the 3D model different digital products able to guarantee various levels of accessibility and fruition of the reconstructions while keeping, where possible, records of the reliability levels of the reconstructions themselves [Scopigno et al. 2017; Statham 2019; Fanini et al. 2021].
The experiments were conducted on the rehabilitation project of the Crypta Balbi (Rome, 1985) by the ABDR firm, described by documentation corresponding to reconstruction level LOR B. The techniques and tools used for the visualisation and sharing of the reconstructions were different: static renderings and dynamic animations, spherical renderings and web platforms for the publication of the 3D model and its fruition without specific software on local devices.
The different types of renderings –static, dynamic and spherical– were realised with software that allows a high control of framing, lighting and definition of material properties [5]. Static (fig. 9) and dynamic renderings represent the minimum level of interaction for the end-user who is guided through partial views of the 3D reconstruction chosen at significant points in the project. The spherical renderings allow for a greater involvement of the user, who can explore the entire space around him by turning his gaze in all directions (fig. 10). The possibility of joining different spherical panoramas in sequence also allows the creation of virtual tours that further increase the level of user interaction, allowing the viewer to choose which direction to take within the 3D model.
In addition to the generation of images from the model, two web platforms for model publication have been experimented with, allowing a high level of user interaction, free to move in and around the reconstructed architecture. The two tested solutions were the commercial platform *Sketchfab* [6] and the open-source tool *3DHOP* [7] developed by ISTI-CNR in Pisa (fig. 11). They allow interactive navigation but have different strengths: Sketchfab has a higher quality of visualisation and broader availability of outputs (VR and AR, the latter only through the mobile app), while *3DHOP* has tools for model interrogation, such as measurement tools, and interactive editing, such as the possibility to place section planes at significant points. The different solutions were evaluated according to several parameters –the simplicity of implementation, quality of the visualisation, level of user interaction, presence of querying/information enrichment tools– and a target user was defined (tab. 2).

Conclusions

The conveying of analogical contents in the digital system with scientific criteria is the challenge that the area of Drawing has to face in the digital transition in the field of architectural archives. The previous paragraphs aim to show the state of the art about the preservation process where the creation of computer systems, industry software, platforms, portals and document management systems has been the focus of research in the field of cultural heritage and, progressively, also in the field of technological development, in order to respond to the strong and rapid demands deriving from the content digitisation and the public and massive use of technologies for research and dissemination. The state of the art of the interpretation processes and access to architectural drawings is also part of the survey. The authors have proposed to include the contribution of the drawing through the theorisation of a unitary conceptual model. The development of digital products is the result of investigation of the methods and technologies used for the elaboration of new descriptive contents that can place the considered image on a scientific level, identifying standardised parameters. The scientific construction of new contents will be an added value to the original source, initiating a new process of knowledge of architectural work and reconnecting different knowledge related to the figurative arts, techniques, economy, culture of places and development of representation tools. Moreover, a process of use of technologies, which are constantly evolving, has started and for this reason the funds will only become richer. The user can be more or less expert, because the contents can be declined in different ways.
This is an open field that concerns digital curators of archives. The first mandatory step for the disciplinary scientific field is understanding that the paths that can be followed by the drawing disciplines in the field of conservation and valorisation of drawings are numerous and on several levels of intervention.

Credits

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Notes

[1] The International Standard for Archival Description was elaborated between 1988 and 1993 by the Ad Hoc Commission on Description Standards of the International Council on Archives (ICA), and revised during the following five years. Based on proposals sent by 25 countries, a second version was elaborated, approved in September 1999 in Stockholm, and made public during the ICA Congress in Seville in September 2000.

[2] The International Standard for Archival Authority Records of Entities, Individuals and Families was drafted between 1993 and 1995 by the Ad Hoc Committee on Descriptive Standards of the International Council on Archives (ICA) and then revised during the four years 2000-2004. Based on the proposals submitted, the second edition was drafted, discussed and approved in Canberra (Australia) in October 2003 and subsequently published and presented at the ICA Congress in Vienna in 2004.

[3] The experiments were performed with *Grasshopp*er in the McNeel *Rhinoceros* 7 software environment.

[4] Experiments were performed with the *Unity Game Engin*e.

[5] The renderings were executed in Maxon *Cinema4D* software environment with *Corona Renderer*.

[6] <https://sketchfab.com> (accessed 20 April 2022).

[7] <https://www.3dhop.net/index.php> (accessed 20 April 2022).

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