DESIGN INTERNATIONAL SERIES

Direction: **Silvia Piardi**

Scientific Board:
Alessandro Biamonti, Ezio Manzini, Carlo Martino,
Francesca Tosi, Mario Piazza, Promil Pande

Over the last few years the international design research network has become an important reality, which has facilitated the sharing of ideas and opinions, improved understanding of the subject and increased awareness of the potential of design in various socio-geographical contexts.

The current expansion of the educational network allows teachers, students, researchers and professionals to meet, both online and in person.

It would seem therefore that the time is now right to propose a new series of books on design, contributing the construction of the international design community, helping authors bring their work onto the world scene.

The Design International series is thus born as a cultural setting for the sharing of ideas and experiences from the different fields of design, a place in which you can discover the wealth and variety of design research, where different hypotheses and different answers present themselves, in an attempt to draw up a map of Italian design, though in a continuous comparison with the world scene.

Different areas of design will be investigated, such as for example: fashion, interior design, graphic design, communication design, product and industrial design, service and social innovation design, interaction design and emotional design.

Books published in this series are selected by the Scientific Board and submitted to two referees for peer-review.

DESIGN RESEARCH IN THE DIGITAL ERA

Opportunities and implications
Notes on Doctoral Research in Design 2020

—

edited by Lucia Rampino and Ilaria Mariani

Contents

5

Digital Transformation

Ethics and social awareness

7

Digital Transformation

From Adriano Olivetti's project:
Eduardo Vittoria. Research, drawing and design.
New methods of representation to enhance
modern architecture

Sara Conte
Department of Design, Politecnico di Milano

Abstract

The research develops in the disciplinary field of drawing and representation. The workflow experiments the use of info-graphic BIM-oriented software and parametric models as a tool to preserve, communicate and enhance modern architecture and its historical documents in the museum and archival sector. The main objective is the integrated digitization of an architecture and its archive documents from the executive drawings, making the three-dimensional parametric model an interface for heterogeneous data. At the same time the model allows the virtual reunification of archived documents and facilitates the research, providing an overview of the design process, strengthening the system of document collections and introducing possible new archiving methodologies. Specifically, the thesis proposes the enhancement of the cultural heritage left by Adriano Olivetti and his company to the city of Ivrea through the work of Eduardo Vittoria, one of the most representative designers employed by Olivetti but less popular than other authors. The subject of the digitalization project is one of his most symbolic buildings designed for the company: the 'Centro Studi ed Esperienze' built in 1954.

Theoretical and critical background, design context and research objectives

The thesis, which develops in the disciplinary field of design and representation, focuses on the study of the Information and Communication Technology (ICT) tools and their relationship with design process. These tools can be defined as all the technologies that allow to process and communicate

information through digital media. They intervene methodologically in the construction and representation of the project. Specifically, the research investigates the possibility of using the info-representative Building Information Modelling (BIM) systems, created for the design and construction of new buildings but which have already been used in the field of restoration as a tool for the conservation, consultation and communication of architecture and its materials in the museum and archival field.

The BIM-oriented applications are one of the most interesting technologies developed in the field of computer-aided design. They are based on three-dimensional parametric modelling, which uses a relational database combined with a three-dimensional geometric model to process and represent information about buildings. These software connect different types of information and documents to the geometry of every building and real parts of an architecture, and allow the construction of three-dimensional informative models or visual databases in continuous updating. The virtual models that have already been produced become navigable and queryable hypertexts, potentially able to relate the architecture to its iconographic materials. The opportunity for testing with this methodological approach in the conservative, expositive and communicative logic of modern architecture and its documentation was offered by the need to enhance the cultural and building heritage left by Adriano Olivetti and his company to the city of Ivrea.

To fully understand the importance of the Olivetti company in the development of the modern project, we should start from its foundation, when the basis was provided for what will be recognized in the world as 'Olivetti style' and to become an ethical enterprise capable of generating social, cultural and human development. Since 1908 the Eporedian company, the first Italian factory of typewriters, led by its founder, Engineer Camillo Olivetti, has been characterized by constant attention to research and innovation, not only applied to the field of industrial production. The company gradually gained national and international credibility and success with its policy of relentless technological and aesthetic product development on a commercial network of monobrand stores, and by relying on avant-garde art forms for the transmission of the advertising message. From the onset, these factors, which were innovative at the time, remained constants during all the development phases of the company, and were combined with actions and protective tools in order to support and facilitate human work and lifestyle. These *social welfare* aspects were systematically applied under the factory management of Camillo's son, Adriano Olivetti.

It was under Adriano's leadership that the role of design as a fundamental tool for the transformation of reality was concretized within the industrial

setting. Starting from the 1930s, he became so interested in E. Persico's idea of architecture with a moral purpose that he said, in the article *Architettura al servizio del sociale* published in the magazine *Casabella,* "sia compito degli imprenditori e dei progettisti affrontare il tema delle relazioni tra industria, lavoratori e luoghi che vengono a modificarsi con il consolidamento della società industriale. Questo atteggiamento deve quindi dar forma a un'architettura pensata come un servizio sociale atto a trasformare un processo economico in uno sociale"[1] (Olivetti, 1936, pp. 4-5 orig. ed.). According to the entrepreneur, "il tentativo continuo e permanente di vedere più avanti del momento che si sta vivendo"[2] (Vittoria, 1988, p. 162 orig. ed.) in the field of architecture and urban planning must follow continuous research and innovation in the field of product. This led the company to have no rivals on the market in the Fifties. These characteristics combined with industrial theories, liberal and social thoughts developed by the entrepreneur during his life, established an ethical industry, capable of generating not only profit but also economic and cultural value for the territory and the community in which it is located.

This translates concretely both in designing innovative products that facilitate human work and in projects and architectures that improve the quality of life. In order to achieve this goal, Adriano Olivetti did not rely on a single designer but invited sociologists, artists, philosophers, young architects, designers and urban planners to Ivrea, asking them for "strutture architettoniche, organizzazione degli ambienti e del territorio capaci di far coesistere bellezza formale e funzionalità, miglioramento delle condizioni di lavoro nell'impresa e della qualità di vita fuori dall'impresa"[3] (Olivetti, 2015). Between the 1930s and the late 1950s, the entrepreneur implemented a global design process based on the relationship between industry, man and territory. It led to the construction of new districts and modern residential and social buildings, to the development of research on modern living and to the construction of productive buildings, which respond to the new work organization systems proposed by the company. These are places that recognize human dignity at work and enhance individual protection. Starting

[1] It is the task of entrepreneurs and designers to address the issue of relationships between industry, workers and places that change with the consolidation of the industrial society. This attitude must, therefore, give shape to an architecture designed as a social service capable of transforming an economic process into a social one.

[2] A continuous and constant effort to think beyond the living moment.

[3] Architectural structures, organization of the environment and the territory capable of ensuring the coexistence of formal beauty and functionality, improving working conditions in the company and quality of life outside the company.

from 1932 a series of productive buildings, functional to the life of the industry, joined the original red brick building designed by the founder Camillo in 1895, the historical headquarters of the company. These buildings made in different styles by different authors but showing a modern rationalist efficiency marked the renewal of the Olivetti image. Four extensions of the *ICO* plant implemented by Luigi Figini and Gino Pollini, the *Falegnameria* by Ottavio Cascio, the *Centro Studi e Esperienze*, the *Officina H* and the *Centrale Termica* by Eduardo Vittoria, are just some of the buildings that still characterize the road and productive axis *Viale Jervis*. As mentioned, renovation works were not limited to the design of industrial buildings in this area. Social structures afferent to the factory but open and functional to the community were built, such as the *Mensa-Dopo Lavoro* of Ignazio Gardella, the building *Servizi Sociali* by Figini and Pollini, in addition to the first two residential districts. Then the socio-residential experiments were extended to the whole area of Ivrea and Canavese, where the development of the company and its choices designed a large urban and industrial territory, to all locations of corporate branches situated in other parts of Italy and in the world, and to places which are the object of the political and urban initiatives conducted by Adriano himself as President of the INU[4].

In the latter half of the 1980s, after the death of the entrepreneur in 1960 and during a time of corporate reorganization, the need arose to preserve and enhance the cultural heritage of both the company and the family, which was about to be lost due to the slow decline of productive activities. The *Associazione Archivio Storico Olivetti*, *AASO*, was established with this purpose, and since its foundation promoted a series of initiatives starting from the systematic collection of the documentary material produced by the industry during the years of activity and that related to it. Together with the documentation cataloguing the AASO, in collaboration with a research group, a programme developed in two phases for the preservation and enhancement of the buildings constructed by the company began in 1996 (Bonifazio, Giacopelli, 2007). They are a collection of the architectural solutions implemented in Ivrea, and faithfully represent the uniqueness and values of Olivetti's project, and the complexity of Italian architecture during that period. The preliminary aim was to quantify the existing building stock, attribute the design, verify the conditions and start a preservation and restoration process. The research led to the cataloguing of nearly 237 buildings in Ivrea and its surroundings, and to the opening, in 2001, of *Museo a cielo Aperto dell'Ar-*

[4] Adriano Olivetti has been President of the INU since 1950, and Director of IRUR and UNRRA-Casas since 1954. These positions were maintained until his untimely death in 1960.

chitettura Moderna, the MAAM: a medium to spread the knowledge, the enhancement and the communication of the Eporedian heritage (Bonifazio and Scrivano, 2001). After a long process, Olivetti's works linked by the museum and the thought, which underpinned their creation, were recognized by UNESCO, and the site was added to the World Heritage List as "Industrial City of the 20th Century" on July 1, 2018.

The proposed research focuses on the heritage protected by *MAAM*, and today also by *UNESCO*, which consists of both a material part, all those architectures that characterize the city of Ivrea, and also the relative documentation preserved in the company's historical archive (fig. 1).

Fig. 1 – Location of the architectures that from 1 July 2018 are UNESCO heritage: "Ivrea, industrial city of the twentieth century".

The architectural heritage in its material condition is the most evident but at the same time most fragile object of the design process and of the cultural and social system that led to its implementation. The buildings narrate their present and the place where they are located, often revealing complex situations and contexts. Especially in the framework of modern and contemporary architecture, buildings are conditioned by the events of their properties, the dynamics of technological development and the economic and urban developments of the territory in which they are located. Despite

129

the rules[5] developed during the definition of the MAAM, even in the Ivrea case the disposal of most of the productive and organizational activities of the company have caused the heaviest transformations in the architectural heritage. Many buildings have been transformed to adapt them to new and more limited functions, others have been surrendered and reconverted, and yet others, long since abandoned, are in a poor state of conservation. Most of the works are inaccessible and the exhibition path of the museum reveals some criticalities caused by traditional infographic media that do not support the interaction between the user and the building, and do not allow personalization of the visit.
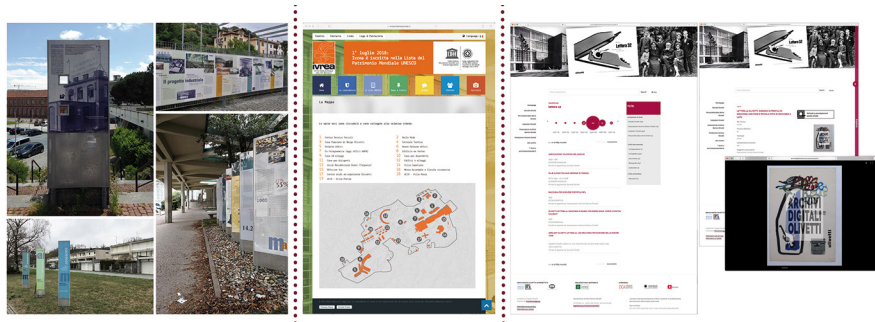
Fig. 2 – In order from the left: views of the museum itinerary, the site to diffuse news about the heritage of Ivrea, "Archivi Digitali" site that through a nominal search and temporal filters allows access to some digital content. These enhancement methods are not mutually connected.

The documentary part and in particular the drawings, place of the conceptual and design process of a building, and the documentation of the archive instead tell about the past of a building. Preparatory sketches, maquettes, executive drawings, photographs, correspondence between clients and designers, and personal diaries testify through fragments the contents and meanings of the work itself. This documentation, which finds an initial form of enhancement in academic research and publishing, is protected and preserved in Italy, unlike in other countries, by small entities and institutions spread over the territory. Despite the shortcomings caused by a late recovery, Olivetti's material has a remarkable quantitative and qualitative consistency,

[5] "Normativa per gli interventi sugli edifici e le aree pertinenziali dei beni tipologici costruttivi e decorativi della città d'Ivrea" is drafted to Article 2.4 of Regional Law 35/95, and was completed and approved in 2000. This identifies the intervention criteria on each building or category of building, and represents the first stage of protection and safeguarding for the recorded and listed heritage in the area of Ivrea. Today this legislation is adopted as Building Construction Regulation.

and represents an irreplaceable tool of investigation of the complex architectural heritage. The archive, preserved in Villa Casana, Ivrea, comprises many collections, such as the Olivetti company, family and many associations of former employees, and has different mediums and typologies. Not all the documentation relating to these works is kept in the company's archive. Sketches, design hypotheses and study models are, however, collected in the author's personal archive, thus promoting the preservation of the unified designer's archive, not the building's. We find such an example in Figini and Pollini's work, whose documents are filed in the *Archivio del Novecento* at Mart Museum in Rovereto. Today's framework of the archival system, the fragmentation of the preserved documentary heritage which, in fact, determines the present order of the Italian archival system, and the lack of use of consistent organizational standards among them involve a series of critical issues that hinder the integrated reading of the architectural work and its documentation (fig. 2).

In recent years, the introduction of computer methodologies to the archival and museum sector has been mainly involved in simplifying interaction between the work and the user, often making it easier to immediately access data, and allowing the user to customize the visit depending on his level of interest or expertise. In a scenario that witnesses the increasing use of ICT in the museum and archival fields, in addition to being a tool in the design area, the research proposes the use of BIM-oriented applications and parametric models generated with them as a document archiving system and as a tool for communication and enhancement of modern architecture. The main objective is integrated digitization of the architecture and its documents produced from the project drawings, making the three-dimensional parametric model a container and interface for heterogeneous data. At the same time the model, capable of bringing together virtually archived documents, which are physically preserved in places even distant from each other, can become the content of traditional or virtual museums in an attempt to overcome the inherent difficulties in the exposition of architecture on the one hand, and in the transmission process of the underlying cultural contents of architecture to heterogeneous users on the other.

Methodology and focus of the research

The dual field project developed within the research, the info-representative BIM-oriented system and Olivetti design process, were analysed using the register methodology that led to the creation of databases, thanks to

which parameters have been identified in order to compare different data types with a cross-reading system. The main applications were recorded and studied within the BIM-oriented system field, introducing the technical features as discriminating parameters with the aim of identifying the most suitable one for the experiment. Some of the key features are compatibility with existing digital two-dimensional drawing and three-dimensional modelling applications, the possibility of use with multiple operating systems, ability to connect different types of computer data, the existence of proprietary applications for intuitive navigation of the model and the predisposition to augmented or immersive reality.

At first the extreme variety of Olivetti's design process made it necessary to catalogue the production with the primary objective of identifying a timeframe to limit the area for the research of the case study suitable for experimentation. The preliminary action was a thematic subdivision of activities, which resulted in the identification of five sectors: design, architecture, urban planning, publishing and promotional activities, graphics and advertising. This first classification evidenced relationships between the different design fields, identifying as meaningful for the register[6] only the sectors of design, architecture and urban planning, in view of the subject matter and the specific subject of the research. A classification system was established for the different sectors, taking into account the specific factors of each of them and the common ones to allow a comparison. This operation led to the creation of different typological databases later visualized through temporal lines. The design sectors of architecture and urban planning were brought together in a single register, subdivided later into two distinct schemes for better readability of data: the first one gathers Olivetti's presence in the world, the second Olivetti's presence in Italy.

The cross-reading between the database dedicated to the products produced by the company and that of the architecture, narrowed typologically to the only Italian and worldwide industrial building, highlighted a period of intense development delimited by two discontinuities: the first one in 1950, which identifies a productive change within the company, and the second one in 1964, which identifies an administrative-corporate one (fig. 3).

The selection of this timeframe, defined as the period of corporate expansion, and a further geographical selection, carried out through the architecture and urban planning sectors' register, allowed to circumscribe the focus

[6] The general register takes into account from the establishment of the company in 1908 until the definitive change of ownership in 1999.

of research. Then, a systematic analysis of the designers and their projects was performed, identifying in the Neapolitan architect and designer Eduardo Vittoria the most representative author of Olivetti's design activity and the main interlocutor for Adriano Olivetti's architecture in the period considered.

During this period the author designed twenty-nine projects for Olivetti, including detached villas, residential buildings, a community centre, two thermal power plants, experimental and agricultural laboratories, the company's first branch in San Bernardo d'Ivrea and then, together with Marco Zanuso, the main Olivetti production campus in Italy. He is the main protagonist, with Ludovico Quaroni, of the experience of *Comunità* in the relationship between landscape and architecture. He designed flexible structures for the company, which required a continuous transformability of its production sites, integrating in his work technology and interpretation of the surrounding environment. He was the one who, better than any other, gave a visible and working form to the entrepreneur's thought by experimenting with innovative solutions and forms, consistently with the construction process.

To define the case study within Vittoria's design activity, the building's belonging to the industrial typology, the *MAAM* museum area and the construction process used to design it were introduced as key parameters. This allowed to identify the first project for Olivetti as a trial, implemented when Vittoria was still very young and possessed the relative experience for which he was called by Adriano himself to Ivrea.
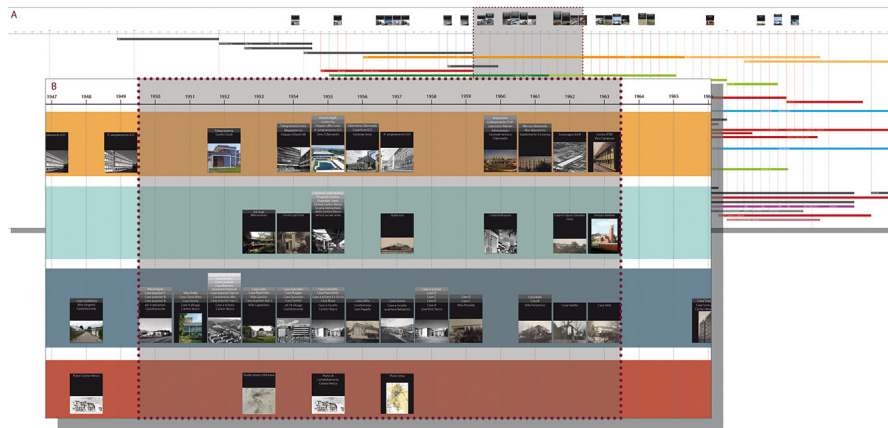

Fig. 3 – Register of Olivetti products compared to all the company's branches (A) highlights a range of time between 1950 and 1964, the period of expansion of the company. The buildings built in Ivrea (B) in this timeframe were analyzed and the case study was found.
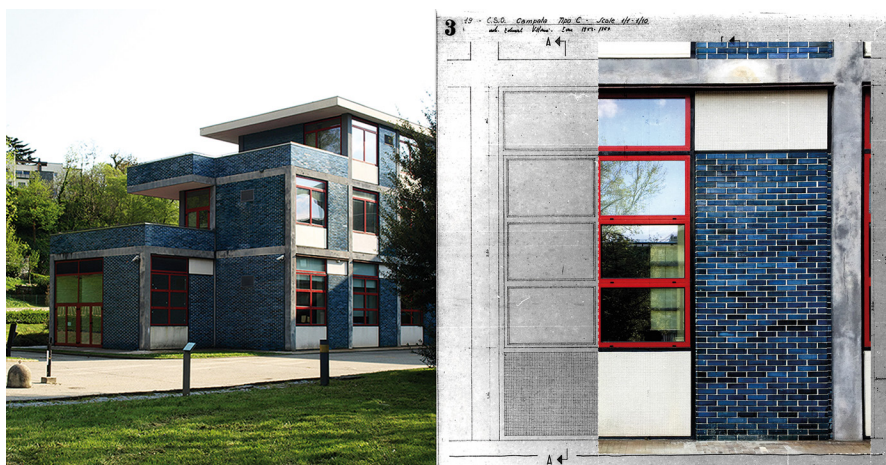
Fig. 4 – From the left, view of one of the 4 wings of the building, comparison between the photo-rectification and the executive drawing of the type c module.

The *Centro Studi ed Esperienze* of 1952-1954 was the first building built in a perspective of functional decentralization of the company, and had a high symbolic value for company. It mirrored the corporate image in the world as the place of design and prototyping of all future Olivetti products. With this building and by experimenting with shape and colour, Vittoria broke the rationalist scheme of buildings built up until then in Ivrea. It introduced an organic spatial articulation and expressed the author's architectural poetry of continuous research and rejection of previously established patterns. The building was not far from the *Officine Ico*, and was expanded for the first time in 1965 by Ottavio Cascio. In the 2000s, the interior spaces and the curtain wall were renovated by studio Sottsass to host the Interaction Design Institut d'Ivrea. Today it is an integral part of the *MAAM* museum itinerary, and is protected by UNESCO, although it is not accessible (fig. 4).

The analysis of bibliographical sources referred to the author and the archival search at the Olivetti archive initially allowed to collect and study only the executive drawings related to the building and some historical images. Research and publication activities carried out during the doctoral years helped to re-discover Vittoria's unpublished drawings, projects, photographs and writings from two separate collections preserved at the *Dipartimento di Architettura Univerisità Federico II*, Naples, since late 2017. The first collection, preserved for a long time by Prof. Giovanni Guazzo, former Dean of the *Facoltà di Architettura e Disegno industriale* of Ascoli Piceno founded by Vittoria and his historical collaborator, collects projects implemented

I FASE

BIBLIOGRAFIA
- Comunità, n.69
- L'architettura. Cronache e storia, n.4
- L'architettura. Cronache e storia, n.39
- L'architecture d'aujourd'hui, n.69
- Zodiac, n.5
- Eduardo Vittoria. L'utopia come laboratorio sperimentale

ARCHIVIO OLIVETTI IVREA
- 90 disegni esecutivi, su microfilm dal 1988
- 10 fotografie esterni, stampa, bianco e nero
- 15 fotografie interni, stampa, bianco e nero

CATALOGAZIONE/DATI

II FASE

VERIFICA
- Restituzione bidimensionale
- Analisi planimetrica
- Rilievo qualitativo
- No rilievo strumentale, indisponibilità edificio
- Pianificazione della modellazione parametrica

III FASE

MODELLAZIONE
- Scelta software
- Scelta dei disegni d'archivio
- Modellazione parametrica Modulo C
- Configurazione Cloud
- Collegamento ai disegni

IV FASE

ARCHIVIO VITTORIA NAPOLI
- 90 disegni esecutivi, eliocopie
- 6 disegni progetto I versione, prospetti e piante, matita su lucido
- 2 assonometrie, matita su lucido
- 5 prospettive interni, matita su lucido
- 8 prospettive esterni, matita su lucido
- 15 schemi di progetto, matita e china su carta

CATALOGAZIONE/DATI

V FASE

CONDIVISIONE
- Esportazione attraverso BimX
- Utilizzo portable device
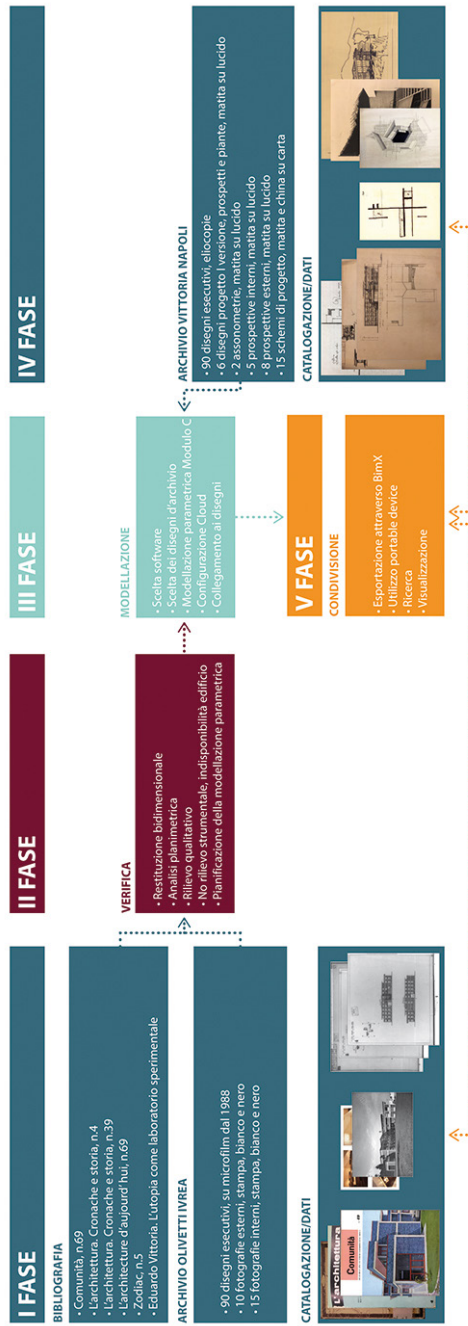- Ricerca
- Visualizzazione

Fig. 5 – The testing phase.

during the years of training and of partnership with Olivetti, and those from professional studies in Milan and Rome in the 1960s and 1970s. The second collection comes from the architect's private studios in Rome and Capri, and collects, in addition to writings and annotations, a series of sketches related to his architectures and to architectures considered exemplary by him. Above all, these collections comprehensively relate the architect's cultural context and design process; in particular, the drawings concerning the Centro Studi ed Esperienze, mostly unpublished, highlight the design and construction process split into its architectural elements, and are essential sources to understand Vittoria's production in the Olivetti period and in the subsequent ones.

The research activity has brought to light a vast and significant documental heritage present throughout Italy and hard to converge, unless virtually.

The trial process was divided into five phases, which can be grouped into an analytical-cognitive macro-phase and a simulation one (fig. 5). In the first phase, all the information, derived from the rare bibliography available on the building, and drawings and images, kept at AASO, were collected and catalogued. The trial continued with a check of the data collected, through a two-dimensional drawing of the plan, which allowed to study the building's spatial composition and to compare it against the existing building only with a qualitative survey, given the partial accessibility of the building.
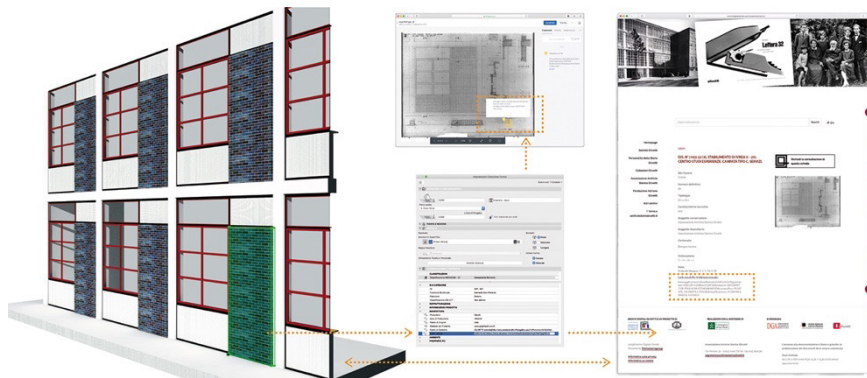
Fig. 6 – The relationship between the model and analogue design is bidirectional. It allows to make the model accessible from the catalogue cards and the reverse, for a quicker and more immediate archival research.

The third phase deals with the process of reconstruction and insertion of catalogued data of a curtain-wall module of the building, to verify the correctness of the methodological process, and then extended to the entire building. In addition to standard information, such as dimensions, positions, function

and material, the information sheets of each construction element within the model were integrated with the archival classification and the digital location of iconographic documents related to the elements; furthermore, sheets were customized with other external contents, such as links connecting the object to the Web (fig. 6). This made it possible to connect every virtual element to the corresponding archive documentation previously digitized and stored in the cloud. The process can be implemented with possible documentation from other archives or users.

The fourth phase, which coincides with the re-discovery of Vittoria's archives, provided for a new data collection and cataloguing process, with the aim of also linking these documents with the relative geometry. The accessibility of the model created was finally tested in the archival and museum sector with the BIMX application that allows virtual navigation of the building through a simple and intuitive interface, to access archive data from their virtual image and vice versa. It has also experienced the predisposition to virtual and augmented reality, which makes these virtual models a useful tool to enhance and communicate the architecture both in the real and virtual museum exhibition (fig.7).
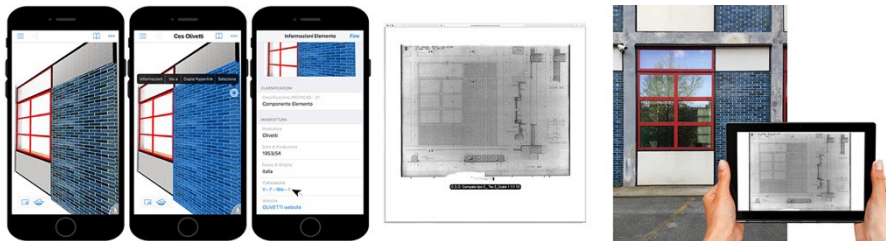

Fig. 7 –Example of use of the 3D model in portable devices.

Research findings and possible outcomes

The research shows how parametric modelling, applied in archival and museum sectors, can help to communicate the architecture to users with different skills. The characteristic of being a three-dimensional database favours reunification into a digital *unicum* of archival data related to an architectural work, making the virtual collection continuously expandable. This enhances the meanings of the archival collections and amplifies the possibilities of accessing them by introducing the concept of the archival unit related to the architecture and not to the designer who designed it. In addition, as a

result of the immediacy of the three-dimensional representation, the model allows innovative, different and easier access to the archival research, adding a visual one to the traditional one. The intuitive virtual representation, the pictures and audiovisual document facilitate interaction between visitor and architecture, and become an important tool to recognize inaccessible or transformed place.

The virtual reality, conveyed by the parametric model, makes the coexistence and the integration of the digital and analogue medium possible, allowing to customize a museum itinerary, either physical or virtual, according to the skills and the degree of experience or interest of the users.

The model thus acquires the double value of container of archival documents and of content of a museum collection, overcoming the dichotomy that exists between the representation and the object of the representation. The model becomes a tool potentially able to relate architecture museums and design archives, solving some critical issues associated with the complexity of the architecture. In this specific case, the Olivetti heritage in its entirety, a tangible example of experimentation carried out in the '30s and the' 60s by leading Italian and non-Italian architects on the theme of residential, social and work places, can become the object of a new experience conveyed by ICT through a more direct relationship between the reality of architecture and the virtual nature of the project.

The typological registers of the Olivetti design process, one of the first results of the research and, particularly, their graphical representations, lay the foundations for a future project of reordering and visualization of data, remaining open to the introduction of possible new information from various bodies and of new forms of communication.

The Vittoria archive and the drawings preserved there, which are another outcome of the research, enabled to validate the use of BIM-oriented systems as a tool capable of virtually reunifying material related to an architectural work and kept in mutually distant archives.

Mostly, the study of these unpublished collections, made possible by Prof. Massimo Perriccioli and Prof. Pietro Nunziante, has allowed to develop important initial considerations on the meaning of the drawing in Vittoria's design process, and on the sequence of his production during the early years in Ivrea (Conte and Rossi, 2019). The study has also allowed to spread the work of one of the most important designers in the Italian scene, one who is still little valued to date.

This opens new possible research scenarios focused on completing the analysis of the author's design activity carried out for Olivetti, cataloguing the entire Vittoria archive and enhancing it in the future.

References

Bonifazio, P. and Giacopelli, E. (Eds.) (2007). *Il paesaggio futuro. Letture e norme per il patrimonio dell'architettura moderna a Ivrea*. Torino, Italy: Allemandi.

Bonifazio, P. and Scrivano, P. (2001). *Olivetti costruisce: architettura moderna a Ivrea: guida al Museo a cielo aperto*. Milano, Italy: Skira.

Conte, S. (2018a). *Un modello tridimensionale per la conoscenza e la valorizzazione dei documenti d'archivio: il Centro Studi ed Esperienze d'Ivrea,* in Salerno R. (Eds.), *Rappresentazione materiale/immateriale – Drawing as (in) tangible.* Roma, Italy: Gangemi, pp. 1067-1074.

Conte, S. (2018b). Il colore nella cittadella razionalista di Ivrea: l'opera di Eduardo Vittoria. In Marchiafava, V. and Valan, F. (Eds.). *Colore e Colorimetria Contributi Multidisciplinari" Vol. XIV A*. Milano, Italia: Associazione Italia Colore, pp.139-150.

Conte, S. and Rossi, M. (2019a). *Il modello BIM per la valorizzazione dell'architettura moderna. Il caso Olivetti/Bim model for enhanching modern architecture. Olivetti's case*, in Empler, T. and Fusinetti, A. (Eds.), *3D MODELING & BIM. Modelli e soluzioni per la digitalizzazione*. Roma, Italy: Dei, pp. 30-45.

Conte, S. and Rossi, M. (2019b). *Il disegno di Eduardo Vittoria tra progetto e costruzione. Il Centro Studi Olivetti a Ivrea. The drawing of Eduardo Vittoria between design and construction. The "Centro Studi Olivetti" in Ivrea.* In Paolo, B. (Ed.). *Riflessioni: l'arte del disegno/il disegno dell'arte / Reflections: the art of drawing/the drawing of art*. Roma, Italy: Gangemi.

Eastman, C. (1999). *Building Product Models: Computer Environments Supporting Design and Construction.* New York, NY: CRC Press LLC.

Giacopelli, E., 2005. *Ivrea: museo a cielo aperto dell'architettura moderna*. In Fascia, F. (Ed.), *Museums Merely buildings for culture?* Atti del International Symposium, Napoli 13-15 ottobre 2005. Napoli, Italy: Luciano Editore, pp. 93-103.

Guazzo, G., (Ed.) (1995), *Eduardo Vittoria. L'utopia come laboratorio sperimentale*, Roma, Italy: Gangemi.

Guiducci, R. (1959). Eduardo Vittoria. *Zodiac*, *5*, novembre 1959, pp. 183-188

Musatti, R. (1955) Centro studi della Olivetti a Ivrea, architetto Eduardo Vittoria. *L'architettura. Cronache e storia, 4*, novembre-dicembre 1955, pp. 484-495.

Musatti, R., Bigiaretti, L. and Soavi, G. (Eds.) (1958). *Olivetti: 1908-1958*. Ivrea, Italy: C. Olivetti & C.

Nunziante, P., and Perriccioli, M. (Eds) (2018). *Eduardo Vittoria. Studi Ricerche Progetti*. Napoli, Italy: Clean Edizioni.

Olivetti, A. (1936). Architettura al servizio del sociale. *Casabella, XIV,* 101, 4–5.

Olivetti, A. (2015). *Città dell'uomo*, Ivrea/Roma, Italy: Edizioni di Comunità.

Pacchioli, E. (1998). *L'archivio storico Olivetti.* Ivrea, Italy: Ivrea: Associazione archivio storico Olivetti.

Sacks, R., Eastman, C., and Lee, G. (Eds.) (2018). *BIM Handbook. A guide to Building Information Modeling for Owners, Designers, Engineers, Contractors, and Facility managers*. Canada: Wiley, pp. 228-245.

Saphira, N. H. and Zorzi, R. (Eds.) (1983) *Design process: Olivetti, 1908-1983.* Ivrea, Italy: Ed. Olivetti.

Tentori, F. (1959). Profili di architetti: Eduardo Vittoria. *Comunità, 69,* aprile 1959, pp. 53-58.

Vittoria, E. (1956-57). Centre de recerches Ivrea. Italie. *L'architecture d'aujourd' hui, 69*, dicembre-gennaio 1956-57, pp. 98-99.

Vittoria, E. (1988). *Adriano Olivetti e la cultura del progetto*, in: Fabbri, M., and Greco, A. (Eds.), *La comunità* concreta: progetto e immagine. Ivrea, Italy: Quaderni della Fondazione Comunità.