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*Original*

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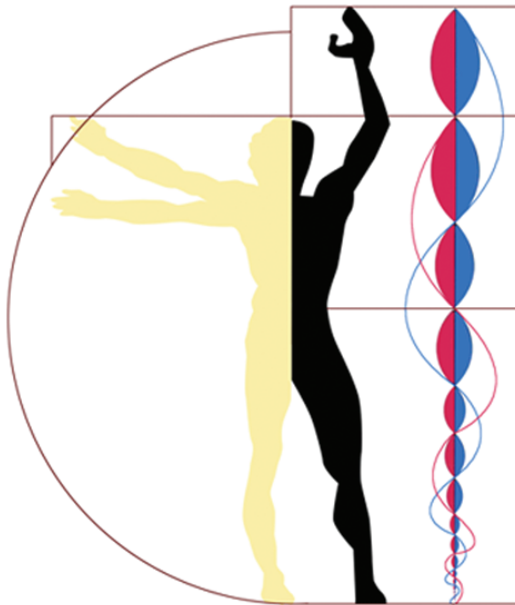
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Fabbrica della Conoscenza

XIII Forum Internazionale di Studi

Le Vie dei  
Mercanti

Carmine Gambardella



# HERITAGE and TECHNOLOGY

Mind Knowledge Experience



**Fabbrica della Conoscenza numero 56**  
Collana fondata e diretta da Carmine Gambardella

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**HERITAGE and TECHNOLOGY  
Mind Knowledge Experience**

Le Vie dei Mercanti \_ XIII Forum Internazionale di Studi

Carmine Gambardella

## HERITAGE and TECHNOLOGY

### Mind Knowledge Experience

Le Vie dei Mercanti

XIII Forum Internazionale di Studi

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### Progetto CAMPUS Pompei

Il Progetto "Ecoturismo urbano per la fruizione sostenibile dei Beni Culturali in Campania", in attuazione degli Obiettivi Operativi 2.1 e 2.2 del Programma Operativo FESR Campania 2007/2013 per la realizzazione e/o il potenziamento, nel territorio della regione, di forti concentrazioni di competenze scientifico tecnologiche, di alto potenziale innovativo, intende favorire la concentrazione di competenze scientifico-tecnologiche finalizzata a rafforzare la competitività dei sistemi locali e delle filiere produttive regionali non solo nei settori dei servizi associati al turismo e beni culturali ma anche in settori ad altissima tecnologia che possano rappresentare una svolta tecnologica e culturale all'approccio innovativo per lo Sviluppo sostenibile in aree ad altissima vocazione turistica.

*Conference topics:*

**Heritage**  
**Tangible and intangible dimensions**  
**History**  
**Culture**  
**Collective Identity**  
**Memory**  
**Documentation**  
**Management**  
**Communication for Cultural Heritage**  
**Architecture**  
**Surveying**  
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**Modelling**  
**Data Integration**  
**Technology Platforms**  
**Analysis**  
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**Safety**  
**Resilience**  
**Transformation Projects**  
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**Materials**  
**Cultural landscapes**  
**Territorial Surveying**  
**Landscape Projects**  
**Environmental Monitoring**  
**Government of the Territory**  
**Sustainable Development**





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**Peer review**

Scholars has been invited to submit researches on theoretical and methodological aspects related to Heritage and Technology, and show real applications and experiences carried out on this themes.

Based on blind peer review, abstracts has been accepted, conditionally accepted, or rejected.

Authors of accepted and conditionally accepted papers has been invited to submit full papers. These has been again peer-reviewed and selected for the oral session and publication, or only for the publication in the conference proceedings.

**Conference report**

357 abstracts received from:

Albania, Argentina, Australia, Benin, Brazil, Bulgaria, Canada, Croatia, Egypt, France, Greece, Iraq, Israel, Italy, Japan, Latvia, Malta, Mexico, Norway, Poland, Portugal, P.R. China, Russia, Slovakia, Spain, Turkey, United Kingdom, USA.

More than 500 authors involved.

291 papers published.

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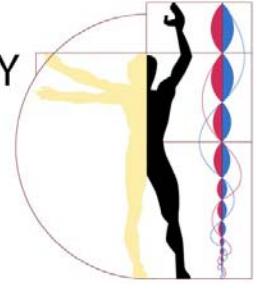
## **Preface**

The theme of the thirteenth Forum “Le Vie dei Mercanti” aims to investigate the complex relationship that develops between technological innovation, knowledge, enjoyment and protection of cultural heritage and the landscape. This leads to the need for an international multidisciplinary comparison in order to explore the questions and issues that are being debated not only in academia, but also among those who govern, manage and control Public Administrations, Institutions and businesses.

The subtitle specifies the macro areas: Mind, intended as both speculative thought as well as the preparation of a methodological process; the subject who investigates, establishes an inescapable destiny with the object analyzed at different scales of analysis, from the architectural structure and design, to the infrastructure and the landscape; Knowledge, as the historicizing of the state of the art reached by the disciplinary skills, integrated with those of material culture, humus generative of innovation for the formation of a human capital that continues to grow; Experience, the representation and sharing of results obtained with good practices, exemplary and paradigmatic, as patrimonial value for humanity to achieve a better quality of life and places created working with Art.

The conference is open to multidisciplinary experiences on one or more of the proposed themes. Scholars are invited to present research on either the theoretical and methodological aspects or concrete applications carried out on these issues.

*Carminé Gambardella*



## Contemporary design drawings as cultural heritage: interpretation and communication. Towards a digital archive of Rosani's industrial projects.

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### Abstract

Contemporary design drawings represent an immense and quite complex cultural heritage to be interpreted, communicated, preserved and publicised. Digital technologies - and the convergence they provide - have much to offer, for example in safeguarding the iconographic heritage ascribed to the field of so-called minor architecture, otherwise in danger of oblivion.

Among the prerogatives of digital representation, archive drawings could be used to create models, animations and dynamic interactive exploration tools, which could then be applied to selected examples. This methodology would allow us to reconstruct different design hypotheses, to break down buildings into thematic interpretations and to provide access to otherwise inaccessible buildings.

This essay intends to develop these considerations and to propose applications for digital technologies in relation to the Rosani Industrial Architecture Studio Archive, our case study. The Rosani Architecture Studio was founded by Nino Rosani, who received his training in the technical department of the Lancia automobile company in Turin, and later taken over by his son Paolo.

In continuity with Nino's prior experience, the studio was mainly involved in projects for major and medium-sized industries based in Italy and abroad. It obtained prestigious assignments and collaborated with several masters of contemporary architecture, such as Giò Ponti on the design of Lancia Office Building in Turin (1954-'57).

**Keywords:** 3D modeling, digital animation, design drawings, digital archive, Rosani's archive

### 1. Introduction (Roberta Spallone)

Architectural design archives of the 20th century are probably the latest and the hugest collections of architectural documents on paper. Their conservation depends largely on the discovery, analysis, comprehension and interpretation of their value as a useful heritage to understand the historical-architectural period in which they arose and to preserve their memory.

Knowledge is so the motive to their safeguard, study and communication.

Archives produced by great masters of the XX century are usually digitized: their drawings on paper are shared in the web at scholars' disposal, although the limits due to the low quality of photo-reproduction and visualization, to the shortage of tools of digital archives for measure and scale, and to the lacking standardization of metadata. In case that archives were produced by the so-called "minor" architects, even economic reasons related to the preservation and the dissemination become often unchallengeable. In this way, too many drawings – as in the case-study of this paper, risk the oblivion because they are unknown, usually roughly catalogued, lost in storages in public and private institutes, like the case-study of this paper, which consists of 138 linear meters of documents (as stated by the *Sistema Informativo Unificato delle Soprintendenze Archivistiche SIUSA*), guarded in the Laboratorio Beni Culturali (Cultural Heritage Laboratory) at the Politecnico di Torino.

Doing choices up against such hefty collections is essential regarding projects to be enhanced, contriving a real narrative process that could reveal the interpretation of the architect's work in its entirety by an accurate exam of the sources. Such enhancement could take advantage firstly of the graphical analysis tools towards a deeper knowledge of geometrical, proportional and modular matrices of the projected building, secondarily of the three dimensional modeling as opportunity of synthesis and geometrical, architectural and thematic interpretation. Furthermore, the possibility to create itineraries around and inside the virtual model or, even more, to allow users free explorations could give fresh views of the object.

The digital reconstruction could be referred to works considered emblematic or exemplar within the architects' activity, or to buildings that have been demolished, transformed or unfaithfully realized in comparison with the original design idea, even to inaccessible structures because of their use – in the case of industrial buildings such problem is particularly considerable. The different morphological hypothesis regarding previous phases of executive processing could be evaluated and explored, even contemplating their territorial impact.

The case study and digital strategies for its conservation, interpretation and communication are the subject of the PhD thesis by Francesca Paluan, supervised by prof. Roberta Spallone and prof. Chiara Aghemo.

## 2. The state-of-the-art: digital archives (Francesca Paluan)

Archives created by architects and engineers since the 20<sup>th</sup> century are unique and significant sources for scientific research, in relation with multiple disciplines: history of architecture and representation, conservation, urbanism and landscape. If they are considered from the strict archival point of view, they belong to the wide category of private and professional archives, upon which the Archival Superintendences apply protection and safeguard activities.

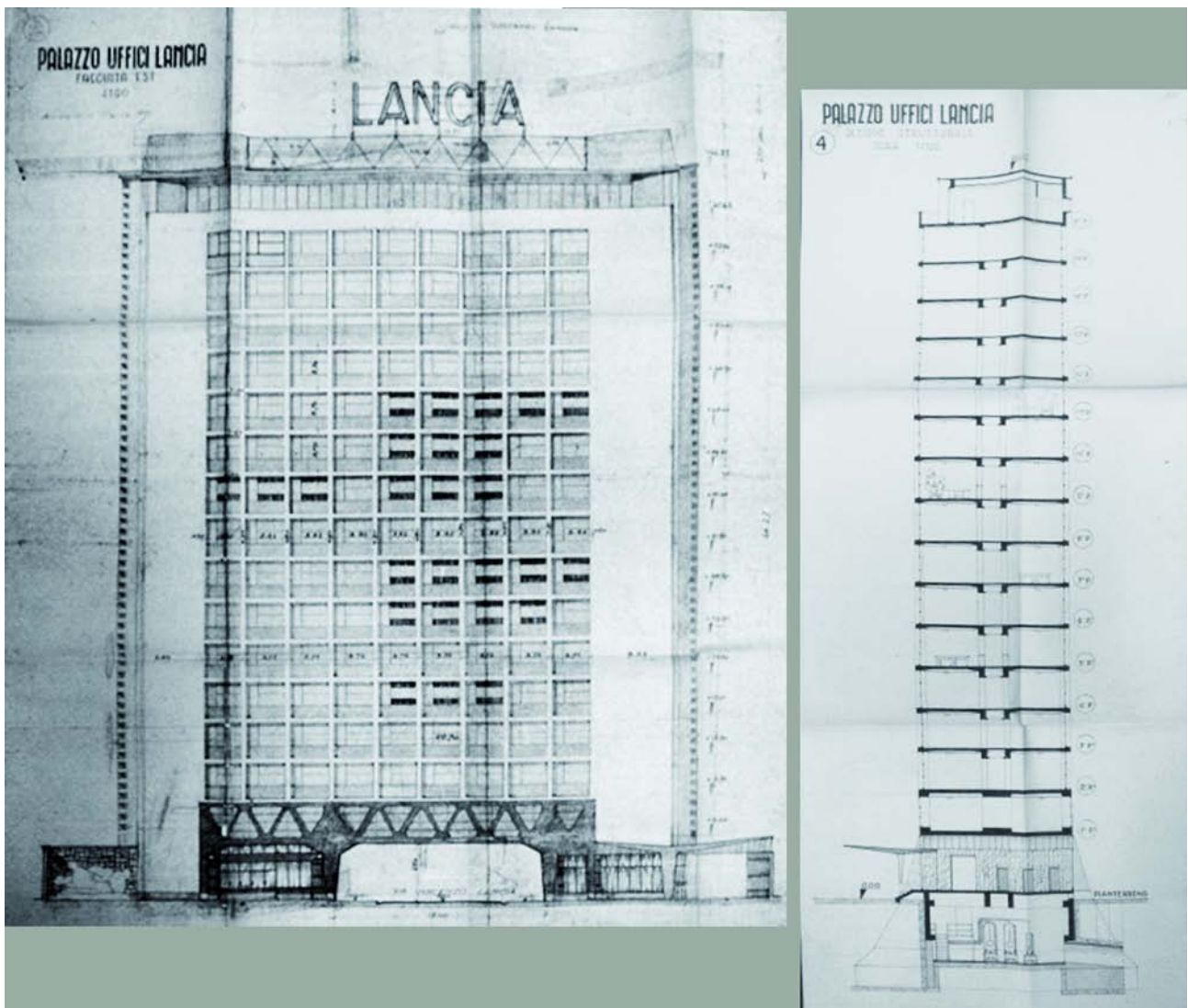


Fig. 1: Lancia Office Building, 1954, elevation and cross section (Laboratorio Beni Culturali - Politecnico di Torino)



Contemporary architectural archives constitute more than a documental heritage, recently recognized and validated: the first exhaustive and persuasive definition of “Architectural document” was formulated only in 1982, in which clarification architectural drawings belong to [1]. Since the end of the Seventies, effectively, the principal North-American and North-European institutions engaged in the knowledge and diffusion of Architecture are working hard and more carefully into conservation and enhancement of contemporary planning drawings, which need specific standards for their description, preservation and fruition guaranteed by international associations, like the ICAM and the ICA since 1979.

The materials collected in contemporary architectural archives, in their physical components and iconographical message, constitute a heterogeneous documentation, whose analysis is sometimes too complicated. The use of traditional materials is associated to the employment of new supports, like polyester and acetate films; the iconographical message is also devolved to different graphical techniques, from the most conventional ones - like inks and lead - to the more recent ones - like halftone screens. Furthermore, architectural archives include an overloaded, and sometimes redundant, *corpus* of copies, coming from the need to modify the project and to show it to the different subjects involved in the realization of the building. The traditional techniques of reproduction, like the use of the contact paper upon which the drawing is retraced, have been supplanted by the recent techniques of photo-reproduction making possible the mechanization of the copying process.

Contemporary architectural archives, as a documentary evidence, contain relations which cannot easily be read and contextualized because of the documents organization: documents often find a collocation threatening and making difficult the analyses of the planning path because of the archival necessities, the lacking adequate spaces and the archival bound defined by the producer. According to the archival science, giving a new order to documents is forbidden even if it could be helpful for their analyses, so the use of digital databases allows the contextualization of the archival data, in order to elaborate information and acquire relations. The digital database runs at microscopic scale, when it is applied to the archival unit containing the single project; at macroscopic scale it makes possible some inconceivable operations within analogical archives: the cross research and the connection between different documents and archives.

The digitation of contemporary architectural archives becomes one of the best practices of sources communication, making possible the visualization of the original documentation through remote mode, and of the preservation, reducing direct manipulation. This process has been started since the beginning of the 21<sup>th</sup> century by institution preserving contemporary architectural archive, that have benefited from this way: low cost for the digital documents production; the sharing of sources to a wider public; the possibility to underline relationships inside and outside the archive group. However, the use of digital images not always pledges a high definition during the images visualization, inducing the loss of resolution and relationship between scale and content, and problem of orientation. The digitation, moreover, supposes a constant update for data, software and hardware in order to prevent the continuous, inexorable and inevitable process of technological evolution, from which organizations and individuals cannot escape without risking the loss of accessibility of contents and the guaranties of the sources integrity.

The digitation of architectural archives is also a favorable management methodology to the new policy of sharing documents, but digital archived appeared ten years later the use of automatic design software in architectural firms. Digital files risk to remain silent if they are not translated in the analogical form as physical traces, or if their format is not changed into others more popular (.pdf, .tiff, .jpeg, .png) or they need a



**Fig. 2:** L'Oréal-Saipo plants in Settimo Torinese, 1959, perspective view (Laboratorio Beni Culturali - Politecnico di Torino)

hardware that can support their original format (.dwg). Probably, digital archives were born also as consequence of digital files production during the planning phase: institutions collecting contemporary architectural archives mobilized their efforts in digitation at the beginning of 21<sup>th</sup> century, adopting different solutions because standards about format, description and catalogue had not been established yet [2].

At the same time that projects about the digital archives production and preservation were financed by European Community - like Gau:di programs (the first one in 2002 – '04 and the second one in 2005 – '08), North American museums, archives and archives/museums of Contemporary Architecture managed the same research, coming to same conclusions: the need of interdisciplinary actions between archivists, architects, restorers and computer technicians; the need of a digital format "preserving" the original characteristics of documents and making it usable by the public in the same time, as best it can; the impossibility to foresee how much technological evolution could be a double-edged sword about preservation and enhancement strategies; the reach of change conveyed by ICT from a static to a dynamic model, made possible thanks to users. In this sense, the development of a network for contemporary architectural archives represents an auxiliary tool not only for institutions engaged with data management, but for the users too, who could have a great heritage at their disposal upon which an individual methodology of analysis could be applied.

Archives network becomes indispensable in the Italian situation: the archival heritage is diffused in the territory, collected in different kinds of centers, like the institutional ones – State and Municipality archives -, the specialized ones – the architectural museums -, and research centers – universities, academies, etc. Their coordination is guaranteed by the *Associazione nazionale Archivi di Architettura Contemporanea* (AAA/Italia) since 1999, which organizes census, conferences and expositions.

This polyedric model finds a digital collocation in the portal *Archivi degli Architetti SAN (Sistema Archivistico Nazionale)*, which has involved in the unitary access to information about an increasing number of archives created by engineers and architects since 2009. As declared in the homepage [3], "the portal, promoted by the *Direzione generale per gli Archivi*, on the basis of a national project previously begun, is the result of a strict collaboration between Archival Superintendences, Regions, cultural Institutions and Universities which have directed cooperatively safeguarding and conservative actions for such archives risking the dispersion long since".

The portal is configured as the access point for non-experts to archival databases, but also as a place of confluence of the results from multiple activities, executed for archival heritage by different institutions presided by the Archival Superintendents. The resources on which the portal is based therefore derive primarily from the census coordinated by the Regional Superintendences, with the addition of inventories and digital images of drawings and objects. Databases, images, multimedia, interviews and historical footage produced by *Istituto Luce* are now available on-line and were elaborated by the Regions – in particular by Piedmont and Lombardy -, Athenaeums like Politecnico di Torino and Politecnico di Milano, cultural and training institutions like the Accademia di San Luca in Rome, the Brera Academy of Fine Arts in Milan and the Academy of Fine Arts in Venice, the Archivio del Moderno in Mondrisio, the CASVA (Centro studi arti visive) in Milan, the AAA/Italia, the Fondazione MAXXI, the Association of Architects in Rome [4].

The portal has several access key-words as the protagonists' biographies, the guided tours, and projects allowing both to start easily a basic search about "light" archival contents, or a more specific search, outlining connections between materials described in the SAN. The portal has an editorial and graphical aspect obligated and a reduced possibility to use particularly innovative technological solutions: the rules for the accessibility of public websites limit the readability of the information [5]. Its value does not lie therefore in the modern technology employed or in the aesthetic results, but in making easily available a really significant amount of data and in showing the many connections and peculiarities of such a very little known and heterogeneous documentary heritage.

A thematic section of the portal that deserves mention is related to the Archives of Enterprise (*Archivi di Impresa*) [6], in which users can find architectural documents such as historical evidence of the transformations undergone by productive buildings in the secondary and tertiary sectors.

The portal of the Architectural Archives, therefor, was born because of the need to enlarge the knowledge of a widespread heritage, but very inaccessible and at the high risk of dispersion; it is also planning an evolution aimed in particular on two directions: widening the "specific funds contained in the technical offices of many institutions, even the municipal ones, the public and private companies" [6]; connection to other European archives.

### **3. Interpretation and communication of digital archive's contents: the Representation discipline's contribution (Roberta Spallone)**

As said before, the simple digitization of archival drawings seems not to be sufficient to transmit the potential of knowledge and meaning that it was caught by the direct study of the sources.

The knowledge data, resulting from documentation analysis, needs to be interpreted, represented, and communicated.

Digital models are the most useful database for collecting and synthesizing these analyses. The extreme care in implementing 3D reconstructions is the final result of a new attention paid by the stakeholders to the communication capability of information technologies, both as for the large audience and the narrow scientific community. The simplest language is required to the producers of these models [7], in order to share and diffuse information in a readily understandable form to a wide-ranging spectrum of public. Thanks to these models, the era of graphic papers that only specialists can decipher is over. In the present research project, we propose methodologies and techniques that can actively contribute to widen the knowledge and the understanding of Archival Drawings intended as Cultural Heritage and support its sharing, in the firm conviction that safeguard and fruition should go together. The analytical activities start from reconstruction, through the re-drawing of the archival drawings, possibly supplemented by other documentary sources, which can enrich the mainly geometric data arising from technical drawings, and could provide information on materials, colors, building techniques and characteristics of the original surrounding environment. When the building is still in existence, direct surveys, extended to the context, provide the exact measures which can be compared with the dimensions of drawings. During this representation phase, the re-drawing of plans, elevations and sections involves the check of projective correspondences, aimed to three-dimensional synthesis, and the possible need to interpret inconsistencies and blanks. In this way the act of modeling may enhance knowledge acquisition, not only for others, but for the modeler as well [8]. Regarding the next stages of modeling, the drawings created are the basis of the "blue-prints" technique, in which the two-dimensional drawings which write-up archive drawings in vector format, are placed on orthogonal planes in the space of the digital work, so they can directly infer the geometric and dimensional references. 2D drawings could also be the basis of graphical analysis, inspired to Pagnano and Docci's methods [9], aimed at finding regulator patterns, harmonic proportions and modular grids that belonged to the cultural background and methodology of architects in the period considered. The transformation of several technical drawings into a 3D digital model is a process which changes one model into another and deserves some attention. It is, as a matter of fact, not a simple variation without alteration of contents, but it modifies, each time, "the wealth of the model, its expressive potentiality. In fact, the transmutations of the models are moved by the interpretative intent of the scholar, and they converge, therefore, toward an abstract model... that we can identify in the project idea" [10]. Since all the models are simplifications and schematizations of the reality, there is always a difference between the real and the level of details included in the model. This is true not only in comparison with the reality: 3D model level of detail, compared to the ratio between scale and contents of the original 2D drawings, conveys the geometric simplifications necessary to avoid excessive modeling times, considering the distance from the object of projection's centers, static or dynamic, to be set in the visualization phase [11]. The creation of a 3D digital model offers, as a result, infinite possibilities of observation - which means also survey -: from the objective visualization of a cylindrical projection, orthographic or isometric, to the subjective visualization of a conical projection, perspective [12]. The model thus becomes an essential tool to



**Fig. 3:** L'Oreal-Monsavon plants in Aulnay-sous-Bois, 1958, perspective view (Laboratorio Beni Culturali - Politecnico di Torino)

check and control the validity of reconstructive hypotheses and the congruence between the building elements.

During the render phase we prefer to apply plaster material to the opaque parts of the model and glass to the transparent ones and eventually differentiate its colors, according to build or natural elements, and finally to light the model with sunlight.

In any case we share Gaiani's opinion: "the fundamental attribute of the digital models is not as much that of photorealistic simulation of the reality, or of formal prefiguration or structural and/or functional simulation mean, as that of being capable to function as a real virtual prototypes" [13], endowed with similarity of behavior and performance, foremost topologic, geometric and perceptive, capable to allow us to observe, to simulate and to analyze the project in a much better way than the analogical technology.

As Moriconi said, and in a sense foresaw, over a decade ago, with info-graphic support, digital drawing simulates a hypothetical reality, goes beyond the limitations of the static and allows interaction with any type of sign. Through the creation of virtual images, info-graphic technology represents what is perhaps the most appropriate tool for the interpretation of the complexity of reality [14].

Thanks to the most recent technological developments in the field of computer graphics, dynamic and hyper-medial visualizations have burst on the scene of architectural representation methods, traditionally static. Several digitally based techniques, such as 3D modeling, animation, montage, virtual and augmented reality are establishing as primary emerging modes of architectural representation and could be effectively applied to the communication of archival heritage.

The ability to access the fourth dimension, through the construction of a sequence of images, constitutes a specific prerogative of digital representation, which goes beyond the static constraint imposed by conventional methods of representation [15].

In this phase of the research, the production of walk-through and fly-through is evaluated to allow scholars to explore the 3D modeled buildings.

#### 4. The case study "Rosani's Archive": characteristics of the drawings and materials (Francesca Paluan)

##### 4.1 Rosani's Industrial Architectural Studio, Turin

The case study, on which an evaluation about the most appropriate strategies of enhancement and preservation is carried out, is the professional archive produced by Nino and Paolo Rosani, preserved at the *Laboratorio di Beni Culturali* at the *Politecnico di Torino*, since November 2011. It had been one of the most prolific industrial architectural firms in Piedmont, operant since 1958, when it was founded by Nino Rosani (1909-2000), until 2010, when his son Paolo (1939) gave up working. The Industrial Architecture Rosani's Studio worked for big names of Italian firms, designing factories, industrial plants and offices not only in Italy but also abroad. Nino started working as an architect after he had worked in the technical department of the Lancia automobile company in Turin for thirty years, directing the Systems and Constructions Service with the responsibility of the design and maintenance of the Italian and foreign offices. The task that gave him fame was committed in 1954 by the same Giovanni Lancia, for whom Nino planned the *Palazzo Uffici*

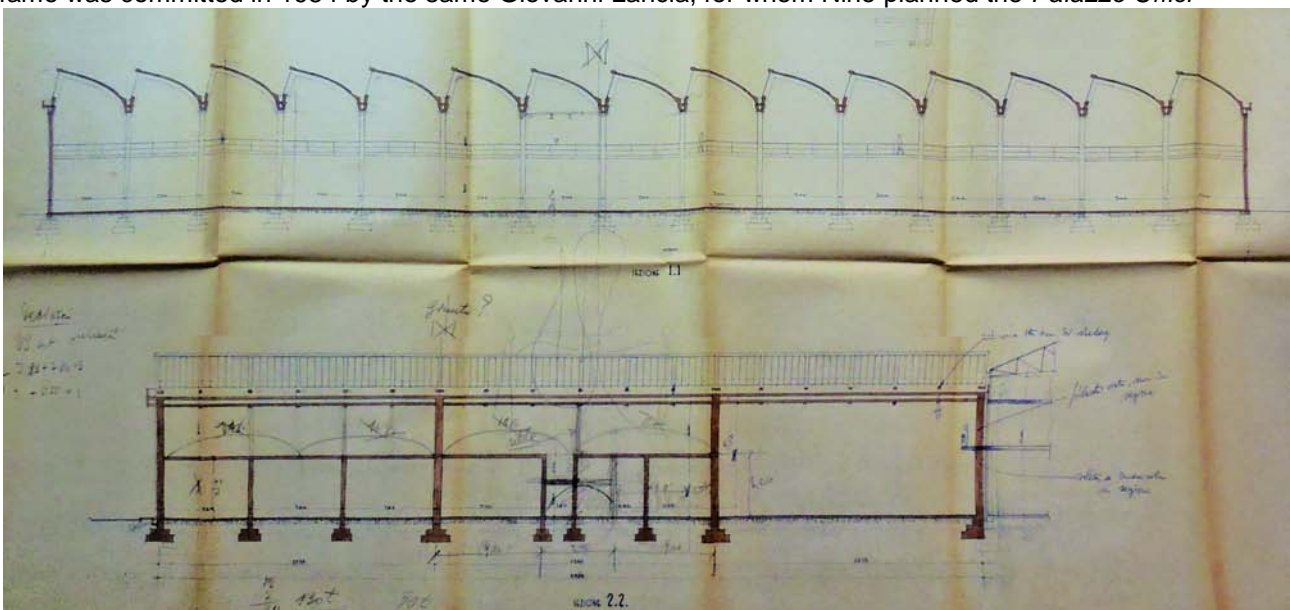


Fig. 4: L'Oreal-Monsavon plants in Aulnay-sous-Bois, 1958, sections (Laboratorio Beni Culturali - Politecnico di Torino)

*Lancia*, known as the Lancia skyscraper (Figure 1), in collaboration with Nino Gio Ponti, Antonio Fornaroli and Alberto Rosselli [16]. The building, now for residential use, at the time was the second highest structure of Turin (after the *Mole Antonelliana*), constituted by 17 floors, conceived to overpass Vincenzo Lancia Street as a liaison - bridge between the two lots occupied by the factory. After the enterprise and the open of a professional studio at the civic number 12 in Corso Tassoni, Nino remained in contact with the Lancia family, receiving private commissions in the aftermath.

Since 1958, Nino Rosani had received important assignments for the city of Turin, the planning of INA INCIS houses in Corso Sebastopoli, in collaboration with the *Studio Architetti Riuniti* (Carlo Alberto Bordogna, Franco Campo, Carlo Graffi, Francesco Dolza) directed by the architect Carlo Mollino [17].

Another great work he received was the plant for L'Oréal-Saipo (1959) in Settimo Torinese (Figure 2), whose design was initially undertaken by Pier Luigi Nervi [18]; it is an important example of the way in which Rosani was able to manage so large spaces dominating them with shed roofs [19], approached by elevated structures for office use. This scheme resulted from the combination of the horizontal manufacturing structure with the vertical administrative one was recalled the following year by the same Rosani for L'Oreal-Monsavon (1958) in Aulnay-sous-Bois (Figures 3-4), made in collaboration with the French architect Alain Leon. Rosani planned other representative offices for L'Oréal in the city center of Turin, Rome, Padua, Naples, Messina, Madrid and Lisbon, caring even the interior design. In the first decade, Nino was involved with the planning of other extended structures for the big industries, like the saltworks in Araya (Venezuela), the tanneries CIR in Pescara, the new headquarters and the Centre of Research CSELT for SIP-Telecom in Turin, the Centre of Research for Pininfarina in Grugliasco. At the same time, he was working for medium and small enterprises, above all in Piedmont - i.e. Colongo, Carello, Universal, De Coster (Figure 5) -.

Nino was flanked by his son Paolo at the beginning of the Seventies, as proved by the correspondence; in the same years the study was transferred into a new address (51, Corso Galileo Ferraris, Turin). Even at that time they undertook other important commissions, including establishments expansions designed and made in the previous years (for example CSELT and L'Oréal-Saipo) and new headquarters in San Giorgio Canavese and Cambiano, the Wind Tunnel in Grugliasco for Pininfarina [20].

#### **4.2 Rosani's Archive: drawings and materials**

Nino and Paolo's intense activity, from 1958 until 2010, is collected in their archive, donated in 2011 by Paolo Rosani and his wife to the Politecnico di Torino. The archive, inserted into SIUSA (*Sistema Informativo Unificato per le Soprintendenze Archivistiche*), is considered expression of historical and cultural interest.

Overall, the preserved documentation consists of nearly 300 planning practices, numbered and collected by the same architects. In most cases, for each practice there is a binder containing the technical documentation, correspondence and photographic material, which corresponds to a container with graphic documents. Unfortunately, some of the documents, especially those related to Nino's beginning as an architect freelancer, had been lost or drawings are rolled miscellaneously, without any documentation.

Rosani's archive collects only preliminary plans and executive drawings: sketches, studies and conceptual drawings are missing, perhaps trashed by the same architects once the project had been completed, refused or the construction had been started. The lack of this type of drawings is indicative of the architects' extremely rational "personality", whose interest was only dedicated in storing the technical drawings, useful for the building; this aspect, however, determines a gap for the planning knowledge, so it is not possible the analysis of the first stage generating the idea and the evolution of the project. Even second thoughts, especially about the size of the building in its interior spaces, are present only in copies of the executives stored separately within paper documents.

Among the drawings preserved, there are those related to the informational documentation: maps, geographic maps, floor plans, surveys, geological and hydrogeological studies. In sporadic cases, there are preliminary drawings to be approved by the customer and to have permissions or building concessions. The preponderant part of the info-graphic material regards the executive plans related to different parts - architectural, structural and plant - necessary for structural calculations, cost estimates and for the execution of the building. Documents drawn are definitive plans, technical drawings about the architectural and structural aspects, the electrical, plumbing and heating system, and detail drawings of architectural parts or completions.

The techniques of representation of the executive compositions are plans, elevations, sections and axonometry; on the other hand, projects about a building or an interior preparation were communicated through photomontages or perspectives drawn on numberless and sometimes in watercolors or pastels.

The archive contains Rosani's drawings whose execution covers a time span of fifty years, during which the materials and techniques of photo reproduction had been changed, as evidenced by the documentation kept. The great variety of supports and graphic techniques is common among the contemporary architectural archives, but the knowledge of contemporary materials is perilously in danger: often, architects used alternative media to paper and contact paper, so the recognition is difficult even by experts, archivists, conservators and architects themselves. Rosani's archive collects, among many contact papers, a considerable amount of radex, unknown by young architects, but used until the previous two generations.

This type of documents is the product of the heliographic reproduction technique on contact paper or on polyester film: the method allows making copies characterized by gray or brown signs on a brownish-gray background [1].

Usually transferable films and halftone screens are also applied to the translucent supports, not interfering with the reading of the iconographic message, although they are one of the causes of the drawings degradation. The interaction between materials and graphic and reproduction techniques with the environment, in fact, causes the onset of chemical and physical degradation. The preservation of a contemporary architectural archive, therefore, appears to be extremely complicated not only because of the great variety of materials used, but also because each archive is unique: therefore, the application of the guidelines devices is only one of the operations to be performed, in addition to the evaluation of the previous conditions of the archive.

Rosani's Studio of Industrial Architecture used also computer-aided design software in the last decade of activity; only prints are preserved in the archive, while the digital media (for example floppy, CD, hardware), and consequently the files too, are not present.

For reasons of space, drawings are stored in separate containers: each project, therefore, appears to be split into its info-graphics data and complementary data (for example technical, etc.): this physical separation of documents can be virtually filled, conducting a data analysis for the reconstruction of the project and for the following phase - the synthetic model development - as the result of an interpretation, with the intent to communicate the documents.

## 5. Meta-project of a digital archive for Rosani's drawings (Francesca Paluan)

Rosani's archive collects a historical and cultural heritage in danger of dispersion and forgetfulness: consultation is reserved for few experts, a non-specialist potential audience cannot immediately understand the data, the planned buildings are earmarked mainly for the industrial use, so they are difficultly communicable because they represent an economic and social logic little different from the Cultural Heritage is generally subjected to. The hypothesis of a physical exhibition of the drawings considered the most exemplar would be a temporary event that will surely enhance the archive, but then it could not guarantee a return of interest from the public.

These reasons let hypothesize and, if possible, apply the strategies considered the most suitable for the enhancement and the safeguard, through the representation techniques and methodologies for the interpretation and communication of the projects, and through the physical conservation techniques for the exposition of the drawings. These objectives, under development, will be the basis of a meta-project Rosani's archive will be made ready for.

The importance of ICT in the communication phase of Cultural Heritage is renowned; referring to the case study, ICT aided the analysis of the projects.

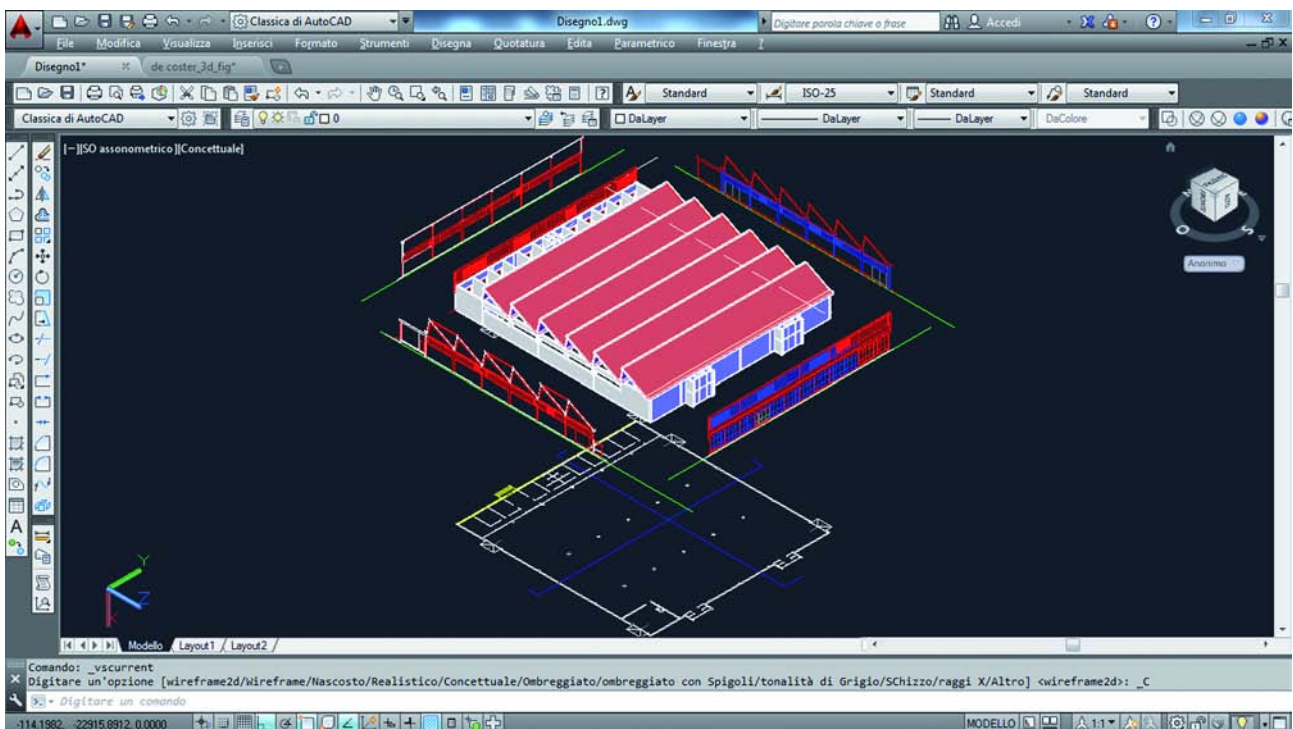


Fig. 5: Blue-prints and 3D modeling of De Coster plants (Digital drawings and 3D model by Francesca Paluan)

The magnitude of the archival collection obliged to focus only on some of the most significant projects by Nino Rosani. The selection was conducted according to certain parameters: the exemplarity of the plans; the existence of design variants; the inaccessibility of the existing building (because it is still in use), and the importance of transformations and expansions on the structure over time.

The method to be pursued, adopted at the end of the consultation of all the projects by Nino Rosani and of a part of Paolo's projects, consists of a detailed analysis of the documentation, drafting a form containing the metadata related to the drawings. These forms are related to a more concise inventory in which all the projects are included and divided into categories according to the typology of customers. Such a division, as well as outlining the different types of use of the buildings planned by the Rosani during their business, has given a virtual order to the archival units, crucial to make emerge how much the first commissions have induced the Rosani's architectural Studio fortune: the first customers, in fact, turned repeatedly to Rosani not only for extensions of their establishments, but also for other types of works (for example, the accommodation for the SIP-Telecom workers in Gressoney, Aosta).

The projects selected as case studies become, therefore, the subject of a trial communication using the tools of the digital representation. Among them, the project for L'Oréal - Monsavon in France and L'Oréal - Saipo in Settimo Torinese were preliminarily selected for several reasons: as confirmed the exemplarity of these plans as stated by bibliographical references [21], the French case presents a transformation of the structure different from the plan at our disposal; in the Italian case, however, the preservation of all documentation, including the various design solutions and the two following expansions, allows to reconstruct the architectural evolution both in terms of design and through the comparison with what was actually achieved.

The phase of re-drawing the project is preparatory to the following modeling, creating models of cognitive synthesis of the documentation and processing thematic readings paths. Buildings surveyed, in fact, can be decoded according to different interpretations: the geometric and dimensional one, taken from the Drawing disciplines, can support a historical reading, which deals with the changes of the building and of its different uses over time.

These different interpretations are possible because of the peculiarity of the case study: industrial architecture, in fact, has a particular propensity to the critic analysis in its historical, manufacturing and social meanings. The inaccessibility to the structures constitutes a further reason for which the modeling, as well as being a heuristic practice, becomes indispensable for the project communication. The virtual model, therefore, has been already conceived in its future online presentation to a non-expert public, shown like an "experience" through the use of animation and the possibility to run virtual visits, assisted and not. The addition of the fourth dimension becomes, therefore, the life-giving and participant element, in line with the changes undergone by the information technology and web communication: from the static meaning of the 2.0 web to the dynamic meaning of the 3.0, where the user from passive spectator becomes actor, moving in its own scene and actively consulting the system.

Another possibility of communication using ICT involves the employment of the Augmented Reality (AR): the virtual model is displayed on a mobile devices monitor. Presumably, the ARtags will be installed in the real archive, so that they allow the immediate understanding of the content in the folders and, therefore, to convince users to continue the consultation and exploration of the material, both in its analog form and in that digitized.

This proposal, therefore, intends to add a new interpretative value to those found in digital archives: not only documents scanned will be viewable, but the purpose is to make consultable the drawings, allowing to measure the scanned drawing in its original size when the dimensions are missing; synthesis models will be shared on the network and made surfable in the way they were conceived; virtual reality will be applied to the original document, offering a snapshot of the plan through the AR techniques. All these operations require the primary objective of the enhancement of documents, avoiding providing further degradation, and the increasing of exposure and knowledge of such a cultural heritage at high risk of misunderstanding and loss.

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