

The Mock-up as a Tool of Projecting. Innovation and Experimentation in the Nuova Rinascente by Albini and Helg (1961)

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Abstract

The construction details presented during the XII Milan Triennale in 1960 and at the Venice Architecture Biennale in 1968 suggest that Franco Albini and Franca Helg employed the mock-up as a tool to evaluate innovative solutions in the realization of the Nuova Rinascente in Piazza Fiume, Rome, inaugurated in 1961. Faced with regulatory constraints and contingent factors, the architects explored various project possibilities. It is noteworthy that the transition from an initial design (1957), characterized by steel portals and travertine walls, to the completed project (1961), featuring a steel frame and exterior closure in Silipol panels, is primarily attributed to an imposition by the Superintendency which required a 'Roman' character for the building. Consequently, the 'ostentatiously two-dimensional' front of the initial project had to change into a 'corrugated surface' of panels, leading the architects to conceive a prefabricated version of the traditional stone facade. By reconstructing the ideational process of the Nuova Rinascente project in Rome, this contribution aims to explore the architect-engineer's general inclination to experiment, through the mock-up, with an 'unconventional' approach to design, conceived as the potential radicalization of new spatial, formal, and material protocols that require the precision of work as an essential prerequisite for the quality of outcomes.

Keywords: Franco Albini, mock-up, design tool, facade.

Introduction

If during the Renaissance, with Alberti, the components of the building were designed directly on-site through the direct involvement of artisan craftsmen in the design and realization of detailed full-scale models, in the architectural and engineering culture of the second half of the 20th century, "the elements of the building are separated and articulated in order to respond to the structural and functional constraints imposed by the spatial program" [Venturi 2014, p. 46]. This period marked a crucial era, where prominent figures like Albini, Moretti, Nervi, Ponti, and others, aimed to reaffirm Italian architecture on the international scene. Their vision embraced a "reinvented modernity in which lives that Italian measure which is something

unmistakable and intense [...] a hybrid, metamorphic, and plural fact" [Purini 2008, p. 35]. Not surprisingly, these ideological affinities led to the exploration of the frontiers of *structural modeling*, a particular experimental technique that involved the creation of sophisticated 1:1 scale models. Working on a model was equivalent to working on reality: contact with physical matter pushed towards "a mental attitude of modest admiration in front of the mysterious and complex wisdom of things, a much more appropriate and profitable attitude than the simplistic certainty to which the formal absolutism of mathematical schematizations can lead" [Nervi 1947, pp. 4, 5]. This phase of renewal, especially in the field of compositional and constructive solutions, highlighted

Fig. 1. Franco Albini and Franca Helg, The Rinascente department store in Rome (© Clementeste CC BY-SA 4.0).



the delicate balance between form and technique, structure and envelope. In these terms, there was an attempt to simulate not only the dimensions of the represented object but also its material and constructive principles [Mindrup 2019, p. 75]. Several contributions have already examined the scientific issues related to such experiments, often coming directly from the actors involved. However, this study aims to integrate the scientific contribution of such models, interpreted here as mock-up, to contextualize them in Franco Albini's design experience. Through a theoretical approach and a critical analysis of the Nuova rinascente project in 1961 in Rome, it aims to provide insights into the use of the mock-up and promote a deeper understanding of the possible implications and potentials in the field of design practice, as a design tool in the construction industry, and in academic research.

Mock-up in the history of architecture and Franco Albini's legacy

The use of mock-ups may not constitute an absolute novelty in the history of architecture. Already in 1770, Jacques François Blondel, in his *Cours d'architecture*, discussed the utility of this practice, emphasizing how the creation of models 'at the same scale' could ensure the excellence of work or persuade the client of the effectiveness of the forms or materials of a structure [Blondel 1773, pp. 160, 161]. He referred to the wooden model of the frame of Michelangelo's project for the Palazzo Farnese, which was placed on-site during construction, along with French models by Pierre Lescot, Claude Perrault, and François Mansart, to evaluate its effect from the ground. Even during the XVII century in Rome, scale models "carefully made to imitate the form and substance of the intended material" [Ackerman 2014, p. 72] continued to be used. Between the 1930s and 1970s, the attention to structural modeling favored experimentation with models that, "subjected to a series of agents" [Gargiani, Bologna 2016, p. 157], allowed the ideation of the structural form. Despite the differences between 'architectural' and 'structural' models, a solid point of contact between architecture and engineering can be found in the tangibility of the latter. These models serve as an intermediary tool that manages both structural and formal needs, allowing a reworking of the material beyond

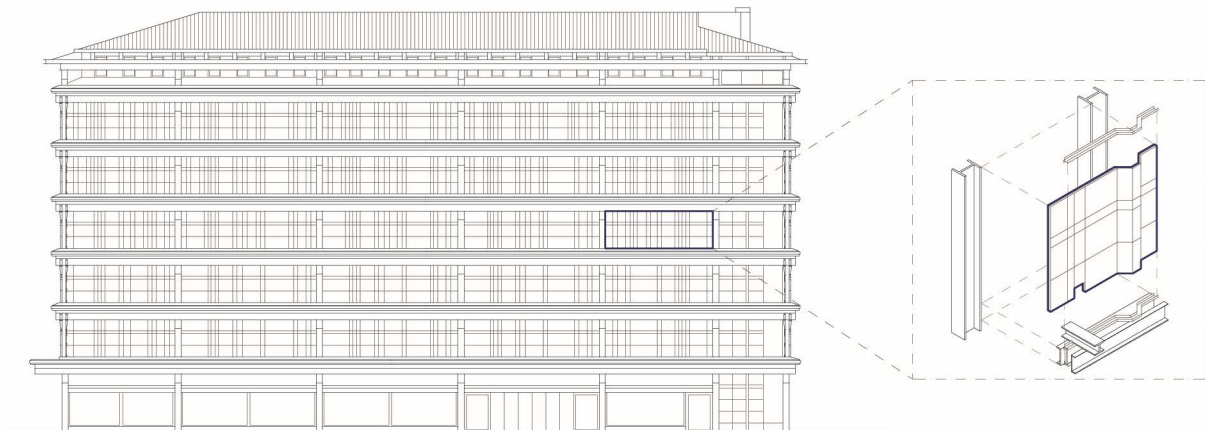
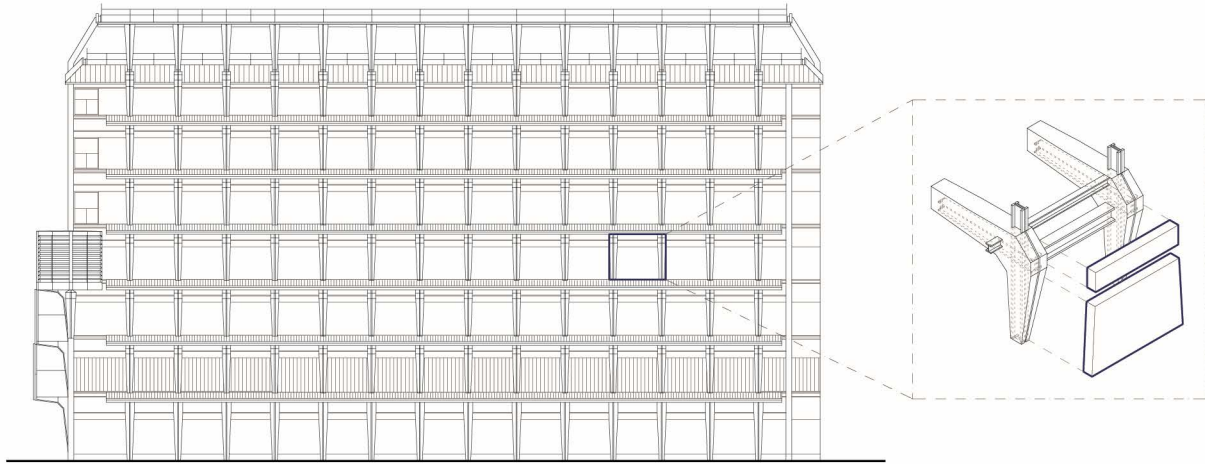
the capabilities of calculation or two-dimensional representation. Franco Albini's models [1] are part of a long tradition that spans through the history of construction, alongside other illustrious examples such as the wooden and clay models commissioned by Filippo Brunelleschi for the dome of Santa Maria del Fiore, those already mentioned by Antonio da Sangallo il Giovane and Michelangelo for St. Peter's, the models described by Leon Battista Alberti and Giorgio Vasari in their texts, the red wax and clay sculptures made by Francesco Borromini, Christopher Wren's models for St. Paul's Cathedral in London, Antoni Gaudí's funicular models, Pier Luigi Nervi's *capolavori in miniatura* [Neri 2014], and many others. In this context, Franco Albini was primarily recognized as a 'great craftsman' [Bucci, Irace 2006, p. 165]; his hands-on approach and attention to detail gave his works a unique human quality because "if ever a machine could perform those operations, the piece would not have the feverishness of the one executed by man" [De Seta 1980, p. 16]. He preferred to develop ideas through sketches and adopted "a method and a reverse process, from the particular to the general" [Bucci, Rossari 2006, p. 213], refusing to conceive a completed architectural project a priori. The physical model thus became a practical opportunity to verify insights and test solutions studied for specific contexts even on a different scale. In addition to their primary function of structural verification, Albini's models offer multiple interpretations that inform the project. Behind the formulas and technical nomenclature, themes and problems are revealed that touch on the process of design genesis.

The role of the mock-up between industrialization and craftsmanship: comparing experiences

In the context of the Nuova Rinascente project in Rome (fig. 1), the use of mock-ups takes on a primary role as a tool for research and experimentation. The ideation process stands out for the exploration of new spatial, formal, and material approaches, following "a continuous and rigorous verification of the coherence between proposed solutions and intrinsic and extrinsic data of the problem" [De Seta 1982, pp. 9-12]. The centrality of thematic and typological issues distinguishes the work of Franco Albini and Franca Helg from the project of Ferdinando Reggiori and Aldo Molteni in Milan. While the

Fig. 2. Design proposal 1957. Axonometric view of the construction detail of the façade module (graphic elaboration by the authors).

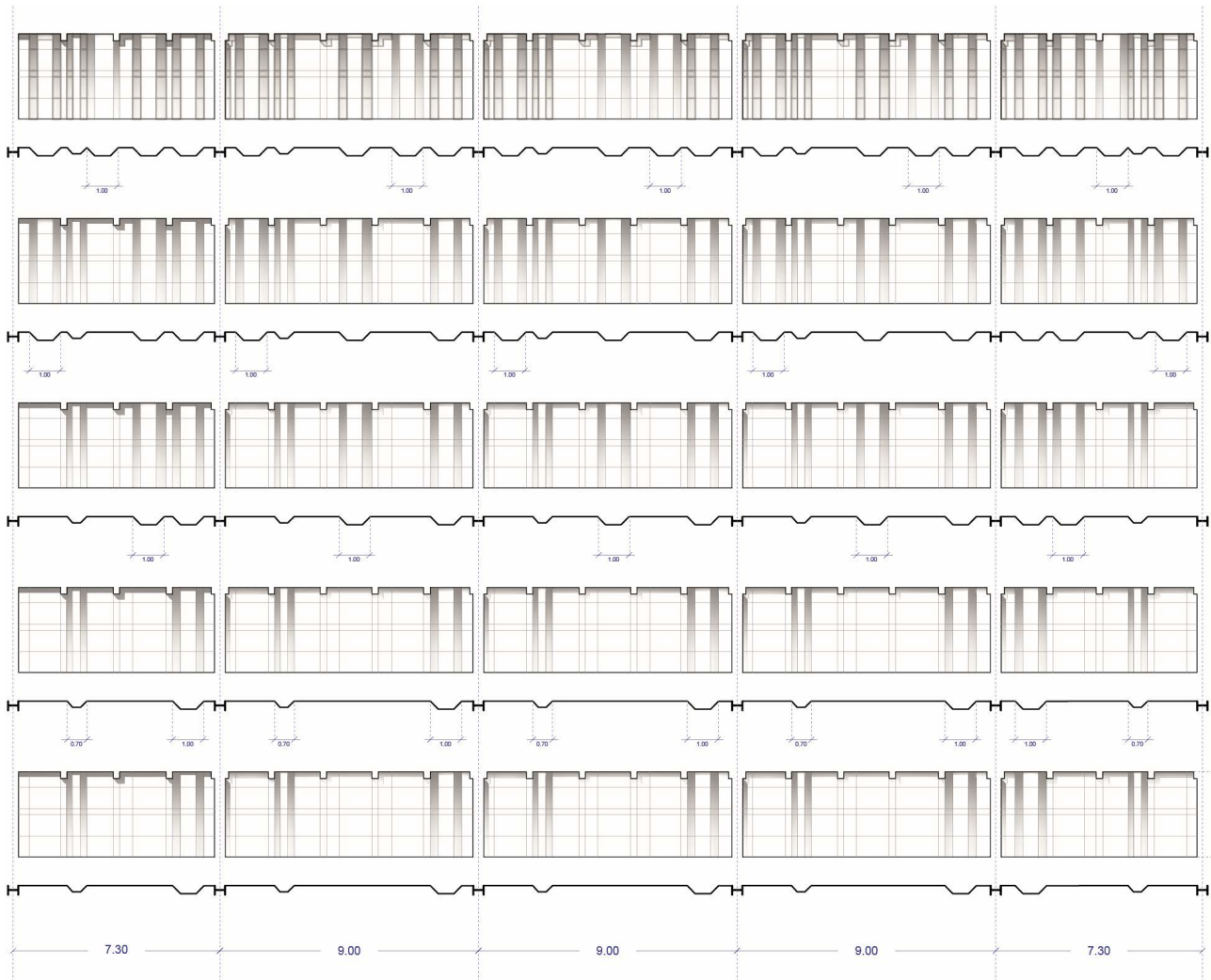
Fig. 3. Final design 1961. Axonometric view of the construction detail of the façade module (graphic elaboration by the authors).



latter “did not pose the theme of the department store but only thought of a building suitable for the location” [Bucci 2009b, pp. 16-41], Albini and Helg faced specific challenges related to the commercial destination, urban planning regulations, and structural constraints. The Roman project, in fact, develops in response to a series of functional needs and regulatory contingencies that led to the adoption of an ‘unconventional’ approach. The department store had to meet destination constraints, which required large unpartitioned spaces with limited external windows –hence we witness the decentralization of stairs and service rooms– and constraints dictated by the master plan, which required a controlled facade symmetry. To these challenges were added the client’s requests to create a building that was “anonymous and typical with one floor identical to the other” [Zevi 1978, p. 287], pushing towards the search for innovative solutions [Albini, Helg 1961]. Despite the perimeter, shape, and height being already fixed by the detailed plan, the first project presented to the Municipality of Rome in 1956 for the Nuova Rinascente reflected a clear influence from Giulio De Angelis’s first Rinascente at Piazza Colonna. It is indeed likely that Albini’s adoption of a metal load-bearing structure is in continuity with “that iron and cast iron skeleton” [Bucci, Irace 2006, p. 171] of De Angelis’s project. Located between the emerging bulk of the Aurelian walls and late nineteenth-century residential buildings, the main front on Via Salaria, in this version, had a recessed ground floor that created a deep shaded recess, with “marked horizontal bedding of the facade strongly rhythmized by double T portals with variable section with an inter-axis of three meters” [Bucci, Irace 2006, p. 171]. This first project (fig. 2) demonstrates a particular interest in the degree of prefabrication of elements since it influenced the construction system, the arrangement of elements, and the methods of assembling facades [Wachsmann 1989]. This innovative vision is realized through the creation of instrumental mock-ups, representing a transition from the conceptual phase to a final solution. However, despite the travertine slabs covering the infill walls, giving the building fronts an “ostentatiously two-dimensional appearance” [Portoghesi 1962, p. 608], this initial solution underwent modifications. The requests of the Commissione Edilizia [Rogers 1961, p. 2] combined with the needs of distributing the air conditioning system led to modifying the ‘flat head’ to integrate them with the

load-bearing structure and the floors of the building [De Seta 1980, pp. 23, 24]. Despite these interventions, the project was not approved by the client because “there was a lack of a functional stimulus in designing the facades” [Zevi 1978, p. 287]. The transition from the initial conception to the final solution in the project of the Nuova Rinascente in Rome is realized through the creation of an envelope that assumes two environmental roles: “one passive, as a barrier to prevent the passage of external climatic conditions or the loss of internal ones; and one active, as a distributor of air conditioning and environmental energy” [Banham 1978, p. 256]. In fact, the second solution (fig. 3) –the one actually implemented– features a structure consisting of four multiple frames, each composed of two spans of nine meters [Bucci, Irace 2006, p. 172]. These frames support a steel skeleton characterized by long longitudinal beams and transverse girders which, together with the vertical uprights, are fully readable on the facade. The use of this type of structure is motivated by design needs: “the deformations of steel in case of fire force to hide it inside behind cement thicknesses. Bringing the steel structure outside [...] is the consequence of an architecture that derives its forms from structural realities” [Albini, Helg 1962, p. 6]. Another point of interest is provided by the walls that enclose the building inside the structure frames: they are moved in relief, revealing the passage of vertical air conditioning ducts to the outside [Albini, Helg 1962, p. 6]. This functional aspect has been transformed into an expressive element, highlighting Albini and Helg’s ability to use technology as a design tool. The experimentation of new spatial, formal, and material protocols emerges through the use of full-scale mock-ups, allowing architects to test and verify the complexity of contingencies that influence construction, form, and the choice of materials for prefabricated panels. These panels, horizontally divided into four parts and edged by an ivory-colored middle band, represent a modern and prefabricated version of the traditional stone facade: “experimented for the first time, under the close supervision of architect Albini, by the FULGET company of the Capoferri Brothers of Bergamo, the Silipol cladding is a material used for exterior cladding” [Albini, Helg 1962, p. 17]. In this context, precision becomes the cornerstone upon which all creative ambitions rest, manifesting in the ‘piece by piece’ construction of 50,000 granite blocks [Piano 2006, p. 189] (fig. 4), following a

Fig. 4. Progression of the external facing in Silipol panels with plan sections of the elevation along Via Salaria (graphic elaboration by the authors).



serial design methodology that requires constant conceptual and constructive rigor [Jones 2020, p. 50]. The recognizability of each structural element and the mechanics of the device are further highlighted by the clear distinction of the string courses. These are composed of a C-edge beam mounted on a plane different from the pillars, leaving space for the passage of utility ducts in the protruding horizontal bands. This new arrangement of the facades alludes, through formal and proportional references, to the great Renaissance palaces and “with that protruding iron frame on the edge of the facade, it ironically seems to wink at the Michelangesque cornice of Palazzo Farnese” [Piva, Prina 1998, p. 24]. Finally, the choice of materials was dictated not only by the indications of the Sovrintendenza ai Monumenti, which imposed a ‘Roman’ character in chromatic agreement with

the Aurelian walls [Portoghesi 1962, p. 609], but also by economic considerations. In fact, in the transition from the first to the second solution designed by Albini and Helg, there was an increase of two floors, from four to six, in response to the different needs for the use of available volume. Ultimately, in the complex process of the Nuova Rinascente project, the synergistic interaction with construction companies and material producers was central. A concrete example is manifested with the F.lli Brambilla company, responsible for the realization of windows, doors, and venetian blinds in the Rinascente project, which was then commissioned to assemble at the *Venice Biennale* in 1968 (fig. 5) “the large true-to-scale model of a detail of the building” [Albini, Helg 1962, p. 14]. This partnership highlights the inherent potential in the collaboration between company, client,

Fig. 5. Mock-up design, Venice Architecture Biennale, 1968 (© Venice Biennale Historical Archives, ASAC, Photo: Ferruzzi).



Fig. 6. Detail, XII Triennale, Solo exhibitions of architecture
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and designer. Through this synergy, the architect-engineer charts a new course in the design landscape, where the unconventional approach serves as a catalyst for the generation of innovative spaces, forms, and materials. The mock-up, therefore, assumes a primary role as a research laboratory, where the precision of work proves to be the indispensable foundation for the realization of architectural solutions of excellence.

The role of the mock-up between industrialization and craftsmanship: comparing experiences

Franco Albini collaborated with a generation of architects who adeptly operated across the scales of furniture, interiors, architecture, and the city, acquiring skills in both craftsmanship and industrialization, especially during his tenure at the Ponti and Lancia studio. This professional-craft relationship with industrial production was not confined to the exclusive realm of design but directly involved the industrial and technological process, leading to a “direct confrontation with materials and their transformability” [Bucci, Irace 2006, p. 165]. This tension between idea and artifact, between production and craftsmanship, stimulated the experimentation of new design approaches and procedural innovations. Indeed, the production of experimental building elements was primarily facilitated by the necessary relationship with companies. For example, Giò Ponti, collaborating with the Saffa company in Milan, produced the *Populit* panel after the production of some prototypes [Griffini 1939, pp. 132, 133], while Bruno Morassutti experimented with new design methodologies applied to facade components, working with the Facep company in Mantua. Although industrialization, and thus mass production and automation processes, favored a broader diffusion of Italian design, Albini’s pioneering contribution seems to have been premature in fully embracing the changes induced by new industrial practices, as indicated by Vico Magistretti’s statement: “he was born too soon”. While it is possible to assume that Franco Albini employed the mock-up already in the project of the Palazzo del Lavoro for the Trade Fair of Milan in 1954 on parts of the facade, the structural system, and the interior furnishings, the subsequent experiments of some architects contemporaneous with him are

equally notable. Starting from the project of the Palazzo dello Sport in Rome by Nervi (1956-1957), which led Nervi to create full-scale models to test the suspended roof and overcome imperfections [Gargiani, Bologna 2016, p. 315], to the prototypes of the Pirelli Skyscraper (1956-1960) in Milan by Giò Ponti used to test and verify facade solutions. Therefore, while the 'unmediated' approach of the architect can generate invention, the cultural predisposition of architecture as a discipline seems to have progressively abandoned craftsmanship, instead of investing in the possibility of radicalizing spatial, formal, and material protocols, which require the precision of work as a prerequisite for disciplinary advancement [Gelpi 2020, p. 24].

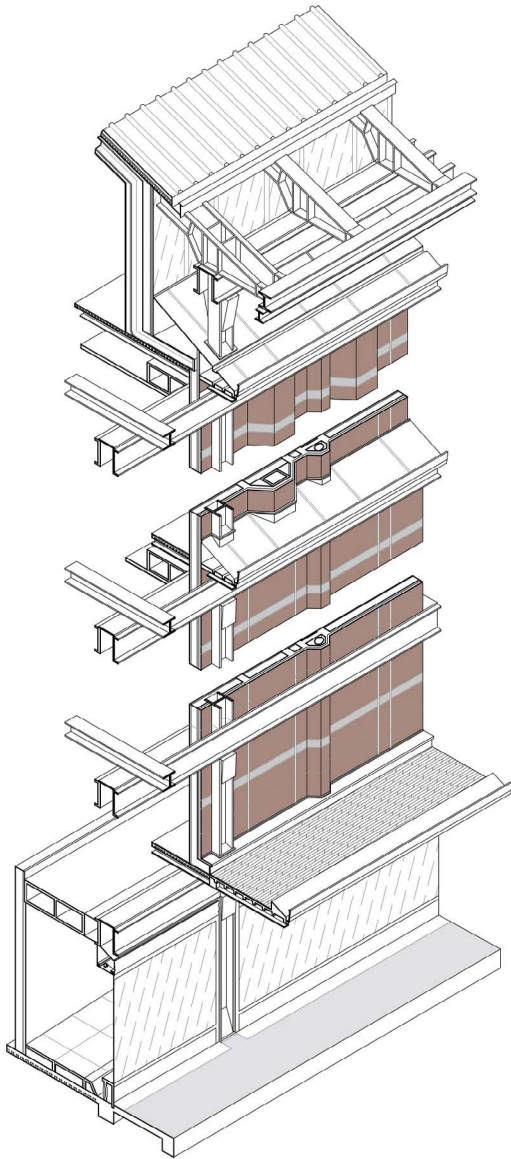
Twentieth-century exhibitions: 'sign' of new interpretations

Throughout the twentieth century, exhibitions in the fields of design and architecture have represented a fundamental ground for experimentation and innovation. In this context, Albin's early collaborations in interior design, during the 1930s with Persico, and from 1946 onwards with Giancarlo Palanti and Anna Castelli-Ferrieri, played a decisive role in his career up to the relaunch of the magazine known as *Costruzioni Casabella*. However, it was within the framework of the *Triennale exhibitions* in Milan and other Milanese galleries that Albin had the opportunity to explore new materials, construction techniques, and modes of assembly on a large scale (fig. 6). His transition from designer to architect emerged from the constant effort to control every aspect of the project and ensure "perfect execution through the instrument of design" [Prina, Piva 1998, p. 10]. Some elements, which in the executive project appeared as simple 'normality', became exceptions in the uniqueness of the detailed solution: "infinite sections of fixtures, joints, fittings, hinges, are investigated by scaling down to full-scale reproduction" [Prina, Piva 1998, p. 10]. This attention to detail, traceable to a logical-mental process of composition-decomposition for individual elements, extended to every scale of work, from the building to the furnishing elements, supported by the extensive use of scale models and full-scale prototypes [Cortesi 2019, p. 36]. Albin's participation in the Milan

Fig. 7. Detail 1:1, XII Triennale, Solo exhibitions of architecture (© Archivio Fotografico Triennale Milano, Fondazione Triennale di Milano).



Fig. 8. Exploded view of the building and plant system components in their entire elevation development, 1961 (re-elaboration by the authors).



Triennale exhibitions was guided by an interest in modern manufacturing methods and the desire to revive artisanal practices in architecture [Helg 1979, p. 552]. For the architect, the exhibition has an affinity with entertainment, and for its success, it is necessary to detach the visitor from external reality, introducing them into a particular atmosphere and sharpening their sensitivity without fatiguing them [Albini 2005, pp. 9-12]. After the three *Design Triennials* (IX, X, and XI), in the *XII Milan Triennale* of 1960, it was decided to abandon the criterion of organization by merchandise sectors, in order to invite the public to observe the different elements of the event in their contents and in the relationships between the exhibited objects. On this occasion, Albini was invited to exhibit in the section dedicated to 'personal exhibitions' and showcased the models of the first and second design solutions proposed for the project of the La Rinascente building in Piazza Fiume in Rome. He distinguished himself from his colleagues by presenting full-scale models and construction details of the external envelope (fig. 7), highlighting his ability to design and present objects in space: «the black metal frame, like the uprights of his installations, supports the panels covering the mechanical systems, as if these were paintings in an exhibition» [Bucci 2009a, p. 37]. Such aestheticization of the model changes its understanding and enhances its perceptual characteristics, previously ignored [Geiser 2021, pp. 69-80]. In this regard, it seemed that architectural models could have their own artistic or conceptual existence, relatively independent of the project they represented. Therefore, signals of new interpretations that enhance 'its artistic and communicative dimension' are advanced to the use of the mock-up as a design tool. The importance of the Roman project is such that it soon became a linguistic and typological reference model, so much so that it was presented at the *Venice Architecture Biennale* of 1968, where "the architect's autobiography was simply told by a full-scale piece of the Rinascente building" [Bucci 2009a, pp. 37, 38], as descriptive and narrative of the artistic and architectural process that distinguishes it. Generally, the production of such "highly exhibitionistic value elements" [Martín Díaz 2023, p.124] –which took place through construction companies– confines the mock-up as an architectural work in itself, a text to tell a design process [Eliasson 2009, pp. 9-12].

Conclusion: continuity and innovation

The innovation and experimentation of the Rinascente project have demonstrated how Albini employed the mock-up as a tool for research and experimentation to address specific challenges related to commercial destination, urban regulations, and structural constraints. The architect's journey throughout the 20th century, intertwined with that of his contemporaries, reflects a constant attempt to blend tradition and modernity, craftsmanship and industrialization, technical precision and artistic creativity. Through the study and realization of full-scale prototypes and mock-ups, an unprecedented integration between prototyping and industrial pre-fabrication has been achieved. Also noteworthy are the projects of the Milan Metro (1962-69), where a series of three panels (30, 40, 50 cm) in Silipol, supported by an iron framework, allowed for the possibility of disassembling the pieces for inspections of the installations in the perimeter cavity [Albini et al. 1966, pp. 42-48], and the project of the Snam office complex in San Donato Milanese (1969-1974), where the rose-granite cladding panels will reappear "although far from the surprising chromatic and three-dimensional corrugation of those prototypes of the Rinascente" [Bucci, Irace 2006, p. 176].

Therefore, each project "invited innovative solutions for modern work environments" [Jones 2020, p. 195], and this could be the lesson that a young Renzo Piano inherited from Franco Albini and that we will similarly find in the more renowned Pompidou Centre.

Nearly seventy years after its inauguration, the restoration and re-functionalization intervention of the Nuova Rinascente in Rome by Studio 2050+ testifies to a hypothesis of continuity and innovation. Through the targeted replacement of specific building components and the repair of Silipol panels, the aim was to preserve the integrity and identity of the original project, adapting it to the needs and challenges of a contemporary department store [2]. In this context, the moldings, which concealed the original installations (fig. 8), "have proven insufficient to support the functioning of the building due to changing climatic and regulatory conditions, showing how much the architects have thought about both what is seen and what is not seen" [Ricci 2023, p. ??]. In conclusion, the research aimed to demonstrate how, in various stages of the design process, the mock-up can be used as a true tool for controlling the conceptual and scale transition between the ideative and realizable scope as well as managing the complexity of the technological project.

Notes

[1] In the latter half of the last century, Giovanni Sacchi collaborated on industrial design projects with Franco Albini, Marcello Nizzoli, Marco Zanuso, Richard Sapper, Achille Castiglioni, and many others.

[2] In 2050+, *La Rinascente – Piazza Fiume* <<https://2050.plus/projects/la-rinascente-piazza-fiume/>> (accessed on 17 February 2024).

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