LARGEST ARCHITECTURAL FIRMS

edited by
Lorenzo Ciccarelli
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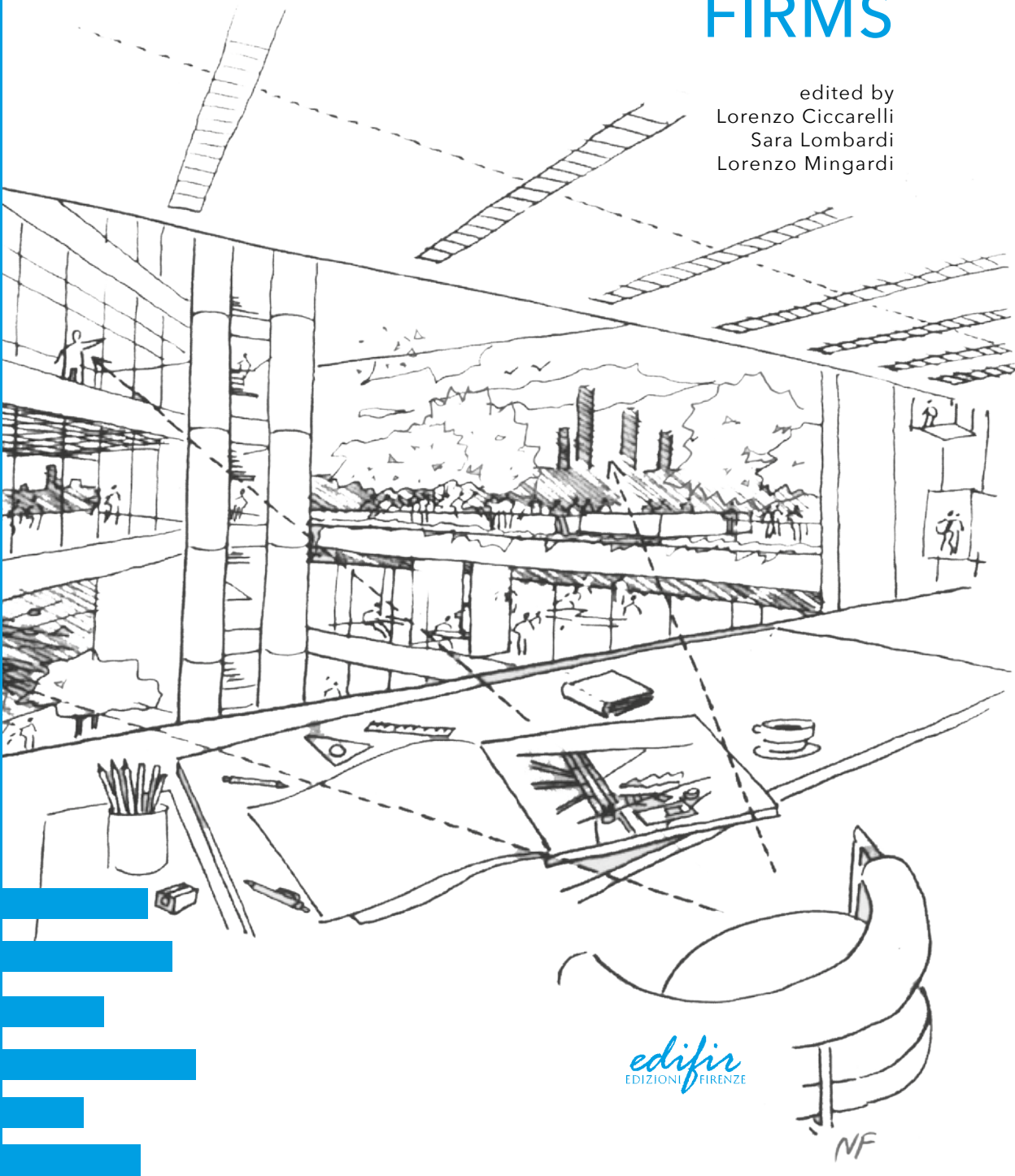

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Norman Forster, *Perspective*, sketch for the Commerzbank Headquarters (Frankfurt am Main), 1991.
Courtesy of the Norman Forster Foundation

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DESIGN AUTHORSHIP AND ORGANIZATION MANAGEMENT

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INTRODUCTION

Lorenzo Ciccarelli
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During the twentieth century, and increasingly in the last decades, the architectural and engineering firms increased their size, starting to count hundreds or thousands of employees, having to structure themselves as real creative companies, managing the interaction between different skills – architects, structural engineers, plant engineers, graphic and product designers, information technology experts, model-makers, accountants and so on – in order to remain competitive in a market increasingly competitive and international. The importance of careful management of knowledge resources is also consistent with the inclusion of the architectural firms among the so-called Professional Service Firms: companies that provide services based on three main factors: highly specialized knowledge, the involvement of a workforce of professionals, and a continued emphasis on creativity. This book aims to investigate the impact of organization design and managerial skills as key elements of architectural creativity in the contemporary scenario, concerning in particular the environment of largest design firms.

In the following pages architecture is interpreted as a profession in which technical knowledge, management, and an understanding of business are as crucial as design. It is increasingly critical for the largest architectural firms to understand how their creativity can be sustained over time – even beyond the death of the founder – not only through the hiring of young talents from universities or skilled professionals from other architectural firms, but by refining a working methodology that enhances the individual and collective contributions. This book aims to provide a first contribution in this field, trying to answer crucial questions for the architectural historians who want to investigate the contemporary environment of largest design firms: How the workforce

The several dozen architects and engineers of the Skidmore Owings & Merril Chicago office, Chicago, 2014.

is organized and coordinated in such practices? How to fit individual creativity with the competitive aims of huge firms? How the design practices and architects' daily work evolved in the last decades? Which is the effect of architecture firms' heterogeneous skills on their performance? Which is the role that Information Technology could play over the next years in reshaping the architectural firms?

The multiple deviations of the concept of authorship (i.e. a shared authorship) bring together and underlie all these questions. Architecture is a collective profession, and none of the great buildings of the past was responsibility of a single person. Beyond the architect's studio or *bottega*, the creative contribution of the client(s) and the workers always played a major role. However, in the last century, and increasingly in the last decades, a considerable growth in the number of creative people involved can be observed *within* the design firm. The media interest in the charismatic figure of the «archistar» often conceals the complex and wide professional organization that takes his/her name, e.g. Zaha Hadid Architects counts around 400 people, approximately the same number of employees of Herzog & de Meuron and OMA, while Foster + Partners reaches more than 1400 employees.

Foster + Partners studio at Riverside, London, 2016.

It is clear that the conventional historiographical approach focused on the figure of the author-creator cannot cast light on these wide and complex organizations. The real strategic asset of these firms are the people they employ, their skills, ideas and abilities, often divergent and complementary from those of the «archistar». In this way, the creativity of such firms derives not only from the eclectic personality or psychological traits of the «archistar», who manage to translate his/her brilliant ideas into projects, but also from both formal and informal aspects of organizational design, aimed at enhancing the ideas of all, with a view to improving collective performance.

Alongside the analysis of the archistars' biographies, projects and construction sites, it is therefore necessary to emphasize the study of managerial strategies and business models. In particular, some key issues that would deserve more attention regard architecture firms' organization design; the sharing of responsibility and authorship within their organizational boundaries; the implementation of certain incentive systems; the active role of consultants and suppliers; the impact of the most up-to-date Information Technologies.

Even if, at the end of nineteenth century, McKim Mead & White counted more than 100 employees, it was Albert

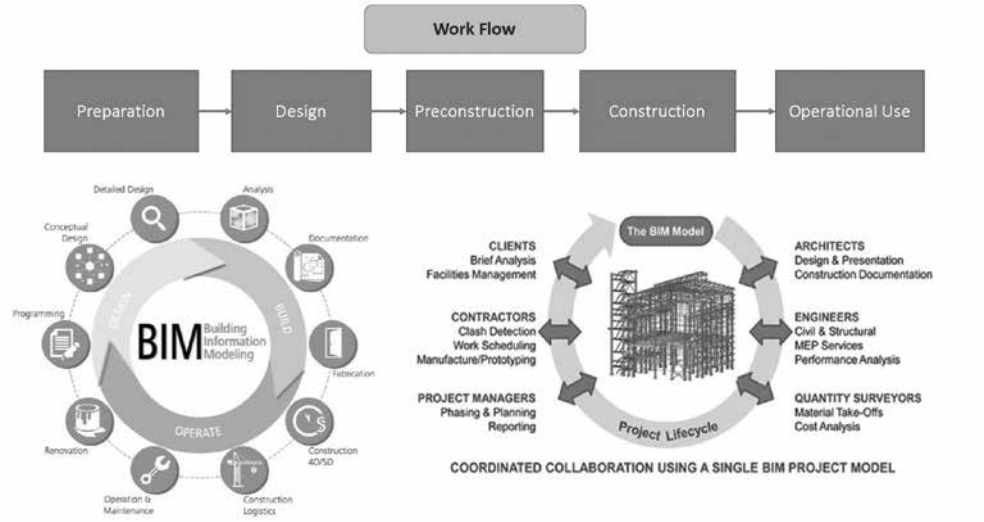
Kahn the first who settled the practice of architecture on a business basis, integrating in some way the Ford's standardization and mechanization into his design studio in the first decades of the twentieth century. The analysis of his figure and the organizational strategies of his firm made by Federico Bucci is the best introduction to the four sections of the book.

The first one questions the rise and consolidation of the largest architecture/engineering firms during the twentieth century, casting the light on the ones that anticipated and promoted the organizational strategies and market choices that will be implemented in the following decades. Through the contributions by Nicholas Adams, Lorenzo Mingardi, Peggy Deamer and Aaron Cayer, the organizational structures and the design methodologies of Skidmore Owings & Merril, Arup Architecture, Gensler and AECOM will be presented.

The second section is devoted to architectural and engineering big offices that operate in both public and private sectors, but in very different geographical and socio-economic conditions. Ruth Lang discusses the London County Council Architects' Department in the Post-War period while Xiahong Hua analyses the evolution of the Chinese University Affiliated Design Institutes during the last century; further, Klaus Rippel presents the internal organization and body of activities of the German Baden-Württenberg Bundesbau.

The panorama of contemporary archistars, their iconic and shared authorship and the interactions with the offices they led are the topics of the third section of the book. Lorenzo Ciccarelli discusses the figure of Norman Foster and the stories of the different offices he led in the last fifty years; while Rosa Sessa analyzes the dynamics of VSBA Architects & Planners after the death of Robert Venturi. In addition, Sara Lombardi presents the outcomes of a pilot study on architecture firms' creativity that involved some of the most important Italian contemporary design firms; and Pietro Messina discusses the many shades of authorship and legal issues for the design, architectural and engineering works.

The fourth section of the book focuses on the multi-disciplinary approach that binds many of the contemporary largest design firms, whose services span from the product design to the urban design. Elena Dellapiana introduces the historical evolution and methodologies of those multiscale firms, while



How the implementation of BIM changes the workflow of a typical architecture and engineering firm.

Davide Turrini and Elisabetta Trincherini present the case-studies of Snøhetta and Zaha Hadid Design, and Emanuela Ferretti explores the dynamics of the contemporary art sites and markets, that seem to be increasingly affected by business and industrial considerations. An afterword by Marco Biraghi concludes the book, discussing the distortion of the architect's role in contemporary capitalist society, and the many compromises he/she has to make in order to feed the global construction market.

This book takes shape as the final step of a research project conducted over the years 2018-2021, and coordinated by Lorenzo Ciccarelli at the Department of Architecture of the University of Florence. A part of the research outcomes was discussed in the international conference *Largest Architectural Firms in the Global Scenario. Authorship Histories, Design Cultures and Organization Management* held at the University of Florence on February 11 and 12, 2021. To benefit from the contributions debated during the conference, the presenters – coming from all over the world – as well as a few further distinguished scholars were invited to refine their papers and submit them to this edited book, targeting an international audience. We would like to thank all colleagues and friends who accepted to contribute to this book, including the Dean of the Department of Architecture of the University of Florence Prof. Giuseppe De Luca and the Dean of the Department of Economics and Management Prof. Maria Elvira Mancino who warmly supported this project.

THE RISE AND CONSOLIDATION OF LARGEST ARCHITECTURE/ ENGINEERING FIRMS

HOUSING, HOSPITALS, AND HULLABALOO: THE RISE OF SKIDMORE, OWINGS & MERRILL

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Though the architectural firm of Skidmore, Owings & Merrill (founded 1936) is known for its work for business and industry, its origins are in the fields of commercial architecture, housing, and hotels. Though these commissions affected the size of the work force (notably with the development of Oak Ridge, from 1942) the transformative growth of the firm came only with the development of its connections to corporate America in the early 1950s. Documenting the early growth of firm reveals alternative paths of development that might have produced a very different kind of practice. With the construction of the Terrace Plaza Hotel, Cincinnati (1949) and Lever House, New York (1952) an explosion of advertising allowed the partners to erase their early history. The definitive publication prepared by the firm (1963) present Lever House as the firm's first building and auger the development of the firm as a specialist in corporate architecture.

Nicholas Adams has degrees from Cornell University and New York University (Institute of Arts). His work has been supported by the National Endowment for the Humanities, the National Gallery of Art, the Institute for Advanced Study, and the American Academy in Rome. He has published books on Gunnar Asplund and the city of Gothenburg (2014), Skidmore, Owings & Merrill (2007), the architectural drawings of Antonio da Sangallo (1994, 2000), and military architecture in Siena, Italy (1986). He serves on the board of *Casabella*. His most recent work is *Gordon Bunshaft and SOM: The Building of Corporate Modernism* (2019).

Keywords: Skidmore, Owings & Merrill; Corporate modernism; United States; Chicago; Lever House

No American architectural firm is more closely associated with big business than Skidmore, Owings & Merrill (SOM): their factories, office towers, and corporate campuses are found around the world. In 1957, in acknowledgement of their standing, the firm was featured in a Museum of Modern Art exhibition on the architecture of business and government (*Buildings* 1957). Given that Louis Skidmore (1897-1962) and Nathaniel Owings (1903-1984) had their start at the Century of Progress International Exposition in Chicago (1933-1934) where Skidmore provided design guidelines for corporate pavilions, it is no wonder that when we think of SOM we think «modern business». Though founded in 1936 in Chicago, in their first published volume of collected works, they set the chronological parameters of the book at 1950-1962 and the overwhelming majority of the works pictured were corporate or industrial: it was as if the years from their foundation to 1950, the early years of growth, had been forgotten (*Architecture 1963*). How did they develop into a large-scale firm? They started with a handful of employees, by 1941 there were still only 90 technical (i.e., non-secretarial) employees; by 1953, that number had risen to 386 and to 1000 in 1958? (*Publicity 1941, 1953*; Stephens 1981, 138)

What happened?

In the beginning, the work they found was rarely corporate or industrial: they launched themselves as exhibition designers, housing specialists, and as providing general architectural services. For the Museum of Science and Industry in Chicago they designed and built a «working» coal mine (Dawes to Skidmore); they updated offices in the Monadnock Building, Chicago (*Interior* 1938); they proposed a new façade treatment for the Hartman Building, Chicago (*Hartman* 1937); they remodeled a barber shop and designed a playful coat of arms (*Maybe* 1938); they proposed models for a 70-acre housing

Skidmore and Owings, model of their Bildcost Home, *Better Homes & Gardens*, October 1936, p. 14.

development in Highland Park, north of Chicago (*Less* 1936). According to a news article, they had been at work «for the last few months... on 20 different designs of houses costing $3,250 to $3,750» (*Selects* 1936).
By July 1936, nine «economical country estates» had been completed (*Classified* 1936). In October 1936 they published house plans (and a model) in the magazine *Better Homes and Gardens* (Skidmore, Owings 1936); it formed the basis for a «Home of the Year», built in Charlotte, North Carolina in 1937 (*Home* 1937). They even designed more luxurious houses; a rambling brick and timber house for the Kimberly estate overlooking Lake Winnebago was completed in 1939 Young 1939). It is no wonder that they added John O. Merrill (1896-1975) to the masthead in October 1939. Merrill was an engineer, a convenience, but perhaps more relevant to his selection was that he had worked for the Federal Housing Authority, bringing expertise in housing and in government contracts (*Housing* 1938). He had also been a partner at Granger & Bollenbacher, a Chicago firm that specialized in housing. Merrill brought on-going projects (such as the Marcy Village Apartments, Indianapolis) to the newly renamed SOM (*Skidmore* 1980).
The opening of the New York office in 1937 did not mark a significant change in their commissions: an exhibition display for the American Standard Corporation sent Skidmore to head the office there. He positioned SOM, with the help of Robert Moses, to design exhibitions and displays for the 1939 New York World's Fair. Skidmore also advised business on their displays – and housing soon played a significant part of the practice. Out of this

Skidmore, Owings & Merrill, Bellevue Hospital, New York University Medical Center, model, 1946.

new office they obtained contracts for the development of 400 prefabricated houses for the Glenn L. Martin Company, Middle River, Md. (1941) and the John B. Pierce Foundation, a division of American Standard (1941). Their Experimental House no. 2 was the basis for the project (*Defense* 1940; *A Design* 1941; *600 Low-Cost* 1941). Using Cemesto (sometimes called «Cemest-o-Board»), a wartime substitute for plywood, they also built a demonstration house in Ravenna, Ohio for the Celotex Foundation. Thereafter followed commissions for dormitories at Arlington Farms, Washington, DC (1942–43) using Cemesto (*200 Move* 1943), and housing for the United States Maritime Commission in a series of southern port towns. These experiences ultimately led to SOM's first great expansion at Oak Ridge, Tennessee (Johnson and Jackson 1981).

Owings liked to claim that the commission for Oak Ridge came out of the blue. As he told a gathering in 1946: «On a crisp winter afternoon in 1942, two quite ordinary looking men in even more ordinary civilian clothes walked into our New York office – unannounced – and

requested an interview with our man, Skidmore» (Owings 1946). But the reality is that the exploitation of Cemesto and the development of standardized housing was what had recommended SOM. Robert Cutler, another early New York employee and later a partner at SOM recalls a further detail: evidently a friend of Skidmore's at the Pierce Foundation had been commissioned to design a town plan (site unspecified) for an unknown client that turned out to be the United States government (Cutler 1976). It was against this background, Cutler recalls, that the Pierce Foundation also learned of the plans for Oak Ridge, and that an official at Pierce phoned the Manhattan District of the U.S. Army Corps of Engineers to describe the virtues of Cemesto, thus making the connection. Oak Ridge transformed SOM – the construction budget alone, $160 million, dwarfed the work of the firm to that point.

Though Oak Ridge gave the key employees at SOM the experience of large-scale work, the size of the firm (475 technical employees in 1947) could not be sustained: many employees were temporary «project hires», released when the job was done (*Publicity* 1947). Housing was one of the keys to sustaining their size. Between their foundation and 1960 there were some 32 housing projects and reports with construction costs over $1.3 billion. Among the most notable works were four developments for the New York Housing Authority: Kingsborough, Brooklyn (1166 units, 1940), Abraham Lincoln, Manhattan (1948), Sedgwick Houses, Bronx (1951), Red Hook Extension, Brooklyn (1951). For the New York Life Insurance Company SOM built two projects: Manhattan House, New York (1952) and Lake Meadows, Chicago (1952).

Hospitals were another early area of expertise. Through his wife's family (her father was president of the hospital association), Owings obtained a commission for the Little Traverse Bay Hospital to be built in the summer-community of Petoskey, Michigan (*Indiana* 1938; *Little* 1939). In his autobiography, *Spaces in Between,* Owings expressed embarrassment about the design: he described it as «American brewery» (Owings 1973). On the interior, extensive mural decorations and a bright interior had the qualities of many institutional buildings of the day with simplified ornamentation and streamlined furniture (Richardson 1990).

After the war, hospital construction was on the national agenda. In 1946, President Harry S. Truman signed the Hill-Burton Act. The Hospital Survey and Construction

Act, as it was officially known, offered grants and loans to communities to build clinics and hospitals. In the ten years following its passage, more than a thousand hospitals were built nationally. In New York, Robert Cutler (1905-1993) was SOM's resident expert and Gordon Bunshaft (1909-1990), the firm's chief designer, was a natural choice to work with him having had wartime experience with hospital construction. In 1952 *Architectural Forum* presented Bunshaft and Cutler as SOM's hospital team. Cutler, quoted in the article, emphasized that the firm brought fresh skills to the task and he emphasized the role that big housing projects played in influencing the design of hospitals. Owings pressed the publisher of *Forum* to run a feature on SOM's hospital work Owings 1952). By 1954 the New York office alone had undertaken the design of fifteen hospitals and clinics: Brooklyn, NY, Long Island College of Medicine, Medical School and Hospital, design only, 1945; New York, Montefiore Hospital for Chronic Diseases, expansion, 1945; New York, New York University Medical Center, 1945, 1948, 1952; Brooklyn, NY, Fort Hamilton Veterans Hospital, 1948; New York, Sloan-Kettering Institute for Cancer Research, 1948; New York, New York Hotel Trades Medical offices, 1949; Greenwich, CT., Greenwich Hospital, 1950; Columbus, Ohio, Ohio State Medical Center, 1951; West Palm Beach, FL, St. Mary's Hospital addition, 1951; Alexandria Bay, NY., Edward John Noble Hospital, 1952; New London, CT., Medical Research Laboratory, 1952; Gouverneur, NY, Edward John Noble Hospital, 1953; Amsterdam, NY., General Hospital, design only, 1953; Canton, NY., Edward John Noble Hospital, 1954; New York, New York Infirmary, 1954. Architecturally, the most notable of these was the 1000-bed Fort Hamilton Veterans Hospital; the small hospital at Alexandria Bay is beautifully integrated into the landscape.

What made hospital construction particularly valuable for the growth of the firm was that they required continuous updating and reorganization. At Rush-Presbyterian St. Luke's, Chicago, between 1957-1978, SOM undertook nine separate jobs with over $9 million in construction. At Bellevue, the New York University Medical Center between 1945-1979 there were 21 separate jobs with $66 million in construction. Partners like Cutler and under him, men like Harold Olson (1917-1994) could, for all intents and purposes, work their entire life on hospitals (Olson 1997). In fact, the opening of an office in San Francisco in 1947 was a result

of SOM's East Coast experience with hospitals. The architect Timothy Pflueger, an old friend of Skidmore's, asked him for an eastern specialist to advise on the construction of Mt. Zion Hospital in San Francisco (*Mt. Zion* 1947). To manage the consultancy, Owings opened a new office there – and in the following years SOM collaborated with Pflueger as well seeking other jobs in the San Francisco area (*$500,000 Building* 1951). By 1960 SOM had built some 46 hospitals across the country with over 6000 beds and, including medical facilities, with more than $1.5 billion in construction costs. Hospital work was labor intensive, requiring complex programming (and frequent changes) and light on innovative design possibilities – hospitals were disdained by Skidmore and by Bunshaft.

A third influence on the growth of SOM was publicity. Owings was a master who enjoyed being in the public eye. He had been entered in baby contests as an infant and had been featured in the Indianapolis newspapers for his entrepreneurial skills while in elementary school. In college he had designed the decorations for dance halls and at the Century of Progress he had been responsible for the development of a changing program of entertainment to bring Chicagoans back to the exhibition more than once. To put Skidmore and Owings's projects into the newspapers, they entered competitions and took jobs large and small (Adams 2021). And when the projects became larger, as they soon did, Owings sought out the architectural magazines, befriending journalists like Allan Temko in San Francisco and the editor, Douglas Haskell in New York.

The period at the end of war was critical for SOM's use of publicity. Though the American Institute of Architects banned direct advertising by architectural firms, nothing prevented them pressing for repeat coverage or blanketing the magazines with their buildings, even using the building to advertise building materials or even other products (Shanken 2010). The realization of the possibility of blitz-style publicity begins with two buildings: Terrace Plaza Hotel, Cincinnati, Ohio (1946-1949) and Lever House, New York (1949-1952). In Cincinnati, the clients Ellsworth Ireland and John Emery helped advance the publicity value of the building; in New York, the president of Lever House, Charles Luckman, though fired before the opening of the building, had a keen sense of public relations. Both building exemplify this trend but Terrace Plaza, a hotel and retail complex, looks to the tradition of previous commissions – while in Chicago, Owings had

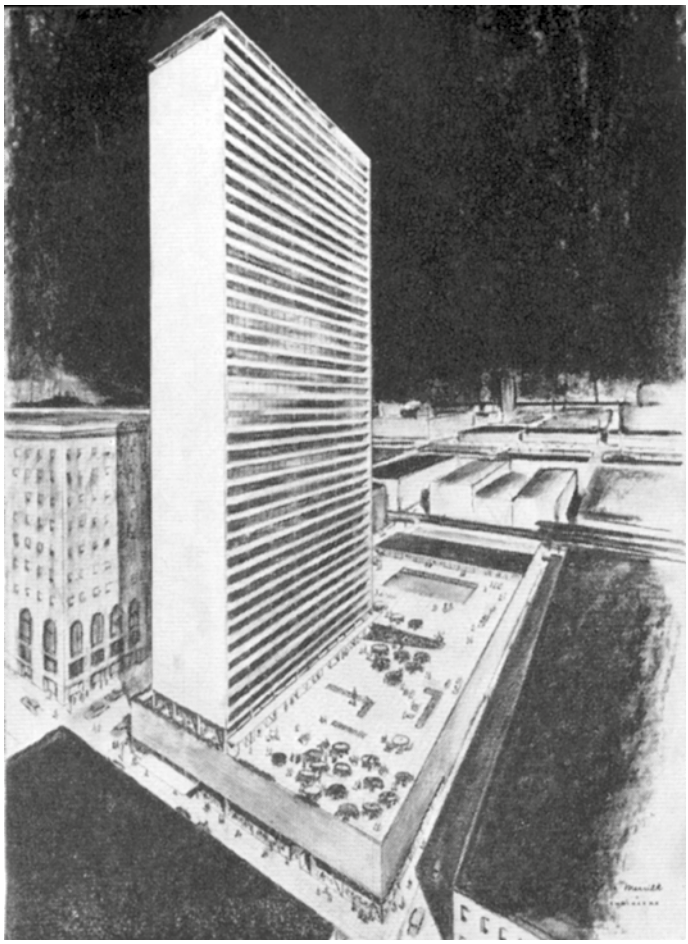
Skidmore, Owings & Merrill, Single Family Homes, Oak Ridge, TN, 1949.

developed clients in retail. Lever, by contrast, comes to be a kind of refoundation building for SOM, placed at the center of the exhibition of their works at the Museum of Modern Art (1950) and used to open the first volume of their collected works (*Architecture* 1963, 22-27); as a corporate headquarters and office tower, Lever marks the future direction of SOM.

Lever House, moreover, was born from publicity. Starting in 1947 Owings undertook the repeated publication of an ideal office tower: once in the magazine *Skyscraper Management* (1947), in *National Real Estate and Building Journal* (1948), and finally in *Architectural Forum* in 1949. The design was also circulated to the Associated Press and published in many American newspapers. Ultimately the *parti* as developed in paper form became the basis for Lever House (Adams 2007, 66).

For this design, Owings conceived of a glamorized building thick with novelties – it was, he wrote in 1947, first and foremost, a solution to the «dark, grimy, dismal canyons of stone» of the American city. He recounted its special selling points with breathless enthusiasm.

Skidmore, Owings & Merrill, Ideal Office Tower as proposed by Nathaniel Owings, October 1947.



It would be completely air conditioned; it would take advantage of prefabrication throughout; it would have parking underground and in the second and third story; an outdoor park «with real grass, pools, and restaurants» on the horizontal block; and automatic window washing for the slab. And all these advantages, Owings argued, would mean that it might rent for $5 a square foot more than other offices. Owings proposed to set up a «planning and research office (on site) where the needs of each tenant are studied in order to utilize the space to its maximum efficiency». This was not unlike an office he and Skidmore had run at the Century of Progress to help exhibitors plan their pavilions. And he promised to «cut space requirements as much as 25%» thus reducing rental costs significantly. It would, wrote Owings, «throw into obsolescence our present standards in the field of multi-storied building design». He had a salesman's faith.

> We Americans are going to eat tender juicy steaks, no matter what they cost us because we like them. We are going to keep on buying big fat, sleek automobiles as fast as they roll out of the black market at twice pre-war prices because we want automobiles. I firmly believe that the American will pay for whatever he wants but he has got to want it and want it badly. This takes glamorizing, takes a keen knowledge of human passions, takes courage, brains to produce (Owings 1947, 11).

His building was, however, far from an economic proposition, as the developer George R. Bailey, later president of the Chicago Buildings Owners & Managers Association, pointed out in the next issue of the same magazine. His article argued that the building proposed by Owings was too costly for a Chicago center city site (Bailey 1947). Owings persisted. He published the idea again in 1949 (*The Ideal* 1949). and the Associated Press published newspaper accounts, too. In 1949 he even had a client for this building connected to a new Greyhound Bus Terminal in Chicago (*Pickaback* 1949). The idea was to have buses descend to an underground entry area, keeping high-value retail stores at sidewalk level. The glass slab could then float above and behind the block. Ambrose Richardson (1917-1995), who worked on the project, comments «with few exceptions, that's exactly what happened in Lever House, except at Lever House they went even further. They opened up the ground floor at Lever House to make a garden-like open atmosphere out of it with a tower coming out» (Richardson 1990).
An unpublished account of the period leading up construction stresses the importance of public relations and advertising. In a lecture delivered to a session on the Economic Values of Design at the AIA Annual Convention in New Orleans in June 1959, J. E. Drew, the Public Relations director for Lever Brothers, described the strategy adopted prior to the inauguration of Lever House and during its first years. The success of the publicity program at Lever House, Drew notes «was due in no small measure to the assistance of our architects. Through their understanding of our problems, their patience, efforts, and most important, their ability to convert technical language into laymen's terms, they were able to provide an abundance of highly usable material» (Drew 1959, 19). The narrative line advanced by Owings in his lecture on the ideal office tower even found its way into the architectural press. In 1947 (and repeated in slightly different forms in 1948 and 1949) Owings had his ideal tower speak: «Our environment is

established. We are self-contained. Because of our size we are clearly identifiable as a single important unit. We have *individuality*! We have *character*! Our office building is a clear simple rectangular shaft rising from a pedestal, or base, free of obstruction on all sides, permitting in perpetuity, light air and view» (Owings 1947, 11). The editors of *Architectural Forum* took Owings' description and ran it through Louis Sullivan's famous description of H.H. Richardson's Marshall Field Warehouse and produced one of the most memorable statements about modern American corporate architecture:

> Here I stand in complete clarity, without mystery. Look, here are my structural columns, my office space, my circulation system – all visible, evident and obvious. It's easy to see. I am completely expressive of this industrial age. Look at me and I'll reflect back your image, darkly – but no more dramatically than you would like really to be. My personality is the image of yourself you see in my shining walls, as you stand before me in a luxurious suit made in Rochester and wonderful shoes made in St. Louis, with an airline ticket to California in your pocket. I'm you. I'll be standing here when you're gone, to say what you were like. I'm you, but I'm bigger than you (*Lever* 1952, 106).

Owings' narrative tool had served its function giving even the mute walls of the glass shaft a public voice. Success was instantaneous: according to Drew, over 750 publications covered the inauguration of Lever House by Mayor Vincent R. Impellitteri (29 April 1952) and publicity followed. *Fortune, Time, Life, Newsweek, Business Week, Saturday Review,* and *The New Yorker* provided the national image reflected in the local New York press; professional magazines also covered a specialized variety of glamorized elements, thus: *Chemical and Engineering news, Chemurgic Digest, Engineering News-Record, General Contractors Association Newsletter, General Electric Review, National Safety News, Plats Power, Refrigerating Engineering, Steel Construction Digest* as well as the major architectural periodicals (Adams 2011, 188, n. 31). Advertising was coordinated alongside the opening for maximum effect. *Architectural Record, Architectural Forum,* and *Progressive Architecture* ran product advertisements between May 1952 and November 1953 that featured Lever House. Advertising also appeared regularly in suppliers' magazines such as *Glass Digest* (between September and December 1952) culminating in an article on Lever House (*An All-Glass* 1952). Lever House also provided the background for automobile advertising that

Pittsburgh Plate Glass, Advertisement in *Progressive Architecture*, March 1953, p. 180.

ran in lifestyle magazines. A large firm needed not only to be large, it needed to be noticed, to look big to other professionals and to the public.
For decades after its construction, Lever House was a draw for clients who sought to sun themselves in a comparable aura: they came to SOM for similar effects. For example, Léon Lambert sought out SOM for his Brussels bank hoping, initially, for a European Lever House-like building (Adams 2007, 200). Others felt the same way – see, for example, Preferred Insurance, Grand Rapids, MI., 1955; Libbey-Owens-Ford, Toledo, OH., 1960 and many others. There are also Lever House replicas throughout the world: David Helldén, Sergelstorg Stockholm, 1956; Collins, Melvin, Ward, Castrol House, London, 1959; Arne Jacobsen, SAS Hotel, Copenhagen, 1960; Rino Levi, Banco Sul Americano, Saõ Paulo, 1962. SOM itself used the Lever House parti and elevations in a number of its own buildings: YWCA, Metropolitan Headquarters, Pittsburgh, 1956; Medical Towers, Houston,

1957; Crown Zellerbach Building, San Francisco, 1959. In 1958 SOM had 1000 technical personnel; by 1981, it had grown to 2000 (Stephens 1981, 138).
Many factors brought SOM to its size and prestige: the originality of its design; its attention to detail and finish; its ability to fulfill the functional demands for efficiency by the client; the ability to budget accurately and complete buildings on time. And no one should ever discount luck. Was it the originality of Lever House or the public relations associated with the building that brought to the expansion of the firm or both – that led SOM to a new scale? What is evident is that a similar publicity campaign for Terrace Plaza did not have the same effect – and SOM confined it and their earlier stock of housing and hospitals to silent limbo when it came time to bring its buildings together in their collected works (*Architecture* 1963).
Myths play an important part in the foundation of architectural firms, even the largest of them. In assembling its collected works in 1963, SOM's origins were hidden by its desire to emphasize its current business opportunities. SOM's partners caught the breeze of the corporate moment; they had the flexibility to abandon their origins in housing and hospitals and exploit their new success. They used publicity and original design to capture a new market becoming, thereby, one of the largest architectural firms in the world.

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«PUTTING ARCHITECTURE ON A BUSINESS BASIS»: ALBERT KAHN AND THE SCIENTIFIC MANAGEMENT OF DESIGN WORK

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In 1909, after having projected the first reinforced concrete factory in Detroit (Packard Building n. 10), Albert Kahn (1869-1942) is introduced to Henry Ford (1863-1947). From the joint work of those two self-made-men, an industrial capitalist and a promising architect, derives a revolutionary way of considering mass production and industrial architecture. The text examines the most innovative aspects of Albert Kahn work, that are the organization of designing following the hints given by Henry Ford in his factory organization. Federico Bucci, author of the book Albert Kahn: Architect of Ford *(Princeton Architectural Press, New York 1994), inquires into the methods of work organization applied in the Albert Kahn Inc., that acquired enormous importance during the II World War climate.*

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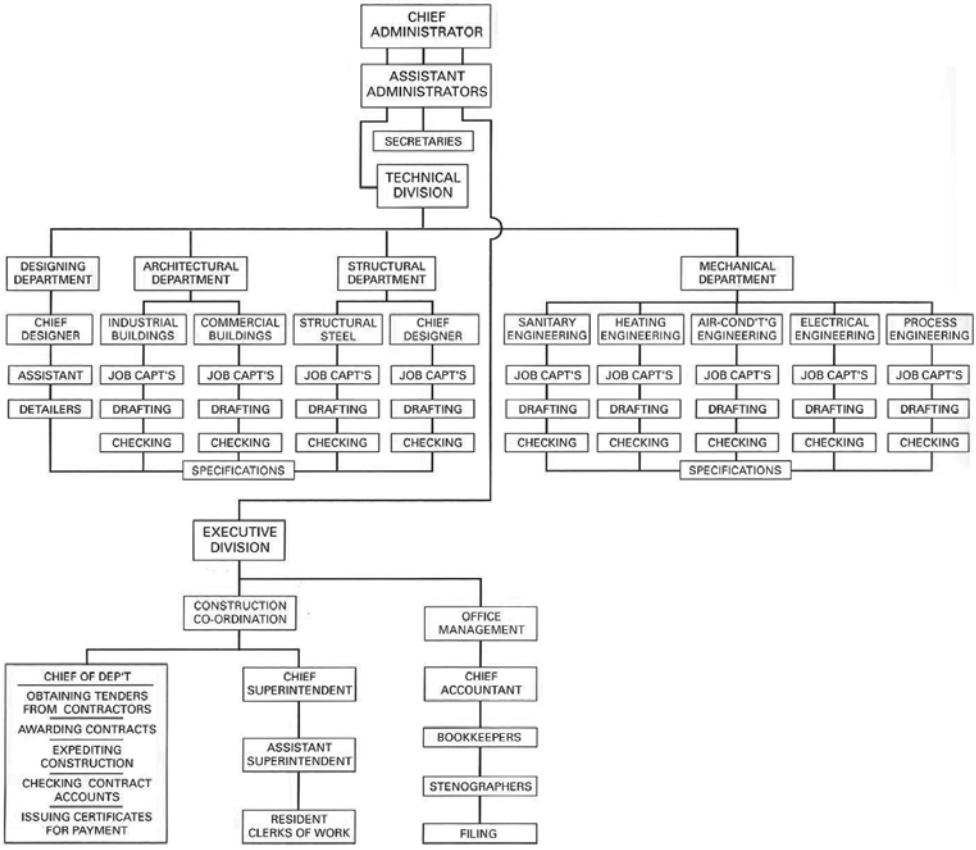
Keywords: Albert Kahn; Detroit; Industrial architecture; AE firm; Organization management

In the book *Architecture: Nineteenth and Twentieth Centuries*, published in 1958, the American architectural historian Henry-Russell Hitchcock (1903-1987) wrote: «Albert Kahn took the lead around 1905, in developing a type of subdivision and flow of work in his office in Detroit comparable to the new methods of mass-production that his motor-car factories were specifically designed to facilitate» (Hitchcock 1958, 547).
Albert Kahn (1869-1942) was born in Rhaunen, Germany, the first son of a Rabbi. In 1880 the Kahns emigrated to the United States and settled in Detroit. At a very young age, Albert was forced to interrupt his studies and he was taken on by the architectural firm Mason & Rice, where he began his self-education. In 1895, he started his own practice: from 1903 with the architect Ernest Wilby (1869-1957), and finally, from 1918, as Albert Kahn Inc. Architects and Engineers, he established a firm to leave a decisive mark on North American industrial architecture (Ferry 1970; Hildebrand 1974; Bucci 1994; Matuz 2002; Hodges 2018).
The career of Albert Kahn was linked to the Ford Motor Company which had built plants in Detroit in the beginning of the twentieth century (Conot 1986). Henry Ford (1863-1947) was not in search of an artist who would build him a celebrative image of achieved economic potential, nor was he interested in paving the way for a new tendency in industrial aesthetics; he wanted only a designer capable of responding concretely to the specific demands of mass production. As a perfect «business Architect» Albert Kahn immediately understood this need and, above all, intuited the possibility of establishing a design enterprise that was based on an efficient organizational method.
To meet Ford's orders, it was necessary to have cohesion between the work of the production engineers, who concentrated on the technical definition of the product, the lines of labor and the tool machines, and that of the

architects who designed the space. The interaction of the two processes of conceptualizing resulted in a precise method of work management within the firm of Albert Kahn itself.
There are numerous talks in which Albert Kahn spoke of the need to organize design work according to the principles of scientific management. These papers provide an outline of the essential elements of Kahn's ideas on organizational problems: most helpful is the text of the conference, entitled *Putting Architecture on a Business Basis*, held at the Cleveland Engineering Society on December 15, 1930. Through a series of observations, which, as was his custom, he pulled from his own experience, Kahn defined the tasks of the different professional figures involved in the construction of an industrial building. His objective was to demonstrate that mass industrial building problems could be resolved adequately only by resorting to teamwork and scientific management.
Referring neither to Taylorism nor to the assembly line, but not forgetting the homage to Henry Ford, Albert Kahn talked of professional profiles and the specific functions of the technicians involved in designing an industrial building, often implying the possibility of translating his considerations into more general terms (Nelson 1980; Guillén 2006).
First, Albert Kahn spoke of the work of the architect:

> The architect qualified to handle the problems of today must be a combination of many parts, and, as I recently read, must, like the conductor of a well-organized orchestra, assume leadership in directing groups of men to produce concerted and harmonious results. Even thirty years ago, there were comparatively few firms employing more than fifty assistants. Today, we have numerous firms with hundreds of employees. Their practice must necessarily be managed with proper system and on a business basis. Not only must their forces be properly organized, but the important commissions entrusted to them, often running into the millions, must be looked after in a business-like manner. There is no place here for the temperamental artist, the clear-headed businessman must have charge. Don't misunderstand me—this clear-headed businessman-architect must not be devoid of artistic training or ability, for this must ever be the corner stone of the profession (Kahn 1931).

Kahn proposed, then, an architect capable of directing a group of collaborators. The most significant collaboration was with the engineer, who concerned



Organisation layout of Albert Kahn, Inc., 1938.

himself with the manufacturing processes, the structure, and the mechanical plants.

> There is, of course, no need for stressing the important part played by the engineer in carrying on architecture on a business basis. Good business demands that only the most competent be selected to collaborate with the architect to the end that the structural parts be designed as simply and as economically as possible; that every attention be paid to permanency, that the right materials be employed, and that the design be such as to make for speed in erection. The latter is especially important since every day's delay in costly investments means loss in returns. The contributions of the engineer who has made possible that one outstanding achievement of this country, the skyscraper. The steel frame and the modern elevator are the parents of this type of building. The modern industrial building, as well, owes much of its success to the engineer, for to him is assigned the task of providing the network of mechanical veins and arteries of a modern structure nearly as complex as in the human body (Kahn 1931).

Albert Kahn, Inc., Chrysler Corporation Tank Arsenal, Detroit, MI, 1941.

Also essential to the construction sector is the contractor, who is responsible for ensuring that everything is implemented correctly in the actual construction of the building. Albert Kahn further specified the skills of the coordinator/designer. To establish a correct relationship with the various tasks, the architect – or better, a group of designers – had to be prepared to furnish detailed designs and instructions (to avoid delays and misunderstandings), pay attention to costs, insurance, and payroll, oversee the phases of the construction, and provide inspection and assistance on the worksite. Lastly, but most importantly, there was the client. For Albert Kahn, relationship with the client called for the observation of precise rules, as well as the mobilization of specific skills in areas of building laws and restrictions, the best methods of financing projects etc. Architects of industrial buildings had to demonstrate «sincerity, honest frankness, open-mindedness,

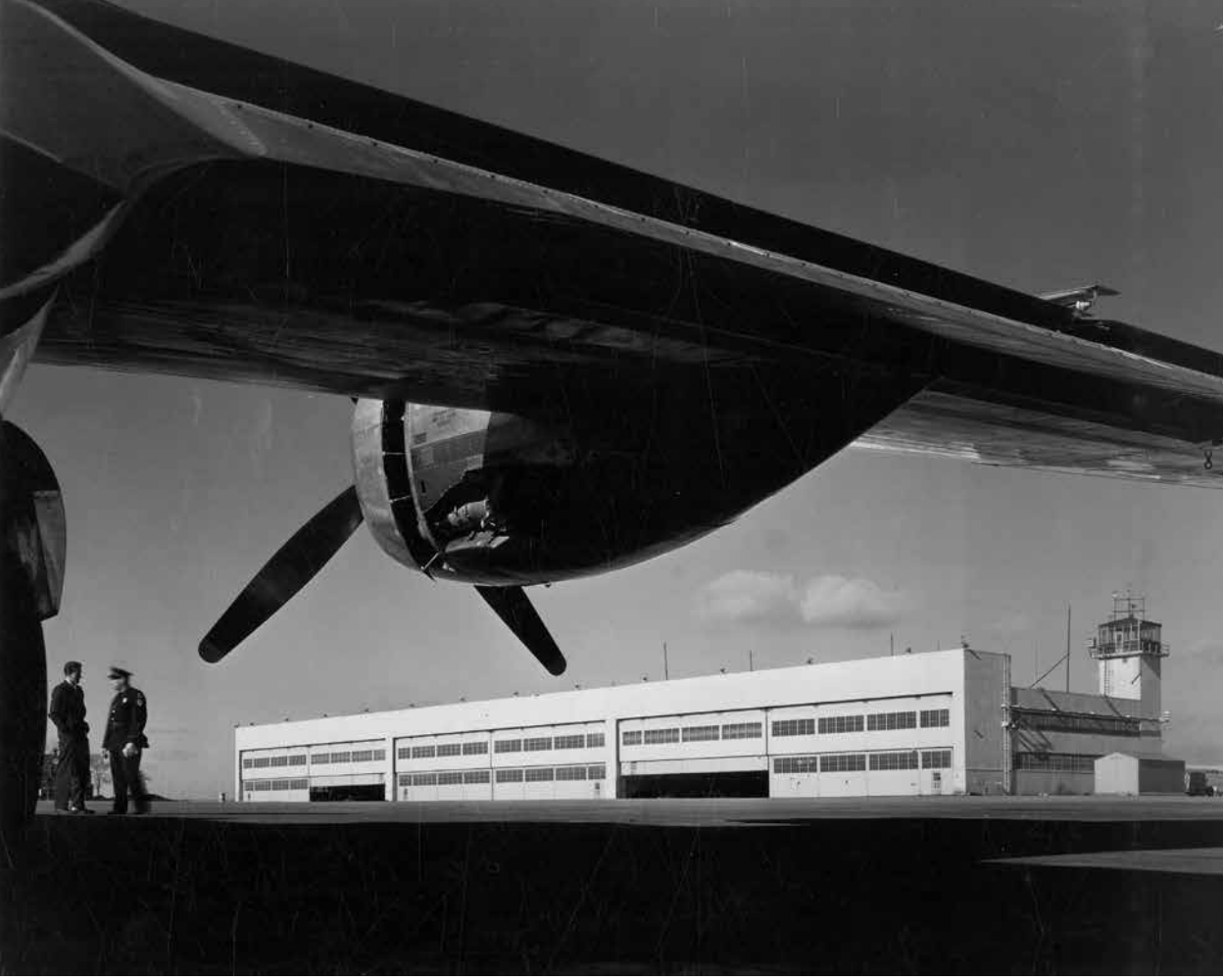
Albert Kahn, Inc.,
Kelvinator Corporation,
Plymouth, MI, 1936.

common sense and aptitude to grasp requirements, directness and willingness to consider and accept the owner's point of view», in order to establish «a proper relationship» (Kahn 1931).
All this, according to Kahn, could be obtained only in a structure that included architects, urban planners, and civil and mechanical engineers; an organization in which the teamwork of diverse collaborators, motivated by adequate salaries, was essential. Finally, such a conception meant a radical transformation of the internal relationships in a large professional firm.
Early on, Kahn realized the need to bring to his technicians not only the methods of mass industry, but also a very advanced system of direct participation in the profits of the company. Well beyond the traditional methods of incentives, he had made the decision to make his colleagues co-participants in the economic vicissitudes of the company, guaranteeing them both a

certain percentage of the profits proportional to their responsibilities, and a life insurance policy redeemable every five years, as well as personalized bonuses according to the merits acquired in each specific job. In conclusion, declared Albert Kahn

> this is the creed of every business architect today: to plan carefully so as to save waste and with a view to the future to make possible expansion when necessary, to construct economically without resorting to cheap materials which in the end prove costly, to encourage the development of new materials and make use of such after careful investigation, to design logically so as to gain maximum aesthetic results, to serve the owner's interests to the best of one's ability and in a thoroughly business-like manner, to see to it that he obtain that which he is entitled to, to treat both owner and contractor fairly and to have in mind at all times the aesthetic and practical welfare of the community (Kahn 1931).

In 1918 the newly formed Albert Kahn, Inc. occupied the top floor of the Marquette Building. For these headquarters of the company, there was an illustrated description appearing in the columns of *The Architectural Forum*, with the presentation of the workspaces and methods (Baldwin 1918, 125-126). In 1931, the company changed headquarters, and relocated to the New Center Building – now the Albert Kahn Building – in the new business center of Detroit.
The size of the firm increased with the volume of business. «In normal times the firm of Albert Kahn, Inc.», wrote George Nelson in the book *Industrial Architecture of Albert Kahn, Inc.*, published in 1939, «employs about 400 men and women; among them some 40 secretaries, stenographers, typists, and file clerks; about 15 accountants; 80-90 mechanical and electrical engineers; 40-50 field super-intendents; some 30 specification writers, estimators, expeditors, etc.; 175 architectural designers and draftsmen» (Nelson 1939, 19). All the stages of conception and production of the project were ordered by a precise diagram that organized the work in a complex interdisciplinary procedure, articulated in the specific skills of the two sectors that constituted the axis of the company: the Technical Division and the Executive Division.
The Technical Division, further divided into four departments, was responsible for the design of the buildings. The design department prepared the executive designs, the architectural department provided



Albert Kahn, Inc., Glenn L. Martin Company, Middle River, MD, 1942.

the stylistic definition of the buildings according to whether the structure was industrial or commercial, the structural department performed calculations on all of the structures, depending also on the relative specialization in steel or reinforced concrete structures, and finally, the mechanical department, divided into five sections, had jurisdiction over the design of mechanical aspects – sanitation facilities, heating, air conditioning, electrical systems, and the diagrams of operations.
Each of these departments was organized according to an identical hierarchical plan, composed of a job captain, technicians specialized in drafting designs, and staff assigned to control duties. The work was controlled by two groups: one that collected the work of the first three departments, and a second group devoted solely to the different sections of the mechanical department.
The ample supply of facilities for each section of the firm was explained, as Nelson noted, by the fact that «all departments start work simultaneously instead of working in successive stages, and this, in addition to

Albert Kahn, Inc., Ford Motor Company, River Rouge Plant, Dearborn, MI, 1938.

speeding up the work of making the drawings, means that plans and specifications for all trades can be submitted for bids at one time, thus enabling the client to determine the cost of the building in its entirety before starting to build» (Nelson 1939, 19).

The Executive Division also held an important position within Albert Kahn, Inc. It was divided in two parts. The office management dealt with accounting and administration. Construction coordination, with a superintendent, announced the competitive bidding and chose (with the client) the best offers, coordinated the phases of construction, verified the schedules, assisted the work in progress, periodically informed the client of the progress of the jobs, and acted as liaison between the various enterprises. Finally, the superintendent ensured timely payment.

During the war climate, «standardization» of the architectural solutions acquired enormous importance. It was a practice that Albert Kahn Inc. had refined and perfected during the Ford years. Kahn's considerable amount of accumulated technical knowledge justified

the imperiousness of his specifications for the standardization of the industrial constructions: a «one-story structure of incombustible materials, with enormous uninterrupted floor spaces under one roof, with a minimum number of columns» (Kahn 1941, 61). While he tended towards a single construction principle, the team he directed showed a great capacity for finding solutions for every conceivable problem.
The coexistence of these two principles – standardization and the flexibility of solutions – made possible the perfect functioning of the design machine put in motion by Albert Kahn. In this true assembly line to produce factory designs, the question of aesthetics remained. Albert Kahn himself, in one of his last interviews, did not fail to make a clarification on the characteristics of industrial architecture.

> Strictest economy must prevail in manufacturing buildings, especially in National Defense projects. Therefore, elimination of non-essentials and of everything not purely utilitarian is imperative... Just as the mere clothing of the skeleton of a modern airplane by designers with an eye for line and a sense of fitness produces an object of beauty, so the frank expression of the functional, the structural, element of the industrial building makes for success... Occasionally, a client is particularly solicitous about the appearance of his factory, and occasionally it proves difficult to dissuade him from building a classical temple (Kahn 1942, 359-360).

On December 8, 1942, six months after having received official recognition from the American Institute of Architects, Albert Kahn died of a bronchial infection. Albert Kahn Inc., however, was organized to be able to continue its activity even after the loss of its founder. The presidency was immediately transferred to Louis, the youngest of the Kahn brothers after Julius (1874-1942), an engineer involved in experimentation with the uses of reinforced concrete, and Moritz (1881-1939), an associate of Albert Kahn Inc. that assumed, from 1928 to 1932, the delicate task of managing the Soviet affiliate of the firm (Cohen 2021).
Louis Kahn (1885-1945), graduated from the University of Michigan with a degree in architecture, began to work in his brother's firm in 1908. From the first years of his career, he specialized in dealing with administrative problems and the organization of project tasks and ended up preparing an enormous manual for use exclusively within the firm. All the instructions for the

operational management of every possible activity were documented in this manual. In a speech at the 75th annual meeting of the American Institute of Architects, held in Cincinnati in May 1943, Louis underlined the need for each sector of industrial construction to be governed by a «complete architectural and engineering organization». Louis also presented some amplifications of the organizational model of the firm of which he was president. The great bulk of work for the «Arsenal of Democracy» (Albrecht 1994; Cohen 2011) and the consequent need to speed up production time required, in his point of view, required specific sectors for each of the two operations. In that period of frenetic activity (and spending), these sectors assumed great importance. At the end of his speech, Louis Kahn manifested great optimism for the future: «In my opinion, industrial work is likely to be the principal field for architects, not only for the duration [of the war] but for a number of years following the cessation of hostilities»[1]. Albert Kahn Associated Architects and Engineers Inc., based in Motor City, was therefore prepared for the post-war industrial challenge.

[1] *Speech by Louis Kahn at A.I.A. 75th Annual Meeting at Cincinnati on May 26, 1943*, Albert Kahn Papers, Bentley Historical Library, University of Michigan.

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ARUP ARCHITECTURE: THE PROJECT AS THE PROVISION OF A SERVICE

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Arup and Partners started off as an engineering firm founded by Ove Arup in 1946. Even in the Sixties, Ove Arup was speaking about "Total architecture" and wanted to introduce architects into his firm to make it an entirely independent organisation. The group founder's intention has now come to fruition. Today, the Arup firm does everything: it can be an engineering firm (only providing structural support for an architectural project created by another firm) and an architecture firm (Arup Architecture) which comes up with the initial concept of the project and then constructs it. The paper focuses on the intricate structure of the world of Arup. In order to satisfy the client, i.e. construct the work in a short time and on budget, Arup Architecture puts together a different team for each project, made up of architects, engineers and economists from its different offices. The continuous rotation of the people involved is due to the geographical situation and specific expertise required by the different projects. The paper highlights how the projects accomplished entirely by Arup Architecture do not make merit assessments about the places where the works are constructed. It is the legislative and economic context of the particular project location that determines the multiform architecture of Arup Architecture. Unlike other large firms in which the name of the reference architect is highly prominent in the media and that always feel the need to put their brand on show, often making changes to the initial programme, Arup is instead a provider of services. Arup Architecture's goal is to construct architecture that remains as close as possible to the agreed costs and schedule.

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Keywords: Ove Arup; Arup Group; Horizontal connections; Total architecture; Starbucks

"We shape a better world." The slogan that stands out triumphant on the initial pages of the Arup website, appearing in different forms on its social network profiles, does a great job in conveying the size and complexity of this organisation which reported a turnover of almost two billion pounds in its 2019-2020 financial statements. Arup has around 17,000 employees (architects, engineers, economists, communication experts) working in 75 offices in all five continents. Apart from a construction company, the Arup group encompasses all the different construction disciplines.

This in-depth focus however will only consider one sector of Arup, namely Arup Architecture, but we will see how misleading the term "sector" can be within the Arup world: each discipline works in close connection with the others and there are no clear divisions between them. At present there are around 2500 architects currently involved in the organisation, 15% of the total number of employees. This figure is not very high, but we should remember that, although architecture is a discipline strongly rooted in the group's DNA since its foundation, Arup Architecture is a relatively new company. It was only established in 2016.

Before getting into the heart of the matter, a very important and significant issue should be mentioned. Arup's company policy does not allow any type of research or in-depth analysis of the group's work. It was therefore very difficult to penetrate the world of Arup in order to understand its multifaceted and changing dynamics.

Of course, such a collective dimension of architectural work is nothing new. Even if we consider other historical periods, it is difficult to interpret the various skills that generated the built architecture. But in the case of Arup, and that of others, in the *tout-court* study of these contemporary macrocosms that operate in the building industry, there are other degrees of difficulty. In the

'multiple write-ups' of Arup, everything is to be decoded. There are no material traces on which a historian can construct their argument. This is above all due to strong reticence on the part of Arup – which is absolutely non-negotiable – to allow consultation of its documentary materials. The reasons for this reluctance lie in the very nature of the group, which insists on a haughtiness that cannot be undermined by external narratives of its work, and the delicate dynamics linked to the privacy of clients who do not wish any data concerning their relations with Arup to be disclosed.

Despite these objective obstacles, we shall attempt, through the case study of the construction of the Starbucks Roastery in Milan, if not to fully comprehend how the Arup machine operates, at least to focus on the main inner workings of Arup Architecture. In this sense, the meetings held with some members of the group, in particular James Finestone (Europe director, Architecture) and David Hirsch (associate, Architecture), were essential. Most of the information on the current working structure of Arup was deduced from the interviews conducted with them.

To attempt to understand the current structure of the firm, we must plot some historical coordinates of the group. Ove Arup was one of the major players in the history of architecture in the second half of the twentieth century. A philosopher and engineer, he was born in 1895 to Danish and Norwegian parents and graduated from Polyteknisk Laereansta in Copenhagen. By the 1920s he had moved to London and in 1938 he established Arup & Arup Ltd, an engineering firm, along with his cousin Arne. He worked with several architects from or based in London, among whom, above all, Bernard Lubetkin should be mentioned, with whom he created the Regent's Park Penguin Pool, which represented a sort of starting point for both of their careers (Jones 2006, 52-54). This closeness to modernist architects saw him involved in the Modern Architectural Research Group (MARS), the association of British designers who participated in the *Congrès Internationaux d'Architecture Moderne* (CIAM). This was no small thing. Arup, in fact, was the only engineer in the group and among the few non-architects to participate in congresses. He had a genuine interest in architecture design and this made him highly critical when it came to works built by the so-called "Modern Movement": "Often badly planned, badly ventilated, badly heated, etc. In other words, only limited use is made of all the existing technical knowledge. New knowledge, new materials,

Arup office, Berlin, 2018.

new processes have so widened the field of possibilities, that it cannot be adequately surveyed by a single mind... our needs increase with the means the problem arises of how to create the organisation, the "composite mind" so to speak, which can achieve a well-balanced synthesis from the wealth of available detail. This is one of the central problems of our time" (Jones 2006, 122; Tonks 2012, 19-21). In 1942, Arup openly declared how architecture must be a hetero-directed practice. In light of our current knowledge this seems to be an entirely obvious statement, but it certainly wasn't at the time. In this phase his great interest in total identification between architectural form and structural behaviour was already apparent, which must occur in the concept phase, from the initial draft sketches. This modus operandi is also one of the cornerstones of Arup Architecture today.
In 1946, Ove Arup started a new company, Ove N. Arup Consulting Engineers, which three years later became Ove Arup and Partners (Ronal Jenkins, Geoffrey Wood, Andrew Young). In just twenty years it became one of the largest engineering consulting firms in the world. From a single office in London, working on low-budget projects, Arup and Partners soon opened new offices in Africa and Australia (Jones 2006, 155). The change from a small to a large company was made to coincide with the group's involvement in the construction of one of the iconic architectures of the twentieth century: the Sydney Opera House designed by the architect Jørn Utzon who had won the international competition. This is not the

place to discuss the particularly intricate events that led to the construction of the building or the relationship between Utzon and Arup, but it is important for us to highlight that the Opera House was the starting point for the status and current organisation of the group (Jones 2006, 173-205). At the end of the Fifties, precisely due to this indissoluble union between architecture and engineering that the founder has always pursued, there were several architects working at Arup and Partners. Before speaking about the current status of Arup, we should mention another very important and significant step. Arup Associates was established in 1963 as an architecture firm initially intended as a sort of "side project" of Ove Arup and Partners (Jones 2006, 266-270; Powell 2018, 3-4). Later, in 1970, it became an actual part of the Arup firm, which in the meantime had increased to more than 1500 employees (Jones 2006, 277). In 1970, the Arup Partnership was established, which incorporated Ove Arup and Partners and Arup Associates into a single organisation. From the outset Associates was a group that carried the name Arup, but to all intents and purposes it was independent, an organism in itself. On the other hand, Arup Associates was founded due to an internal conflict within the company: Ove Arup and Partners worked for the big names in architecture (Utzon, and thereafter Renzo Piano, Richard Rogers, Norman Foster and many others) and did not want to compete with its architect clients. Therefore, for opportunity-related reasons, many partners were against having a high number of architects join the firm. At the time Ove Arup believed there was a need to "free" the core of architects at Arup from this "slavery." In a parallel organisation such as Associates they could also participate in international and national architecture competitions without having to give in to other designers and enter into conflicts of interest. But in the long run this union did not work. For this reason, Associates gradually pulled away from the parent company, even more so after the death of Ove Arup in 1988. In 2016, Arup Associates disappeared for good. Arup has become such a big firm and provides such a number of services that engineering support for external architects is no longer the core business as it was at the end of the Nineties, and therefore there are no longer conflict of interest issues. It began to understand that architecture had to become a discipline to all intents and purposes embodied within the group. This is the reason why Arup Architecture was established.
Let us now turn to the present day. Arup Partnership has

been a limited company since 1999, so it is not headed by a single owner whose economic interests are exclusively within the group, but rather a board of directors and a trustee board. In 2001 the name changed from Arup Partnership to Arup Group. The group's main headquarters is still in London, where its board is based. It is still the office of the current chairman of Arup. The Arup organisation is divided into five geographic areas ("regions")[1]: UK, Middle East, Africa and India; Europe; America; East Asia; Australia. Each region is made up of different groups. Some countries have more than one Arup office: starting with the United Kingdom, which has sixteen offices, but this is a separate case given that the company was established in London, while Germany, for example, has three offices (Berlin, Dūsseldorf, Frankfurt). One particularly important fact to take into consideration is that these divisions are not meant to be considered as airtight compartments. How is the working structure of the group organised? Within Arup there are "invisible horizontal structures", as they are called within the group, which connect the various parts (employees, project teams, entire groups, regions)[2]. If we want to schematize the work structure of Arup, it would not look like a bicycle wheel with a leader (or group of leaders) at the centre and then spokes made up of the different directors of the groups that complete the mechanism.
The most adapt framework would resemble the clusters designed in the Fifties by the British architects Alison and Peter Smithson – who collaborated with Ove Arup and Partners on some projects, including the Hunstanton school between 1949 and 1954 (Smithson 1967, 30-32) – who used such cluster systems to define their projects characterised by a plant with a labyrinthine conformation. Another very fitting example to describe the current structure of Arup in graphic terms could be the utopian visions of cities designed by the British group Archigram in the early Sixties, such as the Plug-In City by Peter Cook (1964) or Computer City by Dennis Crompton (1964), where the elements are connected to each other through an intricate network of services, such as a series of communication hubs.
This intangible network characterised by horizontal connections was fundamental in the group's internal structure, as the process is entirely based on a skills network. For example, if an architect from Milan or Madrid needs advice on a project, there is an "Arup data

1 James Finestone in conversation with the author, 14 July 2020.
2 Ibidem.

centre" which can accept requests that can be answered by an engineer in Frankfurt or Copenhagen, should they be free at the time[3]. This engineer would probably join the project team of the architect who made the request, if only for a short time. Therefore, the figures necessary to define a project phase can be found in the shortest time possible without waiting for top-down decisions. For each project, Arup seeks to create studies that are in a certain sense autonomous. In this sense, the hierarchical part is downplayed: a top manager can be contacted even by a junior architect. This aspect clearly has organisational value not only for the architecture project, but it is also an economic model inspired by the *efficiency wage:* enforced equality, very high employee wages (at all levels), extra packages. All this increases the architect's involvement in the project and in the Arup group, generating loyalty to the company in the employee and, therefore, increased productivity (Akerlof-Yellen 1986).

It is easy to understand that Arup employees are constantly connected to the network. This has been the case for some years, even before the COVID-19 pandemic disrupted our work relationships and daily dynamics. Economic reasons drove Arup to adopt this continuous interface among its employees: the project phases are completed more quickly and close ties are created between employees of the different disciplines within the Arup group, which are then highly functional at a later stage. These connections are not lost and may be useful to optimise the timing and therefore costs in a future project.

The current multidisciplinary structure of Arup stems to a large extent from the approach that Ove Arup had planned from 1970 onwards. We must therefore take a step back to that particular and delicate time when Arup was already a large company with different offices located throughout the world. Ove Arup had felt the need to compact the different elements of the Arup world and give the company precise objectives for the future. So, on 9 July of that same year he held a discussion with all his employees at the Arup Partnership meeting in Winchester, Great Britain. Given the importance of this event, it was no coincidence that his talk came to be known as the Key Speech and is known almost by heart by all employees of the current group. It represents a sort of religious text, a psalm to be recited to those who,

[3] Ibidem.

Arup office, Berlin, 2018.

as outsiders, approach the Arup world. "Today, the Key Speech is required reading for each person who joins Arup and is valuable to anyone who wants to understand what continues to motivate us, both as individuals and as an organisation"[4]. Why was the Key Speech so important and representative? What did Ove Arup speak about? To guide the future of the group, Arup borrowed the phrase "Total Architecture" from Walter Gropius (Gropius 1956): "We are then led to the ideal of 'Total Architecture', in collaboration with other like-minded firms or, better still, on our own. This means expanding our field of activity into adjoining fields: architecture, planning, ground engineering, environmental engineering, computer programming, etc. and the planning and organisation of the work on site" (Arup 2021, 4). In addition to the removal of barriers between the disciplines, Ove Arup also insisted on the importance of rewarding employees, involving them in the company's organisational processes, focusing on concepts such as "unit" and "enthusiasm" which still form the basis for communication at Arup: the group is doing none other than taking the indications already contained in the mysticism of the Key Speech to extreme conclusions (Uihlein 2016, 102-105).
Another point Ove Arup was insistent about, even before 1970, and that is now one of the company's focal

[4] Ibidem.

points, is the constant professional development of the employees. There is now an Arup University, which is a sort of real university within the group organising different kinds of courses (from computer software updates to acoustics, lighting and other disciplines). The University is also one of those horizontal connections mentioned earlier; it does not have physical classrooms located in the offices but rather virtual ones and the employees (architects, engineers, economists, lawyers) are hired mainly to provide training.
Reinforcing the motto "Seventy twenty ten", very familiar to Arup employees – that is, seventy percent of the expertise of a member of Arup comes from their daily work, twenty is acquired through the skills of other colleagues and ten per cent through internal training programs – there is also a sort of "Erasmus" programme which allows Arup departments to swap employees for a set number of months. Beyond the division into regions and groups, most Arup offices are particularly knowledgeable in a certain field or type of construction. There are strong leanings. Germany, for instance, mainly focuses on Industry and Science (pharmaceutical and automotive industries), and these tendencies remain very marked within Arup. Employees can also acquire skills by physically moving from office to office.
To complete the training field, the company offers master's courses and design schools in focus areas that change from year to year. The purpose of these courses – also invisible horizontal structures – organised in association with state and private universities, is to direct young graduates towards Arup.

Starbucks Milan

For an organisation as large and complex as Arup, there are many differences from project to project. They depend on the scale, project type and many other factors. For a better understanding – as far as possible – of how the Arup Architecture machinery works, we shall focus on a case study: Starbucks in Milan.
In 2016, for its first Italian sales outlet, Starbucks wanted to build a roastery and not one of its typical franchises – to be opened subsequently in Rome, Turin, Florence, as well as Milan – but it wanted to create a more sophisticated place (Olivetta 2017, 489-508). That is, a space that is not just a coffee shop but also a place where the production of coffee is both a practical necessity and a business vehicle. Visitors can appreciate and admire the entire roasting process: they see the product arrive still in its

Arup Group, Starbucks in Palazzo Broggi, Milan, 2016.

jute sacks, they see how it is opened and transformed, how the process of roasting the beans works and they can understand how Starbucks coffee is a genuine product at kilometer zero. This creates an experiential space where the customer is enticed to consume. Starbucks' most representative products, such as the famous Frappuccino, do not appear on the menu. Moreover, no drinks are served in the iconic green and white containers, but rather in ceramic mugs.

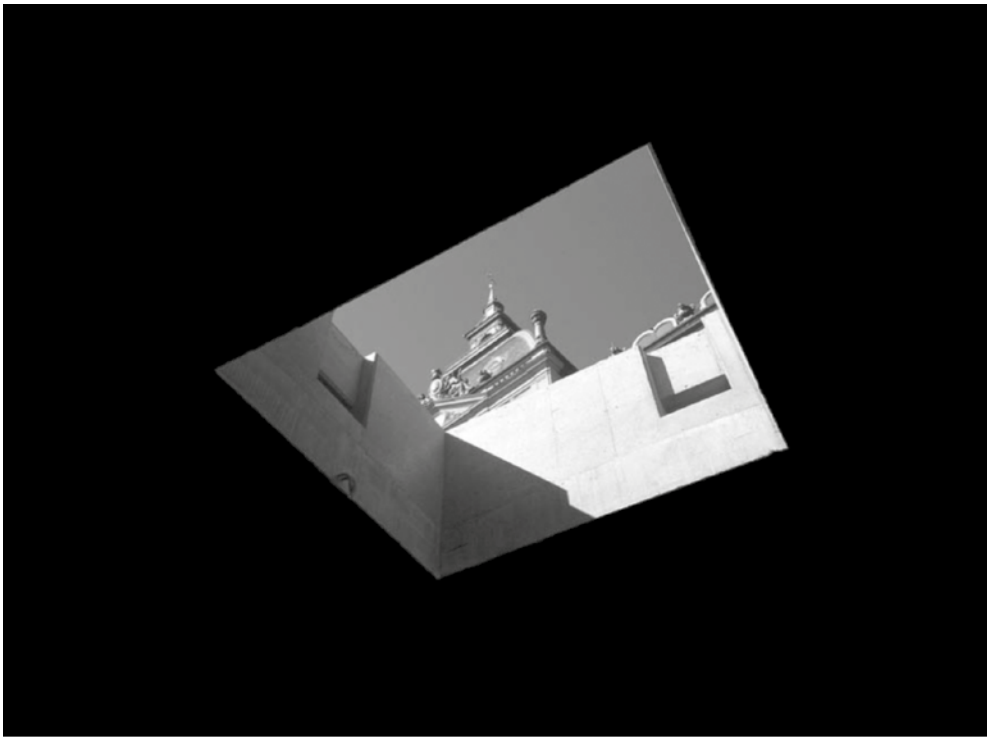
For two years already (since 2014) Starbucks had had an agreement with Arup for different types of consultancy services, so when the American multinational decided to "land" in Italy it immediately turned to Arup. And it did so in the city where the group's only office in Italy was located. Arup's initial task was to understand the client's request and provide technical support, given that the work was to be carried out inside an existing building subject to restrictions by the authorities: the former Palazzo della Borsa in Milan, later transformed into Palazzo delle Poste. So, Arup started by doing due diligence and a feasibility study on the space so that Starbucks could sign

Arup Group, Starbucks' Reserve Roastery and Tasting Room, Milan, 2016.

a general agreement with the building owner – a private investment fund – to lease the rooms[5].
Starbucks is a large company that already has its own internal team of architects and designers. At the start of the project a group of architects from Starbucks moved to Milan to work with Arup on the project concept. Before arriving in Milan, the company had very clear ideas on the organisation of the spaces and the arrangement of the coffee roasting machines, which are the crux of the roastery. The group of architects and interior designers from Starbucks was led by the designer Liz Muller, who had previously worked on the company's first roastery, built in Seattle in 2014. So, Arup Architecture's role was to make the construction of the *mise-en-scène* of the Starbucks designers technically possible (from a structural and plant engineering perspective). The two groups worked together on the choice of the materials used, which were particularly expensive, and the finishes, while the entire construction phase was managed by Arup. Starbucks Milan has two sides: one that deals with the public, characterised by impressive elements and attention to detail, and another more technical side

5 David Hirsch in conversation with the author, 29 January 2021.

consisting of the machines that carry out the roasting process. This latter part is hidden from public view, but it is highly complex from a technical point of view. To all intents and purposes, it is as if the roastery were a sort of small factory. Given the management of such a complex job – involving coordination between architecture, structures, design and various machinery on the industrial side – the project was developed entirely using the BIM system (May-Pynn-Hill 2018, 4-24).
The Starbucks Milan project allows us to understand some important group dynamics. The initial consultancy services, feasibility studies and construction site are offered when a project is entirely managed by Arup Architecture (although in this case Starbucks had some input on the design side). That is, projects in which Arup controls everything from the outset of the process, even the architectural design. On the contrary, this is not a given when Arup acts as mere support for other architecture firms where it only provides consultancy on the structures or other expertise. In this latter case Arup did not involve its architects.
For obvious reasons, the Arup Architecture project team usually has a "heart" where the project must be built: it is familiar with the administrative and legislative dynamics of the place and is more knowledgeable about the construction companies. However, as mentioned earlier, if a particular skill is missing in the working team it is obtained from another office, even outside of the region. This was not the case with Starbucks Milan, but on some occasions, above all when Arup works in countries where it has no office, local collaborators external to the group are also employed. In general, before starting a project, Arup always assesses the importance of the local market and how much space there might be in it. If a market is already saturated, and therefore there is little room to expand, Arup Architecture works alone, otherwise, in order to put down roots in that region, it establishes relations with local architects.
The Starbucks project involve over forty Arup employees in the most complex stages of the planning and it started out with collaboration between the Milan office (with 35 architects out of a total of 120 employees) and the Seattle office which was involved in the first roastery in 2014 and therefore provided important know-how on the client. It was not only architects and engineers from Seattle who were involved, but also a project management unit which during the various design stages handled relations with the client and with the



Arup group, Cityringen, Presentation of the project, Copenhagen, 2017.

property owner. Better communication with the client shortens the project time and therefore also the costs; each choice Arup makes is aimed at achieving maximum efficiency, at all times.
As on many other occasions, Arup immediately had to deal with client confidentiality issues. Starbucks did not want the citizens of Milan to know that it was opening a shop in the former Palazzo della Borsa in Milan.
It wanted it to be a surprise for the city. This made management of the construction site very challenging. The extreme confidentiality of the clients who employ Arup is one of the most problematic issues for the work of a researcher. It was not possible to publish drawings or images of the construction site because each project Arup Architecture works on is subject to huge restrictions linked to the client's privacy, which cannot be infringed in any way.
For the Milan project, but also as is standard practice for many other Arup Architecture projects, the team members hold very few meetings as they are always in contact with each other. But the work must also be assessed internally: there must be quality control. How is this achieved? It is carried out through technical reviews, which can be kick-off, state of progress and

Arup group, Cityringen, Presentation of the project, Copenhagen, 2017.

completion of the work. They are not coded steps, but obligatory. These reviews can involve different figures, in addition to the project team, who have specific expertise referred to the job. This was not the case for Starbucks Milan, but the kick-off technical reviews can turn into real workshops to which several Arup employees are invited from other offices that have nothing to do with the project. On many occasions the project team might be formed on the basis of the workshop results. In this case that system of invisible horizontal connections so characteristic of the group becomes crystal clear.

The reviews subsequent to the kick-off step not only aim to assess the project, but they also assess the employees involved. The meetings are recorded and each team leader is assigned a score based on the success of the project: Was the initial budget met? What was the client's rating? These, and other questions, form the basis of the yardstick. The system is two-way, the juniors also leave feedback on the project managers. Almost to demonstrate equality between the "boss" and the "worker." But it is totally contrived. So in this element too there are references to the economic model of efficiency wages mentioned earlier.

The Architectural Language at Level Zero

As we have seen, Arup's architectural design process is incredibly fragmented. So, managing to understand the actual authorship of the group's projects is an impossible and likely pointless process. Arup is a deliberately impalpable company from this point of view. It is not interested in affirming its identity as the author. Its objectives raise other questions. We are not referring to the entire Arup organisation, as it would greatly increase the problematic nature of the dissertation, but we are only focusing on the case of Arup Architecture.

What is important for Arup is to deliver a given project. Those who appoint Arup know that Arup – given its network of expertise – is an excellent provider of services. Some large international architecture firms always need to showcase their brand, their formal research, and often make changes to the initial programme envisaged by the client or by the urban planning regulations in the project location. Although, as we know, authorial architecture is a contradiction in terms, in the case of these large firms the work has become one with the author. The author is everything. The purpose for Arup is instead just to construct architecture of high technical quality that stays within the costs and schedule agreed. This satisfies the client. Arup is not interested in imposing its language. So, we are speaking about performability. We certainly do not touch on the problem of excessive 'authorial' customisation when discussing the Arup case.

Of course, this performability leads us to inevitable considerations. Arup Architecture's works do not make merit assessments, from a formal, linguistic and character perspective, about the place where the work is constructed. It is the legislative, climatic and economic context of that particular place that determines the architecture of Arup Architecture. With respect to extreme performance-based research (from an economic perspective and in terms of the efficiency of the materials used) there is a complete lack of formal and linguistic research. While it is true that the term architecture, combined with a building that has been constructed or even just designed, should be the result of linguistic and syntactic research, we do not see this with Arup Architecture. There is no character. If we believe, and we do believe, that architecture must have a character, obviously not in the eccentric meaning of the term, Arup does not have this quality. It exclusively deals with a substantial and formidable series of technical skills. However, the group's communication

is at times misleading in this sense: when presenting their Copenhagen metro project (2019), for example, the group's architects questioned one of the greatest systems in the history of Western architecture: they compared a skylight in one of the metro stations to the oculus of the Pantheon.
Very often, attention is placed on the choice of the local material. For example, in the case of Starbucks in Milan we find Palladian flooring as a tribute to some inserts in the Vittorio Emanuele Gallery. But the group also declares this openly: the materials must align with the client's image. Starbucks wanted those materials to attract Italian customers to a place that felt familiar. So, using typically local materials and workmanship is not the result of architectural research, but rather, once again, aimed at satisfying the client's requirements.
Arup is a changing, chameleonic, immaterial company. Like those invisible horizontal connections. And it is at least paradoxical, if not bizarre, to talk about immateriality when referring to a group that constructs buildings. But that is the case, it adapts to each situation in order to do business. Without giving a negative connotation to this conduct. However, if we stop to analyse the architecture produced by a corporate organisation with these starting assumptions, we are faced with works that express themselves through architectural language at level zero.

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«ARCHITECTURE IS WHAT WE SAY IT IS»: GENSLER AND AECOM AS MODELS OF NEOLIBERAL PRACTICE

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By the Seventies, corporate forms of practice had come to dominate the architecture profession in the US, surpassing partnerships in popularity and in number. Corporations were relatively anonymous entities whose structures prioritized the pursuit and expansion of profit over organization and design, and their growth was informed by the urban political-economies in which they were embedded. In particular, firms that were based in developing metropolitan regions began to absorb these lessons and challenge the boundaries and standards of architecture practice altogether. This article examines how architects at the firms Gensler and AECOM were informed by theories of corporatism and liberal economics during the late Sixties and Seventies, and it describes the historical meaning of their corporate business models. Both Gensler and AECOM ballooned in California after the Sixties, and we argue that, while distinct, both firms can be understood as producers and products of neoliberal political economies: they demonstrate how corporatism challenges state sanctified professional practice.

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Keywords: Corporation; Neoliberalism; Expansion; Gensler; AECOM

From Gensler to AECOM, the story of postwar economic triumph is familiar: Art Gensler began his firm in the mid-Sixties with only $200 to his name, and AECOM was founded by architects who were hospitalized during the Fifties due to stress about profit and bankruptcy (Gensler-Lindenmayer 2015, 276; Gensler 2015, 162). Yet both Gensler and AECOM emerged as global giants during the second half of the twentieth century to become among the five largest architecture firms in the world, ranked by both revenue and employees. Both firms were imagined by architects who turned to incorporation as a means to economically advance their individual practices. While incorporation carried with it collective ownership and stratified layers of profit between owners and employees, it also made possible an expanding scope of architectural work that has come to include virtually everything, from the designing of buildings to interiors to real estate to maintenance to finance. «We are AECOM, we can do anything» one Senior Vice President at AECOM recently argued (Seward 2010), while at Gensler, a former Senior Architect asserted: «architecture is what we say it is»[1].
In this article, we briefly examine the relationship between corporate structure and the expanded scope of architecture work. While incorporation (rather than a partnership or other business model) has been integral to the expansion and dispersal of both the discipline and profession of architecture since the Sixties, we argue that it challenges such state sanctified «professional» practice. What was once viewed as good for business growth, we suggest, may not have been always good for disciplinary and professional integrity.
While the vast majority of architecture firms in the US are presently corporations, we turn to AECOM and

[1] Former architect in conversation with the authors, 26 September 2020.

Gensler as two extreme versions of expanding corporate practice, as firms with imperialist tones that challenge professional «standards» altogether. As Hannah Arendt has argued, the motivating principle for imperialists was «expansion for expansion's sake» during the last third of the nineteenth century, when individuals met limits to capitalist production. While politics, she argues, represent the central thrust of imperialism, its origins were business speculation and the expansion of industrial production (Arendt 1973, 124-135).

Architects in the United States responded to the economic turbulence following World War II by incorporating their practices in order to expand. They both produced corporate spatial imaginaries for their clients—other corporations, cities, and governments—and absorbed the lessons they offered. Incorporation enabled architecture firms to support multiple economic functions, and they were relatively anonymous enterprises structured for maximum efficiency and expansion. In particular, incorporation was defined by a hyper division of labor and the production of new expertise in fringe areas beyond architecture (Berle 1991; Drucker 1972; Chandler 2002). They *created*, rather than merely found, new markets.

Incorporation functioned especially well for firm owners. In addition to limiting personal liability, corporations provided greater tax benefits than partnerships or sole proprietorships. They supported more elaborate pensions plans that could be deducted as a business expense, they provided new means by which to distribute and transfer ownership beyond founding individuals, and they offered new ownership and investment opportunities through shared stock (*The Architect's Handbook* 1971, 3-6). For salaried workers, the centralized nature of corporatist wage setting that is relatively unaffected by market fluctuations put pressure on employees to justify the value of their labor by internal markers of productivity (Fuess-Millea 2021).

Architectural incorporation was part of a larger post-WWII change as Fordism morphed into corporatism. Defined in the shadow of the Soviet Union with whom it had to compete both at home and internationally for political, social, and cultural hegemony, corporatism had to prove its superior capacity not just for innovation, economic dominance, and cultural hegemony, but for worker security and career longevity (Deamer 2011, 160-167, 202-203). Corporate dominance was justified for the sake of all players—employees, directors, and stockholders alike – at the same time that it proved

American moral and economic superiority. Peter Drucker, «the man who invented corporate society» and whose book *Concept of the Corporation* about the managerial organization of General Motors forecasts the outward thrust, proposed that the success of this new economy was based on enlightened management. Management implied the superior knowledge held by corporate heads to organize all sectors of production for the benefit of progress. Even in the «knowledge economy» that Drucker predicted would change the nature of corporations as they transitioned from manufacturing to information production, enlightened management was the key to competitive advantage. As competition between corporations was increasingly foregrounded, corporatism by the early Seventies – especially with the termination of the Bretton Woods accord which had held the dollar to a gold standard, a termination that effectively let the dollar's value float freely in the market – was increasingly a game of elite executives primarily interested in the value of their stocks. While Drucker warned of growth for growth's sake, in the neo-liberal turn, maximizing profit more and more was the chief responsibility of the corporation.
The majority of architecture firms resisted incorporation during the first half of the twentieth century in keeping with early professional ethics to remain as sole proprietorships. This began to change during the Sixties and early Seventies and by 1977, the corporate structure of practice in the US surpassed the partnership in number (Bruegmann 1997, 116; Bannister 1954). By the Eighties, corporations surpassed even the number of sole proprietorships, and today, nearly 80% of architecture firms are corporations (Cayer 2019, 183). But AECOM and Gensler are still unique in their structural absorption of incorporation. Looking beyond the pension and liability advantages, they embraced the drive for diversification that characterizes non-professional – «general» – corporations. Perhaps because they were both based in California – where large firms were emerging just as craft forms of production were declining and industries were disintegrating, subcontracting, and linking to production companies focused on more generic tasks – both AECOM (Los Angeles) and Gensler (San Francisco) could take advantage of these paradigmatic «post-Fordist» cities in which the knowledge economy predicted by Drucker was both flourishing and particularly open to the shared, unfettered corporate business structure (Storper-Christopherson 1987, 104-117). Even Drucker moved from New York to California in 1971 to develop an MBA program at Claremont Graduate College.

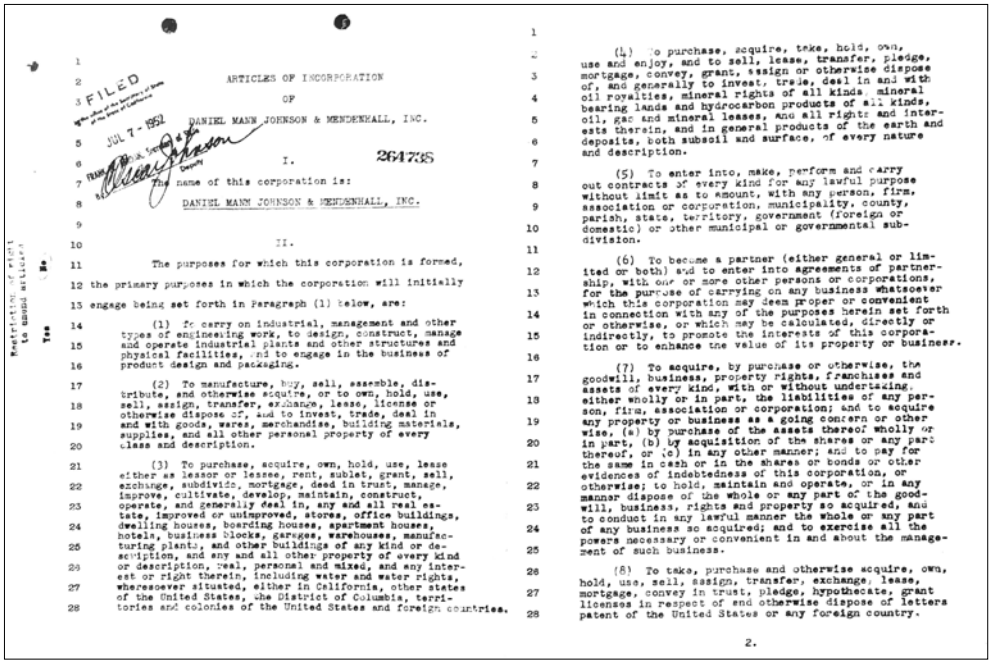
As manufacturing jobs plummeted and industrial zones were vacated in cities across the country, LA and San Francisco marked their exceptionality by re-industrializing during the Sixties and Seventies with technologically advanced manufacturing in high technology industries, such as aerospace and electronics (Scott 1993). DMJM and Gensler emerged just as development in these American cities was occurring on the «periphery» rather than in traditional industrial centers (Soja-Scott, 1986, 249-254).

AECOM

AECOM is presently a publicly traded corporation based in Los Angeles, and it ranks as the largest publicly traded revenue generator in the city, with over $18 billion in annual revenue and nearly 90,000 employees (Cayer 2019, 179). It was formed as an outgrowth of the post-war architecture firm Daniel, Mann, Johnson, Mendenhall architects (DMJM), which was launched into economic prominence during the Cold War by government commissions unprecedented in scale, budget, and state patronage. These projects included underground ballistic missile prototypes and military bases that peppered the globe, from Japan to Vietnam to Sudan to South Africa to England.

In practice, the firm used the corporate form to grow by acquiring and merging with a diverse array of firms to keep up with the demands of the post-War urban political economy. The firm's subsidiary firms allowed the company to not only offer architecture and engineering services, but also real estate, data processing, cosmic X-rays, and even aerial surveillance.

Yet this transformation in practice did not occur overnight or without managerial guidance. As architects after the war sought to replicate the managerial tendencies of big business, management consultants were ushered in as advisors. DMJM turned to the business consulting firm Booz, Allen & Hamilton (BAH), a top management consulting firm that had worked for architecture firms including Perkins & Will, which created an internal management training program to disseminate the corporate ideas of the management guru Peter Drucker (Hyman 2018, 119). The leading BAH consultant drafted a new structure for DMJM that was based on the structure of BAH itself (*Profile* 1957, 27-28). Each partner was to be paid the same small salary and they were only permitted to bring half home; the remaining half was partially held for taxes, while the rest was kept at DMJM for «plowing



ARTICLES OF INCORPORATION

OF

DANIEL MANN JOHNSON & MENDENHALL, INC.

FILED

JUL 7 - 1952

264735

I.

The name of this corporation is:

DANIEL MANN JOHNSON & MENDENHALL, INC.

II.

The purposes for which this corporation is formed, the primary purposes in which the corporation will initially engage being set forth in Paragraph (1) below, are:

(1) To carry on industrial, management and other types of engineering work, to design, construct, manage and operate industrial plants and other structures and physical facilities, and to engage in the business of product design and packaging.

(2) To manufacture, buy, sell, assemble, distribute, and otherwise acquire, or to own, hold, use, sell, assign, transfer, exchange, lease, license or otherwise dispose of, and to invest, trade, deal in and with goods, wares, merchandise, building materials, supplies, and all other personal property of every class and description.

(3) To purchase, acquire, own, hold, use, lease either as lessor or lessee, rent, sublet, grant, sell, exchange, subdivide, mortgage, deed in trust, manage, improve, cultivate, develop, maintain, construct, operate, and generally deal in, any and all real estate, improved or unimproved, stores, office buildings, dwelling houses, boarding houses, apartment houses, hotels, business blocks, garages, warehouses, manufacturing plants, and other buildings of any kind or description, and any and all other property of every kind or description, real, personal and mixed, and any interest or right therein, including water and water rights, wheresoever situated, either in California, other states of the United States, the District of Columbia, territories and colonies of the United States and foreign countries.

(4) To purchase, acquire, take, hold, own, use and enjoy, and to sell, lease, transfer, pledge, mortgage, convey, grant, assign or otherwise dispose of, and generally to invest, trade, deal in and with oil royalties, mineral rights of all kinds, mineral bearing lands and hydrocarbon products of all kinds, oil, gas and mineral leases, and all rights and interests therein, and in general products of the earth and deposits, both subsoil and surface, of every nature and description.

(5) To enter into, make, perform and carry out contracts of every kind for any lawful purpose without limit as to amount, with any person, firm, association or corporation, municipality, county, parish, state, territory, government (foreign or domestic) or other municipal or governmental subdivision.

(6) To become a partner (either general or limited or both) and to enter into agreements of partnership, with one or more other persons or corporations, for the purpose of carrying on any business whatsoever which this corporation may deem proper or convenient in connection with any of the purposes herein set forth or otherwise, or which may be calculated, directly or indirectly, to promote the interests of this corporation or to enhance the value of its property or business.

(7) To acquire, by purchase or otherwise, the goodwill, business, property rights, franchises and assets of every kind, with or without undertaking, either wholly or in part, the liabilities of any person, firm, association or corporation; and to acquire any property or business as a going concern or otherwise, (a) by purchase of the assets thereof wholly or in part, (b) by acquisition of the shares or any part thereof, or (c) in any other manner; and to pay for the same in cash or in the shares or bonds or other evidences of indebtedness of this corporation, or otherwise; to hold, maintain and operate, or in any manner dispose of the whole or any part of the goodwill, business, rights and property so acquired, and to conduct in any lawful manner the whole or any part of any business so acquired; and to exercise all the powers necessary or convenient in and about the management of such business.

(8) To take, purchase and otherwise acquire, own, hold, use, sell, assign, transfer, exchange, lease, mortgage, convey in trust, pledge, hypothecate, grant licenses in respect of and otherwise dispose of letters patent of the United States or any foreign country.

2.

Daniel, Mann, Johnson & Mendenhall Architects, Inc., Articles of Incorporation, 1952.

back into the business» (*Six Partners* 1957, 184). The consultant concluded by arguing that architecture firms most likely to thrive after the war would be those that: i) integrated architecture and engineering services; ii) diversified their geographic reach and project types; and iii) incorporated.

DMJM was first incorporated in 1952, and the legal change left open broad possibilities for future services that in turn could increase the value of the shared stock owned by the firm's (all male) senior management and partners.[2] The articles of incorporation defined DMJM as an entity able to «acquire, by purchase or otherwise, the goodwill, business, property rights, franchises and assets of every kind... of any person, firm, association or corporation» (Cayer 2019, 184). And so, as new expertise was needed, entire companies and their assets were acquired in lieu of simply hiring the experts in those firms. This was both a strategy for mitigating competition and for building up wider geographical breadth and clientele.

Due to its managerial strength and ability to manage widely disparate parts, DMJM was absorbed by the oil company Ashland Oil in 1985 – a company that was

[2] DMJM, *Stock Ownership September 1966*, Arthur Mann family papers, Irvine, CA.

also seeking to rapidly diversify for economic stability. However, DMJM's firm owners and employees rallied together in Nineties and initiated an employee buyback. A new, more anonymous company was formed, with DMJM's initial corporate charter as guide: AECOM. The firm's new name, A-E-COM, was reduced to its anonymized services. A and E were clear: architecture and engineering, yet the COM was specifically left open-ended. It could be used to suggest Construction, Operations, and Management; or, Contracts, Operations, and Maintenance; or, Construction Management. As business leadership at AECOM changed throughout the Nineties and early Two Thousand, and as DMJM leaders and architects slowly retired or, in some cases, were violently pushed out, AECOM went public in 2007. It is currently ranked 163 on the Fortune 500 list (*AECOM* 2021). Looking past the scale and scope of singular buildings, AECOM defines its site for work as the substrate beneath buildings. Beyond «Architecture and Design», AECOM's began to include those as far-ranging as «IT and Cybersecurity», «Cost Management», and «Equity Investment», which have enabled the firm to not only design buildings for their clients in ways that are familiar to histories of architectural practice, but also to build, finance, and operate them after they were constructed. Indeed, the seemingly limitless scope of work offered by AECOM enabled the firm to produce entire urban systems in ways that architects at DMJM could only imagine. As a senior vice president of AECOM has argued: «We are AECOM, we can do anything» (Seward 2010). This unhinging of the architect from the production of buildings suggests a contradiction of terms and calls into question the role of the architect. Of AECOM's 90.000 employees by 2017, only 1.491 were architects – less than two percent of all employees. The revenue generated by architecture alone accounted for only $320-329 million of the firm's $18.2 billion. Since going public in 2007, the company has made substantial economic investments in self-evaluation programs, hoping to «reinvigorate» and «redefine» the value of architecture within the firm. As individual architects were pushed out, company executives continued to earn unprecedented profits; the firm's most recent CEO, Michael Burke, was paid an annual salary of 15.9 million dollars: 11 million in stock value, 1.5 million base pay (*Salary* 2021). The architectural losses and capital gains pose a fundamental proposition to architects: expand and redefine one's work or lose out altogether. This proposition reflects the history of

other large firms, such as Caudill Rowlett Scott in Texas, which went public in 1970 and disintegrated thirty years later as pursuits of profit clashed with an unwillingness of architects to expand beyond modernist visions of architecture. The firm's architecture group was sold to Missouri-based Hellmuth, Obata + Kassabaum in 1994; its engineering and construction groups were sold to California-based Jacobs Engineering; and its cogeneration group, CRSS Capital, was sold to the engineering firm Tractebel (Tombesi 2006).

Gensler

Gensler began as an interior design firm in 1965 and like DMJM, remained for most of its half-century existence, happy to stay out of the «icon building» lime light. Nevertheless, by 2017, Gensler generated $1.197 billion in revenue – the most of any architecture firm in the United States – and is currently identified with the icon of architectural icons, the Shanghai Tower, China's tallest building. As of 2018, it operated offices in 48 cities and worked for clients in over 100 countries. Unlike AECOM, however, which flourished on the back of US military patronage and grew by acquisition, Gensler grew on the firm's popularity with corporate clients – a popularity linked to the attention Art Gensler, its founder, gave to corporate CEO's and their specific programmatic and branding needs (Gensler 2015).[3]

In the late Sixties and early Seventies, the firm designed the interiors of Bank America and the Alcoa building in San Francisco, the headquarters of the real estate giant Cushman Wakefield in LA (which connected Gensler to its corporate clients), and Pennzoil Plaza in Houston.

It went on from there. As Art Gensler said, «I really enjoyed the fact that I was dealing with such professional people who went into buildings. The IBMs, the Marconis, and the Potlatches. These big corporations». And Steve Jobs. «I worked with... really quality people, [all] these super important CEOs». (Gensler 2015, 120) But *like* AECOM, Gensler (both the man and the firm) knew how to exploit the corporate structure for growth and diversification and joined the post-Fordist embrace of corporate culture and business expansion.

Gensler Associates was incorporated at its founding.

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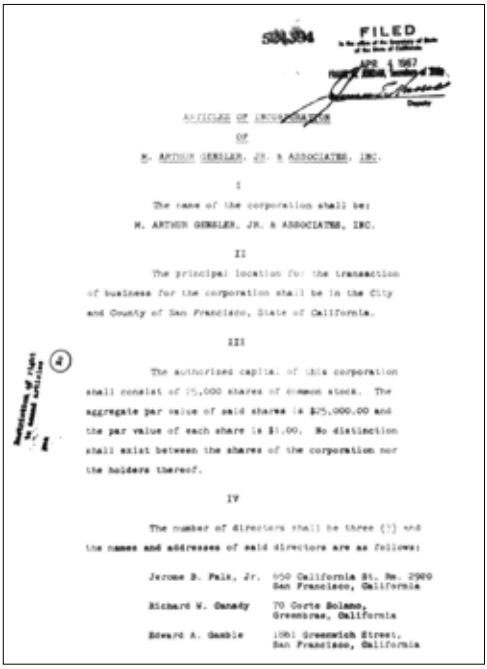
[3] During the writing of this piece, Art Gensler passed away at the age of 85. On May 10, 2021, he died in his home in Mill Valley, just north of San Francisco. He stepped down from chairmanship of his firm in 2010. He was proud to be «a general advisor».



FILED

ARTICLES OF INCORPORATION

OF

M. ARTHUR GENSLER, JR. & ASSOCIATES, INC.

I

The name of the corporation shall be:
M. ARTHUR GENSLER, JR. & ASSOCIATES, INC.

II

The principal location for the transaction of business for the corporation shall be in the City and County of San Francisco, State of California.

III

The authorized capital of this corporation shall consist of 25,000 shares of common stock. The aggregate par value of said shares is $25,000.00 and the par value of each share is $1.00. No distinction shall exist between the shares of the corporation nor the holders thereof.

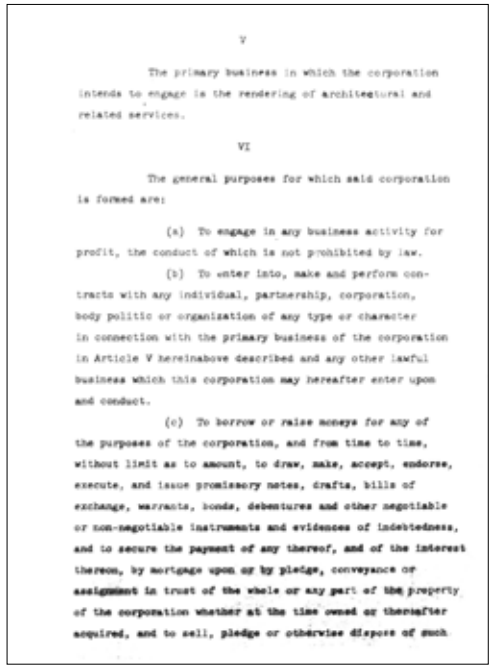
IV

The number of directors shall be three (3) and the names and addresses of said directors are as follows:

Jerome B. Falk, Jr. 650 California St. Rm. 2900 San Francisco, California

Richard W. Canady 70 Corte Solano, Greenbrae, California

Edward A. Gamble 1061 Greenwich Street, San Francisco, California



V

The primary business in which the corporation intends to engage is the rendering of architectural and related services.

VI

The general purposes for which said corporation is formed are:

(a) To engage in any business activity for profit, the conduct of which is not prohibited by law.

(b) To enter into, make and perform contracts with any individual, partnership, corporation, body politic or organization of any type or character in connection with the primary business of the corporation in Article V hereinabove described and any other lawful business which this corporation may hereafter enter upon and conduct.

(c) To borrow or raise moneys for any of the purposes of the corporation, and from time to time, without limit as to amount, to draw, make, accept, endorse, execute, and issue promissory notes, drafts, bills of exchange, warrants, bonds, debentures and other negotiable or non-negotiable instruments and evidences of indebtedness, and to secure the payment of any thereof, and of the interest thereon, by mortgage upon or by pledge, conveyance or assignment in trust of the whole or any part of the property of the corporation whether at the time owned or thereafter acquired, and to sell, pledge or otherwise dispose of such

M. Arthur Gensler, Jr. & Associates, Inc., Articles of Incorporation, 1967.

While not described as a bona fide «multi-firm» corporation like AECOM, its corporate structure came to be described as a network of «clusters», as the firm developed «new services» beyond interior and then building design.[4] In a 2014 oral history, Art Gensler argued that the firm did not merely offer services in interior design or architecture, «but a little more… other things that we got into. We were just not offering a traditional service… I think it was the beginning of us understanding that we had leverage and an advantage of being diversified» (Gensler 2015, 209). In other words, Gensler's interest in being a «general advisor» was matched by being a «general corporation». From the start, Art Gensler recognized that architecture was not just design or service, it was a business. And as a business, traditional architecture was «dumb». He said:

> I think we still are probably the poorest paid of the professions. That seems dumb.
> We seem, to me, to add a lot of value, so I see no reason why it should be that way. It's that fine line between: are we artists or are we businesspeople? I think the line isn't that fine. I think we're business people (Gensler 2015, 155).

[4] Former architect in conversation with the authors, 26 September 2020.

Like DMJM, Art Gensler participated in workshops with Peter Drucker. Part of Drucker's management philosophy was recognizing the contributions that individual actors bring to the organization. Art took this to an extreme. On the one hand, he made his clients his friends to create a vital network of patronage, while and on the other hand, he made sure that the executive officers of the multiple Gensler offices were Gensler «family members». He insisted on maintaining a «one-firm firm culture» and pooling office profits.

Unlike AECOM, Gensler stock is privately held, which is essential to the firm's business ethos. As a result, the partners are not beholden to any outside forces, and the «family model» remains relatively intact. However, it allows the firm to reward its work force with what is known as an Employee Stock Ownership Plan (ESOP) – a structure in which a certain percentage of the company's stock is put into a trust which then gives «shares» to employees, redeemable upon retirement leaving the firm. The ESOP is indeed a positive retirement and succession plan. But it also facilitates acquisitions and expansions. When a company raises the capital needed to implement a growth strategy by borrowing, payments to the loan will typically be made directly with after-tax dollars. With an ESOP, the company can sell stock to the ESOP on terms that mirror the required payments on the loan, effectively letting the company make the payments with pre-tax dollars.

Gensler's ethos to be a general advisor to their clients now means that the firm offers these services: Architecture, Brand Design, Real Estate, Digital Experience, Sustainability, Interior Design, and Urban Strategy Design. It has trademarked its Workplace Performance Survey (WPI) and its Gensler Experience Index, which quantifies the impact of design on experience. Internally, the firm now has a Gensler University for leadership development, a Community Impact Program, and a Gensler Research Institute. Today, Gensler has 1.28 billion in annual revenue, «the most in US architecture firms», and has 6,000 employees.

What unites Gensler and AECOM, despite their differences in structure, clients, and stock ownership, is that their power is predicated on expanding the scope of «architecture» to such an extent that architecture itself disappears; for both, it is anything and everything. As Gensler and AECOM now produce entire cities, such as The Abdullah Economic City in Saudi Arabia by Gensler, or the Kigali Masterplan in Rwanda by AECOM, with «design» including infrastructure to buildings to legal

rights, both firms demonstrate how individual economic pursuits slowly evolve into imperialist ones, motivated by «expansion for expansion's sake» through the apparatus of the firm. This is not a problem if the goal is only profit and power. Indeed, one can argue that architecture only gets its power from moving beyond its limited, risk-averse confines. More than this, it can seem inevitable in a neoliberal economy that, just as the termination of the gold standard decoupled the dollar from any tangible standard, architecture has been set free from a precise standard. One can go farther still and point out that, given the aggressive move by American antitrust defenders in the Seventies to make professionals compete just as any other business, it seems almost absurd *not* to compete at the most profound level. The problem, however, is that the profession in this corporate model desires to have its cake and eat it, too. In other words, it delights in its new-found economic leverage resulting from expansion and dispersal while holding on to the ethical halo that comes with being a «learned profession» and its codes of carefully guarded ethics.

By interrogating the corporate structures and rhetoric of AECOM and Gensler, this article aims not to disregard or denounce the bigness of architecture firms as such; indeed, many small firms are incorporated and behave badly, while many large firms are driven by social good. Instead, these stories of practice reveal how large corporations driven by professional expansion and disciplinary dispersal silently break social contracts. As firms such as Gensler and AECOM continue to stretch beyond standard professional boundaries for their own survival, it seems logical for them to also detach themselves from the profession (Gensler 2015, 96, 111). In this case, if the business executive and architects with these firms desire to prove an ethical commitment that responds to social and environmental needs, they can establish themselves, as do many existing non-professionals, as a B-Corp – a business that balances purpose and profit and is legally required to consider the impact of its decisions on their workers, customers, suppliers, community, and the environment. Alternatively, they can stop pretending that ethics or social responsibility dictate behavior.

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ARCHITECTS' DEPARTMENTS BETWEEN THE GOVERNMENT AND THE MARKET

ORCHESTRATION OF AN ORGANISATION: THE BUREAUCRATIC FRAMEWORKS OF THE LONDON COUNTY COUNCIL ARCHITECT'S DEPARTMENT

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The publication of The London County Council's County of London Plan *in 1943 set the aspiration and parameters for the postwar (re)development of London, which traversed scales from the urban to the individual, and demanded coordination across disciplinary boundaries. It set out a task of unprecedented proportions, which necessitated the reorganisation not only of the urban fabric, but also of the structure of «the world's largest architect's department» to deliver it – their strategies to counteract the sprawl which had enveloped London's urban structure, informing the programmatic and interpersonal relations established in the workings of the Department. With recourse to archival drawings and quotidian operational documents from the peripheries of the official archive, this paper explores the processes which catalysed the Department's intentions into urban and architectural form, highlighting a reconsideration of the interrelationship between «architecture as practice» and «architecture as product».*

Ruth Lang is a writer, curator, architect, and senior lecturer at the Royal College of Art, London School of Architecture, whose PhD thesis at Newcastle University investigated the tension between bureaucracy and creativity evident in the work of the of the London County Council Architect's Department from 1943-1965. Her work exploring the obscured mechanisms and practitioners of architecture has formed the basis for exhibitions with the Victoria and Albert Museum in London in 2015, and a photographic series exhibited at the Jerwood Gallery in Hastings in 2018. She is an editor for Architectural Research Quarterly, and writes for a broad range of non-academic publications.

Keywords: London County Council; Architectural practice; County of London Plan; Postwar planning

The creation of an Architect's Department at the London County Council provided a platform within the mechanisms of local government which challenged definitions of professional boundaries and accepted forms of practice. In contrast to their peers in private practice, the structures of employment within the Council placed these architects within a broader network of extra-professional resources. The architecture and planning proposals developed by the London County Council's Architect's Department in the aftermath of World War II have gained notoriety for the innovation in design and policy which they embodied, situated within a network of political, artistic, and tectonic influences which were to affect the manner in which they practiced architecture, and the designs they produced as a result. Yet the processes by which these were produced have previously been under explored.

The Architect's Department – hereafter referred to as «the Department» – initially grew from a role created whilst part of the Metropolitan Board of Works, charged primarily to address quality and financial concerns regarding the outsourcing of the Board's slum clearance rebuilding programme to external bodies who were motivated by the prospect of a financial return at the Council's expense, whilst delivering poorly designed dwellings (Beattie 1980, 12). Contrary to the status of the previously autonomous structure of the Metropolitan Board of Works, upon its creation in 1889 the London County Council – hereafter referred to as the LCC, or the Council – which subsequently absorbed the functions of the Metropolitan Board of Works was to be led by democratically elected representatives. The resulting internal politics of ever-fluctuating imperatives of local government, combined with the elected councillors' personal and political agendas, had the potential to undermine the intended sense of coordination and control for projects which might outlast the lifespan of the electoral term.

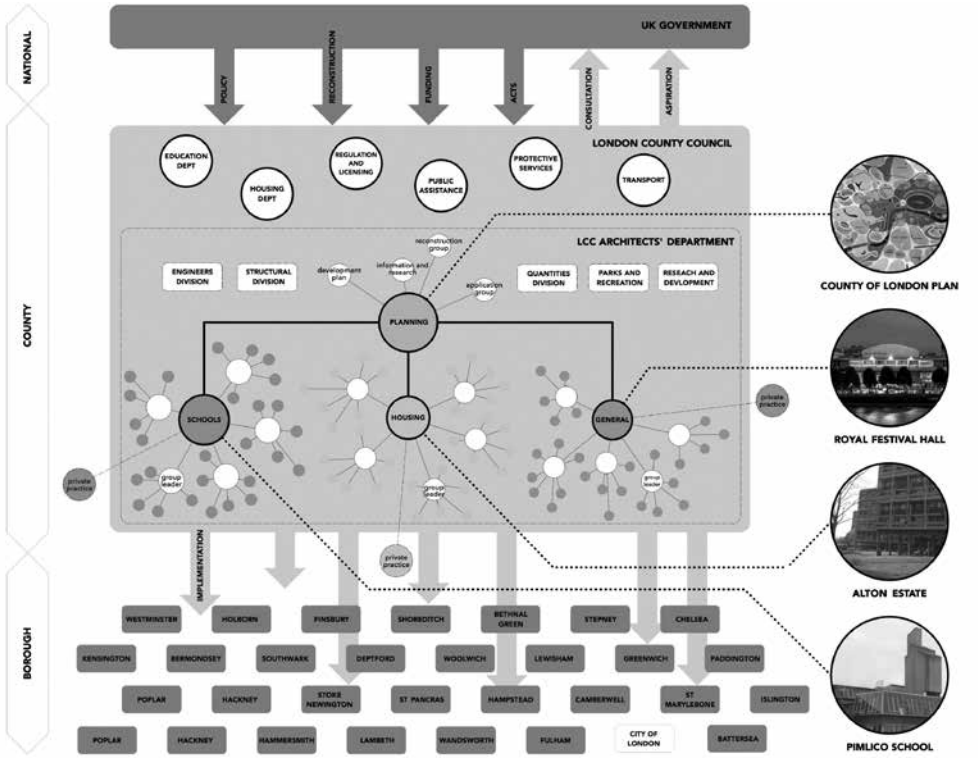
To mitigate such pitfalls, a permanent network of directly appointed Departments was created in order to bring a

greater sense of continuity, efficiency and stability to deliver key objectives for prospective development over such a vast area – of which the Architect's Department was one. Within the Council structure, the Department provided a link between the local governmental structures above, to that of the specific Borough-level architectural implementation. Being sandwiched «between upper and lower tiers of government and secure only in the administrative certainties of the moment» (Saint 1989, 216), the Department thus sat at a pivotal point within the mechanisms of Local Government, imbued with an agency which would otherwise be divorced from the practice of architecture. This connection with political structures facilitated both proactive and reactive changes in social policy within the Department. The Department held the remit of restructuring an entire county physically, socially, and programmatically. Their political position also facilitated the direct proposition of the legislative powers required to apply their intentions, whilst their position of employment within local governmental structures also offered financial support and the commodity of time to develop propositions for how these might be readdressed during wartime, when private practices were unable to self-fund in such a manner.

The Council's compilation of the *County of London Plan* published in 1943 – hereafter referred to as 'The Plan' – set out the scale of work to be undertaken in the advent of peace. Its success was dependent upon Government action, being based on aspirations for future development, and «assuming that new legislation and financial assistance would be forthcoming» (Forshaw 1943, V). Yet the political autonomy of the Department also enabled bold, long-term initiatives – such as the cross-borough Ringway road network, and the creation of New Towns as part of an integrated strategy to redistribute the County's population and industries beyond the County's geographic boundaries – to be included, which would outlast any political parties that facilitated their introduction.

The Plan acted as both an ideologic «esquisse» and a «brief» for future development (Furneaux Jordan, 1956) which set out an ethos for a much more ingenious approach to collaboration and coordination than those which preceded it. But the Department's architects were tasked not only to dream, but to deliver.

Adopting the ambitious demands for redevelopment of the County, the Department was to create and staff Divisions dealing with the specific typologies of Schools, Housing, Planning, and Special (or General) Works. Such experimental propositions transgressing architectural remits required the support of the resources provided in the LCC's base at County Hall – their social positioning



away from the generalities of national government enabled them to conduct research «on the ground» which was extensive in breadth and intensive in resource requirements, which called upon the expertise of the Quantity Surveyor's Department, study of local area calling upon bomb damage maps compiled by the Council, and historical surveys undertaken by the Survey of London. They also had access to the expertise of Margaret Willis, a sociologist employed within the Planning Division at County Hall, who undertook first hand research into existing social conditions, for publication within the Division. As a result, the Department was able to provide the expertise in implementation and feedback to develop social and planning research, which would influence transport and housing provision (and the subsidy of both), land ownership, construction and the creation of community infrastructure, despite the differing views of the alternately presiding Conservative and Labour Councils under which they ostensibly worked. The LCC was thus uniquely placed to deliver The Plan's objectives – being large enough to encompass the necessary architectural workforce to address the numbers required, but also imbued with the authority through the powers of local government and planning to deliver them in unison, empowered by the Town and Country Planning Act of 1947.

The operational structure of the Department consisted of different typological Divisions for the implementation of the demands of the County of London Plan, straddling between the agency of national government, and borough level implementation.

Planning: How and Where to Live

The intentions of The Plan are often misconstrued as stemming from the necessity of «rebuilding» after the Second World War, yet the desire to address these issues was preexisting. Unplanned and uncoordinated sprawl had by this stage engulfed the County, and transgressed various jurisdictional, legislative, and geographic boundaries. The result was a lack of connectivity, emerging instead as an aggregational collage of infrastructure and inhabitation, which historically had resulted in plague, fire, overcrowding, industrial obsolescence, and inefficiency. War had both necessitated and made possible the redevelopment of the material needs of the County with a pressing urgency, and had instilled a willingness, knowledge and facilities to reappropriate skills and technologies from wartime use for peacetime building – particularly in relation to industrial production of building components and prefabrication.

One of the central tenets of the Plan was for the provision of housing. This was urgently required, not only to replace war damaged buildings, but also to enable the eradication of the slum dwellings which were rife in the County before the War, and to accommodate the forthcoming baby boom. Yet the proposals of The Plan did not consider the provision of *where* to live in isolation from *how* to live. Abercrombie and Forshaw recognised that future development was not sustainable to be conceived as concentric around one central urban nucleus, as it would likely fall foul of the surrounding sprawl in the same way that the pre and inter-war situation had. Instead, they proposed a series of smaller centres, complete Neighbourhood Units, building on the historic precedent of Ebenezer Howard's Garden Cities. These could then be developed incrementally, their designs imbued with the foresight to address the urgency of housing provision without compromising on the long-term intentions for community building, a strategy addressing their intentions for both «immediate provision and future possibilities» (Forshaw 1943, IV). Units would be interconnected with others through the means of a revised infrastructure plan, coordinated by the Planning Division into what the authors termed a «highly organised and inter-related system of communities» (Forshaw 1943, IV). These neighborhoods – such as the Lansbury Estate in Poplar, the first scheme to be implemented, despite being identified as Neighbourhood Number Nine in The Plan – were intended as self-contained entities for 6.000-10.000 residents, within which all the residents' day-to-day needs would be provided. The work of

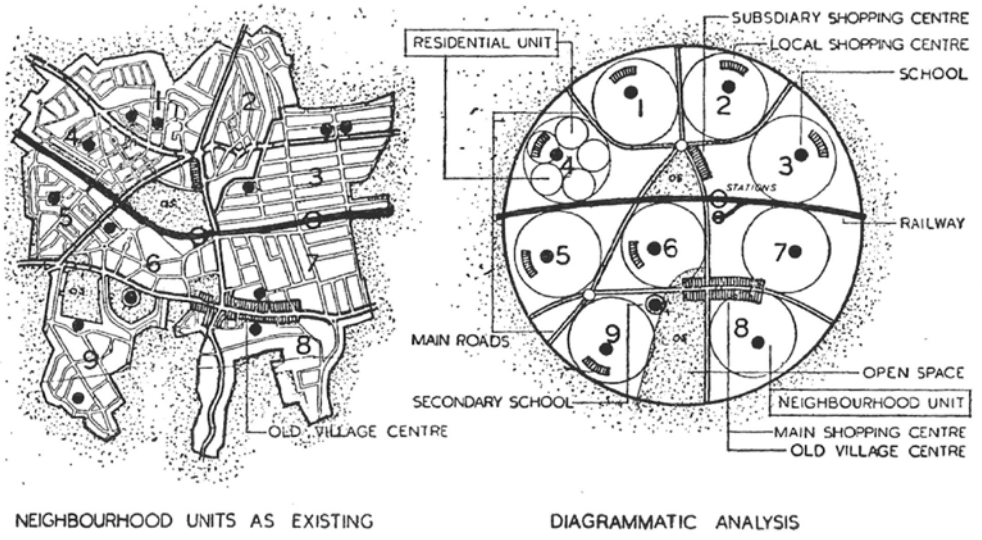


Diagram of *The County of London Plan* Neighbourhood strategy.

the Department's separate Divisions was brought together in their strategic plans for these Neighborhood Units, where facilities included retail provision, social areas and housing to cater for a broad spectrum of ages and family types in the community. These were conceived as whole neighborhoods from the outset, with «community buildings, essential elements of the community's structure... erected at the same time as the housing and not at a later date» (Willis 1957) so as to enable residents to intermingle, and form cohesive interpersonal relationships as part of The Plan's aims to build a community – a strategy Margaret Willis notes made Lansbury popular with its new residents. At the heart of each unit was a school, which also set the maximum distance any child would need to travel for their education, with the transport network orchestrated to ensure they would not need to cross main roads to get there. It was intended that the introspective nature of plan of the Neighborhood Units would induce familiarity between residents, through which community bonds would be built. This neighborliness on the scale of the locally autonomous unit needed to operate successfully individually, but still relate to the overall structure of the county, forming a contributory facet of a plan for the whole county, rather than solving its own problems in geographic and typological isolation.

The Plan was instrumental in setting the aspiration for the interconnected considerations for the reformation of London.

Yet in considering the nature of The Plan and the propositions it set out, we must also appreciate how this was a Plan to be implemented; and that planning

implies not only orchestration of urban fabric, but also that of the architects to implement such changes. There was a necessity for «keeping plates spinning» to avoid the resulting Development Plan becoming a «dead letter» (Furneaux Jordan 1956). After all, the Plan was only a brief – it required material implementation. Functioning as a pivotal point, The Plan instigated shifts in the bureaucratic processes within the Council, which catalysed typological change in the architecture produced as a result. Its propositions defined not only the legislative measures required of the governmental position, but also the operational structures necessary in order to deliver the aspirations it contained, including those which reached beyond the Architect's Department itself. Whilst The Plan proposed a networked system of neighborhoods to better reform the fabric of London, it also demanded a networked system of practice to deliver it. Both the Plan and its delivery established parallels in autonomy and interconnectedness, which enabled the architecture and the architects to be individually responsive whilst operating at a larger scale. In delivering The Plan, therefore, the image of the city was to become a mirror of the Department which created it.

How and Where to Practice

The extent of the aspirations of The Plan demanded a similarly ambitious employment structure to deliver a seemingly endless supply of its own development and reconstruction work, encompassing both internal delivery and external commissioning of private architects and consultants. This in turn required that the Council construct a vast employment structure spanning many different disciplines, and ensuring efficient contractual and communication links were established between them. By 1951, the Architect's Department of London County Council had become what Elain Harwood notes to be «the largest Architect's Department in the world» (Harwood 2013). Its 8000 employees comprised «1500 professional, technical and administrative and clerical grade; about 500 porters and caretakers; and about 6000 building trade operatives and miscellaneous grades» (Jones 1951). Although the enormous staffing resources were intended to counteract the urban sprawl engulfing the County's urban structure, the Department's own incremental growth was in danger of subsuming the structure of the Department itself. Henry Russell Hitchcock had anticipated that a workforce of such size and without the controlling agency of a discernible figurehead – paralleling the collaborative and anonymous

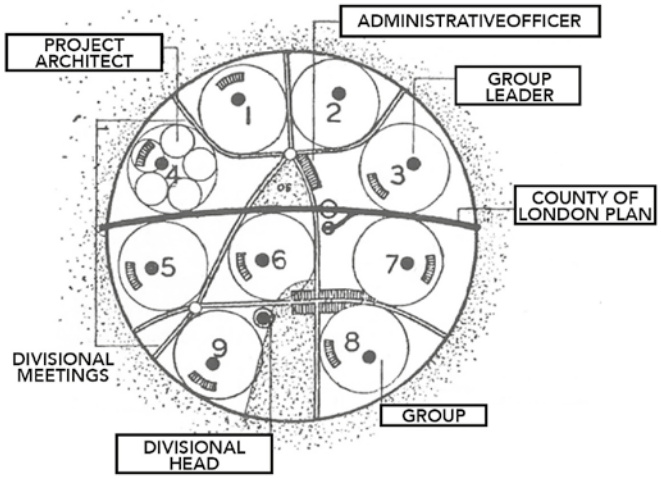
practices such as Albert Kahn Associates in America, and its much smaller counterpart TAC – would result in swathes of «bureaucratic» architecture; standardised, utilitarian buildings, created to meet short timescales and tight budgets, which he declared to be the inevitable «product of large-scale architectural organisations, from which personal expression is absent» (Hitchcock 1947, 4). Frank Lloyd Wright agreed, and «was appalled» (Furneaux Jordan 1956, 304) that the delivery of London's architecture would be determined under the remit of such a vast and anonymous working structure. Like Hitchcock, Wright assumed that any such freedom for individual design ingenuity would be swallowed by the behemoth structure of the Department. For him, true creativity – by which he meant that fusing «plan and construction into a vehicle of personal expression» (Hitchcock 1947, 5) – could only be achieved by an independent, 'heroic' architect. Yet in contrast to these expectations, according to Lionel Esher, the Department in the postwar era «could fairly claim to be not merely the largest but the best design organisation in the world» (Esher 1983, 127). The Department had been able to achieve such an accolade thanks to a rigorously developed orchestration of the working environment – both programmatically, and spatially.

Networks of Practice

The remedy for urban sprawl which The Plan set out, and the means by which Hitchcock's and Wright's fears would be addressed were a mirror to each other; both linked by the work and practices of John Henry Forshaw. Following on from his work considering how London could be reconfigured to work more efficiently through re-networking and addressing functional deficiencies, Forshaw also sought to remedy similar concerns in his restructuring of the Department in 1944. Forshaw's previous experience was able to inform this restructuring, since he had run the architectural Department of the Miners' Welfare Commission prior to his appointment to the LCC in July 1939. The working practices established there assigned each job to be run by a senior assistant supported by a small team, which was noted by Summerson as being «an arrangement very different from the usual haphazard distribution of hack-work among temporary employees [with] responsibility to the chief for all designs» (Summerson 1942, 235).

The LCC Architect's Department had previously operated hierarchical lines of reporting, under the control of those higher up, as was common for Civil Service employment. Yet with the Department expanding beyond its original

Group working diagram, showing channels of communication within the Department, as a parallel to the urban interconnectivity of the neighbourhood plans.



GROUP WORKING DIAGRAM

extents – mirroring the sprawling expansion of the County itself – this became unsustainable. The sprawling mass of architects employed within the council were proposed by Forshaw to adopt a system of Group Working, establishing networks and nodes which paralleled the interconnected neighborhoods outlined in The Plan.
This structure organised the architects into a series of smaller, more cohesive units, between which networks of communication were established to coordinate their architectural propositions as part of a greater whole. Group Leaders led individual architects in core units (or teams) of 12-16, a number deemed «the most that could be managed by a senior architect», each operating akin to a small design office. «Streams» of communication were established between the Group Leaders and the heads of each Division, who would then meet together each week with the Chief architect to provide an administrative and architectural overview of the work being undertaken. This enabled an awareness of the interrelation of the many tentacles of implementation, as well as better informing the financial parameters and necessary distribution of materials – particularly pertinent due to the steel shortages post-war. As for the Plan's proposals for how the burgeoning population would live, work and be educated, this structure was intended to cater for both «immediate provision and future possibilities», (Forshaw 1943, IV) establishing an operational structure which could expand with later demand without adversely affecting the overall workings of the system.
There was contractual provision for leisure, and the intention to establish a sense of camaraderie and

interpersonal, introspective identity through their small scale, with communicative infrastructure to ensure these individual units remained part of a well-connected, coherent whole. In this manner, proposition and implementation were interdependent. Such restructuring – later expanded by Robert Matthew, and restructured again under Hubert Bennett and Leslie Martin in 1956 – was necessary to enable overall coherency, yet it was intended to do so without constraining the central tenet of architectural work undertaken at LCC; for non-standard, explorational architecture which was able to respond to the local context and changing approaches to tectonics, social issues and – in the case of the schools programme – educational edicts. As for the neighborhoods, these groups were to operate as individual and autonomous units, yet be closely interrelated to the greater whole. The Group Working strategy gave a sense of overall coherency to the Department, establishing both the architects' spatial disposition as well as how they would communicate with each other. It also engendered a greater degree of autonomy to each sub-set, who were further removed from the central points of control. In turn, this instilled a sense of freedom – architecturally and programmatically – within which to operate in fulfilling the requirements of The Plan. While the size and nature of the Department could have proven oppressive, its orchestration in this manner instead empowered its employees. Thus, it can be seen how series of decreasing scales employed by Forshaw in the Group Working strategy established a meditative relationship between the benefits of the Department's size and resources, whilst enabling employees to maintain a certain degree of creative autonomy. The architecture produced as a result was to be – in the words of Terry Farrell, once a member of the Special Works Division – «anonymous, economic and collaborative yet at the same time highly artistic and of real value to society» (Farrell 2004, 64).

Network Fragmentation

These freedoms for challenging previously accepted approaches to architectural implementation and operational networks of practice established within the Department were only possible due to the Department's position bridging between architectural practice and governmental processes. The transformation of the LCC to the Greater London Council (GLC) as recommended by the 1960 publication of the Herbert Commission's report on Local Government in Greater London – as implemented

via the 1963 London Government Act – was intended to curtail and segregate the LCC's previously overarching powers. Ostensibly the Division's architects still operated in the same Department – physically, and in terms of their employment contract – and the day to day experiences in this transition period remained unvaried. Yet due to the necessarily networked nature of their practice, the agency of the Architect's Department was dissipated in the wake of the transformation from the LCC to the GLC. The absorption of additional Outer London boroughs into the new Council, increasing Conservative-led privatisation of utilities and transport networks, and the transfer of the Schools Division to the newly created ILEA in 1965, rendered the Division's capacity for implementation too constrained relative to the number of boroughs the County now encompassed, and the Neighborhood Unit structure atomised. The expanded jurisdiction of the GLC had become too large for the architects to be able to respond to the many more varied local conditions required by the contrasting urban contexts covering both Inner and Outer London, and created a disjunction between the overlapping territories of local and national politics, and the frameworks of the Welfare State, in which the LCC had previously thrived. This diminished the potential for coordinating the transformation of the County of London as a whole, and the all-encompassing remit established through The Plan instead shifted back to segregated borough-level considerations. This divided the Department's delivery of civic architecture from the political and educational spheres, constraining its involvement in both. And thus, the delicate ecology of the unique network of influences established within the LCC Architect's Department was broken.

Conclusions

The multifaceted nature of the term 'architecture' is a lynch pin in this research, since it concerns not only architecture in terms of buildings, and their manifestation and disposition, but also architecture as practice, and the strategic processes through which these were orchestrated. The aspirations of The Plan in rewiring the urban fabric of London considered not just what was produced, but how they would produce it, the two being necessarily intertwined, with architecture as practice informing architecture as building – and vice versa. We can see how despite – and perhaps because of – the networked nature of their bureaucratic setting, these architects were able to subvert Hitchcock's expectations, producing an architecture of 'genius' and individual spirit

thanks to the autonomy afforded by the units of their Group Working structure, supported by the financial, programmatic, and political resources afforded by their bureaucratic context. The architects of the LCC were working not as bureaucrats, nor as architects (in the anticipated sense), but as bureaucratic architects.
Thanks to its size, location, and operation, the work of the Department straddled between top level governmental intention and the tectonic scale of local architectural implementation, establishing a greater sense of coherency than previous isolated top-down or bottom-up operations were able to achieve. Through the authorship of The Plan, the architects were able to propose a radical approach to systemic thinking, which transgressed previous boundaries of the profession with its inclusive nature of considerations, and adopted a both/and rather than either/or strategy.
The Plan proposed an infrastructural network for the disposition of the County's requirements, whilst the Group Working strategy enabled systems of communication and coordination to inform the working practices of the potentially unwieldy employment base of the Department, mediating between the genius of the individual and the bureaucratic operation of the Council. Whilst Hitchcock deemed it necessary to segregate these two approaches, the architects of the LCC saw the necessity and benefit to straddle this line, programmatically and professionally.

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INTEGRATING PRODUCTION, EDUCATION AND RESEARCH: THE HISTORICAL EVOLUTION OF UNIVERSITY ARCHITECTURAL DESIGN INSTITUTES IN CHINA

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University Architectural Design Institute (UADI) is a unique professional organization in China, whose trajectory has been embodying China's political, economic, social and cultural transformation for the past seven decades, especially due to its role in the rapid urbanization. UADI was established in 1958 as a product of Socialist Education Revolution and Great Leap Forward. After China's economic reform in 1978, UADI became an experimental field for architectural creation as well as for organizational and economic reform in Universities. Since 2001, UADI has served as a representative of National University Sciences and Technology Park and University-centered Design and Creative Industrial Cluster, integrating production, education and research, and exhibiting strong and incessant economic and cultural power. Through examining three historical phases of UADI, the research aims at exploring the transition of design culture and institutional system in modern China, as well as the changing relationship between Chinese university architects and the domestic and global context.

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University Design Institute (UDI, Daxue Shejiyuan, 大学设计院) is a unique form of design practice in China, mostly named after top public universities directly governed by the Ministry of Education, based on the leading engineering fields in the mother university, such as architecture, urban planning, civil engineering, geological survey, water conservancy, railway, electricity, information engineering etc., among which University Architectural Design Institute (UADI, Daxue Jianzhu Shejiyuan, 大学建筑设计院) is the majority. Today, there are more than 50 UADIs in China.

UADI is a comprehensive design organization, in which architects, civil engineers, equipment engineers, budget account engineers and other professionals work together to build environment-related design projects. Most of them are not only large, but also economically and technologically efficient. According to 2020 statistics, eight UADIs have more than 500 employees, half of which even hire more than 1,000 workers. The biggest UADI, Tongji University Architectural design and research institute group (TJAD) has totally 3.355 employees, with 0.67 billion US dollars annual income and another 1.28 billion US dollars new contract. TJAD was listed among the top 65 global design firms according to the Engineering News Ranking.

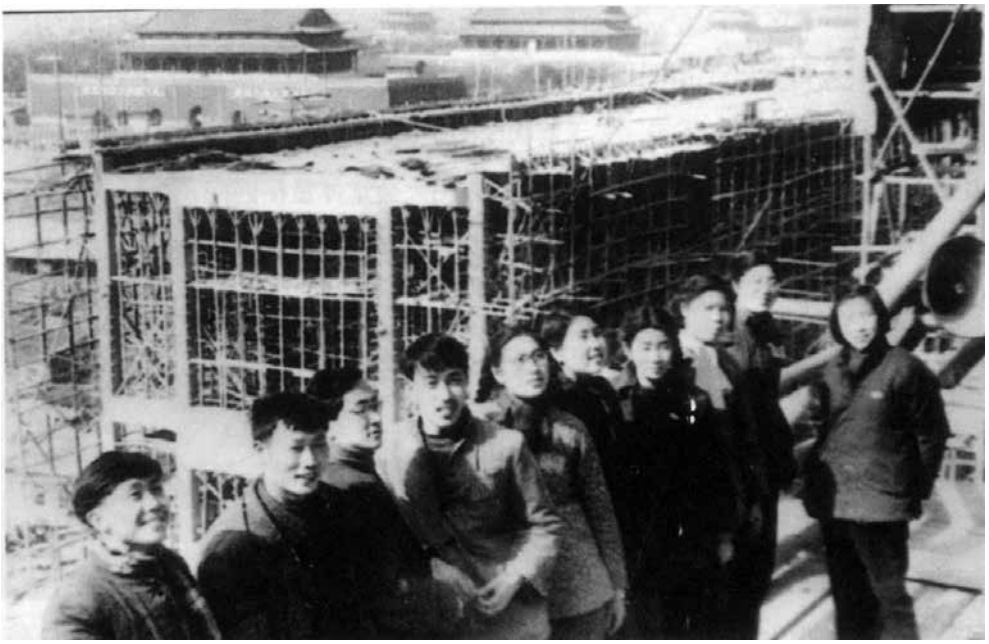
As an institutional form, UADI was forged in 1958, the historical period of Great Leap Forward, an economic and social campaign launched by Mao Zedong to achieve rapid development for both China's industrial and agricultural sectors. UADI was built as an intern section for architecture and civil engineering departments in universities specializing in building related academic fields. Far beyond the college version of Architectural Design Institute (ADI, Jianzhu Shejiyuan, 建筑设计院), a socialist Work Unit for architectural practice under the planning economy following the Soviet Union model, UADI was mainly a product of Socialist Education Revolution

(Jiaoyu Geming, 教育革命). Through combining education with production, it aims at replacing the old architectural pedagogy system based on market economy and capitalist humanities with a new socialist one serving for the proletarian politics and industrialization agenda (HUA 2018, 22).

1952-1977, Learning Architecture Through Production

Architect as a modern profession emerged in China in the middle of the nineteenth century. Before 1949, both the educational and professional systems were following the western model since the first generation of Chinese architects; some of them, being also founders of Chinese architectural departments, were mainly educated from U.S., Europe and Japan. Likewise, individual creativity was highlighted in the curriculum and recognizable authorship was a guarantee for market competition and academic accomplishment.

Since 1952, to achieve quick socialist transformation and construction, following the Soviet Union model of planning economy and centralized governance, private design companies were nationalized into ADI, a big and comprehensive design organization where hundreds of architects, civil and equipment engineers were working together equally as collective technicians. Projects were designated by government and design fee was cancelled, even the title of architect was replaced by that of engineer. Meanwhile, universities of various origins were assembled into state-owned universities, mainly gigantic polytechnic institutes combining related science and technology subjects, to meet the urgent demand of advanced technicians for rapid industrialization. Under such a circumstance, eight most influential architecture schools in China were shaped, mostly in 1952, including that of Tsinghua University, Nanjing Institute of Technology (now South East University), Tongji University, Tianjin University, South China Institute of Technology (now South China University of Technology), Chongqing Institute of Civil Engineer and Architecture (now Chongqing University), Xi'an Institute of Architecture Engineering (now Xi'an University of Architecture & Technology, built in 1956) and Harbin Institute of Architecture Engineering (now Harbin Institute of Technology, built in 1959). The faculties and students of these universities had diverse origins. The most extreme case is the architecture department of Tongji University, which resulted from a mixture of thirteen architecture or civil engineering departments from Southeast China, among which the most powerful



Students from the Architecture Department of Tsinghua University who have contributed to the construction drawings visiting the construction site of Revolution History Museum.

were architecture departments from two former Christian universities, St. Johns's University and Hangchow University, and the civil engineering department of former state-owned Tongji University (Hua-Zheng 2018, 14-15). Organized by the local Ministry of Higher Education, architectural professors, most of whom once founded or co-led a private practice, started their collective work in architectural design agency named after university in 1953 to build quickly teaching and dormitory facilities for their own largely expanded university and other reorganized universities and institutes in surrounding areas. Under the guidance of these experienced professionals, young teaching assistants and students had contributed notably to the production.

In 1958, one year after the Sino-Soviet split, China started the Great Leap Forward movement, the whole society turning into a big factory. The Higher Education Policy followed Mao Zedong's direction, «education must serve for the proletarian politics» and «education must combine with production and labor». To achieve rapid development in education, research and production, UADI was inaugurated successively in universities with strong architecture and civil engineer departments. In March 1958, following the model of university-affiliated hospital as well as university factories, Tongji University-affiliated Civil Engineer and Architecture Design Institute was formally established, including totally 107 professors,

Professor in Tongji University was guiding the college students on Shanghai Grand Theater Project, 1958.

among which, 59 architects, 29 civil engineers, and more than 100 senior students from architecture department and civil engineering department (Hua-Zheng 2018, 54-55). In July, South China Institute of Technology built Architecture Design Institute in architecture department and Architectural Construction Company in the civil engineering department (Xiao-Chen 2009, 10). In the same month, Civil Engineer and Architecture Design Institute of Tsinghua University was established and then played an important role in co-designing «The Ten Great Buildings» dedicating to the 10th Anniversary of the People's Republic of China (Liu 2018, 145-147).

Different from other big design institutes, UADI must develop both drawings and professionals. New curriculum designated three stages of internship in UADI or local ADI where the design project was located, including two-semester or eight-month for the senior students, one-semester or four-month independent project for the graduates, and graduate program focusing on the design practice of particular programs. Different from a former private design studio where the professor was the authoritarian center and students improved professional skills majorly through independent houses

or public mansions highlighting aesthetic criteria and individual creativity, in UADI professors and students worked together on «real sword and gun projects», frequently including the People's Commune, factories and worker's villages, finding solutions through plentiful investigation, field work and even building construction, following the guidance of «practical, economical, beautiful under possible conditions». Through this socialist revolution of architectural education, the traditional theory-oriented educational system, a leftover from the «corrupted Feudalist or Capitalist society» was replaced by a practice-oriented one. The privilege of mental work to physical work was demolished. Instead of an artistic creator with strong sense of individual authorship, architect was expected to be «red and expert», just like a loyal and efficient screw on a collective machine, on one hand as a state cadre, executing the planning and administration for central and local government, on the other hand as an «all-inclusive» technician, mastering all skills of architect, engineer, budget account and even construction leader.

Learning architecture through production resulted in the anti-elitism, pragmatism, and efficiency-orientation for Chinese modern architecture. UADI has played a notable role in this process (Hua 2018, 22). Supported by statistic success, half-teaching half-producing was seen as «the best way to combine theory with practice» (Wu 1958, 39). Statistics showed that from 1958 to 1963, UADI of Tongji University had completed 476 buildings, covering a gross area of 60-million square meters, among which, 327 were industrial projects, 149 were civil projects, the building programs varying from educational facilities to public landmarks like 3000-Seat Opera House, 80,000-Seat Stadium, Memorial Hall of Revolutionary History etc. Technology breakthroughs crowned the productive achievements. For instance, through investigating old Lilong houses, young professionals and students created independent kitchen and bathrooms for small apartments with humble standard of four-square-meter each person, improving the Soviet-Union residential units. They created new methodology for sight analysis and seat design in large auditorium and stadium and achieved large-span rein-forced concrete thin shell structure (Tongji 2007, 1833-1853).

However, one cannot deny that there was a big gap between production and education. Without enough qualified professionals and practicing time, UADI possessed limited capacity to handle big and

sophisticated projects. The students had to sacrifice their time for comprehensive and advanced knowledge in repeating simple building types and rushing for standard construction drawings, even physical labors.
Like many other institutions, UADI was shut down during the Culture Revolution between 1966-1976, when professors and senior technicians were sent to rural labor camps to receive socialist reeducation. However, the practice oriented educational revolution climbed on a new stage, calling for the trinity of education, design, and construction. Junior faculties and students were living and working together with other technicians and construction workers on the building fields of «Typical Projects» of various types, mostly factories and workers' residences. Architecture major was finally canceled and merging into the architectural engineering department.

1978-2000, An Experimental Field for Architectural Creation and Institutional Reform

In 1977, after a ten-year hiatus due to the Culture Revolution, Chinese university returned to the normal track as a center for intellectual enlightenment, professional training and scientific research. When reestablished after 1978, UADI was divorced from architecture department; faculties and students were liberated from production burden while remaining the channel to practice.
The Ministry of Education decided to keep this institutional form for at least three reasons: the shortage of qualified architects and engineers due to ten years' halt of higher education; second, to speed up the construction of university infrastructure, UADI was the most efficient and experienced agency; finally, through real practice and design research, educators could redefine the academic field and improve teaching and researching. The first five University Architectural Design and Research Institute (UADRI) named after their mother universities were officially approved to establish in August 1979, including Tianjin University, Tongji University, Nanjing Institute of Technology, South China Institute of Technology and Middle China Institute of Technology (now Huazhong University of Science and Technology). Many others followed. The research function was emphasized in the new name.
Driven by the anxiety for correcting the ideological mistakes and catching up with the world, Chinese society underwent a widespread cultural revival for the following decades; all academic areas were struggling for new theories and disciplinary breakthroughs. In the

Tsinghua University Library Expansion designed by Zhaoye Guan.

architectural field, «creation» replaced «production» as the buzz word, pursuing for conceptual, formal and spatial innovation, especially for various public and commercial projects. Consequently, the design authorship, or the individual genius of artistic and cultural expression for architecture, regained its significance.

In this trend of cultural turn, university professors not only played a major role in importing modernism and postmodernism architectural theories, updating the pedagogy system for architecture discipline, but also reached a new peak of original design and regional practice. Compared with those large ADI administrated by the municipal government, UADRI had much less employee and relatively weak technological strength and few construction knowledges. University designers were usually specialized in small and medium educational, cultural and institutional projects, mainly commissioned by local governments or different institutes, with limited bougets, asking for more spatial and formal innovation than industrial breakthrough. Many influential university professors completed their signature buildings in this historical period, most of which

succeeded in creative intervention with the natural or urban context as well as transforming traditional culture symbols and applying vernacular building elements into new design. Famous cases including Fangta Garden and Helouxuan Tea House (Shanghai, 1979-1986) designed by Jizhong Feng (1915-2009) from Tongji University; Xixi Villa (Zhejiang Province, 1980-1982) by Feng's colleauges Ruliang Ge (1926-1989) and Yongling Long (1935-2016); Juer Hutong (Beijing, 1992) by Liangyong Wu (1922-); Tsinghua University Library (Beijing, 1991) by Zhaoye Guan (1929-); Nanjing Massacre Memorial Hall (1985-1996) by Kang Qi (1931-) from South East University; Tianjin University campus and architectural department building (1990-1995) by Yigang Peng (1932-); Museum of the Nanyue King's Mausoleum (Guangzhou, 1993) by Bozhi Mo (1914-2003) and Jingtang He (1938-) from South China University of Technology.

After China established the socialist market economy in 1992, those UADRIs affiliated with top architectural schools and universities showcased strength in winning design competitions, especially for educational and cultural facilities. This strength rooted in the flexible collaboration between architectural professors and the technological design team based in the UADRI. The creativity for those professors' studio resulted from both the fame and design capacity of the leading professor as well as the growing population of their talented and energetic young teaching assistants and graduate students thanks to the expansion of high education in China since the end of 1980s. Through plenty of practices, some leading professors launched new academic fields, such as Urban Design, Architectural Programming, Historical Preservation, etc., while those young graduates grew into the most fruitful Chinese architects in the new millennium.

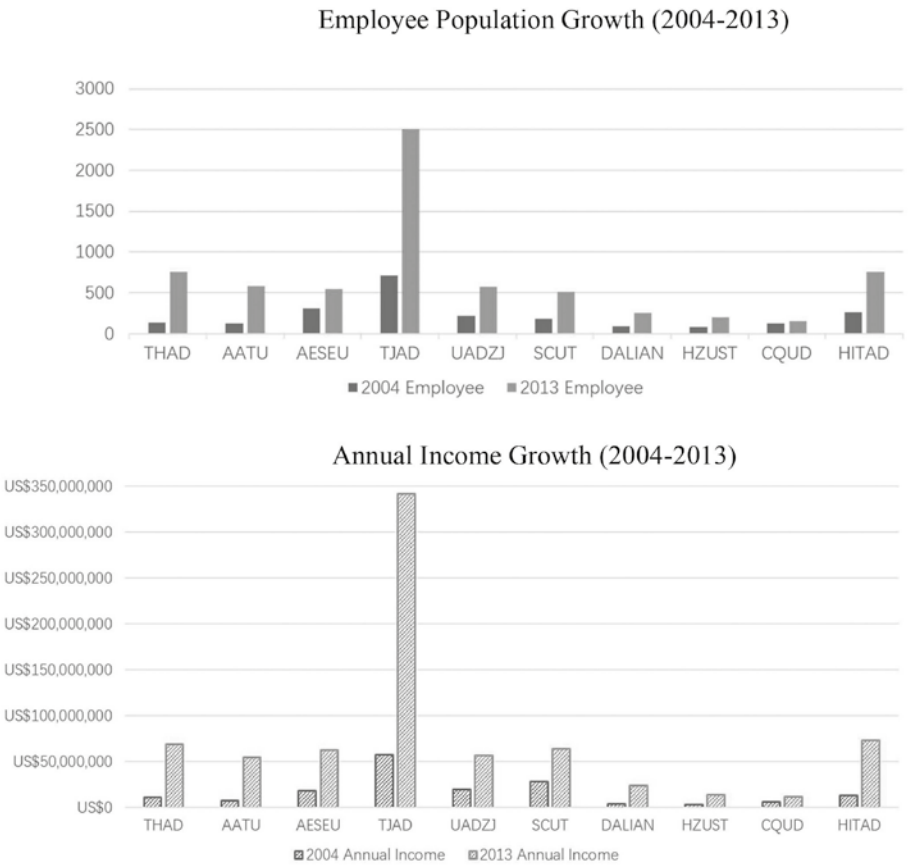
For the last two decades of the twentieth century, UADRI has also served as an experimental field for economic and organizational reform for state-owned universities. Since 1984, one year after the Ministry of Construction announced that design institutions can experiment a system of economic contract, several UADRIs initiated a financial independence from the mother university, searching for projects from market competition instead of top-down planning and admission. The annual design profit was for the first time divided into three parts, 40% submitting to the mother university to support education and research, 30% paying for the employees, and 30% keeping as the developing fund (Hua-Zheng 2018, 166-

171). In 1990, the Ministry of Education completed a Total Quality Control System for UADRIs under its domain to update their technological capacity to win market competition. After 1992, more and more state-owned ADIs turned into corporations, so did UADRIs. Thanks to the rapid urbanization, UADRIs grew rapidly as all the other ADIs, and architectural design gradually turned into one of top 10 highest-paying careers for college graduates in China.

Although architectural design is among the earliest fields open to market and international competition, the administration system of design practice license for both institutions and private clients keeps a centralized control. The Ministry of Construction is responsible for releasing all essential issues, such as building-related planning, policies and standards, the classification of design license, the design fee rate, the quality and safety control, as well as the national awarding system. Since qualified architectural design institute is the only institutional organization who can complete the whole design process, they have participated, at least partially, in all projects. As part of the state-owned institutional system, UADRI from those top universities all received the Class A design license, which is also a guarantee for their success. Since 1996, China established a registered architect system, later also registered engineering system. But the registered role for the designer cannot be separated from his or her institutional position. That is why university architects are largely combined with the home UADRI. To summarize, the integration of the public university brand, the centralized administration, and the rapid economic development and urbanization in China has largely led to the growth and success for the UADRIs.

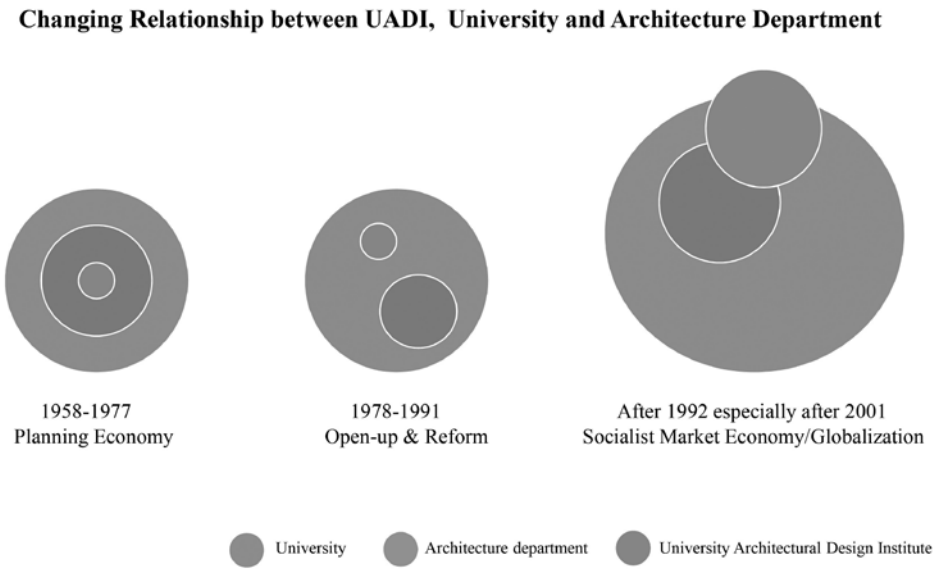
2001-2021, UADRI as Part of the Science, Technology and Creative Engine for Rapid Urbanization and Globalization

In the first decade of the new millennium, the urbanization rate in China climbed from 36.2% to 47.5% with the urban built areas expanding in 7.01% every year and the average annual GDP increase reaching 9.9%. From 1992 to 2018, China has totally built more than 54 billion square meters new spaces. Furthermore, China won the bid to host two international big events, 2008 Beijing Olympic and 2010 Shanghai World Expo. When the design market was opened after entering the World Trade Organization (WTO), China undoubtedly became the largest architectural market in the world. Stimulated



Employee Population and Annual Income Growth for Top 10 UADI in China between 2004 and 2013.

by this economic booming and rapid urbanization, more than 300 universities started architectural education. UADRI affiliated with renowned universities underwent a dramatic growth both in size and profit. Statistics collected by the university branch of China Engineering and Consulting Association (UCECA) showed that from 2004 to 2013, the average staff population grew in 14% every year, while the annual profit growth reached above 20%, with a per-capita production value of more than 600,000 yuan. In UCECA, seven UADRIs under the umbrella of universities directed by the Ministry of Education can be listed as the first tier, including Tsinghua University Architectural Design and Research Institute Co. Ltd (THAD), Tianjin University Research Institute of Architectural Design and Urban Planning (TJADUP), South-east University Architectural Design and Research Institute Co. Ltd (SEUAD), Tongji University Architectural Design and Research (group) Co. Ltd (TJAD), The Architectural Design and Research Institute of



Changing Relationship between UADI, University and Architecture Department.

Zhejiang University Co.Ltd (ZUADI), South China University of Technology Architectural Design and Research Institute (SCUTAD) and General Research Institute of Architecture & Planning Design Co. Ltd, Chongqing University (CQAPDI). At the end of 2018, THAD, CQAD and ZJAD all own over 1000 employees, while TJAD even boasts more than 3000.

Meanwhile, in a global transformation towards a knowledge economy, following the guidance of «Science and Technology are Primary Productive Force», National University Sciences and Technology Park (NUSTP) and University-centered Design and Creative Industrial Cluster (UDCIC) were mushrooming in China. Through integrating production, education and research, UADI became a representative of these university-centered industries, exhibiting strong and incessant economic and cultural power (Hua 2019, 39).

Firstly, by cooperating with their colleagues majoring in urban planning, UADRI made great fortune in new city/town planning and urban designing, grasping more opportunities to design administration centers and adjacent public facilities. They also contributed significantly to the booming of new city campuses and university parks in the suburban area. For example, from 1998 to 2007, TJAD won approximately 150 university planning and architectural projects all around the country (Hua-Zheng 2018, 288-289), while SCUTAD has designed

more than 300 new campuses and built at least 100 from 2000 to 2009 (He 2009).

When more and more cities falling into the signature building fetish stirred by those national landmarks designed by international superstar architects, Chinese architects in ADIs gradually lost their chance for original conceptual design in significant public programs as in 1990s, instead they once again serving as technicians busying in construction drawings known as Local Design Institute (LDI), which is a privilege owned only by local companies or institutes with Class A license.

Under this increasing pressure of international market competition, UADRI still boasts strength for several reasons. Firstly, many senior experts in state-owned top universities, especially those academic members and prestigious professors are designated by the local government as consultants for policy making, urban planning and project reviewing; the whole university as a think tank has a better chance to participate in the early investigation and research. For example, thanks to the first Expo Research Center established in Tongji University, in which 20 colleges and 2,000 experts participated, TJAD group finally completed 53 projects, 138 buildings for Shanghai World Expo in 2010, covering a gross area of 737,000 square meters, cooperating with designers from 21 different countries and supervising another 950,000 square meters buildings (Hua-Zheng 2018, 318). Secondly, UADRI also plays an important role in both domestic and international aid constructions supported by Chinese government. Compared with commercial design companies, university professionals have better chance to lead volunteer designs with more social and academic meaning than commercial interest. For instance, after Wenchuan Country in Sichuan Province suffered from a tremendous earthquake in May 2008, in addition to new city planning and residential constructions, seven top UADRIs, including THAD, TJAD, SEUAD, TJADUP, ZUADI, SCUTAD and CQAPDI have provided school aid architectural design under the guidance of the Ministry of Education, finally built 32 schools. They have also edited guidelines and illustrated reference for rebuilding campuses with good efficiency and quality (Hua-Zheng 2018, 315-316). Likewise, during the COVID-19 epidemic in 2020, UADRIs have contributed notably in designing and building public health facilities, emergency hospitals as well as establishing related design standards. In the national task of international aid design, statistics show that from the 1950s to 2015, «over 2,000 aid projects had

been delivered to more than 160 countries worldwide» (Chang-Xue-Ding 2019, 3), UADRIs have played a major role, especially for public institutional, educational, sports and cultural facilities.
China boasts a regional geographic and cultural diversity and distinctive vernacular building heritage, architectural survey and research in vernacular buildings are listed in the curriculum of architectural schools. With less burden in routine production and commercial pursue, and more academic research pressure and student resources, academic professionals frequently participate in historical preservation and regeneration program. Since many of such projects have political and cultural significance, university professionals could serve as the representative of the government. Historical preservation was finally established as a new major in China in 2005 when there was an increasing demanding for architectural renovation and urban regeneration.
UADRI has also benefited from the postgraduate education. Compared with normal ADI, more senior architects and engineers are assigned as master and doctoral advisors by the mother university. For example, at the end of 2018, there are 29 master advisors and 2 doctorial advisors in TJAD, from 2001 to 2018, under their supervision, totally 452 theses were finished, including 22 doctoral dissertations (Hua-Zheng 2018, 407-408). Consequently, small design and research studios are easier to build in UADRI, where professors can integrate production, education and research to achieve higher academic accomplishment and social influence, and young talents are also more easily attracted. They can focus more on the concept design and technological experiment, leaving the construction drawing to other departments in UADRI. Supported by those doctoral and master dissertations as well as related research programs and publications, UADRI also enjoys favored tax policy as High-Tech Enterprise.

Conclusions: Towards an Architectural Modernism for Social Progress

By providing a unified platform for the university experts to keep practice, UADI is a typical institutional model for Chinese public system, in which leading public university is designated a role of think tank and technological service organization for the domestic built environment and related public issues. Although it underwent dramatic transition in three historical phases, the historical evolution of UADI has illustrated Chinese

universities' statue as the server for the state and society, no matter within or without the market economy. Instead of searching for an alternative world by criticizing the status quo, Chinese architects tend to «conceive new possibilities from within the existing socioeconomic conditions» and aim at an architectural «modernism for social progress» (Zhu 2015, 40-45). This situation can trace back not only Chinese intellectuals' Confucian gene and socialist collective spirit, but also the utopian ideal and social engagement of architectural discipline, especially advocated by modernists.

As an experimental organization for education revolution and socialist transformation, UADI has contributed notably to legitimize this progressivism and pragmatism in Chinese architectural discipline with its early production success. The consequent practice-oriented pedagogy has been even strengthened by the souring demand for urbanization and economic growth for the last four decades. This success exhibits not only the strength of this institutional form, the integration of production, education and research, but also the efficiency of top-down governmental system, the nationalization of practice license, registration, design fee regulation and evaluation process (Hua 2019, 42). Nevertheless, academic professionals' high engagements in social agenda may also sacrifice their independency and criticality, which are necessary for transcending utilitarian ends to achieve original creation, theoretical reflection and disciplinary breakthrough. Therefore, the biggest challenge for Chinese UADRI now and in the future is whether and how it can exceed the quantity and commercial success and contribute more to universities' leading role in homegrown intellectual, cultural and technological innovation.

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SERVING AND REPRESENTING THE FEDERAL GOVERNMENT. ARCHITECTS AT THE CROSSROADS OF ADMINISTRATIVE CONSTRAINTS AND CREATIVITY

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In the Federal Republic of Germany, its federal construction tasks are developed, managed and led through decentralized agencies. This decentralization is broken down into the sixteen states within the FRG and one of these sub-organizations is the Federal Construction Baden-Württemberg (Bundesbau Baden-Württemberg). With its seven hundred and fifty employees, this organization delivers own-designs and contracts for design and construction in tight cooperation with market-based design offices and builders. In 2020 the gross revenue turnaround was about three hundred and eighty million euros. The range of constructions covers airport runways, water towers, hospitals, and museums. One of the outstanding current examples is the Museum of the 20th Century in Berlin which is currently under construction with Herzog & de Meuron being the architects of note. The author discusses the role of government architects and some of their constraints. Their key role is to bring intertwined interests, demands, and laws into equilibrium with cultural aspects.

Klaus Max Rippel is a chartered Architect. He graduated in 1987 from the University of Stuttgart. In 1991 he received his post graduate degree from the State Construction Office as Regierungsbaumeister (Government Master Builder). From there he worked as Architect, Project Manager and subsequently as Project Director with the Freiburg University Construction Office. Between 2000 and 2004 he was instrumental in supervising architects for the Universities of Freiburg, Constance, Heidelberg and Mannheim. In 2004 he moved to the Federal Construction Office in Freiburg. As Project Director he was Managing Director for several major construction projects in Kosovo and Afghanistan. Since 2018, Rippel is President and CEO of Federal Construction Baden-Württemberg. He has also a teaching appointment for courses in Construction Project Management at the University of Stuttgart.

Keywords: Federal construction; Architecture; Museum of the 20th century; Bundesbau; Public building

For most of its history, Germany had been a patchwork of states, duchies, fiefdoms, imperial cities and the like. As a major force through the historic developments, Prussia has left its mark on how administration is done in the field of construction within the federal states throughout Germany. We still strive to act in Karl Friedrich Schinkel's succession as neutral and reliable civil servants, rather than following Leo von Klenze as an egocentric court artist in Munich (Geist 1993; Peschken 1993).
In and around 1800, just at the turn of the nineteenth century, both of them had been students to the art of building under the tutelage of David Gilly in Berlin, a precursor of Schinkel's Building Academy. Their southern counterpart in the State of Baden-Württemberg had been Friedrich Weinbrenner in Karlsruhe. So, from the turn of the nineteenth century onward, we may consider this to be a turning point for a new perception of how building for the state was to be conceived. The balance from then on seems to favour a more structured, technically sound and affordable approach of designing and overseeing works for the community and society as such, rather than the traditional artistic pursuits (Strecke 2017).

The Bundesbau Baden-Württemberg
With a volume of approximately four hundred billion euros, the building industry is one of Germany's major economic sectors. In 2020 the total financial investment in public construction and infrastructure exceeded thirty-eight billion euros, the federal portion of this reaching four billion euros (Weitz 2020).
The German federal construction is administered by specific federal ministries such as the Ministry of the Interior, Building and Community being key in the process, but with the Ministries of Defense and Finance weighing in heavily in the process; the Federal Office for Building and Regional

Planning (BBR), supervising federal building projects in Berlin, Bonn and worldwide. The Federal Government borrows the necessary services from the 16 federal states' regional construction administrations in a wide variety of uniquely and individually structured assignments. In total, the German Federal Construction workforce consists of approximately 4,000 employees (BBSR 2021).

The Federal Construction Baden-Württemberg is a state funded division (Bundesbau Baden-Württemberg, i.e. BBBW), which in turn is «leased» by the Federal Government from the State Ministry of Finance. Therefore, even though we belong to the State of Baden-Württemberg, we do not work for the State. This responsibility is bestowed upon our sister organization, the Baden-Württemberg Agency for Management of Assets and Property (Vermögen und Bau Baden-Württemberg), with whom we have a cordial partnership (BMI 2019).

Having started in 1952, from a fresh slate post World War II, the Federal Construction Baden-Württemberg has been established in its current form in 2004 (BMVBS 2012). Today, our headquarter in Freiburg not only oversees about two thousand five hundred construction projects mostly in the State of Baden-Württemberg, but also some major projects in Berlin and in thirty locations worldwide. In 2020 the BBBW closed out the fiscal year with an investment of three hundred and seventy-nine million euros, this being the highest investment on constructions and design fees to date (FMBW 2020). Requests for services and support are addressed to us solely from the Federal Government, but we do need to apply the administrative hierarchy of the state administration in regard to our personnel, the remuneration of our employees, the means and methods we use our resources for any given task and the office spaces needed, flexibly adjusting where and when necessary.

Our workforce mainly consists of administrators, architects, and engineers. We work out of six main local branches, in Freiburg, Karlsruhe, Heidelberg, Schwäbisch Hall, Stuttgart, Ulm and a smaller one in Berlin. Most of my colleagues in upper management, graduated as architect or engineer from universities, worked in industry and then received a post graduate degree from the State, after an intense internship and a quite stringent testing regime. At the site supervisory level, our colleagues have usually graduated from a university of applied sciences, a technical college or a vocational training school. All

things considered, we design and develop about twenty percent of our workload with in-house design. We find this to be a healthy percentage to ensure and enrich the in-house expertise, as we do not want to be deemed unbased and removed from reality, sitting in badly lit back offices, but rather be perceived as open-minded helpful agents to the task-in-hand. Eighty percent of our projects are awarded through a competitive screening process aimed to select the most qualified freelance architects' sub or engineering offices. If our workload ever diminishes, we could easily raise the percentage of our in-house design. Our area of responsibility covers military airports, barracks and hospitals as well as the Supreme Court of the Federal Republic of Germany, the Federal Customs, the Federal Police, the Federal Agencies for Technical Relief (THW), numerous scientific laboratories, housing developments, and much more.

Procedures Applicable

The users or tenants of our construction assignments mainly are institutions and usually have no experience with buildings as such. Sometimes our counterparts might just have some basic understanding from building their privately-owned homes, but most likely not being privy to any knowledge on institutional project requirements and procedures. Hence, in general our clients need our counseling in a pre-design phase while defining their needs and the basic operational requirements. Our experience has shown that if this pre-design phase is leapfrogged, many addendums to the original scope will surely arise, which in turn becomes detrimental to the cost plan. As we are not the proprietors of federal real estate, the Institute for Federal Real Estate (BImA) has to be involved right from the get-go; they act as landlords for the users.
The bigger the project, the more stakeholders with conflicting interests participate; hence our due diligence, professional and neutral supervising capabilities, regarding quality, time and cost control become an instant necessity. Consistent with the increasing complexity, we not only act as an engineering and planning organization, but also offer the federal construction agencies throughout Germany our specialized knowledge and services in various fields such as security, sustainability and risk management and reaching as far and deep as design and management for facilities in health care, hospitals, laboratories and research facilities.

The funding process starts with a cost estimate, based on the scope of work and maybe some sketches, followed by a cost calculation with the conceptual design phase, comprised of a design brief and drawings in the scale of 1:100 up to 1:50. All documentation is to be evaluated, checked and approved hierarchically in several predefined steps; subsequentially at our local branches, at our headquarters, at the responsible ministries and lastly at the Federal Ministry of Finance. This is seemingly an almost endless multi-layered review process – one does wonder if all these steps actually do improve the quality of the design. Perhaps this has to be a systemic inflection point. If one considers the magnitude of some larger projects, the whole process begins with a tentative scope and ends with the ribbon cutting and hand-over, on average some ten years later. To put it bluntly, that is not too impressive, or is it? Therefore, as a sign of the times, reforms are under way to accelerate the process. Rest assured there will be new regulations, missions, visions and rules for governance, this is a foregone conclusion.

Collaborative Partnerships

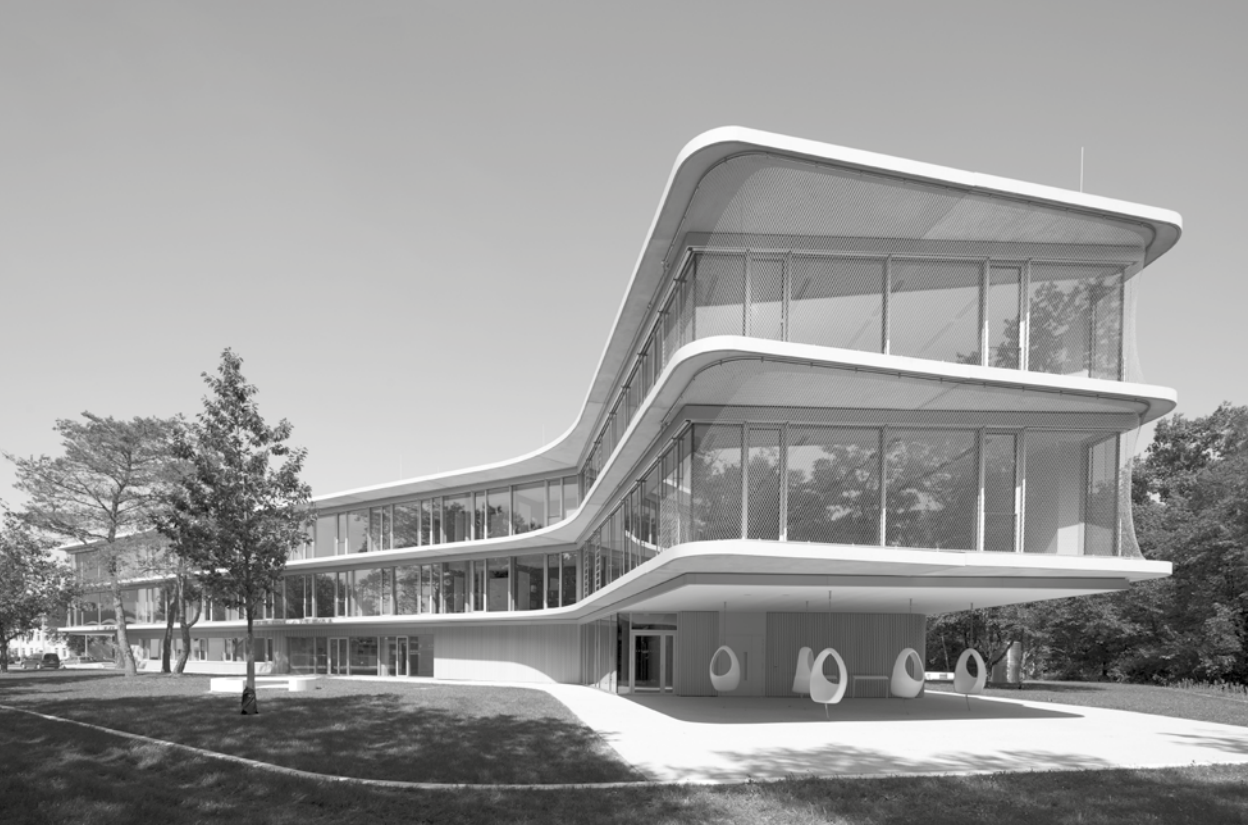
Uniquely placed and most notably prominent design commissions in the public domain are awarded via open international design competitions, most commonly with noteworthy international designers and architects participating. Almost since the beginning of civilization the powers to be were susceptible for pompous buildings and architects were willingly and sometimes even playfully aware of this as the mundane seemed less appealing. Even today we can see this affinity: those in government and those of affluence succumbing to this notion of grandeur. We act as intermediary in that gap where the authorities or powers to be need professional guidance and we ensure that those sometimes formidable architects stay on course. Our incentive is to establish a good working partnership with our freelance partners. We usually guide them through a maze of local and federal regulations, a fruitful cooperation based on mutual respect and understanding. With this in mind such a respect driven partnership can push a project to newer heights and perhaps even ensure an exceptional if not fantastic outcome, equally balanced culturally in the public perception, meeting the budgetary and timeline challenges and ensuring the highest quality and sustainability standards.

With a construction cost forecast up to four hundred and fifty million euros, the Museum of the Twentieth Century

Herzog & de Meuron for Bundesbau Baden-Württemberg, Museum of the 20th Century, rendering of northeast elevation, Berlin, 2021 - under construction.

in Berlin is recently one of our major construction projects. Herzog & de Meuron, the architects of the Elbphilharmonic, have won the European design competition for the new museum next to the Neue Nationalgalerie designed by Mies van der Rohe and the Berlin Philharmonic designed by Hans Scharoun. This project was funded directly by the German Parliament, the Bundestag. Construction works started in 2021 with massive earthworks, reaching as deep as 16 meters below the water table. Due to the size and the situation right in the middle of a pulsating city, construction will not conclude before 2026.

Another important project is the Bundeswehr School of General Education in Karlsruhe. The German Military strives to ease the transition to civilian life for its soldiers, after completion of their service to the Nation. To ensure this pursuit, we were commissioned to build a new education and training facility. V-Architekten from Cologne submitted the winning design during the architectural competition, which we had organized. They proposed a very light structure, reminisced in design of a three-bladed propeller. The competition jury comprised of the client's representatives and our team found this to be the most suited design response



V-Architekten for Bundesbau Baden-Württemberg, Bundeswehr School of General Education, eastern elevation, Karlsruhe, 2020.

considering the facilities' location at a former airfield. The Bundeswehr School of General Education in Karlsruhe received excellent reviews from experts and within noted and relevant publications. The school's «out of glass design» won the Hugo Häring Best Design Award in 2020, but more importantly teachers and students love the building.

The German Embassy at the Court of St. James in London has a very prominent address at Belgrave Square nestled in historic terraced houses. Under the watchful eye of Historic England and Westminster City Council, we and ÜberRaum Architects had to reestablish structural safety, reinstate the leaking roof, refurbish the complete interior and the façade of this historically relevant Grade I listed building. Whoever said, that chief surgeons are the most demanding clients has never dealt with diplomats. But the outcome is convincing: the sophisticated restauration appreciates the architecture of the beautiful garden square. Pomp and Circumstance!

Following some major fire disasters in alpine tunnels, the European disaster prevention regulations were revised. Since then, a multitude of tunnels for federal roads in the Black Forest had to be upgraded. Service installations had to be relocated from the interior of the tunnels to the outside, nearer the tunnel openings.

ÜberRaum Architects for Bundesbau Baden-Württemberg, Refurbishment of the German Embassy, view from Belgrave Square, London, 2019.

These service facilities were designed and realized with own-design over the last ten years. The depicted example in Waldkirch was designed by a young architect. She joined the BBBW after getting her feet wet as a freelance architect, like so many of us do. The building is conceived in Corten steel and sits like a sculpture on a wall alongside the road. Although the design of such buildings primarily focuses on their functionality, this does not necessarily exclude a willing design intent. This extraordinary construction received a Design Award for outstanding design within the Black Forest, one of Germany's protected National Parks.

For certain types of buildings, approximately one percent of the construction cost is reserved for artwork and artwork design relevant to the projects' intent. The BBBW then invites artists to participate in a «Kunst-am-Bau» competition, to add something artistic to the construction project, to create something uniquely special, fitting the purpose and the location of the building – a customized art piece blending art and architecture. A wonderful example for art in architecture is the Federal Eagle, conceived by Markus Lüpertz for the Federal Supreme Court in Karlsruhe.

Bundesbau Baden-Württemberg, Tunnel Service Facilities, view from the federal highway, Waldkirch, 2019.

Representation, Administration and Culture

In a democratic society, and more precisely in a «federation», the scale of things sometimes seems rather abstract, removed from the individual, just like with architectural ideas which most commonly are based on an abstract vision and sometimes even conceived by formidable personalities. The BBBW at its core is assigned to coordinate a variety of entities, project partners and characters, ensuring that «things get done». We are the mechanics, if you wish, with the oil can in-hand keeping things smooth and running. Building as such is in the public eye – always. Hence, calls for democratic participation processes, on questions such as 'shall we build at all and where?' are commonly justified, but design by referendum won't work. A democracy must be able to rely on the cultural, technical and economic expertise of its professionals and experts. The principal of checks and balances within this necessarily transparent process is paramount to all supporting entities either in an advisory capacity or as prize judges in competitive scenarios. Any outside advisory entities need to be spared from overbearing systemic responsibility but supported by entities such as BBBW, to focus on the unique professional input these specific processes require.

In serving the public, the awarding, design, and building processes need to be transparent and without discriminations, unlike in a dictatorship or oligarchy. We cannot award contracts to the run-of-the-mill

Markus Lüpertz, Federal Eagle, Art in architecture for the Federal Supreme Court, Karlsruhe, 2005.

guy from the local sports club. We strive to provide the environment and the conditions to allow the best ideas succeed. Architectural competitions and similar processes for smaller tasks fit into our European contracting regulations and serve this purpose. Other regulations, e.g. for CO_2 reduction should not suppress creativity but fuel new ideas.
When awarding construction contracts to builders and building contractors, it is still required to follow the traditional way of individual contracts for separate trades. Usually, the lowest bid wins. In theory, however, «the economically most beneficial bid» should win, but that can easily result in time consuming objections by the lowest bidders. Therefore, we are often forced to award the contract to the at first glance lowest bid,

knowing full well, that we will most likely end up with an enormous number of addendums, more paperwork, additional site-supervision and coordination tasks to both our colleagues and the freelance architects and engineers under our direction.
We define the architect's profession as someone with an artistic vision combined with a thorough technical knowledge and who feels an artisanal responsibility to put that vision into reality. However, we do encounter more and more architects with a shear artistic design approach and who then need additional experts for almost everything besides their core artistry. They do not want to be held accountable for such mondain and trivial issues such as waterproofing a roof, let alone cost overruns or schedules. That is why we are constantly testing more and more progressive forms of contracting in engaging with general planners and or general contractors, exploring integrated project delivery methods or multiparty contracts, etc.
Furthermore, we reflect on our ongoing worldwide projects, where we experience quite different construction cultures, rules and regulations, which provide ample occasion to infuse our domestic projects with lessons learned abroad. We are very susceptible to evolving trends: modular building, prefabrication, BIM, sustainable timber constructions, you name it. Our approach is, we try everything at least once. This infusion of new technology even led to some of our newest wooden structure designs receiving prestigious architectural or engineering awards.
«I couldn't care less about buildability», a famous British designer once said. But we at the BBBW do care! The luminaries within the architectural community move projects forward with their visionary ideas. This occasionally creates poetic masterpieces, the public is longing for and is willing to afford. On the other hand, practical and generic solutions are as relevant as a glass of milk or water. Without this understanding the sparkle from a glass of champagne woudn't be as delicious as it is. Notwithstanding, it would be presumptuous to assume that everything can be at the same time good, durable, timelessly beautiful, and inexpensive, be on schedule and without any incurring risk. Extraordinary buildings are culturally sustainable and do persevere. Aren't we now much more lenient in our judgement of the architects for the Sydney Opera or the Elbphilharmonic in Hamburg?

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THE ARCHISTAR AND/VS THE FIRM: ORGANIZATION MANAGEMENT AND LEGAL ISSUES

FOSTER + PARTNERS. THE STORY OF A PRACTICE

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During his career Norman Foster experienced all types of practices: from the two-people studio he set up with his wife in 1967 through the 30-50 people medium-size office he led during the Seventies, to the globalized multi-centers practice he established in the last decades. Foster + Partners is a case-study of particular interest in the contemporary scenario: an office that aims to merge the financial and organizational structure of a worldwide generalist firm with the design structure of a medium-size studio gathered around a charismatic leader. The paper analyzes the improvements in the financial and organizational structure of Foster + Partners from the Seventies, and how those changes impacted on the selection of the works and on the design method. Moreover, it will be explored the different roles that Norman Foster assumed in 'his' practice along the time, questioning the shades of a singular or shared authorship in such an office.

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Keywords: Norman Foster; Architectural Firms; Design Authorship; Organization Management

Twenty days after the death of Zaha Hadid in 2016, her closest collaborator Patrik Schumacher granted an interview to Steven Erlanger, bureau chief of the «New York Times» in London. Grief over the sudden death of the famous Anglo-Iraqi architect was still palpable, but timing is an essential quality in business and Schumacher's message in the columns of one of the most important newspapers in the world could not have been more explicit: «we want to tell the world that we are still a viable, vibrant address for major work of cultural importance», adding that «my ambition is to become more visible as a leader of the field to clients» (Erlanger 2016). As in any large global business – like the firm Zaha Hadid Architects, which has around 400 employees and a turnover of £57 million – a power and leadership vacuum is unacceptable. Just as Tim Cook instantly took over from Steve Jobs at Apple, taking the Californian company to new heights in terms of sales and turnover, Patrik Schumacher had to quickly reassure clients and investors that, despite the death of Zaha Hadid, nothing would change in terms of the global growth of the firm which «has just opened an office in New York and is looking to continue to do major projects in key cities, and while keeping offices in Beijing and Hong Kong, it plans offices in Dubai and Mexico City» (Erlanger 2016). As has been noted, «architects die, brands do not» (Ferrando-Silenzi 2016, 65).

While some of the most famous contemporary architects have perpetuated the traditional model of a small studio, with few collaborators and a stringent selection of commissions – from Peter Zumthor to Glenn Murcutt and Paulo Mendes da Rocha, for example – others – like Zaha Hadid, Norman Foster, Richard Rogers and Rem Koolhaas – have chosen to fully exploit the rules of the capitalist system, organising offices with hundreds if not thousands of employees and numerous offices scattered around the world. These authentic creative

businesses – whose public and commercial profile is inextricably linked to the figure of the founder who has risen to the role of archistar – are an interesting field of study for anyone wishing to investigate different aspects of the profession of architect in the contemporary context and their elusive role in the tortuous process of designing large-scale works, questioning in particular what critical weapons need to be sharpened to understand these professional environments (Deamer 2014; Agamben 2017; Deamer 2020).

While several generalist design firms prospered in the twentieth century after the retirement or death of their founders – from SOM to Gensler, Perkins & Will and Nikken Sekkei – this has not been the case for architectural firms intimately linked to the design qualities and charisma of the architect-demiurge. The process of the gradual (although difficult) detachment of Zaha Hadid Architects from Zaha Hadid therefore represents a new episode, but one that is destined to be repeated (Hopkirk 2019). Norman Foster, for example, stated that the current structure of Foster + Partners is designed to ensure the firm's operation and success after his death (Foster 2010, 117). Rogers Stirk Harbour + Partners, on the other hand, has recently announced that the name of Richard Rogers, who has long since ceased to be involved in day-to-day management and has resigned from the Board of Directors, will be dropped from the firm name within two years (ING 2020). In these cases, as Pedro Fiori Arantes has suggested, we are witnessing the «progressive dissociation of authorship in favour of branding» (Fiori Arantes 2019, 17).

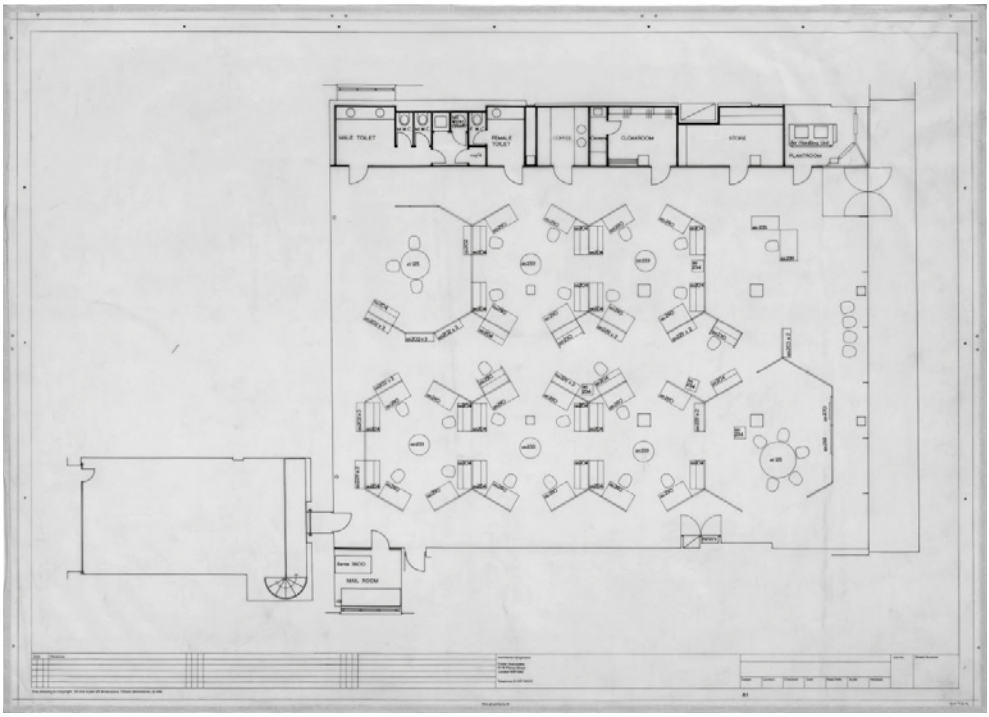
As with haute couture fashion houses, which have thrived well beyond the presence and commitment of their iconic creators, this will likely be the case of these architectural firms, where new charismatic figures will be called upon to replace the founders, updating their creative legacy (Kipnis 1997) – and this is how Patrik Schumacher's explicit and well-timed declaration of intent, just days after Zaha Hadid's death, should be interpreted.

The media attention polarised by these archistars often masks an understanding of the professional bodies they founded, which, initially based on the model of the traditional studio, have become something very different over time: genuine creative businesses fostered by the iconic figure of the founder used for commercial purposes. It is clear that the traditional historiographic approach focused on the figure of the author-creator can only understand these professional environments

Foster Associates team on *The Architectural Design* cover, 1972.

to a limited extent (Saint 1983; Kostof 2000). Alongside the analysis of biographies, projects and construction sites, the study of managerial strategies and company organisation models must be backed up by all that this entails: an in-depth analysis of the hierarchical structure; the sharing of responsibilities and authorship; the choice of specific projects that are highly remunerated; the active role of consultants and suppliers; the impact of the most up-to-date information technologies (Boland-Collopy 2004; Cayer 2016, 164). Although there is no lack of bibliographical sources dealing with the evolution of architectural practice in recent decades, they have rarely analysed the creative businesses led by archistars (Deamer- Bernstein 2010; Carpo 2011).

This paper seeks to offer a first contribution in this sense, examining a particularly interesting case study, that of Foster + Partners. First of all, we will see how the firm has grown over time, and how this growth was accompanied by the evolution of the organisational structure and a different distribution of design and management responsibilities. Some of the factors that facilitated this global expansion process will then be



Foster Associates, Distribution plan of the Fitzroy street office, London, 1972.

highlighted: multidisciplinary tension; the marginalisation of traditional projects and a preference for the design of infrastructural works, industrial buildings and the headquarters of large companies; integration between the architectural studio and suppliers of materials and technological systems; the positioning of offices in the main geo-political hubs and the leverage ensured by financial capital. In conclusion, historiographical questions will be raised, linking them to the new characteristics that the traditional model of architect-demiurge assumes in these professional organisations.

A Growing Practice

Norman Foster is both one of the most recognised and acclaimed figures in the architectural star-system – winner of the Pritzker Prize and all the major honours that exalt the individualist nature of the profession – and the founder and Executive Chairman of one of the largest global design firms, Foster + Partners, which employs more than one thousand people in fourteen offices on five continents – London, Madrid, Dubai, Abu Dhabi, Bangkok, Singapore, Hong Kong, Shanghai, Shenzhen, Beijing, Sydney, Buenos Aires, San Francisco and New York – with a turnover of £272 million in 2020 (ING 2020). Foster was the first,

Inside view of the Fitzroy Street office, London, 1972.

and most successful, to attempt a synthesis between the narrative of a carefully constructed authorial profile and the collective and impersonal dynamics of a global professional association: he has succeeded in combining the appeal of a studio led by an archistar with the advanced industrial organisation of a generalist design firm (Quantrill 1999; McNeill 2005; Foster 2010). However, in the first decades of his career Norman Foster was not interested in coordinating such a large and complex studio. Until the Nineties, his office had no more than fifty people, and he stated on several occasions that «thirty was the ideal number of people in a successful architectural studio» (Sudjic 2010; Powell 2006, 512). Investigating the Foster phenomenon – not in terms of his architectural choices, but rather his production and organisational strategies – will enable us to understand why, at a certain point, he was able to reorganise and excessively expand his company, creating a radically different role for the architect-demiurge than in the past. Norman Foster's professional career can be divided into three phases: the first decade, from 1967 to 1978; the twenty years between the Hongkong and Shanghai Bank competition (1979) and being award the Pritzker Prize (1999); and finally the last two decades. For each of these periods, a geography of assignments – England

Foster Associates team at the Fitzroy Street office, London, 1981.

in the first phase; Europe, Hong Kong and Japan in the second; and the five continents in the third – and an organisational model can be defined in a schematic but pertinent way: a company wholly controlled by Norman Foster in the first phase; a company controlled by Foster and a small number of minority Partners in the second; and finally a company independent of Foster's control and with a large number of Senior Partners, Partners and Associate Partners, with equity shares held (at least for a certain period) by investment funds. As we will see, as the number of people employed and the complexity of the organisational structure increased, both Norman Foster's managerial and more specifically creative responsibilities gradually reduced.

After studying at Manchester University's School of Architecture and City Planning and spending two years at the Yale School of Architecture on a scholarship, in 1964 Norman Foster returned to London, working in Team 4 (with Richard and Su Rogers) and then, in 1967, setting up Foster Associates with his wife Wendy Cheeseman (Lambot 1991). After a few years marked by a lack of work, in the early 1970s the firm began to acquire commissions, increasing its visibility which culminated with the design of the headquarters of the insurance company Willis Faber & Dumas in Ipswich (1972-1978), which received unanimous and widespread acclaim (Foster-Powell 2012). Almost all the projects carried out by Foster Associates in its first decade were located in England, and the London office – first set up in Norman and Wendy Foster's flat in Hampstead, and from 1972 in Fitzroy Street – was joined for a few years by a small office

The Hong Kong team of Foster Associates just after the completion of the Hongkong and Shanghai Bank, Hong Kong, 1986.

in Oslo which undertook specific projects for the Norwegian shipowner Fred Olsen, where no more than five or six people worked at the same time (Jenkins 2003, 559; Hernández 2020). In this period Foster Associates employed between thirty and fifty people on a permanent basis, and Norman Foster had strict control over the design output and management of the studio (Sudjic 2006, 274). In the early seventies he appointed some of his earliest associates – Michael Hopkins, Birkin Haward and Loren Butt – as partners in the office. But in 1976 he bought back their shares and remained the sole partner until 1992 when, while remaining the majority partner, he decided to appoint Spencer de Grey, David Nelson, Ken Shuttleworth and Graham Philips as new minority partners (Sudjic 2010, 266).

Winning the international competition for the Hongkong and Shanghai Bank in 1979, and the long design process that ended with the building's inauguration in 1986, brought about a sudden and radical change in the organisation of Foster Associates (Davies 1986; Williams 1989). In order to supervise such a complex construction site an office was opened in Hong Kong, managed by Spencer de Grey and Graham Phillips. The concept and initial design drawings were developed in London, but from 1983, when construction started, most of the team moved to Hong Kong where, by hiring local architects, the office grew to about 130 people, compared with the 35 employed in London at the same time (Powell 2006, 515). Although the Hongkong and Shanghai Bank was by far the most prestigious, challenging and lucrative assignment in the office, Foster decided not to relocate

Great Portland Street studio in the mid-Eighties, London.

to Hong Kong, instead making periodic trips there. He remained in London looking for other assignments that could secure the future of Foster Associates once the construction of the bank was complete, a decision that proved to be far-sighted (Powell 2007, 529). While the number of staff in Hong Kong gradually reduced as the construction site neared completion, and the office was closed in December 1986, the London office – which in the meantime had relocated to a larger premises in Great Portland Street – had won major commissions such as Stansted Airport (1981-1991) and Carré d'Art in Nîmes (1984-1993).

The legacy of the Hongkong and Shanghai Bank was broad and long-lasting (Sudjic 2006, 278-279). First, it transformed Foster from a talented London architect into one of the most famous architects on the global scene, giving rise to the internationalisation of his firm. While up until the 1979 competition almost all the projects and buildings built by Foster Associates were within the English borders, by the end of the 1980s around 90% of the commissions came from abroad (Powell 2006, 518). In 1987 a new office was opened in Tokyo, run by Chris Seddon – one of the project managers of the Hong Kong office – and Andy Miller (Powell 2006, 518). The Japanese office was active for a decade, and was responsible for some of Foster Associates' most important projects in the early Nineties, such as the Century Tower in Tokyo (1987-1991).

Moreover, the experience of the Hongkong and Shanghai Bank convinced Foster of the need to embark on a process of sharing the design and management

responsibilities. The complexity of the projects in which Foster Associates intended to compete was increasing and the assignments were located further and further away from London and England. It was clear that the organisational structure of the firm, closely centered around Norman Foster, was no longer sustainable. So in 1984 he asked Gordon Graham (1920-1997) to take on the role of director of Foster Associates, and put him in charge of the economic and financial management (Foster 1997).

Graham was an architect with long and consolidated experience, but more importantly he had been President of the Royal Institute of British Architects from 1977 to 1979, personally managing the organisational apparatus of two complex international competitions such as the new headquarters of Lloyd's of London and the Hongkong and Shanghai Bank – it was Graham who had included Foster Associates on the shortlist for the bank competition. He was well versed in legal and economic aspects as well as organisational procedures pertaining to large international architectural commissions – the field into which Foster Associates wished to expand.

In 1990 the London office moved to Battersea, where it remains today, and at the age of seventy Gordon Graham retired. The role of finance director was taken over by Graham Phillips who, after being one of the most important members of the Hong Kong group, had returned to London. Gordon Graham's legacy was that he finally convinced Norman Foster of the need to implement the firm's management structure. In 1991 Foster Associates was renamed Foster and Partners and, as mentioned, Norman Foster sold part of the shares in the firm to Spencer de Grey, David Nelson, Ken Shuttleworth and Graham Philips, who became minority partners. This sharing of the responsibilities and the organisation of a hierarchical structure that was more open to contributions from collaborators was reflected in the gradual growth of the firm. While in 1990 Foster Associates employed around 100 people, divided between the London and Tokyo offices, in 1995 the employees of Foster & Partners had grown to 250, distributed in offices located in six countries, with most of the workforce being based at the London office nonetheless.

The hierarchical structure of Foster and Partners in the Nineties was based on deep mutual knowledge and trust between Norman Foster and his Partners, who were all hired in the mid-1970s. The five partners all worked in the London office, and while Graham Philips handled

the financial management of the company, Spencer de Grey, David Nelson and Ken Shuttleworth supervised the day-to-day design activities. Each new commission was assigned to a project manager who led a work team under the supervision of one of the three partners, who instead were responsible for the major projects: for instance Spencer de Grey directed the Great Court project at the British Museum (1994-2000), David Nelson the reconfiguration of the Reichstag in Berlin (1992-1999) and Ken Shuttleworth the new London City Hall (1998-2002) (Quantrill 1999, 57-58). Norman Foster's role was general coordinator, like the conductor of an orchestra; he could decide to get involved in a project he found particularly interesting, or develop the concept for a new assignment which he then delegated to a Partner or project manager. In any case, frequent meetings between Foster and his Partners ensured there was widespread knowledge of what was happening in the various offices, establishing a clear and shared line of direction and coordination.

The effectiveness of this management model was ensured by the relatively small number of people employed – 250, as mentioned, with almost all of them working in the London office – as well as the fact that Foster and his partners worked closely together in the same office, and the relatively small number of assignments which allowed the management team to oversee the design aspects of the project on a daily basis. This organisational structure, and the quality of the projects developed by Foster and Partners in the Nineties, earned Norman Foster the most important personal honours, such as the Pritzker Prize in 1999 and the Praemium Imperiale in 2002.

In the years that followed, however, the firm was renamed Foster + Partners and by 2008 it had 1250 people working in 20 offices around the world – Abu Dhabi, Berlin, Boston, Buenos Aires, Copenhagen, Dubai, Dublin, Edinburgh, Geneva, Hong Kong, Houston, Istanbul, Kuala Lumpur, London, Madrid, Milan, New York, Beijing, St. Petersburg and Zurich – with a portfolio of projects in 62 countries (Foster+Partners 2008, 326).

Why overturn an organisational model like the one developed in the 1990s which had proven to be efficient and capable of guaranteeing Foster and his firm commercial success and critical acclaim?

First and foremost, Foster expressed the desire to create a firm that could continue to be successful after his death, which was not guaranteed by the previous organisation modelled around him and a few partners whose careers had developed alongside his. A few years

Foster + Partners team at the Riverside studio, London, 2004.

later he declared that «the office can continue without me... I've created something that doesn't need me to be there. That's my legacy» (Foster 2010, 117). The second reason was to create a truly transnational organisation that could take advantage of the opening of new and huge markets – particularly in Asia after China became a member of the World Trade Organisation on 11 December 2001. This required further expansion of the hierarchical and decision-making organization chart, and the injection of new capital to invest in this global growth process. To achieve these objectives it was necessary to create a studio that could count on a wide range of skills that went well beyond mere architectural design. As a result the vast and integrated range of services on offer to clients made Foster + Partners reliable when it came to the assignment of complex commissions that brought in much higher remuneration than traditional ones – and in this sense the awarding and successful completion of the first phase of the new Chek Lap Kok airport in Hong Kong (1992-1998) proved that the firm could aspire to such jobs. Steady growth in the number of people employed – 250 in 1995, 600 in 2004, 1250 in 2008 – was accompanied by the creation of a structured and complex partnership, establishing the management structure of the design firm that is still operational today.

The transformation occurred in two phases: in 2003 Foster appointed new management, expanded and differentiated the base of Partners and Associate Architects, and divided the staff of the London office into six parallel and independent design groups; while in 2007 the London-based investment fund 3i acquired a minority stake in the firm, bringing substantial capital and financial expertise that accelerated the company's global growth (Fiori Arantes 2019, 38-41).

The 2008 publication of a catalogue of Foster + Partners' work, with detailed descriptions of the new organisational structure, makes it possible to analyse this growth process. First of all, the increase in the number of offices from six to twenty, and their strategic location in the fastest growing markets – Abu Dhabi, Dubai, Kuala Lumpur, Beijing – and in cities where the circulation of economic and financial capital is concentrated, such as Hong Kong, New York, Geneva and Zurich (Knox-Taylor 2005). While these satellite offices continued to be structured in a rather conventional way, with a few dozen employees led by one or a few partners, the London office experienced exponential growth in the number of staff and was significantly altered. The new Chief Executive Mouzhan Majidi reported how «we expanded the company's ownership to include nine senior partners, increasing the number of shareholders from four to fourteen, and later the same year we welcomed another thirty-three partners as shareholders» (Majidi 2008, 327). Two of Foster + Partners' long-standing collaborators, Spencer de Grey and David Nelson, became Senior Executives, while new Senior Partners were appointed to head up the six new project teams: six independent offices, headed by Grant Brooker, David Summerfield, Mouzhan Majidi himself, later Luke Fox, Stefan Behling, Gerard Evenden and Nigel Dancey, each of which had over 200 people, divided among Partners, Associate Partners, Associate Architects and simple architects (Foster+Partners 2008, 328-338). Despite the rotation and change of personnel in management roles, these six groups are still operational and form the backbone of Foster + Partners' London office.

Contrary to what one might imagine, the six firms have not been organised around areas of specialisation. On the contrary, each of them can take on assignments at any project scale, from product design to urban masterplanning, in any location in the world. In addition to ensuring better organisation and coordination of the

workforce, the division into six groups also triggers latent internal competition – so it is essential that each of them can work on the same projects and compete for the same assignments, without pre-assigned areas of specialisation. Unlike traditional architectural firms, organised to develop a concept, the large number means that a multitude of design solutions can be developed for each assignment, and the one that best meets the client's needs can be chosen later, combining solutions and ideas from the different working groups (Yaneva 2009; Villa 2016, 22-23).
The new organisational structure of Foster + Partners has facilitated the shift from a design methodology not so far removed from that developed in a Renaissance workshop or the studios of twentieth century masters, to an advanced industrial dynamic. It is no coincidence that the London office, open 24 hours a day 365 days a year, is capable of producing «an incredible number of fully-developed project options, 50 on average for each commission» (Foster 2010, 117). To assess the output capacity of Foster + Partners once the new organisational structure had been implemented, consider that from 2000 to 2010 the office developed almost 60,000 project proposals, which is around 16 per day (Foster 2010, 117).
To ensure the supervision of this workflow a Design Board was established, made up of Norman Foster, the firm's long-standing staff and talented young architects promoted to management positions over that time (Foster+Partners 2008, 344). The Design Board could review projects in progress, focus on someone of particular interest or sensibility, and contribute ideas.
Finally, to complement the six working groups, a series of more agile, highly specialised teams were created to provide specialist expertise: Business Development; Communications; Construction Review; Design Communication; Design Systems; Information Centre/ MRC; Information Systems; Management; Model Shop; Product Design; Specialist Modelling; Sustainability Research; Urban Design; Visualisation; Workplace Consultancy (Foster+Partners 2008, 340-343; Sudjic 2014, 550).
What was Foster's role in this new organisation? While up until the early 2000s he continued to exercise undisputed dominus from a design, organisational and corporate perspective (being the majority partner), in the new organisational and corporate structure he acts above all as a media ambassador, promoting the firm's image throughout the world, having considerably reduced his involvement in day-to-day design activities (Sudjic 2014,

554; Fiori Arantes 2019, 201-203). In this sense, the two press releases of 11 May 2007 and 30 June 2014, in which the London-based private equity fund 3i announced its entry as a shareholder in Foster + Partners, are revealing. It was Foster himself who sold 85% of his shareholding (corresponding to approximately 40% of the company's capital) to the 3i fund – whose portfolio contained a wide range of companies in the medical, IT, mechanical sectors as well as others – for the amount of £350 million (Fiori Arantes 2019, 41).

Why did Foster himself go searching for a private equity fund among companies in the City of London to propose the acquisition of a minority stake in the company? First of all to inject capital to be invested in new hires, the acquisition of IT tools and the opening of new offices; but, above all, to acquire the management and financial governance knowledge needed to transform an architectural studio into a global design firm (Foster 2010, 130).

The 3i fund would have helped Foster + Partners to «broaden and diversify the ownership of the firm», transforming a company that until then had been in the hands of a few individuals – Norman Foster and his historical Partners – into a «shareholder long-term partnership», i.e. a company in which shareholdings were divided among a growing number of individuals, with a significant portion available to new future investors (Foster+Partners 2007). The investment fund supported Foster + Partners in identifying «new markets for large scale infrastructure projects», with the priority objectives of creating specific «engineering and project management» departments and supporting and training the new management (Foster+Partners 2007).

The 3i fund decided to invest in Foster + Partners not only due to the design capacity demonstrated over the decades and the portfolio of work in progress, but above all because «the value of the company is directly linked to Lord Foster, the use of his name and his ongoing presence», and as «as part of this transaction he has therefore agreed to assign his personal 'Foster' trademark to Foster + Partners» (Foster+Partners 2007). What was defined as the «Foster brand» was therefore the decisive element in convincing the private equity fund to invest in Foster + Partners, and the basis on which it intended to increase the turnover.

Freed from management and design-based tasks, Foster was given the role of promoting the company's image, embodying its values and striving for excellence, granting interviews and participating in meetings with potential

clients, administrators and politicians – a role not dissimilar to the one Steve Jobs held at Apple, or held by the creative directors of the major fashion houses (Sudjic 2014, 554). Having crossed the numerical, geographical and economic threshold that divides an architecture studio from a creative business, the latter also needs to structure itself as a subject engaged in political and financial dialogue. As Foster + Partners aims to obtain more and more commissions in strategic sectors such as logistics and aerospace, Norman Foster's reputation and charisma are essential values in promoting the firm's image to public administrations and the boards of directors of private companies.
The strategy implemented by the 3i fund paid immediate dividends as in 2008 Foster + Partners saw its turnover grow to £191 million, up 25% on the previous year (Fiori Arantes 2019, 41).
Having achieved its financial and corporate reorganisation objectives, in 2014 the 3i fund sold its stake in Foster + Partners, almost doubling the investment made in 2007, and announcing that, in addition to increasing the turnover, «during this time, Foster + Partners core architecture offering has been enhanced by the addition of an environmental consultancy practice, the expansion of its engineering business, and the launch of its interior design business» (3i 2014). The transition from architecture firm to global creative business – with a stable spot in the annual rankings of the world's richest design firms – could be considered complete. The organisation is now capable of covering all project scales, from furniture design to architectural and urban planning, environmental design, engineering, aerospace and infrastructure. The 3i investment fund and Norman Foster proudly announced how Foster + Partners had become an «unrivalled global brand in its sector» (3i 2014).

Challenging the Borders

So far we have analysed how the firm led by Norman Foster transformed over time and the organisational and corporate structures it assumed. Now we shall attempt to understand *why* at a certain point – from the early Nineties – his practice was in the best conditions to undertake the global expansion of its activities and profits. Or rather, why his practice demonstrated the design and management skills that were attractive to large public and private clients, capable of shifting the huge amounts of capital needed to encourage growth (Gutman 1996, 17-21). It sounds trite to say it, but in order to organise a design

company capable of employing thousands of people, with offices in most important cities of the world, it is first necessary to generate enormous profits on a constant and regular basis. Therefore, these design firms are required to go beyond the meagre selection of commissions typical of architectural studios – accepting only what is most congenial to the interests of the archistar or the studio's profile – but they necessarily have to attract commissions capable of generating huge revenues – in the logistics and airport sectors, large infrastructures, skyscrapers, production plants and the headquarters of transnational commercial companies – marginalising projects that traditionally monopolised the architect's work, such as private residences and the headquarters of religious, political and cultural power. This process was already evident in US design firms in the Thirties which were the first to experiment with large numbers of employees and increase the number of offices: while the success of Albert Kahn & Associates was in fact closely linked to the largest automobile industry of the time, Ford, SOM owes its early success to government contracts linked to the military sector (Zimmerman 2017; Adams 2006, 23-24). Public contracts for infrastructural and logistical works, the design of headquarters and factories for large-scale industry, and financial and telecommunications companies therefore represent the privileged field of work for architectural studios that aspire to become global creative businesses. Moreover, it can be observed how, in the second half of the twentieth century, an increasingly transnational and financial clientele encouraged the creation of organisations of similar design companies (Gutman 1996, 58). And while up until the Eighties such commissions were the prerogative of generalist design firms, media coverage of the phenomenon of archistars has made it more economically advantageous to use them in recent decades. It has been demonstrated that residential complexes designed by one of the big names in the architectural jet-set guarantee the client a market value around 30% higher than that of a generic firm (Ponzini 2014, 15).

Foster Associates – and other firms such as Richard Rogers & Partners or the Renzo Piano Building Workshop – were the first architectural firms to break down the barrier between studios «focused on public commissions – housing, schools, universities and cultural buildings» and generalist design firms that «serviced industry and commerce» (Powell 2007, 526).

Buckminster Fuller, Michael Hopkins, Tony Hunt, John Walker, Norman Foster, James Meller meeting at Bedford Street studio, London, 1971.

Norman Foster first accepted and then skilfully exploited the conditions offered by the emerging global market, progressively transforming his local architectural studio into a global creative business.
Why was he able to embark on this path earlier and better than many others?
Leaving aside questions of authorship for a moment, one of the reasons lies in the fact that from the outset he did not set up a traditional architectural studio but rather a multidisciplinary studio, successfully concentrating on the design of logistical hubs and the headquarters of technology companies.
Despite the extreme shortage of work, between 1967 and 1970 Foster put together a team with a wide variety of expertise – and this immediately distinguished him from traditional studios which only employed architects and draftsmen. Looking through the records of Foster Associates, early hires included the structural engineer Tony Hunt, plant engineer Loren Butt, cost control manager John Walker, and two artistically trained interior designers Martin Francis and David Nelson (Sudjic 2010, 116-117), with Loren Butt even being identified as one of the office's first Partners.
Foster has always emphasised how decisive the years he spent in the United States were, not only on account of his training at the Yale School of Architecture under Paul Rudolph, but above all due to his direct observation

of the American professional context of the time, from Roche Dinkerloo to SOM (Sudjic 2010, 91). The fact that the two engineers Fazlur Khan and Myron Goldsmith held leading roles (managerial and design) in the complex organisation of SOM undoubtedly struck the young architect, for whom close integration between architectural definition, load-bearing structures and installed systems was to become a characteristic feature (Powell 2006, 521). Moreover, Foster's most significant design experience in the Sixties, together with his wife and Richard and Su Rogers, was the design of the Reliance Controls industrial plant in Swindon (1967), where such an integrated approach proved to be the best way to respond to a complex functional programme and extremely tight construction and delivery schedules. He founded Foster Associates immediately after the successful completion of the Swindon plant, and organised the structure of the fledgling office on the basis of this multidisciplinary approach. Moreover, his experience in the United States guided him not only towards the traditional projects that an architectural studio was used to dealing with – residences, schools, university and cultural buildings – but also towards commissions usually reserved for commercial firms, such as buildings for industry and commerce (Powell 2007, 526). It is no coincidence that Foster Associates' first clients, between 1968 and 1971, were the shipowner Fred Olsen and IBM, for whom the London office designed the Passenger Terminal and Amenity Centre at the London Docks (1968-1970) and the Pilot Headquarters in Cosham (1971) respectively, while Foster Associates' first notable building was the headquarters of the insurance company Willis Faber & Dumas in Ipswich.

These successful design projects – and the high degree of spatial, structural, plant engineering and interior design innovation that his office's wide-ranging expertise enabled him to demonstrate – convinced the President of RIBA, Gordon Graham, to include Foster Associates on the shortlist of firms that could respond to the request for proposals launched in July 1979 by the Hongkong and Shanghai Bank for the design of its new headquarters in Hong Kong.

Since its foundation in 1865, the Hongkong and Shanghai Bank had looked after and facilitated the interests of major British companies, acting as one of the most significant hubs in relations between London, China and other South-East Asian countries (King 1987). In view of the return of the colony of Hong Kong to China, in the

Foster Associates,
Hongkong and Shanghai
Bank Headquarters,
Hong Kong, 1986.

Eighties the bank stepped up its internationalisation process, in particular by reconnecting with the financial centre of London, where the central headquarters of HSBC Holding moved to in 1991. In this context of geo-political relations, the bank's board decided to entrust the RIBA of London with organising the competition for the Hong Kong headquarters, and perhaps also the decision to award the project to a young and talented British architect like Foster, and not to more solid US and

Australian competitors like SOM and Yuncken Freeman. As is known, winning the 1979 competition and the construction of the Hongkong and Shanghai Bank was the turning point in Norman Foster's career, not only for the quality of the building and the vast media coverage it generated, but also – and this is what is most interesting here – for the ability he demonstrated to conceive of an innovative managerial structure to support and integrate the many design and technological aspects (Campioli 1993, 67-80; Matsushima 2003).

Up until then Foster had no experience of designing skyscrapers and had never constructed a building outside of England. The imposing Hongkong and Shanghai Bank headquarters also had to be built in a colony like Hong Kong, which had no heavy industry. Each part of the building had to be imported and erected in a relatively short time: the project was approved in January 1981, and the client required the building to be delivered by November 1985.

Foster responded to these imperatives by taking charge of the entire operation, and integrating industry-specific expertise and knowledge into the design process. The coordination of construction sites of this level of complexity was usually entrusted to a general contractor, who acted as the main contact for the client. The architectural firm would provide the general contractor with the design documents, and the latter would be responsible for recruiting and coordinating all

Foster + Partners studio at Riverside, London, 2016.

the various sub-contractors and suppliers of materials and building systems. In this case, however, the lead and coordination role was taken by Foster Associates, which on the one hand integrated the contributions of structural engineers (Ove Arup & Partners) and plant engineers (Roger Preston & Partners), and on the other, with the backing of the client, it hired a Management Contractor (John Lock & Partners and George Wimpey International) to coordinate and draw up the contractual documentation.

The team of architects, engineers and managers led by Foster Associates produced the documentation needed to identify and negotiate with the various industries, construction companies and suppliers of technology and materials. These procedures were handled by Foster Associates, and not the general contractor. The preliminary design was limited to the definition of the performance requirements for the approximately one hundred and ten sub-systems of the building – for example: the load-bearing structure, infill walls, stairs and lifts, service modules, internal panelling, etc. – they had to ensure, not only avoiding defining materials and techniques, but rather asking manufacturers and suppliers to put forward proposals based on their know-how and experience (Campioli 1993, 70-72). This enabled Foster Associates to pass on significant parts of the final and detailed design, giving consultants and industry a maieutic role. This was the innovative working method that he tended to

replicate at this scale, wherever possible, also in the large construction sites of the following decades (Sudjic 1986, 75). For each part of the construction, Foster Associates selected the industry that provided not so much the most advantageous economic conditions but rather the technological solutions most suited to the desired performance, often engaging in a joint design process with these industries to develop components that were shipped by sea and installed at the Hong Kong site. The final and detailed design was no longer conceived as the exclusive domain of the project team, rather it was understood as a shared platform where the knowledge of architects and engineers had to mix and collaborate with the specific knowledge of the industry and suppliers (Matsushima 2003).

The success of this innovative Construction Product Delivery System, and the successful completion of the Hong Kong site, enabled Foster to gain respect in the eyes of large public and private clients not only as a talented architect, but also as an efficient 'manager' of complex operations. In just four years, he (and his office) was capable to complete a large-scale building, constructed on time and on budget, in a city-state with delicate political, economic and manufacturing conditions, by creating and managing a multi-skilled design team and agreeing to integrate industry and suppliers into the design process.

Beyond the design choices and the technological and organisational challenges involved in the construction of the Hongkong and Shanghai Bank (and the media celebrity it earned Foster), this was a decisive turning point for the English architect and his firm as it gave him access to the enormous and profitable Chinese market – through the privileged gateway of Hong Kong – much earlier than other archistars. We need only recall that Rogers Stirk Harbour + Partners obtained its first commission in China in 2009 (the Gateway residential tower in Nigbo), while the Renzo Piano Building Workshop only got its first commission in 2013 (JNBY Headquarters in Hangzhou) and Zaha Hadid Architects the following year (Daxing International Airport in Beijing).

Having had an office in Hong Kong throughout the years of the bank's construction also allowed Norman Foster to establish relationships with political bodies and economic players in the British colony. In view of China's re-absorption of Hong Kong, the colony's political and business classes was interested in strengthening

its ties with London, and Foster and his office took advantage of this relationship context, winning two strategic and highly remunerative commissions a few years later: the new airport terminal and the Hong Kong Air Cargo Terminal (1992-1998). It is no coincidence that most of the projects Foster + Partners was assigned thereafter in China always relate to the banking and finance sector – such as the Citic Bank Headquarters in Hangzhou (2009-2017) or the tower for the Jiushi investment company (1995-2001) and the Bund Finance Center both in Shanghai (2010-2017), to give a few examples. The Hongkong and Shanghai Bank assignment allowed Foster to forge ties with the management of one of the world's largest investment banks, crediting his name in the financial centre of the City of London, where HSBC Holding was listed in 1991. These relationships would prove decisive, as we have seen, for the growth of Foster + Partners, also due to the investment of the 3i Private Equity fund in 2007.

Conclusions

One of the most significant aspects that can be understood from the analysis of Foster + Partners is the extent to which the process of growth from a studio to a global creative business was necessarily connected to the transfer of significant portions of design authorship and managerial and organizational coordination. This must occur both within a firm – involving structural and plant engineers, experts in bioclimatic solutions, interior designers, cost control managers, and so on, from the earliest design phases – and externally, integrating specific knowledge of the industry and suppliers of materials and technologies in the detailed definition and construction phase (Anstey-Grillner-Hughes 2007; Ortega 2017). In fact, it can be said that this process of transferring authorship – relinquishing the role of artist-creator and demiurge that has characterised the architectural profession since the time of Filippo Brunelleschi and Leon Battista Alberti – is one of the fundamental requirements for aspiring to work on the complex commissions that are necessary to increase the size and turnover of design companies (Tombesi 1999; Carpo 2011; Tombesi 2012). It is precisely this redefinition of the role and tasks of the architect that, more than other factors, seems to have held back other archistars who at the end of the Eighties and in the Nineties seemed set to pursue the path taken by Norman Foster. A comparison can be made with Renzo Piano, for

example. Like Foster, the Genoese architect trained between London and the United States in the early Sixties, seeking close integration between architectural definition, structural design and plant engineering (Ciccarelli 2017). Like Foster, Piano's early years were also studded with projects for manufacturing plants and commercial premises, and the complex design and construction site of the Centre Pompidou (1971-1977) is in some ways comparable to that of the Hongkong and Shanghai Bank. In the late Eighties and early Nineties, the Renzo Piano Building Workshop was also awarded the project to design two complex works such as the Kansai airport in Osaka (1988-1994) and the reconstruction of the Potsdamer Platz area in Berlin (1992-2000), which were successfully completed. The firm therefore had a multidisciplinary approach and all the organisational skills to aspire to global growth. However, unlike Norman Foster, Renzo Piano never agreed to relinquish the strict design control he exercises over all the assignments passing through the Genoa and Paris offices. This choice meant he had to limit the number of people he employed, which has never exceeded one hundred and fifty (Ciccarelli 2021).
In recent years, Anglo-Saxon historiography has conducted many studies of how the integration of new information technologies – BIM in particular – and access to cloud computing and big data are changing the nature of the profession, in both methodological terms and as regards the reorganisation of roles within the construction sector, overturning the authorship style that has traditionally informed architectural design in past decades and centuries (Scharphie 2014; Carpo 2017; Bernstein 2020).
New IT tools and the rapidity and ubiquity of exchanges facilitated by the Internet have certainly fostered and accelerated the industrialisation and globalisation of architectural firms, but the analysis of Foster + Partners seems to indicate that they should not be interpreted as the causes of this process. For example, close integration between project development and construction phases, openness to multiple and simultaneous disciplinary approaches, and careful control of the performances of the various systems and elements of the construction facilitated through use of the BIM platform had already been accomplished – by different means, but with the same aims – by Foster and his collaborators in the Hongkong and Shanghai Bank. The so-called second IT revolution is certainly creating new professionals, such as BIM Managers, who are set

to play a leading role in design companies in the years ahead. However, at present, they do not seem to disrupt the multidisciplinary design and shared authorship context that we have observed in the professional path of Foster + Partners, and that already existed in generalist American design firms after World War II (Martin 2003). The study of the impact that the computer revolution has had and is having on the construction sector can be a useful tool for analysing the methodologies and organisation of contemporary design firms, but it certainly cannot be the prevailing investigative tool. Broader geo-political, economic and authorial-organisational considerations have given rise to and guided the transition from studio to creative business in the case of Foster + Partners, and we can assume that the same is happening at Zaha Hadid Architects.
In this regard, at the end of 2014 Mouzhan Majidi moved from Foster + Partners – where he had worked for 27 years and was Chief Executive for 7 – to Zaha Hadid Architects with the declared aim of implementing the same process of financial transformation and global growth that characterised Foster + Partners in the early 2000s (Majidi 2014). This process is actually taking place, despite the traumatic death of Zaha Hadid in 2016.
This raises interesting historiographical questions. While in the case of archistars who lead small firms and still have a strong design role, as in the case of Renzo Piano and the Renzo Piano Building Workshop, the approach focused on the biography and works of the architect-demiurge may still be valid, it can only partially penetrate the complex nature of archistars who instead manage vast and complex industrial organisations. In these cases, scrutinizing the biography of the founder – with their creative references, encounters, relationships with clients, etc. – and analysing individual works allows us to understand only part of the story. In addition, the company organisation, management strategies, the influence that investment funds exert over certain choices being made and not others, the location of the offices, etc., must also be studied. The methodologies of business history must therefore complement those of the history of art and architecture. Despite the confidentiality clauses that often limit the consultation and analysis of this documentation by historians, it will be increasingly important to be able to access the economic and financial documentation of these design companies and to study the clauses of the contracts that regulate, for example, how the image of the archistar can be used by the client.

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FROM VENTURI & RAUCH TO VSBA ARCHITECTS & PLANNERS. HISTORY AND LEGACY OF THE FIRM OF ROBERT VENTURI AND DENISE SCOTT BROWN

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Robert Venturi and Denise Scott Brown are renowned as one of the most famous and prolific architects' couples and firms of the second half of the twentieth century, able to change the course of the history of architecture with their unique synergy of innovative design and planning, theoretical research, and ironic iconicity made of historical as well as pop references.
Following the retirement of the couple in 2012, a new office was founded, led by Daniel McCoubrey and Seth Cohen as principals. While it seems impossible not to associate the acronym VSBA directly to the personal projects and theoretical positions of Venturi and Scott Brown, VSBA Architects & Planners tries to transfer actively the precious – and undoubtedly cumbersome – tradition of the founders to the needs and challenges of the actual global condition. This paper investigates the evolution of the firm through the decades and the current organization of the office, specifically addressing the issue of authorship.

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Keywords: Robert Venturi; Denise Scott Brown; VSBA Architects & Planners; Authorship; Architectural legacy

«We're fascinated by what's come before and the variables that have shaped it, so it's no surprise that Robert Venturi and Denise Scott Brown's inclusionary approach resonates with us».
(Koller 2020)

The current organization and activities of VSBA Architects & Planners, a Philadelphia-based practice that represents the next generation of Venturi, Scott Brown and Associates, owes much to the spirit, the development and the radical professional choices of the office funded by the two renowned architects and urban planners Robert Venturi and Denise Scott Brown. To fully understand the new office now led by president and principal Daniel McCoubrey and principal Seth Cohen – its shift towards the most current topics of our contemporaneity while managing not to betray the values and commitments of its original founders – it is necessary to start from the beginning of the professional endeavors of Venturi and Scott Brown, that date back to the Fifties.

History: Venturi and Scott Brown

«Venturi, Rauch and Scott Brown's architecture is meant to make the educated viewer look twice, to see why the ordinary is extraordinary. Because never doubt it for a moment, the Venturis are determined to make it so» (Huxtable 2008, 245).

Robert Venturi, born in Philadelphia in 1925 and graduated in Architecture at Princeton University in 1950, during the Fifties is a young architect who collects relevant professional and scholarly experiences on both sides of the Atlantic (Brownlee-De Long 2001; Sessa 2020). In the United States, between 1950 and 1953, he works for the architectural offices of the German émigré Oskar Stonorov (1905-1970) in Philadelphia and for Eero Saarinen (1910-1961) in Bloomfield Hills, Michigan. Back to Philadelphia, Venturi collaborates with his mentor

Louis Kahn (1901-1974) in 1954 and then again in 1956-1957. In the mid-Fifties, the young architect undertakes a two-year research stay at the American Academy in Rome as a recipient of the Rome Prize in Architecture (Costanzo 2009; Stierli 2007; Sessa 2020). The privilege of conducting his independent research on the history of architecture for a prestigious transatlantic institution, together with the precious first-hand experience of the Baroque buildings and the urban spaces of the city of Rome, is considered by Venturi as the most transformative experience of his life (Milovanovic-Bertram 2007; Venturi 1996, 47-58; Waller 1985, 92-100).

Once back in the United States, it is not a coincidence that his first job as an independent practitioner is related to the renovation of a historical building – the Duke House, designed by Horace Trumbauer and Julian Abele in 1912 – and its adaptation to the new program as the Institute of Fine Arts of the New York University (Cohen 2019, 114-127). To successfully complete the job, Venturi calls to collaborate Paul Cope (1921-2006) and Horace Lippincott (1921-2010), previously met at the office of Oskar Stonorov, and in 1958 formally starts his association with the two architects based in North Philadelphia. This association lasts for two years: in 1960 Robert Venturi establishes his office on South Street with his long-time friend William Short (1925-1991). The two young architects will work together on all the projects developed at the beginning of the Sixties, such as the headquarter building for the North Penn Visiting Nurses Association in Ambler, Pennsylvania (1960), the renovation of the Grand's Restaurant in West Philadelphia (1962) and several entries for competitions or commissions for private clients that will never be realized – and among them the Meiss House (1962) – all projects presented in the eleventh chapter, *Works*, of the first book published by Venturi, *Complexity and Contradiction in Architecture* (Venturi 1966, 104-133). After four years Short leaves the office and Venturi establishes a new practice with his younger collaborator John Rauch (1927-2008) in 1964. In the same period Denise Scott Brown, an urban planner met during a faculty meeting at the University of Pennsylvania four years before, starts to collaborate with Venturi, not only as an academic peer but also as a professional colleague.

At that moment in time, Denise Scott Brown already shares many interests with Robert Venturi. Born in South Africa in 1931 from Jewish-Latvian emigrees, during the Fifties she had successfully built up her academic and

professional career while traveling three continents: Scott Brown studies Architecture at the Witwatersrand University in Johannesburg and at the Architectural Association in London, then in 1956 she is in Italy (for the CIAM Summer School in Venice and for a short collaboration with the architect Giuseppe Vaccaro in Rome), and finally moves to Philadelphia to enroll in architecture and urban planning masters at the University of Pennsylvania. At that institution she meets Robert Venturi, contributing not only to his theory classes but also to his architectural projects since the beginning of their relationship. However, she will officially become a partner of the office Venturi & Rauch only in 1969, two years after her marriage to Venturi (Scott Brown 1984, 69-81; Scott Brown 1996, 5-13; Scott Brown 2018).

At this point in history, and for the subsequent decade, the office has a quite modest size. Venturi & Rauch are still geographically located in the Center City of Philadelphia, they count less than ten people, and the youngest collaborators are often former university students of Venturi and Scott Brown. The commissions are still predominantly residential (Steele 1992): Venturi and Rauch work mostly for private clients who live in Pennsylvania or along the East Coast, as in the case of the Lieb House, built in New Jersey in 1967, or of the Trubek and Wislocki Houses, two summer residences built in 1970 on Nantucket Island in Massachusetts. Nevertheless, a few interesting exceptions of designs for important institutions are built around the country, such as the Department of Humanities (1968) and the Department of Sociology (1970) of the State University of New York, or the expansion of the Allen Memorial Art Museum and the Oberlin College of Art, completed in Ohio in 1973 (Von Moos 1987). It is the latter project that makes the little office nationally known for its design sensibility – that is defined as «urbane, cultured, deeply responsive to history and art, and unusually understanding of existing values» – while also fueling and settling, mostly thanks to the iconic presence of the 'ironic column', «the legend of Venturian perversity» (Huxtable 2008, 247).

The Seventies are mostly dedicated to their independent research: in 1972 Venturi and Scott Brown publish together with Steven Izenour (1940-2001) the paramount study *Learning from Las Vegas*, and from that moment are involved in the development of urban studies commissioned by a variety of clients and associations, in an intense writing and publishing activity, and in the delivery of university lectures and event presentations – a

Left to right: John Rauch, Denise Scott Brown and Robert Venturi at their office, Philadelphia, 1985.

public exposure that made their name quite famous throughout the States. These activities go along with the organization and curatorship of significant exhibitions, such as *Signs of Life. Symbols in the American City*, presented in 1976 at the Renwick Gallery in Washington D.C. on the occasion of the American Bicentennial Exhibition. *Signs of Life* was curated in collaboration with Steven Izenour, who suggested the involvement of the young photographer Stephen Shore (b. 1947), who was asked to take pictures during a road trip between the cities of Los Angeles and New York.

The Eighties represent the period of the most drastic transformation of the office, an evolution that involves not only its size and composition but also a vast differentiation in the typology, scale and geography of the new works, with a sphere of influence that gains international attention thanks to their writings, exhibitions and projects. The evolution starts with a change in a not secondary aspect of the firm: the crucial role of Denise Scott Brown is finally acknowledged in the name of the office, which becomes Venturi, Rauch & Scott Brown in 1980. In the same year, the office is selected by the Roman architect and scholar

The front desk of Venturi, Rauch & Scott Brown office on Main Street in Manayunk, Philadelphia, 1985.

Paolo Portoghesi (b. 1931) for the Venice Biennale of Architecture, notably titled *The Presence of the Past*. The Philadelphians take part in the *Strada Novissima* installation at the Arsenale with a reproduction of their most iconic façades, and among them the front elevation of the Vanna Venturi House, the modest-size residential building designed for the mother of Venturi in Chestnut Hill and completed in 1964. On that occasion, Venturi and Scott Brown gain international recognition, and the Biennale – together with the translation in many foreign languages of their two major books *Complexity and Contradiction in Architecture* and *Learning from Las Vegas* – marks their entrance as undisputed protagonists in the international architectural debate of the time. From the Venetian event, the growth of the office is rapid and consistent. New commissions come from prestigious academic and cultural institutions scattered all around the country, and Venturi, Rauch and Scott Brown need to restructure their practice by hiring new people with different specialties. The office itself needs to be changed and this leads to the relocation in a much larger space. A three-story building on the Main Street in Manayunk – a post-industrial neighborhood in the Northwest section

of Philadelphia – is occupied by a team that soon counts dozens of professionals and employees.
The most substantial transformation happens in 1985, when the office wins the competition for the design of the expansion of the Sainsbury Wing for the National Gallery in London. This incredible opportunity leads to a complete change in the organization of the firm, that will reach the participation of more than a hundred of people. New figures are hired in Philadelphia, while new partnerships with external specialists and professionals are built overseas: the project is followed by local consultants who supervise the construction in 1989-1991. In particular, Venturi and Scott Brown collaborate with the British firm Sheppard Robson Architects, one of the most established architectural practices in the UK, with three offices in the country and hundreds of employees, originally founded in 1938 in London by another husband-and-wife architects couple, Sir Richard Sheppard and Jean Shufflebottom.
Following the resignation of John Rauch in 1987, the end of the Eighties and the Nineties represent the moment of maximum expansion of the firm, that is renamed Venturi, Scott Brown and Associates (Von Moos 1999). The global success is reflected also in the achievement of the highest architectural award, the Pritzker Prize in 1991 – a recognition that goes, however, to the sole Venturi, outrageously leaving out the essential role played by Denise Scott Brown for the previous thirty years.
In that hectic and successful period, Venturi and Scott Brown participate in competitions abroad and manage to build their projects in three continents – North America, Europe and Asia – at the same time, such as the Hotel du Département de la Haute-Garonne in Toulouse, France, completed in 1999 with the collaboration of Anderson / Schwartz Architects and the Atelier d'Architecture A4, and the Hotel Mielmonte in Nikko, Japan, in 1997 thanks to the collaboration of the Japanese office of Marunouchi Architects & Engineers and the Philadelphian Andropogon Associates.
This is the moment when they could have considered expanding the firm and, following the example of many contemporaneous star-architects, establishing offices around the United States and even the world. However, they would eventually dismiss this tempting as well as attainable opportunity, always preferring to collaborate with local offices and consultants when working in distant or foreign contexts. What did prevent the world-renowned Venturi Scott Brown Associates from becoming a large-

Denise Scott Brown and collaborators, Philadelphia, 1990s.

scale firm, able to successfully compete on the ever-changing global market?
The choice to remain a 'Philadelphian office' comes from a deliberate decision of Robert Venturi and Denise Scott Brown, willing to remain coherent to themselves and to defend their ideas and their ethics from the compromises of a larger corporate organization. For two architect who based their professional career on the value of constant and fruitful collaboration – not only among the professionals involved in the projects but also with the clients –, the managerial approach of the largest firms was not a possibility, and was certainly seen as a threaten to the creative quality of the office. Even in the years of the greatest expansion of the firm, Venturi and Scott Brown pursued a working method that was more similar to the one developed in their university studios, where the principal is deeply involved in every phase of the process, from the first meetings with the clients and the early sketches, to the completion of the building. Indeed, Venturi and Scott Brown tried to knock down the rigid hierarchy of the contemporary architectural office, and remained personally committed in the communication with every member of the staff, often busy to generously share intellectual positions and intuitions even with the youngest collaborators, a *modus operandi* that resembles

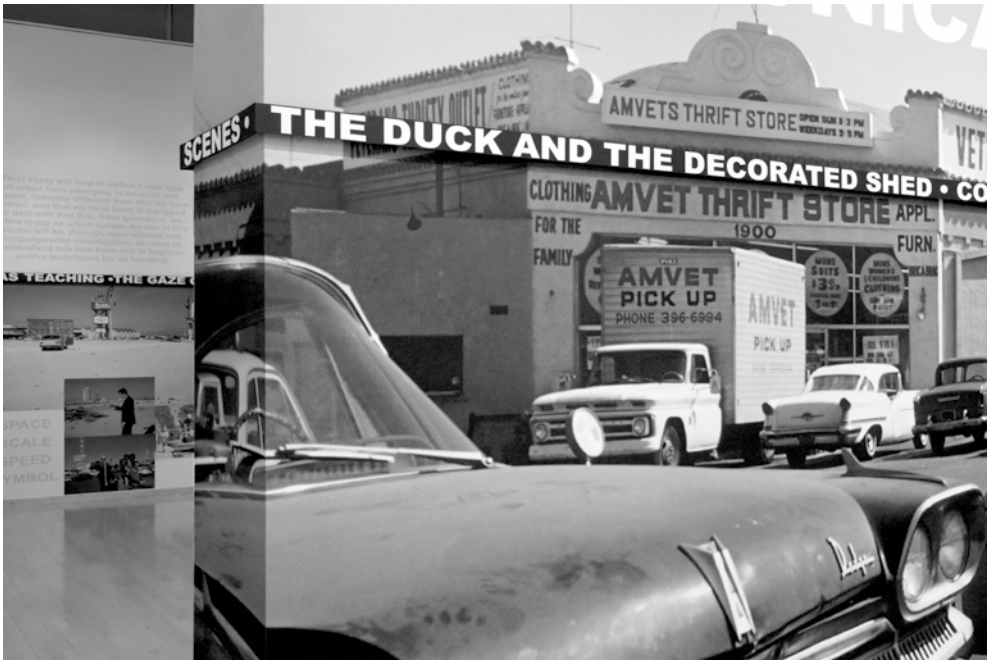
more that of the teacher or mentor, than that of the boss. Therefore, Venturi and Scott Brown decided not only to never establish any other office outside of the city of Philadelphia but even to reduce the number of their employees in the very same moment of their widest professional success. At the end of the Nineties, the office went back to count only a few dozens of professionals and administrative employees.
If a most complex managerial structure of the office was out of their interests, this does not mean that Venturi and Scott Brown were not concerned about the continuity of their firm, and in particular of their message and their ethos. This is why they initiated the so-called «transition phase».

Legacy: VSBA Architects & Planners

«VSBA Architects & Planners is the next generation of Venturi, Scott Brown and Associates. We carry on their tradition of creating amazing places... that enhance their contexts... Every project is a first for us» (VSBA 2021).
The «transition phase» started at the end of the Nineties, when Robert Venturi and Denise Scott Brown, after reducing their design team back to a most approachable size, became concerned about the future of their professional endeavor. The choice of the next generation of architects and principals, destined to deal with the cumbersome heritage of Venturi and Scott Brown, fell on a long-time collaborator, Daniel McCoubrey, and a younger architect, Seth Cohen, who joined the firm in 1999. The two partnered with other previous collaborators of Venturi and Scott Brown, all decisions backed and carefully followed by the founders, who kept working and collaborating at the office during all the transition phase, which officially ended with their retirement in 2012.
Today the firm's name is VSBA Architects & Planners. VSBA is single-proprietor limited liability company and, for tax purposes, it's an S-type corporation. McCoubrey, president and principal, is VSBA's sole owner. The office relocated in March 2017 in the same neighborhood, on the third floor of a former industrial building that now houses artists' and designers' offices. As planned together with Venturi and Scott Brown, McCoubrey and Cohen are still the two principals and they carefully follow as project managers all the design works developed at the office. Daniel McCoubrey is also committed to education and holds a position as Adjunct Associate Professor in the Architecture Program at the Drexler University: he graduated in Architecture at the University of Pennsylvania

From left to right: a consultant, principal James Kolker, and principal Robert Venturi, Philadelphia, 2010.

and joined the firm in the Eighties, contributing to the vast scale dimension of the Philadelphian office led by Venturi, Rauch and Scott Brown. Coming from past experiences in the archeological and preservation fields, he followed the projects of the office related to the restoration and adaptive reuse of existing buildings. While Seth Cohen – the second principal – graduated in Architecture at Syracuse University, and is experienced in the design and renovation of academic, civic, cultural, and institutional facilities. Together with Matthew Wray Yoder, as associate architect, and Jeremy Tenenbaum, as Director of Marketing and Graphics, the office counts today a total of approximately ten collaborators, five of them hired as full-time employees.
Continuing the habit of Venturi and Scott Brown, the firm preserves a small-to-medium size, while collaborating with other offices and consultants around the country, and among them: audiovisual consultants; civil, mechanical, electrical and plumbing engineers; code and cost consultants; landscape architects; structural and sustainability experts. Consistent to the office's origins, their projects remain linked to the region of Philadelphia, with a few buildings and studies planned outside of Pennsylvania – such as academic and cultural facilities for the Universities of Alabama, Delaware, Kentucky, Wisconsin, Yale, Harvard, etc. – and the recent project



One of the rooms of the exhibition *Denise Scott Brown: Learning to See* at the Tyler School of Art and Architecture, Temple University, Philadelphia, 2021.

for the RYSE, a 20-story hotel in Seoul, South Korea, designed in association with the local office Steven Song Design Lab. The actual office also takes care of the intellectual heritage of Venturi and Scott Brown, updating their websites, editing publications, and co-curating exhibitions all over the world, such as the most recent one, *Denise Scott Brown: Learning to See*, dedicated to the photographs of the African urban planner, on show at Temple University in Philadelphia between May and September 2021.

If the cultural and academic commissions represent a trait of continuity with the previous work of Venturi and Scott Brown, a new typology of buildings never designed before by the founders inaugurate its presence on the drawing boards of the new generation: that is, the project for health care facilities, not only as a single building but also at a much larger scale of the hospital complex. This is a deeply-felt commitment for VSBA Architects & Planners: on their website, they declare their challenge in rethinking health care as «community centers that connect medical services to education, recreation, and literacy. Health care is neighborhood care». The close collaboration with health care facility specialists, the investment in the digitalization as well as a renewed attention for sustainability, leads to the completion of buildings such as the South Philadelphia Community Health and

Literacy Center in 2016, and the vast complex of the Lehigh Valley Hospital in 2008.
Questioned about the organization of the office, VSBA reply that their structure does not follow rigid hierarchical rules, echoing the way the founders led their practice:

> Our office is an open studio where partners, experienced architects, and interns work side by side in a highly collaborative atmosphere. Information and ideas flow freely as concepts are conceived, developed, and documented. Principals are fully engaged with each project and project teams stay together for the duration of the project[1].

This also means that they consider each project as the result of a «joint authorship», as Tenenbaum accurately defines it.
Every project of VSBA Architects & Planners is committed to creativity and pragmatism: it is considered as an addition that must be responsive and sensitive towards the social, cultural and built context as well as towards the environment, thanks to the responsible use of resources, the adaptation of the new technologies to the features of the building, and the strive towards the understanding and respect of the clients' needs and ambitions. While all esthetically different and undoubtedly gifted with a contemporary allure, it is undeniable a certain filiation from the most recognizable and iconic language traits of the founders Venturi and Scott Brown, such as the bold and colorful lettering, the juxtaposition of architectural elements in unexpected shapes and scales, the general planarity of the façades, and a pervasive feeling of wit and fun that resonates in the entire composition. Consequently, a controversial question spontaneously raises while analyzing their projects: how can the new office convincingly deal with the indisputably recognizable language of the architecture of Robert Venturi and Denise Scott Brown? How can VSBA Architects & Planners inherit today and thoroughly interpret in their projects the distinct and iconic style of the founders?
Walking along Locust Street in Philadelphia Center City, in one of its most historic sections, one can accidentally stumble upon the façade of the Lenfest Hall of the Curtis Institute of Music and think that, somehow, it recalls the «pop mannerism» (Huxtable 2008, 246) of Venturi and

[1] Jeremy Tenenbaum in conversation with the author, 22 January 2021.

Scott Brown's most famous elevations. This process of association is pretty common in Philadelphia, a city where one can find easily buildings that resound not only like Venturi and Scott Brown's post-modern, but also like the Victorian eclecticism of Frank Furness (1839-1912) or the brutalist modernism of Louis Kahn. These three offices have left the major and long-lasting influence on the architecture of the city, and it is sometimes difficult to immediately separate the originals from the works of their disciples, collaborators and epigons. Among citations and allusions, the Lenfest Hall, completed in 2011, does communicate a twenty-first century identity with its large windows and the big carved lettering of the frieze, while paying homage to the style of the masters.
Asked about the evident and unquestionable resemblance between the work of the current office and the projects of the founders, VSBA Architects & Planners reply that they don't see a direct stylistic link between the buildings of the two firms. In their design process there is no intention to copy or to look like Venturi and Scott Brown, who had different references and therefore looked «more flamboyant». As Tenenbaum put it during our interview: «We inherited from Bob and Denise, but we don't look like them. We never say 'how would Bob do this?». There is no doubt, however, that the current designers leading VSBA – who both worked closely with the previous architects – are deeply influenced by Venturi and Scott Brown's sensibility and profound appreciation of context, by their imaginative design and their respect for the dreams of the community. «Every project is designed on a case-by-case basis». VSBA reply to my question, «and we expand on the philosophy of Venturi and Scott Brown». Thanks to the genuine loyalty to the values – and not to the estheticism – of the founders' office, the issue of authorship is saved, once again.

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INVESTIGATING ARCHITECTURE FIRMS' CREATIVITY: AN ORGANIZATIONAL DESIGN PERSPECTIVE

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Since the last decades, the most important architecture firms started to count hundreds of employees, having to structure themselves as effective companies. Learn how to manage the interaction between different skills is key to remain competitive in the market.
This work thus grounds on the idea that architecture firms' organization design and the fruitful intersection of their internal heterogeneous skills can result in innovative design methodologies that significantly affect the quality of their projects and their competitiveness. Accordingly, this work investigates the impact of organization design and employees' skills on architectural creativity. To do so, it presents the preliminary results of a pilot study conducted among four Italian architecture firms. T-tests *and Analysis of Variance demonstrate that organization design and employees' knowledge might play a critical role in supporting these firms' creativity. The work concludes with relevant implications for practitioners and Universities as well as with directions for future research.*

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Starting from the fifties, and with an ever-greater acceleration since the eighties, the most important architecture firms in Europe have come to count hundreds of employees. As a consequence of their large size, these organizations often operate in various locations around the world. This requires them to conceive themselves and act as effective companies. More importantly, they have to learn to manage and to value the opportunity to benefit from the interaction between the different skills brought by the various actors that are involved in their activities (e.g. architects, structural engineers, graphic designers, IT experts, model makers, accountants etc.). To give some examples: the Renzo Piano Building Workshop has 150 people; Rogers Stirk Harbor + Partners about 200 people; the Herzog & de Meuron employs 450 architects; until reaching the approximately 1,500 employees of the Foster + Partners studio. Indeed, as highlighted by scholars «architecture is a business in which technical knowledge, management, and an understanding of business are as important as design» (Heintz- Aranda-Mena 2012, 595). This would suggest that some of the most important buildings of the second half of the twentieth century (for example the Center Pompidou in Paris, 1971-77, Piano & Rogers; the Hongkong and Shanghai Bank, Foster + Partners, 1979-86) were most likely the outcome of an effective and successful organization and management which required the architecture firms to follow procedures, standards, to apply a clear division of tasks, to adequately coordinate different activities, thus stimulating and facilitating virtuous synergies among different professionals and skills.
While the literature on architectural firms has predominantly focused on the profession itself as a unit of analysis (Pinnigton-Morris 2002), the aim of this project is to deepen the understanding of the managerial practices underlying the most successful architecture

studies. In particular, the goal is to shed light on the ways in which these firms organize work and design their organizational structures to support their performance over time, also trying to explore the relationship between their organization design and the type of architecture they create.
In so doing, this work aims to investigate the impact of organization design and employees' skills as antecedents of architectural creativity. Thus, it intends to demonstrate that architecture firms' organization design and the fruitful intersection of their internal and heterogeneous skills can result in innovative design methodologies that will significantly affect the artistic quality and competitiveness of the architecture firms. Accordingly, this research extends prior research on architecture firms' creativity which mostly focuses on the archistar's reputation as well as her distinctive architectural style (Brown 2010). Ultimately, it seeks to contribute to the emerging field of study on the impact of organization design and managerial skills as key elements of architectural creativity.

Theoretical Background

To fill the aforementioned gap, this work acknowledges that architecture firms can be considered as Professional Service Firms (Von Nordenflycht 2010), i.e. companies that provide their services based on three main factors: the use of highly specialized knowledge, the involvement of a professional workforce, and the continuing emphasis on creativity. As contended by scholars (Aharoni 1993; Løwendahl 2001), if the aim is to understand creativity and knowledge based-processes, PSFs can provide a highly valuable setting, because they represent a sort of 'extreme case' (Starbuck 1993): they employ a high proportion percentage of highly educated individuals and, as such, are strongly dependent on those individual's ability to attract, mobilize, develop and transform their own knowledge into value for clients. This idea is rooted in the principles of the Resource Based View of the firm (Barney 1991; Barney 2001; Penrose 1959; Rumelt 1984; Wernerfelt 1984), which, around the 1980s, placed substantial interest in the role played by firm-specific resources in building and supporting companies' competitive advantage. This view of the firm, supported by the so called VRIN framework, indicates that firm's sustained competitive advantage derives from the resources and capabilities one firm controls that are valuable (V), rare (R), imperfectly

imitable (I), and not substitutable (N). According to this, research acknowledges that, among all available resources, those that are more like to reflect the VRIN framework are the intangible resources, meaning the knowledge, capabilities, and skills that people bring into their organizations.

To allow these resources create value both for the internal and the external stakeholders (e.g. respectively, the firm's owner, its employees, etc.; the firm's clients), architecture firms can apply a number of organizational tools and interventions. Being them actual business firms, they should consider the contribution that organization design could provide to their success and effectiveness (Løwendahl 2001). Defined as the process of aligning the structure of an organization with its goals to make it both efficient and effective (Burton 2020), organization design is key to any firm, especially the project-based ones, whose performance is strictly linked to its workforce knowledge. Resulting from a variety of dimensions, such as the coordination mechanisms implemented, the choice regarding the organizational form to adopt, the way the decisions are made in the organization, organization design has found to be crucial to architecture firms (Yoo 2006).

In line with this, architectural firms are considered not only companies that offer highly qualified services, but also examples of creative organizations, in which professionals transform their ideas into methodical practices, and these practices into profits (Jeffcutt-Pratt 2002). It is therefore essential for architectural firms to understand how creativity can be guaranteed over time by leveraging both the available knowledge assets and the organization design.

Based on this, this work grounds on the idea that the strategic assets for any architecture firm are the individuals, together with their skills, their competences, and ideas. Given this, these firms' creativity ends up resulting not only from the eclectic personality or psychological traits of the archistar, but also from both formal and informal features of organizational design (Brown 2010). As a matter of fact, companies in creative sectors find themselves having to balance the desire to carry on their ideas, often revolutionary, with the inevitable economic and business-related constraints that have to be managed and controlled in order for the competitive advantage to be sustainable.

Research Method

This works presents a pilot study that the author, together with two researchers of history of architecture, conducted in 2019, by administering a web-survey to four among the most important architecture firms in Italy. To collect as many perspectives as possible on the importance of organization design and employees' knowledge to the firms' performance, the survey targeted all people working in the firms. A first wave of data collection resulted in 73 fully filled questionnaires. To mitigate the social desirability bias (Podsakoff 2003), the research team explained each firms' representative that the participation was anonymous, no reward was provided, and that data would have been managed with maximum confidentiality.

Respondents are unevenly distributed across the four firms involved in the study, with Firm 2 providing 60% of the overall questionnaires (Firm 1=18%; Firm 3=15%; Firm 4=7%). Regarding the current job role, most respondents are architects (34%), 19% are associates, while 12% are consultants. 26% is included in the "Other" category, including Chief Financial Officer, intern, secretary, HR Director, whereas the remaining 8% includes Senior Partners and Managing Directors. In so doing, we are confident we were able to capture a variety of perspectives on the phenomenon of interest. Further, the majority of participants is Italian (95%); almost half of the participants is between 41-50 years old, while around 45% is under 40 years old. As for the gender, males represent 64% of the respondents, reflecting the gender unbalance of the architecture sector. Further, around 80% of the participants is graduated, thus indicating a proxy of the skills, competences, and knowledge potentially available within the firms investigated.

In order to better comprehend the composition of the sample and, more importantly, the degree of skills heterogeneity among employees, we also collected information on further job experiences that respondents might have had before joining their current organization. We found that 70% of the respondents have had previous experiences in other architecture firms, while more than half of the participants have had prior experience in non-architecture firms, working as engineers, researchers, teachers, etc. The latter information might indicate the extent to which employees are likely to bring in their current organization different pieces of knowledge. Hence, as indicated by scholars, creativity is fostered

when different knowledge domains meet (Huang 2014).
As for the main variables investigated in this study, they were selected following a thorough literature review conducted by carefully examining the contributions published in the most relevant international journals in the fields of organization studies, management, and individual creativity. The variables were distinguished into four different categories, each one including the constructs we intended to study. Moreover, they were measured based on already validated scales taken from the literature.
To better capture individuals' judgment, the measures were all self-perceptual (Howard 1994) and anchored to a 5-point Likert type scale. The variables investigated and the measurement scales are reported in Table 1.
The descriptive statistics calculated on each variable, including mean and standard deviation, are included in Table 2.
Further, in order to examine the relationships existing between the variables, we calculated the correlation coefficients (Table 3). As can be noted, we found a number of significant correlations above > .30 among the variables investigated. First, firm creativity is found to be strongly and positively correlated with task standardization, knowledge sharing, perceived organizational support, Person-Organization fit, and Perceived ability-Job Fit. Thus, it seems that all variables' categories examined are salient to architecture firms' creativity, with a particular focus on employees' knowledge and Person Organization fit.
Given that the simple analysis of the variables' means might not rigorously inform the researcher on the phenomenon of interest, we conducted *t-tests* and analyses of variance on the data collected (Table 4). A *t-test* is a type of inferential statistic used to determine if there is a significant difference between the means of two groups, which may be related in certain features. That is, the *t-test* helps understand whether two groups (no more than two) are different from one another. In case the groups to be compared are higher than two, then the appropriate test to perform is the analysis of variance. Given this, we ran *t-tests* to compare respondents across the variables which were coded as dummies, that is nationality (Italian/Other), further job experiences they had in other architecture firms (Yes/No), and further job experiences they previously had in non-architecture firms (Yes/No). Differently, we had to perform an analysis of variance on the remaining variables considered (which were codified as categorical

Variable category	Construct	#items	Sample Item
Organizational structure	Autonomy in the job	3	How much autonomy is there in your job?
	Task standardization	3	Thinking about your organization, to what extent are the following statements true or false? a) When developing a project, I always check to see that I am following the rules
	Participation in the decision making process	4	In your organization, how frequently do you usually participate in the decisions regarding... a) The management of the firm (e.g. strategy formulation)?
	Coordination mechanisms	4	To what extent each of the following mechanisms is used to coordinate the work within your team/ work unit? a) Personal coordination modes
	Organic vs mechanic structure	7	The management philosophy in my firm favors... a) Insistence on a uniform managerial style throughout the firm
Employees knowledge	Knowledge sharing in the team	8	In my project team, every member... a) Readily shares his/her expertise to help resolve work group problems
	Perceived organizational support (POS)	5	In my organization, the top management... a)Takes pride in its employees' accomplishments at work
Employee-Organization fit	Person-Organization fit	3	To what degree do you feel your values "match" or fit the current employees in your organization?
	Perceived ability-Job fit	5	I feel competent and fully able to handle my job
	Firm creativity	6	Staff members are encouraged to explore new fields of knowledge

Table 1, Measurement scales and sample item of each variable investigated.

variables): firm the respondent belongs to (Firm 1/Firm 2/Firm 3/ Firm 4), current job role (Managing Director/ Senior Partner/Associate/Architect/Consultant/Other), age (< = 30 years/31-40 years/41-50 years/51-60 years), gender (male/female/Not available), and education (High school or equivalent/Bachelor degree/Graduate/Master degree/PhD or MBA/Other).

As can be noted, we found some statistical differences. In particular, in our sample, belonging to a certain firm instead of another makes a difference in terms of participation in the decision-making process and the extent to which the organizational structure is more or less organic (i.e. flat, non-hierarchical, based on

Scale	Source
1=Very little, 5=Very much	Hackman and Oldham (1974)
1=Definitely false, 5= Definitely true	Adapted from Bacharach et Al. (1990)
1=Never, 5= Always	Dewar et Al. (1980)
1=Used to no extent, 5= Used to a large extent	Adapted from Van De Ven et Al. (1976)
1=Very little, 5=Very much	Adapted from Covin and Slevin (1989)
1=Strongly disagree, 5= Strongly agree	Adapted from Bartol et Al. (2009)
1=Strongly disagree, 5= Strongly agree	Adapted from Eisenberger et Al. (2001)
1=Not at all, 5= Completely	Cable and Judge (1996)
1=Strongly disagree, 5= Strongly agree	Xie (1996)
1=Strongly disagree, 5= Strongly agree	Lang and Lee (2010)

teamwork and delegation of responsibilities). Further, the job role that is currently held by the participants matters to the perception regarding the organizational structure that is implemented in the firm (organic vs. mechanic structure), to the orientation toward sharing knowledge with others, and to the perception related to the firm's creativity. Moreover, nationality plays a role in the perception regarding the coordination mechanisms implemented in the firm and for the knowledge sharing behaviors. Being more or less old leads to differences in the means obtained regarding the following variables: coordination mechanisms, perceived organizational support, and firm creativity. In addition, while having had

Table 2, Descriptive statistics for all variables

	Mean	S.D.
Organizational structure		
1. Autonomy in the job	3.53	1.03
2. Task standardization	3.17	1.08
3. Participation in the DM process	2.62	1.29
4. Coordination mechanisms	3.14	1.13
5. Organic vs. Mechanic Structure	2.72	1.07
Employees' knowledge		
6. Knowledge sharing	3.83	1.02
7. Perceived organizational support	3.43	1.04
Employee-organization fit		
8. Person-Organization fit	3.30	0.82
9. Perceived ability-Job Fit	3.64	0.91
Firm creativity		
10. Firm Creativity	3.29	0.96

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. Autonomy in the job	-									
2. Task standardization	-.08	-								
3. Participation in the DM process	.53***	.09	-							
4. Coordination mechanisms	.11	.20	.21	-						
5. Organic vs. Mechanic Structure	.40***	-.24*	.23	-.15	-					
6. Knowledge sharing	.22	.15	.33**	.39***	.13	-				
7. Perceived organizational support	.25*	.35**	.27*	.10	-.07	.45***	-			
8. Person-Organization fit	.36**	.30**	.33**	.24*	-.01	.35**	.57***	-		
9. Perceived ability-Job Fit	.54***	.18	.33**	.05	.18	.27*	.38***	.45***	-	
10. Firm Creativity	.29*	.37**	.25*	.17	.01	.54***	.51***	.52***	.44***	-

* p < 0.05, ** p < 0.01, *** p < 0.001

Table 3, Correlation coefficients among all variables investigated.

prior job experiences in non-architecture firms does not have any impact on the variables examined, having had further experiences in other architecture firms seems to shape the respondents' perception regarding the way knowledge and efforts are coordinated in the firm. Finally, the level of education makes a difference in terms of the organic vs. mechanic organizational structure.
Overall, the variables where most differences were detected are participation in the decision-making process, coordination mechanisms, organic vs. mechanic structure, knowledge sharing, perceived organizational support (POS), and firm creativity. Moreover, the demographic variables that appear to be most influential are current job role and age.

		Firm	Current job role	Nationality	Age	Gender	Further job experience in arch. firms	Further job experience in non-arch. firms	Education
Organizational structure	**Autonomy**	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig
	Task standardization	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig
	Participation in the decision making process	***Sig (.10)***	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig
	Coordination mechanisms	Non-sig	Non-sig	***Sig (.05)***	***Sig (.10)***	Non-sig	***Sig (.05)***	Non-sig	Non-sig
	Organic vs. mechanic structure	***Sig (.05)***	***Sig (.01)***	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig	***Sig (.01)***
Employees' knowledge	**Knowledge sharing**	Non-sig	***Sig (.01)***	***Sig (.10)***	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig
	Perceived organizational support (POS)	Non-sig	Non-sig	Non-sig	***Sig (.01)***	Non-sig	Non-sig	Non-sig	Non-sig
Employee-Organization fit	**Person-Organization fit**	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig
	Perceived ability-Job fit	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig	Non-sig
	Firm creativity	Non-sig	***Sig (.05)***	Non-sig	***Sig (.05)***	Non-sig	Non-sig	Non-sig	Non-sig

Table 4, *T-test* and one-way ANOVA results.

Implications and Future Steps

Even if in its preliminary version, this work intends to set the ground to shed light on the masterpieces of recent architecture, as resulting (also) from a certain 'firm's organization design'. Consistently, its advancements might facilitate undergraduates and young architects entering major European firms. Indeed, we might expect that large architectural firms will increasingly be more inclined to hire people who know how to fit into complex organizations and are confident about the managerial and team management aspects of architectural practice. Moreover, it intends to encourage the awareness of small architectural firms about the importance of

developing an effective business strategy to grow also internationally, providing them with guidelines and best practices. Additionally, this study might help conceive and design new university and/or master courses that allow architecture students to develop professional skills concerning organization design, job design, and managerial skills. The goal is to support future architects in developing business and organizational skills to prepare them to more effectively support the firms they will work for over their career.

As for the limitations of this study, first, this work might benefit from enriching data analysis with qualitative research. In particular, interviews with the managing director/archistar, senior partners, associates and managing directors of the architecture companies might be conducted. They might help deepen the understanding of the issues that emerged from the pilot quantitative study. In so doing, we intend to adopt a mixed method (the so-called triangulation of research methods), based on both a quantitative and a qualitative approach, by using both objective (e.g. performance data, organizational dimension) and subjective measures.

Second, as a further advancement of this research, the study might be expanded to European architecture firms to collect a certain amount of data to allow the adoption of more sophisticated econometric analysis, likely to explore the phenomenon more in depth.

Third, as the ultimate purpose, this work could be widened by relating the variables investigated with a firm-level outcome variable that measures architecture firms' performance, quality, and reputation. To do so, the researcher might follow these suggestions: on one side, to conduct a thorough review regarding how these outcomes could be better captured and operationalized; on the other side, to identify secondary data that might objectively measure firms' performance, quality, and reputation in order to avoid any bias deriving from the common method variance.

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DESIGNS, ARCHITECTURAL WORKS AND ENGINEERING PROJECTS: LARGE FIRMS, AUTHORSHIP AND KEY LEGAL ISSUES IN AN INTERNATIONAL AND COMPARATIVE PERSPECTIVE

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Creative works of architects and engineers are protected under the laws of copyright. What are the conditions for a work of authorship to exist and what rights are guaranteed will be outlined and expounded with reference to an international environment where large firms operate. Important legal issues concern authorship for the creative design of architects working for large firms, as well as the entitlement and transfer of ownership over author's rights from the architect to the firm or client. Although the Berne Convention lays out a common minimum level of protection for copyrights, significant differences may still be found between the rules adopted by various states. The approach of different legal traditions is often reflected into the choices taken by national legislators and judges. For instance, the outcomes for the author's rights of architects and global firms acting in common law and civil law countries will be scrutinized and evaluated.

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Keywords: Architectural works; Author's rights; Copyright; Authorship; Ownership

Author's rights, also known as copyrights, are the most common and relevant Intellectual Property rights which may arise in a construction context. Designs, drawings, specifications, plans, as well as building and their models, are examples of works in which author's rights may subsist in.

What are the conditions for a work of authorship to exist and what rights are protected under copyright laws will be outlined and expounded with reference to the works created by architects and engineers in an international environment where large firms operate. Departing from the commonly accepted principle that the right to be named author of a work is independent from the right to own it or use it, so that authorship and ownership may reside in different persons or entities, important legal issues need to be addressed related to authorship and ownership of the author's rights.

Whereas in a small domestic project the creative activity is most likely the result of the mind and hands of a single independent architect, who will be vested in all of the copyrights, in the environment of large or international firms, designs are created by the collaboration of several architects and engineers of an organized practise, often lead by a partner or someone acting in a supervisory capacity, sometimes running different aspects of one project, or could be developed by teams of multiple firms, which may also be involved at different stages of the design elaboration. Who will be recognized as the author in such circumstances? Can a firm as a legal entity be considered the author? Will the ownership over the economic rights initially follow the human author or will the firm or the client commissioning the design be entitled to them? And how could they be transferred?

Although multilateral conventions, as the Berne Convention, lay out a minimum level of protection to be incorporated in the national laws, significant differences

are still found in the approach taken by various jurisdictions to this area of the law. The common law tradition, for example, moves from a utilitarian approach which envisions copyright as a property right and focuses on the economic exploitation of the work, while the civil law tradition perceives it as a personality right and promotes the creative work as an expression of the intellect of an author.
How these perspectives are reflected into the rules set out by national legislators and judges with regards to the key legal issues, and what practical outcomes they have for architects, engineers, global firms and their clients in different legal systems, will be scrutinized and evaluated.

Copyright Protection in a Construction Context

In a construction context there is a variety of productions which fall within the scope of protection of copyright laws. These productions can assume the form of: literary works, as for the majority of documents in a construction project (specifications, client's requirements, preliminaries etc.); artistic works (as for concept design, detailed design, executive design, drawings, plans, graphic works, diagrams, maps, charts, photographs irrespective of artistic value); works of architecture (as for a building), or – except for some states (eg. in the USA) – a three-dimensional structure, or a model for a building (Pollock 1991, 873).
To attract copyright protection a work needs to be of a creative nature. It doesn't have to be of high artistic quality or a distinctive work. The threshold is low. It needs to have a minimum of originality and novelty (Ginsburg 2016, 4). The originality and novelty do not refer to the idea included in a work, but to the form in which it is expressed and materialized in the outer world.
In the common law tradition, a work meets the required standard when it is not a copy of another work and where there was a minimum investment of «skill and labour» to produce it. However, it has to show a «minimal degree of creativity» (USA, Feist Publications Inc v Rural Tel Serv Co 499 US 340, 345, 1991). In the civil law tradition, a work normally needs to reflect in some way the author's personality in order to attract copyright protection. It needs to be a personal and individual expression of the author of a work and present some elements which show a difference with other works (European Court of Justice, Case C-5/08, 2009).
Elements of design which are basic elements (Greenstreet-Klingaman 2000, 179) or common place

will not qualify for copyright protection (Mann 2010, 736), unless it would add a minimum creativity to the known or elements of common experience (Ginsburg 2016, 5). Courts would normally be generous in granting copyright protection as long as the creation shows the «fingerprints» of the author and entails a personal elaboration even of the elements of public domain. The novelty and originally may also subsist just in the organization of the different (known or common) parts or its style (Pollock 1991, 878). A work of interior design, for example, in which there is a unitary design, with a visually and defined scheme, or style, of organized components, expressing the choice, combination and coordination of the author, may find protection under copyright law notwithstanding the single elements or part of the composition are simple, common or already used in a specific design sector (Italy, Corte di Cassazione, 8433/2020). Lack of novelty of the single parts may not be decisive for the existence of a protectable copyright:

> The constituent parts of the house design are not novel does not preclude this conclusion... Many compilations have nothing original in their parts, yet the sum total of the compilation may be original (Australia, Federal Court, Ownit Homes Properties Limited vs Mancuso Investments, 1990).

The minimum requirement of creativity is excluded when the work is intended to solve a technical problem. If forms, shapes, lines, are required by a particular function, there will be no creativity to determine the existence of author's rights. Architectural or engineering projects that are partially dictated by a technical function but still have some creativity will enjoy copyright protection if the function «does not command the design elements» (Ginsburg 2016, 8). Functional designs in some countries (Italy, Law 633/1941, Art. 99) may also find the protection of so-called «related rights» under certain conditions (eg. representing an original solution of technical problem), which afford some prerogatives similar, but less extensive, of copyrights. To determine if a work is a copy of another one produced earlier, the test applied is a qualitative not quantitative one. It is sufficient that a more recent creation presents the application of a certain degree of «skill and labour» or «author's personality» in substantial elements. In architectural works, taking ideas from earlier productions, without copying their expression, is not an infringement of copyright (Mann 2010, 734).

A work reproducing an earlier work with differences in mere detail infringes on the earlier creation. Where the creative effort stays in some elements with a recognizable creative contribution, or «sufficiently gross difference» (Greenstreet-Klingaman 2000,181), then the new production would be an elaboration or derivative work, which is itself a work of authorship for the original and new features (Ginsburg 2016, 6). However, its exploitation will be subject to the recognition of the paternity and consent of the author of the original work.
A common issue related to derivative creations in a construction context is raised between design works produced at different stages of the design process When a concept design which qualifies for copyright protection is subsequently transfused into the final project, it retains all its rights, including for the author to be recognized. In a case where the executive design had incorporated the preliminary design, the presentation of the final project for purely exhibition purposes would be considered a copyright violation where it did not recognize authorship in the preliminary design (Italy, Corte di Cassazione, 15158/2018). However, if the elaboration has a high level of creativity, it could be considered an original work itself. This is so when the parts of the previous work have been so modified that there are no similarities in the substantial parts.

Rights Protected Under Copyright Laws
Architects working in large firms, frequently engaged in international projects, must bear in mind that author's rights may be governed by a national law of a foreign country (eg. the law of the client's place of business or the construction site) with significant differences on how such rights are entitled, transferred or protected, compared to the law of the country where the firm has its offices, or the design was created.
Indeed, the most relevant international treaty in this field, the Bern Convention for the protection of the rights of authors in their literary and artistic works (concluded in 1886 and then revised several times), does not provide a uniform law for every aspect of copyright. The Convention just aims at harmonising the copyright laws of the participating Nations (179 as of today). It sets basic principles while identifying the works and rights that shall receive protection in any case and minimum standards to be satisfied.
With reference to the protected works, the Convention clarifies that literary and artistic works shall include

«every production in the literary, scientific and artistic domain, whatever the mode or form of its expression» (Art. 2, Par. 1). An illustrative list of examples follows this general definition. Notably – for the interest of this study –, the works of drawing, architecture, illustrations, maps, plans, sketches and three-dimensional works relative to geography, topography, architecture or science are expressively recalled in the list.
The rights to be guaranteed, for a minimum duration of 50 years after the death of the author (subject to some exceptions), are of two types: economic and moral rights. The economic rights are those of reproduction, use, commercialisation, distribution, adaptation and arrangements, translation, public performance, broadcast and other communication, of the work. They are intended to be exclusive rights: the exploitation of the work is granted only to the right holder, who can prevent any third party from exercising any of those rights.
The Convention also guarantees to authors the moral rights (Art. 6bis) «to claim authorship of the work and to object to any distortion, mutilation or other modification of, or other derogatory action in relation to, the said work, which would be prejudicial to his honour or reputation». The first prerogative been known as «right of paternity» while the second as «right of integrity». While the moral rights directly aim at protecting interests of a non-economic nature, it is undoubtedly true that indirectly they may also implicate some economic interests: having the name circulating and being recognized as the author of a particular production, definitely helps to promote the art work or creative skills of the identified individual and to obtain more job opportunities.
As clearly stated in the Convention (Art. 6 bis, Par. 1), the moral rights are independent from the economic rights and can be exercised even after the transfer of latter. Therefore, the author of the work can assign to a third party the rights to own the economic prerogatives over the work and therefore to exploit it. That marks a fundamental consequence of this area of the law: authorship, and the moral rights, can be separated from ownership, or the economic rights, of a creative work.
Within these boundaries, the contracting states are left with the discretion to define or extend the works to which afford the protection, determine how individuals or legal entities shall be entitled as the author, if and how the rights can be transferred, the form and extent of

the protection and the means of redress afforded to the author (or owner) of the work.
To cite an example of the discretion of the states to implement the principles of the Berne Convention with reference to architectural works, we can recall the Italian law related to the right of integrity which poses some limits to the exercise of this prerogative: the author cannot oppose the modifications that may become necessary during the execution of the construction or after its completion. However, if the work is recognized by the competent state authority as having an important artistic character, it will be up to the author to study and implement such modifications (Italy, Law 633/1941, Art. 20, Par. 2). The Italian courts interpret extensively what would be a «necessary» modification, to include also modifications imposed by economic reasons and not only by technical or legal motives (Italy, Corte di Cassazione, 586/1981; Corte di Appello Bologna 23-4-1979).
Differences between national laws often reflect the approach of the legal tradition a country belongs to. Limiting our analysis to the western world, some distinctions can be drawn observing the two main legal traditions, the common law and civil law, whose underpinning values and tendencies may explain the divergencies in the outcomes (von Lewinski 2008, Ch. 3). The common law tradition moves from a utilitarian approach which envisions copyright as a property right (UK, Court of Appeal, Re Dickens 1935, Ch. 267) and focuses on the economic exploitation of the work and the diffusion to the public (Rigamonti, 360), while the civil law tradition perceives it as a personality right (Plaisant 1991, 12) and promotes the creative work as an expression of the intellect of an author (Santini 1959, 29). Common law jurisdictions tend to pursue the general interest in the diffusion and promotion of science, culture and information (US Constitution, Art. 1, Par. 8). The main goal is to protect the cultural progress and the public, not the artist (Winick 1992, 1601). Civil law jurisdictions privilege the remuneration of the authors and «the moral dimension of author's rights» (Ginsburg 2016, 13). The prevailing interest is to promote better conditions for them, to incentivise the creative effort, to realize literal and artistic works (Brown-Pedersen 2018, 117-119).
That been said, it is not uncommon that legal systems of different traditions sometimes are pervaded by mixed reasons (Ginsburg 2016, 2) which, together with practical purposes and the existence of loopholes, may lead to some similar results. We will further investigate the

discrepancies and similarities with reference to the vesting and transfer of the authors' rights.
In a design project carried out by a single independent architect the moral and economic rights over the creative activity normally do not raise complex issues. Conversely, the task to determine authorship and ownership in the creative productions of architects and engineers working, often in teams, for large firms may not be of immediate solution (Pollock 1991, 876).
In the context of organized architectural or engineering practices, where two or more persons carry out the development of the design, consideration must be given to the way works have been generated and what the applicable law requires for the vesting of copyrights. Furthermore, to understand the transfer of author's rights, attention shall be placed on the working relations between the consultants and their firm as well as the contractual arrangements with the client.

Authorship in Common Law and Civil Law Countries
The right to be named author of a work is the object of some significant differences between civil law and common law countries, especially where the designing production was carried out in the course of employment. The right of paternity in the civil law tradition is, in fact, normally considered non-transferable, non-waivable, and not subject to statute of limitation (Ubertazzi 2016, 1592). The Italian law, for example, specifically provides that moral rights cannot be transferred (Italy, Law 633/1941, Art. 21), while the French law states that the enjoyment of moral rights may not be limited either by contract or employment (France, Code de la Proprieté Intellectuelle, Art. 111). Moreover, as they are regarded as personality rights, it is also commonly understood that an author cannot renounce such rights, either by contract or other instrument, or be time barred in its exercise because of prescription (Santini 1959, 29). Consequently, an architect – with very few loopholes – shall always be able to claim to be the father of a design he generated. No agreement or voluntary act would permit to waive the moral rights or assign them to somebody else than the creator. The same, would be for an employment relation or a commissioning relation. They cannot deprive the author from the possibility to exercise these rights nor admit the transfer to the employer or client.
Legal systems belonging to the common law tradition, on the contrary, have been reluctant to offer an extensive

protection to moral rights (von Lewinski 2008, 3, 54). In the UK, where these rights were formally introduced only in 1988 with the enactment of the CDPA (Copyright, Designs and Patents Act), the law allows important limitations to the rights of paternity and integrity.
For instance, the right to be recognized as the author must be asserted (UK CDPA, Section 78). Until the creator of a work has issued a specific declaration for this purpose, the right of paternity may not be infringed. More relevantly, all the moral rights may be completely waived by an author (UK CDPA, Section 87, Par. 2).
This faculty is seen by commentators as the primary shortcoming of the law in UK in the field of moral rights, favouring the editors or clients who can often exercise (economic) pressure on authors, the weaker party of the contractual relation, persuading them not to retain their moral rights (Brown-Pedersen 2018, 122).
In the construction context, while the UK most used standard form of contracts (JCT and NEC) do confirm that the copyright shall be vested in the author (eg. consultant or constructor where also responsible for the design), it is not uncommon to see amendments to the provisions of the standard contracts or bespoke agreements that require the designer to waive the moral rights.
Furthermore, the right of paternity does not apply in any work made in the course of employment (UK CDPA, Section 79), unless an agreement states to the contrary. In other terms, an employee in UK may not claim to be the author whereas his creation was made under the duties of his employment. This is a first, softer, form of the «work for hire doctrine», which protects the employers for their investments and promotes the capacity of investors to diffuse to the public the creative and innovation productions of authors.
The work for hire doctrine reaches broader consequences in the USA (U.S. Code, Title 17, Section 101), where it goes as far as recognizing the authorship to the employer, permitting to a non-natural person to hold moral rights over a work (U.S. Code, Title 17, Section 201b). In other words, allowing for a corporate authorship.
Therefore, authorship in the American law is defined by the working status of the architect, whether an employee or an independent contractor, knowing that the courts would look to the means and manners of production rather than the control exercised over a person to determine if an employment relation in fact exists (Winick 1990, 1642).

Under the work for hire doctrine, ownership over the economic rights of the creative work is attributed originally to the employer or commissioner in the common law tradition (US Code, Title 17, Section 201; UK CDPA, Section 79). Similar results are however reached by civil law countries, where the ownership over the economic rights of a work made within an employment relation will be attributed to the employer as long as the creative activity was part of the employee's duties and was carried out in the working place or hours. This interpretation is based on labour law principles, for which the employer acquires the results of the activity of his employee (France, Code de la Proprieté Intellectuelle, Artt. 113-119).
The two legal traditions also conceive similar outcomes for commissioned works: where the design was created by an architect as independent consultant, all of author's rights will remain with the creator. An express or implied agreement will be necessary to license or transfer the economic rights (Adrian 2008, 529-530). The contract must be made for a creative purpose and provide for the right of the commissioner to exploit such creation. Where the contract is made just to obtain a copy of a work, there will be no implied transfer of any further economic right. Where there is no contract to illustrate the boundaries of the concession of the economic rights, the courts would look to the object and scope of the contract, or to use the words of an English judge:

> The engagement for reward of a person to produce material of a nature which is capable of being the subject of copyright implies a permission or consent or licence in the person giving the engagement to use the material in the manner and for the purpose in which it was contemplated between the parties that it would be used at the time of engagement (UK, Beck v Montana Construction, 1964-1965).

Authorship Over Works as Expression of a Collaboration

Interesting outcomes may be found in common law and civil law experiences with reference to authorship which are the expression of a collaboration of more professionals, as for instance in the creation of architectural works. As a matter of fact, the design created within a partnership or firm of architects would very often see the contribution of more professionals. To whom would authorship be attributed depends, initially, to the degree of participation and creativity of each

contribution, and secondarily, on how the different inputs are put together or intertwined.
One side of the spectrum may be well described by situations where the works are generated under mere supervision or, the opposite, under strict direction of someone else. It is the case, for example, of the design produced by junior or associate architects under the supervision or direction of a partner or director. A work which is mere execution of original concepts of another individual would hardly be considered to qualify for copyright protection, especially if the executor has followed clear and specific instructions (eg. UK, Case Cala Homes) or where its contribution is of a functional nature. At the same time, mere advises, or organizational support, may not attain the necessary degree of creativity for vesting with author's rights the architect overseeing the contribution of others (eg. Italy, Venice Law Court 1-10- 2007; Milan Law Court 5-10-1995).
On the other side rest the situations where the involvement of each participant achieves a minimum degree of creativity. The collaboration of more architects then may be arranged either by the merging of their design activities and creative effort in a joint work, or by the coordination and assemblage of their single and distinctive contributions in a collective work.
Even if there are some differences in their characterization (Ginsburg 2016, 10), joint works and collective works are – with a few exceptions – similar concepts used by the copyright laws of most common law and civil law countries. A joint work would be defined as a work «in which the contribution of each author is not distinct from that of the other author or authors» (UK CDPA, Section 10) or where contributions of two or more authors «are merged into inseparable or interdependent parts of a unitary whole» (U.S. Code, Title 17, Section 101), or «created with the indistinguishable and inseparable contribution of several people» (Italian Law 633/1941, Art. 10). Where the contributions of more professionals remain distinct from the others, as independent works, but are selected, organized, and arranged by a coordinator who assembles them together in an autonomous creation, a collective work would be originated (U.S. Code, Title 17, Section 101; UK CDPA Section 178; Italian Law 633/1941, Art. 3).
In terms of authorship, a joint work would create a «co-authorship» vested in the participants for the entirety of the work and resulting from the creativity of the different authors blended together. Otherwise, even after their inclusion in the collective work, the moral (and economic) rights of the individual contributions collected together belong to the respective authors of the single

parts, but the coordinator will be recognized as author of the collective work been represented by the selection, coordination, and arrangement of the different parts (cfr. Italy, Milan Law Court, 9106/2015).
In the context of a large firm, and unless the applicable law is the one of a country where the work for hire doctrine applies and the architects work as employees – in which case the authorship is vested directly (eg. in USA) into the firm or may not be reclaimed (eg. in UK) –, all the professionals contributing to a design process resulting in unitary project, not formed of singular parts, would be co-authors of the work as a whole. Where individual aspects of project have been developed by distinct architects, selected, coordinated, and assembled by a supervisor or partner, on this latter could be envisioned the authorship of a collective work.
Some interesting principles, somehow deviating from the civil law tradition, are found in the French concept of collective work: a work created on the initiative of a natural or legal person who edits, publishes and discloses it under their direction and name and in which the personal contribution of the various authors participating in its development is merged in the whole for which it is designed, without it being possible to attribute to each of them a separate right over the set produced (France, Code de la Proprieté Intellectuelle, Art. 113).
In the designing context, the French Supreme court (France, Court de Cassation, 19-12-2013, 12-26.409) has clearly stated that the drawings which only constitute a contribution to a collective work produced at the initiative and under the direction of the employer (a company), where each contribution of an employee cannot be distinguished from the others, does not create a right for the employee to the design produced as a whole. The only condition is that the coordinator must always give specific instruction or specific directives. Otherwise, the work will then be recognized as created independently by the different participants.
Two exceptional outcomes – for a civil law country – can be derived from the collective work doctrine under French law: authorship over an entire work created as a merger of contributions of more participants may be recognized in the person that directs them; where such a collective work was produced under a relation of employment, a legal entity (the employing company) shall be entitled not only to economic right but shall also be the «author» holding the right of paternity of the work. The director of the work, or the legal person, are in fact entitled to both authorship and ownership of the copyrights over the whole work.

Conclusions

Architectural works attract copyright protection satisfying a low standard of creativity. The rights afforded for the creative effort are both moral and economic rights. However, authorship and ownership may be separated and live independently.

Authorship in architectural works flourished in an international context of large firms presents several issues, amplified by different approaches of legal traditions and national laws in the field of copyright.

The main questions to be addressed regard the scope of protection afforded to moral and economic rights by the applicable law of a design project, how such law vests authorship and entitles ownership over creativity, how the design activity has been conducted, whether joint works or a collective works subsist. Careful consideration shall be given to what law will apply to the project, what the working relation would be between the architects and engineers, on one side, and the firm or commissioning client on the other side.

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MULTISCALE DESIGN METHOD IN LARGEST CONTEMPORARY FIRMS

WHEN THE GREAT ARCHITECT BECOMES A DESIGNER. THE MULTISCALE FIRM BETWEEN RESEARCH AND MARKET

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After a phase of separation between architecture and design, what we can see nowadays is a reverse movement. The large architecture firms, on the verge of becoming headquarters for the field of the archistars, have begun to design objects and equipment for the home, the city and the individual, in collaboration with big companies. Objects that mimic forms and approaches of architecture, according to the criteria of authorship, can be considered symptoms of different attitudes: the ever-present need to maintain an open and circular relationship between the scales of architecture and design according to the lesson of the «masters» or, more pragmatically, the response to market pressures that push for an expansion of the brand on the two levels. The paper sets out to explore these dynamics through a first survey of the relationships between architecture and design in the studios of renowned designers, with the aim of posing questions rather than providing answers, highlighting short circuits, and drawing up a scenario for the present.

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Keywords: Architects' Design; Communication; From Spoon to the City; Product design

Different Paths

Architects and designers, since the beginning of the last century and depending from the project culture they are trained in, have followed clearly separate careers or have frequented both architecture and design, contaminating them and overlapping the scales of building and product in a circular approach.

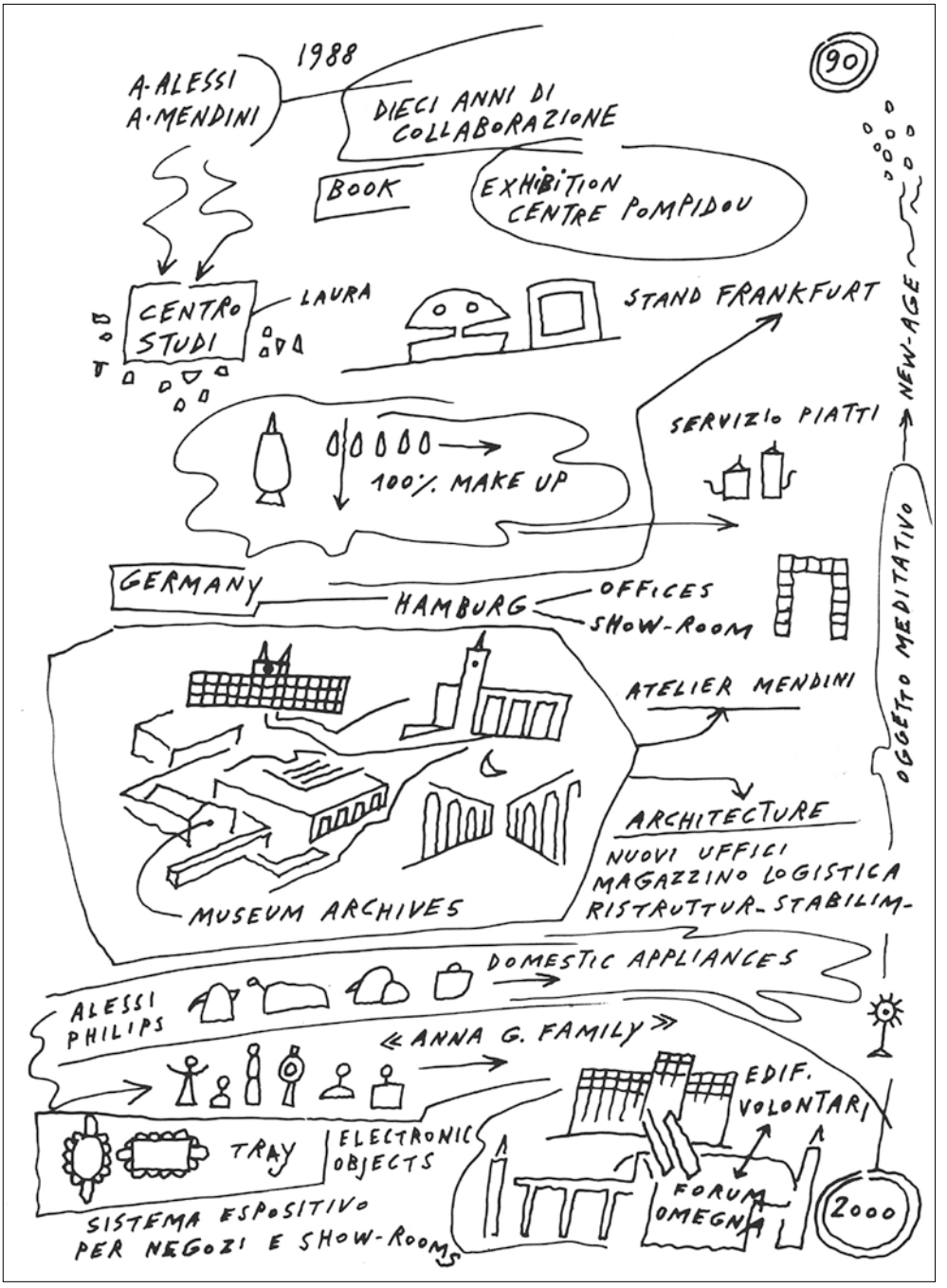
Behind the statement «Vom Sofakissen zum Städtebau» (Schwartz 1996, 22) which led to the creation of an outright mythography that lasted until the Sixties, lies a crossroads affected as much by the education system as by the production and market system. Just to give a few quick examples, the Anglo-Saxon and North American contexts saw the early emergence of an autonomous category of designers – industrial or visual – thanks to the impetus of the industrial system applied to consumer goods.

In the United States (Pulos 1988), in particular, the trade associations have played a major role in promoting the importance of the designer's work, including in the field of mass consumption, advertising, improving the performance of mechanical equipment, transport, food and personal items, under the blanket of the slogan: «ugly things sell badly» (Loewy 1951; Jodard 1992, 151).

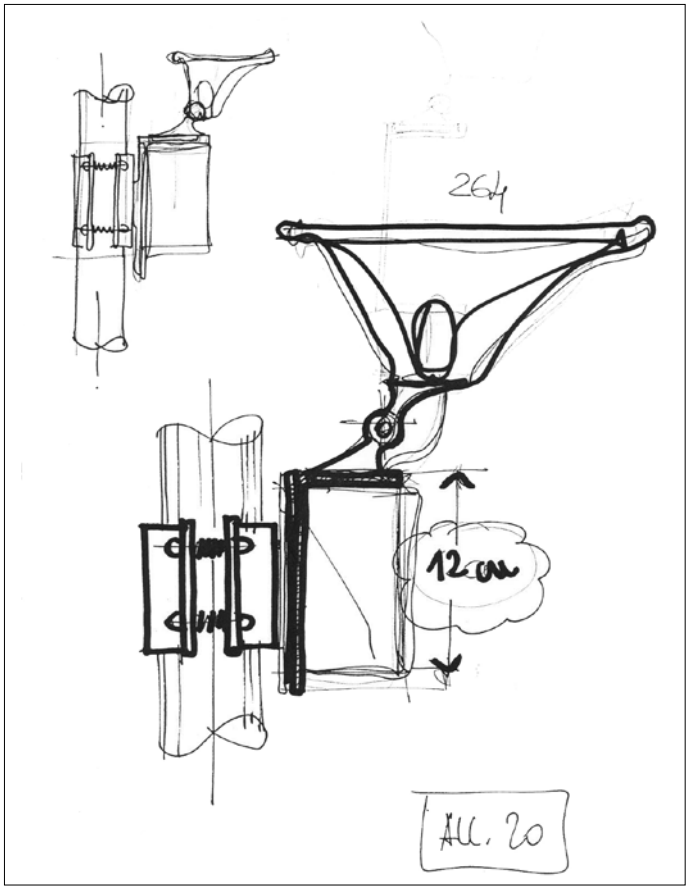
The American Design Institute, founded in 1938 (Sheumaker-Wajda 2008, 255-259), has always stressed the importance of the designer in the activity of the big companies: a designer who can take on the role of freelancer, art director or consultant, but always plays a pivotal role in the discourse on the professions (Dellapiana, Rispoli). On the other hand, the foundation of the American Institute of Architects as early as 1857 was meant «to promote the artistic, scientific, and practical profession of its members; to facilitate their intercourse and good fellowship; to elevate the standing of the profession; and to combine the efforts of those engaged in the practice

of Architecture, for the general advancement of the Art» (*History* 2021). This is the ground from which large firms specifically devoted to design emerge: ones that would manage the design and communication of several major American companies, from transport to food, from locomotives to Coca Cola bottles: Dreyfuss, Bel Geddes, Teague, Loewy, to name but few, are the bosses of studios with hundreds of employees and interests in all fields of industrial design and communication.
Something similar had happened on a smaller scale in the UK. Here an early promotion by the State – the establishment of the Council of industrial design in 1944 (Blake 1984; Armstrong 2015, Atkinson & Beegan 2008) – and an education system that laid the foundations as far back as the Cole Circle – which had been, in turn, the starting point of the London Great Exhibition (Pevsner 1951) – shaped a clearly defined approach characterized by both a powerful profession and an education system scrupulously detailed: for example, as early as 1932, Milner Gray held a course in Packaging Design at the London Art School. From the point of view of the professions, the Design Research Unit (Cotton 2012) – a group formed in 1942 to contribute to the recovery of British production system damaged by the war – gathered multidisciplinary specialists (among others Milner Gray and Misha Black) and became one of the largest European firms, specialized in product and communication, during the Post-War.
On the other hand, the countries culturally based in the Mediterranean area have a different story to tell. In Italy, for example, despite the attempt by leading intellectuals of the late nineteenth century such as Camillo Boito to define a process for the training of workers in the «arti applicate all'industria» (Industrial applied arts), the university system developed in 1920 to train an «architetto integrale» (integral architect) (Dellapiana-Savorra ft.) tended to unify the paths and, as a consequence, the newly graduated professionals are without any distinction of specialization or scale of action.
Architects and designers were one and the same, and even in the years following the *Ventennio* and the war, this coincidence of roles was functional to shaping the image of Italian design.
In his article on Milanese design written for *Vogue* in 1949 (Rogers 1949), Ernesto Nathan Rogers – not by chance, the inventor of the Italian version of the Werkbund slogan – drew a picture of a dense network of small firms dedicated to both architecture and interior and product

design. BBPR, Albini, Zanuso, Gardella, Romano were those whose «wide vision, which embrace from the spoon to a city, admits of no such contradiction».
Networks rather than large studios, therefore, and even the size of the larger groups was not comparable to other Western realities. Gio Ponti's studio in 1952, with an important production in the fields of architecture, design and publishing (one corner of the Via Dezza atelier was destined for the editorial staff of *Domus*) included the three partners – Ponti, Fornaroli, Rosselli – three secretaries and a dozen draughtsmen.
Much more often do we find one-man-bands with a few temporary aids or collaborations that help reinforcing the modes of authorship, somehow anticipating archistaring. Carlo Mollino, as another example always worked – also due to his unconventional attitude mirrored in his projects – with no more than three collaborators, dedicating himself to one project at a time, whether it was a theatre or a racing car (Bolzoni 2019).
Certainly, after the mid-Fifties, with the strengthening and increasingly global fortune of Italian design – 1954 being conventionally considered its *annus mirabilis* (Fallan 2013) – a certain separation between the two scales of design started to appear, although designers continued to train as architects until the 1980s, the decade in which the most substantial changes occurred (Bulegato-Dellapiana 2014; Pansera 2015).
In Italy and elsewhere, the recomposition of the two fields was one of the ingredients of the postmodern recipe (Jencks 1977). The failure of metanarratives and the need to rediscover the communicative power of design facilitated a more liquid relationship between the scales of architecture and product.
The tricks of decontextualization, jumps in size and cosmetic operations paved the way for a new circularity between architecture and design, as theorized by Alessandro Mendini and others. The result, after the experimentations at the 1980 Venice Architecture Biennale and with the support of a number of companies, was the miniaturization of the volumes on a building scale and the appearance of sectors dedicated to furnishings or complements in what were at that time medium-sized architectural firms. Among the most iconic results is arguably Mendini's *Tea&Coffee Piazza* commissioned by Alessi (Mendini 1983, Polinoro 1989), which featured table-wares by Mendini himself, Aldo Rossi, Michael Graves, Charles Jencks, Hans Hollein and others, i.e. architects who were leading the postmodern discourse while at the



Alessandro Mendini,
Alessi-Mendini, Dieci anni di collaborazioni, 1988.



RPBW, *Lingotto* spotlights, I Guzzini, 1990.

same time were involved in increasingly large orders and, as a result, were expanding the size of their studios.
In parallel and in alternative over the same decade, another channel of communication between architecture and design occurs in less theoretical and more empirical directions, as in the case of «transfers» from site specific projects to mass production for the market. Renzo Piano is certainly part of this chapter, first with architectural components (the ferrocement wings at the Menil-Collection, Huston 1982-87), then with proper industrial design (*Lingotto* spotlights, I Guzzini prod. 1990) (Bulegato-Dellapiana, 238-243).
To sum up, the combination of new lines of research, the favorable economic climate and the gradual transfer of meaning and value from manufactured goods to their creators (Lo Ricco-Micheli 2005) is behind the exponential growth in the size of architectural firms and in turn behind the emergence, within them, of sections – if not fully-fledged departments – dedicated to the design of products by architects.

All Great Architects are Designers (Even if They Don't Know It)

Since the Nineties, these paths have intertwined and blurred, with a unique clear common result: as the architectural firms linked to the authorship's mythography have grown in size, initially employing more than 150-200 people and in some recent cases even more than 400-500, with building sites in the four corners of the world, the design of «branded» objects has become a refrain, with variations depending on the signature in its original meaning of «style».

Returning to the Renzo Piano Building workshop, after the almost casual beginnings, relations were established with various companies for which the studio designed products in large and small series. The Piano studio signed household appliances for SMEG (since 1995), characterized by a choice of workmanship and materials evoking the High-Tech trend, systems for wooden furnishings for Riva 1920 (2002, with Matteo Piano) reflecting the research on «technological» wood being carried out in the auditoriums of Turin (1990-1994) and Rome (1994-2002), and even handbags for Max Mara (2016) signed by the RPBW but driven by Elisabetta Trezzani, as a merchandise linked to the opening of the Whitney Museum in New York, of which the clothing company was one of the sponsors (Asnaghi 2021). Sponsorship is certainly one of the most impactful aspects of the link between architectural projects and related products at this stage.

Something similar happens with the whole generation of the «first» archistars: Mario Botta, whose workshop employed more than a hundred people between the Eighties and the Nineties, designed furniture and furnishing accessories both for large companies (the *Shogun* lamp for Artemide, 1985) and for smaller, experimental companies (the *Prima – Quinta* chairs for Alias, 1982-1984), and also in domestic objects he re-proposed the same composition of volumes, made of materials with a 'hard' appearance, that he was experimenting with in the architecture of single-family homes or collective buildings (Pellandini-Boyer 2013).

It is worth remembering that the decade saw the completion of the Made in Italy branding process in the field of design – but also fashion, food and other symbols of the Italian *savoir vivre* – and that many companies started orienting their production towards the international market. The 'historic' companies aimed to recruit the most promising and mainstream names into

Frank O. Gerhy, *Little Beaver Armchair*, Vitra, 1987.

their ranks, and new companies were set up as design factories to ride the «Made in Italy» narrative conceived for foreign buyers (Dellapiana ft.).
One symptom of that could be the inclusion of many pieces (Botta's chairs, Alessi's teapots and kettles etc.) in the MoMA's permanent collection, and the fact that also other museums opened or reinforced departments entirely dedicated to design.
Similar approaches can be seen in the work of Norman Foster – one of the architects who best meet the definition of a Largest firm – who in 1986, while working on the Honk Kong & Shanghai Bank project, also designed a series of office furnishings (*Nomos*) for Tecno that recalled the reticular structure of the skyscraper and the combination with crystal surfaces. Similary, Gehry's experiments with alternative materials somehow resemble self-construction, as in the studies on plastic laminate in the *Fish* and *Snake* lamps (1983, Formica prod) or in the *Little Beaver* corrugated and pressed cardboard seats for Vitra (1987). The parallelism between

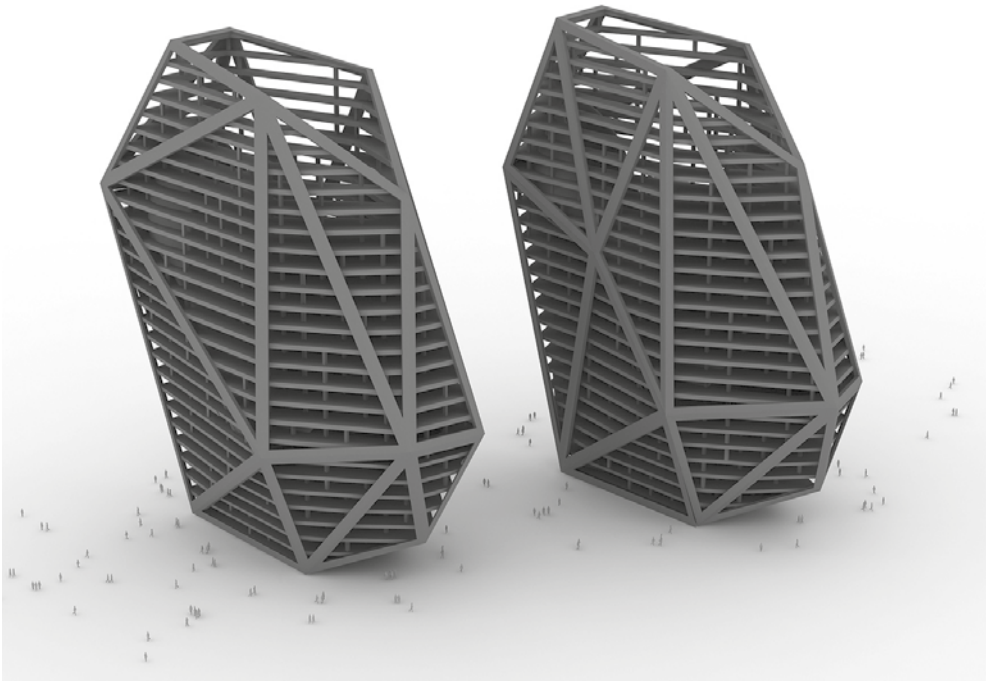
architecture and design can also be seen in the Canadian architect's distance from the objective of mass and serial production and, on the contrary, his cross-fertilization with the field of visual arts, another characteristic feature of his architectural research in the Eighties (Munson 1999).
The second «wave» of architects who were even closer to an artistic, authorial and recognizable vision of architecture, and who, precisely because of their very personal «style», have seen an increase in the number and importance of commissions and, consequently, in the size of their studios, are taking more and more extreme paths. Furniture and accessories are spin-offs of architectures destined for museums, exhibition containers and, in short, «signed» land-mark.
The *Spirit House Chair* (Nienkämper Furniture & Accessories Inc, 2007) was designed and produced to furnish in a coordinate way, Daniel Libeskind's Royal Ontario Museum and corresponds to the ideas of unhinging canonical orientations, breaking down volumes and reverberating surfaces (*Spirit* 2021).
Such works – which only rarely give rise to series and are closer to the idea of an artistic installation – are often produced in collaboration with people who master other disciplines than architecture, as in the case of the lighting system for Zumtobel (2012), based on a mathematical approach attributed to the designer's son, an astrophysicist, or in the case of the seating system produced in 2018 for David Gill's gallery and presented, along with the sketches, as artistic installations rather than objects for use. In some cases, this process origins engineered models ready for production, as in the case of the *Gemma* series (2015), which Moroso adapts from the original, rigid, heavy and demanding solutions for the Canadian museum, to obtain a version that is faithful to the original in shape but softer and more comfortable to use.
Obviously, the curiosity, the press coverage, the events surrounding such equipment only virtually intended for the house are all caused by the authors' reputation and the immediately recognizable correspondence with their respective architectural works. These objects are often overlooked by the traditional trade press, while blogs, house organs or tabloids treat them as curiosities or even artistic objects far from the domestic uses.
This is the case of the furnishing system and items conceived by Zaha Hadid to achieve the *Ideal House* (2007) with pieces by herself matching with Shiro Kuramata's ones (Red. 2011). The Hadid's firm is one of those with 400

Zaha Hadid, *Seamless* Furniture, 2006, Established & Sons and Phillips de Pury & Co., 2013.

to 500 employees and the *Seamless Furniture* (2006) (Red. 2000) and a large number of other pieces are projects of a specific design department, directed by Woody Yao and Maha Kutay. It deals with site-specific furniture, exhibit design, small series, collaborations with companies such as Alessi, Moroni, Ernesto Meda, but also clothing, jewellery and shoe manufacturers.

OMA's activities are more limited and variable in geometry (about a hundred employees in each decentralized studio), and it has only been involved in design since 2015 with the *Tools for Living* series for Knoll (Grima 2013; Lizza 2013; *Tools* 2021). Prior to production, a series of events in collaboration with Prada (Red. 2013) act as a forerunner both of future commissions (Fondazione Prada) and of the presentation of Koolhaas' philosophy applied to living equipment (i.e., more «mechanisms» than furniture). In this case the «design» spin-off appears, more than in others, to be a moment of patronage and communication to bring the public closer to the cerebral creations of the Dutch studio, once again with coverage by newspapers or lifestyle magazines (Barba 2021).

Although coming from architecture, as at the origins of the discipline, the picture briefly sketched is one of a «design» increasingly distant from its original practice



Rem Koolhaas, *Highrise Shoes*, United Nude, 2014.

and closer to visual art or, on the other hand, to pop phenomena (although scarcely affordable).
Perhaps merely coincidentally, Koolhaas' nephew, Rem D., after have been trained as an architect, set up a creative footwear company, The United Nude, in 1999, and over the years has worked with Zaha Hadid, Issey Miyake, Iris van Herpen and others (Prideaux 2019). The result is a sequence of extreme, artistic and «architectural» shoes whose main testimonial is Lady Gaga, as regularly recorded by the Gagapedians, but which obsessively refer to architecture (*United* 2021). The very first United Nude shoe, an elegant high-heeled slipper made from a single strip of steel (*Moebius,* 1999) is frequently juxtaposed with the Bauhausian Cantiliever chairs, referring to the continuity of the line that originates it and the use of the material. And if it can be done, as is evident, the circle of relationships between large architectural firms and design closes and anything is possible, with the blessing of the market.

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THE SNØHETTA MULTISCALE DESIGN METHOD

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Snøhetta is one of the highest mountains in Scandinavia, and its name and stylised profile also identify the biggest Norwegian design studio, which has been at the top of a range of categories in world rankings in the sector for some time. Today, this company has over 270 employees distributed across seven branches in Europe, America, Asia and Oceania, and promotes an interdisciplinary and collaborative approach to design that encourages complex, sustainable, multiscale creations in the sectors of architecture, landscape design, interior design, and graphic and product design. Such projects, along with the work processes they originate from, are taken into consideration by the author in the development of this paper, in a critical analysis made possible by a long, direct research relationship, in order to recreate the profile of a big contemporary design firm for which, if the classifications of branding or the creative industry are to be used, it must be done with quite unique meanings.

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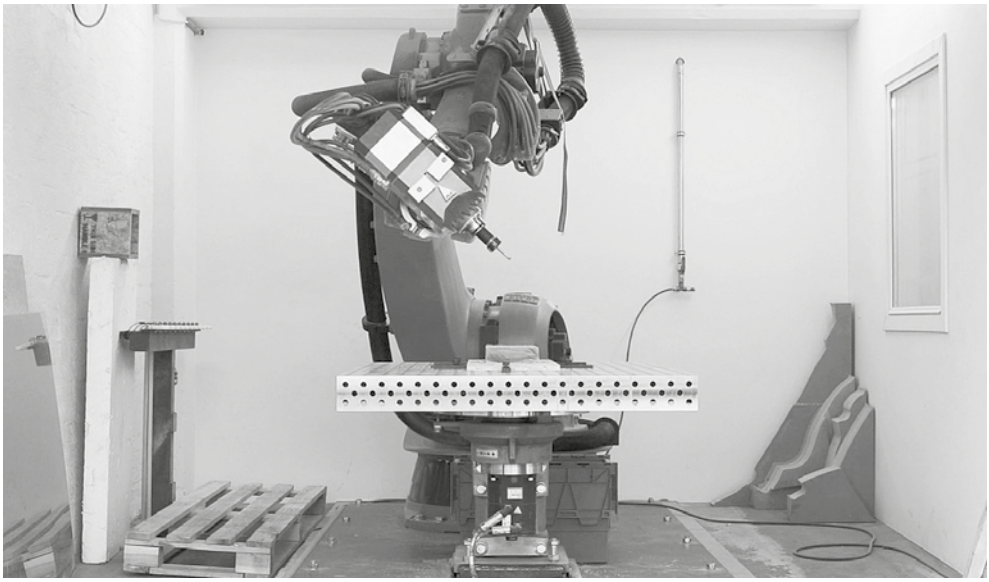
Keywords: Design method; Design process; Multiscale design; Sustainable design; Material design

Snøhetta is one of the highest mountains in Scandinavia, and its name and stylised profile also identify the biggest Norwegian design studio, which has been at the top of a range of categories in world rankings in the sector for some time. Chosen in 1989 by the founding partners, Kjetil Thorsen and Craig Dikers, for a new collective professional experience, this now well-known name, with its distinctive crossed-out letter O, has been synonymous for over thirty years with a design method deeply rooted in the long Nordic cultural tradition, for which architecture and design are intimately linked to people, nature and the climate. And the idea of the peak as a destination, a place and a physical and mental state to conquer before operating in the world, is at the heart of this method, not only in a conceptual sense: indeed, every year, at the end of the summer, the members of the studio climb the mountain they chose as their name, and gather in a pavilion they designed themselves, around a fireplace, facing the summit. This ritual symbolises the high value given to the concepts of journey and destination because – as stated in a principle declared by the founders themselves – «Snøhetta is a place nobody comes from, but where everyone can go».
So, inspired by the mountain that stands out white above the Nordic landscape, from work to work the large design team opens, not only ideally, a broad and profound view of the world; a view from the top that is not due to hierarchical ambitions, but the desire for a long-distance, all-encompassing perspective that, free of legacies and preconceptions, soars above in order to understand the complexity of reality, and to construct specific, articulated responses to contemporary demands. These solutions, along with the work processes they originate from, are taken into consideration by the author in the development of this paper, in a critical examination made possible by a long, direct research relationship.



Programmable manufacturing robot for 3D rapid prototyping at Snøhetta's headquarters in Oslo.

Design Method

Today, the studio employs over 270 people, of 32 different nationalities, in seven branches: in the now historic main offices in Oslo and New York, and in Paris, Innsbruck, Adelaide, Hong Kong and San Francisco, which, while operating across the board, have a strong incubator value for the constant renewal of the working group. Snøhetta's activity is based on interdisciplinary and experimental criteria; a collaborative method that drives complex, multiscale interventions in the fields of architecture, landscape design, interior design and graphic and product design (Snøhetta, 2021).

If we arrived in Oslo at the Snøhetta offices, which are facing the port, we would find evident the dimension of a big firm of contemporary design that can be defined as such not only on the basis of parameters such as quantity and consistency of assignments, their revenue, the number of employees or the articulation of the company structure, but also by virtue of the data relating to the quality of the work, such as the high incidence of structured positions, the interdisciplinary character of training and skills, the high level of gender equality and the multiculturalism of their human resources (Baunetz, 2021; Fast Company, 2021; Snøhetta, 2021). We would also fully understand the values and dynamics of a kind of work that is participatory and has no hierarchy. We would be welcomed around large tables, or in agoras on wooden steps, or in transparent rooms where – through dialogue – they design as a

collective; we would take part in prototype laboratory activities where the operation of numerically controlled robots is integrated with traditional machine tools for the modelling of scale models and mock-ups; finally, attracted by the smell of food, we would enter the open space kitchen, to have lunch in a convivial atmosphere, considered an integral part of the workday.
Before and after meals, the tables become surfaces for design activities, meetings or simple informal conversations. The prevalence of large surfaces for collaborative work, terraced steps and free seating instead of individual workspaces reflects fundamental values that involve the transparency of processes, flexibility and sharing. Nobody can book a table, and anybody can sit down at any point to join a meeting or a group, which of course has designated group leaders, but remains open to everyone's contributions.
In order to find and develop new ideas, Snøhetta practices the design *charétte* method, which is long and intense, and often open to the involvement of all the stakeholders of a project; creativity comes out through internal sessions using post-its and brainstorming, based on a playful approach, with the aim of activating processes of generative resistance and triggering debates; it also comes about through moments of transpositioning, where participants are invited to exchange professional perspectives in order to break disciplinary conventions and acquire empathy (Carlsen-Clegg-Gjersvik 2012, 105-109, 157-159, 171).
The approach to each project and its related conceptual projections passes through a narrative phase where, before starting to work on visual representations and physical creations, problems and concepts are mapped in words, in order to follow up on the initial intent to replace deep-rooted «ideologies» with a transdisciplinary logic created collectively, with the ultimate aim of composing a pluralistic scenario of comparison and choice. For Snøhetta, as the following assertions explain, introducing formal expression too early in the creative process could pull them away from the difficult task of verbalising ideas and reaching consensus in the work group on a general conceptual level that is rich and original.

> Early on, we typically avoid diagramming, which tends to condense design thinking into a single, isolated idea. In its lack of mystery and open-endedness, the diagram diminishes the potential for free association, multiple readings, and fortuitous accidents to occur within the creative process. Narrative, on the other hand, remains

Convivial moments and working around the tables in the Snøhetta offices in Oslo.

> fluid, variable, and open to interpretations (or productive misinterpretations). It allows us to envision many possibilities quickly before establishing an overall direction (Snøhetta, 2019, 10).

This is why, when working with elements of language and the relationships that can be established between them, words, before drawings, become tools for design, identifying the subjects involved in the creation and future life of a piece of architecture or a product, and imagining their possible relationships, in an analogy between linguistic structures and spatial and functional structures that appears evident once again in the methodological statements of the studio itself:

> We're particularly interested in the analogous relationship between the syntax of language and syntax of space, where pronouns (she, he, they, it, we) and prepositions (on, in thorough, with, into) are key to describe the way bodies

Collective design sessions at the Snøhetta offices in Oslo.

> interact with their environment. Deconstructed to its basic parts, language becomes a framework and a design tool for transforming imaged narratives into the real experience of new environments (Snøhetta, 2019, 9).

The collective approach to conceptual thought and the propensity to examine projects simultaneously from many disciplinary perspectives relies on maintaining a diverse body of staff in terms of training and skills, as well as on the high capacity for negotiation that the studio directs outwards, towards multi-head clients and subjects often with conflicting interests; the engineering of projects is then carried out independently, or collaborating with other large architectural or engineering firms: emblematic in this regard is the recent project for the Charles Library in Philadelphia conducted together with the U.S. giant Stantec (Hernandez, 2019).

I	*aboard*	everybody	*by*	themselves	*outside*
you	*about*	everyone	*despite*	one	*over*
we	*above*	everything	*down*	both	*past*
us	*across*	nothing	*during*	few	*per*
they	*after*	no one	*except*	many	*plus*
them	*against*	nobody	*for*	several	*round*
she	*along*	neither	*from*	all	*since*
her	*amid*	each	*in*	any	*through*
he	*among*	either	*inside*	most	*to*
him	*around*	something	*into*	some	*toward*
it	*at*	somebody	*like*	none	*under*
this	*before*	someone	*minus*	me	*up*
that	*behind*	myself	*near*	my	*upon*
these	*below*	yourself	*of*	his	*versus*
those	*beneath*	herself	*off*	hers	*via*
anybody	*beside*	himself	*on*	their	*with*
anyone	*between*	ourselves	*onto*	your	*within*
anything	*beyond*	yourselves	*opposite*	our	*without*

Mapping problems and concepts through words as an initial step of Snøhetta's creative process.

Snøhetta, pedestrian-only space of Times Square in New York, 2010-2017.

Designing for Cultural and Social Democracy

Listening to the proposals of the many operators, from the client to the contractor, as well as potential end-users, strongly influences the design processes promoted by Snøhetta, as a sign of respect and appreciation for the socio-cultural and environmental contexts in which it intervenes[1]. Works from the Nineties and the beginning of the Two Thousand, such as the Lillehammer Art Museum, the Karmøy Fishing Museum, the Sandvika Cultural Centre, or the libraries and museums built later in the United States, or even the Memorial for 9/11 and the pedestrianisation of Times Square in New York, or the Shanghai Opera House, today under construction, demonstrate the studio's commitment to programmes aimed at giving value to local culture and memory, supporting and developing art and handcrafts, and democratising culture and society, from large cities to the perspectives of decentralisation in even the most remote places. Along with the search for a true, sincere relationship with the environmental and human landscapes it is inserted into, a Snøhetta project practices a distinctive syncretism of languages: at times it presents a friendly disarticulation of forms and volumes, at others

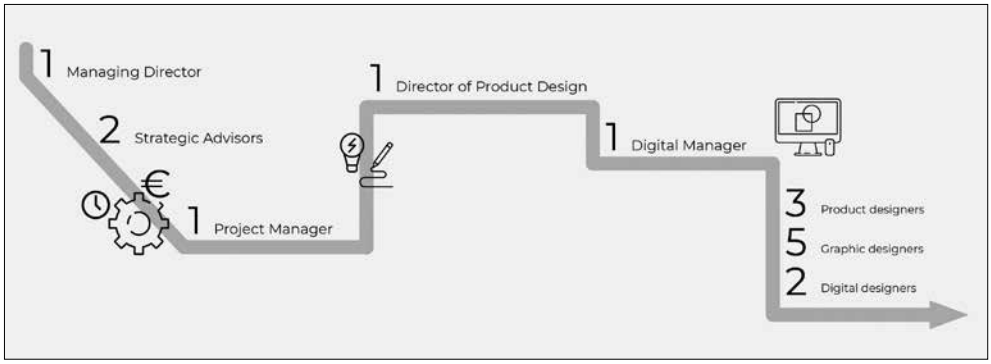
[1] Kjetil Thorsen (Founding Partner Snøhetta) in conversation with the author, September 2014.

the elementary figures of conceptual minimalism, and at others the sinuous plasticity of a liquid modernity, expressing an aesthetic of dynamic forms declined into many variations, made up of thickenings, rarefactions, slashes, twists, angled profiles, oblique ridges, box-like structures or enveloping surfaces (Turrini, 2014, 102-105). This syncretic practice, which blends and transfuses materials and languages into a process subject to continuous regenerations and inclusions, does not derive from one single theory (significantly, the studio has never produced publications of a theoretical nature, but rather essays relating to their design processes and methods), but instead metabolises diverse ideas, from those of Bob Somol, Sarah Whiting and Christopher Alexander that are more clearly aimed at architecture, to those borrowed from tangential or parallel disciplines such as aesthetics and land art (Lootsma, 2009, 71-83).

Having always operated on a global scale, Snøhetta modernises the Scandinavian tradition of architects and designers with a pragmatic, international approach, such as Alvar Aalto, Jørn Utzon, Ralph Erskine and Sverre Fehn, consolidating a style of method rather than language, symbolic for its ability to transform a multiscale design into an effective ambassador for culture and socio-environmental sustainability that often goes hand-in-hand – as we have seen – with high-profile political programs and ethical commitments (Saggio, 2010, 187-189, 232-235, 363).

Significant in this regard are works such as the Library of Alexandria in Egypt, the design for which Snøhetta began work on in 1989, or the Oslo Opera House, built between 2000 and 2008. The latter project in particular can be taken as a model of a rich, clear philosophy of intervention. The planning process for the theatre, led by the studio in all phases, was extremely well-structured; the worksite saw a succession of over 50 companies, called to construct a large building, particularly advanced from a technological perspective and loaded with cultural and symbolic value, not only for the city it was built in, but also for the entire Norwegian community.

Designed with a confident choice of materials and a high definition of the construction details, the building has a flat, engaging monumental nature, obtained by expanding the construction horizontally instead than developing it vertically; the concepts of free access and the stimulation of gatherings and congregations of people are at the heart of the design of the large, sloping stone surface, which allows people to come from the city and



The staff and the structure of the design department at Snøhetta in the Oslo offices, 2021. (Graphic scheme by Davide Turrini and Marco Manfra).

enter directly into the foyer or access the water, and then walk up, with various changes in incline, until they reach an accessible shelter/viewpoint (Turrini, 2014, 105-106). And considering this project, we can make a transition into the analysis of multiscale design, which, along with method, is one of the focuses of our attention; observing the complete, integrated design for the theatre, in all its aspects and parts, we are able to introduce the multiple scales and types of intervention that the studio has always dealt with – and for the last decade or so, with precise espansive purposes, creating a dedicated internal office for this – making our way downwards from the dimension of the landscape, the city and the architecture, through interior design, furniture design and product design, to two-dimensional graphics and the virtual world of digital interfaces. A further important concept to acquire is that relating to Snøhetta's persistent desire and ability to incorporate contemporary art into their works. The theatre is emblematic in this case as well: the curtain and other parts were created in collaboration with Norwegian artists, in an authentic revitalisation of the practice of applied arts (Snøhetta, 2008, 55-80).

Multiscale and Integrated Design

The design department is based in Oslo and is structured around 16 positions, but it should not be forgotten that in this case too, the global scale of operations and Snøhetta's integrated method involves – even for these types of project – intense exchange and convergence of skills and contributions, whether in person or through interactive collaborative tools such as *Figma*. This continuous debate around prototypes is yet again a constant in their workflow, in a single, multiscale approach that keeps the purpose and tension in providing the client with a holistic result unchanged – at a high level of creativity and quality – regardless of whether this client will be entering

Snøhetta, *Barr* cutlery set, prototypes and final products, 2017-2018.

a building, sitting on a chair, or appreciating a brand and a visual identity while surfing the web[2].

The design projects the studio has worked on, especially in the last decade, are numerous and varied. They range from furniture to product design, with pieces of furniture and everyday objects that avoid the dangers of rapid obsolescence in terms of form and function, thanks to their clean lines, high quality of execution and the solid, natural materials used in Scandinavian tradition, such as wood and ceramic, or thanks to recycled materials obtained from sustainable supply chains. We then move on to exhibition set-ups, installations and signage and wayfinding systems for cultural institutions all over the world, where the values of accessibility, inclusivity and clarity of the functional and distributive palimpsest are again evident, belonging to a style of design that we can observe in all its articulations. Snøhetta also has many-layered experience in retail projects, which have manifested in setting up real commercial spaces or online retail environments (the latter is now growing fast) that aim to highlight the quality of the products sold and the values underlying them, beyond the more short-lived dynamics of contemporary commerce and

[2] Sanda Zahirovic (Strategic Advisor Snøhetta Design) in conversation with the author, January 2021.

Snøhetta,
new banknotes design
for Norges Bank,
2014-2019.

communication. Finally, we have the many projects involving graphics and visual identity, in this case also both analogue and digital, created for public institutions or private companies, again taking inspiration from observation of nature and analysis of local culture. Design is the fastest growing area of focus for the firm in recent years, and due to its many forms and dimensions, as well as its immediate nature and the pervasiveness of its target, it is often interpreted by Snøhetta as an experimental testing ground for processes, techniques and materials, or to gain feedback from different kinds of users before getting to the level of architecture or city design (Turrini, 2014, 37-39).

Multiscale design, total and integrated project, identity and inclusivity are the conceptual cruxes of the studio's work, ideas on which we're going to proceed to reflect through a few emblematic projects, progressively decreasing in size, starting from *Stua*: a livable space conceived for *Ikea* through a series of joint workshops carried out with designers and technicians from both companies. It is a circular pavilion with an area of 20 square metres, made from wood and transparent materials, to place in an open-air space such as a garden or a courtyard; sold as a self-assembly kit, it is light and easy to construct for a small team of installers with the participation of the clients who have chosen it to expand the study, play or work areas of their home (Snøhetta, 2021).

The macro-object scale can be appreciated in the case of the *Vulkan* urban beehives, designed in cooperation with various stakeholders in the city of Oslo, able to stimulate curiosity about the symbiotic relationship between bees and mankind, as well as providing specific functional responses to the complex requirements of apiculture.
In an ideal journey from the «spoon to the city» round trip, the integrated design for the *Barr* restaurant in Copenhagen goes as far as the product design scale, and is characterised by a clear contemporary synthesis of local tradition that comes out in the choice of natural materials such as stone and oak wood, strong and minimal forms, and a simple, incisive, graphic languages. After designing the interiors and the visual identity of this business, the studio came up with a dedicated cutlery set that improves the experience of those working in the establishment and the clients themselves, at the same time offering itself as an ambassador of *Barr's* values and atmosphere, as it can be purchased freely thanks to a partnership with the brand *Table Noir* (Snøhetta, 2019, 20-21, 84-85).
The set was co-designed with the staff and the executive chef at the restaurant; the weight, the essential, solid forms, and the rough or glazed finishes give the cutlery an original sensory identity, in alignment with *Barr's* philosophy, by which every ingredient and its preparation is carefully selected to create authentic and original culinary experiences. The function of the tools is carefully designed for ergonomics and stackability, with handles cut and shaped to guarantee easy, pleasurable use, as well as allowing compact, tidy storage before setting the table.
Descending further down the scale of size and type of designs by Snøhetta, we arrive at an institutional identity graphic design project with strong symbolic value and, at the same time, notable social impact: the new design for the Norwegian krone banknotes, developed between 2014 and today, commissioned by the national bank. The studio's proposal links the metaphor of the sea –– so important for the prosperity of the country – to a graphic expression inspired by ancient Scandinavian mosaic artifacts, and abstracts all of this into the creation of textures of waves and pixels: the mosaics of our time. The textures vary based on the value of the banknote, in reference to the Beaufort scale, which measures the speed of the wind, and are enriched by tracings of the constellations that historically guided sailors. On the 50 kroner note the wind is gentle, the pixels are grouped in

solid, square shapes and the waves are long and calm; on the 1000 kroner note, the waves are short and choppy and the pixelated design is densely layered (Snøhetta, 2019, 140-141).
The arrival at the digital dimension can be represented by the website design for *Vestre*, a business that produces sustainable furniture for urban spaces. The company site designed by Snøhetta is particularly well-structured and innovative, not only because it includes an interface where potential clients can personalise and simulate the configuration of the products they are interested in, but also, and primarily, for two further reasons relating to content and communication. On one hand, the objective of the project was the clear narration of the unusual production background and the predicted life cycle of the products; on the other, it was based on an original formulation of exhaustive micro-texts that reject the simplistic approach of «click to learn more» in favour of more explicit dynamics that stimulate the desire to find out more thanks to buttons that pre-announce the content that will open, aiming for accessible and engaging surfing (Snøhetta, 2021).

Sustainability and Material Design to Seal a Peculiar Profile

As we have seen, a foundational principle of Snøhetta's activity is their constant, respectful relationship with the socio-environmental context in which their work is inserted. This can be summarised by the motto «form follows environment», and by a holistic direction of design that makes it unthinkable to use solutions not contextually sensitive or site responsive. This attention to context entails a poetics of environmental and social sustainability that comes back around, closing the methodological circle of values promoted by the studio, confirming how appropriate the a-hierarchical process of developing ideas is when the designers state:

> Thinking of habitat as both the underlying model and goal of good design help us skirt the pitfalls of professional collaboration as a hierarchical practice and develop more meaningful kind of disciplinary integration, opening up the process of design to more responsive typologies, more imaginative narratives, and more meaningful thresholds of experience (Snøhetta, 2019, 11).

Snøhetta, samples of material experiments with recycled plastic (left) and the *S-1500* chair (right), 2017-2019.

The sustainable approach also runs through the different dimensions and types of intervention, assuming a particularly rich meaning at the micro-scale of analysis and design (or rather redesign) of materials that are not yet configured into finished products, with experiments that aim to change public opinion about the performance and aesthetics of recycled materials and activate production chains in the circular economy. In the last two years, for example, Snøhetta has been working on research into used plastic. An initial objective was to understand the material, its life cycle and its influence on the value chain, as well as its formal and expressive qualities, with the ambition of changing its perception by producers and consumers so that it can be considered not simply as a waste, but as a precious resource and an opportunity for design. The research continued with experiments on the rigidity or elasticity of the plastic, its colours and its textures, to demonstrate to people at special events. Central in this process was the *Snøhetta Plastic Lab*, housed in a container clearly visible to the citizens in the port area of Oslo. Here, different treatments have been developed for waste such as fishing nets, hay bale films, pipes, packaging, office supplies, and polystyrene components of various types (The Explorer, 2020).

The first output of this research is the *S-1500* chair, conceived by Snøhetta in collaboration with the furniture

Snøhetta, samples of material experiments with clay, 2019-2020.

producer *Nordic Comfort Products* (*NCP*) as a re-edition of the *R-48*, designed at the end of the 1960s by the Norwegian modernist designer Bendt Winge, which sold over 5 million pieces to schools and offices all over the country. The entire production cycle of the *S-1500* is concentrated in the north of the country: the plastic to recycle for the body is 100% made from worn out nets, pipes and cords collected from local aquaculture companies *Kvarøy Fiskeoppdrett* and *Nova Sea*; *NCP* has a branch in the same county; and finally, the frame and the legs of the chair are made from recycled steel, and also fit into the local circular economy that has been created, as these also come from a company in the area (The Explorer, 2020).

If the original objective of the research into materials was to transform waste into aesthetically original products with sustainable design, we can say that the *S-1500* fully succeeds at realising these intentions: the plastic is collected and reduced into used granules to produce the body through moulding and injection, a technique that allows exactly the amount of raw material necessary to be used – in this case, 1500 grams of recycled plastic – without excess waste and without the need for further finishes; the chair is made to last a long time, and as the recycled material contains no additives, it can be re-melted and used again and again; the colours of the fishing nets and the other waste used blend into a

characteristic dark green colour with a marbled texture, so no added colour is necessary; finally, the project has inspired the industry to continuously use recycled plastic in new ways. Indeed, *NCP* is launching a new designer lamp made with similar criteria (Hitti, 2019).
The exploration of the method and works of the studio could continue, outlining ever more effectively the characteristics of a particularly significant piece of the current phenomenology of the large global design firms, for which, if we want to use the classifications of branding or the creative industry, we must do so with quite unique meanings. However, we must leave Snøhetta as their work continues, as they accept the task of taking on different cultures and landscapes at all latitudes, on all continents, without ever forgetting, however, to return to their origins; to the snow-covered Nordic nature that in recent months they have been studying and recreating in immersive sensory spaces, conceived for the hospitality and wellbeing sector, or to primitive materials, in a literal «return to the land». Indeed, the project on plastic has recently given way to a similar research on clay as a building material, in a sector, such as construction, with a high environmental impact both in terms of consumption and emissions. Clay is a raw material found in large quantities in almost all places around the world, is extremely versatile, and has excellent aesthetic and structural qualities and thermo-acoustic insulation. It is therefore local, sustainable, ideal for creating quality living spaces, and the studio has placed it at the centre of their cradle-to-cradle experimentation aimed at design and production innovation: even though this material has been widely used since antiquity, there are still many unexplored possibilities connected to it, such as those relating to the use of rammed earth apart from the more usual firing process to obtain terracotta (Snøhetta, 2021).
In conclusion, as a final analysis, through the creation of many political or cultural programmes that become constructive or productive, Snøhetta demonstrates the practicability of a model characterised by strong, unique traits; a benchmark example, hopefully replicable in which the characteristics of an advanced, complex organisation, as well as the operational efficiency in responding to the competitive global situation marked by more restricted timelines and budgets, coexist virtuously with respect for the context of the intervention, with the ability to provide multiscale solutions, while maintaining authorial recognition that is not personal, but collective.

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ZAHA HADID ARCHITECTS. FROM ARCHITECTURE TO DESIGN, THE DESIGN SEARCH FOR A LANGUAGE OF IDENTITY

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This paper investigates the formation of Zaha Hadid's design language in parallel with the development of her practice, Zaha Hadid Architects (ZHA), and the founding of the Zaha Hadid Design (ZHD) branch in 2006. ZHD was founded with the aim of finalising collaborations with industries from a wide range of sectors, developing new technologies and methodological approaches for furniture, fashion and product design of every kind. The birth of ZHD in some ways marked the point of arrival of Hadid's studio along the path from an almost artisanal dimension at its foundation in 1980 to the gigantic machine it is today, with over 400 members, capable of dealing with the most diverse orders spread over six continents. Hadid was a global architect before the term acquired its current meaning, thanks to her ambition to use architecture as a unifying force. Her autonomous and identity-driven language that moves from the scale of the building to that of the object confirms her approach.

Elisabetta Trincherini works in the field of the culture of design and the relationship between artistic production and cultural habitus. At the University of Ferrara, she teaches Design Theory and Criticism in the Industrial Product Design course. She has taught at the Accademia di Belle Arti in Florence, the University of Siena and Oklahoma University. She has worked together with institutions such as: the Ragghianti Foundation, Swiss Radio and Television, the Pecci Centre, the Palazzo Strozzi Foundation, the Canadian Centre for Architecture in Montreal, the Institute of Contemporary Art in Miami. Since 2017 she has been in charge of the Historical Archive of the Poltronova Study Centre for Design and the related exhibition, cultural and editorial activities.

Keywords: Zaha Hadid; Design; Suprematism; Non-Euclidean geometries; Brand

Zaha Hadid was born into a cosmopolitan family in Baghdad in 1950, and grew up in a rapidly developing Iraq where architecture was part of the nation-building process (Hadid 2011). She studied mathematics at the American University in Beirut, just before the long Lebanese civil war. In 1972, perhaps struck by reading *Town and Revolution. Soviet Architecture and City Planning 1917-1935* by Anatole Kopp (Kopp 1967) – which famously investigates the expression of «new space» in line with the Revolution – she moved to London to study at the Architectural Association, then headed by Alvin Boyarsky (Marjanović-Howard 2014).
After graduating, she moved to Rotterdam to work and then into a partnership (1977) with her former professors in London, Rem Koolhaas and Elia Zenghelis. Her professional origins are therefore linked to the O.M.A. group, and there are recognisable cues and openings that recall the architectural experimentation of the Sixties and Seventies, also and above all Italian. It is no coincidence that Zaha Hadid's first Italian exhibition held in Fiesole in 1982 – a group exhibition that, together with Hadid, brought together some of the brightest students of the Architectural Association at the time, including Nigel Coates, Jenny Lowe and Peter Wilson –, was commissioned and curated by Gianni Pettena (Pettena 1982), who also taught for a period at the prestigious Bedford Square school of architecture, and belonged to the Italian Radical movement. A movement that had certainly exerted an influence on the work of Koolhaas and Zenghelis and on that of Hadid herself.
Leaving aside the milieu in which she completed her training and in which her professional debut took place, no one can doubt the creativity and independence in terms of design language which Zaha Hadid, in her early thirties, already showed.

Her works after her departure from the O.M.A. group, which coincided with the founding of her studio in London (1980), such as the transformation of *59 Eaton Place*, are not only creative and provocative. In fact, they envisage a new aesthetic that Hadid arrived at through new languages compared to the «glorious past» celebrated by postmodernism. Her references, often purely in terms of formal language, were more to be attributed to the Russian avant-garde of the early twentieth century (Bliznakov 1972) than to certain formulations and visualisations of neo-modern design. In this sense also the residence of the Irish Prime Minister in Dublin, (1979-1980), perhaps Hadid's first important project, although never actually built.
Hadid herself pointed this out and her graduation work at the Architectural Association, *Malevič's Tektonik* (1975-76), left no doubts in this regard. This was further emphasised in the exhibition Zaha Hadid and Suprematism at Galerie Gmurzynska in Zurich in 2010, which gave rise to a publication of the same name in 2012. (Douglas-Obrist-Gmurzynska-Hadid 2012).
If this is true in the strictly formal sphere of design production, it is also true from an exquisitely theoretical point of view. In fact, for Malevič, a painting was a sign that defines existence as an equation between an external and an internal world; it was not an object, but a mind tool. The creation of a language as a mental tool was fitting for Hadid too, although her aim had always been to design architecture that was concretely realisable, as opposed to the previous phase of utopian-designed architecture – even though this too had been of interest to her. In the same way, the equation between interior and exterior theorised by Malevič expressed itself, in the most mature phase of Hadid's production, in an evolution towards spatial continuity, abandoning fragmented, broken lines in favour of a sinuous curve moving from the interior to the exterior and vice versa, without any break. One of the many examples of this is the Heydar Aliyev Center in Baku (2007-2012) (Giovannini 2013).
Hadid's itinerary had therefore been pictorial before being architectural, before returning to decorative art, the results of which are particularly visible in the work of Zaha Hadid Design.
The use of the pictorial medium is visible both in the development of her language and in her production, which initially, when construction opportunities were still limited, was largely dedicated to research and to taking part in competitions, with contributions that were often pictorial in nature.

Zaha Hadid Architects, MAXXI, Rome, 1998-2009.

It all happened very quickly: Hadid's London studio, founded in 1980 with just a few collaborators, grew to a hundred in just over a decade.
The Nineties saw the massive introduction of computers into design, which led to major changes in the definition of Hadid's language. This development coincided with a major change in the Iraqi architect's designs, and gave them new life. From the mid-Nineties onwards, Hadid became increasingly interested in complex, curvilinear and fluid-dynamic forms that could also be conventionally drawn by hand, but which the introduction of certain software made much more immediate and accessible.
The Hadid studio was still making sketches and pictorial contributions – though perhaps more for exhibition purposes and therefore lacking the earlier expressive urgency – during the realisation of two key designs in the evolution of the practice: the National Museum of Twenty-first Century Arts in Rome (1998-2008) and the Rosenthal Centre for Contemporary Art in Cincinnati, Ohio (1997-2003) (Woods 2008).
These projects, and perhaps particularly the Italian one, marked a sort of watershed within the studio between the

years of experimentation and design research, carried out with no more than fifteen collaborators, a phase which brought out Hadid's language but which still raised perplexities about the actual possibility of building those projects, and the years of the definitive transition to large-scale construction with consequent global consecration and a team of 400 people at work.
These were also the designs that mark the transition from the broken line to the curved and sinuous one. The shift to exclusive use of computers in designing made possible the construction of the unprecedented forms, the «new space», which have become Hadid's signature to this day.
Zaha Hadid's aesthetic has an important reference in fragmented geometry, which comes from both the Suprematist avant-garde and mathematical studies. Perhaps it is not surprising that the very Arab propensity for mathematics and geometry, and therefore towards abstraction, led Zaha Hadid towards Russia.
This at a time when the most advanced elements of that culture were developing the concept of abstraction in art. The Russian/Soviet avant-garde had also been a benchmark for other architects of that generation. Koolhaas himself had looked to it, although he was more interested in an alibi to start again from a metaphorical «degree zero» of architectural production that could wipe out both what he saw as the negative aspects of modern architecture, and the equally despicable return to historicism in vogue at the time.
Hadid, on the other hand, looked to Malevič, exploring his forms, indifferent to dimensional scale. For her, abstract art and architecture potentially had the same degree of concreteness. *The World 89 Degrees* (1983) goes beyond Cartesian coordinates, shows the curvature of the earth, and subverts every known horizon. Kandinsky's nephew, the philosopher Kojève, had also convincingly argued in an essay dedicated to his uncle that traditional representational art is abstract in the sense that it 'abstracts' from the world of the objects and motifs it depicts. So-called abstract painting, on the other hand, does not 'abstract' anything from the world but creates new forms, and can therefore be defined as 'concrete' painting (Kojève 2005).
Digital technology was beginning to make the translation of her non-Euclidean approach to form into built architecture truly possible. The mathematical aspect on which her design language is articulated concerns in particular the geometry of «Attractors». An attractor is a whole towards which a dynamic system evolves;

Zaha Hadid Architects, MAXXI, interior view, Rome, 1998-2009.

the description of the trajectories produced during the evolution of the system is one of the elements investigated by the design process (Ruelle 1989).
In mathematics there are also so-called «Strange Attractors», an attractor is called strange if it is a set with a «fractal» structure. A fractal repeats itself in its own form in the same way on different scales, and so enlarging any part of it produces a figure similar to the original. Similarly, the leap in scale starting out from a formal identity is one of the keys to Hadid's language. Fractal geometry is the non-Euclidean geometry that studies such recurring structures. Fractals also exist in nature and describe very branched forms, if one section of them is enlarged, one will come up against the same geometric configuration again.
We may also reflect on the fact that a dynamic system evolving in time and space generates figures from the trajectories it draws. In the same way, the design process at the end of its unfolding crystallises an architectural or design product that is the final synthesis of a series of starting variables. Many such identifiable forms of Hadid's language are based on strange attractors on the one hand, and on Malevič's spatial intuition on the other. Her apparently impossible creations, far removed from the certainties of Euclidean geometry, in fact end up transforming constraints into spatial opportunities.
The design activity of the ZHA studio, in the global context, involves development of an autonomous, original and strongly identifiable language based on the assumptions we spoke of before. In this language there is no difference, either in scale or in the way of proceeding, for either object or architecture – the architecture is summed up in an object and the object serves as a prototype for the architecture.
To give just two examples, the Crevasse vase for Alessi and the Hadid tower in Milan for City Life are realisations of the idea of the fractal and of this modus operandi.
In other words, identity of architecture and object. The *Crevasse* vase for Alessi is a project that presents two vases cut from a single block, cut diagonally to create deformed and upside-down surfaces, either to be connected as solid forms in playful interconnection, or to stand alone as distinct objects. The «Hadid Tower», the Generali Tower for City life in Milan, was the result of the 2004 competition to redevelop Milan's trade fair district, following the relocation of the trade fair to Rho. The building's distinctive feature is its torsion, which becomes less and less pronounced as its height increases, until

Zaha Hadid Gallery, external view, London.

it becomes vertical. The two forms are almost identical, though on completely different scales.
Today, the Zaha Hadid studio has some 400 employees in two locations, London and Beijing. In London, the studio's space is located on the upper floors of a building on Bowling Green Lane, whose ground floor houses the Zaha Hadid Gallery. The gallery was initially conceived as an exhibition space used exclusively by the studio's clients, who needed to see projects in progress or completed. It featured skyscraper models as well as bags, jewellery, tables, bookcases, vases, shoes and much else. The gallery has since evolved, becoming exclusively an exhibition space with its own public opening hours.
The Zaha Hadid Gallery has also changed in terms of its openness to the city, and is therefore set up from time to time according to the main events taking place in London.
To describe the organisation chart of the current studio, a gigantic creative machine, we can imagine a pyramid starting from the bottom up, made up of 70 lead architects, 55 Associates, 30 Senior Associates, six heads of management, 16 Associate Directors, 18 Directors, five board members. On its website, the Zaha Hadid studio

team presents itself with some 200 individuals; of the 18 directors, first step below the board, two are directors of Zaha Hadid Design.
ZHD was founded in 2006, but since its inception Zaha Hadid Architects has explored and expressed the formal, structural and material strategies within its architecture through product design. ZHD's two directors, Maha Kutay and Woody Yao, are among the 18 directors in the organisation chart, and the team specifically dedicated to design is permanently made up of 15 people, although this composition is flexible depending on the needs of the moment and the orders in progress[1]. ZHD was created to collaborate with a variety of industries, researching and developing new methods and technologies for product, furniture and fashion design. When Kutay and Yao were asked whether ZHD design was born out of internal or external needs, in other words, whether it was certain industries that had asked for collaboration, or whether the decision to set up a branch specifically dedicated to design had been developed within the studio, they replied that it was an internal need. The need arose as a natural and inevitable consequence of a process that had always paid special attention to the decorative aspect of the product. Yao also pointed out that for some years prior to the founding of ZHD, in large-scale competitions, part of the order concerned the final architectural aspect of the interior design and the product.
The designs of these products confirm Zaha Hadid's strong affinity for mathematics, which is embedded in the DNA of the studio's methodology and design process. The issues that the production of new products inevitably brings with it are solved, as happens with architecture, by pushing ahead the boundaries of what is possible. This process means that ZHD's projects are placed within an architectural perspective in which furniture, jewellery, shoes, bags and so on contribute to making explicit the research carried out by the studio on new ideas, new materials and technologies.
An example of this attitude to design is *Moon System*, a sofa produced for B&B Italia, in which the idea of a traditional sofa gives way to fluid forms: the backrest, seat and armrest are as if merged into one another, and the final dynamism is again well explained in terms of the geometries of attractors.

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1 Maha Kutay and Woody Yao in conversation with the author, 9 February 2021.

The *Mesa* table, made by Vitra with a polyurethane base, fibreglass for the top and a metallic paint finish, can be read as a sort of microcosmic extrusion of the spatial ideas inherent in Hadid's architecture (Fairs 2021). In this case, there is a clear reference to the site-specific installation for Art Basel Miami, *Elastika*, for which ZHA created an intervention that engaged in a dialogue, while marking the difference, with the Moore Building, built in 1921, which housed it. Here too, as with the Crevasse vase and the Generali Tower, the two designs maintain an identity of language on completely different scales: the table encapsulates the strength of the architectural dimension of the installation project.
The *Marea* bookcase for Magis is made of square modules which can be assembled infinitely. On the one hand, the design recalls the mathematics of «optimal» geometries and the symmetrical fragmentation of fractals. This refers to geometries whose origin is a derivative that calculates the dimensions of the modularity that adapts optimally to the surface on which the module is placed. On the other hand, the white, red and black of the models are a reference to Malevič's Suprematist composition, *Black Square and Red Square* on a white background.
Here the material aspect is also of particular interest: *Marea*'s modules are of a biopolymer of natural origin made of lignin and cellulose, an environmentally compatible compound similar to plastic in terms of its technical and mechanical characteristics (it can be cast in moulds), but its vegetable origin makes it decomposable and recyclable many times over.
It has the same design flexibility as plastic but is produced from one hundred per cent renewable sources.
Partnerships with the fashion world play an important role in ZHD's design activity. Classic designers such as Versace, Balmain and Cardin all studied architecture before turning to fashion, while archistars such as Frank Gehry and Zaha Hadid successfully experimented with jewellery (Abbasi Mahmoud 2018, 675), shoes and bags. What for some architects was a sort of time out from the discipline, for Hadid was an experience of the same intensity and relevance.
The studio's product design in this area combines new digital design with the skills of traditional manufacturing and craftsmanship. An example is the jewellery for Bulgari (2016 and 2018): the design evolved from a set of principles laid down by ZHD to address a range of criteria to be taken into account. These criteria include: the material performance of gold, the predetermined

dimensions that incorporated a flat surface for engraving the BVLGARI motif, and the volume of gold within each piece. These constraints had to be subordinated to the work to be done at a level of detail that showed the expertise of Bulgari's jewellers, who create each piece by hand. As with architecture, the constraint had to be transformed into an opportunity.

During her tenure at Louis Vuitton, creative director Marc Jacob invited Hadid to design her version of the French fashion house's iconic bucket bag. Conceptually, reinterpretation starts from the essential function of the container, followed by a series of physical interventions, extrusion, distortion and cutting of materials. The bag was shown at the *Icons* exhibition in Paris in 2006. This shows that behind the choice made internally at the studio, right from the foundation of ZHD there was a demand that, by 2006, was also coming from outside, permanently transmuting it into a gigantic 360-degree creative machine. Nor can we rule out the possibility that at that time, given the studio's enormous size, the design branch must have represented for Hadid a sort of free zone of creative liberty in which to apply her design methods and language.

At the same time, for the *Icons* exhibition, Hadid designed *Eolia*, a display support for the bags, the result of an exploration of container and content, structure and void. Like the bags, each sculptural base/seat *Eolia* is interchangeable within a larger composition.

In 2013 ZHD also partnered with manufacturer *United Nude* to design not just a new shoe but a whole new method of shoe production. In fact, injection moulding and rotation along with vacuum casting were used to create *Nova Shoes'* seamless upper. Striations juxtaposed with realignments express the primary structure of the shoe, which incorporates a cantilever system that allows the heel, placed 16 centimetres high, to appear unsupported, just as happens in the cantilevered volumes of Hadid's architecture. The effect for the wearer is reminiscent of Boccioni's *Unique forms of the continuity of space* (1913), and perhaps this too is no accident.

The shoe combines innovative materials and ergonomic considerations with the dynamism of Hadid's typical architectural language that conveys an intrinsic sense of movement. It is worth emphasising that this was a limited edition, 100 pairs in three available colours. In this case, the impression is that what drove an operation like this, and therefore the logic implemented by the studio, was perhaps not so much a return from a strictly

Zaha Hadid Design, *Plex Vessels*, 2020.

commercial point of view but the same approach that guides architectural commissions: making something that seems impossible through a high level of experimentation and research.
A different case was the collaboration between the Hadid studio and the Brazilian shoe manufacturer Melissa – already known for its talent scouting for architects who lent themselves to the cause, such as the Campana brothers – with whom a model signed by Hadid was put into production to be sold on a larger scale. Among the limited editions are two pieces made for the London-based David Gill Galleries: the *Liquid Glacial* table (2012), limited to just eight pieces, and the *Ultrastellar* chair (2016), edited in 144 pieces. The former looks like a sort of transparent, liquid sculpture in which the geometry evolves from static to dynamic thanks to the ripples that seem to break through a surface made of water. Like *Liquid Glacial*, the *Ultrastellar* chair, made of walnut wood, is also endowed with a sculptural sensibility, staging the exchange of forces derived from ZHD's explorations into the relationships between structure and surface.
On the opposite front stands the *Zaha Hadid Design Collection*, created to respond commercially to the great

Zaha Hadid, *Elastika* at Design Miami, 2020.

demand that Hadid's work had generated. The label was developed to showcase a selection of homeware and gift items retailed globally in selected shops and online. It too operates under the guidance of ZHD co-directors Woody Yao and Maha Kutay. The label includes products that, even when made in series, stand out for their intrinsic material and, above all, design quality.
The studio chose to place these products in various market brackets, preferring the buyer not on the basis of economic targeting but by seeking out those able to read the design and semantic complexity of the object. After all, architecture which becomes an object of design involves an aesthetic, sensorial and communicative level. We can say that it is naturally also a status symbol, i.e. a phenomenon mediated by a marketing strategy.
ZHD has therefore designed both in small and large scale, and even made unique pieces. The phenomenon of design collection has grown exponentially, partly linked to events in the fashion world and partly linked to a mix of social, cultural and emotional factors that change over time. ZHD's productions, due to their physicalisation of motion, seem to be able to follow this dynamic evolution, as do the systems on which they are based.

In *Fantasia*, Munari explained how the role of invention and creativity is based on subversions that may involve size, scale, motion, material, etc. (Munari 1977). ZHD undoubtedly subverts all the canons of purely functional design and establishes a language scientifically based on the overturning of known codes (and of the geometries we can directly experience) that impresses and amazes. In ZHA, this profoundly innovative and creative aspect, both with respect to the final result and to the production and design process, was accompanied internally by an awareness of the possibility of «branding» that language and process.

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PROCESSUALITY IN CONTEMPORARY ART AS IT RELATES TO THE ARCHITECTURAL AND LANDSCAPE CONTEXT

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Contemporary art is now studied through an interdisciplinary approach. The analysis of the aesthetic aspects is sided by sociological and iconological studies. It is therefore important to analyze the work of art through the study of the artist's personality and, at the same time, the results of his research and his vision of the world. Furthermore, when art is confronted with the landscape or urban spaces, it is important to deepen not only the outcome and the iterations with the environment, but also to reconstruct the entire organizational process that allows to reach the final result. This paper presents the results of a seminar held at the School of Specialization in Architectural and Landscape Heritage of the University of Florence, where the students examined a series of projects, digging out the questions that arise in the passages from conception to realization of a work of art. In those cases, the traditional concept of authorship has to find new epistemological categories, capable of restoring the 'picture' in its complexity.

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Keywords: Contemporary architecture; Contemporary art; Environmental art; Design thinking; Art and urban contests

In the interview opening the new edition of the catalogue of the well-known exhibition *Ambiente/Arte. Dal futurismo alla Body Art* Germano Celant, with great rhetorical effectiveness, briefly reconstructs the critical path that led him in the early Seventies to research the «practice of constructing environment» (Celant 2020, VII). With the 1976 Venice exhibition, Celant consolidated themes and cultural orientations that had become stratified over more than sixty years, which can be circumscribed in the expression «environmental art». The common thread that informed the exhibition project, and that it highlighted and enhanced, was therefore the relationship between a work of art and space, outlining an itinerary that unfolded over time, starting with the historical avant-gardes, and that – thanks to the experiences of the Sixties – achieved the expressiveness of the following decade with experiments that were capable – according to Celant – of «cannibalising the space» (Celant 2020, VI). Celant's cognitive operation of restoring the increasing complexity of the theme has highlighted some critical aspects underlying the study of art in relation to architectural, urban and landscape space, which are largely also valid for studying the aesthetics of hyper-contemporality in relation to the qualities of the space: among them, the often ephemeral nature of the works stands out, or in any case the importance of solidifying the creative process which gives rise to the need to analyse all the phases, also developing specific and interdisciplinary interpretative tools (Acocella 2017).
It is well known that, in general terms, the art-work binomial, from a twofold ideal and factual perspective, has been sent into crisis by conceptual art. This latter, with the deflagrating and definitive splitting of the hendiadys *ars-tecnè*, results in the completion of instances that had already germinated in nineteenth century modernism, which then fully coagulated around

the figure of Duchamp, as Hans Belting pointed out: Belting's refined exegesis of Duchamp's *Large Glass* is a central element of the itinerary outlined by the author on the idea of a masterpiece in twentieth-century art (Belting 2018, 366-379).
In contemporary art that creates relationships with the space, therefore, the theme of art as an idea that transcends the physicality of the work is certainly a fundamental aspect. From the perspective of the architecture historian, when the work embodying that idea forms a relationship with a spatial context, and in a circumstance where the quality and the «invariants» of that context take on characteristics that could be defined as deterministic, it seems important on the one hand to bring out the *a priori* elements that qualify that «space» and on the other hand to analyse the figures that play a leading role in the whole process and decisively contribute to the final result of the work, in its physical-material, perceptive and reception/communication components with regard to the public (both critics and ordinary spectators).
This reverse engineering of the process of conceiving and creating a work of environmental art evidently leads us to review the traditional hendiadys work-author, too often emphasised in mass communication (and elsewhere), for obvious reasons of branding and therefore marketing (with interpretations similar to those of the works by 'archistars'). On the other hand, it should be noted that the most attentive studies in this sphere always highlight the culturally barycentric position of those who organically oversee the technical implementation and «staging» of the work (Celant-Niccolini 2004; Celant 2010), either as a curator-stager, or as curator-designer or purely as a technical consultant: the attention paid by critics – even historical-architectural ones – to figures such as Frederick Kiesler, Arnold Bode, Harold Szeemann and, in the younger generation, Hans Ulrich Obrist, is significant evidence of this (Obrist 2008; Stazzone 2014; Green-Gardner 2016; O'Neill, 2016; Bann 2019). These historiographical studies therefore reveal that a leading role, alongside the artist that creates a work of environmental art, is played by a figure who does not have a standard professional profile but is often either an architect or in any case a professional with specific expertise in managing the expressive and technical issues involved in the creation of works in space, in the broadest sense of the term. In this regard, I would like to make a brief

Jeff Koons,
Pluto and Proserpina,
Piazza della Signoria,
Florence, 25 September
2015 - 21 January 2016.

digression given that these reflections also concern the world of the professions, in addition to student architects. In a recent book, Maddalena D'Alfonso called for architects to have greater prominence and greater awareness in the «staging» of contemporary works of art in existing museum spaces, as well as in the creation of museums specifically designed to accommodate present-day creativity (D'Alfonso 2017, 55-56). Analysing and therefore enhancing the contribution of the architect (according to the profiles and roles mentioned above) in the analysis of installations and works of environmental art in an increasingly extensive and continuous way is, in my opinion, not only an important aspect of critical exegesis to overcome the simplistic duality of artist-work, but it is also relevant from a purely educational perspective. I believe we have a duty to make increasing efforts at both cultural level *tout court* and educational level in particular, so that architects' skills can be increased in this area (Rykwert 1993, 68-69), also in relation to the ethical aspects implied in the fetishistic tendencies of the market. This is in order to ensure that architects are capable of developing adequate heuristic tools when they find themselves alongside an artist who

works with/on the environment, but also in situations where – as 'conservators' – they are responsible for checking and controlling the results and cultural, social and economic impacts of the work in the context, and the case of Jeff Koons's *Pluto and Proserpina* (2015) in Piazza della Signoria in Florence is quite exemplary (Bartoloni 2019). In this regard, it should be noted that very few cities in Italy have specific permanent commissions to govern the processes of selecting and implementing contemporary art projects in historical contexts or landscapes.

This long introduction – which seeks to clarify the presence of a contribution of this kind in the context of this volume – whose explicit themes include the various interpretations of the concept of authorship in the context of works by large design firms and the heuristic tools to be developed for the purpose – lays the groundwork for the presentation of a multi-year research project, the initial result of which was a seminar held at the School of Specialisation in Architectural and Landscape Heritage at the University of Florence (Academic Year 2019-2020). A number of case studies were selected in which insertion into a particularly complex context with specific historical-architectural, urban or landscape value was the foundational basis for the artistic project. The case studies include works produced for the most part in Italy, between the Eighties and 2017, and cover various forms of expression by both established and emerging artists. The analysis was conducted on the basis of bibliographic and sitographic sources, but above all using interviews with the artists and the various figures involved in the conception and implementation process. The creation of the work – in terms of the bureaucratic, organisational, financial, construction site and subsequent staging/setting up aspects – was the main focus of the seminar: these themes, developed from a comparative perspective, focused specific attention on the relationships and hierarchies between the various 'actors' in the field and, in particular, the role of architects and conservators, as well as that of curators and patrons, also considering the forms of financing and the communication/reception aspects of the works themselves.

One of the themes that clearly emerges from the cases analysed is the weight in the economy of the work of the implementation of complex and specific «actions», above all by architects and engineers, which allowed them to respond pro-actively to various and highly stringent

constraints. The analysis of the reification of the idea has shown that these aspects are so important in the economy of the enterprise that they affect not only the smooth progress of the whole process but, above all, the final result. As could be expected, but at times with unexpected evidence, it emerged that interacting and interdependent skills had been mobilized, in addition to highly qualified and qualifying knowledge, so much so that such enterprises could be read as actual collective works of art. At this point, we wondered whether the traditional concept of authorship should be reviewed on the basis of the bearing of the individual 'actors' and their capacity to govern complexity. Over the course of the research, we clearly perceived the danger underlying this anatomization of the work, namely the tangible risk that the artist/author might disappear: moreover, the «death of the author» is a topic that in literary criticism, starting with Foucault, is now the subject of a multi-layered in-depth study.

> The author function – writes Foucault – is linked to the juridical and institutional system that encompasses, determines, and articulates the universe of discourses; it does not affect all discourses in the same way at all times and in all types of civilizations; it is not defined by the spontaneous attribution of a discourse to its producer, but rather by a series of specific and complex operations; it does not refer purely and simply to a real individual, since it can give rise simultaneously to several selves, to several subjects-positions that can be occupied by different classes of individuals (Foucault 1969, 17).

However, if the «author function is therefore characteristic of the mode of existence, circulation, and functioning of certain discourses within a society», renouncing it would mean accepting that the contents of the work and their manifestations take place «in the anonymity of the murmur» (Foucault 1969, 17). The road is therefore very narrow: on the one hand, all the organisational, administrative, economic and regulatory factors pertaining to the context in which the work of art will take shape in relation to the space (be it architectural, urban or natural) should not be overlooked; on the other hand, the role of the author/artist (and therefore, *mutatis mutandis*, also of the architect or designer in the macro-realities of large firms) should not be sweeten or diluted in the analysis and restitution of the complexity of the process.

Sticking to general issues, in the case studies examined the economic issues that inform the creation of a work and its subsequent life emerged as matters of great importance, resulting in the investigation scope being expanded to the underlying financial dynamics and, in particular, to a study of the added value that a given context of insertion offers the work, with the corollary of ethical issues of primary importance. It has been noted, in fact, that «the emergence of new needs, especially the aesthetic, symbolic and emotional needs of modern society, has led to the birth and development of industries specialized in the production of goods and services with high creative consumption, whose use and exchange value is determined by the symbolic content of the product» (Zorloni 2014). The connection between the cultural capital resulting from the creativity of past generations and contemporary artistic production generates not only conceptual and aesthetic interactions but also very precise economic activity, as we will see shortly, where – in a complex game of mirrors – the work and context reciprocally influence each other also from a financial perspective (Celant 2018, V). Unfortunately, the location of the work of environmental art and therefore its architectural or naturalistic circumstance means it is not entirely immune to market scourge, despite the hopes of some critics. In this case, the architect, and specifically the architect-conservator, has even greater responsibilities.
The interpretative grid that was prepared in the analysis of the case studies examined aims to highlight these aspects: the values and problems of the setting in a historical or naturalistic context; the role of the architect and engineer, in both the executive phases and in the design of the «staging» of the work; the construction site aspects of the works, with the relative engineering side; the administrative procedures and the role of the organisations set up to protect and govern the territory; the presence of external 'catalysts' that create the conditions for the start of the work and for its dissemination in the media.
I would like to focus on a few works analysed in the seminar, which exemplify some of the themes mentioned above.
The case of the *Floating Piers* by Christo and Jean Claude on Lake Iseo. Fully exemplifies a well-known observation by Gillo Dorfles who, with regard to the installations by the two artists, said: «It is difficult to say what the work is, the finished result or the whole design process that led to it». In this installation it is clear that the technical-design aspects are fundamental elements in both the

Christo and Jeanne-Claude, *The Floating Piers*, project for Lake Iseo, 18 June - 3 July 2016.

design phase and the installation phase. A prototype of the canopy structure, on a 1:1 scale and measuring 20 per 16 meters, was built and tested in the waters of the Black Sea to determine its stability and strength. During the installation phases, the Arup group played a decisive role in the construction of 190 concrete blocks weighing 5,5 tons each, placed at intervals of 100 metres from each other, as well as complex systems of anchoring to the lakebed (Celant 2016; Kratchmarova 2020). It is equally important to point out that without the establishment of a special Services Conference (an instrument of Italian law) to coordinate the 21 entities involved in the authorisation process, the project would not have seen the light of day[1].

The construction of Lorenzo Quinn's work *Support* in Venice (2017) involved similarly complex bureaucratic process. In this case, the Mayor of Venice overcame the resistance of the Superintendence which had issued a negative opinion, forcing the conservation body to take note. Although to a lesser degree than Christo's project, *Support* also required specific attention to be paid to the technical aspects of its installation and set-up. The artist appointed a group of engineers to work alongside him on a regular basis, but for this project he also involved the Venice-based architectural firm *C and C* which handled

[1] Maria Rita D'Angelo and Mara Doytchinov in conversation with the project managers, May 2020.

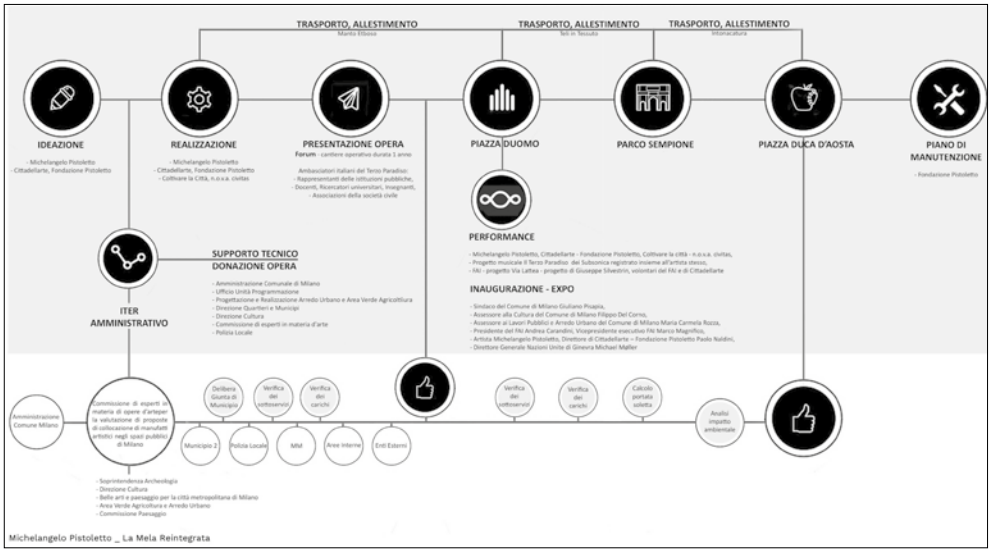
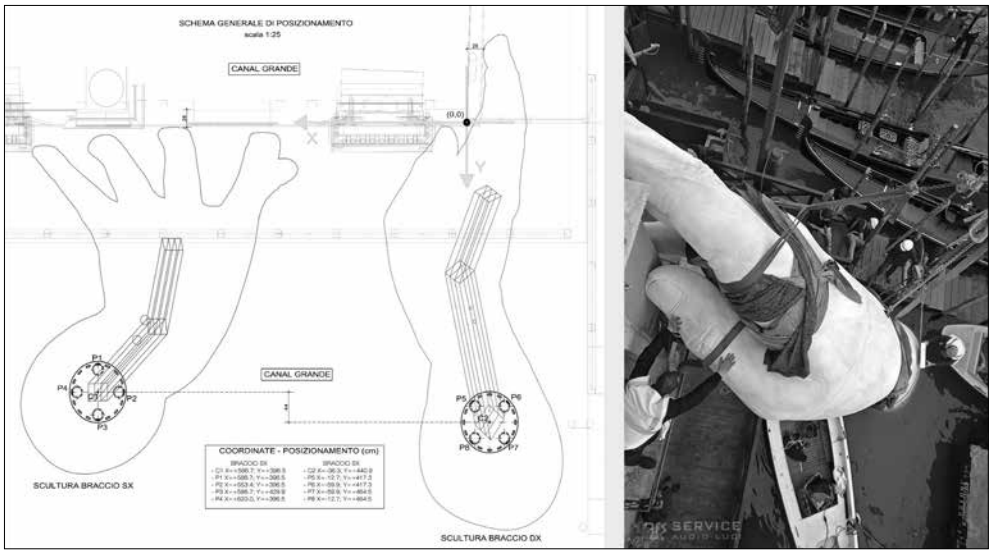
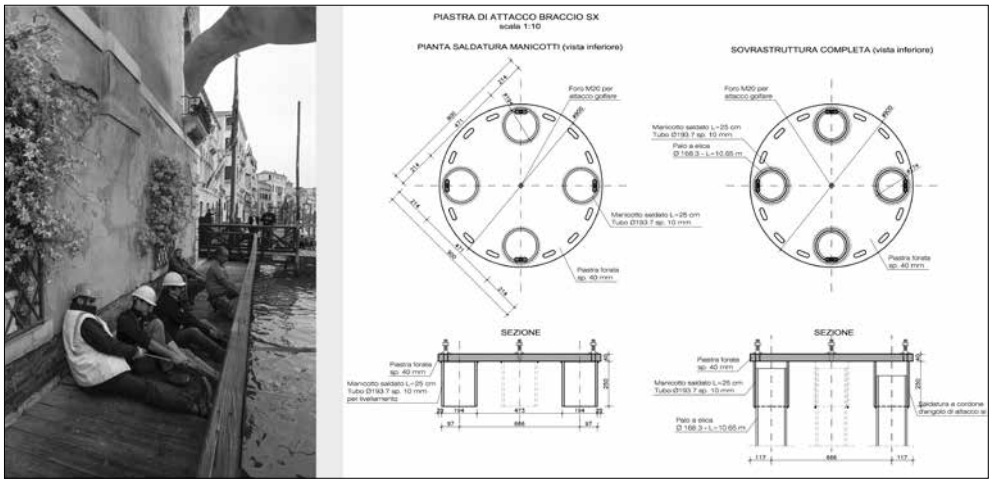


Diagram of the bureaucratic process for the installation of Michelangelo Pistoletto's *Mela reintegrata*. (Graphic by Elena Carnaroli and Marta del Sere)

the authorisation procedure and the installation and setting-up aspects, designing highly effective lighting solutions that contributed to the final image of the work. The timeframe for the construction was very tight. The large expanded polystyrene hands were made in 10 days. The work was assembled in just one day and involved the foundation piles being driven in and the positioning of the hands simulating the support of Ca' Sagredo. The structural core of the hands was made up of a reticular metal skeleton welded to a circular plate, designed especially so that it would attach to the foundation structures. The design firm, which is very familiar with the lagoon context, decided to use foundation piles affixed by screws alone to avoid any stress and vibrations, thereby also meeting the criteria of reversibility of the intervention. Each hand was supported by 4 piles 17 centimetres in diameter; to facilitate assembly and transport, the piles were divided into two sections measuring 5,35 metres each. The emerging parts were connected by two 1-metre plates. Without the expertise of *C and C* and knowledge of the delicate lagoon context it would not have been possible to overcome the problems linked to high water (not foreseen on installation day)[2]. Going back in time, technical-structural aspects were critical in another of the works covered in the seminar: Mimmo Paladino's *Salt Mountain* in Milan (2011). The

[2] Marco Anghilante and Francesca Forlin in conversation with Fulvio Caputo, May 2020.





architectural' content, from both a compositional and structural perspective, is a constant aspect of Paladino's works. In the Milan installation, these aspects were developed by an architect from Campania, Nicola Fiorillo (with arch. Paolo Petti), linked to Paladino by a long collaboration (Arensi 2011). For the Milan project, Fiorillo was responsible for the definition of renderings to create maquettes to be used to establish the proportions of the base cone in relation to the urban context (an element that is clearly essential for the expressive outcome of the installation), in addition to designing the structural framework of the cone. The need for a careful static study of the support became extremely clear when Milan fans climbed the Salt Mountain after their team won

Lorenzo Quin, *Support*, Venice, June 2017. Executive design by *C and C*.

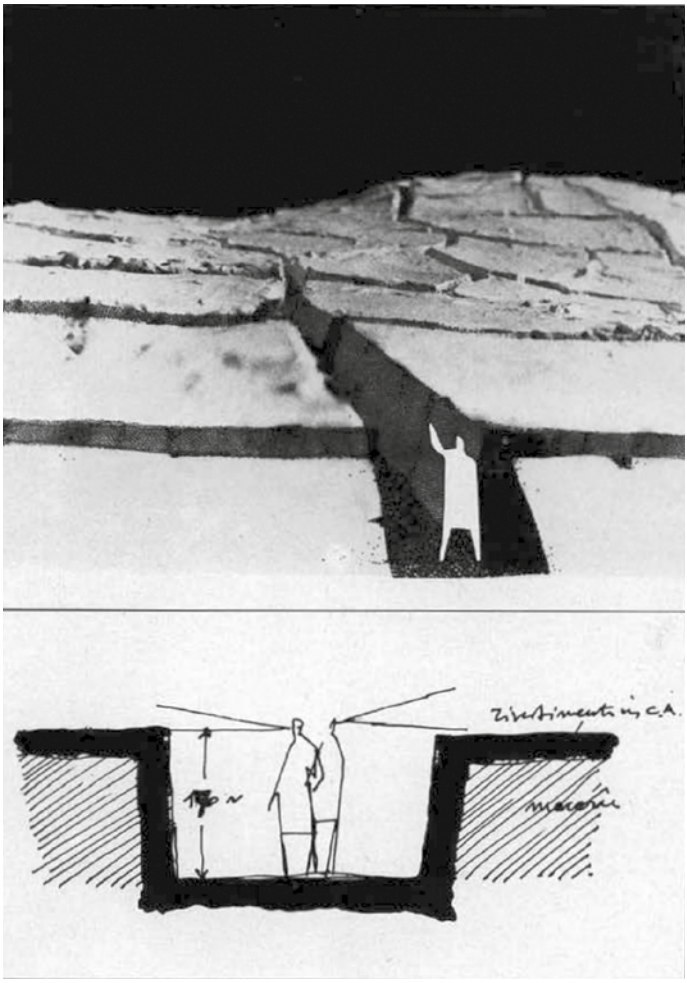
Lorenzo Quin, *Support*, Venice, June 2017.

the championship, to Paladino's great satisfaction and perhaps some apprehension on Fiorillo's part. Remaining within the sphere of fruitful collaborations between artists and architects, the value of the collaboration between Alberto Burri and Alberto Zanmatti in the famous *The Great Cretto* at Gibellina (Sicily) stands out. While the «artist's gesture» is of great value and highly expressive, the work's founding elements must be attributed to the architect Alberto Zanmatti. A multifaceted figure as a designer and curator of installations, Zanmatti (who graduated in Florence) had a long collaboration with the protagonists of art in the second half of the twentieth century (Pratesi 2014). In the *Cretto* work, Zanmatti not only gave substance in general terms to the ideas of Burri (whose presence onsite was very sporadic, with an objective rarefaction of even the design documents), but he also defined some of the work's denoting characteristics: I am referring in particular to the height of the blocks containing the compacted rubble, deepening and resolving the fundamental perceptive issues underlying

the work (Moschini 1981; Recalcati 2018). His technical drawings and reports, moreover, were decisive in the philological restoration of the the *Cretto* carried out by the local Superintendence in 2015[3].
Interactions between art and built or natural space can be particularly profitable when the artist demonstrates distinct sensitivity towards architecture in addition to specific skills in the field. This is the case of the young Edoardo Tresoldi, whose education included a period of study at the Polytechnic University of Milan. His working group also includes many architects and engineers. In his permanent installation in Siponto (Manfredonia, Foggia), Tresoldi evokes the lost early Christian basilica with an electro-welded mesh forming the piers, perimeter walls, apsidal basin and trusses, in a form that dialogues with that of the ruin. Since there is no available data on the measurements of the church's elevations and their metric characteristics, the artist developed the dimensions on the basis of type-morphological evaluations. Particular attention was paid to the study of the structural aspects of an imposing but fragile construction: for instance, the connection between the structure and the wall partitions of the ancient church through the creation of sacrificial surfaces over the surviving wall ridges, which enabled their conservation. The particularly successful outcome of this construction site, which received attention from archaeological journals and thus found its way into scientific debate on «archaeological restoration» solutions, is also linked to the fact that the work was commissioned by the Archaeological Superintendency for Apulia, with public funding through European channels. The artist participated in person in the creation of the work, coordinating a team of architects, engineers and specialised workers (Innaco 2019).
The figure of monument conservator, which as we have seen played a leading role at the Siponto site, was also fundamental in the work by the Japanese artist Chiharu Shiota created in the St. Nicholas' Church in Berlin (2017), an exhibition space managed by the city's Stadtmseum and of great symbolic value: it was here in 1991 that the first freely elected Berlin House of Representatives of the reunified city was formed. The church, founded in 1230, underwent extensive restoration work in 1985 after

[3] Antonietta Milano and Giacomo Maria Panfili in conversation with Valeria Patrizia Li Vigni, April 2020.

Alberto Burri with Alberto Zanmatti, Studies for *Cretto* in Gibellina, 1984.



decades of abandonment following the destructions of the Second World War, followed by a subsequent period of adaptation in 2008. The close interaction between the museum's director Paoul Spies, who has a background in archaeology and antiquity, the gallery owner Friza Krella and Shiota created the conditions for the success of this installation, conceived in the context of the 500th anniversary of the Protestant Reformation. A student of Marina Abramovic, Shiota rose to international fame following her participation in the 2015 Venice Biennale, where she met Friza Krella. The installation in Berlin, a few weeks after that in the church of Saint Joseph in Le Havre, created a dialectical relationship with the ancient building: the structure of threads, created with 5000 balls of yarn, does not emphasise the axiality of the building but instead creates 'other' paths, strongly altering how the church is perceived and working with a

Chiharu Shiota, *Lost words*, St. Nicholas' Church, Berlin, October 2017.

great sculptural quality in terms of transparency and the play of light (Huber-Krella 2018). The director of the Civic Museum, as emerged from interviews with the artist and the gallery owner, followed the work closely, ensuring that the installation did not damage the structure and also allowing Shioto to fully understand the characteristics of the structure: this was the case in the creation of a temporary floor surface to ensure anchorage without damaging the walking surface, and the definition of how the wires are secured to the piers[4].

Shiota's work ideally brings us back to Belting's book which analyses the function of the Gothic cathedral in the poetics of Ruskin, Proust and Monet, up to

[4] Giulia Paoloni and Gabriele Pellegrini in conversation with Friza Krella, May 2020.

utopian reinterpretations of the Bauhaus, showing how it becomes an archetypal symbol of collective art and a place of memory, as well as a bulwark against the commercialisation of art (Belting 2018, 274-279). However, for this Berlin installation too and the others, we must agree with Benedetti who noted that

> the processes through which the modern work is constructed... require processes of attribution to an author: the attribution of an artistic intention, a choice, planning ability, aware or unaware, a poetics, an idea of literature, or even a style...; and therefore if the author now resists is not simply because the publishing industry or the art market prevent them from disappearing, but because their function is required by the same methods of artistic enhancement (Benedetti 1999, 18).

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AFTERWORD

IS THIS THE END? ARCHITECTURE IN THE AGE OF FINANCIAL CAPITALISM

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Today, not only architecture has become a commodity, but architectural practices themselves have often turned into large production mechanisms that increasingly resemble complex factories. And the role of the architect – specialised, fragmented, subject to the laws of division of labour – has in turn been transformed into that of an able but at the same time acquiescent "supplier" to the system. The demands of a clientele fed by increasingly abstract, less and less rooted, "territorialised" capital, the division of the architectural project into a very large number of different skills (only a small part of which pertain to the actual architect), the use of digital technologies for the conception-design-production-representation of buildings – will all this determine the end of architecture? Is it nostalgic to see in this an ineluctable, ruinous mutation of its status, or is it rather nostalgic to continue to attribute the term "architecture" to everything that is built today?

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Keywords: Producer; Supplier; Transformation; Production process; Ethics

From the very title of the conference held in Florence on February 11 and 12, 2021 – *Largest Architectural Firms in the Global Scenario. Authorship Histories, Design Cultures and Managerial Organization* – one senses a certain courage in putting together words and meanings that only apparently are in a «peaceful» relationship with each other. I am referring in particular to the subtitle, where authorship is put in relation with design culture and managerial organization. It seems to me that there is an almost titanic effort to «hold together» the words and concepts that make up the title and to try to think – or re-think – the sense of their concurrence.
Nevertheless, the conference showed how under that title does not occur a simple series of possible «solutions» of that relationship, but rather the juxtaposition of those terms is observed under the category of «problematic». It literally constitutes a problem: a problem to be studied historically, but also to be observed critically from a current perspective. Starting from the «cultural sense» behind the idea of managerial organization and its problematic nature. Already in the great American firms of the late nineteenth century or the first decades of the Twentieth century (McKim, Mead & White, Albert Kahn, SOM) the architectural project, from an essentially cultural production – as it could have been in Europe in previous centuries – had become an enormous entrepreneurial problem. The same happened, more or less at the same time, also in European studios such as those of Otto Wagner, called at the end of the nineteenth century to realize the great interventions of urban infrastructures in Vienna, from the subway to the Danube canal's waters regulation, or Peter Behrens' office, who from the beginning of the twentieth century worked on the projects for AEG, the biggest German electric industry, founded by Emil Rathenau. Here we are at the very heart of the great bourgeois Kultur, the same Kultur

that «produced» the encounter between great German industrialists and artists and architects under the name of the Deutscher Werkbund, in an attempt to give an aesthetic to German industrial products (Campbell 2016). It is that bourgeois Kultur which saw the engagement of major players of the German scene like Max Weber or Walther Rathenau, son of Emil, politician and source of inspiration – years later – for the protagonist of Robert Musil's novel *The Man Without Qualities* in the debate between economy, politics and society (Cacciari 1979). Or even an intellectual of Thomas Mann's importance, who, in his book *Considerations of an Impolitic* (1918), dedicates a chapter precisely to the «Spirit of the Bourgeoisie». Here, inquiring what this spirit consists of, he replies quoting the young György Lukács (who in 1911 had published his first book, *The Soul and the Forms*): «It is the primacy of ethics in life» (Mann 1985).
Our problem is precisely the same: is this reconciliation of ethics and praxis still possible today? The reconciliation of ideas and the world? Of culture and profession? Of culture and business? Is it still possible to keep together the largest architectural firms inserted within a «global scenario», making them rhyme with authorship, design culture (*Kultur!*) and managerial organization? Can they still be together? It seems to me that this is *the* problem. I don't want to affirm that this reconciliation has become impossible today, but it has certainly become a problem. Architecture – we could easily say – has become a commodity. This is certainly nothing new: architecture, in the form of buildings, has always been a product subject to being bought, sold, traded, not only for necessity but also for profit. And there is nothing strange or abnormal in this. If it is clear that buildings have (or at least can have) a cultural value, it is equally clear that they have an indisputable material value. And if, from the point of view of the history of architecture, there is always a tendency to put the material value in brackets, emphasizing instead the cultural value of a building, it is clear to everyone that when we talk about architecture, we are not talking about pure «ideas» – not even exclusively about «ideas of architecture» – but rather about ideas that have been embodied in material and tangible objects; objects that have a market, that are «on the market», as is right and proper for any kind of goods. Architecture is therefore subject to the laws that regulate that market – the real estate market! – or rather to the laws of goods. No illusions from this point of view. Eventually, the problem is that of how to «combine» ideas and the market. Can ideas and

the market be combined? Can the idea survive even when it is «on the market»? This is the question we need to ask ourselves, and which the architecture of large firms in the global scenario urgently requires.
Obviously, this problem, which has a certain declination when observed from a cultural perspective, takes on a completely different outlook when observed from the point of view of those large architectural firms. First of all, because architectural firms (at least many of them) have grown in size and have transformed themselves over time into large production mechanisms that increasingly resemble «factories»; precisely those factories that many of them sometimes design and produce, and that they themselves, in their internal organization, reproduce. The Taylorist or Fordist logic of the factory has entered the architecture practices, and therefore the work within the largest of these is increasingly specialized, fractionated work, subject to those same laws of labor's division that in the era of mature capitalism has touched more or less all productive sectors. And like other sectors, after the phase of the studio-factory, the largest architectural firms are now experiencing a phase that we could call post-Fordist, in which work becomes «smart» – that is, work that can also be done from home, or organized on the basis of other configurations, more «flexible», apparently (but only apparently) more «free». And as in the case of other productions, for which the factory ceases to be a physical place, also the architecture office can «disperse», and collective intelligence, that «social brain» of which Marx speaks, can be used and put to work according to different forms of organization.
Within all this, the role of the architect has in turn been transformed, often and willingly, into that of an able and «acquiescent» supplier of the system. The term «supplier» is used by Walter Benjamin in a 1934 essay, *The Author as Producer* (Benjamin 1999). The theme of the essay is the position that intellectual labor (especially Benjamin refers to writers) occupies within the production processes. There are two possible positions: the first is that occupied by those who «supply» the system, the other is that of those who he calls «producers» in respect to that system. With regard to the first, Benjamin writes: «To supply a productive apparatus without transforming it to the possible extent represents an extremely oppugnable procedure even when the contents to which this apparatus refers seem revolutionary». The attitude of the «suppliers» is typical of those who conform to habit («*rutiniers*», Benjamin calls them with a French word), tiredly repeating what is already known; they are those who, acting «according

to fashion», renounce making corrections to the system of production, leaving it substantially as it is. Benjamin contrasts the figure of the supplier with that of the producer. For Benjamin, the producer is the one who, in producing, transforms the mode of production itself. It is a transformation that puts the method of production in crisis, even if only in its apparently secondary aspects: and yet enough to force a changeround.

The producer in this sense is not the one who simply produces or – even worse – re-produces, but is the one who transforms «in a technical sense», says Benjamin, the productive apparatus. Benjamin is very keen to emphasize that the one who transforms – that is, the one who produces – must have a profound knowledge of the productive mechanism: one cannot transform something simply in an external, impressionistic way.

The transformative capacity of the producer responds to his/her perfect control of the productive process: he/she knows it and transforms it; he/she does not reproduce it. He/she does not leave the world as it is.

Transformation in this sense is the exact opposite of innovation. Innovation is a word we constantly hear (which should make us suspicious, to some extent). Especially in a mercantile context the term «innovation» recurs over and over again: every latest model of computer, car, cell phone, «innovates» to some degree. And yet innovation doesn't actually challenge anything; innovation actually stabilizes, perpetuates. Of course, with that small rate of «new» that is inherent in the very meaning of innovation. Something «new» is of course fundamental, but this novelty does not, after all, undermine anything. That newness annexes us, keeps us within the «chain» of the productive mode in which already we are.

What does all this imply in the field of architecture? First of all, the architect must have perfect knowledge of the productive mechanism in which he/she is immersed. But, if the architect really wants to be a producer-transformer, and not only a supplier of the system, this knowledge cannot be limited only to what constitutes the immediate object of his/her intervention: the knowledge of the architect producer-transformer should also extend to the surroundings, to all the conditions that only apparently can be seen as «external» to it. Therefore, if the city is the place of his/her intervention, he/she should also have a deep knowledge of urban space, public space, collective space. Otherwise the transformation is casual, sporadic, without real effects; it is no longer a transformation but rather an innovation that is limited to simple, marginal, superficial, «aesthetic» aspects.

This would be an intellectual architect: a producer, capable – through his/her own knowledge – not only of carrying out his/her own profession, of responding to the demands of his/her clients, and therefore also of positioning himself/herself in the best way «on the market», but also of transforming that world with which he/she interacts in its different dimensions, at different scales.

In reality, this is not very different from what Vitruvius attributed to the architect's skills, when he said: «you must have a literary education, you must be an expert in drawing, you must be prepared in geometry, you must be knowledgeable in history, but also in philosophy, music, medicine...» (Vitruvius 1931, 1-3). It is a truly formidable accumulation of knowledge: the architect must know everything. But why must he/she know everything? Because the architect must know everything that allows him/her to intervene not only as a «technician», an «expert» in a given aspect of construction, but as someone who acts on a deeper level and, to a certain extent, on a larger scale, even when his/her intervention is limited. His/her intervention is, after all, always limited. And yet, what is required (and what Vitruvius also demands) to an architect that aims to be producer is that he/she knows how to show, how to reflect, in the part the whole. In one word: *pro-portione*.

So, what is the problem that arises today when we find ourselves confronted with the work of those large architectural firms that operate on the global scenario? In other words, of those studios that work on a completely different scale from the one we are used to? I believe that the problem is not so much authorship, which is undermined by the plurality of skills that contribute to the final result. Authorship as we usually understand it is basically the residue of an idealistic conception of the work which identifies it as a product of a single mind, of a single «creative genius». We know that this is not the case, and that the author's work is, in most cases, a «fiction». Therefore, the crisis of this idea of authorship is not in itself a problem. Possibly the recognition of the role of «author», more than the recognition of a «paternity» (or «maternity»), could be relevant from the point of view of the responsibility, even in legal terms. Who does the project belong to? Who will be responsible for that project when the skills that have worked on it are many and varied? This is certainly a big question.

Thus, the problem of the work of those large architectural firms operating on the global scenario is not that of the

survival – or of the forms of survival of the «author» – not even the survival of the simple «fetish» of authorship. Their problem is neither an aesthetic one. From this point of view, the difficulty of producing aesthetically pleasing architecture is common to architectural practices of all scales, although large studios certainly have the structure to deal with complex aspects of the project, on the other hand they have less control over the perspective of the result, a problem potentially common with the great architectural studios of the past. This makes the aesthetic issue marginal in the discussion about the character of big architectural offices. The real problem is another: when the architecture produced (or «supplied») by large global firms loses those connections that the bourgeois *Kultur* of the last century still managed to «keep», built on a humanistic «foundation» and based on the dialogue between the complexity of technical issues and ethics. In this case, does that kind of architecture still allow itself to be defined as such? This is certainly not a purely nominalistic problem, but it also has to do with this.

Before answering, however, it is necessary to address other aspects of the question that make it problematic today to combine large-scale professional commitment and ethical behavior. One of the issues, that presents itself as central within the «global scenario», is that of clients. A clientele fed by capital that is increasingly «abstract», less and less rooted, less and less «territorialized». A financial capitalism, or rather a rootless capitalism, the one that nowadays commissions those big construction companies of which the big architectural firms provide the results. Are these clients capable of exercising their role by having at heart not only their own interests but also local, social, collective interests?

And to the question of clients we could add the already mentioned multiplication and fragmentation of competences, roles and «subjects» that contribute to defining all aspects of large-scale projects; and again, the role played by digital technologies, which becomes fundamental in all phases of the elaboration of contemporary architectural projects, from their conception and representation to their realization and promotion, particularly when they involve those great interests that such clients places in them, interests that are then definitely decisive in entrusting the project to large firms. None of these elements constitutes a novelty in itself. They are elements already present in the field, albeit in their previous versions, which now compose a scenario that in its complexity is, however, completely new.

Will all this determine the end of architecture? I do not believe that architecture can end in an «apocalyptic» sense. The end of architecture could rather be represented by the end of a certain way of thinking about it, a way to which the past centuries had accustomed us and that the new century and millennium are increasingly putting into crisis. Subjected to the action of all the factors that characterize the «global condition», the risk of architectural projects is to become radically different from what we have known up to now; to become something that no longer has a design «head», but rather a multiplicity of «heads», corresponding to the numerous competences that manage it, something that completely loses any ability to enter into connection with the place in which it arises and with those to whom it should serve. Something completely devoid of ethics (the Greek word *ethos* originally echoes the meaning of «seat», «dwelling place»): something, therefore, devoid of roots. Is this science fiction? Is it a dystopia that we can easily dismiss by looking elsewhere? Or is this a possible future for architecture? Is this where architecture will end up, from «innovation» to «innovation»?
Plausibly, the greatest risk could be that of assuming a nostalgic attitude. But – we could ask ourselves – is it more nostalgic to see in this ineluctable mutation of the status of architecture as a loss, or is it more regretful to insist on calling with the name of «architecture» everything that is built by the large global firms?
If the first attitude can be opposed by trying to criticize from within the mode of production that determines it, thus trying to transform it; the second attitude can only be defused by not accepting the indiscriminate and «unreflective» use of the term «architecture», of which the same alleged «criticism» becomes an accomplice on a daily basis. Therefore, it is starting from a work of linguistic revision that tries to identify something «other» than architecture in what is «supplied» by the big studios to financial capitalism, that a conscious «critique of architecture» can prove to be really such.

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This book investigates the importance of organization design and management practices as key elements of creativity in the realm of largest architectural firms. During the Twentieth century, and increasingly over the last decades, the most important design firms started to count hundreds or thousands of employees, having to necessarily structure themselves as real creative companies, managing the interaction between different skills – architects, structural engineers, plant engineers, furniture and product designers, graphic designers, IT experts, model-makers, accountants, legal experts etc. – in order to foster their performance and remain competitive in the market. Such an organizational complexity should not only be understood as a functional element for supporting the design activity, but also as an instrument of creativity in itself. The effective application of managerial skills and the fruitful intersection of different competences are likely to foster innovative design methodologies, opening up new markets and design typologies. In this book, a wide range of international scholars take into account, from different perspectives and field of studies, the organizational structure and design methodology of some of the most important largest design firms in the last century, from the USA to Europe and the Far East, as well as specific analyses on managerial and legal issues.

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