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Research Article

ADAPTIVE REUSE PROPOSALS FOR THE FORMER ELECTRICITY FACTORY IN IZMIR (TURKEY). CONTEMPORARY INTERVENTIONAL APPROACHES FOR THE 'CITY FACTORY PROJECT'

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ABSTRACT. In a fast-changing World, cultural heritage buildings fall frequently into a state of obsolescence and disuse. The reintegration of those structures within the disposable building stock requires ad-hoc refunctionalization strategies, usually based on a set of architectural interventions with contemporary approaches. However, new design for cultural heritage buildings and sites is a challenging task due to the complexity of relationships established with historical and contextual factors. Individual design problems contain unique conditions and require specific solutions. Therefore, interventional design studies have been ranked among the most crucial design research areas in architectural discourses. Accordingly, the importance of educational formats aiming at introducing, evaluating and simulating interventional design applications is rapidly increasing.
The City Factory Project is a Design Studio experience challenging third graders to the identification of adaptive reuse proposals for the refunctionalization of the first power plant erected in Izmir in 1926. Aimed at increasing the awareness about the protection of cultural heritage, and to develop the ability to interfere with heritage buildings without diminishing its historical authenticity. The Studio preliminary introduced relevant issues related with conservation principles. The evaluation of iconic architectural interventions for industrial heritage buildings was then promoted with the aim of defining a set of relevant principles of contemporary design applications. Finally, Izmir Electricity Factory had been proposed as the case study of the course for a design exercise. Course outcomes were analyzed comparatively and evaluated within the framework of parameters related either to protection and transformation. This paper aims on the one hand at reporting a completed experience in design studio education in relation to how theoretical debates focusing on architectural design processes in the historical environment are promoted and interpreted by students; on the other hand, the paper aims at highlighting the crucial importance of conservation-based issues within architectural education curricula.

Keywords: *industrial heritage, conservation, interventional design, adaptive reuse, education*

INTRODUCTION

Changing Approaches in Adaptive Reuse of Architectural Heritage

Initiated during 19th century, through an innumerable variety of experiences and the contribution of theoreticians and international documents, such as agreements, charters, resolutions, recommendations, finalized by organizations like UNESCO, COE, ICOMOS, the conceptual development of conservation studies stands on the establishment of a comprehensive set of theoretical basis, and on a defined atlas of applicative principles identified through scientific studies and systematic methods. The

urge of reusing existing architectural artifacts that have lost their former function for new social purposes, without diminishing the original set of qualities and values, has been emphasized in every stage of the intellectual development. Today, beside mere maintenance and restoration, conservation studies include researches based on the intention of reintegrating historical buildings and settings into contemporary life. The challenging establishment of physical, spatial, functional and environmental relationships between the old and the new in historical settings encouraged several architects and theoreticians to contribute to the theoretical development of the subject up to day.

The imitation of the past while interfering with historical structures and sites is a methodological approach highly disapproved by an international consensus. Le Corbusier, one of the pioneering architects of the modern era, stated that mimicking the past in the historical contexts damages and decreases the value of original and authentic features [1]. On the other hand, approaches disregarding characterizing elements of historical contexts, also result in unsuccessful practices diminishing or erasing values and impeding the sustainability of existing cultural values [2]. Therefore, conservation concepts and approaches beyond merely replicating original features and ignoring contextual factors need to be explored and discussed.

Cultural heritage structures need to be preserved and enriched by adding new values; yet the question arises on how to integrate contemporary signs into existing historical environments [3]. Kuban [4] argues that necessary changes and additions must be made in the buildings via the initiation of a new architectural design process demanded by functional transformation, in order to meet the requirements of the new program, as long as those modifications appear to be respectful and compatible with the historical context and capable to emphasize authentic features. In line with Kuban's argument, visual relationships (size, space, color, texture, shape, harmony) to be established between old and new is always a subjective matter. Those relationships would promote a formal harmony, a sensitive harmony, a dynamic harmony that emphasizes contrast, or an attitude that rejects harmony. However, since dimensions and elevations of old building are the basic components in historical environments, new annexes should not go beyond the original volum of the building.

De Sola-Morales Rubió [5] remarks that the character of the new design, which is formed by understanding all aspects of the existing structure, provides emphasis on different qualities and allows the definition of the approach that establishes at best the old-new relationship. In this regard, important components of the actual historical environment should be used as analogical signs of intervention. Existing conditions form the basis of each analogy in terms of difference and similarity, and all meanings are built on this analogy. Thus, tangible and intangible elements of the space are conserved and enriched with the new design, while the historical structure becomes an object that directly or indirectly shapes the new design.

Although buildings are long lasting physical elements, human activities are changing rapidly and controlling the rate of transformation in urban systems becomes one of the objectives of the protection of the urbanscape. Feilden and Jokilehto [6] argue that interfering with historical structures and environments with contemporary approaches is inevitable to ensure sustainable developments. Worthington [7] defines the role of protection as the ability to manage and direct change, and states that the purpose of protection is to maintain the values of the past, and move them to the future while adding new components able to meet the needs of changing living conditions.

Brooker and Stone [8] argue that existing buildings are the guidebook containing the inputs for new design. If a strong connection is established between the existing structure and new elements inspired by it, both can survive strongly and independently, maintaining their own character. Differentiation of new additions in terms of color, texture and design language may result in isolation from the existing structure. On the other hand, the new structure, which has similar features with the existing artifact in terms of size, scale, rhythm, and structural composition, sometimes appears as an interpretation of the past. Therefore, a relationship should be established between the old and the new structure that increases their own identity [9]. Davies [10] states that the new design in the historical setting is polarized as extreme history and extreme modern approaches and diversified between the two; the author emphasizes that the most appropriate intervention should be inspired from the past by respecting the historical context.

In addition to important theorists, there are also approaches defined by international documents such as agreements, regulations, charts, addressing architectural intervention matters. The Venice Charter (1964) represents the most influencing of those texts. In the document, it is stated that the use of cultural heritage structures for social purposes facilitates their protection, changes and additions are allowed, as long as there is no harm for their authenticity and original relationship with their environment. In accordance to the principles formalized in international documents, cultural heritage structures and environments should be reintegrated into the life of contemporary societies in order to reveal and protect tangible and intangible values. It is also stated that contemporary interventions, which are respectful and harmonious with the old texture, consciously using materials, technologies and design features of the construction period, reversible, conserving the authenticity of the existing structure, interpreting scientific data, offer the opportunity to enrich social, functional and aesthetic characters of the existing artifact. Moreover, it is emphasized that contemporary additions increase the value of the urban identity [11]. However, principles and practices are often contradictory, and these recommendations are not always effective to guide designers.

To summarize, architectural interventions for historical buildings and environments are requested to reflect their own period, and it is recommended to encourage creativity within the framework of preserving textural integrity of historical settings. Living cities contain traces of every period of their historical development. These traces are the best indicator of the vitality of the physical environment. Contemporary interventions, when compatible with the context, leave their marks on cities and enrich historical environments. Cultural heritage buildings that have been transformed into contemporary spaces can be protected more effectively with up-to-date functions, with the participation of users within the transformative process. Therefore, in order to promote the awareness of actual architecture students who will interfere with historical buildings in the future, design studio formats focusing on adaptive reuse of cultural heritage become crucial in the formulation of comprehensive educational curricula.

Iconic Adaptive Reuse Projects of Former Power Plants. Design Practices and the Effect on Built Environment.

Following a long conceptual development, towards the end of 20th century, adaptive reuse and functional transformation of the existing building stock gradually became one of the major focus of architectural practice based on the urge of preserving tangible and intangible values of the built environment as a whole and in quest of creative and innovative approaches. Yet, it is not an easy task to reveal a permanent doctrine with

regard to the methods utilized by architectural interventions to redefine existing buildings. When exemplary case studies are examined, approaches based on the imitation of original features together with the ones erasing authentic characters represent the two extreme points of a wide spectrum of intermediate attitudes. Due to the diversity of typological, historical, environmental, and contextual factors characterizing each case, a variety of different approaches needs to be at hand. Therefore, in the following section, iconic samples of adaptive reuse of industrial heritage buildings where contextual data are successfully used as the input for new design proposals are examined.

The process of re-integration into daily city-life of former industrial facilities originally erected for the production and distribution of electricity is commonly considered to have had its initial step in 1995, with the beginning of the construction works for the transformation of the redundant Bankside Power Station in London (Fig. 1), designed by Sir Giles Gilbert Scott and built in two phases between 1947 and 1963, into the Tate Modern, a gallery for international modern and contemporary art, complementing the Millbank art space of Tate's institution.

Fig. 1. *External view of the Bankside Power Station in London, UK.*

Selected through an international competition and among 148 entries, after a two-stage shortlisting process, the eventual winners were the Swiss firm Herzog & de Meuron [12], who rapidly become a leading architectural duo in transformative projects for industrial heritage structures, with the following completion of two prominent adaptive reuse projects, the CaixaForum Museum completed in 2008 in Madrid (Fig. 2), the transformation of a former power plant originally built in 1899 [13], and the Elbphilharmonie (Fig. 3), completed in 2016 in Hamburg, built on the Kaispeicher A, designed by Werner Kallmorgen, constructed between 1963 and 1966 and used as a warehouse until close to the end of the last century [14]. With the Tate Modern project, Herzog & de Meuron succeeded to turn a 'cathedral of power', functionally built and hidden in plain sight on London's previously neglected Bankside, into a 'cathedral of art', able to showcase the finest modern art and attract millions of people a year [15].

Fig. 2. *External view of the Caixa Forum in Madrid, Spain.*

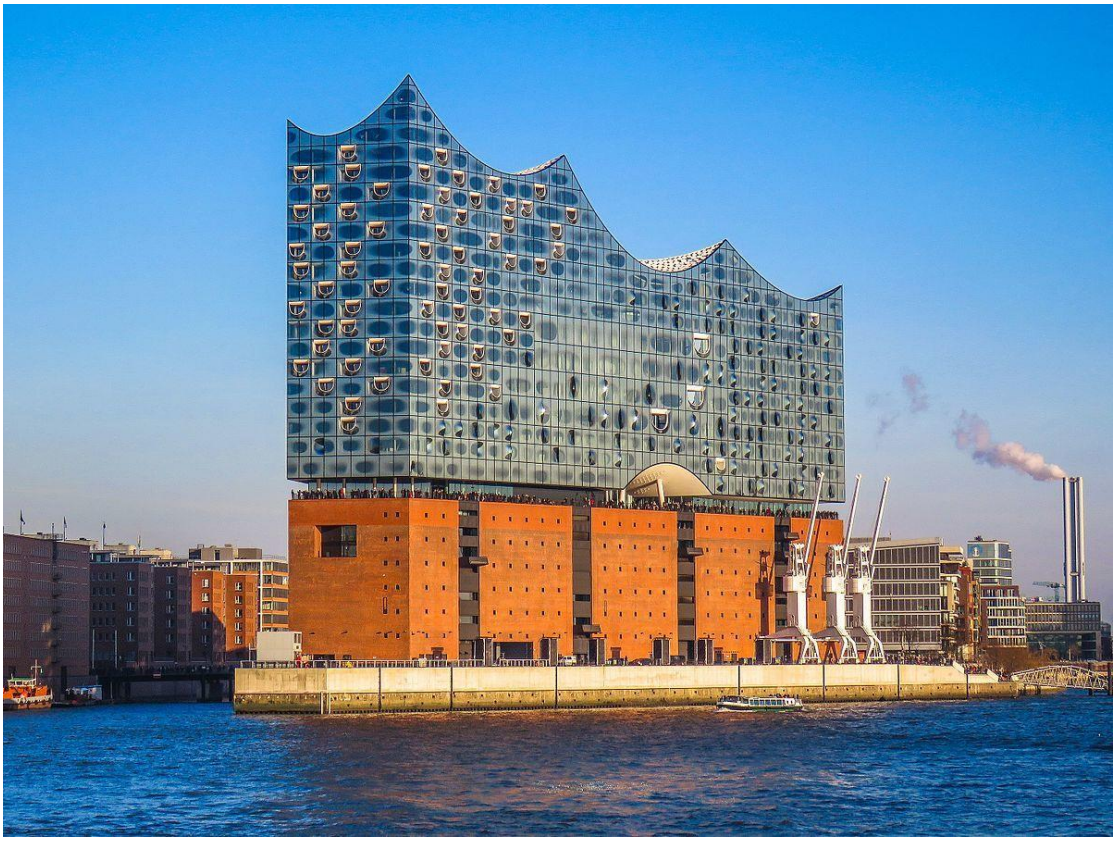


Fig. 3. *External view of the Elbphilharmonie in Hamburg, Germany.*

Herzog & de Meuron stated their excitement to deal with existing structures due to the very different kind of creative energy demanded by the attendant constraints, considering these issues to become increasingly important in metropolitan urban contexts. The challenge of the Tate Modern is a 'hybrid of tradition, Art Deco and super modernism: it is a contemporary building, a building for everybody, a building of the 21st century' [16]. Given the impossibility to start from scratch, the Swiss architects had to identify architectural strategies that were not primarily motivated by taste or stylistic preferences, with the tendency to exclude rather than include. The final strategy was 'to accept the physical power of Bankside's massive mountain-like brick building and to even enhance it rather than breaking it or trying to diminish it' [16]. In general, the design strategy might be indicated as 'insertion', with the construction of an inner architecture within a relevant portion of the envelope of the building. The power station, as designed by Giles Gilbert Scott, was organized in three parallel spaces, each of which served a specific function. The boiler house was installed to the north facing the Thames river, the huge turbines (Fig. 4) were placed in the middle, and the switch house lay to the south. In central position along the longitudinal axis of the building, the iconic chimney of the power plant faces the Thames river with its height of 99 meters, creating a modern counterpoint to the dome of St Paul's Cathedral on the opposite side of the river.

Fig. 4. *View of the turbine hall of the Bankside Power Bank in the found state of the interior space before the adaptive reuse process for the transformation of the building into the Tate Modern.*

The Swiss designers intended to consider the Turbine Hall as an inner public plaza (Fig. 5), a galleria that establishes the link between inside and outside, and the introduction of a large scale ramp, leading visitors down to the floor of the turbine hall situated below the water level of the Thames, generated the starting point of the new inner circulation toward the access to the museum entrance, shops, cafeteria, educational facilities, auditorium, concourses and exhibition spaces, all arranged vertically into the seven-storey museum block.

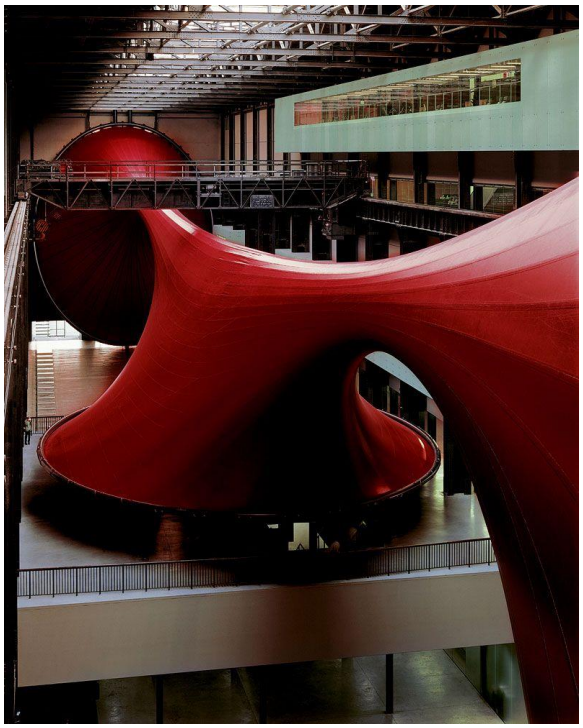
Fig. 5. *View of the turbine hall of the Bankside Power Bank after the transformation of the building into the Tate Modern.*

Beside the large Turbine Hall, the inner plaza, the inserted museum shows its facade to the visitors (Fig. 6). Occupying the site of what was once as open-work steel structure with no floors or ceilings, in which countless boiler and other machines were installed, the new inserted steel structure replaces the old one and 'its facade, adjoining the turbine hall, looks to visitors like a gigantic screen showing the Tate Modern's varied programmed of events and exhibitions' [16]. The only extension proposed by Herzog & de Meuron, somehow pre-announcing following design approaches to be applied in CaixaForum and Elbphilharmonie projects, is what they have named as the Light Beam, 'a huge body of light hovering above the heavy brick structure of the former power station' [16]. The two-storey high glass prism (Fig. 7), that runs the whole length of the top of the building, aims at pouring daylight into the galleries on the top floor of the museum and, at night, illuminates London skies.

Fig. 6. *View of inner plaza of the Tate Modern with the museum facade (on the left) visible from the public inner walkway.*

Fig. 7. *External view of the two-storey Light Beam on the rooftop of the Tate Modern.*

The Tate Modern is one the world's most celebrated examples of adaptive reuse and the first prominent sample of industrial heritage conversion for cultural purpose, led by a completely new strategic approach, based on the designer's acceptance of the power and the energy of the original building whilst finding new ways to enhance and utilize these qualities, leaving the original power station building largely intact and reusing a significant part of the plan. One of the most relevant aspects embedded in the Tate Modern design challenge is the fact that while dealing with the gigantic structure of the Bankside Power Plant as the future location of a large section of the Tate collection, Herzog & de Meuron had a chance to interpret the physical configuration of a contemporary museum, discovering unusual spatial solutions able to respond to new direction of artistic investigations. Integrating the existing scale of the building into the new spatial distribution of the museum determined undisclosed possibilities, from conventional spaces for art display to unconventional gigantic inner voids where oversized artworks would find a fertile soil for their conception. The sculpture *Marsyas* of Anish Kapoor (Fig. 8), displayed between October 2002 and April 2003, and the installation *The Weather Project* (Fig. 9) of Olafur Eliasson in 2003, both specifically designed by referring in total to the large dimensions of the Turbine Hall, materialize the undiscovered possibilities of oversized artworks to enter into museum spaces, generating innovative ways of interactions between visitors and the exhibited piece of art, and at the same time showing how the unprecedented transformation of a large industrial facility for cultural purpose could determine a reflection on programmatic decisions for the design of a museum imagined for the 21st century, yet being encapsulated within the walls of an historical building constructed for a different purpose.



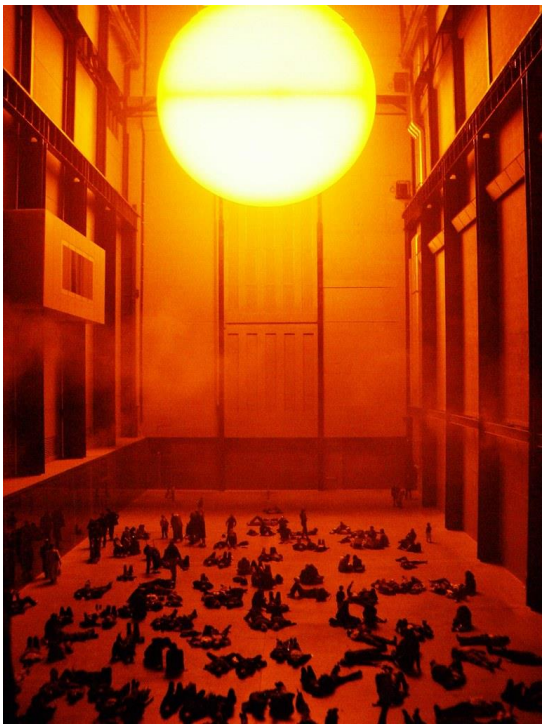


Fig. 8. *(left) and* ***Fig. 9.*** *(right) Art installations in the turbine hall of the Tate Modern.*

Another relevant aspect of the Tate Modern design challenge is the impact of the renovation of the former power plant led by cultural intentions on the neighborhood scale, with the surrounding green areas promoting a new public usage (Fig. 10). Given the

architectural strategy of transforming the Bankside Power Station into a 'landscape accessible and open to the public from all four directions, the gardens are important topographical sites that mediate between the space of the city and the building. The gardens blur the distinction between inside and outside' [16]. The power of building conversions on the urban scale is always a considerable factor while planning the rehabilitation and the refunctionalization of historical buildings, either as a chance to redefine the identity of an area or to start from scratch in the integration of derelicted city fragments into the patterns of people movements.

Fig. 10. *View of the Tate Modern from the Thames river.*

The consideration of the above mentioned urban effect of the rehabilitation and conversion of former industrial facilities is a crucial aspect of Santralistanbul project, coordinated by İhsan Bilgin, in collaboration with Turkish architectural firms of Emre Arolat, Nevzat Sayın and Han Tümertekin between 2004 and 2007 in Istanbul. Built at the turn of the 20th century at the tip of the Golden Horn, an area that at the beginning of 19th century 'saw modern industrial facilities spring up alongside the shipyards it harbored since earlier times' [17], the Silahtarağa Power Plant (Fig. 11) had ceased to function in 1984. 'In the early 1990s, the Board for the Preservation of Cultural and Natural Heritage registered it as a landmark of industrial archaeology' [17]. Following a series of initiatives such as Kadir Has University, the Rahmi Koç Museum, Feshane, the Sütlüce Congress Center, and the Minyatürk Architectural Theme Park, which 'began to put their stamp on the Golden Horn's landscape as culturally-oriented public projects resulting from the conversion of industrial facilities' [17], the transformation of Silahtarağa Power Plant into Santralistanbul, with a 'shift from electricity to art, culture and education' [18], greatly contributed to the remake of the Golden Horn into Istanbul's new cultural and recreational center.

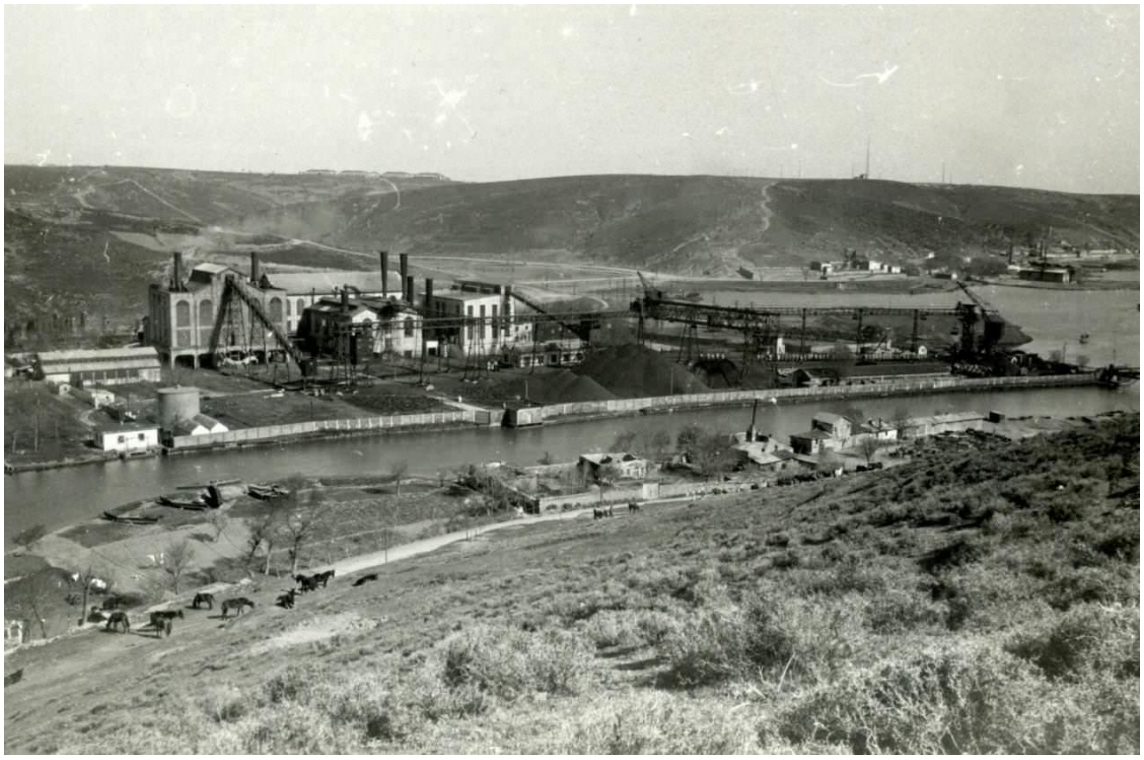


Fig. 11. *Aerial view of Silahtarağa Power Plant in Istanbul in its original setting.*

The design team, while engaging with the project's adaptive reuse program, had to face two layers of contradiction. First, they were expected 'to convert a single-function complex into an integrated one accommodating several functions. Secondly, the project mandated that the initial program should give way to projected cultural and social functions that would acquire their character with time' [17]. Furthermore, 'the Silahtarağa's monumental machinery halls and boiler rooms had been designed to hold bulky machinery and boilers rather than workers engaged in production' [17]. In other words, the architects were challenged to create a space of social and cultural interaction out of a monumental industrial space practically devoid of human beings. The in-depth evaluation of two prominent samples of industrial heritage conversion was openly stated by the design team, seeking to extract strategical approach inputs from the Tate Modern project in London and the Zeche Zollverein (Fig. 12) project in Essen. Being the first 'a rather easy solution to a difficult problem' [17], with the complete transformation of the interior of the monolithic power plant, leaving only the exterior shell, the second, in contrast, 'involved taking an old mining complex whose time was past (it was established in 1847 and closed down in 1993) and leaving it practically untouched, turning it into a gigantic performance and experience center in the middle of the Ruhr basin's loose. Occupying two opposite ends of the spectrum of intervention, the former project completely transformed the interior space within a preserved shell, while the latter converted the old plant into a "found object", creating an art object out of something originally not intended to function as such' [17].

Fig. 12. *External view of the Zeche Zollverein in Essen.*

With Santralistanbul, the search for more complex answers by exploring the new design area between preserving the old and proposing something entirely new became of extreme importance, looking for an answer to the question 'how could change coexist along with resistance?' and 'how could change imply resistance, and vice-versa?' [17]. As the result of the intersection of given rules of preservation and found data via site investigation, the conversion project included 'the preservation / adaptive reuse of the registered structures, the construction of a new museum building (Fig. 13) on the footprints of demolished industrial buildings, and the construction of new educational buildings following the traces of unregistered buildings located at the edges of the site' [17]. With regard to the preservation and conversion of registered machinery buildings, generally cast-iron constructions with thin exterior shells made of brickworks and large openings, what was 'essentially the standard, anonymous, and monumental industrial shed grammar ubiquitous everywhere until the 1920s' [17], the architects acknowledged that 'this grammar owed its elegance to the ability of the exterior shell to exist independently of the crude internal construction that bore the weight of the gigantic machinery housed within' [17]. Accordingly, the machine halls, which needed structural reinforcement for overall stability and earthquake resistance, were converted into the Energy Museum (Fig. 14), with the only addition of movement-based architectural element, such as a stairway / escalator and a viewing gallery, gently inserted within the building shell to create a compelling experience which takes visitors to explore the gigantic scale of machinery and the technological complexity of the original control room. In addition, interactive experiences had been integrated within the visit tour of the museum, including a large series of physics games for kids and adults (Fig. 15).

Fig. 13. *External view of the Contemporary Art Museum (left) at Santralistanbul, designed by Emre Arolat.*

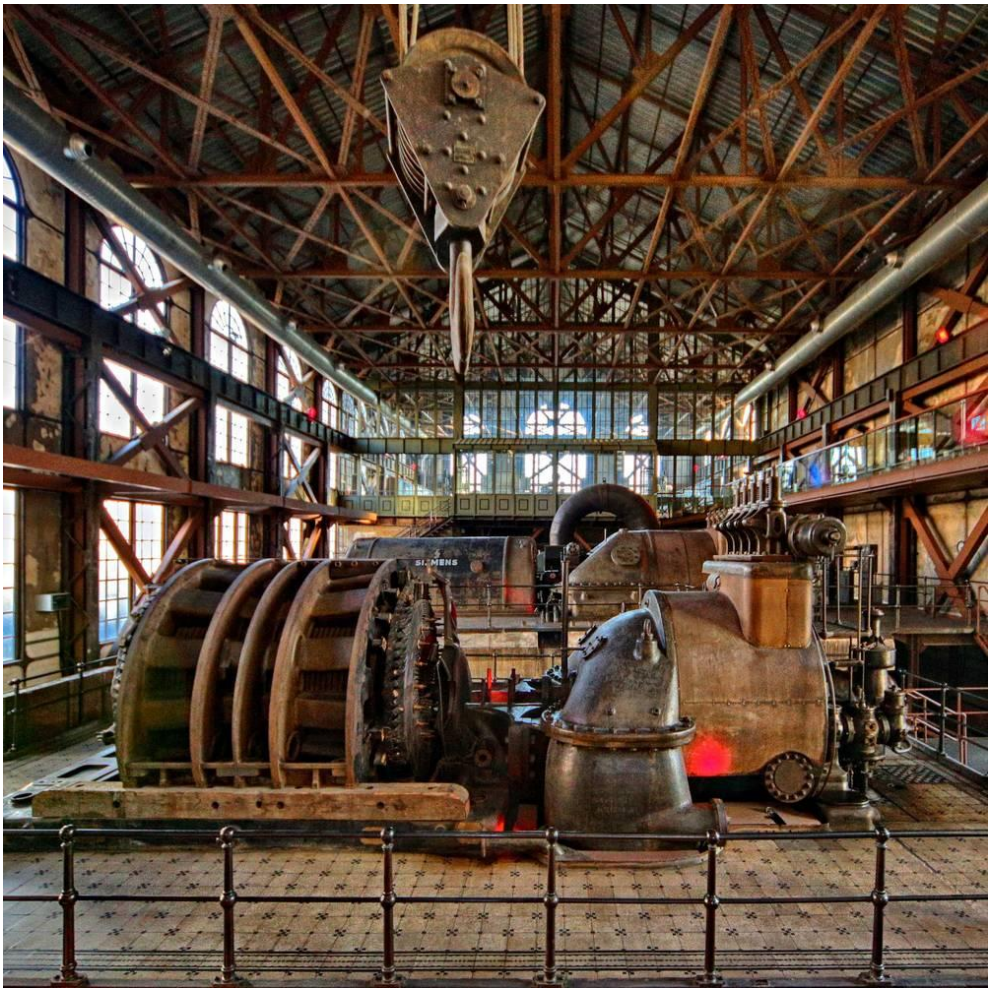


Fig. 14. *Inner view of the Energy Museum at Santralistanbul.*

Fig. 15. *Inner view of the Energy Museum at Santralistanbul.*

The boiler rooms were not integrated into the project's museum programs. 'Rather, their shells were preserved through additional structural reinforcement, while fragments of the interior were retained, and the entire structure was transformed into the new university library' [17], and the design studio block of the faculty of architecture (Fig. 16), with the insertion of a tall steel frame, creating four levels of unfragmented spaces for studio works, eventually inspired by the original open-work steel structure with no floors or ceilings, in which countless boiler and other machines were installed.

The converted Silahtarağa, an electricity works, has not become an introverted cultural and educational area, but 'rather a lively public location for a wide variety of users and uses' [18]. Santralistanbul is acting today as an urban catalyst. 'The former electricity works is an industrial monument, but its conversion has also made it a vital location in the city. These developments were made possible through collaboration between public and private protagonists' [18].

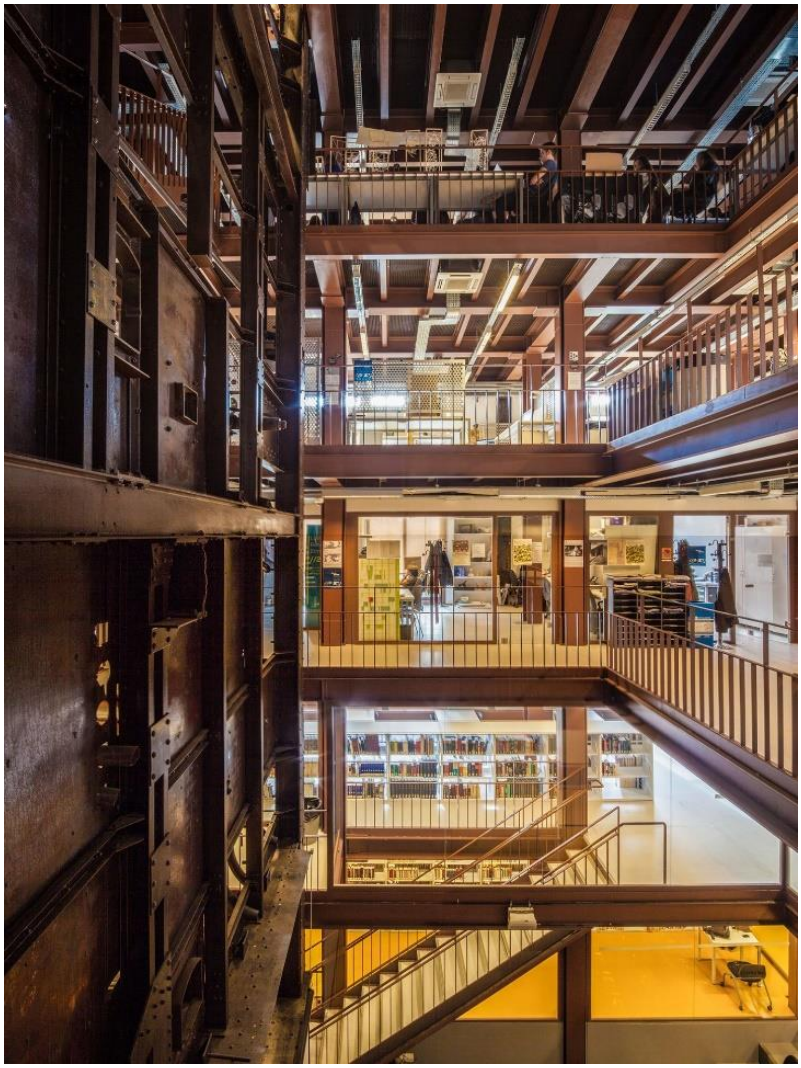


Fig. 16. *Inner view of the multi-storey studio block of the Faculty of Architecture of Bilgi University at Santralistanbul.*

All above described samples of adaptive reuse of industrial heritage buildings integrate several complementary approaches such as typological, technological, programmatic and strategic, and therefore they are characterized by the synthesis of a large range of adaptation strategies. What seems to be common feature of all these different strategies is that the designer's approach for the regeneration of the architectural artifact is always based on an in-depth interpretation of tangible and intangible values of the building as a whole. In other words, designers use the qualities of heritage buildings to design the contemporary layer.

The 'City Factory Project'. Adaptive Reuse Potentials of the Former TEK Electricity Factory in Darağacı-Izmir.

The RITM (Restoration, Intervention, Transformation, Modification) Research Team of the Department of Interior Architecture of Yaşar University, under the supervision of the authors of this paper, have conducted during the Spring Semester 2016-17 a Design Studio for third graders aimed at the identification of potential programmatic indications

and design proposals for the conversion of the first power plant of Izmir, located in *Punta* district, for social, cultural and public uses.

During the Ottoman period, Izmir became an important settlement and trade center of the Empire. In the city, while commercial activities were concentrated around the harbor in Konak and Pasaport regions, Punta and Darağacı districts were vastly used as agricultural fields. In 1858, with the construction of Alsancak Railway Station, the terminal station of the first railway track in Anatolia (Izmir-Aydın), those regions were gradually turned into an industrial and storage area [19]. With the masterplan proposal prepared by Aru-Canpolat-Özdeş group, selected via a formal competition in 1951, harbor and storage areas were located in Alsancak due to logistic benefits ensured by the railway lines [20]. The region, locally referred as *Liman Arkası* (the backside of the harbor), is a crucial fragment of the city that needs to be protected with its rich industrial heritage buildings and port facilities. One of the most prominent industrial heritage buildings located here is the Electric Factory, currently in state of ruin.

The electrification process in Izmir started with the concession attempts in 1883 to enable the tramway trams used in urban transportation to work with electricity, but it was only in 1928 that Izmir gained electricity [21]. The erection of the Electric Factory by the Belgian Company Traction-Elektricite had been a turning point in the social and economic life of the city, the needs of small industrial enterprises and workshops in the city were met, horse-drawn tram were replaced by electric trams and the main districts and main streets of the city were illuminated [22]. The construction of the Electricity Factory started in 1926 and the Factory was opened in 1928. The area of Old Izmir Electric Factory, is surrounded from the north by Liman Street, 'which connects the settlement of Alsancak to the north and east areas of the city, and from the other directions by storage buildings and workshops' [23].

Turbines were turned with the steam obtained by burning coal or lignite coal, the generator produced electricity and sea water was used for cooling. The electrical energy produced was transmitted via cables to transformers erected in different regions of the city and then distributed to the districts with high voltage lines [19].

'The Factory was handed over the Municipality of Izmir in 1944. Its power was increased at 1949 and 1953, and it was described as a Station after 1956. Izmir Electric Factory was handed over the Turkish Electricity Institution (TEK) in 1971. The operations of the Factory were stopped in 1989 with the justification of fulfilling its economic life' [24]. In 1998, the factory was registered as cultural heritage with other 53 buildings consisting of industrial complexes, factories, warehouses and residences in this region [19].

Izmir Electric Factory is the second largest power plant structure after the Silahtarağa Power Plant in Istanbul [25]. Izmir Electric Factory (Fig. 17) and its landscape 'were registered as a 2. Group Heritage Building that needs to be conserved by Izmir 1 numbered Conservation Committee of Cultural and Environmental Asset in 1998. The Factory building is striking with its plasticity of mass, steel framed structure and interior space among industrial buildings in the region. The interior volume, which sometimes reaches the height of 27 meters, is shaped with functional considerations regarding the dimensions of machinery and mechanical equipment. The construction system of the building is steel frame, with pressed bricks filling the spaces between the steel columns. The reinforced concrete slabs are carried by steel trusses, and the roof is also made up of steel trusses' [24]. (Fig. 18)

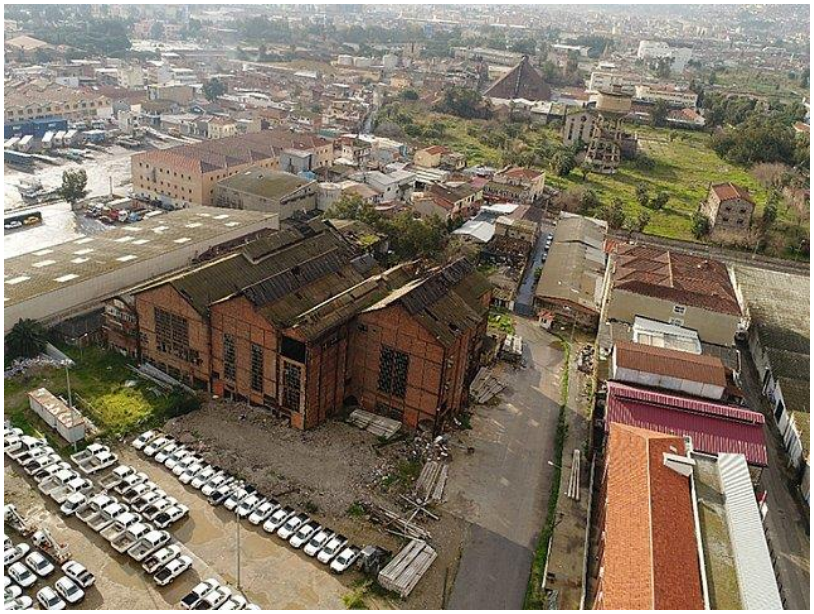


Fig. 17. *Aerial view of Electric Factory.*

Fig. 18. *Image taken during the construction of the Electric Factory in 1927.*

The factory had a crucial role in modernization process of the city. The electricity produced here was used for public transportation for the illumination of the city, giving a bright, modern and technological appearance to the city of Izmir. Moreover, the industrialization process triggered consistent changes in social life by revitalizing the city and its surroundings.

While the historic factory building is dramatically perishing (Fig. 19-21) due to loss of functional and economical values, 'it is still extremely valuable because of its location in the city, its exhibition of advanced construction and production system of its time' [19].

Explicit goal of the Design Studio was the identification of appropriate refunctionalisation proposals aiming at converting the old electricity factory to become a vibrant center within the city cultural network. The approach was essentially based on the

principles of the Experience Economy method, as developed and described by Pine & Gilmore, and as discussed over last fifteen years by academicians and researchers in the field of urban planning, architecture, and interior architecture. Common target was to form a vibrant building programme while elaborating experience-based solutions to enable the participation of the users of the City Factory. In other words, the aim of Design Studio was clearly defined as the transformation of a heritage industrial building into a new place or stage 'for the production and consumption of experience services and goods' [26].

Fig. 19. *Northern elevation of the factory in its current physical state.*

Fig. 20. *Southern elevation of the factory in its current physical state.*

Fig. 21. *Interior view of the factory in its current physical state.*

The 'City Factory Project' embraces crucial aspects of the refunctionalisation scenario. A Factory for the City, obviously reminding the former function of the building, a Power Station which has been supplying for decades the fundamental 'fuel' to factories and city facilities since the early nineteenth century industrial breakthrough of Izmir. But also, a new Factory for the City, a place where a new production begins. Moreover, a place for the city and its citizens, the venue of cultural and entertainment events, transversal in terms of users' age, multi-cultural and multi-language, where the openness of space and ideas is the core identity.

The building program was identified as composed of four major functions:

- Energy Museum and Incubation Centre;
- Public Market;
- Performing Arts Centre;
- Co-Working Spaces.

The proposed mixed-use, based on the combination of fundamental actions such as 'learn/experience/buy/work'- integrates considerations of different nature. Firstly, it proposes the symbolic continuation of the energy-production-based function of the factory. Secondly, the consideration of a new public meaning of the factory, considering the public market as a great opportunity to bring daily life into the place for very essential purchasing needs, in line with international sample of public markets such as the Mercado Santa Caterina in Barcelona or the Mercato Centrale in Florence. Thirdly, the city factory might act as a great source of artistic performances, offering to the city an unconventional performing venue, able to host shows and art installations which cannot find an appropriate place in more conventional spaces. Ultimately, the recognition of the city factory as an alternative working space, with the automatic generation of great social and professional interaction, would secure the continuous use of the place from young professionals and start-up companies, a sort of 'project house'.

The public recognition of the city factory as a 'place-to-be' or a 'place-to-go', as a generator of multiple experiences, from education to leisure, from professional interaction to entertainment, would represent a great achievement of the positive conservation of the place, with a brand new identity.

With regard to the adaptive reuse strategy, it consists of the integration of conservative actions, including the restoration of factory brickworks, large openings and skylights, the rehabilitation and the consolidation of the structural steelwork, and the insertion within the large envelope of the building, of new 'interior architectures', structural metal frames and horizontal planes. The balance between large and undivided total spaces, allowing visitors to appreciate the vastity of the original internal ambiences of the factory, and multi-storey inserted elements, would generate a similar achievement in architectural terms of the Tate Modern project, where large and tall inner spaces host public gathering zones and multi-level configurations provide more intimate, museographic, specialistic and technological spaces.

Another crucial aspect of the project task is to identify design guidelines for the reconstruction of collapsed portions of the building. The reinterpretation from an architectural point of view of those 'missing pieces' of the original configuration of the factory, as opportunities for a more 'expressionist' and 'conceptual' approach, represents a chance to integrate a new architectural language, inspired by the original, but able to project on the outer face of the factory the refunctionalization process. The conversion process of former industrial facilities in the harbor area of Izmir, requires the understanding of future urban interactions of new public hubs in a form of 'network', where symbolic architectural elements, preserved or newly created, would act as landmarks for the recognition of a large quantity of new 'places' of the city.

In this sense, three different hypothesis were simulated, having three different intentions: the first (Fig. 22) considers the reconstruction of the 'missing piece' by referring to the original composition of the exterior facades and the original dimensions of the block, yet using a different materiality, with the combination of regular bricks and glass bricks, arranged with a gradient toward the upper levels of the block, to promote higher introspection from the outer view, with the clear reference to the innovative design for Hermes high-end flagship store in Amsterdam, designed by the Dutch architectural firm MVRDV in 2016 (Fig. 23).

Fig. 22-23. *Design proposal for the Southern elevation of the factory (left) and the Crystal House, flagship store in Amsterdam, designed by the Dutch architectural firm MVRDV (right).*

Opacity and transparency, in a paradoxical combination, would well ensure the continuity of the original language together with the introduction of a diverse design approach. The second and the third solutions (Fig. 24-25), in clear contradiction with the previous one, aim at revealing the hidden construction frame, characteristic of the factory design in its totality, by avoiding the construction of the external skin of the block, generating in the first case a sort of vertical 'journey' ending with a large terrace above the harbor region, and in the third case in a sort of 'constructive' installation, acting as the rear landmark of the rehabilitated factory. All three hypothesis clearly indicate the importance of an appropriate reconsideration of reconstruction opportunities for the adaptive reuse of the former electricity factory.

Fig. 24. *Design proposal for the Southern elevation of the factory.*

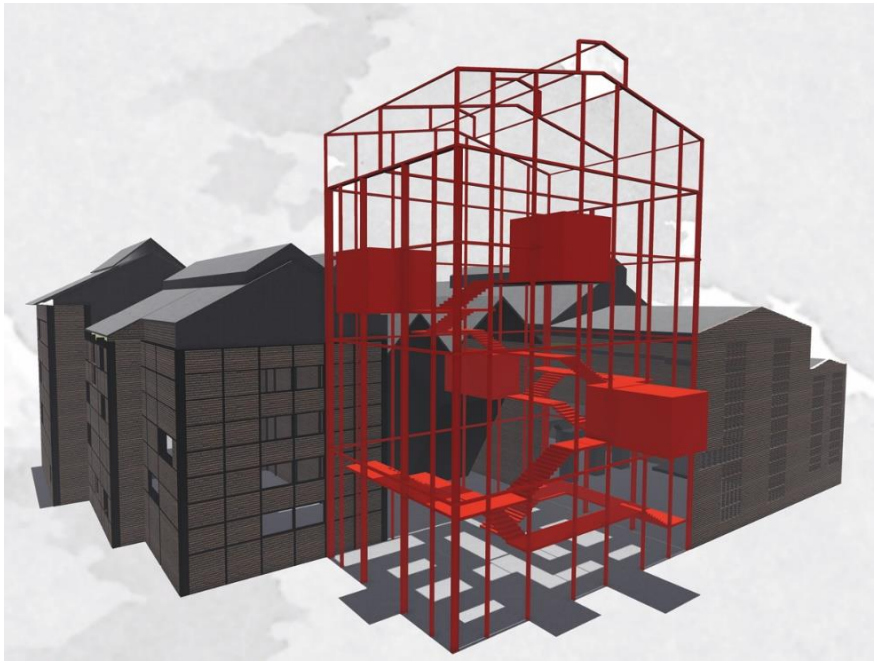


Fig. 25. *Design proposal for the Southern elevation of the factory.*

Programmatic indications were essential for the definition of interior architecture proposals within the envelope of the factory building in all its 'standing' blocks.

Design proposals related with the Energy Museum and Incubation Centre had to take into consideration the complete absence, in the current state of the factory, of original machinery and technical equipment. The impossibility of following the experience of the Energy Museum at Santralistanbul, encouraged to consider a different format for the definition of museographic spaces, with the creation of education-based and information-based interior installations in a compelling manner, to describe the history of electricity production and current directions of research in energy-based studies. The vastity of the inner space of the factory, once hosting machinery of gigantic size, would then host several thematic areas of the museum (Fig. 26-28), integrated with more private spaces for start uppers. A museographic project that informs, educates and looks at the future in the current primary area of study related with energy and sustainability.

Fig. 26. *Design proposal for the Energy Museum.*

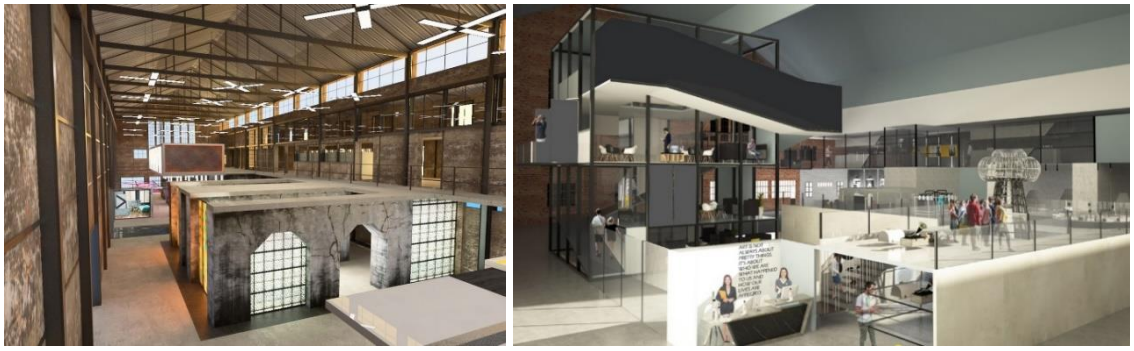


Fig. 27-28. *Design proposals for the Energy Museum.*

The integration within the 'City Factory' project of a large area hosting a Public Market is of relevant importance for the promotion of a greater participation of visitors. The reference to international samples of such spaces, 'Mercado' in Spain or 'Mercato' in Italy, led to the investigation of those cases with the aim of learning from the concepts

applied for the renovation of original market spaces into contemporary 'landmarks' of European cities. The unique variety of Aegean agricultural products and food would be greatly displayed within the large spaces of the former factory, symbolically referring to the essential importance of the products themselves, a sort of shift from 'energy' to 'food', and to the concept of 'trade' in relation with products and nutrition culture, well represented by the City Harbor, only few steps away from the factory. Interior solutions for the design of the public market and food areas were 'inserted' within the large and tall envelope of the main machinery block of the factory. Individual market stands and elevated food areas would create an undivided combination of spatial solutions, a sort of 'temple' of the Aegean food culture (Fig. 29-30).

Fig. 29. *Design proposal for the Co-working Space.*

Fig. 30. *Design proposal for the Co-working Space.*

In order to provide spaces for informal working settings, the creation of a Co-Working Space, was promoted in the form of a Project House, where a diversity of professionality can meet to generate dynamic partnerships for innovative working solutions. The former Administrative Block of the factory was identified as the most appropriate area of the building for that purpose, located on the eastern edge of the building, with a visual connection to the Energy Museum & Incubation Centre, in a sort of continuity in between the cultural and educative section of the program and the professional working area. The integration within the original 'walls' of the administrative block, of a series of physical elements, able to provide a variety of working environment options, from open office settings to cubicals, together with social spaces for events and social interactions (Fig. 31-33) would generate a contemporary co-working space, in line with the general concept of the City Factory project, which considers as primary goal the symbolic continuation of the productive identity of the place.

Fig. 31. *Design proposal for the Public Market.*

Fig. 32-33. *Design proposals for the Public Market.*

The 'insertion' within the factory envelope of a series of new 'architectural objects' (Fig. 34-35) able to enclose suitable spaces for performing art, in the form of a Performative Art Centre, is a crucial aspect of the City Factory Project. Located in a highly strategic location, the City Factory would represent an easily accessible destination for artistic and cultural events, complementing the city offer in terms of spaces for art and

culture, and able to provide a large open-air space, located on the northern side of the plot, for spring and summer outdoor events.

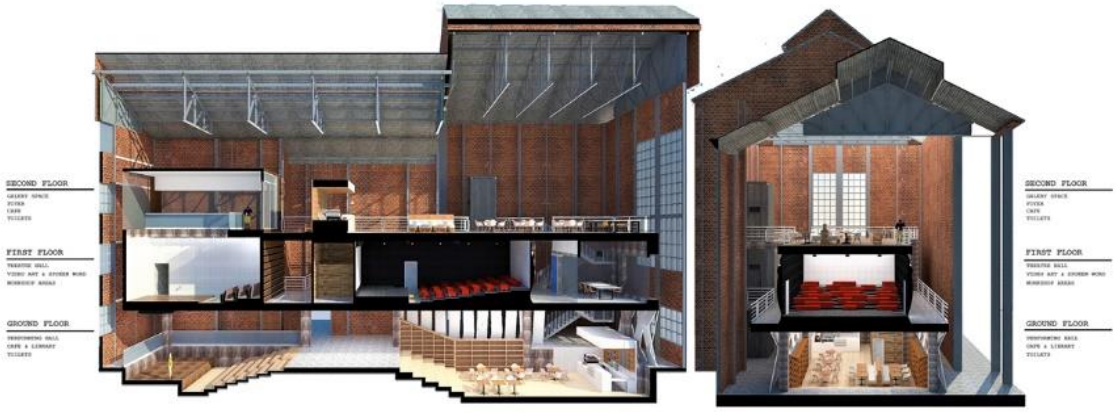


Fig. 34. *Design proposal for the Performative Arts Centre.*

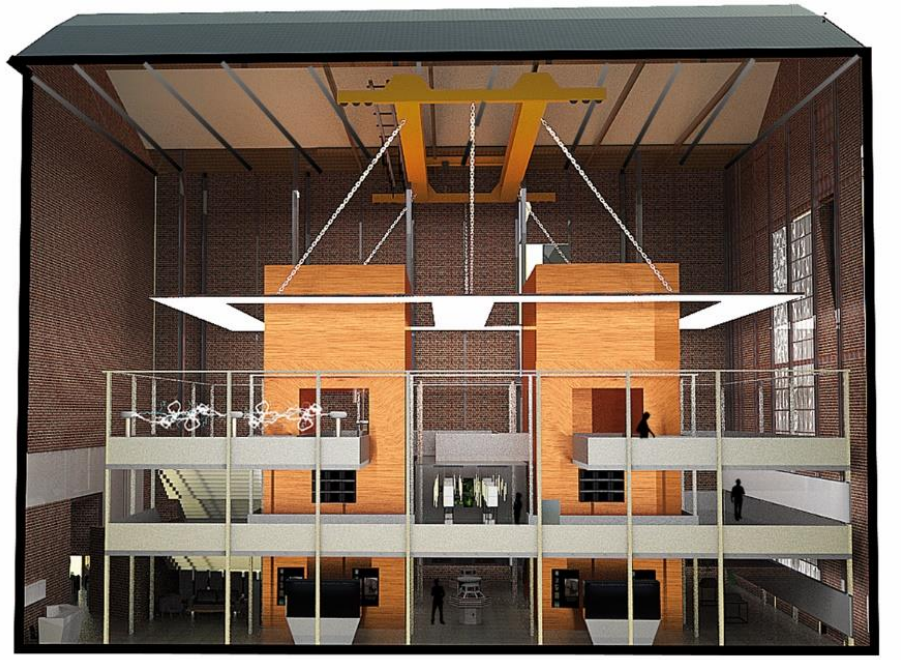


Fig. 35. *Design proposal for the Performative Arts Centre.*

The City Factory Project is an attempt to formulate a programmatic direction and design proposals for the possible future reuse of the factory, considering either spatial potentials of the inner ambiences and the positive effect of the rehabilitation and refunctionalization proposal on the built environment of the region.

CONCLUSION

Industrial heritage, widely consisting of large-scale structures of the Industrial Revolution, represent a crucial trace of the socio-economic memory of cities. These architectural artifacts and their surrounding environment, being inestimable clusters of tangible and intangible values and often experiencing today dramatic states of

abandonment due to radical changes in production technologies, urge to be reintegrated and refunctionalized to match the demands of contemporary life. These over-size constructions, erected to host heavy mechanical equipment for the industrial production, have different characters, depending on their specific supplying purpose. On the one hand, they contain a large variety of contextual data for designers for the adaptation process implementable through complex interventional design operations. On the other hand, these large envelopes have great potentials to be adapted for a wide range of new functions by applying fundamental conversion principles aimed at ensuring the protection of their holistic character.

Izmir Electricity Factory, which was at the time erected on the outskirts of the modern city of Izmir, has lost its function, yet it represents an invaluable trace of the industrial past symbolically embedding one of the most glorious trace of the city's modernization process, and today it has great refunctionalization potentials due to its scale and crucial location in the urban context. With its large span roof structure, tall wall surfaces and wide window openings, the building differs from other surrounding constructions. In addition to its documentary value, it also materializes urban and citizen memories. The *City Factory Project*, preliminary conducted through a series of studies aiming at identifying contemporary requirements in urban environments and at determining re-use potentials of the former power plant, challenged Studio attendees to develop a large number of adaptation proposals while increasing the awareness of the importance of reintegrating heritage buildings into contemporary life through the establishment of visual, functional, spatial, semantic relationships between the old and the new.

In the context of industrial heritage studies, this article investigates how contextual data and theoretical discussions affect design strategies, by analyzing different approaches applied in the design studio in reference and comparison to a wide range of contemporary trends in adaptive reuse practice. The study proves once again that a scientific definition cannot be determined in the functional transformation of cultural heritage - with tangible and intangible multi-layered values - and that these type of design applications cannot be implemented by following pre-constituted approaches. In the development of the projects, two groups of parameters, related to protection and design were taken into account. With regard to the parameters related to design, all adaptive reuse proposals developed within the studio were shaped by using methods such as analogical, contrast, interpretation, abstraction, all referenced to the original industrial building, with an in-depth understanding of tangible and intangible values embedded into the factory and in its surrounding environment. In relation to the parameters addressing theoretical issues of conservation, students have shaped their designs in order to both emphasize the industrial character of the heritage structure and to increase its cultural relevance and the quality of city life through the regeneration of the urban context of the building complex. The new building program was designed to include reuse solutions that target intellectual and operational production in continuity with the former function of the building, a place for the production of electricity as the essential fuel for the modern life of the city. As De Sola-Morales Rubió argues, understanding all aspects of the actual environmental context (historical, cultural, social and spatial) represents the preliminary step of any conversion approach, such as contrast or similarity, and it triggers the identification of the most appropriate approach able to establishes the old-new relationship. The actual context, directly or indirectly, shapes the new design.

Designing for the refunctionalization of cultural heritage buildings is a restrictive yet challenging task for designers, being not very different from design practices conducted in an empty space. The awareness of how to pursue solutions for such complex design problems needs to be gained in an environment supervised by experts on the subject. Therefore, such studies, focusing on refunctioning, should be promoted in architectural education, since they will enable graduate students to carry out functional transformation projects within their professional life by implementing scientific and systematic methods. In this regard, the Studio experience here presented, challenging interior architecture students, aimed at promoting architectural discourses on conservation and interventional design while offering the ideal environment for the completion of design exercises empowering students with crucial skills for the rehabilitation task of the invaluable heritage of our cities.

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