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From Power Plant to Energy Museum: Spatial Perception of Santralistanbul

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ABSTRACT

In this study, examining the spatial effect of old-new technologies combination in the utilisation transformations of industrial areas was examined. The study aimed to pave the way for the old–new concept provided to the visitors by approaching the industrial buildings that have become symbols of industrialisation and contemporary architecture within the context of handing down the historical identity phenomenon to the future in terms of space perception. The study focused on examining the transformation of the Silahtaraga Power Plant to Santralistanbul and investigating the qualities of the energy museum building. This work concentrated on examining the transformation of Silahtaraga Power Plant area, investigating the qualities of the energy museum buildings in the area, and evaluating them in the context of industrial archaeology. The study has three main constituents; literature review, fieldwork, and data analysis. The factors determining the spatial sense in the study were examined under ten sub-topics. One of the original aspects of the study is to conduct and comprehensively evaluate all three of the literature study, fieldwork, and data analysis within the scope of the study.

Historic industrial buildings, which reflect the old industry and technology and have lost their purposes, receive new functions through the change in their utilisation, allowing them to maintain their existence. The power stations, which were transformed into energy museums, are buildings that still preserve their equipment and reflect the production techniques and processes. This paper is among the few works that evaluate the energy museum transformed from an industrial building.

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KEYWORDS

Energy museum, Transformation, Adaptive reuse, Santralistanbul, Spatial perception.

INTRODUCTION

The industrial revolution first began in Great Britain, spreading to Europe and across the world. With the industrial revolution, the industrialisation process began, and industrial facilities were developed in numerous nations. From the late 18th century onwards, the reduction in the fabrication sector and the growth in the service and different economies resulted in the redundancy of countless industrial structures and areas (James, 2006). With the change in technology and the disappearance of some industry branches, these installations lost their functions and remained inactive. The locations of industrial installations became deposit sites in cities. For these historic industrial buildings and sites, much of their value lies in the evidence of change and development in societies they display (Foster, 1995). Today, architecture itself has become more concerned than ever with the memory of space and the inscription of temporal dimensions in spatial structures (Lorenz & Huyssen, 1996). Building conservation is a means of preserving our physical cultural heritage for future generations, its historic, aesthetic, scientific and social value (Foster, 1995).

The lifestyle of the past, the sense of aesthetics, constructive art, and the traces of customs and traditions are handed down to the next generations through historic buildings. In this sense, protecting landmark buildings, which are the witnesses of the past, means protecting the link between the past and the future of society and handing down the material and nonmaterial values of the natural and cultural environment to the future by claiming them (Feilden, 2003). The reasons for the preservation of cultural values are aesthetic - artistic value, tourism income, being a social product, and ensuring that the heritage from previous generations is passed on to future generations (Kesavaperumal et al., 2020).

In general, the best way to preserve historic buildings and sites is to keep them in active use. For the vast majority, this should mean economically viable benefits for their survival. Therefore, the scope and acceptability of possible services should often be an important consideration regarding the future of buildings in protected areas (Circular 8/87, 1994). Abandoned industrial zones contain a contemporary figurative and social essence. Often there stays a social bond, mutual liking, and honor communicated by the people, sustained even after abandonment (Cenci, 2018).

Priority has been given to upgrading these disused industrial buildings and areas to revitalize them with new roles and architectural shapes (Cenci, 2018). The significance of industrial spaces in providing social infrastructure at the urban scale is undeniable. Due to the conditions of the time, various social areas may be needed to meet user needs. In this sense, it is thought that the use of structures with historically different functions positively affects the social infrastructure (Ismailoglu & Sipahi, 2021).

In this study, the spatial effect of gathering old industrial technologies and new technologies together in the utilisation transformations of industrial areas was examined. Historic industrial buildings, which reflect the old industry and technology and have lost their purposes, receive new functions through the change in their utilisation, allowing them to maintain their existence. This transformation means that old technology meets new technology; the old meets the new; and the past meets the future.

The study aimed to pave the way for the old–new concept provided to the visitors by approaching the industrial buildings that have become symbols of industrialisation and contemporary architecture within the context of handing down the historical identity phenomenon to the future in terms of space perception. The buildings transformed from industrial buildings primarily function as museums. However, only a few of them were

transformed into energy museums. This study thus aimed to evaluate the energy museums transformed from industrial buildings. The scope of the study is restricted to the buildings that once functioned as energy generators and then became energy museums after being re-functioned in Turkey. Therefore, primarily the energy museums in Turkey were detected. The example chosen is that the sole structure, Santralistanbul, which was once used as a power generation factory is now being used as an energy museum.

The study examines the historical industrial architecture phenomenon used by adaptive reuse. In this context, the research's main problem was how the industrial building's potential could be used more effectively and sustainably by preserving and refunctioning the historical and cultural structure. So research hypothesis is that architectural values could be preserved and transferred to future generations.

LITERATURE REVIEW

CONSERVATION AND ADAPTIVE REUSE

De-industrialisation is a phenomenon that has affected many regions in complex ways during the 20th century (Auclair & Fairclough, 2015). Industrial buildings and areas are traces of history, and each trace is important. It is undesirable to abandon historical rural buildings, as they determine the characteristic identity of the settlements they are located in and at the same time are concrete documents of the social life and cultures of the past periods (Akturk and Ediz, 2020). The Nizhny Tagil Charter defines industrial heritage as consisting of the remains of industrial culture which are of historical, technological, social, architectural, or scientific value (TICCIH, 2003). Farmhouses, factories, stations, workshops, and mining sites are some of the heritage sites that can be studied under the heading of industrial heritage (James, 2006).

Their conservation has in many cases been instigated since the inauguration of The International Committee for the Conservation of Industrial Heritage (TICCIH) in the United Kingdom in 1979. The dereliction of industrial buildings due to the emergence of new technologies raises the issue of future uses for them (Vehbi et al., 2019). Industrial buildings and areas, which are important indicators of a country's social and cultural past, lose their functions primarily due to rapid technological advancements. When the protection of industrial heritage buildings and economic approaches are combined, we encounter the concept of re-functioning (Edwards & Llurdes i Coit, 2017). By this means, it is desired to draw attention to the decrease in energy raw materials, which is the most crucial problem in the world, and to raise awareness. By this means, it is desired to draw attention to the decrease in energy raw materials, which is the most crucial problem in the world, and to raise awareness.

For many industrial buildings, their original functions may have ceased altogether, thus requiring conversion to avoid the problems of disuse, destruction, and decay (Foster, 1995). This necessity gains importance in reducing the damage to the natural environment by making good use of the existing building stock and maintaining cultural and historical continuity (Aydin & Yaldiz, 2010).

The TICCIH states the aim of adaptive reuse of industrial heritage as the protection of buildings from becoming old and unusable and preventing their possible collapse. Industrial heritage has a social value that provides an important sense of identity, scientific and technological value in the history of construction, manufacturing, and engineering and has a considerable aesthetic value for the quality of its design, architecture, and planning (Url-1). The opinion of taking over these buildings and turning them into signs of renewal has become an appealing choice for both stakeholders and society. Historical industrial buildings are tangible elements that transfer the

economic and technological conditions, cultures, and social lives of the societies they belong to the next generations, as well as being a source for the history of architecture. Due to the developing technologies and changing social needs over time, structures also have to change (Maxwell 1997). Adaptive reuse has been successfully applied in many types of facilities. It is possible to see examples of culturally significant industrial buildings' adaptive reuse. These culturally important structures characterize other looks of cities as living observers of the production culture in those cities (Babutsali Alpler et al., 2020).

An industrial structure or area may represent the splendor of one or more past and the social or financial assistance that the land and its residents have made regarding heritage and communal identity. This historical significance should be seen as an asset, a support instrument for evolution, not as a limitation that needs protection and redevelopment. Therefore, once an area has been specified, it is essential to find a place in a regional dynamic and remain involved as long as the community exists. To achieve this, the area needs to have a symbolic identity, and as a result, the desire to invest in the building is inspired by a program in line with the needs and expectations of the community. Historical understanding of the area and symbolic ownership of the site is essential for a sustainable, material change (Cenci, 2018).

As an option for pure conservation, preserving abandoned industrial areas for use as museums can be economically and socially possible. Yet this choice is suitable especially for old industrial structures. For instance, disused factories, mine structures, and mills are ideal living models of old-fashioned work practices, if not extinct. The abandonment of historical industrial buildings, which have important values for the society, and their idle state, eliminates the local people's sense of belonging and experience over time (Ahunbay, 2010).

FROM INDUSTRIAL SETTLEMENT TO ENERGY MUSEUM

Throughout its growth, architectural elements in the industry were characterized by technological and financial consequences. The industrial revolution led to technical inventions connected to the raised production capability of the industry (Cenci, 2018). When industrial buildings are physically examined, they have a structural installation, spatial order, and interior atmosphere that distinguish them from other buildings. The main reasons for this differentiation are the technology of that period and the function that shaped the building. The appearances of industrial structures differ mainly from famous typologies of ancient heritage (Giuliani et al., 2018). Overall, they are unique, both in height and shape (Babutsali Alpler et al., 2020). At the beginning of the 20th century, inventions related to the improved consumption of electricity, oil, and chemistry were additionally in the industry. Factories have become marks of industrial architecture (Cenci, 2018).

Their wide-open spaces and volumes are significant parts of industrial structures such as power plants (James, 2006). The symbols of the power station industry are big machines and vast crane bridges. Many of these structures have escaped demolition as survivors of the battle and have experienced technical transformation, urban regeneration, or changes in international finances (Crisman, 2007).

In the beginning, the perception of the industry was optimistic. It imaged improvement and modernity, despite plant employees' dirty and tiring work (Cenci, 2018). However, by the mid-20th century, industrial buildings were seen as a symbol of poor working conditions and slow technology (Neaverson & Palmer, 2012). Today, the general thought has grown to the point that industry should not leave its preservation work because the abandoned industrial structures significantly contribute to urban renewal and the visual quality of a city (Babutsali Alpler et al., 2020).

To a different degree, contemporary cities are filled with a messy and harmful industrial area that stems from previous manufacturing movements. The remnants of industrial manufacturing have often been converted into contemporary museums, artistic platforms, educational buildings, and offices through different cleaning and transformation processes and reconstruction (Crisman, 2007).

Museums are significant among these because they constantly hold new exhibitions and have visitors (Stratton, 2000). The use of industrial heritage areas, which have lost their functions as museums, aims to constitute historical consciousness and the past to contribute to the future by claiming society's shared values. By the ICOM Statutes, adopted by the 22nd General Assembly in 2007, the current museum definition: A museum is a non-profit, endless organization for the benefit of humanity and its evolution, available for people, which develops, preserves, studies, and displays the heritage of society and its atmosphere for the objectives of education and research (Url-2).

Industrial areas' adaptive reuse for exhibiting modern art grew in the 1960s and continues to grow (Crisman, 2007). Andreas Huyssen may have attributed the wish to maintain left industrial areas as part of the memorial culture and the present desire with the past, which he explains is a response to the accelerated momentum of modernization, as an attempt to claim a sense of time and memory (Lorenz & Huyssen, 1996).

During the last decade, countless empty industrial buildings in the world have been turned into cultural spaces, both formally and functionally. They often offer excellent places in the metropolitan center and appropriate physical requirements for museum function, including big and unrestrained areas for flexible hall space and public assemblage, a ton of natural light and high tops for showing extensive painting, and structurally stable

constructions that may be recycled better economically than new building (Crisman, 2007).

It is essential to respect that the method of making a tabula rasa from a retired industrial area converts it into natural heritage while changing the harmful notion of an industrial area into a tangible part of heritage (Cenci, 2018).

The industrial areas that have lost their functions are re-functioned with many different functions. Some of these areas maintain their function as museums. Only a few of these industrial buildings, which functioned with contemporary art, selected the energy topic as a major theme. The transformation of these areas into museums dedicated to the things they once produced is fundamental in terms of witnessing the traces of the past. The energy installations, which have a unique industrial heritage quality and accept visitors as if they were in a museum, constitute a basis for comparing the past, the present, and the future.

Energy museums are places where individuals of all ages participate in educational activities, which can be considered a purpose for energy museums. In today's world, where discussions on energy continue, pollution increases rapidly due to technology, and world politics is focused on energy raw materials, the topic of energy has gained universal importance. The objective of energy museums is to highlight the significance of energy through industrial production materials and reflect the impact of energy on the development and transformation of civilisation through interactive areas.

METHODS

This work concentrated on examining the transformation of Silahtaraga Power Plant area, investigating the qualities of the energy museum buildings

in the area, and evaluating them in the context of industrial archaeology. The examination has three significant components: literature study, fieldwork, and data analysis.

Literature study: In the literature, it is seen that there are very rare scientific studies on the refunctioning of the industrial power plant heritage to Energy Museum in the historical. There is no study that examines Santralistanbul in the Golden Horn district for sustainable tourism from the perspective of spatial perception. The literature study was performed similar to the area survey. The main concepts and sub-concepts that constitute the subject of this study were discussed. Within the scope of this study, internationally valid legislation and regulations on restoration and preservation were also examined. Within the scope of international conventions on historical sites, legal regulations such as the Venice Charter (ICOMOS, 1964), Convention Concerning the Protection of the World Cultural and Natural Heritage (UNESCO, 1972), The Declaration of Amsterdam (ICOMOS, 1975), Convention for the Safeguarding of the Intangible Cultural Heritage (UNESCO, 2003), Charter for The Conservation of Historic Towns and Urban Areas (Washington Charter) (ICOMOS, 1987), International Cultural Tourism Charter (ICOMOS, 1999), Vienna Memorandum (UNESCO, 2005), The Valletta Principles for the Safeguarding and Management of Historic Cities, Towns and Urban Areas (ICOMOS, 2011) cover important criteria for reuse and have been examined in detail in order to create the legal framework of the study.

Fieldwork: Two architects specialising in architectural design and conservation carried out this in a 3-year period between 2019 and 2022 with some site visits. It was performed in the following phases: recording observations, including photos, and notes on areas.

Data analysis: Data gathered from the fieldwork were studied regarding architectural components (including location, setting, design, architectural

parts, structural strategy, and building methods), machinery, structure changes, material pollution, and structural damage.

Data were collected through on-site observation, analysis of relevant documentation during multiple site visits. One of the original aspects of the study is to conduct and comprehensively evaluate all three of the literature study, fieldwork, and data analysis within the scope of the study.

ANALYSIS OF THE CASE STUDY: THE TRANSFORMATION OF SILAHTARAGA POWER PLANT

CASE SELECTION

Within the scope of the study, Santralistanbul, which was transformed into a museum in Istanbul, was selected as the study's sample due to its place, role, and historical quality in the historical process in terms of industry and trade. The first function of this building was to generate energy. After losing its function, it was transformed into an energy museum. Silahtaraga Power Plant is an emblematic building of a historical period characterised by technological progress and economic and political conditions. The historical background, the re-functioning process, and the situation today of Santralistanbul chosen from Istanbul were evaluated, and the interventions to the building were determined.

SILAHTARAGA POWER PLANT

The Silahtaraga Power Station was established in 1913 to provide electricity for lighting the streets and the palace, the consumption of residences and industry, and the tramway plant. The factory, which was the first thermal power station in Istanbul and Turkey, provided electricity for Istanbul on its own. With the decision dated 1983, the production had to be stopped because the technical system of the station had become old; raw material could not be provided; the stream from which cooling water was provided

was polluted; technical equipment such as machines and appliances could not meet the requirements of the period; the production was not economic anymore; and the station was causing pollution around the Golden Horn (Neziroglu & Yilmaz, 2013). Since they witnessed the history of the city and had an essential architectural identity, they were recognised as industrial and cultural heritage and put under protection according to the decision of the Ministry of Culture's Cultural and Natural Heritage Preservation Board.

The engine rooms numbered 1 and 2, considered to have been built in 1913 and 1921, were transformed into an energy museum (Fig. 1). The machines and equipment were preserved. The turbines in this building were preserved, and they were being used to exhibit the power-generation process. The museum exhibits the turbine generators with AEG, Brown Boveri, Siemens, and Thomson Houston brandings, which were the most essential elements of production in the Silahtaraga Power Station and reflect the typical characteristics of the advanced technology of that period to the visitors. The escalators, podiums, and steps that were added later to the building offer an opportunity to watch these turbines from different angles. The Santralistanbul Museum of Energy, a field containing 22 interactive units and bringing entertainment and science together, was established to allow visitors to generate their own power, touch thousands of volts of electricity without any hesitation, and perform many more experiments; the Control Room, where the power generation and distribution to diverse neighbourhoods of Istanbul were controlled, is preserved with its detailed command devices and appliances. The energy museum exploits the drama of the internal spaces and skilfully contrasts old and new elements.

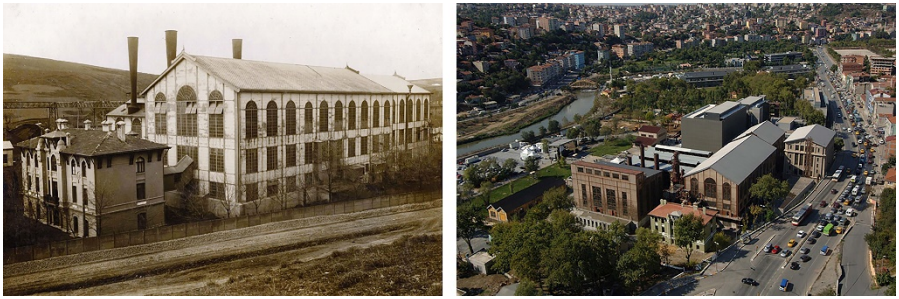

Figure 1. *From power plant (left) to energy museum (right) (Url-3).*

DATA COLLECTION

Santralistanbul presents three principals to lead other transformation projects in terms of designing a method:

– Utilizing history as a lever by combining an industrial culture with the protection and usage of the industrial site as a symbol,

– Reversing a place's harmful notion and famous thought by making cultural affairs in its old place,

– Creating a modern image in the sight of heavy pollution.

While re-functioning was performed on the structures, which are, in fact, the factory's machines, it was attempted not to impair the existing integrity and aesthetic of the building with the concern of touching the building as little as possible. It was also aimed at creating flexible and transformable places. Structural elements inside the buildings from the factory period, machines, machine bases, and all the parts have survived.

In the museum, the chaotic situation caused by the original functions of equipment was fixed, and it was transformed into a science and entertainment area where several experiments are performed. The museum offers visitors the ability to attend educational programs with the themes of electricity and energy. The visitors were informed during these programs about the history of the Silahtaraga Power Station, the sources of energy

down the ages, energy-saving, and the methods of obtaining electricity. It offers the ability to practice with electricity-themed game units in the Energy Play Zone, attracting the attention of all age groups. These programs are significant for the promotion of the unique identity of the factory.

This resulted in a consistent series of transformations that radically altered the appearance of a prominent one-time industrial site. Their rough and unfinished condition evokes history. The tension between the two languages creates a material connection and solid aesthetic knowledge. Santralistanbul guests are instantly encountered with the material facts of the last industrial processes, where their textures and artifacts are not upgraded or maintained for the sake of memories but are preserved for educational objectives and exist amid the daily life of the areas, strange reminders of the activities and culture that once dominated the power plant complex and the entire Golden Horn region. However, the museum differs from the others in its architectural techniques, displaying other perspectives on industrial dirt and leftover materials.

The selected case is a significant example of industrial areas with metaphoric significance, reminiscent of several industrial zones. Factors determining the spatial sense in the study will be examined under 10 sub-topics through the example of Santralistanbul. These factors are the user's visual perception, lighting, material, circulation, security, floor, ceiling, accessibility, technological use, and guidance.

Visual details:
Every detail of the business; movable/immovable production machines that have remained original and retained their original function; overhead crane mechanisms; warning boards; and even tool sets are exhibited in the re-functioned museum (Fig. 2) (Fig. 3). Particularly in areas where the unique identity was displayed by conserving the production equipment, the noise, every technical element, and the natural surroundings, it has become a

location that provides tourists with knowledge about the history of that time, such as workers' daily lives. The minimally revitalized interior, with its vast machinery, oxidized steel frame, and diverse pipes, raises the viewer's understanding of contrasts in technology and culture.

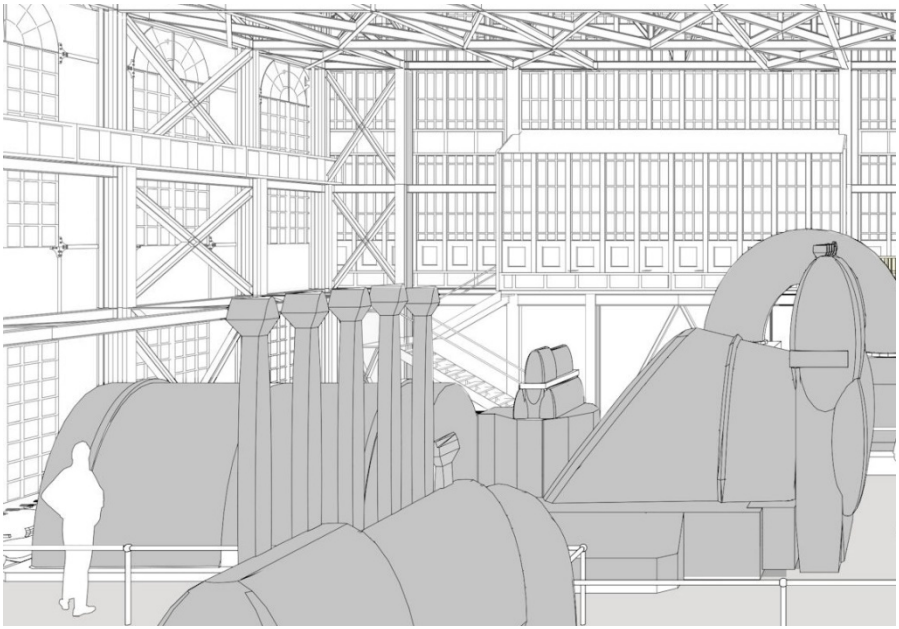

Figure 2. *Old production machines (Url-4).*

Lighting details:

This structure receives excessive sunlight through the large windows, except on the ground floor (Fig. 3). The ground floor is lit with artificial lights. A different atmosphere showed up with the use of blue and red artificial lighting. The coloured and hidden lights influence the glory of the objects. Colour-changing lights were placed between the machines, and at the entrance, attractive hidden lights were used under the metal grate.

Material details:

The steel fortifications made with contemporary materials were painted a different shade of brown, revealing the distinction between the old and the new (Fig. 3). On the floors of the corridors leading to the control room, less-processed wood was preferred, and for the balusters, glass was used. Furthermore, it was revealed that these were added later. The blank spots on the panels were shown by using transparent plexy material.

Figure 3. *Visual (left), lighting (centre) and material (right) details.*

Circulation details:

There are escalators whose mechanisms can be clearly seen when entering the place where coal bands slide horizontally.

Another critical circulation intervention in the place is the sightseeing pier, hanging 12 meters off the ground to allow visitors to perceive turbine-generator groups comfortably and to wander (Fig. 4). The sightseeing pier was designed to let visitors see the machines easily, and it was newly constructed on a steel structure with a wooden floor and glass balusters (Fig. 5).

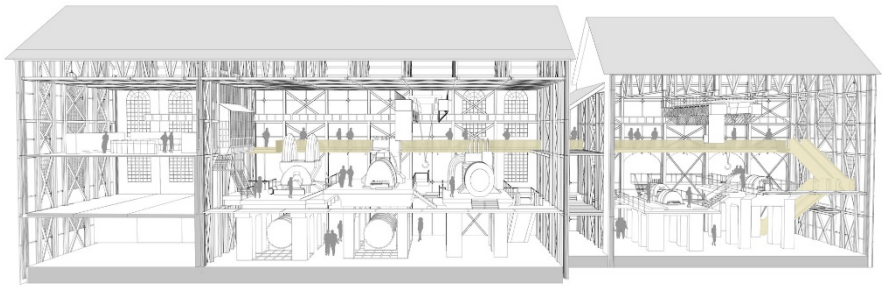

Figure 4. *The sightseeing pier (Url-4).*

Security details:

During the re-functioning, the steel carcass external skin of existing structures and the scissor system roof were fortified with thin steel according to the earthquake code. The steel fortifications on the top and the walls affected the volumetric perception of the place, and the excessive steel intervention on the roof caused the volume of the building to become narrow perceptively.

In addition, balusters were built on every circulation area, and to prevent objects from falling, a safety net system was constructed (Fig. 5).

Floor details:

To close the level gaps on the floor; concrete, metal grate, wooden-steel stairs, and wooden platforms were used partly. The ramps and stairs were renewed very similarly to the originals. It is seen that there are four types of tiling intervention. The interventions to the tiling were as follows: preserving it as it is, renewing it with a material similar to the existing material, adding tiling that did not exist before at some parts, and obliterating the existing tiling (Fig. 5). The ceramic diamond tiling around the exhibited production structure was preserved, and by not completing the missing parts, it was referenced to the past of the building. The metal parts of the tiling, which

were in the exact location on the floor before the transformation but damaged in time, were renewed using a different colour.

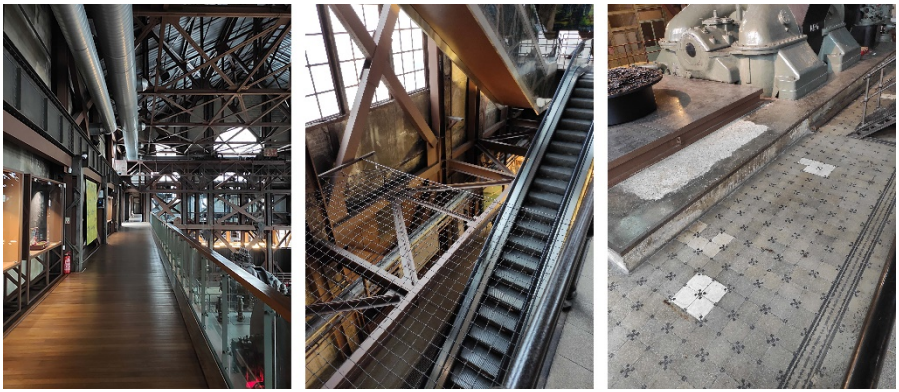

Figure 5. *Circulation (left), security (centre) and floor (right) details.*

Ceiling details:
Installation pipes and electric cables were not hidden and were left exposed with a naked structure (Fig. 6). Through the air ducts, air circulation to the place is provided by flanged blow mouths. Industrial elements such as lights left exposed and air ducts contributed to the unique identity of the building.

Accessibility details:
An elevator was added to the building, and wheelchairs were allowed to pass with the ramps (Fig. 6). Another accessibility intervention in the place is the sightseeing pier, allowing disabled visitors to perceive turbine-generator groups comfortably and to wander (Fig. 7). Disabled visitors can experience all buildings without any help, thanks to the elevator, inclined ramps, and sightseeing pier.

Technological use details:
The industrial background of the building and its situation today is shown on the digital displays placed on the wall at the entrance and on the floor. Also,

the user-interacted digital displays in the control room and at the walking port give information about the building (Fig. 6).

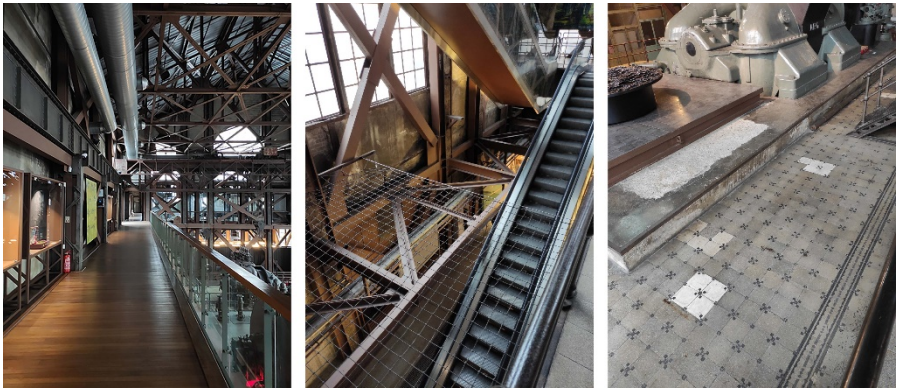

Figure 6. *Ceiling (left), accessibility (centre) and technological use (right) details.*

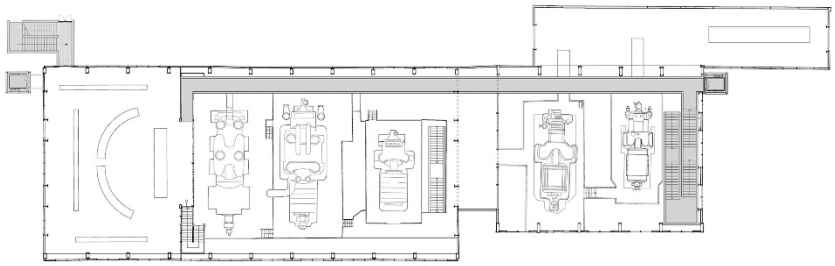

Figure 7. *Accessibility parts on the second floor (Url-4).*

Guidance details:

There is some vagueness related to guidance. Due to the café and standard fields, that the visitors encounter as soon as they enter, it was observed that finding direction gets difficult.

DISCUSSION AND CONCLUSION

In this study, the criteria establishing the spatial perception of Santralistanbul were identified by evaluating the existing structures and historical data and assessed using a literature study. This literature study could have been better in establishing adaptive reuse priorities in the study area. Thus, the literature study was quantified using fieldwork and data analysis methods to be objective while making the spatial perception of Santralistanbul decisions. Therefore, the method used in this study is expected to provide guidance to future research and practice worldwide to detect spatial perception and planning decisions of adaptive reuse.

Adaptive reuse of historical industrial buildings' policies to be developed for the future of the settlement can only be successful if the internal and external factors affecting the settlement are taken into consideration. It is very important that this situation be taken into account in future reuse projects. It is impossible to evaluate Santralistanbul's goals of preserving buildings and spatial perceptions of its cultural and industrial heritage for the future and reviving them independently of each other and from high-level design policies and decisions. Conservation and adaptive reuse policies should provide insights on how to build strengths, maximize opportunities, reduce threats, and eliminate weaknesses.

It is vital for people who use and visit the re-functioned building to see the traces of the past and be aware of its historical identity. However, it isn't very likely whether such sites have the potential to translate the benefit to society profitably. The answer is that some areas have a more excellent heritage significance than other areas. Still, many have a rich history that includes part of the originality of residents, cities, or provinces. Within the context of the relationship between place and time, the transformed buildings connect us to both the past and the future. The proposed new use at Santralistanbul reflects contemporary culture, valuing architectural heritage, and promotes a more robust environmental understanding.

When informing about the functioning of the factory and the technological situation of the period in terms of electricity, several recordings and information boards were used excessively. From the introduction of energy sources to the generation and productive use, all the links in the chain are presented to visitors. The power stations, which were transformed into energy museums, are buildings that still preserve their equipment and reflect the production techniques and processes. The goal of the energy museum is to reveal the historical layers of the building to visitors.

Within the scope of the Venice Charter, in the additions made during the re-functioning process, modern techniques were used, different colours were used, and the distinction between the old and the new was revealed. The industrial background, which can be clearly perceived at the front of the building, can also be perceived from the interior. Santralistanbul is a critical industrial and cultural heritage in Istanbul. These kinds of facilities are the memory of the cities. The restoration of this facility, sharing its story through writings and pictures, and planning the environment to make it suitable for cultural events are extremely valuable for Istanbul.

Factors determining the spatial sense in the study had examined under 10 sub-topics through the example of Santralistanbul. These factors are the user's visual perception, lighting, material, circulation, security, floor, ceiling, accessibility, technological use, and guidance. All these factors examined showed that during the conservation and adaptive reuse of historical industrial Santralistanbul buildings, it was aimed to clearly convey the distinction between the old and the new to the visitors, and design decisions were taken in that direction. The technical details of the changes made to the structure and how the least intervention to the structure was made can be seen in graphic explanations (Fig. 2) (Fig. 4).

The interior setup of the industrial heritage buildings was planned to allow flexible uses instead of the strict uses in the factory period, to be entertaining, and to give room to users from every age group and every profile. The effects in structural and interior in terms of reuse were calculated by considering the interior and exterior characteristics of the industrial buildings chosen from Istanbul. It is believed that it will be helpful in the studies in this area with similar practices.

In addition, we hope that this examination will guide further study and analysis of similar subjects, particularly in Turkey, and help global study.

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