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Adaptive Reuse as a Tool for Sustainability: Tate Modern and Bilgi University Cases

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Abstract
Examples of "adaptive reuse" have started to be applied for giving new functions to the structures in historical environment are commonly used in the world and in Turkey. According to the current planning practise, the future applications should be done with consideration of different dimensions of sustainability. Aim of this study is to examine Tate Modern and Bilgi University Campus that used to have similar functions and were inhabited before restoration interventions in sustainability framework. Both cases were refunctioned with adaptive reuse concept. The structures transformed from energy buildings to serve as art museum and educational/cultural functions. Cases were compared in terms of sustainability principles. Social, economic and ecologic benefits of physical interventions were asked on structures which couldn't continue their original functions and refunctioned by adaptive reuse. Results support the positive impacts of adaptive reuse not only for the structures themselves but also for the environments they were located.
Keywords: Adaptive Reuse; Sustainability; Reuse in Historical Environment; Refunctioning; Sustainable Conservation.

1. Introduction

Necessity of conserving historical cities is accepted and inarguable with all its economic, cultural and ecological dimensions. According to the International Council of Monuments and Sites (ICOMOS) historical cities and areas are known with not only documentation features but also with their values belonging to urban culture (ICOMOS, 1987). The structure in architectural environment are reflections of the lifestyles of cultures they belong to. In this sense, it is essential to conserve them with the heritage value they carry. Transformation of cultural heritage to the next generations without any damage expresses the continuity of conservation in socio-cultural point of view. Keeping the structures that are valuable in some aspects alive by conserving them is more effective only when new functions are assigned to them. All these works are applied considering the concept and dimensions of sustainability nowadays.

Transferring the history without any interruption can be available by sustainable conservation. Giving new functions or conserving the structures by adapting their original functions have become an intervention method. In this sense; the major tool is "new addition". According to Hunt and Boyd, new needs should be done in a contemporary language in order not to cause any confusion and without decreasing the original value (Hunt and Boyd, 2017).

Plevoets and Cleempoel argue that "adaptive reuse" have been started to use more frequently in the sense of urban, architectural and conservation strategy and sustainability of the biggest reasons for this. Concept of sustainability refuses the big scale demolitions and seeks the solution to guarantee ecological and socio-cultural pattern for the sake of future in transformation (Plevoets and Cleempoel, 2019). Giebeler and Kahlfeldt evaluates the renewal concept as an adaptation of a structure in order to satisfy current standards caused by user's needs or technical organisations (Giebeler and Kahlfeldt, 2009; Akdağ & Sayar, 2020). It is acceptable that structures may be out of use or their functions may not be sufficient in time and besides they may be deteriorated. Roca et al. describe these factors as natural ones, climate changes, earthquakes, fires, human caused deteriorations (Roca, Lourenço and Gaetani, 2020). Conservation interventions have been developed against these deteriorations for the sustainability of these historical constructions. After interventions to ensure the physical integrity of the structures, some similar applications like reanimation, rehabilitation, revalorization, adaptive reuse are used to give new functions. Venice Charter (5. Article) emphasizes that monuments should be used for socially useful purposes and it is within these limits only that modifications demanded by a change of function should be envisaged and may be permitted (ICOMOS, 1964).

The changes that are emphasized within these limits are managed through these additions. Even though there are not any clear legal acceptance regarding design principles of these additions, common features of these are evaluated as they become widespread. In addition, conservation attitude of the country, authorized institutions, political conditions, legal arrangements and socio-cultural approaches would affect the approaches towards new designs (Büyükmıhçı and Kılıç, 2015). Rush; mentions the importance of three subjects; sustainability, architectural

feature of additional structure and integrity on the connection of old-new about the historical structures' additions (Rush, 1986).

Adaptive reuse is an application that is used frequently and is attracting attention in recent years among interventions used as a tool for sustainable conservation. In this study; an inspection over different cases were done in order to understand adaptive reuse as a concept. Design principles and criteria to be considered while adaptive reuse studies are being carried out were evaluated in applied case studies with the additions they have. It is among the sub goals to examine the concept of additions that are used in adaptation of transformed structures spatially and functionally.

2. Literature Review

2.1. Refunction and Adaptive Reuse as A Tool for Sustainability

The basis of enabling the sustainability in historical environments rely on evaluating the current resources. Adapting the existing structures by conservation methods and transferring them to the future provide a big resource management. Bullen describes restoration applications as returning the structure back to its original state and renovation as adapting the structure in order to reach current standards (Bullen, 2007). Refunctioning of the structures usually requires adaptation to current conditions. Adaptive reuse is an effective tool for the sustainable conservation in historical environment. It is often needed to introduce new additions to the structure since the works for adaptive reuse is usually related to the new function.

Adaptive reuse is a concept that came out because demolishing and rebuilding of current structures took more time, energy and cost (Velthuis and Spennemann, 2007).

Giving a new function and adaptation of historical structures as functional and spatial means an application that carries all aspects of social, cultural, economic and environmentally. According to Afify, adaptive reuse and refunctioning provide new job opportunities for the society by social cohesion and conservation of cultural identity, creating labour force during restoration applications, economic and social benefit by introducing a modern interpretation of living spaces of their ancestors to young generations (Afify, 2018). Adaptive reuse means enabling economic, cultural and historical continuity, having a labour based process instead of energy consumption and becoming an indicator of ecological approaches (Kuyrukçu and Kuyrukçu, 2015). Yung and Chan; describe adaptive reuse as a form of sustainable urban renewal and argue that renewing a structure instead of demolishing it, has social, environmental and economic benefits for the whole world (Yung and Chan, 2012).

Tanrısever, Saraç and Aydoğdu (2016) express sustainable processes of refunctioned structures visually as in Figure 1.

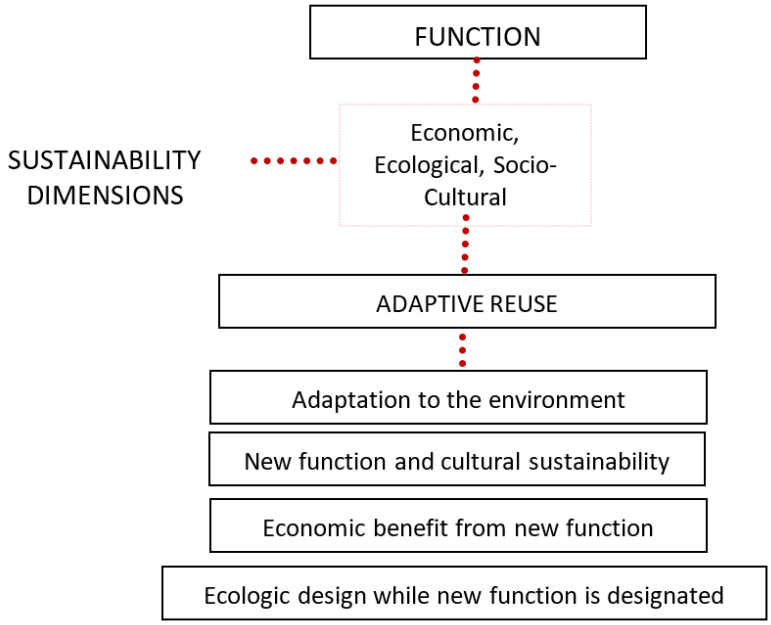


Figure 1. The process of refunctioning applications in terms of sustainability (Developed by the authors using Tanrısever, Saraç and Aydoğdu's work)

Adaptive reuse is defined as using existing structures with new functions in general description. It usually consists of designation of new functions to the isolated structures. The basis of the application refers to the transformation; this transformation is often not only for the function but it enables the transformation of material if possible.

Continuity of cultural phenomena, the existing infrastructure and protection of the place are aimed (Wong, 2017). Sustainable adaptive reuse applications are only possible by choosing a function that people would adopt and like to use in social sense. It is possible to maintain economic sustainability on the condition that the structure is assigned with a new function that would provide benefit without harming the authenticity. While creating new designs by adaptive reuse, priority is given to green spaces especially on the transformation of the inhabited industrial areas with large plots. Restoration applications often contribute socio-economic sustainability as they create a need for new workforce. Transformation of attraction points belonging old generations in urban areas allows sustainable socio-cultural conservation.

2.2. Conservation and Dimensions of Sustainability in Historical Environment

Concept of sustainability was first discussed comprehensively by former Prime Minister of Norway; Gro Harlem Brundtland in Brundtland Report published by United Nations in 1987. The main theme of the report which focused on environmental concerns and consisted of sustainable development strategies is "Our Common Future". Unesco (United Nations Educational, Scientific and Cultural Organisation) defines sustainability as "development that meets the needs of the present without compromising the ability of future generations to meet own needs" (Unesco, 1996). Isolated structures in historical environments both cause the cultural heritage to be lost and create negative impact for the urban identity. For this reason, a planning cycle that can be called as sustainability or continuity was arisen. Reuse and recycling were added to the sustainable design processes which are planning, design, implementation and evaluation stages (Kuyrukçu and Kuyrukçu, 2015).

According to Rodwell, some sources define historical conservation is equal to sustainability. By prolonging a structure's life, saving of energy, money and material is obtained and the best benefit is achieved by conservation. Therefore, sustainability and conservation can be described as complementary (Rodwell, 2017; Rahbarianyazd, 2014). An emphasize of the economic advantage on conserving and transforming structures on historical environments instead of constructing a new one is done. Lower consumptions of sources and lower costs on transportation and installation encourage the refunctioning in terms of economic sustainability. Besides, a new function designated to an isolated structure would enable the structure's sustainability by vitality and new income potential.

The quality of the historical cities starts with environmental potential that urban infrastructure and structures represent and socio-cultural values together with roles of defining social cohesion and belongings of the society. An uninterrupted timeline represented by the past, present and future expresses this socio- cultural value (Afify, 2018). A multidimensional character is gained by contemporary additions that are done mostly for the new functions.

Due to the processes of transportation, installation, material and construction stages, the cost of constructing a new structure rather than transforming an existing one would be disadvantageous considering the economic and ecological dimensions. Historical structures that are conserved and transferred to the future, are socially important both for their society and world heritage.

Yung and Chan; argue a successful adaptive reuse maintains the continuity of vitality of a heritage site. During planning phase; the future operation costs, maintenance costs and potential market of the new function should be well estimated. Another important point is the potential of new workforce thanks to new function. The contribution on tourism development in long term are counted among economic advantages (Yung and Chan, 2012).

Dikmen believes protection of eco-system and sources are the roots of ecological sustainability. Long term use of resources and low cost of them are the roots of economic sustainability. Human health and conservation of cultural values are the roots of socio-cultural sustainability (Dikmen, 2017).

Even though historical constructions that were built in the past don't have active functions today, they carry cultural, historical and artistic values. They will remain their places as essential parts of urban memory thanks to restoration and reuse applications.

Dimensions of sustainability in historical environment were summarized on Table 1.

Table 1. The evaluation of restoration applications in historical environment in terms of major dimensions of sustainability

DIMENSIONS OF SUSTAINABILITY IN HISTORICAL ENVIRONMENT		
Economic	**Ecologic**	**Socio-cultural**
Saving of material and in transportation, energy consumption	Minimum waste and less carbon emission thanks to less resource consumption	Creating an attraction point for society with new function, providing social cohesion
Long term economic benefit with suitable new function	Less waste and new material usage thanks to recycled authentic material	An international level of tourism contribution and creating an iconic attraction point in the city
	Smart systems that helps producing solar or wind energy	Ensuring cultural continuity by reuse of existing structure
	Increasing green spaces in refunctioning	Ensuring social life continuity by given new function
	Providing public transportation if possible accessing to refunctioned structure (low carbon production)	

2.3. Concept of sustainable addition in adaptive reuse

The concept of new additions in historical environment refers to the interventions like contemporary material or construction techniques during refunctioning and adaptive reuse of original structure. The relation between historical structure and addition was named after the terminology of biology. The original structure is defined as "host" and term of "symbiotic relationship" is used to define relationship that is set between new-old. Symbiotic additions are often used in historical environments as effective tools of sustainable conservation (Figure 2- pictures on the middle and right).

Symbiotic relationship is set when two sides are benefited from this relationship as mutual. If the balance is lost and one of the sides gets benefit while the other gets damage, parasite relationship is mentioned (Sijakovic and Peric, 2018). A parasite relationship is mentioned when interventions are too dominant, harming the authenticity or cultural value of the original structure (Figure 2- left picture).

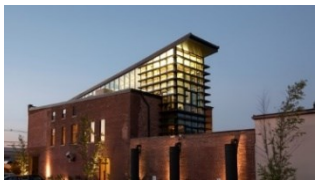
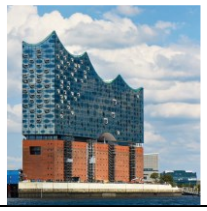
Different thoughts from different researchers and experts are presented about how the additions should be in terms of design principles and conception. Şahin (2011) defines the concept of addition as it is added to a final setting after a time interval (t) and makes this setting as a part of a new whole. It can be described as an effort of making up the deficiencies of a structure that cannot answer the current needs. Additions sometimes exist as a part of a symbiotic relationship, sometimes are needed and accepted but sometimes parasite structures that are undesirable as Viollet le Duc's idea of stylistic unity.

Figure 2. Parasite addition-Moscow (left), Amsterdam National Maritime Museum (middle) (Gürcan, 2013), Berlin Jewish Museum (right)- symbiotic courtyard roof (Sirel, 2015).

According to Brolin (1980), the relationship contrast between new and old is very effective if it is done properly. There is not a defined design criterion for the additions in historical environments. Some classifications according to the place of addition, spatial features or design approaches are done. However, there is no "additional building design" that has been definitely accepted as an international design standard. In Table 2, there are examples that

were transformed by using adaptive reuse with the help of contemporary additions. In the table, evaluation of case studies according to sustainable features is included.

Table 2. Evaluation of adaptive reuse applications in terms of sustainable features (Table was created by authors, visual documents were obtained from URL-1)

	Economic	**Ecologic**	**Socio-cultural**
Coal Drops Yard (HEATHERWICK STUDIO) Original Function: Train Station New Function: Shopping Mall  	- A sustainable future for train station was achieved by shopping mall function (economic benefit) - Transportation infrastructure was renewed and mall is accessible by rail system. Economic sustainability was achieved.	- Sustainable design materials were used to renew roof for comprehensive interventions - The structure was renewed without demolition; the lower levels were turned into stores. Ecological sustainability was achieved by resource and material management.	- By giving new function where people get together, revival and socio-cultural sustainability was achieved - By adaptive reuse, brick structure from 1800s was conserved and transferred to future
The Green Building (FER STUDIO) Original Function: Warehouse New Function: Office  	- Timber in the structure was taken out and used in the floors and other timber sections. Original brick materials were used in new designs. All original materials were transformed wherever possible.	- City water is not used in the building. Rain water is distilled after collected in barrels and green roof. Sustainability was achieved by smart design - Green roof was design in the structure that was renewed by adaptive reuse. Energy production is provided by absorbed carbon dioxide, solar panels and ice storage systems.	- Original warehouse which was isolated was renewed and refunctioned as a commercial and office building. It has been renewed with adaptive reuse with new functions such as restaurants, office units and structure was transferred to the future with a sustainable approach.
Elbphilharmonie (HERZOG& DE MEURON) Original Function: Warehouse New Function: Cultural  	- The surrounding area of the structure became vivid and economically high profit one thanks to cafes, restaurants, hotels and parking lots after restoration.	- The conservation of the original structure that was used as a warehouse without demolishing is a pro for ecologically sustainability. Big scale demolition was avoided by transformation	- The original warehouse located in the port areas was transformed into a prestigious iconic structure attracting attention not only in Germany but also in all over the world - Sustainability was achieved by establishing a place in city's image. An attraction point was created culturally with a sustainable design.

3. Case Studies

In the context of the study, two case studies from England and Turkey were chosen and inspected in terms of economic, ecologic and socio-cultural dimensions to explain the relation between adaptive reuse and sustainability clearer. The main materials of the study are Tate Modern Museum located in London and Bilgi University Campus from Istanbul. The visual documents of plans, sections and facades are included before and after the adaptive reuse interventions. Using these data from the parameters that were created with the help of the theoretical part, an analysis was done and findings were evaluated.

3.1. Research Methodology

Within the context of the study, adaptive reuse that forms the basis of the study, the place of reuse and refunction among conservation and intervention techniques have been revealed. The relation between adaptive reuse concept with sustainable conservation and planning has been mentioned. The importance of sustainability together with different dimensions and how it is shaped in conservation and historical environment were inspected with the help of literature.

Following the conceptual explanation of sustainable conservation and reuse applications, two cases selected from different countries were analysed in order to understand the subject. Interventions in both structures as a result of adaptive reuse concept were evaluated according to the three different dimensions of sustainability. Findings that were obtained from analysis were presented on tables and the result of the study was revealed. Suggestions regarding the subject for the future studies were made.

3.2 Tate Modern Museum

Tate Modern Museum- before adaptive reuse

Tate Modern Museum that is located in London, England is one of the iconic structures of the county. It was built by Architect Giles Gilbert as a power plant in two phases in 1947 and 1963 instead of the original structure destroyed following the II. World War. The structure was abandoned in 1981 as a result of pollution it was creating and other negative environmental effects. It remained abandoned until it started to operate after adaptive reuse intervention applied by designers Herzog& de Meuron in 1996 (Figure 3).

It is known that steam section adjacent to the turbine (35 meters high and 152 meters long) and iconic chimney were standing before the restoration processes. The structure remained isolated for a long time until the renovation processes. British Partnership started work regarding the reuse with an investment cost of £12 million. All later additions were demolished and the structure was turned into original steel and brick construction state.

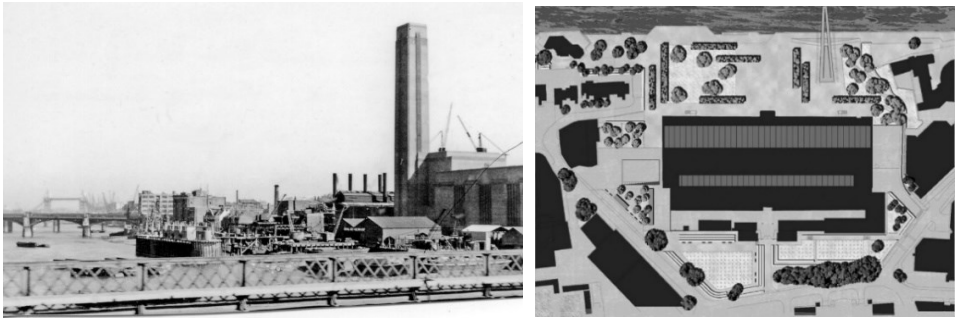


Figure 3. Tate Modern Museum's photo and site plan before adaptive reuse applications (URL-2, URL-3)

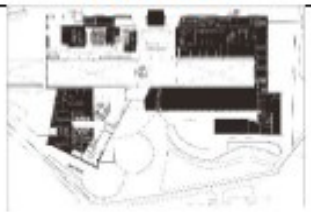
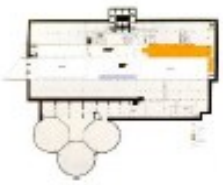
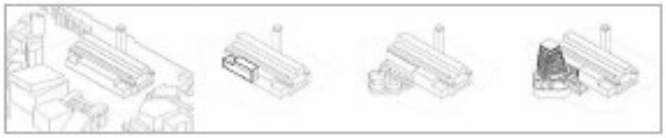
Tate Modern adaptive reuse

The turbine hall from the original structure was configured as a transition and meeting place in adaptation process. The structure has large volume and multi storied and this fact contributed as positive on the selection of its new function as a museum. Herzog& de Meuron created a design dominated by geometrical shapes in Art-Deco style in new version of the structure. Seven storied new addition has a total area of 34.500 square meters. Outer layer of the structure was untouched during restoration applications and original chimney was preserved (Çetin, 2021). Table 3 consists of pictures and drawings of the structure showing current state after restoration. New pyramid-shaped addition which is a concrete structure was designed with inspiration of brick façade of the original structure. In addition, glass skylight that has been designed separated from the original outer wall of the museum is among the most major interventions. This intervention lets interior units which are used as exhibition halls to get fully illuminated (Yiğitoğlu, 2020).

Tate Modern's sustainable features

During adaptive reuse process, design was done according to the sustainable planning targets. Natural ventilation was provided; it was focused on energy production with the help of solar panels. In the new design stage, priority was given to create green spaces and landscape, an ecological sustainable planning was aimed. New additions were designed in such a way to keep energy consumption the lowest and carbon footprint the minimum. Design was based on minimal destruction and usage of the original material of the structure as possible (URS, 2009). Considering the energy strategy, low consumption was aimed especially while the outer shell was designed. Tate Modern building has become an attraction point and an architectural icon with its additions done by two different periods and transformation by adaptive reuse. Different dimensions of sustainability were mentioned in Table 3.

Table 3. Sustainable features of Tate Modern after adaptive reuse (Compiled from in text information by the authors). Visual documents are from Architectural Viva Magazine (2012)

<table>
<tr><td colspan="4">Tate Modern and Its Surrounding
  </td></tr>
<tr><td>VISUAL DOCUMENTS OF THE STRUCTURE</td><td>Economic</td><td>Ecologic</td><td>Socio-cultural</td></tr>
<tr><td rowspan="5"> 
 
  
  </td><td>- Resource management was achieved with new function without demolishing
-Structure became an attraction point with new function. Economic benefit was achieved by high interest</td><td>-Unnecessary disposal was avoided due to not demolishing the structure
-Green spaces increased in new design
-Solar energy was obtained with panels</td><td>-New open public function was given people would gather
-Structure's continuity was achieved by a vivid new function to become an attraction point in all the world</td></tr>
<tr><td>SITE PLAN</td><td colspan="2">FLOOR PLANS</td></tr>
<tr><td>  </td><td colspan="2">  </td></tr>
<tr><td>FLOOR PLANS</td><td colspan="2">SECTION</td></tr>
<tr><td>  </td><td colspan="2">  </td></tr>
<tr><td colspan="4">TATE MODERN ADDITIONAL BUILDING DIAGRAM
Axonometric perspectives showing the progressive additions of the museum
  </td></tr>
</table>

3.3. Bilgi University Campus

Bilgi University Campus - before adaptive reuse

The structure is one of the industrial heritage examples in Istanbul and originally was called as Silahtarağa Electricity Power Plant. It is located in Golden Horn. It was refunctioned by adaptive reuse intervention and started to be used as a part of Bilgi University Campus. The structure was built in Golden Horn during Ottoman Period when Westernization effects were dominant. Silahtarağa Electricity Power Plant was constructed in 1914. The structure that provided city's electricity until 1983 remained inhabited until 2004 when the restoration works started. Silahtarağa Electricity Power Plant was the first power plant on urban scale during Ottoman Period (Figure 4). It was constructed on the point where Alibeyköy and Kağıthane streams are connected and flow to Golden Horn and played an essential role as the only electricity provider until 1952 in all city.

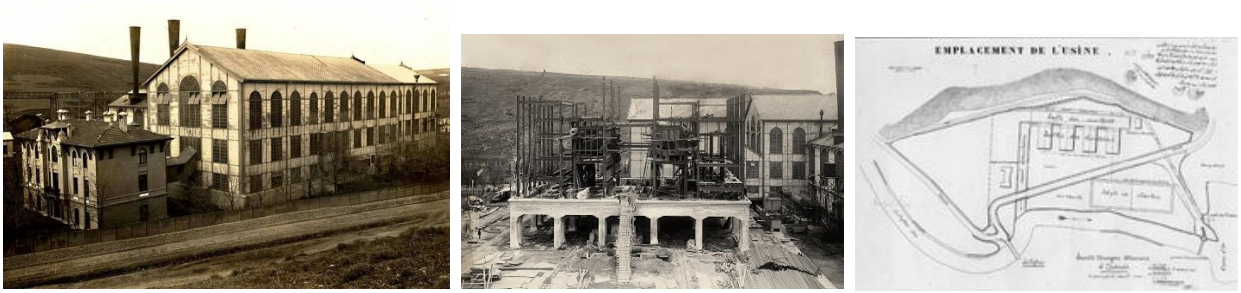


Figure 4. The Silahtarağa Electricity Power Plant' photo and site plan before adaptive reuse applications (URL-4, URL-5)

Bilgi University Campus adaptive reuse

Emre Arolat Architects, Nevzat SAyın Architecture and Han Tümertekin worked for the transformation project of the structure which is the only city scale power plant in Istanbul. The turbines which are the examples of early use of concrete and located in original setting of the structure were conserved with the places they embedded together with the engine rooms inside. The structure is important since it is the first industrial archaeological museum that was transformed in Turkey. Boiler rooms 1 and 2 were turned into Modern Art Museum without touching their integrity. Engine rooms 2 and 4 turned into Energy Museum with minimum intervention (Table 4). A new perforated shell was designed in order to minimize interventions on the original structure. This new shell covered with metal tulle is placed on reinforced concrete legs. Two of the six boiler rooms of the structure was adaptive reused and turned into libraries. Reinforced concrete walls and floors added to create the reading halls were supported with steel columns.

Bilgi University Campus' sustainable features

The structure was spread over an area of 120,000 square meters. Its adaptive reuse is an important gain for urban life with its central location and setting adjacent to Golden Horn. The fact that the structure is spread over a big area has enabled to recover such a large region at such a strategic point. A sustainable design was achieved socio-culturally since the structure was refunctioned as an active education and culture-art functions. Ecologically sustainable design was realized with a careful landscape arrangement in a large area by transformation. Refunctioning was applied with a minimum intervention and keeping the demolishing works as minimum on the original structure. Additional construction costs such as demolition and transportation were saved. Bilgi University Campus and Santralistanbul spaces have become brands in the city and stand out as good examples of sustainable design with their new functions (Table 4).

Table 4. Sustainable features of Bilgi University Campus after adaptive reuse (Compiled from in text information by the authors). Visual documents are from URL-7

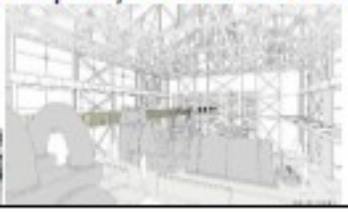
Bilgi University Campus and Its Surrounding

VISUAL DOCUMENTS OF THE STRUCTURE	Economic	Ecologic	Socio-cultural
    	-Resource management economically was achieved by refunctioning -It became an attraction point with new function. A vivid new function was obtained economically.	-Consumption kept minimum with minimum intervention on original setting of the structure Scale of green areas increased in new design	-New open public function was given people gather -Museum and art gallery (Santalistanbul) serve internationally not only for city

SITE PLAN	FLOOR PLANS
	
FLOOR PLANS	**SECTION**
	

BİLGİ UNİVERSITY CAMPUS ADDITIONAL BUILDING

Cad drawings of details showing contemporary additions of museum

4. Findings

The data regarding adaptive reuse and dimensions of sustainability that was obtained in literature review of the study in conceptual framework was accepted as analysis parameters. Case studies were examined according to these parameters.

As a method of refunctioning in historical environment, "adaptive reuse" enables to extend the existence of the structures' and revitalise the inhabited heritage. For preventing waste due to unnecessary destruction and ensuring effective protection of ancient values; "adaptive reuse" is used frequently. Structures and areas that are refunctioned are adapted to social life and often become attraction points in the city. Cultural continuity is ensured by conserving and refunctioning heritage structures. Existing examples show that structures whose new functions are convenient for future use contribute to economic sustainability. It is observed that new additions are mostly needed in design processes of refunctioning. While using these design and materials, ecological sustainability targets are achieved thanks to solar panels, solar glasses and applications that can generate wind energy.

The comparative analysis of Tate Modern Museum and Bilgi University Campus is presented on Table 5. It has shown that both cases are sustainable in terms of economic dimension; thanks to their active use with their new functions and their restoration and evaluation without any demolition. In both cases, ecological sustainability was contributed by minimal additions and allocating large areas to green spaces on new functioning processes. Recycling of original materials in new design during adaptive reuse interventions in Tate Modern Museum are among design parameters supporting ecological sustainability. Both industrial structures have been well accepted by the society with their new functions and have continued their social and cultural continuity actively. They both have become well known and demanded areas within the city. Tate Modern Museum has become a well-known example not only for the city but also for visitors from all over the world making a positive contribution to the touristic promotion of the region. In this sense, interventions of adaptive reuse have made the museum an iconic attraction. Bilgi University Campus is a place that is used frequently in the city and international events are held in Santralistanbul. However, the connection of the structure with its surrounding areas and the worldwide reputation of the structure is not strong as in Tate Modern Museum.

Table 5. Comparison of Tate Modern Museum and Bilgi University Campus according to sustainability parameters (Created by authors)

DIMENSIONS OF SUSTAINABLE CONSERVATION	CASE STUDIES	
	TATE MODERN MUSEUM	BILGI UNIVERSITY CAMPUS
Economic		
Saving of material and in transportation, energy consumption	✓	✓
Long term economic benefit with suitable new function	✓	✓
Ecologic		
Minimum waste and less carbon emission thanks to less resource consumption	✓	✓
Less waste and new material usage thanks to recycled authentic material	✓	-
Smart systems that helps producing solar or wind energy	✓	-
Increasing green spaces in refunctioning	✓	✓
Providing public transportation if possible accessing to refunctioned structure (low carbon production)	-	-
Socio-cultural		
Creating an attraction point for society with new function, providing social cohesion	✓	✓
An international level of tourism contribution and creating an iconic attraction point in the city	✓	-
Ensuring cultural continuity by reuse of existing structure	✓	✓
Ensuring social life continuity by given new function	✓	✓

5.Conclusion

In the study aiming to examine adaptive reuse in context of sustainability by giving new functions while conserving historical structures, two former industrial buildings one of which from England and the other from Turkey were comparatively examined. According to research findings, Tate Modern Museum and Bilgi University Campus which

were originally power plants are successful examples of adaptive reuse. In the process of adaptive reuse of both cases original building components saved as much possible and this is suitable for economic dimension of sustainability. New functions were chosen suitably that will allow their active use for long term and structures provide economic returns. This both ensures the continuity in conserving heritage values and secures sustainability while maintenance costs are being met.

Both cases are areas with large square meters. Thanks to transformation project, green spaces have increased with new landscape areas. Original materials extracted from Tate Modern Museum were used in new additions of other sections. Besides using of smart systems like solar panels during refunctioning stage is notable. In this sense, more emphasis was paid on the ecological dimension of sustainability principles during design phase comparing to Bilgi University Campus.

Both structures are attracting a large group of people since their functions are convenient and they consist areas with social purposes inside. The active use of the structures enabled their socio-cultural sustainability. Tate Modern Museum gained so much fame and popularity that it changed the physical characteristics of the area in which it was located. Thanks to this, its reputation grew internationally. The reason of this is the success of the adaptive reuse. The structure is a good example of a successful adaptive reuse practise in a developed country with a good promotion and management. Both structures were saved from deterioration thanks to refunctioning. Tate Modern Museum has had a positive impact on its surrounding areas and helped these areas to increase their values in terms of regional sustainable principles.

These two adaptive reuse examples show that the more interventions are parallel to sustainability principles, the more successful they are. Connecting with the public transportation facilities, increasing the square meters of green areas, defining a suitable new function that will let the structure be used actively in the future would contribute the success of the interventions to be made. A good management together with the proper new function surely help positively for international reputation. Successful examples show that transformation would be accelerated not only for the heritage structure itself but also for the area it was located in.

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