

T.C.
BAHCESEHIR UNIVERSITY
GRADUATE SCHOOL
ARCHITECTURE HEAD OF THE DEPARTMENT

ADAPTIVE REUSE of the INDUSTRIAL HERITAGE BUILDINGS into
AUTOMOBILE MUSEUMS in the CONTEXT of CULTURAL
SUSTAINABILITY:
CASE STUDY of the TOFAŞ ANATOLIAN CARS MUSEUM

MASTER'S THESIS

AYŞEGÜL ALTIN

ISTANBUL 2024

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THESIS ADVISOR
PROF. DR. MEHMET BENGÜ ULUENGİN

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Doç. Dr. Yücel Batu Salman
Institute Director

This thesis was read by us, quality and content as a Master's thesis has been seen and accepted as sufficient.

	Title/Name	Institution	Signature
Thesis Advisor's	Prof. Dr. Mehmet Bengü ULUENGİN	BAU	
Member's	Prof. Dr. Serengül SEÇMEN	BAU	

Member's	Prof. Dr. Özgür ÖZKAN	MALTEPE ÜNİ.	
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Name, Last Name: Ayşegül Altın

Signature:

ABSTRACT

ADAPTIVE REUSE of the INDUSTRIAL HERITAGE BUILDINGS into AUTOMOBILE MUSEUMS in the CONTEXT of CULTURAL SUSTAINABILITY: CASE STUDY of the TOFAŞ ANATOLIAN CARS MUSEUM

Ayşegül, Altın

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In recent years the concept of adaptive reuse of industrial and cultural heritage buildings has become a phenomenon. Many examples can be seen around the world and in Turkey as well. The study leans towards the transformation of the industrial heritage buildings into automobile museums and the case study in Tofaş Anatolian Cars Museum in Bursa.

The automotive industry and Tofaş hold a huge place in Bursa's history as a city that is known for its industrial zones and automotive industry. Tofaş Anatolian Cars Museum which first opened its gates to visitors in 2002 is also an addition to the city's collective memory and heritage.

With the research methods that are held in the writing of this study, it can be stated that the museum is an example of adaptive reuse in the context of cultural sustainability. The former usage of the building was a silk factory of one of Bursa's oldest and wealthiest families. The plans for the transformation of this building started to be discussed in 1997. The restoration and preservation projects in those years were not seen as suitable or aesthetic so Tofaş Anatolian Cars Museum also carries an exemplary role in Turkey's and especially Bursa's architectural history and heritage in adaptive reuse.

As a result of this study, one of the aims is to review the museum's adaptive reuse process. In addition, stating the preservation policies that are put into consideration and how they are applied in the design process. Lastly, to indicate the place of this museum in both Turkey's and Bursa's cultural heritage.

Key Words: Adaptive Reuse, Industrial Heritage, Cultural Sustainability, Automobile Museums, Bursa



ÖZ

ENDÜSTRİYEL MİRASIN KÜLTÜREL SÜRDÜRÜLEBİLİRLİK BAĞLAMINDA YENİDEN İŞLEVLENDİRİLMESİ: OTOMOBİL MÜZELERİ ve TOFAŞ ANADOLU ARABALARI MÜZESİ ÖRNEĞİ

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Son yıllarda endüstriyel ve kültürel mirasın yeniden işlevlendirilmesi kavramı oldukça duyulan bir hale geldi. Bu disipline dünya çapında ve Türkiye’de örnekler görmek mümkün. Bu çalışma, endüstriyel mirasın otomobil müzelerine dönüşümünü ele alırken Tofaş Anadolu Arabaları Müzesi’ni bir örnek vaka olarak inceliyor.

Otomotiv endüstrisi ve Tofaş, sanayi bölgeleri ve otomotiv ile bilinen bir şehir olan Bursa’nın tarihinde önemli bir yere sahiptir. 2002 yılında ziyarete açılan TOFAŞ Anadolu Arabaları Müzesi de kentin kolektif hafızasına ve mirasına katkı sağlamaktadır.

Bu çalışmada kullanılan araştırma yöntemleriyle, müzenin kültürel sürdürülebilirlik bağlamında yeniden işlevlendirmenin bir örneği olduğu söylenebilir. Binanın eski kullanım amacı, Bursa’nın en eski ve en varlıklı ailelerinden İpeker ailesinin ipek fabrikası olarak kullanılmasıydı. Bu binanın dönüşümü ile ilgili planlamalar 1997 yılında tartışılmaya başlandı. O dönemde gerçekleştirilen restorasyon ve koruma projeleri estetik açıdan uyumlu görülüyordu. Bu nedenle, Tofaş Anadolu Arabaları Müzesi, Türkiye’nin ve özellikle Bursa’nın mimari tarihi ve mirası açısından yeniden işlevlendirilmesi konusunda öncü bir rol üstlenmektedir.

Bu çalışmanın amaçlarından biri, müzenin yeniden işlevlendirme sürecinin gözden geçirilmesidir. Ayrıca, koruma politikalarının tasarım sürecinde nasıl ele alındığını ve uygulandığını belirtmektir. Son olarak, müzenin hem Türkiye’nin hem de Bursa’nın kültürel mirasındaki yerini vurgulamaktır.

Anahtar Kelimeler: Yeniden İşlevlendirme, Endüstriyel Miras, Kültürel Sürdürülebilirlik, Otomobil Müzeleri, Bursa





To my family

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Chapter 1

Introduction

The Industrial Revolution, beginning in the 18th century, led to a period of technological advancement that reshaped societies across the world. The emergence of factories, mills and plants transformed the environment establishing the facilities as the center of industrial production. While the revolution did not lead to rapid industrialization in Turkey, the Ottoman Empire at the time, like in Europe, paved the way for later development in the 20th century.

Bursa, being one of the most important cities since the Ottoman Empire, has a significant history with the automotive industry and silk production. In 1890, with the attempts to establish “Sanayi Okulu”, education and training in this direction started. The “İpek Han” in Bursa, was famous for housing not only silk traders but also carriage makers. The city became a center for traditional crafts which include carriage wheel making, silk weaving and knife making (Küçükerman, 2008).

The establishment of the Organized Industrial Zone in 1961, started to transform Bursa into an industrial hub. The city holds a rich heritage in both the textile and automotive industry. In 1968, the establishment of Türk Otomobil Fabrikası A.Ş. (Tofaş) marked a new era of manufacturing and economic growth for the city. On the other hand, Bursa has a rich history in silk production dating back to the 14th century. Sericulture was a cultural practice formed through learning and teaching before the modern industrialization period. The Industrial Revolution in the 18th century enabled the development of the textile industry. Silk production continued to hold a significant place until the mid-20th century (Oral, 2004). Within the historical district of Bursa, there were eleven silk factories some of which are still known today. One of these factories belonged to the Ipeker family and it is now standing as the Tofaş Anatolian Cars Museum. By the mid-20th century, some of the factories were closed due to the more affordable silk production in the Far Eastern countries and some of them now serve different functions. Nevertheless, Tofaş Anatolian Cars Museum stands as an example, ensuring the continuation of the cultural legacy and offering a glimpse into Bursa’s industrial heritage.

In the era of modern and rapid urbanization, preserving the industrial heritage plays a crucial role. Tofaş Anatolian Cars Museum is an example of a successful transformation strategy for achieving cultural sustainability through the adaptive reuse of an industrial heritage building. By examining the museum's approach to the concept of adaptive reuse, it is argued that the museum serves as a model for sustaining industrial heritage and ensures the continuity of cultural memory.

As adaptive reuse encourages sustainable methods, the need for new construction decreases. Keeping the original architectural elements from the former factory building and blending the elements with the new design and layout, creates the harmony of historical identity and contemporary functionality. Tofaş Anatolian Cars Museum stands as a breathing space in the centre of the city and brings vibrancy to its surroundings and the city of Bursa.

1.1 Statement of the Problem

In a world where urban dynamics change rapidly, the preservation of cultural and industrial heritage appears as a unique challenge. Although modernization requires change and innovation, connection to cultural heritage and history might sometimes be at risk and be ignored in these situations.

In the case of Turkey, historically valuable but neglected buildings might be demolished to be transformed into a commercial project area due to the lack of awareness and knowledge.

The thesis discusses the concept of adaptive reuse as a solution to this problem. With the case study of Tofaş Anatolian Cars Museum, the possibility of the transformation of industrial heritage buildings into new functions being a sustainable and effective approach to the matter is explored.

1.2 Purpose of The Study

The purpose of this research is to define the adaptive reuse concept within the context of cultural sustainability and preservation of the industrial heritage. Tofaş Anatolian Cars Museum plays an exemplary role in the transformation of industrial heritage buildings and opening them to public use on a non-profit basis. In addition,

the examples of industrial heritage buildings transformed into automobile museums from Turkey and around the world are examined.

1.3 Research Questions

The conceptual basis for the understanding of adaptive reuse as a solution can be specified by the following questions:

- How does the adaptive reuse of the Tofaş Anatolian Cars Museum contribute to the preservation of the former factory building?
- To what extent the Tofaş Anatolian Cars Museum is compatible with the accepted adaptive reuse principles and strategies?
- How does the Tofaş Anatolian Cars Museum's transformation and presence contribute to the collective cultural sustainability?
- How do the Tofaş Anatolian Cars Museum's and the Tofaş Information Park's presence contribute to community engagement in the city?
- Can Tofaş Anatolian Cars Museum be an example of the places in Turkey that experience rapid urbanism and promote the importance of cultural sustainability and preserving the heritage?
- How do the applied design strategies in the new layout of the museum ensure a successful result for an adaptive reuse project?

1.4 Significance of the Study

The study on the adaptive reuse concept with the specific case study on the Tofaş Anatolian Cars Museum may be significant in several points:

- Individuals who work on adaptive reuse projects might benefit significantly from the research's examination of the Tofaş Anatolian Cars Museum's approach, which can help them overcome challenges and ensure the success of their studies.
- The research conducted may add to a larger debate on cultural sustainability and the value of industrial heritage preservation. It might draw attention to the fact

that strategies for adaptive reuse may have to be adjusted to be compatible with different cultural environments.

- By highlighting the results of an adaptive reuse project, the research might present a different perspective for the ongoing or upcoming projects and encourage changes in restoration strategies.

1.5 Definitions

Industrial heritage and adaptive reuse are the two important keywords of this research as the case study evolves around these topics.

The keyword's definition is given this way in The Nizhny Tagil Charter for the Industrial Heritage (TICCIH, 2003);

Industrial heritage consists of the remains of industrial culture which are of historical, technological, social, architectural or scientific value. These remains might include machinery, workshops, mills and factories, warehouses, mines and sites.

Industrial heritage plays a significant role in driving economic and urban-scale gains for lost and damaged areas. The reuse of industrial heritage assets ensures that they are still relevant and contribute to the society (Güngör& Gökçen, 2022). By repurposing these sites for new uses, communities may preserve and contribute to the continuation of their cultural heritage (TICCIH, 2003).

Adaptive reuse is an approach for the preservation of historical buildings which is often considered the most environment friendly (Armstrong, et. al., 2023). Adaptive reuse of buildings which have lost their original function limits the need for building demolition. As Kuban states, in adaptive reuse projects, the architect's freedom in the designing process is limited with the remaining from the building (Kuban, 2000). Adaptive reuse as a preservation approach provides the conservation of the historical value and continuation of sociocultural sustainability.

Chapter 2

Literature Review: Sustaining the Industrial Heritage

With the Industrial Revolution in 19th century England, the effects of it started to show in the developing countries as well. Factories were built and industrial zones were formed in the cities. It was a complete change for the world because machines replaced the human workforce in the production area (Köksal, 2012). Over time some of these industrial buildings or factories have lost their original purpose due to the technological development that is taking the world by storm (Tootoonchi, 2020). The buildings remain as industrial heritage after the loss of their former function.

In the current times, adaptive reuse is a popular concept for transforming old and ineffective buildings. Adaptive reuse can be defined as a transformation process for buildings that can no longer function. During the process, it is aimed for the main building to not lose its identity but preserve its heritage significance (TICCIH, 2003). It is considered the best way to protect and restore a heritage building though it is important for the building to retain its originality. The process should be well thought out and searched paying attention to adaptive reuse design criteria.

As Ahunbay states, it is not enough for a building to just adapt to a new function but the architectural fabric of the building should also be analyzed. She continues; that the restoration projects that have been done in the last few years in Turkey do not give a satisfactory result. Also, they are the focal points of the preservation debates. According to the resource, the adaptive reuse concept aims to present the cultural heritage characteristics and aesthetic value without losing its importance (Ahunbay& Oral, 2005). When adding a new function to the building it is crucial not to harm any design characteristics as well as the monumental value of its own.

Ahunbay also states that new adaptations in the name of restoration and adaptive reuse should be done after enough amount of research is held (Ahunbay& Oral, 2005). Otherwise, the renewed parts will look out of context and it will destroy the completeness of the building and the historical value that it holds.

For the adaptations to be successful and not look out of context, there are some criteria that adaptive reuse projects should follow. First of all, the value of the building and its heritage should be preserved as mentioned. In addition to that, the former

identity of the building should be well considered when making new design decisions. The third criteria is maintaining historical and cultural sustainability. Because these are industrial heritage buildings and they hold an important place in the history and heart of the city it is crucial to sustain the collective memory of the citizens as well.

The foundation of today's preservation criteria came with the Venice Charter which was published in 1964 (Kuban, 2000). In the Venice Charter, the discussion topics were renovation and preservation. Under these topics, historical sustainability, the evaluation of the industrial building with its surroundings and sticking to the original features of the building were discussed (ICOMOS, 2002). The Venice Charter was approved internationally in 1965. The goal of preservation was determined to develop solutions to protect the originality and heritage of the former industrial buildings that lost their functions. The method is to refunction these buildings as public places, parks, museums, educational or cultural and art-based places (ICOMOS, 2002). After the recognition of the Venice Charter, the UNESCO Principals for Implementing the World Heritage are also considered globally recognized criteria for the preservation of heritage. The discussed topics in the convention are: Providing the sustainability of heritage buildings for the culture and history as well as sustainable utilization of the adaptations in the buildings in integrity and their authenticity (Tootoonchi, 2020).

The three main criteria that were mentioned at the beginning of the chapter are the preservation of the building's historical value, deciding on new design adaptations considering the former identity of the building and maintaining historical and cultural sustainability. These can be explained in sub-chapters as conservation of authenticity and aiming for the minimum number of interventions. By doing that also considers the integrity of the new implementations with the physical features of the building. The new function's success can be achieved with the compatibility of the new function with the cultural as well as social conditions. Lastly, the key criteria for an adaptive reuse project are that the adaptations and the implementations should always be reversible in terms of sustainability.

When applying these criteria to the Tofaş Anatolian Cars Museum, the building had the necessary renovations preserved in its original form.

Although the surroundings changed over time, the museum itself acts as a breathing space with its living habitat as well as a place for the collective memory of the people.

2.1 Examples of the Transformation of Industrial Heritage Buildings into Automobile Museums

This sub-chapter focuses on the automobile museums that are adaptive reuse project examples. The individual narratives these museums present are investigated and the application of their new layouts and innovations are examined.

2.1.1 Enzo Ferrari Automobile Museum. Enzo Ferrari Museum in Modena, Italy is one of the examples of the older factories transforming into car museums which Naim Arnas also states as “one of his favourite car museums” around the world. The museum was formerly the house where Enzo Ferrari used to live in (ArchDaily, 2012). Modena is a small city with approximately 175.000 people living in it between Milan and Bologna. The city is also the place where the Enzo Ferrari Museum exists. The museum also became a place of his memory and continues to live his legacy (Doğanlar, 2018).



Figure 1. Enzo Ferrari Museum in Modena (ArchDaily,2012).



Figure 2. Façade of Enzo Ferrari Museum (ArchDaily,2012).



Figure 3. Inside Enzo Ferrari's House (ArchDaily, 2012).

The museum includes Enzo Ferrari's house a parametrically designed, shiny yellow-roofed building which they intended to make similar to a race car (Sylvers,2012). After Ferrari was born in this house in 1898 and lived there for a while. They sold the house for economic reasons. His son, Piero Ferrari, states he always wanted to come back to the house but he did not go with his father because he did not want to go until he owned the house again (Sylvers, 2012). The house included the room where Enzo Ferrari was born so he was emotionally attached to the house and wanted the money to buy it back.

Enzo Ferrari was a soldier in the First World War. After the war, he attempted to make his dreams come true, which were producing race cars and racing as a race pilot. From 1920 to 1932 he raced for Alfa Romeo as a race pilot (Biçer, 2015). After that, he returned to Modena to start producing the cars and establish a car company but the workshop he built was bombed so he moved to Maranello where the Ferrari car factory is located today. In 1946 he established the brand “Ferrari” under his name. The brand soon became iconic and still is today. Enzo Ferrari died in 1988 but to remain his legacy the house he was born in Modena was thought of as a museum. In 2009, a Czech architect, Jan Kaplicky and his partner designed the new building next to Enzo Ferrari’s house with its exterior and interior (Sylvers,2012).

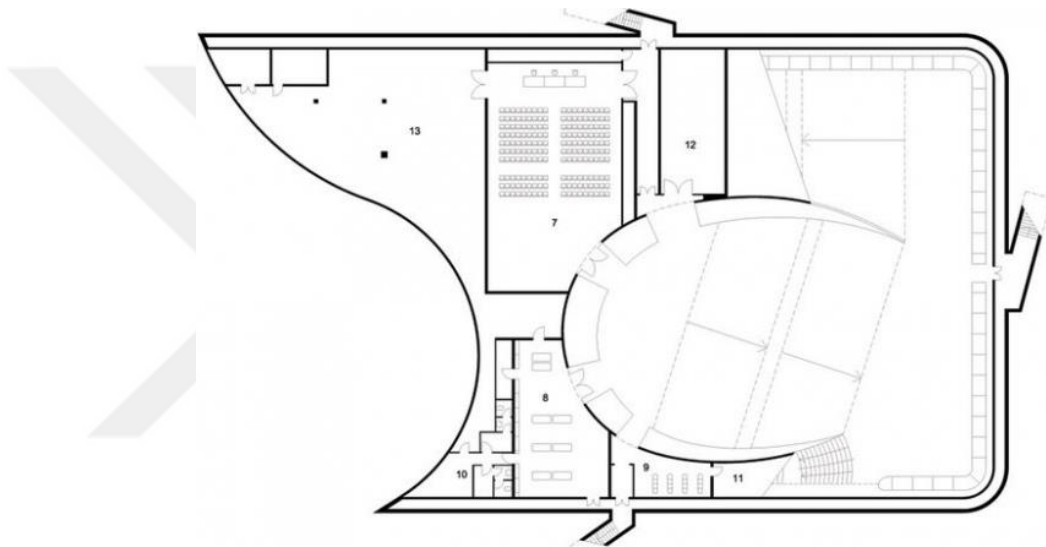


Figure 4. Enzo Ferrari Museum plan (Kaplicky, Future Systems, 2012).



Figure 5. Enzo Ferrari Museum roof detailing (Kaplicky, Future Systems, 2012).

The museum's architecture was inspired by a racecar and its roof with air vents to both get fresh air and daylight. The bright yellow colour of the roof is Ferrari's signature colour and it's made out of 3300 m² of aluminium (ArchDaily, 2012). It was also important to create the connection and attach the two buildings. The newly designed parametric building's façade was designed in a way to view the house to create a feeling of unity between the buildings. In addition, the new exhibition building curves around Enzo Ferrari's house in an architectural gesture of respect and appreciation (ArchDaily,2012). The glass façade is supported by steel cables which are resistant to extreme amounts of pressure. Where the glass façade is placed there is also a cafe with seating elements for the visitors to view the house (Olivier, 2012). The house and the workshop in it are renovated and can be visited as a museum as well.



Figure 6. The curtain wall façade that faces towards the Enzo Ferrari's house (ArchDaily,2012).

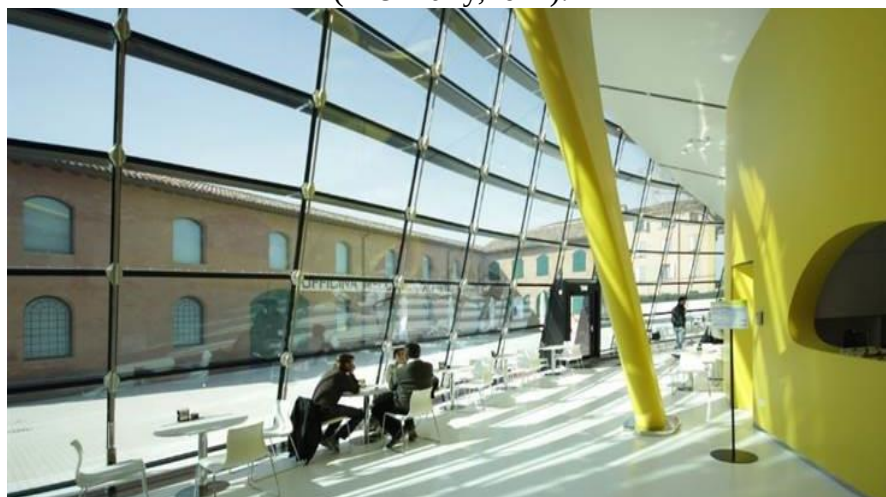


Figure 7. The viewing of the house from the museum (ArchDaily, 2012).

2.1.2 Mercedes Benz Automobile Museum. Mercedes-Benz Museum located in Stuttgart, Germany, is home to the Mercedes-Benz brand and headquarters (RTF, 2022). To represent a new generation of design ideas there was a competition held for deciding the museum's design in 2002. The competition concluded and in 2006, a Dutch architecture firm, UN Studio's design was chosen (Aslanoğlu, 2014). The firm is also known for its sustainable and greener designs. The design's focal point was to bring together the local and the futuristic.

In 1926 the brand Mercedes-Benz was established. After the Second World War, there were the first attempts at the car museum which was in 1936. They wanted to transform a part of the factory into a car museum where they could exhibit their history of producing cars. The museum was closed in 1985 and then reopened in 1986 due to renovations in the interior. The cars were placed in chronological order and the company's history with the car production can be seen. The museum was visited by millions of people. As mentioned, to establish the new generation of design ideas into their brand image Mercedes-Benz wanted to build a new museum. In 2002, UN Studio's design proposal for the new museum was chosen then the museum was opened in 2006 (Aslanoğlu, 2014).



Figure 8. Mercedes Benz Automobile Museum in 1986 (Aslanoğlu, 2004).



Figure 9. Interior of the Mercedes Benz Museum (Aslanoğlu, 2014).



Figure 10. Mercedes Benz Museum in 1986 (Aslanoğlu, 2014).

The newly designed museum is 35.000 m². The design is inspired by the shape of a clover. There is an atrium in the centre and the open spaces are placed around it (Leiva, 2017). The circulation and the connection between the spaces are made by ramps. The museum's outer shell is made of aluminium and glass. There are no walls between the spaces in the museum, there are open spaces. The aluminium on the façade helps to let the sunlight in (mercedes-benz.com, 2022). The geometry of the façade does not follow straight lines, like the exterior outer shell of the building, the organic design continues in the interior part as well. This gives the building a sense of dynamism (mercedes-benz.com, 2022).



Figure 11. Mercedes Benz Museum in 2006 (RTF, 2022).



Figure 12. The clover-shaped atrium in the Mercedes Benz Museum (ArchDaily, 2010).



Figure 13. Mercedes Benz Museum under construction (mercedes-benz.com, 2022).



Figure 14. Mercedes Benz Museum façade (mercedes-benz.com, 2022).

2.1.3 Rahmi Koç Automobile Museum. The Museum is located in Hasköy, İstanbul. Rahmi M. Koç Museum is an important museum in Turkey of science, technology and history. Although the museum's focal point is industrial and transportation technologies which is similar to many museums in Europe or the USA, it still highlights Turkey's history in transportation Technologies (Edis, 2004). The museum' location, Hasköy, is on the shore of the Golden Horn. It is 27.000 m² in total. The Rahmi M. Koç Museum consists of three main sections: The Historical

Lengerhane building, The Historical Hasköy Shipyard and the Open-Air Exhibition Area (müzeler.org, 2020).



Figure 15. The historical Hasköy Shipyard (rmk-museum.org.tr, 2020).



Figure 16. Rahmi M. Koç Automobile Museum (rmk-museum.org.tr, 2020).

The funding of the museum comes from the Rahmi M. Koç Museum and Cultural Foundation whose head is Rahmi Koç of the Koç Group (Edis, 2004). Koç Group is one of Turkey's largest companies and Rahmi Koç's father Vehbi Koç was the founder of the Corporation in 1963. In the 1930s Vehbi Koç was the local partner for the Ford Motor Company. Koç Group was the pioneer for the Anadol which is the first car that was completely produced in Turkey in the 1960s.



Figure 17. Inside the main exhibition hall of the Rahmi M. Koç Museum (rmk-museum.org.tr, 2020).

The first attempts at the car museum were in 1994 in Hasköy and the museum received an award in the European Museum of the Year Program in 1996 (Edis, 2004). Koç Family's entire collection related to transportation and communication technologies was supposed to be in the museum but the space was not enough for all the exhibitions so in 1991 the Family bought the area for the old Lengerhane building which was close to the museum's location (Bayır, 2014). Lengerhane was not in use in those years so Rahmi Koç paved the way for its restoration and reuse as a museum and exhibition center. It opened after restoration in 1994 and became a part of the museum in 2001 (müzeler.org, 2020). The Lengerhane building was built in III. Ahmet's period in the Ottoman Empire was during the first half of the 1700s. It was built on the Byzantine ruins from the 12th century (Bayır, 2014). Its first function was as an iron foundry for ships. This was one of the reasons that it was built close to the Hasköy Shipyard.

Lengerhane is a two-storey, square-planned building which includes a main dome and four smaller domes on the roof. Rahmi Koç wanted the building to be restored properly and not damage any original features of the building (Edis, 2004). The building was built as one row of stones and two rows of brick. Since the building was below the existing road level, a ramp entrance was used in the later constructions. Additionally, a basement floor-level exhibition space was added and linked to the main Lengerhane building. One can look at the building and see all the different eras the building has lived. Today the Lengerhane building is used for temporary exhibitions.

In the main section, old transportation technologies, and cars are exhibited which have historical value (müzeler.org, 2020).

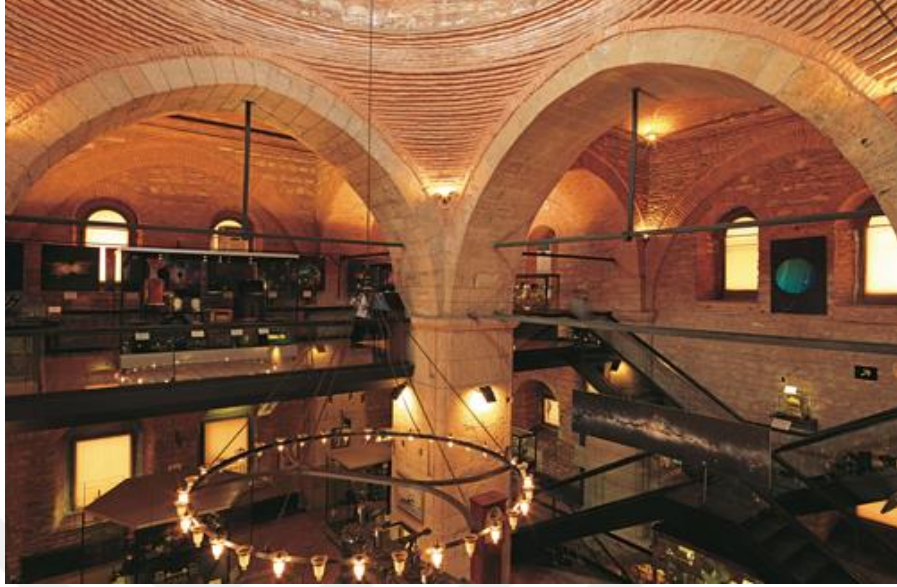


Figure 18. Inside the Lengerhane building (rmk-museum.org.tr, 2020).



Figure 19. Rahmi M. Koç Museum Lengerhane building façade (rmk-museum.org.tr, 2020).

2.1.4 Toyota Commemorative Museum of Industry and Technology. Japan's manufacturing industry has a long history and has been the envy of other nations. Toyota Group, which began as a textiles manufacturer in 1911 by Sakichi Toyoda at the former Toyota Boshoku Headquarters Plant which is still the museum's current location, before moving on to automobile manufacturing (aichi-now.jp, 2020).



Figure 20. The Toyota Commemorative Museum today (aichi-now.jp, 2022).



Figure 21. The Toyota Commemorative Museum in the 1960s (Youtube, 2016).

The Toyota Commemorative Museum of Industry and Technology is located in Nagoya, Japan. As a former factory area, the museum today focuses on the history of textile and automobile manufacturing and the industrial and technological developments made by the Toyota Group. The total land size of the museum complex is 41.597 m². After Sakichi Toyoda established the Toyota Automatic Loom Works, Ltd. in 1911, the company continued to grow. In 1937, Toyota Motor Company was established by Kiichiro Toyoda, Sakichi Toyoda's son. In 1944, a new plant called the "Sako Plant" was built next to the existing plant in the area. The Sako Plant, which is now the automobile pavilion and museum, was used for textile manufacturing until the 1980s (tcmit.org, 2024).



Figure 22. Toyota Commemorative Museum façade before the restoration (Youtube, 2016).



Figure 23. Toyota Commemorative Museum façade after the restoration (Youtube, 2016).



Figure 24. Textile Machinery Pavilion before the restoration (Youtube, 2016).



Figure 25. Textile Machinery Pavilion after the restoration (Youtube, 2016).

The Toyota Foundation funded the Architectural Institute of Japan to do surveying research on the architecture of buildings which are built before World War II in Japan in 1976. The survey included the Sako Plant as well. The Toyota Group established a Surveying Committee in 1987 for the Sako Plant as it holds importance as an industrial heritage building. The committee proposed to reuse the building as a commemorative museum as the Toyota Group's joint project (tcmit.org, 2024). In 1991, the basic design of the renewal project started, evaluating the design concepts

and how the construction should proceed. The museum opened on 11th June 1994, 100 years after the birth of Kichiro Toyoda.

The brick building in the images, which is the plant and factory building founded in 1911, is now a museum where people can see the changes in industry and technology and the history of textile and automobile manufacturing, which are the two largest industries that supported Japan (Takenaka.co.jp,2004).

The former factory building is from the Emperor Taisho era, which ruled Japan from 1912 until 1926. The building, now the museum, still remains in the birthplace of Toyota in Nagoya as a part of the industrial heritage (Takenaka.co.jp,2004). The Toyota Commemorative Museum of Industry and Technology consists of two main parts: the Textile Machinery Pavilion and the Automobile Pavilion (tcmit.org, 2024). Inside the Textile Machinery Pavilion with wooden columns, the exhibition elements such as the machines that are used for textile production are being displayed. Inside the Automobile Pavilion, Toyota's automobile manufacturing is shown from various angles (tcmit.org, 2024). The pavilion is 7900 m2, fitting a variety of machinery inside. The exhibitions along with demonstrations by operators help to create a Picture for the visitors of how actual automobile manufacturing Works (tcmit.org, 2024).

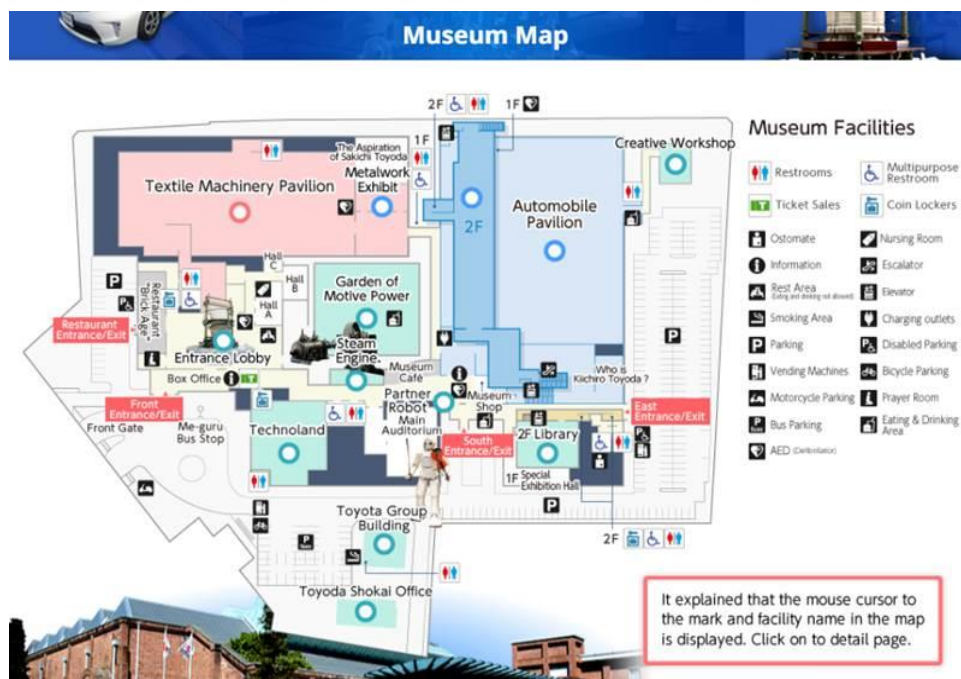


Figure 26. The map of the Toyota Commemorative Museum (tcmit.org, 2024).



Figure 27. Inside the Automobile Pavilion exhibition (tcmit.org, 2024).



Figure 28. Inside the Automobile Pavilion exhibition (tcmit.org, 2024).

The exhibition inside the Automobile Pavilion consists of four sections: “The Initial Period of the Automobile Business”, “Automobile Development Through the Decades”, “Automobile Production and Technology” and “Who Was Kichiro Toyoda?”.

The Toyota Commemorative Museum of Industry and Technology is designated as a heritage of industrial modernization (takenaka.co.jp,2004). The museum offers visitors an understanding of Toyota’s history, technological advancements and contributions to textile and automobile industries spanning over 100 years with excellence.

2.1.5 Museo Storico Alfa Romeo. Alfa Romeo as a brand was established in 1910 in Milan, Italy as “Anonima Lombarda Fabbrica Automobili” (A.L.F.A.). The brand is most famous for its sports cars despite manufacturing personal automobiles, trucks, vans and busses as well (Aslantaş, 2017). Alfa Romeo’s first plant was established in Portello, Italy and stayed as the main factory until the 1960s. The production started to be transferred to the new plant in Arese at the beginning of the 1960s. In 1986 the brand was sold to the Fiat Group as a result of an economic crisis and the plant in Portello was closed (Hurst, 2018).



Figure 29. The Alfa Romeo office in Arese in the 1980s (archiproducts.com, 2017).



Figure 30. The Alfa Romeo office in Arese in 1980s (museoalfaromeo.com, 2016).

For the headquarters in Arese, Alfa Romeo requested from the architects Cassi Ramelli, Vito and Gustavo Latis and Vittore Ceretti a building complex with a “horizontal development”.

The design guaranteed a well-connected building complex with modular office blocks (museoalfaromeo.com, 2016).

The construction continued until 1976 and a part of the factory was converted into an automobile museum, “Museo Storico Alfa Romeo”, which could only be visited by booking in advance (Comense, 2018).



Figure 31. Inside of the Alfa Romeo factory in Arese in the 1980s (museoalfaromeo.com, 2016).



Figure 32. Construction of the plant in Arese in 1966 (museoalfaromeo.com, 2016).

The manufacturing activities continued until the 2000s in Arese. To expand the management and administration, the office started to be transferred to Turin. For a

while, the exhibitions in the museum were not updated so it was closed in 2011 (museoalfaromeo.com, 2016). Later it was decided by the Ministry of Cultural Heritage and Alfa Romeo that the museum has a crucial place in the country's industrial heritage so it should be preserved.



Figure 33. The Alfa Romeo Museum in Arese today (museoalfaromeo.com, 2016).



Figure 34. The red canopy from the carpark to the entrance (archiproducts.com, 2017).

The process of reopening Museo Storico Alfa Romeo started with the goal of having a wider context such as including restaurants, book shops, a sales showroom and event halls (museoalfaromeo.com, 2016).

The original structure of the museum, which is divided into six mezzanine floors was inside the factory, therefore access was limited. The architectural firm that Alfa Romeo worked with for the renovations, which is the Camerana&Partners, restyled the architecture with the elements of old and modern (Guzzini, 2015). The initial

design included new forms and functions as well as the existing buildings with 1960s architecture. The renovated museum opened in 2015. The signature “Alfa red” is placed into the new design. The addition of a canopy welcoming visitors in the car park over the visitors’ entrance attracts people from the start. The walkway then becomes a telescope-like structure that views the motorway nearby and it continues on the inside and links to the bookshop, archive, events area and cafeteria on the ground floor, showroom and museum entrance on the first floor (Testa, 2016). As a result, the historical and contemporary architecture come together in harmony.



Figure 35. The “central void” in the exhibition area (Guzzini, 2015).

In this context for the new design, the focal point is the central void of the museum and it provides the continuation of the exhibitions with lights and images as it traverses through all the floors (Quaquaro, 2020). The exhibition inside the museum consists of three sections: “Timeline”, “Beauty” and “Speed”. The “Timeline” takes up the first floor and a selection of nineteen Alfa Romeo cars is displayed in chronological order. In the “Beauty” section, which takes up the ground floor, a series of drawings by Italian designers are displayed.



Figure 36. The historical cars in the exhibition (archiproducts.com, 2017).

The “Speed” takes up the lower ground floor, which is the section where all of Alfa Romeo’s victories are displayed, such as the victories in racing and their debut in Formula 1 (Quaquaro, 2020).

The entire complex consists of old and new elements, bringing modern, contemporary and the “Alfa red” together. The museum stands as an attraction point since its reopening for both the locals and international visitors.

2.2 A Brief History and the Importance of Silk Production in Bursa

The history of silk production in Bursa goes back to the Byzantine period (bursa.ktb.gov.tr). In the 14th century, after the Ottoman takeover, the city was filled with wide streets and grand bazaars. Bursa was the Ottoman Empire’s long-term capital until 1402 and after that, it still is an important city for the silk trade (unesco.org). As a part of the Silk Road, the city was the focal point for the importation of silk from China via Persia (unesco.org). Although the importation of silk was not widespread around the world and only remained in a certain area for some time, after the 17th century the city was relevant in the world market and in the 19th century it was the peak point of the city’s silk importation.

During the 19th century, silk production gained pace with the Industrial Revolution and silk production factories started to be established in Bursa mostly in a neighbourhood called Umurbey. Umurbey neighbourhood is in the Yıldırım District in the city of Bursa, which is one of the central districts of the city. The neighbourhood is located on the slopes of Uludağ so the climate is harsher than most of the neighbourhoods in the city. In the area, there are many rapid slopes and historical buildings such as mosques, Turkish baths, factories etc. The water in the area, because it is coming straight from the mountain which means straight from the source is clearer. In the making of silk, the clarity of the water is a very important factor (Mehmet Batıtürk Interview, 2022). That is why the area was used for silk production for years. It was named after Umur Bey in 1573, who was a respectful statesman who was living in the neighbourhood during the Ottoman Empire era. He built a mosque and a Turkish bath in the area that were both named after him. For a long time, non-Muslims especially Armenians lived in the area but after the 1900s their population decreased. Later, most of their houses were transformed into factories. Ipeker factory is also one of them (Murat Kaleoğlu Interview, 2022). The neighbourhood turned into a district

of silk-reeling factories. Because of its suitable location for silk production, factories are established. There were 11 of them in the neighbourhood and one of them was Muhsin Ipeker's silk factory.

“In 1860, there were 90 silk reeling factories in Bursa (batmaztekstil.com, 2016).” After the First World War, many of the industrial factories were closed. In the following years, steps were taken to revive the industry. As a result in 1934, 80 more silk reeling factories were opened (Ahunbay& Oral, 2005). In the 20th century, artificial silk production started to take over because producing real silk takes so much time. Although silk was a phenomenon from the 17th century to the 19th century and was an important product, it lost its popularity. Ipeker Family is one of the families in Bursa that continued their legacy in silk and one of their family members, Murat Kaleoğlu, is interviewed. As Murat Kaleoğlu states; “Bursa was one of the most important cities in the world for silk production. We even imported products to Europe and America but after some time China took over the world in the case of silk production. The world preferred Chinese silk products because they were more affordable and fast-produced. Of course, it affected the Turkish silk market negatively (Murat Kaleoğlu Interview, 2022).” So silk production in Bursa was stopped because the resources and the budget were not enough for the high demand for silk around the world, especially in Europe and the USA. With the developing technology in the 19th and 20th centuries, eleven silk production factories were in operation. Which are: Fabrika-i Hümayun, Turgut Yılmazipek, Ipeker, Osman Fevzi Efendi, Duruder, Doğan Yılmazipek, Resulzade, Rıfat Özbek, Ete Mensucat, Mehmet Yüksel and Mustafa Dörtçelik (Ahunbay& Oral, 2005).



Figure 37. Istimhane in the Ipeker factory in 1920s (ipekertextile.com, 2022).

In every silk production factory, there are sections that are necessary for the silk production. In Turkish these sections are: “Istimhane”, “Kozaklık”, “Mancınıkhane”, “Dokumahane”, “Boyahane”, “Baca” (Teoman& Bozpınar, 2022).

“Istimhane” is the section where the insect that forms the cocoons is boiled and extracted (ipekertextile.com, 2022). This section was then transformed into the museum. “Kozaklık” is the place where the boiled silk cocoon is then dried (ipekertextile.com, 2022). Today it is used as a children’s education space for them to learn the traffic rules.



Figure 38. Kozaklık in the Ipeker factory in the 1920s (ipekertextile.com, 2022).



Figure 39. Kozaklık in the Ipeker factory in 1997 (Naim Arnas Archives, 2022).



Figure 40. Kozaklık in the Ipeker factory used as a traffic education space (Author's Archive, 2022).

After the drying process, the silk cocoons are brought to “Mancınıkhane”, where they are preserved in an airproof space. It was also important for the dried cocoons not to be close to the open-air space because of the bad smell of a dried silk cocoon (Mehmet Batıttürk Interview, 2022). Now it is used as an open-air exhibition space. “Baca” which is the chimney is an important element in the silk factories. The “Mancınıkhane” sections should also include a chimney to get rid of the bad smell of the dried silk cocoons.



Figure 41. Mancınıkhane in the Ipeker factory in 1997 (Naim Arnas Archives, 1997).



Figure 42. Mancınikhane in the Ipeker factory in 1998 (Naim Arnas Archives, 1998).



Figure 43. Mancınikhane in the Ipeker factory in 2000 (Naim Arnas Archives, 2000).



Figure 44. Strengthening works in Mancınikhane in the Ipeker factory in 2001 (Naim Arnas Archives, 2000).



Figure 45. Kozaklık unit is used today as an open-air exhibition hall (Author's Archive, 2023).

Most of the industrial heritage buildings are facing the danger of disappearing because of neglect over time and the lack of a proper preservation law (Ahunbay& Oral, 2005). Once a silk production factory, the area was abandoned from 1979 until 1998. When starting the adaptive reuse process despite the conditions, the building managed to preserve its original form and structure.



Figure 46. Image of the neglected factory building (Naim Arnas Archives, 1997).

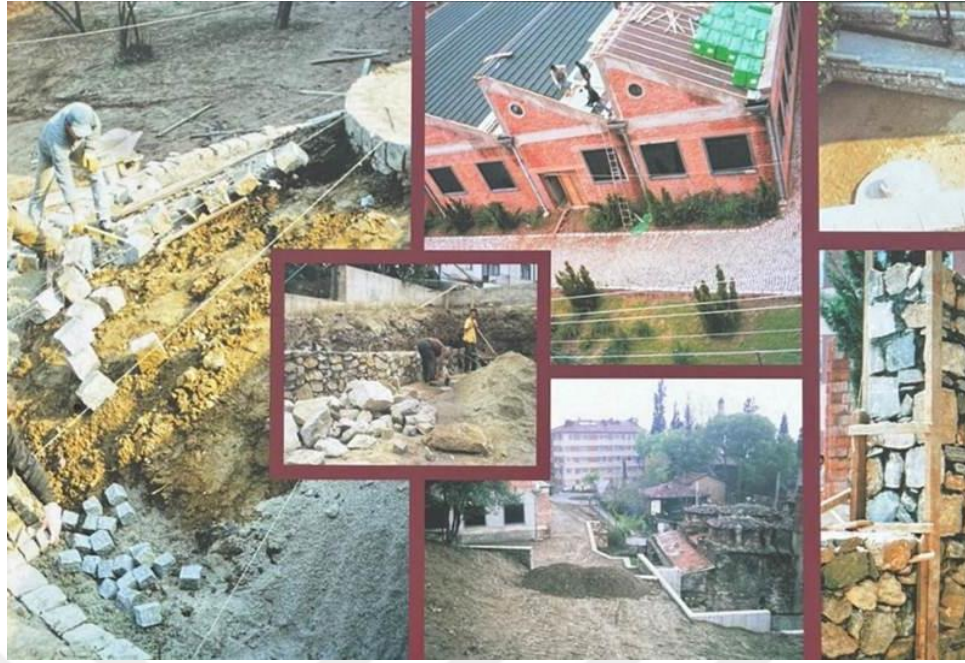


Figure 47. Renovations in the factory in 2000 (Naim Arnas Archives, 2000).



Figure 48. The museum's façade taken from the lower grade (Author's Archive, 2023).

In recent years, protecting the heritage and sustaining it has gained importance. ICOMOS and the Montreal Plan 2002 (Ahunbay& Oral, 2002). As mentioned in the previous parts, the criteria for a successful adaptive reuse transformation are included in these writings.



Figure 49. The museum's façade (Author's Archive, 2023).



Figure 50. The windows on the museum's façade (Author's Archive, 2023).

ICOMOS Turkish National Committee suggested to the council that the industrial heritage buildings in Turkey should also be a part of the ICOMOS (icomosturkey.org). As a result, these practices paved the way for the industrial heritage buildings in Turkey to be protected and transformed under some regulations and criteria. Sustaining the silk factories in Bursa is the way for them to adapt to becoming a part of the city and collective memory.

2.3 Automotive Industry in Bursa and Tofaş

After the Industrial Revolution in the 19th and 20th centuries with the developing industrial technologies, the automotive industry also showed development and grew worldwide. The automotive industry first gained pace in Germany and France then spread to other countries in Europe as well (Erdoğan, 2018). First, prototype vehicles were manufactured in the 1700s then in 1886 Karl Benz took out the patent for the first automobile that worked with fuel. In Turkey during the Republic period, even the smallest parts of a car were hardly brought from abroad (Erdoğan, 2018).

The first attempt to establish an automotive industry in Turkey was Ford Motor Company's montage factory (Sürmen, 2019). In 1929, an economic crisis occurred in Turkey and this attempt had to be terminated. In 1966, Koç Group manufactured the first Turkish-made automobile which is called "Anadol" (Sürmen, 2019). After the 1960s, the automotive industry in Turkey gained pace. The industry is mostly concentrated in the Marmara region. It was important for different industrial branches to choose the right locations in terms of the workforce, budget, raw materials, market etc. For the car and automotive industry, the Marmara region was seen as a suitable location, especially in cities like Bursa, Kocaeli and Sakarya. As a result, 90% of the sub-industry factories were founded in Istanbul, Kocaeli, Ankara and Bursa (İstanbul Sanayi Odası, 2002). Then the European automotive market such as Fiat, Renault, etc. started to recognize the developments and wanted to establish factories to produce the cars in Turkey. Both Renault and Fiat factories are in Bursa. In 1968 TOFAŞ was founded to manufacture Fiat cars. After that in 1969, Oyak Renault was established.

Both quickly became two leaders in the industry (Kaplanoğlu, 2015). TOFAŞ manufactured its first very own vehicle "Fiat 124" or with its common name "Murat 124" in 1971 (Yıldırım, 2020). It continued with Murat 131 in 1976, Şahin in 1977, Kartal and Doğan in 1981 and Tempra in 1990. In 2008 the manufacturing capacity of

the factory rose to 400 thousand vehicles. In 2016 TOFAŞ was chosen as the third biggest and most influential industrial foundation in Turkey by the Istanbul Industrial Chamber (BloombergHT, 2020). Today TOFAŞ, which produces both passenger and light commercial vehicles, has become one of the largest manufacturers in the Turkish automotive industry with an annual production capacity of 450 thousand and more than 7 thousand employees (BloombergHT, 2020).

In 2002 TOFAŞ Anatolian Cars Museum was opened with the title, “first car museum” in the country. The main idea behind the opening of the museum was that Bursa was a city that evolved around the automotive industry and culture. At the time Naim Arnas’ close friend and a lecturer at Uludağ University Önder Küçükerman was writing a book about TOFAŞ and its history in the automotive industry (Naim Arnas Interview, 2022). While he was doing his research, he found remaining of an old car which was 2600 years old, Üç Pınar Tümülüsü which is a Tumulus, near the peripheries of the city and told Arnas about his finding. They both decided to put the Tumulus in the museum (Naim Arnas Interview, 2022). The finds of the carriage with horse harnesses were found at the entrance of the Tumulus. The missing parts of the carriage were repaired and put in the museum. It is also the first you will see when entering the building. Showing the oldest piece of a transportation vehicle.

Chapter 3

Methodology

This methodology is created to investigate the adaptive reuse concept within the context of sustainability and preserving the industrial heritage. With the mixed-methods approach all the knowledge is reviewed, and the study is formed.

3.1 Research Design

The study follows a mixed-method approach. Qualitative and quantitative methods are combined to obtain a comprehensive understanding of the adaptive reuse principles.

Qualitative Methods:

- Case Study: Tofaş Anatolian Cars Museum serves as the case study to understand the phenomenon. Qualitative data is collected through:
 - Site visits to the project area: Multiple visits to the museum are made. Physical space is examined by taking photographs of the architectural elements both from inside and the facade. The images on the panels in the park where the museum is located, showing the transformation of the museum, are also photographed. Different groups of visitors' interaction with the museum are observed.
 - In-depth interviews with professionals: Interviews with the museum staff and architects who are involved in the project are conducted several times until all the knowledge is gathered. The conversations about the oral history and repurposing process are recorded and noted.
 - Visitor Experience: Survey interviews are held with the visitors in the field to understand their views about the museum's transformation and sustaining the cultural heritage.

Quantitative Methods:

- Document Analysis: Architectural plans and drawings of the adaptive reuse project and first-hand historical documents from the museum that are in relation to the building are gathered and reviewed.

- Survey Analysis: Results of the survey that are gathered from the visitors' answers due to their experience when visiting the museum are analyzed.

3.2 Data Collection

3.2.1 Data Collection Instruments. As mentioned in the previous sub-chapter, the physical area of the project is visited multiple times and the visual elements are photographed from various angles by using the mobile phone camera. The interviews with the architects and the museum staff are held in their offices. The verbal data is collected by using the audio recorder with the consent of individuals and then by using the Microsoft Word software, the recorded data is dictated to the written format. In addition, first-hand drawing resources that are collected from the architects' office are scanned and transferred to the computer.

The survey interviews with the visitors are held on different days and 30 individuals attended the survey in total. 12 survey questions are asked to each individual to gather the data on their perspective of the museum's transformation. The answers are noted on a notepad to capture the key points. Names of respondents are not taken to protect confidentiality.

The resources on the literature review are gathered from Google Scholar, Elsevier, MDPI, ResearchGate, Bau Library, ScienceDirect, Ulusal Tez Merkezi, national news pages, local journals and scientific conferences. The combination of the collected data through various instruments shaped the analysis.

3.2.2 Data Collection Procedures. The first interview is held with Mehmet Batıtürk, the site architect of the project, in his office in Bursa on 15th November 2022. "Could you give general information about the area's selection as the museum's location and the history of the building?" is asked Batıtürk to perceive general knowledge about the area and the adaptive reuse project. The interview lasted for 15 minutes and 38 seconds on 15th November at around 1 p.m. A visit to the museum is made with Batıtürk. On the same day, Aylin Tatlı, the head of the museum, is interviewed. Aylin Tatlı is an art historian and started her work at the museum in 2009. The interview with Tatlı lasted for 10 minutes at 1:30 p.m. Questions towards the Ipekçilik neighbourhood's history in silk production and the storytelling in the exhibition inside the museum are asked.

On 18th November 2022, Naim Arnas, the architect that carried out the museum's restoration process between 1998-2002 and the head of Mido Mimarlık, is interviewed at around 1 p.m. in his office in İstanbul. The interview lasted 48 minutes and 41 seconds. "Could you tell the starting point of an automobile museum in the heart of the city?", "Could you tell the procedures that you had to follow during the site selection and starting the project in its current location?", "Could you give information about the adaptive reuse principles that you followed during the repurposing of an industrial heritage building?", "What are the changes and architectural renovations the building has experienced?", "To what extent, the original features of the building is preserved?" are asked to Arnas to get in-depth information about the process.

On 5th December 2022, an interview with Murat Kaleoğlu, the 4th generation of the Ipeker family, is held in his office in Bursa at around 2 p.m. The interview lasted for 30 minutes and 24 seconds. Questions about the Ipeker family's past with silk production and the former factory in Ipekçilik are asked to Kaleoğlu.

Site visits are made several times to collect the visual data by taking photographs from inside and facade of the museum building. The other buildings in the Tofaş Information Park such as the Art Gallery, Turkish House and the Fayton Cafe are visited and observed to grasp information about the area.

On 20th January 2023, the second interview with Mehmet Batıtürk is held to collect the drawing resources and old images from the site about the project. The interview lasted around 20 minutes. The drawing resources are reviewed together with Batıtürk. By comparing the old images to the current state of the museum, the innovations are discussed.

The site is visited several times to interview the visitors on 30th December 2023, 2nd January 2024, 3rd January 2024, 4th January 2024 and 7th January 2024. 30 visitors answered 12 questions on the survey. As the answers became repetitive, the data is collected. The questions that are asked are given in the table.

Table 1

Survey Questions

Q1. What is your age range?
Q2. What is your gender?
Q3. What is your education level?
Q4. What is your occupation?
Q5. How frequently do you visit the museum?
Q6. For what purpose do you visit the museum?
Q7. Does being here comfort you and does it feel peaceful?
Q8. Do you feel a sense of safety when you are here?
Q9. Is the museum compatible with its environment? (dwellings, architectural texture)
Q10. Do you think that the area is functional enough for public use?
Q11. The museum was formerly a silk factory. Considering its old state, do you think the transformation of the museum into its current state was successful?
Q12. Lastly, can you give feedback on the museum's transformation from your own design perspective?

After the survey results are collected. The answers are analyzed individually and the common patterns and keywords are subtracted.

The last interview with Mehmet Batıtürk and Aylin Tatlı is held on 20th March 2024 and lasted 1 hour and 14 seconds at around 12 p.m. The museum is visited together with both of them to hear the architectural innovations as well as the cruciality of the exhibit and its storytelling of the automotive history. The structure reinforcement of the building is explained with in-depth details and illustrative diagrams by Mehmet Batıtürk along with a step-by-step narrative of all the changes that are carried out.

3.2.3 Data Analysis Procedures. The data analysis for this study on adaptive reuse, a case study on the Tofaş Anatolian Cars Museum, consists of thematic content analysis, narrative analysis and statistical analysis due to the following of mixed methods.

- Thematic Content Analysis: The data from the interviews with professionals, the survey results, documents and observations are analyzed with a “coding”

method. Reading through the written resources that are transcripts of the verbal data, notes and documents, the patterns, repeating themes and key points are defined. The results of the analysis are integrated in the “Findings” chapter.

- Analysis of the Narrative: Since a significant amount of the data is gathered from the interviews along with the literature review, each narrative is crucial to the study. The individual experiences and stories are used to create a comprehensive understanding of the process. Each individuals’ narrative is transcribed to notice the overlapping themes which support the “Discussions and Conclusions” chapter.
- Statistical Analysis: The data collected from the visitor survey is analyzed to calculate the percentages of responses by using Microsoft Excel software. In addition, the relationships between the varying parameters (e.g., education level and their view of the museum’s transformation) are used.

After the analysis procedures, the data is integrated into the “Findings” chapter. The data is supported with the architectural plans, figures of details from the site as well as the old images from the site that show the process of adaptive reuse of the building to form the whole image.

3.3 Limitations

The limitations of this study on the adaptive reuse of the Tofaş Anatolian Cars Museum which puts emphasis on its impacts on cultural sustainability are:

- The study is limited in terms of focusing only on the Tofaş Anatolian Cars Museum’s transformation inside the Tofaş Information Park. The park is 17.000 m² in total. Thus, the in-depth research includes the museum’s 1270 m² area.
- Inside the Tofaş Information Park there is also the Tofaş Art Gallery which is an old Turkish bathhouse that dates back to the 15th century, the Administration Office which is formerly a 19th-century Turkish House, Fayton Café which is the outbuilding of the Ipeker family’s mansion and former “Mancınıkhane” and “Kozaklık” units of the silk production factory but serves completely different functions today. Adding to the study, future research should collect data about these buildings’ transformations if the research will do a case study on all of the area. The study can be used as a foundation for deeper analyses which take a wider approach to adaptive reuse and preserving the industrial heritage.

Chapter 4

Findings

The main findings of the research are presented in this chapter. The museum's contribution to cultural sustainability by preserving industrial heritage and encouraging a sense of identity within the community is addressed. The data collected and analyzed through the interviews, architectural documents, visitor surveys and observations are provided. The findings about the museum's adaptive reuse process are supported by photographs from the field and visual resources from Mehmet Batıtürk and Naim Arnas and the museum. All the findings are presented and are divided into several sub-chapters.

4.1 Site Selection Process

The starting point of the project was when Tofaş had the intention to establish an automobile museum to exhibit their many years of experience in the automotive industry. Jan Nahum, the CEO of Tofaş at the time, had contact with Naim Arnas and his architectural firm Mido Mimarlık. Naim Arnas proposed a location and a design for the automobile museum in 1979. At that time, there were discussions about allocating a specific section of the factory to the museum but visits would be limited. Erdem Saker, the mayor of Bursa at the time, proposed his idea to Tofaş to relocate the museum in the former Ipeker family's factory field in the Ipekçilik neighbourhood. The site is evaluated by Tofaş and found suitable for the museum due to several reasons.

- The location is close to the city centre and Ipekçilik is a historical neighbourhood in Bursa's history.
- The layout of the former weaving unit of the factory is suitable for an automobile museum.
- The area is a historically protected site.
- An industrial heritage building's repurposing and transformation to open it to public use and contribute to community engagement.
- Reviving a neglected building and area back to life to contribute to the cultural heritage and sustainability.

4.2 Funding and the Opening of Tofaş Anatolian Cars Museum

In the 1970s, there were discussions about using this abandoned area for a housing project. Erdoğan Uçarsu was elected as the neighbourhood headman of the Umurbey neighbourhood in 1973. During his duty as the headman of the neighbourhood, he made an effort to prevent this historically significant area from turning into a housing project. His name is given to the city park that is located near the museum due to his efforts in protecting the area and contributing to the neighbourhood.

In 1998, Bursa Metropolitan Municipality came to an agreement with the Ipeker family about the ownership of the land. The ownership is transferred to the municipality in exchange for land in the Industrial Zone to the Ipeker family (Murat Kaleoğlu Interview, 2022). In the same year, Koç Group allocated the land from the municipality with the “build-operate-transfer” model. The maintenance of the building is given to Tofaş for 30 years. This includes tasks such as structural repairs, electrical repairs or landscaping (Doğanlar, 2018). The museum opened to the public in June 2002.

4.3 A Brief History of the Ipeker Silk Factory

The oldest drawing source for the silk factories in Bursa is Suphi Bey’s 1862 Bursa city map. Suphi Bey was a former soldier in the Ottoman Empire. The city map started to be prepared in 1858 with the leadership of Suphi Bey and was published in 1862 in the Engineering School’s printing house (Oral, 2004).

In the 1862 Suphi Bey city map, a factory building can be seen in the Ipeker Silk Factory’s project area in the Umurbey neighbourhood. The factory belonged to an Armenian family who were also silk producers (Oral, 2004). In 1920, the factory building and the area, which is known today as the TOFAŞ Information Park, was bought by the Gaffarzade Mehmet Efendi (ipekertextile.com, 2022). Later Gaffarzade Mehmet Efendi got the “Ipeker” surname. The “Gaffarzade” family started silk cocoon production and trading at the end of the 1800s. After they moved to their new location in Umurbey, they continued under the “Ipeker” name (ipekertextile.com,2022). The “Ipeker” company is now run by the 3rd and 4th generations of the family.

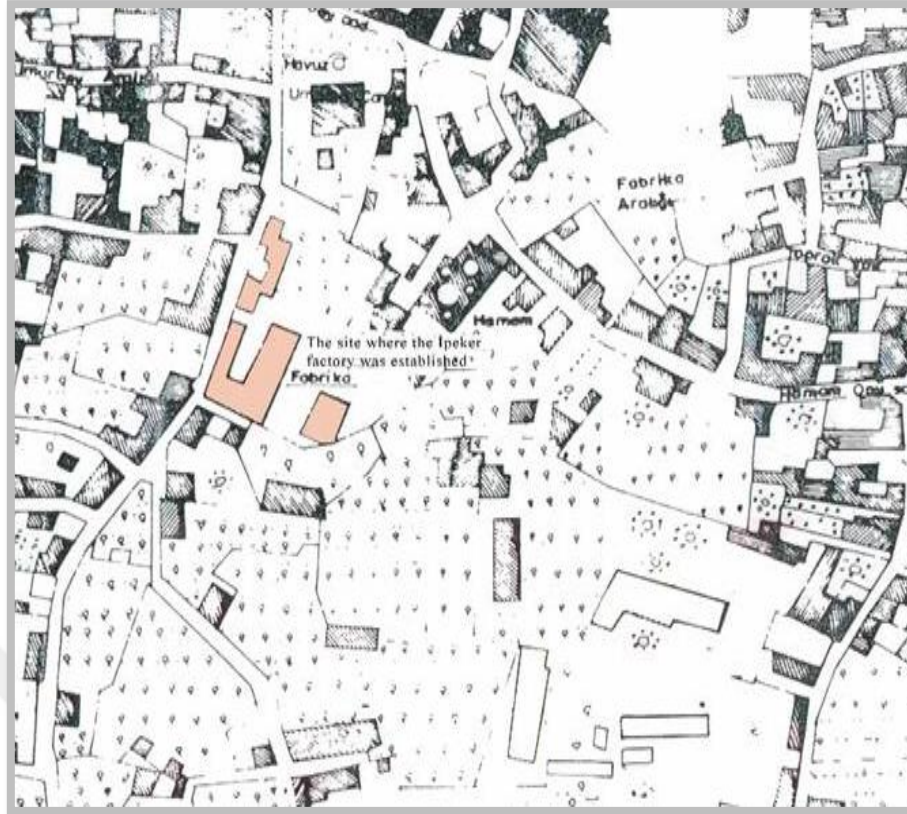


Figure 51. The factory's location in 1862 Suphi Bey city map (Oral, 2004).

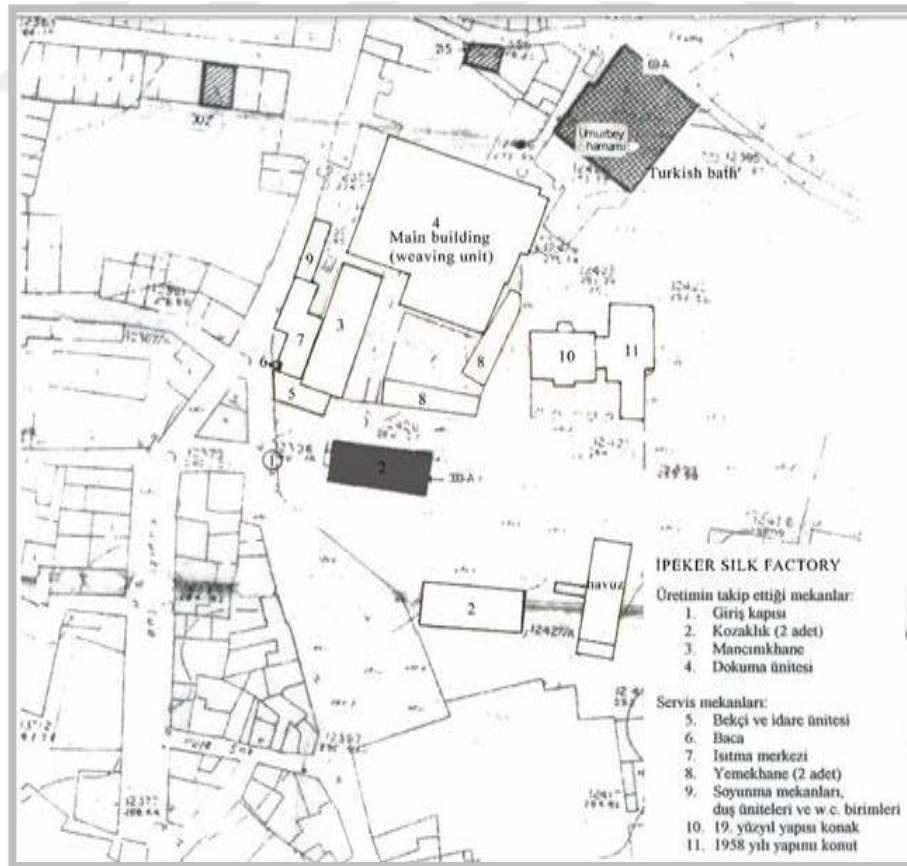


Figure 52. The 1975 map of Bursa (Oral, 2004).

Murat Kaleoğlu from the Ipeker family's 4th generation, states that the family lived in a mansion which was located in the area but could not survive to the present day. Silk unwinding and texturing units were established in 1920. "Kozaklık" and "Mancınıkhane" units are established in 1932 (Oral, 2004). The weaving unit is established in 1942 (ipekertextile.com, 2022). The building now functions as the Tofaş Anatolian Cars Museum's main building. During the 1960s, they established a new production plant in the Bursa Industrial Zone. In 1971, a huge part of the production units were moved to the new factory in the Industrial Zone (Oral, 2004). The weaving units were maintained in the Umurbey factory until 1979.

The silk factory of the Ipeker family is emptied in 1979 due to the high cost of silk production. In the area, there was formerly the Ipeker family's mansion, factory, garden and an outbuilding which now serves as a café and restaurant. As Murat Kaleoğlu from the İpeker family states his earliest childhood memories are from the mansion and its garden. The family had to move out and empty the factory. The cause was the high costs and shifting in the market towards China and Far Eastern countries (Murat Kaleoğlu Interview, 2022). Not only the Ipeker family but all the other factories in the Umurbey neighbourhood were affected by the shifting in the economy of the silk market. They manufactured silk for nearly 50 years and made a big impact in the industry. After 50 years in the industry Ipeker family sold the field to the Bursa Metropolitan Municipality and the Municipality provided them with a field in the Nilüfer Industrial Zone in return. Later, in the 1980s the Bursa Metropolitan Municipality came to an agreement with Tofaş and Koç Group to sell the field to them.

Erdem Saker who was the mayor of Bursa at the time proposed Tofaş to build the museum in the former Ipeker family's field in Umurbey, Ipekçilik. Arnas visited the area, and it was decided that the area is suitable for the museum's location. As previously mentioned, the focal points in deciding on the location were the building to be an industrial heritage building, the location to be close to the city centre and bringing together Bursa's two most recognized industries which are silk manufacturing and automobile manufacturing (Naim Arnas Interview, 2022). With Erdem Saker's involvement in the matter, adaptive reuse started in 1998.

4.4 Findings about the Transformation of the Main Museum Building and Preserving the Industrial Heritage

In the formation process of the automobile museum, formerly the weaving unit, transformation is analyzed. The examination of the architectural design with the resources which are architectural plans, sections and images from Mido Mimarlık's archives revealed that the main concept for the project is to stay true to its original design and create a historical and experiential route.

According to Arnas's understanding of adaptive reuse projects, the industrial heritage buildings tell the story of the city, its people and the daily life in the city. His statement supports the fact that these buildings have a place in people's collective memory.

The whole area for the project is 17.000 m² and it includes the main factory building which became the museum building, a Turkish bath from the 1400s which is an exhibition hall today, a Turkish house from the 19th century which turned into the administration building of the museum and a park that resembles a botanical garden with its variety of the plants.

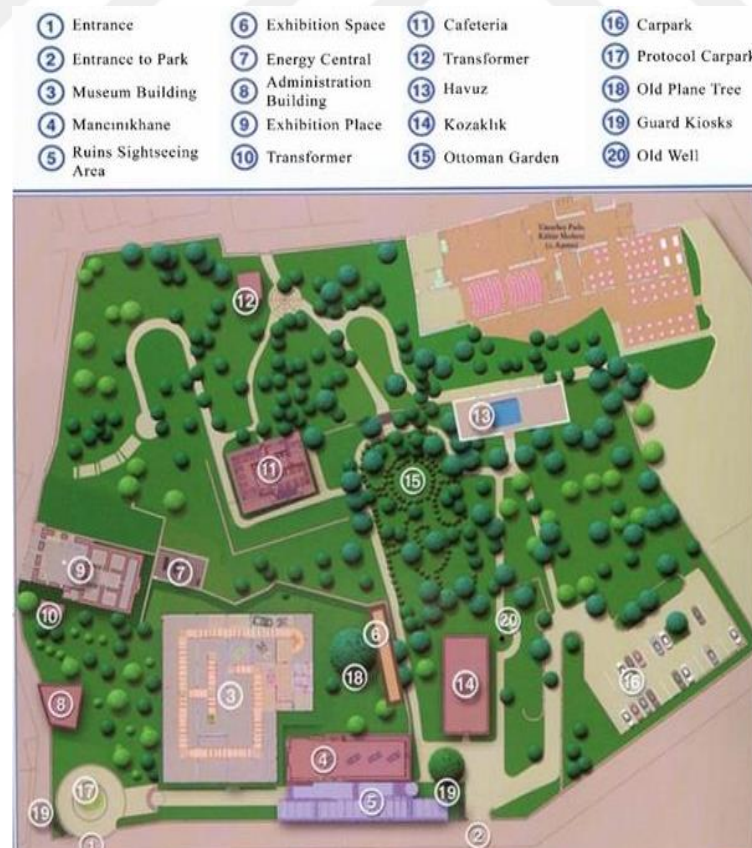


Figure 53. Tofaş Information Park map (Güney, 2009).

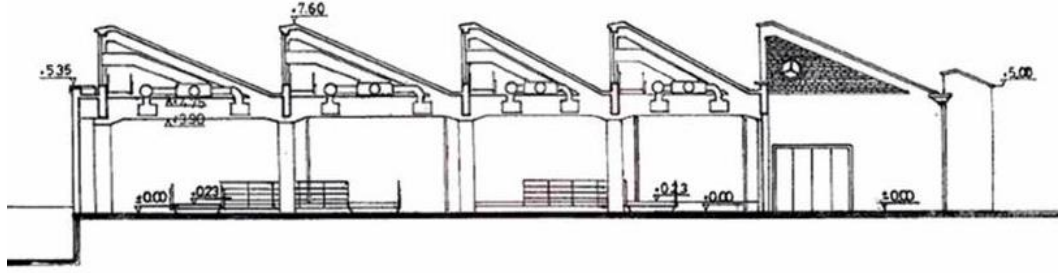


Figure 55. Section of the museum (Mehmet Batıttürk Archives, 2002).



Figure 56. West Elevation of the museum (Mehmet Batıttürk Archives, 2002).

The original spatial layout of the structure could not be determined, but it is learnt from the architects who worked on the project, Naim Arnas and Mehmet Batıttürk, that structural reinforcements are made to the structure. The 3,90 m long 30 cm x 30 cm columns are enlarged on all sides by 15 cm to 60 cm x 60 cm.

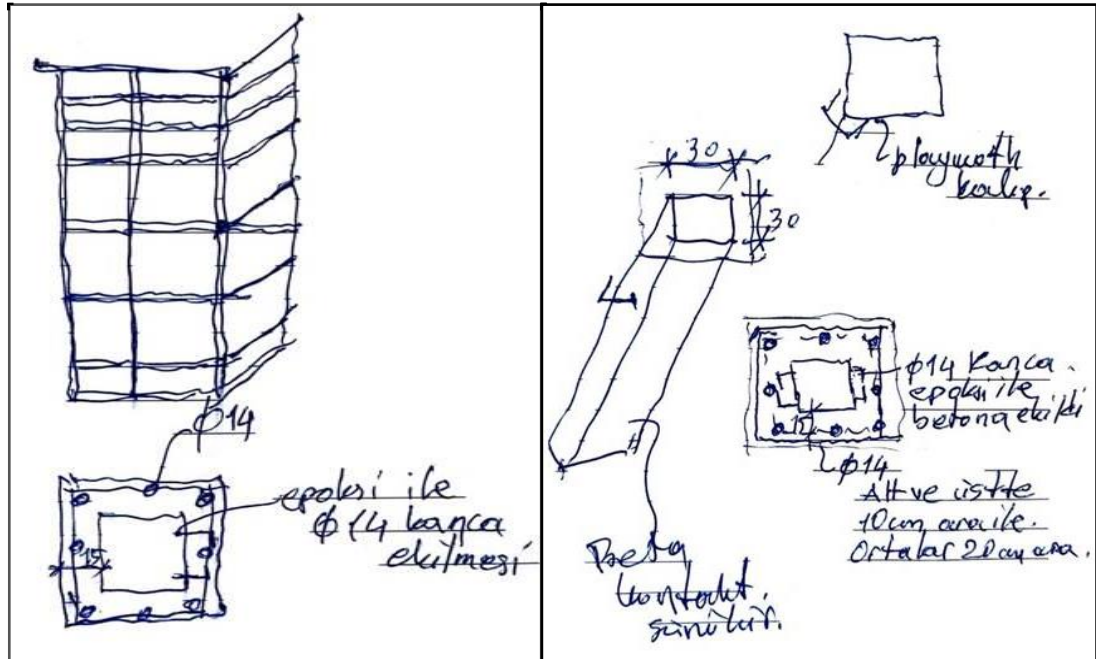


Figure 57. Mehmet Batıttürk's drawings on the strengthening of the structure (Author's Archive, 2024).



Figure 58. The strengthening operations on the columns on the left and 60 cm x 60 cm column on the right (Author's Archive, 2024)



Figure 59. Filling the holes on concrete with epoxy dowels using the “Hilti” machine (hilti.com.tr, 2024).

As a priority, the columns are weakened, and their surface is roughened. For the concrete to hold on together, a chemical material called beta-contact is spread through the surfaces of the 30 cm x 30 cm columns and then 14 Φ thick holes on concrete at specific points are created. The 2/3 of the hole's volume is filled with chemical epoxy dowels using the “Hilti” machine and 14 Φ thick iron hooks are placed.

This is a method that is used for concrete-to-concrete connections. Epoxy dowels are used because of its high weight resistance.

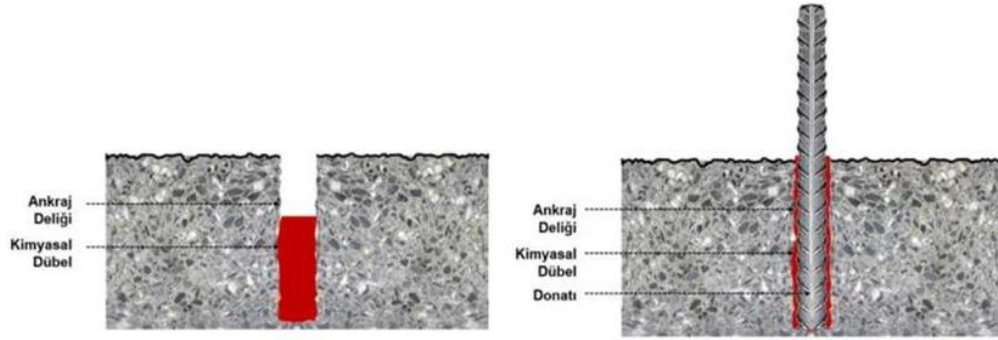


Figure 60. Filling the holes on concrete with epoxy dowels using the “Hilti” machine (hilti.com.tr, 2024).

The 8 Φ thick reinforcing stirrups are bent and placed around the columns with 20 cm spacings in the middle parts and for the top and bottom of the columns, the stirrups are placed with 10 cm spacings. After the stirrups and plywood forms are placed, the C30 concrete is then placed into the form by hand. The process is done for every column individually. The top parts where the columns connect with beams, are left open to fill with concrete grout.



Figure 61. The structure of the building (Naim Arnas Archives, 1998).



Figure 62. An image of the beams that are painted black (Author's Archive, 2024).

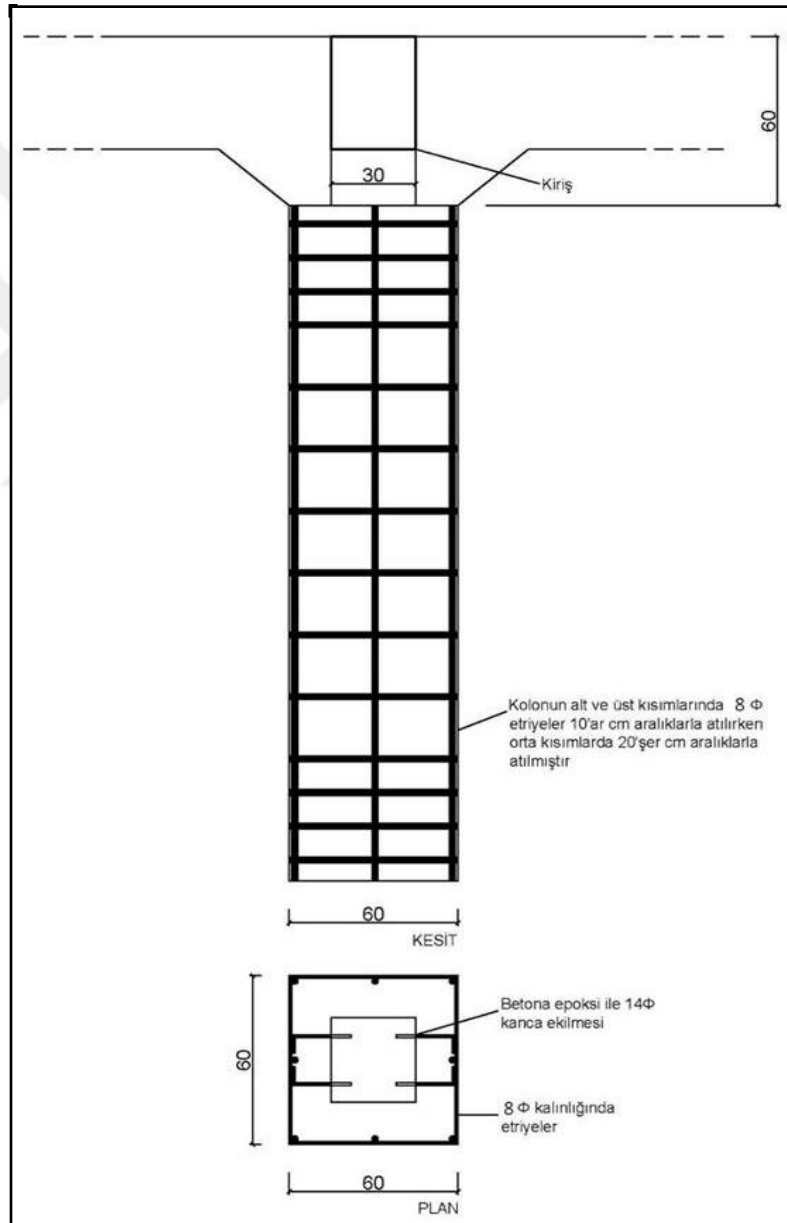


Figure 63. The Autocad drawing of the strengthening of the structure (Author's Archive, 2024).

There were machine foundations that were 25 cm thick on the ground to support the weight of heavy machinery that was used when it was a factory. The machine foundations are dismantled. A self-levelling compound was then applied to the floor to create a smooth and even surface. Since the exhibition inside progresses as a historical route, the cobblestone paving is used on the compound in the first section where the wooden carriages are displayed, in the second section modern horse carriages standing on a more modern cobblestone paving are displayed and in the third section modern-day automobiles standing on asphalt are displayed.



Figure 64. The machine foundations that are dismantled (Naim Arnas Archives, 1997).



Figure 65. Self-leveling compound applied to the floor and some of the exhibited carriages (Mehmet Batıtürk Archives, 2001).



Figure 66. Strengthened 60 x 60 columns and some of the carriages from the exhibition's first section (Mehmet Batıtürk Archives, 2001).

According to the new plan, some of the windows were no longer needed on the back facade. The window openings are closed to include charts by professional graphic designers and photographs from Naim Arnas's archive. The east and south façades the painted with smoky grey paint including the window frames. In addition, to prevent visitors from being distracted by the light, most windows are removed from the project. The back of the building was filled with soil due to a significant difference in grade.



Figure 67. The back façade of the building the windows are cancelled to include charts and photographs (Author's Archive, 2024).



Figure 68. The back façade of the building where the window openings are closed and east and south facades painted with smoky grey paint (Author's Archive, 2024).

The original exterior walls of the building are 40 cm thick and are constructed with 5 cm x 24 cm x 4 cm interlocking bricks that have stood the test of time. The mortar joints between the bricks in the interior wall were repointed to prevent water from leaking through. Plaster is applied to the walls to create an even surface. The interior brickwork has white Khorasan mortar joints, while the exterior brickwork has red Khorasan mortar joints. Mehmet Batıtürk states that, despite it is not a common technique for today's architecture, this decision is made for aesthetic reasons at the time.



Figure 69. The entrance of the museum in 1997 on the left and in 2000 on the right (Naim Arnas Archives, 1997&2000).



Figure 70. The exterior brick walls in 1998 on the left and applied red mortar joints on the right (Naim Arnas Archives, 1998&2024).



Figure 71. Brick walls with white mortar joints applied on the interior (Author's Archive, 2024).

The 180 cm x 180 cm window openings are left as they were in the original. The wood joineries of the windows are taken off due to their neglect. The new windows have 30 mm aluminium frames with sekurite smoked grey glass to create a sense of privacy and for the light to not interrupt. The former railings were rusty or

broken so they are replaced with iron ball-tipped railings on the inner part of the windows. 12 cm casings are installed on the outer parts of the window frames.



Figure 72. The exterior brick walls and windows after their renovation (Mehmet Batıtürk Archives, 1999).



Figure 73. The museum in 2024 (Author's Archive, 2024).

The beams did not go through a strengthening process. They are left in their original state. They are covered with plaster and then black paint on top. The beams are 30 cm wide with supports extending 60 cm. As an aesthetic choice, the exterior of the columns is painted in a smoky grey colour.



Figure 74. The iron ball-tipped railings on the interior (Author's Archive, 2024).



Figure 75. The beams covered with black paint (Author's Archive, 2024).

The interior walls are separatory. The walls have metal stud frames and are covered with MDF panels. The sections are not separated with sharp boundaries to give the place a sense of flexibility.



Figure 76. The interior separatory walls and photographs from Naim Arnas' Archive (Author's Archive, 2024).

A new Fan-Coil ventilation system is placed inside the building. The interior ventilation system features 12 air vents and 2 fan coil units. Electrical cables are routed across the catwalks on the ceiling. Since an open ceiling design creates a sense of spaciousness, a suspended ceiling is not used.

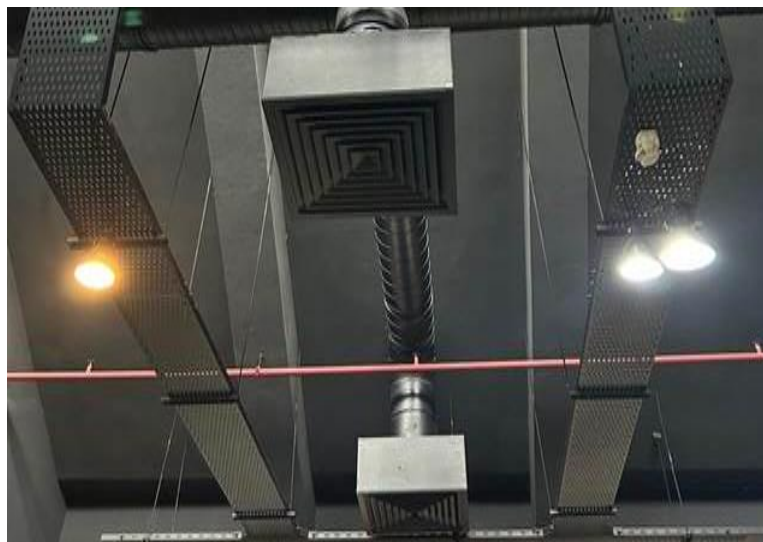


Figure 77. The new ventilation system (Author's Archive, 2024).



Figure 78. Ventilation system plan (Mehmet Batıtürk Archives, 2022).

Most of the former roof tiles are broken and vegetation has started to grow on the roof. First of all, thermal and water isolation is made, and membranes are put in. The tiles on the shed roof are renewed. Metal (tuff tile) tiles are used. The original shape of the roof is preserved which makes the building's form unique. The rafters of the roof are painted the same colour as the beams to make it look more cohesive. The original circular windows on the shed roof are preserved which brighten the interior spaces. The renovations are made to give the design a more modern view.



Figure 79. The renovations on the roof (Author's Archive, 2000).



Figure 80. An image of the roof (Author's Archive, 2024).



Figure 81. An image of the roof and circular window (Author's Archive, 2024).



Figure 82. The square windows that are cancelled and painted with smoky grey paint (Author's Archive, 2024).



Figure 83. The building of the 20 cm interior brick walls in 1998 (Author's Archive, 1998).



Figure 84. Hexagonal stone tiles at the entrance (Author's Archive, 2024).

The wall where the entrance is located is made of 20 cm solid block bricks. The entrance area is floored with hexagonal stone tiles. A suspended ceiling is used only at the entrance. An elevated wooden walkway, supported by an iron frame, extends into the interior. Guardrails made of steel cables are installed. The museum offers the visitors an experience route by following the wooden walkway from the entrance. The old location of the entrance was where the current emergency exit door is now, but it has been relocated to its current position since it is more suitable for the new layout. The entrance area of the building has been divided to accommodate wet areas, a book sales section, and a security booth.



Figure 85. The museum's entrance (Author's Archive, 2024).



Figure 86. The wet areas and book sales section at the entrance (Author's Archive, 2024).

The museum's collection, starting with the “Üçpınar Tümlüsü”, comprises an array of historical carriages, including a two-wheeled horse-drawn Bursa carriage, an oxcart, a cannon carriage, a hay cart, a phaeton, a motorcar, and a Tatar carriage, which exemplifies fine woodwork and blacksmithing.

In addition to the historical carriages, the museum also houses a remarkable collection of automobiles that were manufactured in Turkey, including the Murat 124, the Tofaş Şahin (Fiat 131), the Fiat Uno, the Fiat Tipo, the Fiat Doblo, and the Fiat Albea. A special corner of the exhibition hall showcases the trophies Tofaş has won in motorsports. The museum also features a diverse array of artefacts categorized under the themes of Tumulus and Tomb, Traditional Car Workshops, Motorless Vehicles, Wheels, and Motor Vehicles.

4.4.1 Tofaş Art Gallery. Following the museum building, the bathhouse within the area is restored and converted into an exhibition hall in 2008 and reopened as the Tofaş Art Gallery. The bathhouse is located in the Umurbey neighbourhood and within the Tofaş Information Park. Built in 1430 as the Umurbey Bathhouse, it is restored over the years and served until the 1990s. However, it was later closed due to neglect and lack of profitability.

In 2008, with the support of the Koç Foundation, the bathhouse is reopened, and restored by Mido Architecture. As Naim Arnas states, the bathhouse is expanded by adding a foyer area. The foyer includes wet areas and an exhibition space for temporary exhibitions. This area also serves as a venue for events organized by Tofaş or the Koç Foundation. Additionally, when schools visit, students are engaged in various activities in this area.

The first temporary exhibition after the reopening was called “Eski Hamam Eski Tas”. Until today the art gallery held seven exhibitions since its opening.

- “İşte Benim Zeki Müren”
- “Zaman Makineleri: Saat”
- “Oyuncak”
- “40. Yılında Tofaş ve Vehbi Koç”
- “Piemonte Torino Design”
- “Kantarın Topuzu: Teraziler, Ağırlıklar, Ölçü Aletleri”

In addition to these, many special exhibitions are held and thousands of visitors are welcomed.



Figure 89. Old image of the Turkish bath before the restoration (Doğanlar, 2018).



Figure 87. The art gallery today (Author's Archive, 2024).



Figure 88. An image of the art gallery today (Doğanlar, 2018).



Figure 90. The foyer of the gallery (tofasanadoluarabalarimuzesi.com).

4.4.2 Turkish House. The Turkish House is an example of 19th-century civil architecture. It is located below the museum in the Tofaş Information Park and on the left as you walk towards the Tofaş Art Gallery. The two-story building was in a very damaged state. As a registered building with cultural heritage value, it was restored with careful attention to reconstruction rules. The aim was to preserve its original appearance using materials close to its previous state. It is currently used as an administrative building.



Figure 91. Turkish house before reconstruction in 1992 (Museum Archive, 1992).



Figure 92. Turkish house before the reconstruction (Museum Archive, 1992).



Figure 93. An image of Turkish house today (Author's Archive, 2024).

4.4.3 Fayton Café. The building that currently houses the Fayton Kafe was previously an outbuilding belonging to the Ipeker family. It is located in the Tofaş Information Park, above the museum building. In 2010, it is restored by Mido Mimarlık and opened to the public as a restaurant and café. It is not a registered building. It has been restored close to its original state. Its exterior walls are made of interlocking brick blocks. As Museum Director Aylin Tatlı points out, it is the only commercial establishment within the Tofaş Information Park. It attracts more visitors, especially on weekends and during the spring months.



Figure 94. An image of the outbuilding before the restoration (Doğanlar, 2018).



Figure 95. Fayton Café today (Author's Archive, 2024).

4.4.4 Tofaş Information Park. The Tofaş Information Park's garden is like a botanical garden. According to Naim Arnas, it is home to 300-350 different plant species. In the garden behind the museum, there is a 400-year-old plane tree. The 17,000 m² park offers visitors a peaceful space in the city. As Naim Arnas states, the

other parts, located above the café and formerly used as a pool area for the weaving of silk, have not yet had the opportunity for renovation.

In addition to the Tofaş Anatolian Cars Museum, the structures within the park include the arched “Mancınıkhane” structure located to the right of the museum's entrance, a traffic education track for children which is formerly a 19th-century old “Kozaklık” building, the Tofaş Art Gallery, the Turkish House, and the Fayton Café.



Figure 96. Images of the cobblestone walkway inside the park (Author's Archive, 2024).



Figure 97. Images of the walkway and the wooden stairs and ramp toward the art gallery (Author's Archive, 2024).

Walking paths are arranged within the Information Park. As you enter the park, a walkway made of granite stones greets visitors. Turning left from the entrance, one

can descend the stairs with the security booth and reach the museum. Continuing to the right from the front of the museum and down the area, the art gallery and the Turkish House can be reached via a massive wooden ramp or stairs.



Figure 98. The walkway to the museum in 1997 (Naim Arnas Archives, 1997).



Figure 99. The walkway to the café in 2000 (Naim Arnas Archives, 2000).

4.5 The Utilization of Industrial Heritage as an Automobile Museum

At the Bursa Archaeological Museum, there is a horse-drawn carriage that was found in the Üçpınar Tumulus and was used in this region 2600 years ago. The idea of reconstructing this horse-drawn carriage according to its original dimensions and exhibiting it was considered important in terms of reviving such an industrial heritage

of Anatolia, and it served as the starting point for the idea of an automobile museum (Küçükerman, 2008).

The discussions for the project started with the support of Tofaş CEO Jan Nahum and the head of the Bursa Archaeological Museum, Öcal Özeren. The head architect of Mido Mimarlık, Naim Arnas lead the way on behalf of Tofaş.

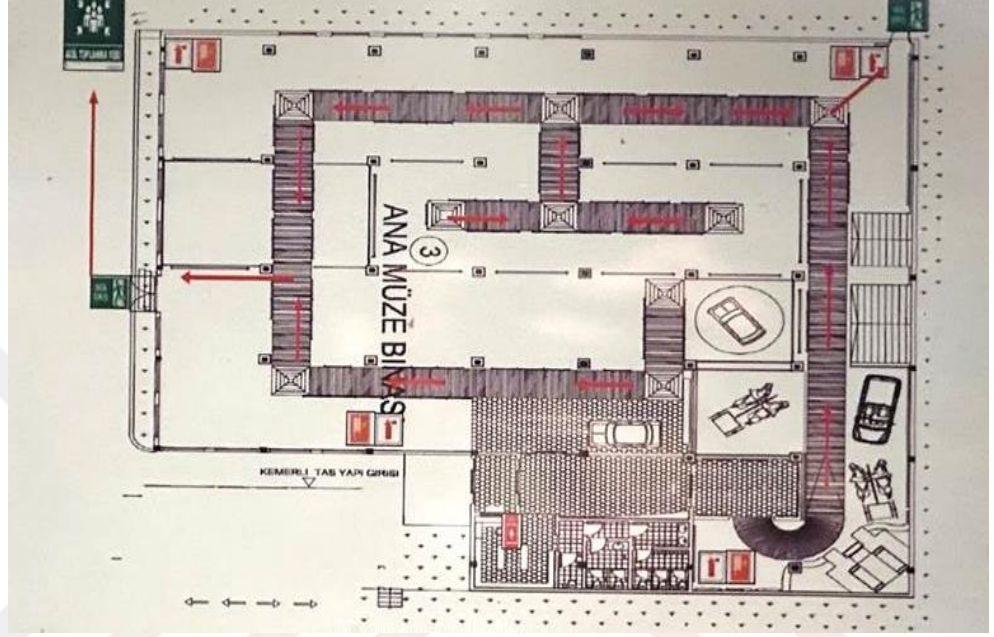


Figure 100. Evacuation plan (Museum Archive, 2024).



Figure 101. Tumulus and the horse-drawn carriage (Author's Archive, 2024).

A team of archaeologists and restorers are assembled, and the reconstruction of this horse-drawn carriage began. While it is unknown how closely this horse-drawn carriage resembles the design of the original craftsman, there is evidence that powerful carriages capable of reaching speeds of 50 km per hour were being manufactured and used in Bursa 2600 years ago (Küçükerman, 2008).

Tofaş Anatolian Cars Museum opened on 28th June 2002. As mentioned before, the discussions for the museum started a few years back from the opening. In 1997, Önder Küçükerman, head of the Industrial Design Department at the Mimar Sinan Fine Arts University, prepared his book “Anadolu Tasarım Mirasının Ayak İzlerinde Türk Otomotiv Sanayii ve Tofaş” to publish (Küçükerman, 2008). Jan Nahum, the Tofaş CEO at the time, and Önder Küçükerman began working on the project of an “Anatolian Cars Museum”. Naim Arnas prepared designs for the project and in 1999, the decision is made by the municipality to transform a former silk production plant into an automobile museum.

Since its opening in June until the end of 2002, 15.100 people visited the museum. The museum, which attracted visitors from all regions of Turkey, was intended to be developed further over a period of time (dunya.com, 2022).

Upon entering the museum, visitors are first encountered by the tumulus and the horse-drawn carriage. At the entrance of the tumulus, pieces of the carriage and artefacts related to horse harnesses are displayed. Continuing on, stelae and tombstones are displayed. There are two styles from the Achaemenid period and a chariot relief from the Roman period (tofasanadolarabalarimuzesi.com, 2022). The original work from the Roman period is in Naim Arnas’s collection as he is a collector and auctioneer.

Next, visitors proceed to the traditional carriage workshops section. Replicas of carriage and phaeton workshops, blacksmith shops, and saddlers’ shops from the 19th century are displayed to illustrate the stages involved in carriage manufacturing. The shops are constructed according to the architectural principles of the time. The workbenches, hearths, metal tools, and saddles found in the shops are original works.

After this section, visitors move on to the carriage section. The museum houses 34 non-motorized vehicles. The first exhibits to be seen are ammunition and cannon carriages from the Aegean region dating back to the 19th century and kağrı (oxcart) carriages from Central Anatolia .



Figure 102. The phaeton workshop (Author's Archive, 2024).



Figure 103. A carriage and informatory chart (Author's Archive, 2024).



Figure 103. Cannon carriages and oxcarts (Author's Archive, 2024).

Turning left on the walkway and continuing straight ahead leads to the display of four-wheeled oxcars from Bursa and Balıkesir, handcarts, a horse-drawn-cart from the Trakya Region, a horse-drawn-cart used as a wedding carriage as well as horse-drawn carts from Bursa. Upon proceeding along the platform in the left corner, in this gallery, horse-drawn carts and oxcars from various regions are showcased.



Figure 104. Oxcars from Bursa and Balıkesir (Author's Archive, 2024).



Figure 105. The sub-section gallery and horse-drawn-carts and oxcars (Author's Archive, 2024).



Figure 106. Phaeton, payton and brichka (Author's Archive, 2024).

In the section where the phaetons are displayed, the path transitions from earth road to stone road. A Phaeton, a Payton and a Brichka are displayed in that section. Continuing on, wheels are exhibited in a closed section with a screen. The wheels are from different regions and periods. The section includes wheels used on oxcarts, horse-drawn carts and modern automobiles.



Figure 107. The closed sub-section where the wheels are exhibited (Author's Archive, 2024).

The path transitions to an asphalt road as visitors enter the motor vehicle section. The first exhibit is a Murat 124 from 1971. Following Murat 124, and Murat 131 models from 1977 and 1983, a Fiat Palio, a Fiat Tempra, a Fiat Tipo, a Fiat Uno model from 2000 and a Palio Go from 2004 are displayed. A Fiat Fiorino model from 2008 is exhibited on a rotating platform. A Palio S1600 that was used as a race car as well as on the wall to the right of the exit door, the front ends of vehicles produced by Tofaş in later years are showcased.



Figure 108. İlk Murat 124 (Author's Archive, 2024).



Figure 109. Fiat Palio, Tempra, Tipo and Uno (Author's Archive, 2024).



Figure 110. An exploded perspective of Fiat Palio (Author's Archive, 2024).

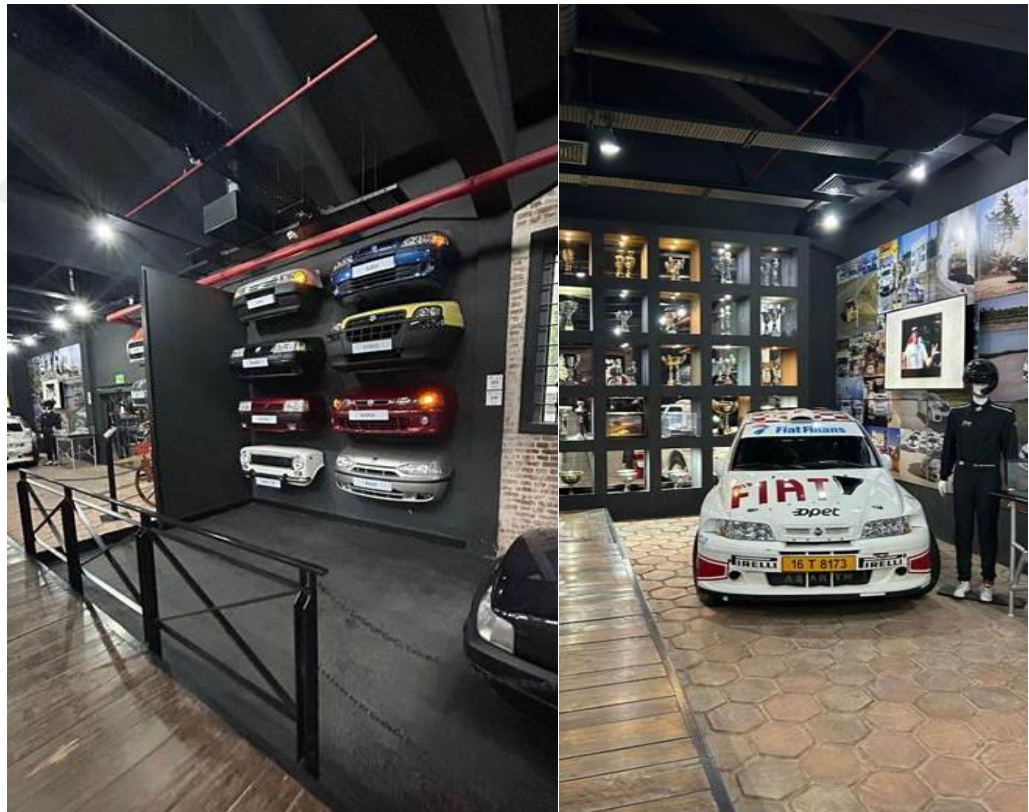


Figure 111. Front-ends of Fiat models and Palio S1600 (Author's Archive, 2024).



Figure 112. Fiat Fiorino on the rotating platform (Author's Archive, 2024).



Figure 113. The front-ends of Fiat models and the exit door (Author's Archive, 2024).

4.6 Findings from the Visitor Experience Survey

Visitor surveys that are conducted, pointed out the high level of satisfaction. Interviews are held with the visitors of the museum. Questions that are asked about

their personal information include their age groups, educational levels, occupations also the purpose and frequency of their visits to the museum. The rest of the questions are based on their experiences while visiting the museum. As the responses became repetitive, the survey results formed.

With the visitor interviews the keywords are determined as “breathing space”, “historically and culturally rich”, “functional”, “well-planned”, and “both modern and historical”.

Table 2

Results of Q1

	15-20	20-30	30-40	40-50	50-60	60+
Age Range	%3	%50	%10	%10	%20	%7

Table 3

Results of Q2

	Female	Male
Gender	%57	%43

Table 4

Results of Q3

	High School	Bachelor	Master	PhD
Education Level	%8	%71	%13	%8

Table 5

Results of Q4

	Student	Employee	Business owner	Retired	Not working
Occupation	%17	%50	%21	%8	%4

Table 6

Results of Q5

	Few times a year	Few times a month	Few times a week
Frequency of Visit	%88	%8	%4

Table 7

Results of Q6

	Activities (eating, sports, etc.)	Relaxing	Meeting with people
Purpose of Visit	%75	%17	%8

Table 8

Results of the Survey

	Yes	No
Q7. Does being here comfort you and does it feel peaceful?	%100	%0
Q8. Do you feel a sense of safety when you are here?	%92	%8
Q9. Is the museum compatible with its environment? (dwellings, architectural texture)	%54	%46
Q10. Do you think that the area is functional enough for public use?	%96	%4
Q11. The museum was formerly a silk factory. Considering its old state, do you think the transformation of the museum into its current state was successful?	%92	%8

Table 9

A part of the Excel table

B	C	D	E	F	G	H
Yaş Aralığınız	Cinsiyet	Eğitim seviyeniz	İşiniz	Müze'yi ne kadar sıklıkla	Müze'yi hangi amaçla ziy.	Sizce huzurlu ve dir
20-30	Kadın	Lisans	Çalışmıyor	Yılda birkaç defa	dinlenme	Evet
40-50	Erkek	Lisans	İş Sahibi	Yılda birkaç defa	dinlenme	Evet
15-20	Erkek	Lise	Öğrenci	Yılda birkaç defa	etkinlik(spor,yürüyüş,vs.)	Evet
20-30	Kadın	Lisans	Çalışan	Yılda birkaç defa	etkinlik(spor,yürüyüş,vs.)	Evet
20-30	Kadın	Lisans	Çalışan	Yılda birkaç defa	etkinlik(spor,yürüyüş,vs.)	Evet
20-30	Kadın	Lisans	Çalışan	Yılda birkaç defa	etkinlik(spor,yürüyüş,vs.)	Evet
20-30	Kadın	Doktora	Çalışan	Yılda birkaç defa	etkinlik(spor,yürüyüş,vs.)	Evet
20-30	Erkek	Yüksek Lisans	Öğrenci	Yılda birkaç defa	etkinlik(spor,yürüyüş,vs.)	Evet
20-30	Erkek	Lisans	İş Sahibi	Yılda birkaç defa	etkinlik(spor,yürüyüş,vs.)	Evet
20-30	Erkek	Lisans	Çalışan	Yılda birkaç defa	etkinlik(spor,yürüyüş,vs.)	Evet
20-30	Kadın	Yüksek Lisans	İş Sahibi	Yılda birkaç defa	etkinlik(spor,yürüyüş,vs.)	Evet
20-30	Kadın	Lisans	Çalışan	Yılda birkaç defa	dinlenme	Evet
50-60	Erkek	Lisans	Emekli	Yılda birkaç defa	dinlenme	Evet
50-60	Erkek	Lisans	Çalışan	Ayda birkaç defa	etkinlik(spor,yürüyüş,vs.)	Evet
20-30	Kadın	Lisans	Çalışan	Yılda birkaç defa	etkinlik(spor,yürüyüş,vs.)	Evet
20-30	Kadın	Lisans	Öğrenci	Haftada birkaç kere	buluşma	Evet
50-60	Erkek	Lisans	İş Sahibi	Yılda birkaç defa	etkinlik(spor,yürüyüş,vs.)	Evet

As may be seen in the graphs, the majority of the visitors agree that the place is peaceful, safe, functional and successful in terms of its transformation. Despite the high level of satisfaction, it is stated by most of the people that they visit the place only a few times a year. The major reason for this situation is its location.

As previously mentioned Ipekçilik is a historical neighbourhood and the main building is an industrial heritage building but in the current times, the lack of public transport and the location being far away affects the museum's frequency of visit.

On the other hand, the whole area serves as a "breathing space" in the heart of the city. With its "well-planned" landscape, as it is shown in the graphic, the main purpose of the visit is with 75%, to do outdoor activities with friends or family members. When visiting the museum, people do different activities on different days. If it is the weekend, one may see people jogging, doing sports, spending time with their families, etc. On the weekdays student groups mostly visit the museum.

The overall thoughts on the museum are positive. Most of the visitors' that are interviewed are aware of the historical value that the museum building holds. The majority of the people agree that the museum offers a "rich cultural and historical experience" and is a flexible space that reflects both "historical and modern".

It is shown on the graphs that the majority of the visitors 50%, are between the ages of 20-30. The age group of 20-30 visit the museum to do outdoor activities, eating,

sports, etc. The older age groups mostly visit the museum to relax, breathe or have a walk in the park.

In addition, the education level pie chart shows that 71% of the people who are interviewed are university graduates. This situation can be interpreted as the visitors are more aware of their surroundings and can evaluate the existing built environment by their own standards of culture, history and architecture. This might be the reason for them giving more thought-out answers and being more expressive with their words.

50% of the visitors are employees and most of them answered that they work in Tofaş and they know about the museum because they work there. To add more, the rest of the visitors answered that they learnt about this place through a friend or a colleague but argued that there is not enough promotion about the place.

In the visitor experience survey, it is observed that the most controversial question was the museum's, and the project area's in general, compatibility with the already existing built environment of the Ipekçilik neighbourhood. It can be seen on the graphic that the people are separated the most in terms of the answer to this question. Of the people who answered the question "Yes" 54%, argue that it is a historical neighbourhood and the museum itself is an industrial heritage building also the transformation of the museum has a positive impact on the environment and maintains harmony within the neighbourhood. It is believed that with the art gallery, Turkish house, café and landscaping the area is argued to be a living habitat in itself and matches with visitors' aesthetic understandings of the architectural texture and there should be more public spaces like this in the city. As for the people who said "No" 46% had different opinions. The most common answer is the museum is a more modern building than the apartments and housing units around the neighbourhood. It is argued that the design of the museum building is more aesthetic and that the surrounding units are not pleasing to look at.

The research process sheds light on future architectural endeavours. The positive impact of the museum on the visitors points out the fact that the design is user-centred or human-centred. The interviews both with the professionals and visitors enriched findings and ensured the project's successful transformation.

The museum is now 22 years old and still holds its significance in Bursa's history. To describe the museum from Aylin Tatlı's perspective, an art historian and the manager of the museum, the museum is a gateway to Bursa's 2600 years of history

in the automotive industry. She adds to her statement; that it is a way to protect and sustain the industrial heritage of the city. The transformation of the building into a museum includes the traditional everyday life of the people of Bursa and the historical heritage can be seen and felt. Furthermore, the landscape of the museum and the gardens are home to 350 different species of plants. It creates its own ecological habitat in itself (Aylin Tatlı Interview, 2022).

The Tofaş Information Park is a part of the city and its history. It is observed that the visitors do not just go to visit the museum but to spend time in the park, enjoying some time with their families, walking their dogs and just making use of this place in the centre of the city. Schools, especially primary and secondary schools are the top visitors to the museum. They visit the museum and play in the traffic education area and at the end of the day the teachers ask them to draw or write about their day at the museum. Workshops are held inside the art gallery for the children which is titled “Make Your Own Pair of Scales” about the scales exhibition in the gallery every Wednesday and Thursday at 11a.m (tofasanadoluarabalarimüzesi.com, 2023).

It does not just serve as a museum but serve as a place for learning the history and experiencing the culture. In the context of sustainability, it is an adaptive reuse project which is respectful to history, architecture and industrial heritage. Transforming the building in accordance with its origin and creating a more modern perspective of the building, gives the building a place in people’s collective memory.



Figure 115. Students on a school trip to museum (Author’s Archive, 2023).



Figure 116. People spending time in the park (Author's Archive, 2023).



Figure 117. Fine arts students on the left and a young girl looking at the information board on the right (Author's Archive, 2023).



Figure 118. Children at the traffic education park (tofasanadoluarabalarimüzesi, 2024).



Figure 119. Children at the atelier inside the art gallery (tofasanadoluarabalarimüzesi, 2024).

Chapter 5

Discussions and Conclusions

Museums are places that preserve the history, art and culture of the city and the people that are living in it. Therefore, museums aim to be informative and educational spaces. Supporting the museums with other functions such as galleries, cafés and parks creates a more interactive and social environment. In this way, people gain the habit of visiting the museums.

With today's modern understanding of museology, it is not possible for museums to survive unless they have the right strategies to implement for themselves. The museum's physical condition, the variety of the collections, people's reactions to the exhibitions, the attractions and the surroundings besides the museum are major factors for the museum's sustainability (Doğanlar, 2018).

It is understood during the research that for a museum to preserve its existence, it should be adaptable to change and improvement, should be dynamic and productive, and should play a role in bringing together the people and the history of the city. In this case, the Tofaş Anatolian Cars Museum has an impact in bringing together the citizens of Bursa and Bursa's history in the silk and automotive industry.

Bursa is a city known for its significance in the silk production and automotive industry. It is the first capital and trade centre of the Ottoman Empire. The city still has recognition for its industrial zones and the automotive industry. Tofaş and Oyak Renault hold the first place in the case of car production. Tofaş, as mentioned previously, is an important brand for both Bursa's and Turkey's reputation in the foreign market. Tofaş also has a cultural and historical impact on the city and its citizens which makes the company reliable for the people of Bursa.

In the research, it is discussed that industrial heritage buildings are the ones which describe a city's architectural identity. The findings of this research offer some key points to address.

5.1 Discussions

- The museum's location in a historical area contributes to its value in cultural heritage.
- The case that adaptive reuse might serve as an effective method for achieving cultural sustainability is supported by this research. The reuse of an industrial structure to create a space for cultural engagement and to establish a sense of belonging to the region's history is an example provided by the Tofaş Anatolian Cars Museum.
- Industrial heritage buildings also enlighten the times in which they were built. One may see the spatial organization, cultural features, and different textures existing together in these buildings. There is no damage to the structure of the museum and no additions are made to the existing structure. The original form and architectural features are preserved.
- Aside from the damaged parts, there are not any other alterations made to the museum's unique features to keep the building's historical feel for visitors. By preserving the architectural and historical identity, passing it on to the future generations and ensuring the building life cycle is achieved.
- The research conducted emphasizes the importance of storytelling and how it performs with the engagement of visitors and creates ties to the past. The Tofaş Anatolian Cars Museum's approach to a story-based experience route exhibition is proof that adaptive reuse projects may involve more than anticipated. The museum serves as a gateway to the past and builds connections to the present.
- The museum receiving financial support from a private foundation, Koç Group, plays a crucial role in the museum's progress and growth. The museum's collection is enhanced with cultural artefacts and art pieces by private collectors.
- The museum's functionality is supported by the other spaces inside the Tofaş Information Park. The art gallery, café, the garden and walkways contribute to the area's utilization as a public space. The museum has the opportunity to bring life to its historical identity while maintaining the narratives they have.

5.2 Conclusions

While a full comparison was not conducted, the findings examined the Tofaş Anatolian Cars Museum's story-based exhibitions and visitor engagement. The similarities and differences with the other museums might be revealed:

- The Tofaş Anatolian Cars Museum presents the local history and the cruciality of the automotive industry in the region. The museum emphasizes the storytelling on an experienced route and different sections on the interior.
- The mentioned museums in the literature review are museums that were formerly automobile factories or automobile manufacturers. The Tofaş Anatolian Cars Museum is set apart from them formerly being a silk production factory. On the other hand, the museum brings together the two most recognized industries of the city.
- The other museums either have larger square meters or expand their existing area to gain more space. This situation provides for them to have larger collections and exhibition halls. They gain attention for not only their storytelling exhibitions but also for their interior design.
- Aside from the exhibitions, the museums attract visitors' attention with interactive experiences by integrating technology. This might especially engage with the younger generation. For Tofaş Anatolian Cars Museum, although the area is limited, integrating technology into the exhibition may present an educational experience as well.

As explored through the findings, no original architectural elements are demolished or replaced with something irrelevant to its character. This supports the fact that the process was carefully planned and executed to preserve the historical identity.

- Adapting the building to a new purpose kept it away from being neglected for years or being demolished to convert the field into a commercial area such as housing units, apartments, etc.
- The transformation of the museum brought new life to the other functions such as the art gallery, garden, and café, in the area as well turning into a public space. The renovations made the museum exist in a harmonious and peaceful environment.

- The absence of a suspended ceiling in the interior allows visitors to notice the unique roof structure of the building and sense a feeling of its past. In addition, the ball-tipped railings used on the windows add an element of traditional architecture. On the other hand, the visible ventilation system contributes to the building's industrial aesthetic. These elements coming together create a connection between the past and the present.

The harmonious coexistence of the elements allows visitors to appreciate the building's transformation and evolution. With the survey and observations, it is revealed that visitors are satisfied with their experience when visiting the museum. The museum allows them to explore the other places and functions in the area as well and some even become regular visitors. The museum's location being not close to a bus station or tramway might be the only negative situation for the visitors. The issue may be solved with the municipality increasing the frequency of public transportation to the area. Due to the slopy terrain of the location, it is unfortunate to get to the museum by walking or bicycle. Increasing public transport might be the most effective solution to reach the area. Since there are not many public places like this in the city, the visitors enjoy the atmosphere here.

Based on this study, it is proven that the Tofaş Anatolian Cars Museum is a successful adaptive reuse project that contributes to cultural sustainability. The museum narrates the long history of the transportation and automotive industry's effects on Bursa and connects the past and present. The research provides valuable insights that may be helpful in future endeavours related to adaptive reuse and cultural sustainability.

5.3 Future Research Suggestions

- Future research could explore how the adaptive reuse approach can be applied to different functions such as art centers or community hubs.
- The study acknowledges the limitations of doing the research on a single case study. Potential future studies may explore the adaptive reuse projects across Turkey and provide comparative research.
- Inside the 17.000 m² Tofaş Information Park the study's focal interest is the Tofaş Anatolian Cars Museum's transformation from a silk factory to an

automobile museum. Further research may examine the transformations of the other functions in the area as well and contribute to the research.



REFERENCES

- Aichi. (2004). Toyota Commemorative Museum of Industry and Technology. Retrieved from https://www.takenaka.co.jp/takenaka_e/projects/museum_entertainment/a31400402004.html
- AichiNow. (2020). Toyota Commemorative Museum of Industry and Technology. Retrieved from <https://www.aichi-now.jp/en/spots/detail/11/>
- Aslanoğlu O.M. (Temmuz 2014). *Zamanla Değişen Müze Tasarım Anlayışı ve Güncel Bir Örnek Olarak Mercedes-Benz Müzesinin İncelenmesi*. Master Thesis. Fen Bilimleri Enstitüsü, İstanbul.
- Armstrong, G. (2023). A framework for sustainable adaptive reuse: Understanding vacancy and underuse in existing buildings. *Sustainable Infrastructure*, 5(1)
- Arnas, N. -Tofaş Bursa Anadolu Arabaları Müzesi Architect- (November 2022) ‘Tofaş BatmazTekstil. (2016). Silk in Bursa. Retrieved March 31, 2024, from <https://www.batmaztekstil.com.tr/en/the-story-of-silk>
- Benz Museum. (2024). Retrieved from <https://www.mercedes-benz.com/en/art-and-culture/museum/>
- Biçer HY. (31 Mayıs 2017). Retrieved March 2024 from, <https://paratic.com/dislanmis-enzo-ferrarinin-inanilmaz-hikayesi/>
- Bursa Anadolu Arabaları Müzesi Transformation and Restoration‘interview. İstanbul.
- Aslantaş, Ç. (2017). Alfa Romeo Museum: Identity built by colors. Retrieved from <https://xximagazine.com/c/alfa-romeo-museum-identity-built-by-colors>
- Batıtürk, M. -Tofaş Bursa Anadolu Arabaları Müzesi Architect- (November 2022) ‘Tofaş Bursa Anadolu Arabaları Müzesi Transformation and Restoration‘interview. Bursa.
- Batıtürk, M. -Tofaş Bursa Anadolu Arabaları Müzesi Architect- (January 2023) ‘Tofaş Bursa Anadolu Arabaları Müzesi Transformation and Restoration‘interview. Bursa.
- Büyükarslan, B. (2013). ENDÜSTRİYEL MİRASYAPILARININ YENİDEN İŞLEVLENDİRİLME SÜRECİ ve İSTANBUL TUZ AMBARI ÖRNEĞİ. *BEYKENT ÜNİVERSİTESİ FEN VE MÜHENDİSLİK BİLİMLERİ DERGİSİ*, 6(2), pp. 31 – 58.

- Batitürk, M. -Tofaş Bursa Anadolu Arabaları Müzesi Architect- (March 2024) ‘Tofaş Bursa Anadolu Arabaları Müzesi Transformation and Restoration’ interview. Bursa.
- Comense, M. (2018). Alfa Romeo Museum. Retrieved from <https://www.architonic.com/en/project/madras-alfa-romeo-museum/5106222>
- Çahantimur, A., Öztürk, R., Özer, G. (2017). Urban sustainability and traditional neighborhoods, a case study: Bursa, Turkey. *International Journal of Development and Sustainability*, 6(12), pp. 1931-1945.
- Doğanlar, B. (2018). ESKİ BİR ARABA USTALIĞI MİRASININ BİR KENT KİMLİĞİNE KATKISINI GÖSTEREN ÖRNEK TASARIM MODELİ OLARAK TOFAŞ BURSA ANADOLU ARABALARI MÜZESİ- Unpublished Master’s Thesis. Haliç University, Istanbul.
- Edis, T. (2004). The Rahmi M Koç Museum Istanbul. *Society for the History of Technology*, 1(1), pp. 590-596.
- Enzo Ferrari Museum. Retrieved January 22, 2023, from <https://www.architectmagazine.com/project-gallery/enzo-ferrari-museum>
- Endüstriyel Mirasın Aynası. (n.d.). Retrieved from <http://www.rmk-museum.org.tr/>
- Erdoğan, B. (2018). TÜRKİYE’DEKİ OTOMOTİV ENDÜSTRİSİNİN ÇEVRESEL YÜKÜNÜN BELİRLENMESİ. Unpublished Master’s Thesis. Uludağ University, Bursa.
- Gedik, G. S. (2015). TARİHİ ÇEVRELERİN SÜRDÜRÜLEBİLİR YENİDEN CANLANDIRILMASINDA KULLANICI GÖRÜŞLERİNİN DEĞERLENDİRİLMESİ: BURSA, HANLAR BÖLGESİ ÖRNEĞİ- Unpublished Master’s Thesis. Istanbul Technical University, Istanbul.
- Günçe, K., Mısırlısoy, D. (2015). Questioning the Adaptive Reuse of Industrial Heritage and Its Interventions in the Context of Sustainability. *Sociology Study*, 5(9), pp. 718-727.
- Güney, A. V. (2009). KÂR AMACI GÜTMİYEN KURUMLAR OLARAK MÜZELERİN SÜRDÜRÜLEBİLİRLİĞİ İÇİN STRATEJİK YAKLAŞIMLAR- Unpublished Master’s Thesis. Yıldız Technical University, Istanbul.

- Güngör, S., Gökçen, Ş. (2022). ENDÜSTRİYEL MİRAS ALANLARININ YENİDEN İŞLEVLENDİRİLMESİ: İZMİR YENİ KENT MERKEZİ ÖZELİNDE FIRSATLAR, SORUNLAR VE ÖNERİLER. *Eksen*, 3(2), pp. 58-71.
- Guzzini, M. (2015). The Alfa Romeo Museum. Retrieved from <https://www.iguzzini.com/projects/project-gallery/the-alfa-romeo-museum/>
- Hurst, C. (2018). The history of Alfa Romeo. Retrieved from <https://www.lookers.co.uk/blog/the-interesting-history-of-alfa-romeo>
- ICOMOS International Secreteriat, (2002). ICOMOS Develops the Montreal Plan for 20th Century Heritage. *ICOMOS News*, 12, pp. 10-12.
- ICOMOS. Retrieved March 31, 2024, from www.icomos.org.tr/dosya.php?k=1
- Ipeker. (2024). Retrieved March 17, 2024, from <https://ipeker.com/tr/Japan>
- Experience. (2017). Toyota Commemorative Museum of Industry and Technology. Retrieved from <https://www.japan-experience.com/all-about-japan/nagoya/museums-galleries/toyota-commemorative-museum>
- İstanbul Sanayi Odası, (2002). Avrupa Birliği'ne Tam Üyelik Sürecinde İstanbul Sanayi Odası Meslek Komiteleri Sektör Stratejileri Geliştirilmesi Süreci: Otomotiv Sanayi Sektörü. 4(1), pp. 1-93.
- Kaleoğlu, M. -Tofaş Bursa Anadolu Arabaları Müzesi Architect- (December 2022) 'Tofaş Bursa Anadolu Arabaları Müzesi History' interview. Bursa.
- Kaplanoğlu, R. (2016, April 14). Umurbey Mahallesi. Retrieved January 22, 2023, from https://www.bursa.com/wiki/Umurbey_Mahallesi
- Kıraş S., (2010). BURSA'DA İPEK ÜRETİMİNİN YÖRESEL KONUTMİMARİSİNDE MEKÂN BİÇİMLENMESİ VE MEKANORGANİZASYONLARI ÜZERİNDEKİ ETKİLERİNİN İNCELENMESİ- Unpublished Master's Thesis. Yıldız Technical University, İstanbul.
- Köksal, G. (2012). ENDÜSTRİ MİRASINI KORUMA ve YENİDEN KULLANIM YAKLAŞIMI. *Güney Mimarlık*, 8(1) ,pp. 18-23.
- Kuban, D. (2000). Tarihi Çevre Korumanın Mimarlık Boyutu. İstanbul: Yapı Endüstri Merkezi Yayınları.
- Küçükerman, O. (2008). *Anadolu Tasarım Mirasının Ayak İzlerinde türk Otomotiv Sanayii VE 40. Yılında TOFAŞ, 1968-2008*. İstanbul: TOFAŞ.

- Leiva, S. (2017, February 24). Mercedes-Benz Museum / Unstudio. Retrieved January 22, 2023, from <https://www.archdaily.com/805982/mercedes-benz-museum-unstudio>
- Mohamed, N. (2016). The Criteria For Decision Making In Adaptive Reuse Towards Sustainable Development. *MATEC Web of Conferences*, pp. 1-5.
- Museo Storico Alfa Romeo. (2016). From the Portello to Arese. Retrieved from <https://www.museoalfaromeo.com/en-us/news/Pages/AreseAlfaRomeo.aspx>
- Nizhny Tagil Charter. (2003). The Nizhny Tagil Charter for the industrial heritage. TICCIIH (The International Committee for the Conservation of the Industrial Heritage) Retrieved March, 2024 from: <https://ticcih.org/wp-content/uploads/2013/04/NTagilCharter.pdf>
- Oral, E. Ö. (2002). Bursa'daki İpek Fabrikaları ve İpekçilikle ilgili Mirasın Korunması- Published Doctorate Thesis. Istanbul Technical University, Istanbul.
- Oral, E. Ö., Ahunbay, Z. (2005). Bursa'nın ipekçilikle ilgili endüstri mirasının korunması. *İtüdergisi*, 4(2), pp. 37-46.
- Olivier, G. (2012, March 21). The new Museo Casa Enzo Ferrari opens to the public on 10 March 2012. Retrieved January 22, 2023, from <https://www.guideautoweb.com/en/articles/15508/the-new-museo-casa-enzo-ferrari-opens-to-the-public-on-10-march-2012/>
- Reddy, M. (2013, August 19).
- Patton, P. (2012). At the Enzo Ferrari Museum, housing 2 legacies. Retrieved from <https://archive.nytimes.com/wheels.blogs.nytimes.com/2012/03/09/enzo-draft/>
- Saieh, N. (2012, July 16). Enzo Ferrari museum / future systems + Shiro Studio. Retrieved January 22, 2023, from <https://www.archdaily.com/253958/enzo-ferrari-museum-future-systems>
- Sürmen, Y. E. (2019). ENDÜSTRİ 4.0 VE OTOMOTİV ENDÜSTRİSİ: BURSA İLİ SWOT ANALİZİ İLE DEĞERLENDİRİLMESİ. Unpublished Master's Thesis. Uludağ University, Bursa.
- Tatlı, A. -Tofaş Bursa Anadolu Arabaları Müzesi Architect- (November 2022) 'Tofaş Bursa Anadolu Arabaları Müzesi History'interview. Bursa.
- Tatlı, A. -Tofaş Bursa Anadolu Arabaları Müzesi Architect- (March 2024) 'Tofaş Bursa Anadolu Arabaları Müzesi History'interview. Bursa.

- T.C. Kltr ve Turizm Bakanlıęı. (2014). İpek ve İpekbcekçilięi Kltr. Retrieved March 31, 2024, from <https://aregem.ktb.gov.tr/TR-131418/ipek-ve-ipekbocekciligi-kulturu--sericulture-and-silkweaving.html>
- Teoman, ., Bozpınar, C. (2022). The Development of the Silk Industry in the Ottoman Bursa: An Analysis of Periodization. *Akademik Bakıř*, 15(30), pp. 157-176.
- Testa, C. (2016). The Alfa Romeo Museum a landmark identity for a historic brand . Retrieved from <https://www.theplan.it/eng/magazine/2016/the-plan-089/the-alfa-romeo-museum-a-landmark-identity-for-a-historic-brand>
- Tofař Anadolu Arabaları Mzesi. (n.d.). Retrieved from <http://www.tofasanadoluarabalarimuzesi.com/Page/Detail/1>
- Tofař Bursa Anadolu Arabaları mzesi'ne 1 Milyon Ziyaretçi. (n.d.). Retrieved from <https://www.dunya.com/sektorler/otomotiv/tofas-bursa-anadolu-arabaları-muzesine-1-milyon-ziyaretci-haberi-678808>
- Tootoonchi, R. (2020). Evaluation criteria for adaptive reuse of modern architecture, (Case study: Qasr Museum-Garden). *ResearchGate*
- Toyota Commemorative Museum of Industry and Technology / *Best in Heritage*. (2016). *YouTube*. Retrieved from <https://www.youtube.com/watch?v=n2OvwicfOBE>
- Toyota Commemorative Museum of Industry and Technology. (2024). Heritage of Industrial Modernization. Retrieved from <https://www.tcmit.org/english/about/modernization/>
- Turkey, H. (n.d.). Tasarım Esaslari. Retrieved from <https://www.hilti.com.tr/content/hilti/META/TR/tr/business/business/engineering/design-center/post-installed-rebar/design-guidelines.html>
- UNESCO. (2024). Bursa Silk Roads Programme. Retrieved March 31, 2024, from <https://en.unesco.org/silkroad/content/bursa>

