



Challenges and Constraints in the Transformative Reuse of Heritage Industrial Buildings for Child-Oriented Spaces

Tarihi Endüstriyel Yapıların Çocuk Odaklı Mekânlara Dönüştürülmesindeki Karmaşıklıklar ve Kısıtlamalar

Mustafa KÜÇÜKTÜVEK¹ Hilal Tuğba ÖRMECİOĞLU²

Öz

Bu araştırma, tarihi endüstriyel yapıların çocuklara yönelik mekânlara dönüştürülmesi sırasında karşılaşılan karmaşıklıkları ve sınırlamaları incelemektedir. Çalışmanın temel amacı; yeniden işlevlendirme sürecinde endüstriyel yapıların korunması gereken özgün yapısal ve teknolojik özellikleri ile çocuk mekânlarının güvenlik, ergonomi ve kullanıcı dostu olma gibi gereksinimleri uyumlu hale getirmenin zorluklarını analiz etmektir. Antalya Dokuma Fabrikası'nın kreş binasından oyuncak müzesine dönüştürülmesi, bu tür dönüşüm süreçlerinde ortaya çıkan mimari, işlevsel ve koruma odaklı sorunları gözler önüne sermektedir. Araştırma kapsamında nitel veri toplama yöntemleri kullanılmış; gözlemler, fotoğraf ve plan analizleri yapılmıştır. Eski ve yeni cepheler, çocuklara yönelik adaptasyonlar ve iç düzenlemeler detaylı şekilde değerlendirilmiş, dönüşümün tarihi doku ile uyumu analiz edilmiştir. Bulgular, çocuk dostu mekân oluşturmmanın yalnızca güvenlik ve işlevsellik sağlamakla sınırlı olmadığını, aynı zamanda yapının tarihi kimliğinin korunması gerektiğini göstermektedir. Antalya Dokuma Fabrikası örneği, özellikle çocuklar için tasarlanan mekân dönüşüm projelerinde, endüstriyel yapıların adaptif yeniden kullanımı sırasında koruma ve uyum dengesinin nasıl sağlanabileceğine dair önemli çıkarımlar sunmaktadır.

Anahtar Kelimeler: Adaptif Yeniden Kullanım, Antalya Dokuma Fabrikası, Endüstriyel Miras, Kreş, Oyuncak Müzesi.

ABSTRACT

This research examines the complexities and limitations encountered in the process of transforming historical industrial structures into spaces for children. The main purpose of the study is to analyze the difficulties of addressing the special structural and technological characteristics of industrial structures that need to be protected together with the requirements of children's spaces such as safety, ergonomics, and user-friendliness. The transformation of Antalya Weaving Factory from a nursery building to a toy museum reveals the architectural, functional, and conservation-oriented problems in such transformation processes. Qualitative data collection methods were carried out during the research, including on-site observations, photograph analyses, and architectural drawing examinations. The old and new facades of the factory, adaptations for children, and interior arrangements were examined in detail and the harmony of the transformation with the historical texture was evaluated. The findings show that creating child-friendly environments does not only include safety and functionality but also the necessity of preserving the historical identity of the structure. The Antalya Weaving Factory example offers important implications on how protection and harmony can be balanced in the adaptive reuse of industrial structures, especially in space transformation projects for children.

Keywords: Adaptive Reuse, Antalya Weaving Factory, Industrial Heritage, Nursery School, Toy Museum

¹ **Corresponding Author:** Iskenderun Technical University, Faculty of Architecture, Department of Interior Architecture, Iskenderun, Hatay, Türkiye, mustafa.kucuktuvek@iste.edu.tr, ORCID: 0000-0002-5354-359X

² Akdeniz University, Faculty of Architecture, Department of Architecture, Antalya, Türkiye, ormecioglu@akdeniz.edu.tr, ORCID: 0000-0002-0662-4178



INTRODUCTION

Industrial heritage sites, much like other historic structures, represent tangible connections to the socio-economic and technological advancements of their time. These sites often face abandonment due to evolving social, economic, and technological circumstances, resulting in their redundancy within contemporary urban landscapes. However, this obsolescence opens up unique opportunities for adaptive reuse, allowing these spaces to be revitalized with new functions that serve modern needs while preserving their historical essence. Over the years, adaptive-reuse projects have gained momentum, both nationally and internationally, transforming industrial heritage sites into cultural institutions, museums, cultural centers, and universities. Such initiatives underscore the potential of these sites to contribute to urban regeneration and community development.

Despite these advancements, the adaptive reuse of industrial heritage for child-oriented functions remains underexplored. Children's spaces, such as kindergartens, toy museums, or learning centers, demand specific design requirements, including safety, accessibility, and developmental appropriateness (Graham & Bryant, 1993; Moore & Lynch, 2015; Cole & Brooks, 2016; Sharlow, 2024). These requirements often conflict with the architectural and structural characteristics of historical industrial buildings, presenting significant challenges. For instance, historical elements such as large open spaces, robust structures, and materials may need to be reimagined to create environments that are both child-friendly and aligned with preservation principles. The rarity of such projects underscores the need for specialized approaches that harmonize these seemingly conflicting objectives.

Adaptive reuse for child-oriented purposes represents a multifaceted challenge that goes beyond simple functional changes. It demands a nuanced understanding of how to balance historical preservation with modern usability. Such projects hold the potential not only to safeguard architectural and cultural heritage but also to enrich the lives of future generations by providing inclusive, safe, and educational spaces. These spaces can act as bridges between the past and present, fostering historical awareness and cultural continuity among children. By engaging with their surroundings, children develop a deeper sense of belonging and a connection to the history embedded within these structures.

Focusing on the Antalya Weaving Factory as a case study, this research offers insights into the process of transforming a historical industrial structure into a toy museum. The analysis investigates the complexities of preserving architectural authenticity while fulfilling the practical requirements of child-oriented programming. These challenges provide valuable lessons for architects, urban planners, and policymakers involved in similar heritage-based transformation efforts. The study underscores the importance of a holistic approach that combines architectural conservation, child-centered design principles, and community engagement.

By contributing to the broader discourse on cultural sustainability and heritage-led regeneration, this study highlights the necessity for context-sensitive and innovative design strategies. Thoughtfully executed adaptive reuse projects can serve as catalysts for urban revitalization, promote intergenerational learning, and reinforce collective memory. Ultimately, such projects ensure that the legacy of industrial heritage is not only preserved but reactivated in ways that are meaningful for future generations.

This study addresses the research gap in the adaptive reuse of industrial heritage buildings for child-focused functions by analyzing a real case with architectural, spatial, and preservation challenges.

1. The Value of Industrial Heritage: Historical and Socio-Economic Perspectives

1.1 Preserving the Historical and Socio-Economic Identity of Industrial Heritage

Dimitriou (2019) highlights the importance of preserving industrial heritage in historic towns by emphasizing conservation, regeneration, and reuse as integral strategies for maintaining industrial identity. This perspective aligns with the broader discourse on the socio-economic and architectural significance of industrial heritage in urban regeneration projects. Similarly, Ozoliņa and Eglīte (2022) underscore the role of adaptive reuse in city branding, using Riga's Hanzas Perons as an example. They argue that repurposing cultural and historical heritage can serve as a valuable asset in urban development, bridging the past and present through innovative architectural interventions.

In this process, it is extremely important to preserve the authentic identity of the building, as these structures represent an invaluable source for the history and past of the city. The authentic identity of urban spaces not only reflects the architectural essence but also contributes to the cultural and historical narrative of the area. As Boussaa (2017) notes, urban regeneration often involves reconnecting with historical roots to maintain a sense of identity in rapidly transforming environments. Furthermore, Hayden (1997) emphasizes the role of urban landscapes as public history, arguing that preserving historical structures contributes to sustaining collective memory and identity within urban communities. Similarly, Serageldin et al. (2001) highlight that cultural roots embedded in historic cities are vital for shaping sustainable urban futures, as they provide a foundation for planning and development that honors historical significance.

Therefore, as in all historical building restorations, accurate evaluation of the elements that form the identity of the industrial building and analysis of the architectural elements—not only its mass, plan, and façade but also details, materials, and colors—is vitally important. Ensuring the preservation of historical identity requires precise assessment techniques. As Biagini et al. (2016) emphasize, adopting technologies like Building Information Modelling (BIM) facilitates the accurate documentation and evaluation of historical structures, ensuring that their authenticity and feasibility for restoration are carefully managed. Similarly, Bruno, De Fino, and Fatiguso (2018) underline the importance of performance assessments for diagnosing and managing historical buildings, which play a pivotal role in restoration processes. Moreover, Feilden (2007) highlights the cultural significance of such structures, stating that historical buildings are symbols of our cultural identity and continuity, underscoring the importance of maintaining their architectural integrity throughout the restoration process.

Nevertheless, at this point, a conventional architectural analysis is not sufficient. Industrial heritage must be evaluated not only for its architectural aesthetics but also as physical document that encapsulate the socio-economic dynamics, production technologies, and social structures of the periods in which they were constructed. Alfrey and Putnam (2003) argue that industrial heritage represents a vital cultural resource, extending beyond aesthetics to encompass its role as a record of industrial culture and its future viability. Similarly, Del et al. (2020) emphasize that the conservation of industrial heritage must account for semantic and contextual values, ensuring that the deeper socio-economic and technological narratives are preserved alongside architectural elements. Bangstad (2014) further critiques conventional approaches, suggesting that industrial heritage demands a broader lens to authentically represent the complex relationships between its aesthetics and historical function. Additionally, Cantell (2005) highlights that adaptive reuse projects must navigate not only physical preservation but also regulatory and contextual challenges to maintain the authenticity of industrial heritage as a socio-cultural artifact.

Therefore, protection and conservation of the specific technical characteristics and features of these buildings, which were built with the most advanced construction technologies of the period, plays a crucial role. Understanding their historical context and architectural character is essential, as emphasized in the Dublin Principles, which advocate for “applying contemporary regulations such as building codes, environmental requirements or risk mitigation strategies to address natural or man-made hazards” (ICOMOS – TICCIH, 2011). Arabulan and Demirel (2023) further underline the importance of harmonizing modern interventions with the historical integrity of industrial heritage, ensuring that adaptations respect both the technical and cultural significance of these structures.

In this context, another key aspect of the adaptive reuse process is choosing new functions that are suitable for the building. As Bullen and Love (2011) suggest, the selection of new functions must consider the contextual and cultural significance of the building, ensuring sustainability in its adaptive reuse. Similarly, Wong (2024) emphasizes that adaptive reuse decisions should reflect the specific context in which the building exists, aligning with conservation principles while extending the building’s lifecycle. Aigwi et al. (2020) further highlight that socio-cultural aspects and performance-based frameworks play a crucial role in prioritizing historical buildings for adaptive reuse, particularly when selecting functions that align with the building’s heritage and future potential. Determining a new function for such industrial buildings requires a sensitive approach, where both the physical integrity of the structure and its contextual relevance are respected. When repurposing an industrial structure, it’s important to consider the relationship between the new and original functions, while also taking into account the building’s historical, cultural, and architectural significance. It is vital that the new function harmonizes with the historic building’s character and that the necessary interventions do not undermine its architectural and historical significance. This scholarly approach to industrial heritage preservation emphasizes the importance of context-sensitive interventions, a deep understanding of historical significance, and the thoughtful selection of new uses that align with the building’s past and future potential.

1.2 Holistic Preservation and Cultural Sustainability in Industrial Heritage

The International Committee for the Conservation of Industrial Heritage (TICCIH) conveys that the social facilities associated with the industry, such as housing, places of worship, and educational institutions are also indispensable parts of industrial heritage. This comprehensive definition emphasizes that industrial buildings are not just factories but also complexes with their social areas, and emphasizes that additional social facilities should be documented, conserved, protected, and repurposed with the same attention (TICCIH, 2003). As Zeren and Karaman (2018: 254) assert, “Each building within the campus is a component of the larger production facility” with a holistic perspective, and they highlight even non-production structures within industrial campuses. Such as administrative buildings or workers’ housing, play a crucial role in the integrity of the site and must be preserved. Therefore, adaptive reuse efforts should account for the entire industrial complex, ensuring that the historical, technological, and social values embedded within these sites are honored and maintained for future generations.

At the same time, the building’s integration with the surrounding social and cultural dynamics must be ensured. Adaptive reuse projects of industrial buildings should meet the needs of local communities and become social spaces (Karıptaş et al, 2015). A well-executed adaptive reuse can successfully reintegrate the structure into the urban landscape, providing it with a contemporary function that continues to reflect its historical roots. Because industrial heritage sites are more than isolated structures; they are integral components of broader industrial complexes, each contributing to the historical narrative of the urban fabric. Therefore, during the adaptive reuse of industrial sites, it is

necessary not only to preserve their physical integrity but also to maintain the cultural sustainability achieved through these structures.

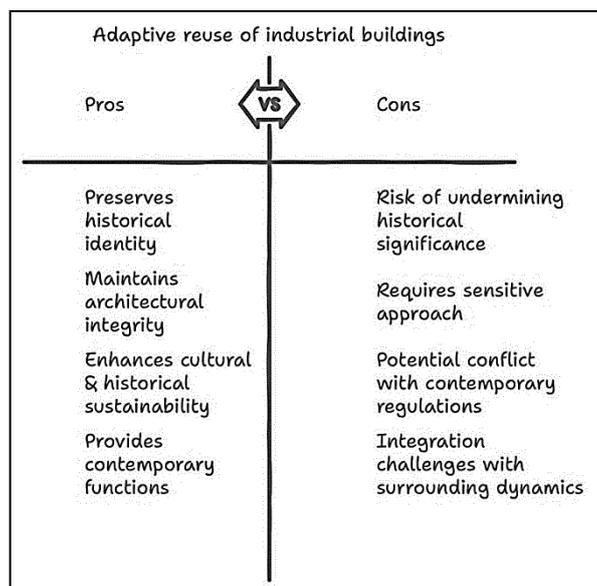


Figure 1. Adaptive Reuse of Industrial Buildings

As a result, the adaptive reuse of industrial structures should be considered as a cultural sustainability strategy that can only be achieved with correct architectural interventions. In this process, the preservation of the historical, cultural, and architectural heritage of the structures reinforces the identities of the cities and keeps the social memory alive. In this context, as Kariptaş et al. (2015) stated, such projects contribute to the preservation and survival of local cultural identities. Hence, a bridge will be established between the past and the present, and the document value of these buildings as cultural heritage will be transferred to new generations. The pros and cons of adaptive reuse of industrial buildings are shown in Figure 1.

1.3 Transforming Industrial Heritage into Child-Friendly Spaces: Opportunities and Challenges

Transformation of historical industrial buildings into child-friendly spaces is a golden opportunity to support children's learning and discovery processes by enabling them to relate with cultural heritage (Karsten, 2005). These spaces allow children to interact more with historical environments and strengthen their ties with the space. Hence, child-friendly adaptive reuse projects also play an important role in creating social and historical awareness and transferring cultural values to new generations. When the original architectural features of historical industrial buildings are transformed into modern children's spaces while preserving their technological and aesthetic elements, children's ties with the space are strengthened, and their sense of belonging increases (Vafaie, Remøy, & Gruis, 2023). Repurposed historical buildings offer an ideal solution for developing historical awareness by creating child-friendly spaces. These structures can be arranged in a way that supports children's interactions with his/her historical environment, physical activities and mental development while preserving their original architectural features (Ott & Pozzi, 2011).

However, re-functioning an industrial historical building as a children's space such as a kindergarten, school, or toy museum is a complex process that requires consideration of child-friendly design criteria and adaptive reuse principles of historical buildings. Various risks and limitations may arise in this process. First of all, the preservation of the authentic architectural elements of the historical building is a vital issue in the adaptive reuse process. However, adding functions such as a toy museum may

cause these original elements to be hidden or changed. This situation may lead to the weakening of the historical character of the building. Therefore, it is of critical importance to strike a balance in order to both meet the needs of children and preserve the historical integrity of the building.

Another important risk is the safety of children. Child safety is among the priority issues in re-functioning historical buildings. Industrial structures are often built using old construction techniques and materials, so they need to be re-designed in accordance with building safety standards, especially considering the dangers that may exist in old buildings. Security measures should be reviewed to ensure children's safety. In the design of activity areas such as toy museums, necessary precautions should be taken to ensure the physical safety of children. In addition, the architectural features of historical buildings should be made easy for children with disabilities to use (Vafaie, Remøy, & Gruis, 2023). While the architectural structure of historical buildings is preserved, it is also of great importance to make them safe and accessible for children (Ott & Pozzi, 2011). Accessibility should ensure that both the physical spaces and the design are suitable for use by all children and educators, allowing them to move comfortably in the space.

1.4 Adapting Industrial Heritage for Children's Developmental Needs

An equally important limitation in the reuse of historical industrial buildings is the need for adaptation of space to the developmental needs of children. Such buildings should be redesigned to support children's physical, social, and cognitive development. Large open spaces or flexible-use areas should be created to increase children's social interactions. From an educational perspective, industrial historical buildings, with large courtyards and long-span areas offer an opportunity to create unique educational spaces. These areas provide important opportunities for children to play and collaborate on creative projects. In addition, elements such as natural light, ventilation, and play areas should be created. Historical buildings equipped with natural light, ventilation systems, and adequate playgrounds allow children to spend time in a healthy environment. The transformation of historical buildings while preserving their aesthetic elements strengthens children's ties with the place and increases their sense of belonging. In this way, both individual learning processes are contributed to, and social interactions are encouraged. During the reuse of historical buildings, attention should be paid to design elements that support social development. Open, spacious, and naturally lighted areas should provide spaces where children can move comfortably and interact freely (Gibson, 2012). Such socially focused designs increase children's self-confidence and allow them to develop social skills.

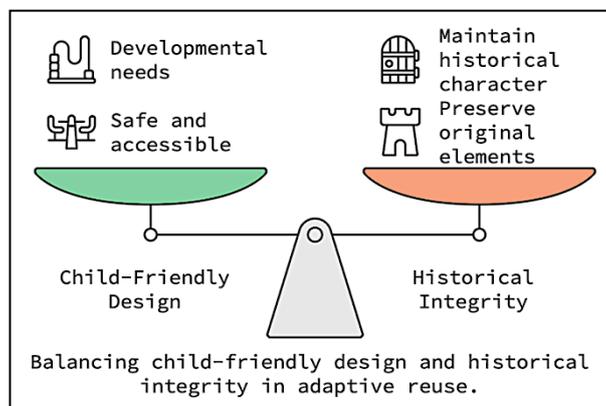


Figure 2. Balancing Child-Friendly Design and Historical Integrity in Adaptive Reuse

In summary, repurposing an historical industrial building as a toy museum carries many complexities and constraints. However, by taking these complexities and constraints into account, it may be possible to establish a balance between child-friendly design criteria and the principles of repurposing historical industrial buildings. This balance both contributes to children's learning and discovery processes and helps preserve cultural heritage.

The transformative reuse of heritage industrial buildings for child-oriented spaces represents a multifaceted challenge that requires a delicate balance between preservation and functionality. These transformations not only safeguard the architectural and cultural heritage of industrial structures but also create inclusive, educational, and safe environments for children. The complexities of integrating child-friendly design principles with the conservation of historical and technological elements demand innovative and context-sensitive approaches. Balancing child-friendly design and historical integrity in adaptive reuse is demonstrated in Figure 2.

Using the Antalya Weaving Factory as a case study, this research delves into the intricate interplay between preserving historical authenticity and meeting modern needs. By addressing architectural, functional, and safety considerations, it highlights the opportunities for fostering social and historical awareness in future generations. The findings aim to contribute to the growing discourse on cultural sustainability and adaptive reuse, offering practical insights for architects, urban planners, and policymakers.

This study underscores the importance of creating child-friendly spaces that not only meet developmental needs but also resonate with historical contexts. Through thoughtful interventions, adaptive reuse projects have the potential to bridge the past and present, enriching urban cultural landscapes and preserving industrial heritage for future generations.

2. Method

This research explores the adaptive reuse of a nursery building, originally used by workers at the Antalya Weaving Factory to entrust their children, into a toy museum. The case study method was employed to enable a detailed and context-sensitive examination of this transformation process. A case study approach allows for an in-depth evaluation of specific examples, providing a comprehensive understanding of the adaptive reuse process and the critical decisions made during the intervention (Yin, 2009). This method is particularly suitable for investigating complex phenomena within real-life contexts, such as the interplay between historical preservation and modern functionality. The study adopts a qualitative research design, which is well-suited to capture the nuanced and subjective dimensions of adaptive reuse projects. The qualitative approach facilitates the exploration of architectural, cultural, and functional changes that occurred during the transformation process. By focusing on the Antalya Weaving Factory nursery building, the research seeks to illuminate broader principles and challenges relevant to the adaptive reuse of industrial heritage.

To gather comprehensive data, multiple qualitative data collection methods were employed. On-site observations were conducted systematically to document the changes made to the building during its conversion into a toy museum. Both the interior and exterior architectural modifications were carefully recorded. Photographs of the building's current state were taken to analyze visible interventions and changes. Archival photographs of the original structure were also reviewed for comparison. Existing architectural plans and historical drawings of the nursery were examined to identify structural and functional transformations. These documents provided critical insights into the alignment (or divergence) of the interventions with the building's original design. Relevant literature on adaptive reuse and industrial heritage was reviewed to contextualize the findings and evaluate the process against established frameworks.

The collected data was analyzed using thematic analysis, a method suitable for identifying, analyzing, and reporting patterns within qualitative data. Thematic analysis enabled the categorization of findings into distinct themes, each addressing specific aspects of the adaptive reuse process:

- **Preservation of Industrial Heritage Elements:** Evaluating the extent to which the building's historical and industrial characteristics were preserved.
- **Architectural Interventions and Structural Effects:** Assessing how modifications influenced the building's original spatial and structural integrity.
- **Functionality and Accessibility:** Investigating the functionality and usability of the transformed space for children and other stakeholders
- **Sustainability of Cultural Values:** Examining whether the transformation successfully integrated the cultural and historical significance of the site into its new function.

To ensure the validity and reliability of the findings, triangulation was employed by cross-referencing data from multiple sources, including visual observations, photographic documentation, and architectural records. These measures enhanced the credibility of the study by providing a holistic and well-supported analysis of the transformation process.

While the study focuses on the Antalya Weaving Factory nursery building as a case study, its findings offer valuable implications for similar adaptive reuse projects. However, certain limitations exist, such as the absence of direct user feedback from children and their accompanying adults using the museum. Future research could address these limitations by incorporating surveys or interviews to enrich the understanding of user experiences in adaptive reuse contexts. By employing this comprehensive methodological framework, the research provides a detailed evaluation of the adaptive reuse process, offering insights into the challenges and opportunities of transforming industrial heritage buildings into child-friendly spaces.

3. Analysis and Findings

In the 1950s, Antalya saw major advancements in cotton agriculture, leading to the start of efforts to establish a weaving factory in 1954 to make use of the growing cotton production (Üstün, 2005). The foundations of the factory were laid by then-President Celâl Bayar and Prime Minister Adnan Menderes on January 5, 1956, symbolizing a significant step in Turkey's industrial development during that period. However, despite this early start, the factory officially began operations in 1961. Initially, its capital structure included notable partners such as Sümerbank, Antbirlik, and various private investors, all of whom played pivotal roles in its establishment and growth. After 42 years of continuous production, the factory ultimately ceased operations in 2003, marking the end of an era in the region's industrial history (Sümerbank, 1973). In 2005, some buildings such as the entrance gate of the Weaving Factory campus, the administration building, and the cafeteria were registered as architectural witnesses of Antalya's industrialization process. Thus, the cultural and historical importance of the factory was emphasized by the Antalya Regional Directorate of Cultural Heritage Preservation, and it was stated that the existing structures should be protected during the transformation process (Akış, 2018; Barbaros, Akay, 2020).

Since 2012, efforts have been underway to reintegrate the Dokuma factory campus into the city, with the existing buildings and landscape being collectively repurposed under the name "Dokuma Park." One of the buildings repurposed in this transformation is the nursery school building (Barbaros, Akay, 2020). While these efforts to revitalize the site are commendable, they must also take into account the preservation of its characteristics as an industrial heritage to ensure that the site's unique historical

identity is maintained for future generations. Machinery equipment and other local components must be protected as an integral part of the industrial heritage, as stated in the Nizhny Tagil Charter (TICCIH, 2003). The preservation of these elements, that constitute the cultural and historical identities of industrial buildings, is of vital importance in terms of the documentary value of these buildings. However, it appears that this principle was not fully complied with in the adaptive reuse of the main production structures of the Antalya Dokuma Factory. Most of the existing machinery in the factory was sold during the adaptive reuse process, and the architectural details that created the tectonic effect in the interior were largely hidden during the interior decoration. The structural and functional components of industrial heritage buildings reflect not only their material existence but also their historical context and technological development. From this perspective, the lack of protection of the machinery equipment of the weaving factory caused serious damage to the industrial identity of the building.

Such violations are visible not only in the main factory buildings but also in the adaptive reuse projects of the factory's additional buildings. For example, in the guesthouse, the original wooden furniture and decorative elements were damaged during the adaptive reuse process, and not restored to their authentic details (Karabağ, 2020). Similar practices were observed during the adaptive reuse process of the administrative building into a museum. The building was not subjected to a restoration process aimed at preserving its original identity; instead, the original architectural details were covered under interventions that prioritized functional requirements.

Unfortunately, especially in the interior arrangements, a restorative approach that reveal the reinforced concrete skeleton system and the technological details of the period in which the building was built was not adopted. Instead, the addition of exhibition and storage areas for the museum concealed the original details and lowered the historical character of the building to the background. These practices have negatively affected both the historical value of the building and the spatial memory experienced by the users. In the adaptive reuse process of historical buildings, protection of such original elements and keeping them alive through a correct restoration process play a critical role in the preservation of the document value and historical identity of the building.

The transformation of the nursery school building into a toy museum is one of the most controversial interventions in Dokuma Park in terms of the adaptive reuse of the industrial heritage. Although the old and new functions are both related to children, and this can be evaluated as the building being repurposed in an approach aligned with its original use, the interventions made in both the interior and exterior make the adaptive reuse of the building problematic. The old façade was a simple and modest design characterized by a smooth, plastered surface painted white above a stone masonry plinth. The facade's ratio of solid to void emphasizes its modest style, complemented by a gabled roof. Reflecting a functional approach and blending harmoniously with its surroundings, this design, unlike the other industrial buildings on the factory campus, which differ in height and scale, aims to provide a more human-scaled solution with a canopy roof, creating a cozier and more welcoming atmosphere for children Figure 3. Although no direct participation activities such as surveys or interviews were conducted with children, design decisions were informed by aesthetic considerations suited to children's preferences, drawing inspiration from architectural forms commonly found in storybooks.

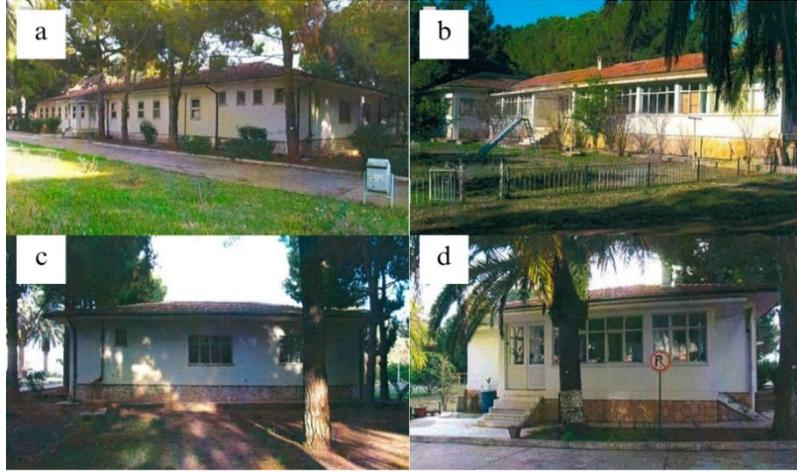


Figure 3. Nursery School Building, Old Modest Façades in 2005 (Barbaros Akay, 2020).

Nevertheless, this modest façade has been altered to suit its new function, incorporating details such as American siding, blue window shutters, and jambs (Figure 4). From a general perspective, the additional façade presented in Figure 4 fails to establish a meaningful visual distinction from the original façade. Although it does not exactly replicate the earlier design, it mimics the old window proportions too closely, resulting in a lack of clarity between the historical and newly added elements. This blurring of boundaries diminishes the architectural legibility of the structure.



Figure 4. Toy Museum, New Façades in 2020 and 2024 (From the Archive of Karabağ, 2020 and Kucuktuvek, 2024).

While these additions and decorative elements at the eaves aim to make the toy museum a more appealing space for children, it is evident that the necessary sensitivity to preserving the historical character of the structure has not been adequately addressed. Non-original features, such as the Palladian railing added to the façade, have rendered the original appearance of the building unrecognizable (Figure 5).



Figure 5. The Original Façade Without Expansion (Source: https://www.facebook.com/antalyadokumafabrikasi/photos_by?locale=tr_TR)



Figure 6. Construction of the Ground Floor Expansions (Source: https://www.facebook.com/antalyadokumafabrikasi/photos_by?locale=tr_TR)

The expansion of the floor area further deepens this problem, resulting in distorted building mass proportions and a disrupted facade layout (Figure 6).

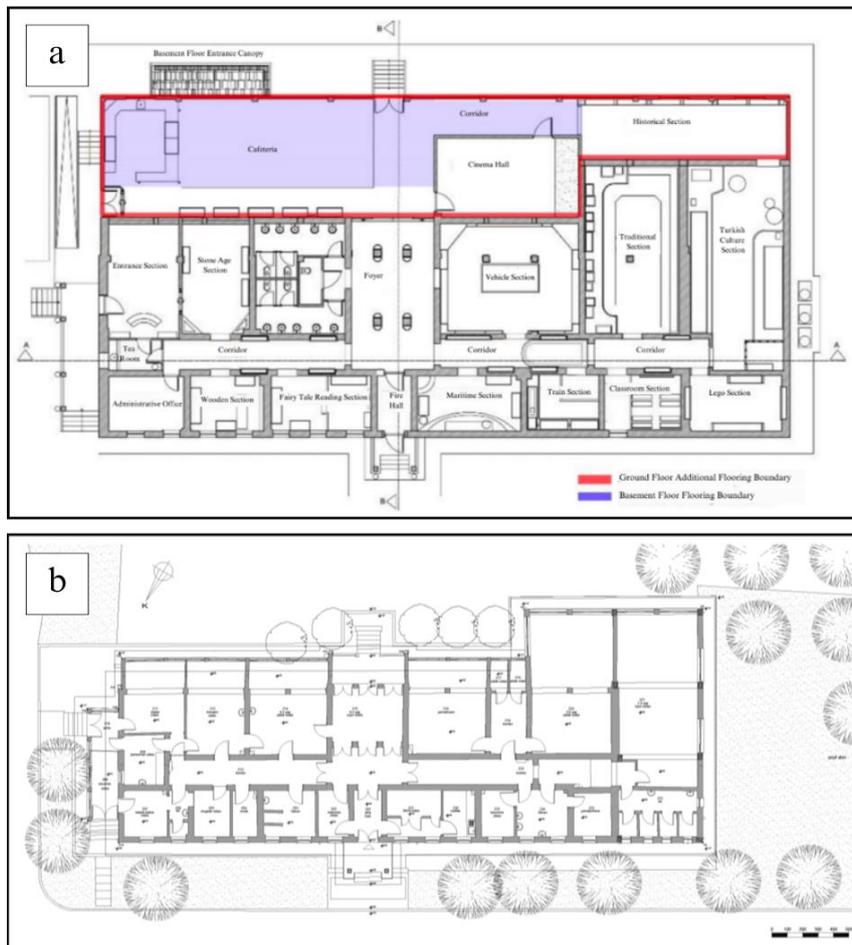


Figure 7. a) Red Line and Purple Area Highlights the Expansions on the Ground Floor (Akış, 2018) , b) Ground Floor Plan Before Transformations (Üreğen Aydoğın, 2019)

According to the restoration principles outlined in the Venice Charter (ICOMOS, 1964), new additions should be distinguishable from the authentic historical structure and clearly legible. However, the extension of the old roof over the expanded ground floor area diminished the clarity of the new addition and compromised the original character of the building (Figure 7a). Zooming into the spatial organization, the comparison between the ground floor plans before and after the interventions (Figure 7b) clearly demonstrates major functional and circulation changes. Construction photos (Figure

8) further reveal that the façade underwent substantial transformation during the building process, indicating a shift away from its original layout and identity.



Figure 8. Expansion, During Construction. (Akış, 2018)

As one moves closer to the structure, the roofline extension becomes especially problematic. The monolithic extension of the old roof over the new volume and the insertion of new masonry elements disrupted the façade's original solid-void rhythm (Figure 9b). When compared with the initial state of the façade (Figure 9a), it becomes evident that the visual continuity has been lost, undermining the authenticity of the design.



Figure 9. a) Original Façade (Üreğen Aydoğan, 2019) ; b) Transformations, RedRLine Highlights the Monolification of the Roof and Purple Highlights Solid/Void Transformations on the Façade, (Graphic by Authors)

The Toy Museum's south façade, displayed in Figure 10, further exemplifies the visual consequences of these interventions. The juxtaposition of pre- and post-intervention images reveals the extent to which the spatial articulation and rhythm of the façade have been compromised, affecting the overall perception of the building's historical integrity.

In contrast, at the site scale, the landscape design around the nursery building represents a positive example of sensitive intervention. The trees on the southeast and southwest sides were preserved, and children's activity zones were designed to be placed beneath these natural elements. This

landscape strategy supports cultural continuity and preserves the contextual relationship between the building and its environment.



Figure 10. The Toy Museum, South Façade **a)** Before **b)** After (Akış, 2018).

Internally, the alterations continued in a similarly invasive manner. Original double-winged corridor doors were replaced with non-original round-arched passageways, and reinforced concrete beams were hidden behind suspended ceilings (Figure 11a, b). The addition of modern lighting fixtures, inconsistent with the historical character of the building, further contributed to the loss of authenticity.

In line with scholarly literature, it can be concluded that many of the original architectural and structural details were either concealed, deteriorated, or completely replaced during the adaptive reuse process. These interventions significantly undermined the architectural coherence and historical authenticity of the interior. Nevertheless, certain spatial elements, such as the overall load-bearing system and general volume proportions, have been preserved and represent limited but important efforts toward maintaining the original structural identity.

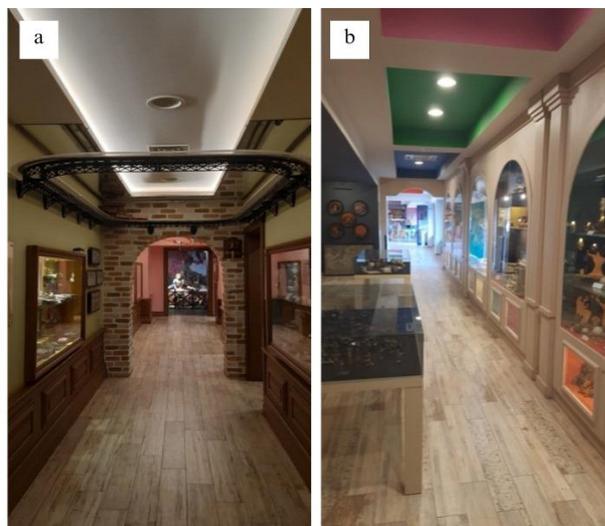


Figure 11. a, b) Non-Original Arches, Suspended Ceilings, Etc. Made Indoors. Applications (From the Archive of Kucuktuvek, 2024).

4. Discussion

Habraken (2000) highlights that professional interventions often lead to alterations in the built environment, significantly impacting the spatial and constructive authenticity of structures. Similarly, Douglas (2006) underscores that building adaptations can impose spatial and constructional constraints, which, while addressing contemporary needs, often obscure original details. Trancik (1991) further discusses how interventions in urban and architectural spaces can result in the loss of original spatial coherence, making it harder to recognize the intent and character of the original design. Moreover, Feilden (2007) emphasizes that conserving historic buildings requires a sensitive approach

to later interventions to avoid compromising the original spatial and structural integrity. With the addition of exhibition areas for the museum, the original façade and window arrangement have been altered, causing the building to deviate from its original form. Furthermore, these additions significantly transformed the spatial organization on the plan level. The interventions made to accommodate new functional requirements disrupted the original circulation flow and spatial relationships, pushing the historic plan scheme into the background. The newly added volumes not only modified the appearance of the façades but also altered the overall perception of the building's mass, diminishing the legibility of its original form. These interventions weakened the architectural character of the building within its historical context and considerably undermined its documentary value (Figures 7 and 9).

However, the landscape arrangements around the nursery school building displayed a positive approach in terms of protecting the historical and natural environment associated with the building. The trees in the southeast and southwest directions were protected and children's playgrounds and activity areas were placed under these natural elements. Thus, the continuity of the historical landscape was ensured and an outdoor design suitable for children was created.

In the process of adaptive reuse in historical buildings, it is an inevitable necessity to transform the spaces according to new functional needs. However, during these transformation processes, interventions must be planned meticulously, remaining true to the historical identity and documentary value of the building. Sewell Jr. (2005) emphasizes that maintaining accuracy in historical interpretation is crucial, as it ensures the authenticity and continuity of the structure's narrative within its socio-historical context. Similarly, Bandarin and Van Oers (2012) highlight that transformation processes should integrate cultural and historical identification, ensuring that the planning and management align with the long-term heritage value of the site. Osborne (2001) further underscores that thoughtful interventions can reinforce collective identity and memory, mitigating the risks of losing the familiar elements that connect communities to their heritage. The interventions made in the Antalya Weaving Factory have weakened its industrial identity and altered its original architectural character. The newly added volumes have significantly reduced the building's original form and documentary value, threatening its historical integrity.

CONCLUSIONS AND RECOMMENDATIONS

The transformative reuse of heritage industrial buildings offers significant opportunities due to their unique architectural and structural features. Their long-span structures and campus-like layouts have the potential to create expansive green areas and open spaces that foster social interaction. However, significant challenges arise in integrating modern technological and mechanical infrastructure. Transforming these buildings into child-friendly spaces is particularly complex, as their existing architectural and structural elements must meet safety standards and the specific needs of children.

The case of converting the nursery building of the Antalya Weaving Factory into a toy museum illustrates the multifaceted nature of adaptive reuse. While the intention was to prioritize children's safety and accessibility, the redesign of interior and exterior spaces often neglected the original architectural qualities. In particular, decorative additions and structural modifications concealed many original features and weakened the historical integrity of the structure. The lack of distinction between new and original elements further disrupted massing and façade relationships, limiting the success of the intervention.

The most notable limitation in the current intervention was the insufficient sensitivity toward preserving original spatial and constructive details. The adaptation prioritized functional and visual transformation for children but failed to maintain the historical essence of the space. Architectural coherence was undermined by the concealment of load-bearing elements and inconsistent material

use. Additionally, the intervention lacked a rigorous framework for distinguishing between new and old components, resulting in blurred spatial legibility and reduced documentary value.

Moreover, the reuse project did not incorporate participatory feedback from users (i.e., children, educators, and parents), nor did it fully integrate sustainability strategies. As such, the transformation fell short of becoming a model for best practices in child-oriented adaptive reuse.

Future adaptive reuse projects involving heritage industrial buildings should employ a holistic approach that balances historical preservation with contemporary usability. The following recommendations are offered:

- Ensure clear differentiation between original and new elements in accordance with international conservation charters (e.g., Venice Charter, Dublin Principles).
- Preserve and showcase original structural systems, materials, and spatial proportions to maintain architectural legibility.
- Integrate child-specific design principles without compromising the historical identity of the building.
- Incorporate sustainability elements, including energy-efficient technologies and environmentally responsive landscape strategies.
- Employ participatory design approaches involving stakeholders, especially children and educators, to ensure that spatial needs and educational goals are met.
- Conduct context-sensitive evaluations for each site, recognizing that each industrial building holds unique cultural and functional characteristics that must be respected.

By adhering to these strategies, future projects can serve both as educational environments for children and as preserved heritage sites that contribute to cultural sustainability and intergenerational continuity.

Compliance with the Ethical Standard

Conflict of Interest: The author(s) declare that they do not have a conflict of interest with themselves and/or other third parties and institutions, or if so, how this conflict of interest arose and will be resolved, and author contribution declaration forms are added to the article process files with wet signatures.

Ethics Committee Permission: In this article, ethics committee approval is not required, and a consent form affirming that a wet-signed ethics committee decision is not necessary has been added to the article process files on the system.

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