

Adaptive Reuse of Historic Industrial Buildings: Insights from the Al-Suyouf Factory in Egypt

Shimaa F. Mohamed

Department of Architecture Engineering, Higher Institute of Engineering and Technology,
King Marriott Academy, 21500, Alexandria, Egypt.

dr.shimaa516@gmail.com

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Abstract

Historical industrial structures in the Middle East and North Africa reflect the intricate exchange of resources and ideas during the late 19th and 20th centuries. These sites are vital components of a contested global heritage that has received insufficient academic attention. In rapidly growing cities, these structures play a significant role in urban development, often situated in strategic locations for revitalization projects. However, their relatively young age and lower appreciation compared to historical architecture hinder conservation discussions, leading to neglect or demolition in favor of any new developments. In this context, this research examines the architectural elements and historical context of the Seyouf Spinning and Weaving Factory in Egypt to assess its preservation value.

The study employs a case study method focused on the Seyouf Factory. Data was gathered through structured observations and surveys of local residents to capture their perceptions of the significance of the factory. Historical assessments explored the background of the factory, while architectural evaluations analyzed its structural elements and symbolic features. This comprehensive approach enabled a critical analysis of the preservation value of the factory within the local context, contributing to highlighting the importance of such heritage and the adaptive reuse of the site.

The findings indicate that adaptive reuse of the Seyouf Factory can enhance the local economic development by creating job opportunities and fostering community engagement. It reveals that preserving unique architectural features of the factory can attract tourism, while repurposing it for community-oriented activities can strengthen the local identity. Engaging stakeholders in the preservation process enhances community ownership, and integrating the factory into urban revitalization promotes sustainable practices. This research thus advocates for policies that support the adaptive reuse of modern industrial heritage sites, emphasizing their potential contributions to local communities.

Keywords: Industrial Heritage, Built Environment, Adaptive Reuse, Cultural Heritage, critical analysis, Industrial Buildings.

1. Introduction

Preservation of industrial heritage has gained significant attention in recent years, particularly in Europe, where it is recognized as a vital component of cultural identity and urban development (Zhang *et al.*, 2022). These sites not only reflect the technological advancements

of their eras but also embody the socio-economic dynamics that have shaped their regions. However, many industrial sites face the threat of neglect or demolition in favor of new developments, especially in rapidly growing urban areas (Yan, Li and Zhang, 2023).

The decline of industrial production has opened opportunities for transforming historic industrial complexes (Reuso, 2024). However, Eber (2020) points out that while several European nations have successfully registered and repurposed many industrial heritage sites, the ongoing loss of this heritage remains a common challenge. This underscores the importance of understanding modern industrial heritage as both a national asset and a transnational legacy (Loures, 2008).

Beyond their historical significance, industrial heritage sites are intrinsically linked to the social fabric of communities (Nocca, Bosone and Orabona, 2024). In this connection, advanced societies have made concerted efforts to document and preserve their industrial pasts, often treating them as attractions that boost local economies and investing in them heavily (Ranasinghe et al., 2021). For instance, New York City transformed an old railway line into a public park, generating jobs and attracting investment (Loughran, 2018).

Spielvogel (2005) points out that in the Arab world, particularly from the 19th century onward, countries have begun to explore their industrial heritage, influenced by global economic and social changes. Indeed, this period has seen the emergence of historical industrial structures, yet this heritage has not received sufficient academic attention, rendering it part of a contested global narrative.

Similarly, in Egypt, industrial heritage is rich in historical and architectural significance, warranting a thorough study and preservation (Hassan, Almakhayitah and Saleh, 2024). In this context, the Seyouf Spinning and Weaving Factory in Egypt, serves as a notable example, reflecting the industrial evolution of the country during the late 19th and early 20th centuries (Spielvogel, 2005). Established when Egypt sought integration into the global market, the factory showcases the architectural styles and technological advancements of its time, embodying the socio-economic dynamics of the era (Allgood, Haraguchi and López-Gómez, 2024).

Indeed, modern industrial heritage holds considerable importance for cities and individual sites, shaped by both national and global processes (Loures, 2008). Although some relics, like the cotton spinning factory in Mahalla, have been overlooked for UNESCO documentation, recognizing these sites as part of the global heritage narrative is crucial for their preservation and sustainable development. There is no doubt that engaging communities and forming partnerships with international organizations can enhance efforts to protect and revitalize these landmarks for future generations.

In this connection, Oevermann (2020) points out that effective management of industrial heritage sites must align with increased awareness, thoughtful planning, conservation practices, and community engagement. Nocca (2017) adds that by ensuring interactions among these elements, the preservation of industrial heritage can strengthen local identities and foster a sense of belonging. In this context, this research emphasizes the significance of industrial heritage in the region, particularly focusing on Egypt and the Seyouf Spinning and Weaving Factory (Hassan, Almakhayitah and Saleh, 2024). This factory exemplifies the architectural styles and technological advancements of its pivotal period in the industrial evolution of Egypt (Spielvogel, 2005), reflecting the country's aspirations for integration with the global market (Allgood, Haraguchi and López-Gómez, 2024).

The study aims to contribute to the broader dialogue surrounding the preservation of industrial heritage in Egypt and the region. Its objectives are:

- To analyse the design, structure, and aesthetic features, of the factory's unique architectural style to serve as a visual narrative encapsulating the historical context of the industrial past of Egypt as Józwick (2024) has shown.
- To identify the architectural elements that enhance the significance of the Seyouf Spinning and Weaving factory as an industrial heritage site.
- To establish the vital importance of preserving these characteristics for future generations as Mfon (2023) has pointed out.

- To advocate for sustainable practices that celebrate the rich industrial heritage of Egypt while facilitating the integration of these sites into contemporary urban developments.

Theoretical Framework

This paper deals with the theoretical ideas of ‘adaptive reuse’ and ‘historic industrial buildings,’ highlighting essential notions in heritage conservation and sustainable development. Its theoretical ideas are derived from the 1972 UNESCO convention concerning the protection of the world cultural and natural heritage, and the 2003 convention for the safeguarding of the intangible cultural heritage. In fact, the significance of both tangible and intangible cultural heritage is emphasized as a foundation to these discussions.

In this connection, Loures and Panagopoulos (2007) argue for a holistic approach to post-industrial landscapes, advocating for the recognition of these sites as cultural heritage. Nocca (2017) links cultural heritage directly to sustainable development, emphasizing the need for empirical evidence to support this connection. Oevermann (2020) integrates heritage conservation with urban planning through the ‘Good Practice Wheel,’ reflecting UNESCO guidelines and principles. In 2023, Di Marino et al. introduced resilience theory in rural development, highlighting the importance of community engagement in the valorization of cultural heritage. The conversation further evolved in 2024, where Juhász, Lane, and Rodrik explore government intervention in industrial policy, while Allgood, Haraguchi, and López-Gómez focus on the collaboration between public and private sectors to enhance supply chain resilience. At the same time, Wei, Yuan, and Li emphasize the role of smart city development in adaptive reuse of urban industrial heritage, while Kurnaz (2024) examines the sustainability of agricultural industrial structures. Oevermann (2020) and colleagues also discuss modern industrial heritage in the Mena region, advocating for adaptive reuse and the incorporation of historical narratives. This progression reflects a growing recognition of the interconnectedness of cultural heritage with sustainable urban development.

Review of Literature

The adaptive reuse of historical industrial buildings is a vital research area that intersects heritage conservation and urban development. Harris (2024) explores heritage applications as defined by UNESCO conventions, focusing on its transformation from a cultural asset to a commodity driven by economic interests. He employs a systematic review of heritage studies, emphasizing theoretical frameworks, historical contexts, and case studies related to intangible cultural heritage, revealing significant variations in the understanding of cultural, social, and political significance of heritage and its role in sustainable development. Similarly, Allgood, Haraguchi, and López-Gómez (2024) highlight the importance of public-private collaboration in developing industrial strategies that address global challenges, while Juhász, Lane, and Rodrik (2024) provide a nuanced understanding of industrial policy through rigorous empirical designs to evaluate its effectiveness.

Simultaneously, Nocca (2017) examines the role of cultural heritage in sustainable development by analyzing 40 culture-led regeneration projects, advocating for comprehensive indicators. In this connection, Oevermann (2020) systematizes criteria for good practices in heritage management for UNESCO industrial heritage sites, producing what is now known as the ‘Good Practice Wheel’.

To add, Wang et al. (2024) extend urban historic landscape theory through multi-dimensional stratification analysis of historic districts, revealing distinct phases of evolution. Loures (2008) analyzes post-industrial landscapes, emphasizing a holistic approach to reclamation that contributes to cultural identity and urban

cohesion. In contrast, in Egypt, Amin, Refai, and Kamal (2020) investigate industrial heritage and strategies for raising awareness, while Wei, Yuan, and Li (2024) explore the potentials of smart city developments to revitalize urban industrial heritage. Moreover, Kurnaz (2024) examines the conservation of traditional olive oil factories in Turkey, advocating for sustainable rural tourism. Adding to this, Hany (2013) raises awareness about the industrial heritage of Egypt, calling for state-supported initiatives for documentation and promotion.

Finally, Meyer et al. (2022) reiterate the necessity of state-supported initiatives to prevent the decline of the industrial heritage of Egypt, utilizing various methodologies to document and promote these sites, emphasizing their historical significance and potential for sustainable urban developments. These studies demonstrate clearly that industrial heritage is an important part of the heritage of a nation and that methods to adapt and reuse of these historic industrial buildings are really needed. This research thus provides that insight needed for implementing such projects in Egypt.

Research Methodology

This research employs a case study method, which is a qualitative approach that facilitates an in-depth exploration of the Al-Suyouf Factory in Egypt, essential for understanding its architectural significance and potential for adaptive reuse. The data gathering techniques utilized include the following.

1. Case studies,
2. Observations,
3. Literature and document studies, and
4. Surveys.

These are as shown in the fig.1.

The case study is the Al-Suyouf Factory, which produces a comprehensive analysis of the architectural elements of the building and its historical context, providing insights into its significance within the local community and urban landscape. Observations are conducted to assess the architectural features and conditions of the structures by systematically examining the design elements, materials used, and the overall aesthetic appeal, which are crucial for understanding the heritage value of the factory.

A thorough review of literature is performed, encompassing historical records, architectural assessments, and previous research related to the Al-Suyouf Factory and similar industrial sites, which provides a contextual background that informs the analysis. It identifies the gaps in the current understanding of industrial heritage in Egypt. A case study has been identified and observations are made.

Finally, a survey is conducted by distributing a questionnaire among the 46 residents in the selected area to gather their perceptions and satisfaction levels related to the architectural proposal for the adaptive reuse of the building. This survey includes questions about the views of the community on the significance of the factory and its potential role in urban revitalization. It produces quantitative data complementing the qualitative insights gained from the observations and the review of literature. It ensures a holistic understanding of the role of the Al-Suyouf Factory in urban development and the preservation of cultural heritage. By employing these methods, the research creates a robust framework that can be replicated by other researchers interested in the adaptive reuse of industrial heritage sites.

The Case Study

The Al-Suyouf Factory, formerly known as Sabahy, serves as a compelling case study for exploring the adaptive reuse of historical industrial buildings in Egypt. It is located in Alexandria, as shown in the figure 2. It was established in 1941 under a royal decree by Sabahy

Pasha, a prominent businessman of the era. Initially named "The Industrial Company for Spinning and Weaving Yarns," it underwent various transformations, including nationalization in 1961 under the Presidential Decree No. 1598. Later, in 1962, it became part of the "Al-Nasr Company for Spinning and Weaving in Alexandria". Following this merger, the factory experienced notable growth during the 1960s, with production capabilities expanding dramatically, a fact noted by President Gamal Abdel Nasser during his visit when he praised its achievements. However, in 1968, the merger of various companies was reversed, leading to a decline in the operations of the factory, which ultimately culminated in its closure in 2011. After many years, the factory was reopened in 2021, but it faced significant deterioration in its facilities.

Observations of the exterior and architectural features of the factory were conducted on-site to assess its historical and architectural significance. The research locations included various sections of the factory, highlighting its operational landscape and context within the urban fabric of Alexandria. According to Elshahawy (2024), this historical model exemplifies the evolution of the spinning and weaving industry in Egypt, contributing to local production and addressing the economic challenges. Overall, the Al-Suyouf Factory stands as a testament to the rich industrial heritage of the region, with potential implications for future adaptive reuse efforts as shown in the figure 3.



Fig. 2: Location of the Al-Suyouf Factory

Source: Author

Findings

The findings underscore the pressing need to enhance awareness of Egypt's industrial heritage through thorough documentation of various sites, encompassing both prominent and overlooked locations. This documentation is vital for safeguarding the stories and importance of these sites for future generations.

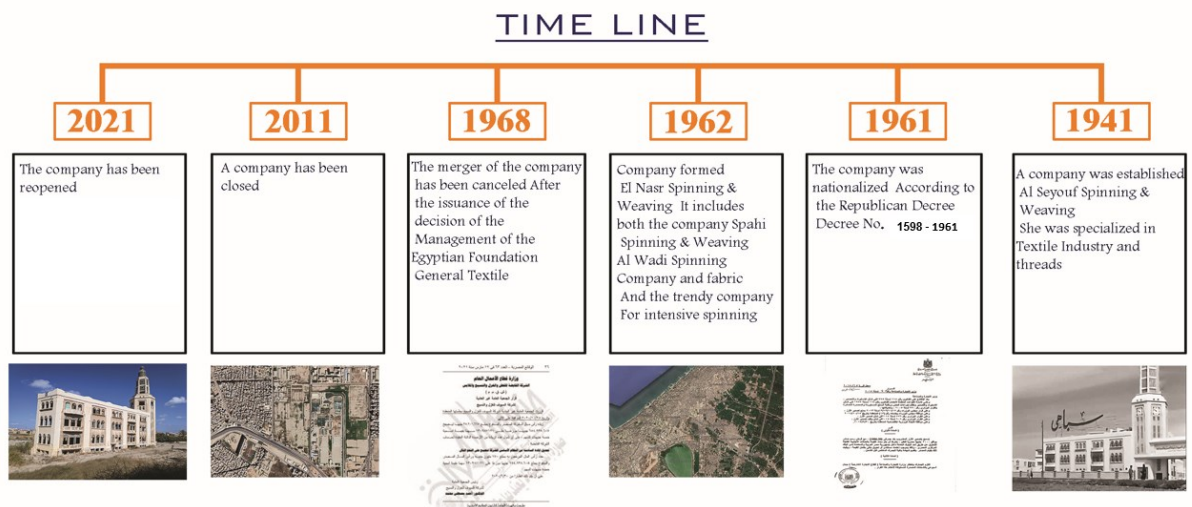


Fig. 3: History of the Development of the Factory

Source: Author

Involving a diverse audience—including researchers, government officials, and stakeholders in historical industries—has been crucial in promoting collaborative preservation initiatives. Notable findings include an examination of the architectural style of the Seyouf Factory and an assessment of the significance of its façade. The research further investigates the factors influencing the industrial heritage of the building and provides an architectural critique of the structure. Moreover, survey results shed light on the socio-economic contributions of key companies like Al-Suyouf. The study highlights the importance of cultural exchange, facilitated by industrial development, in strengthening community identity. It also identifies opportunities to utilize industrial heritage in sustainable urban development, aligning with modern practices that acknowledge the value of heritage sites.

Architectural Style of the Seyouf Factory

The Seyouf Spinning and Weaving Factory showcases a distinctive architectural style that reflects Islamic influences, which Muslims historically used to express their identity. This unique architectural approach has emerged as a response to the regions where Islam spread, including areas like the Arabian Peninsula, Iraq, Egypt, and the Maghreb. The materials commonly employed in this style include wood, glass, ceramics, stones, marble, and gypsum, each contributing to the aesthetic and structural integrity of the buildings.

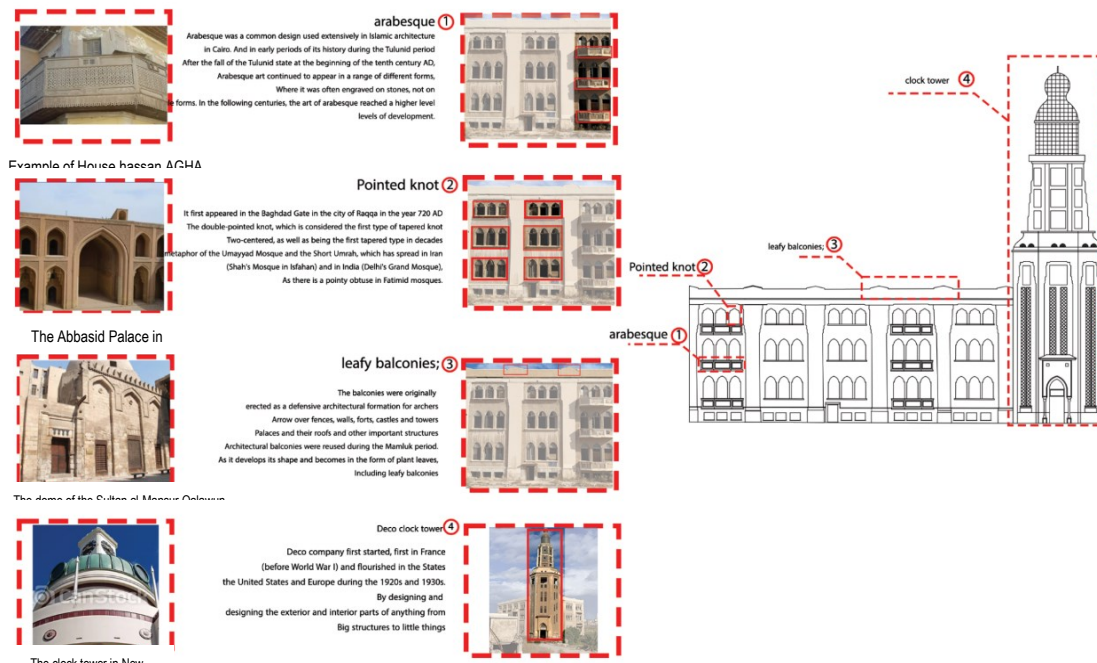


Fig.4: Components of the Façade

Source: Author

Features of the New Islamic style set it apart from the other architectural forms, characterized by exquisite craftsmanship in decoration. This style is notable for its intricate designs and the use of various patterns and motifs, emphasizing the importance of artistry. Indeed, Islamic architecture is often defined by its extensive use of writing, which serves as a significant decorative element (Zhong and Sun, 2024).

The New Islamic style evolved to embody the essence of Islamic identity, with its distinct proportions and dimensions (Shafiq, 2014). This architectural expression not only reflects religious beliefs but also showcases the cultural richness of Islamic heritage (Husni, 2024). As such, the Seyouf Factory stands as a testament to the enduring legacy of Islamic architecture, blending functionality with artistic beauty in its design (Zhong and Sun, 2024).

Analysis of the Value of the Building Façade

The analysis of the building facades reveals the rich tapestry of architectural styles influenced by cultural and historical contexts (Wang *et al.*, 2024). From the intricate arabesque designs of Islamic architecture to the innovative Deco movement, each facade communicates a unique story, reflecting the artistic evolution and societal values of its time (Abdullahi and Embi, 2015).as shown in fig.4.

Arabesque

As known, Arabesque designs have been widely used in Islamic architecture throughout Cairo. During the early phases of its history, particularly in the Tulunid period—following the fall of the Tulunid state at the beginning of the 10th century AD—arabesque art has continued to manifest in various forms, often engraved on stone rather than in three-dimensional shapes. Over the subsequent centuries however, arabesque art has evolved significantly, reaching a higher level of sophistication (Singh, 2017). An example of this can be seen in a house in Asna.

Pointed Knot

The pointed knot first emerged at the Baghdadi Gate in Raqqa in 720 AD. This double pointed knot is considered the earliest version of a tapered knot, notable for its two-centered design. It is also the first tapered type to gain prominence in subsequent decades, serving as a metaphor for the Umayyad Mosque and the Short Umrahb(Gosudarstvennyĭ Ėrmitazh, 2011). This design spread to Iran, exemplified by the Shah Mosque in Isfahan, and to India, as seen in the Grand Mosque of Delhi. Additionally, pointed obtuse shapes can be found in Fatimid mosques, such as the Abbasid Palace in Baghdad (Goudarzi, Bemanian and Leylian, 2020).

Leafy Balconies

Originally, balconies were constructed as defensive architectural elements for archers, allowing them to shoot arrows over fences, walls, forts, castles, and towers. During the Mamluk period, architectural balconies evolved in shape and style, developing into more intricate designs that included leafy details, such as those seen in the dome of the Sultan al-Mansur Qalawun Mosque in Cairo (Wang *et al.*, 2024).

DecoClockTower

The Deco movement began in France before the World War I and flourished in the United States and Europe during the 1920s and 1930s (House, 2017) This movement focused on the design of both the exterior and interior of various structures, ranging from monumental buildings to smaller objects, as exemplified by the clock tower in New Zealand (Marteddu *et al.*, 2018).

Adaptive Reuse of the Seyouf Factory: Balancing History and Modernity

The Seyouf Spinning and Weaving Factory is significantly influenced by several factors, including economic, environmental, and tourism-related aspects as shown in the figure 5.

- **Economic Factors:** Initially, the vacant spaces of the factory has been largely underutilized. However, modifications transformed these areas into dynamic commercial zones, thereby enhancing the economic contribution of the factory (Cooper *et al.*, 2015). This revitalization has not only attracted visitors but also stimulated the local economy by creating job opportunities and encouraging entrepreneurial activities (Weiss, 1998).
- **Environmental Factors:** The factory has faced challenges due to emissions that negatively impacted the surrounding community. Post-modification efforts have focused on improving environmental conditions that have successfully addressed

these issues, resulting in a healthier atmosphere. Indeed, this commitment to sustainability reflects a broader awareness of the importance of environmental stewardship in industrial operations (Velenturf and Purnell, 2021).

- Impact of Tourism:** The unique architectural heritage of the factory has established it as a notable tourist attraction. Before renovations, its historical significance has been under-appreciated; however, recent enhancements have revitalized its appeal, drawing in visitors and enriching the local tourism landscape. The integration of the factory into tourism routes has further solidified its role in promoting cultural awareness and heritage (Lin *et al.*, 2024).

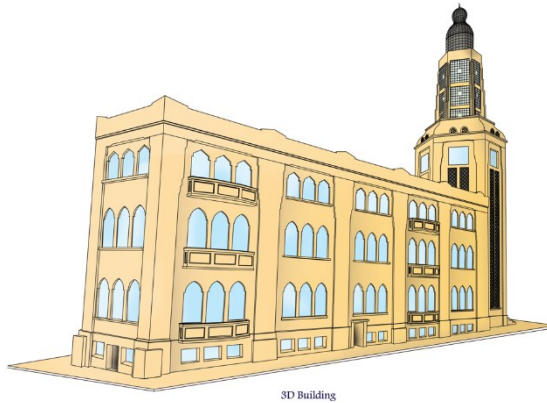


Fig. 5: the main façade of the building
Source: Author

The proposed adjustments to the Seyouf Factory have preserved its historical essence while enhancing its aesthetic charm. This careful balance has increased its attractiveness to tourists, benefiting the surrounding community economically. The factory now stands as a multifaceted entity that combines its industrial legacy with contemporary relevance. Adaptive reuse allows for the preservation of architectural heritage while enhancing economic viability. By integrating modern functions into the existing structure, the factory can attract tourists and foster local growth without compromising its historical essence.

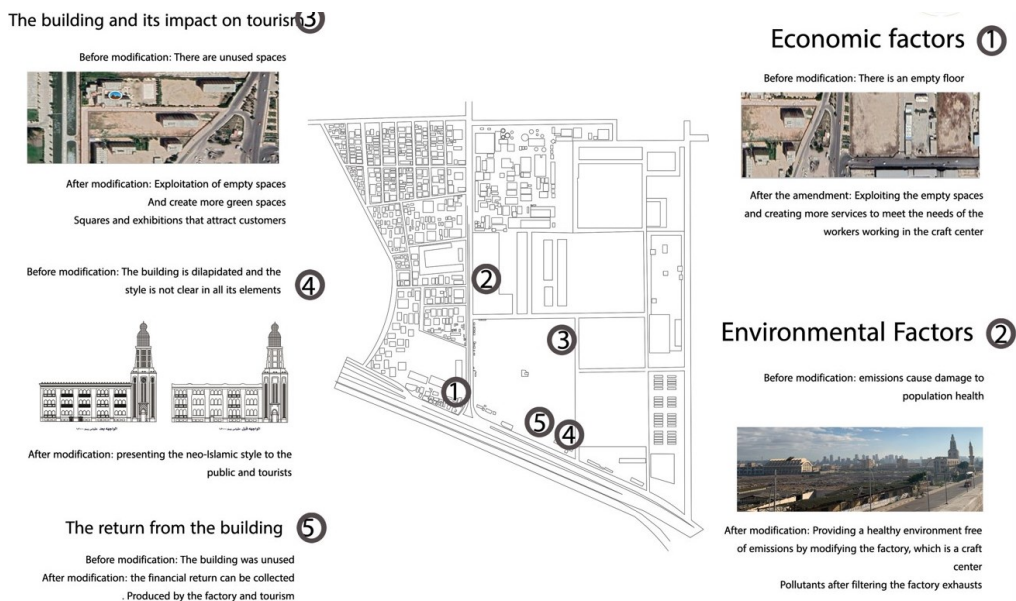


Fig. 6. Factors of Industrial Heritage
Source: Author

Improvements can be made to enhance environmental sustainability, resulting in a healthier atmosphere. The factory's architectural heritage boosts its appeal as a tourist destination, ensuring its continued relevance in a modern context.

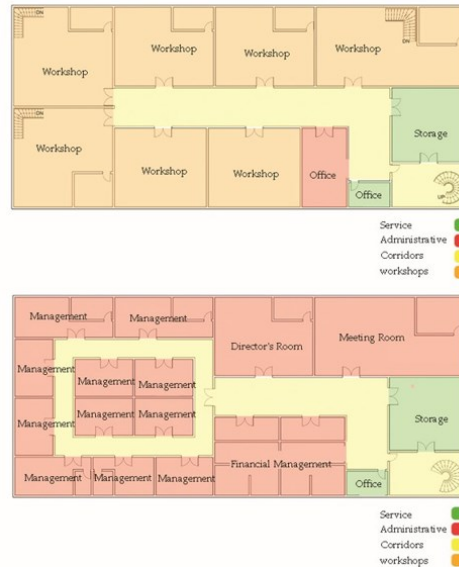


Fig. 7: Distribution of Spaces in plans
Source: Author

Architectural Analysis and Criticism of the Building

a. Descriptive Criticism

Criticism in terms of efficiency

- The building's design features a classic, regular, and symmetrical façade.
- The repetition of shapes highlights the clarity and proportionality of the design, maintaining the balance of form and mass.
- The building lacks functionality as it remains unused and fails to serve its intended purpose. fig 6. the main façade of the building.

b. Theoretical Criticism

Criticism in terms of function:

- **Overlapping Spaces:** Poorly planned spaces that interfere with each other.
- **Narrow Passages:** Limited accessibility due to tight and restrictive pathways.
- **Unused Spaces:** Ineffective utilization of available areas within the building as shown in the fig .7.

c. Transformational Criticism

Criticism in terms of building changes:

- The building's changes adapt to functional or contextual demands, making its evaluation a continuous and dynamic process.
- The redesigned structure contributes positively to the economy by addressing traffic challenges and creating job opportunities, thereby reducing unemployment as shown in the figure 8. The old and redesigned styles of the building .



Fig .8: the old and redesigned styles of the building

Source: Rattibha. (2023). Thread on architecture and buildings. Available at: <https://rattibha.com/thread/1600887217513058310> (Accessed: 7 January 2025).

6.2 Analysis of the Survey Results

Surveys were conducted and distributed among 46 residents of the area, representing various age groups. The survey results were satisfactory regarding the architectural proposal for the building. The key findings from the survey include:

a. Satisfaction with the area

Question: What is your level of satisfaction with the area?

- Highly satisfied: 14.3%
- Moderately satisfied: 28.6%
- Unsatisfied: 57.1%

Observation: The majority of respondents (57.1%) are unsatisfied with the area, indicating a need for improvement in infrastructure, services, or other factors.

b. Preferred use of the buildings

Question: What is the best proposed use for the buildings?

- Cultural center: 43.4%
- Hotel: 30.2%
- Residential: 17.0%
- Other: 9.4%

Observation: The most favored use is as a cultural center (43.4%), reflecting the community's interest in preserving the buildings for cultural or communal activities.

c. Opinion on streets' condition

Question: What is your opinion of the streets' condition in the area?

- Good: 11.8%
- Moderate: 27.8%
- Poor: 39.2%

Observation: Nearly 39.2% of respondents find the streets to be in poor condition, emphasizing the need for maintenance or reconstruction.

d. Building Condition:

- Good: 24.1%
- Moderate: 66.0%
- Poor: 10.0%

Observation: Most respondents (66%) believe the buildings are in moderate condition, with 24.1% rating them as good, indicating a need for minor renovations or improvements.

e. Required Services in the Area:

- Public services: 11.9%
- Private services: 25.4%
- Infrastructure improvements: 33.9%
- Other: 28.8%

Observation: Infrastructure improvements were identified as the most critical need (33.9%).

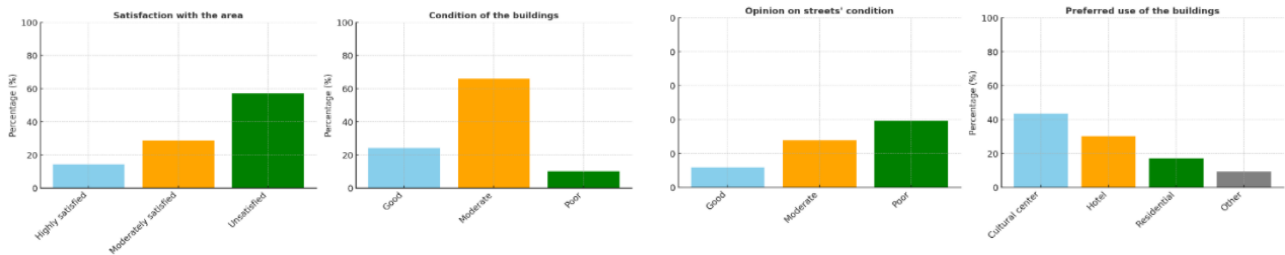


Fig .9: Analysis of Survey Results for the Site
Source: Autor

f. Preferred Redevelopment Plan:

- o Modern use: 56.9%
- o Traditional restoration: 39.0%
- o Other: 8.0%

Observation: A modern approach to redevelopment was favored by a majority.

g. Buildings Increasing the Area's Value:

- o Yes: 85.7%
- o No: 14.3%

Observation: Most respondents (85.7%) believe that the buildings add value to the area, emphasizing the importance of preserving or enhancing these structures.

h. Ease of Movement in the Area:

- o Easy: 76.6%
- o Moderate: 14.5%
- o Difficult: 8.7%

Observation: A majority (76.6%) find movement in the area to be easy, suggesting that the current infrastructure supports accessibility.

i. Opinion on the Condition of the Surrounding Area:

- o Good: 24.2%
- o Moderate: 59.1%
- o Poor: 16.1%

Observation: While most respondents (59.1%) rate the area as moderate, a smaller group (16.1%) believes it is in poor condition, indicating the need for improvements.

j. View on the Urban Fabric of the Area:

- o Good: 39.7%
- o Moderate: 27.6%
- o Poor: 32.8%

Observation: The urban fabric received mixed reviews, with 39.7% rating it as good, but a notable 32.8% expressing dissatisfaction.

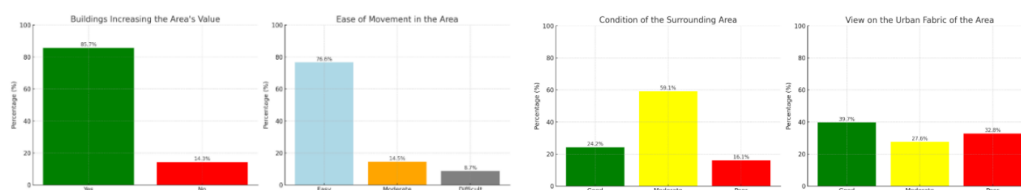


Fig .10: Analysis of Survey Results for the area and factory
Source: Autor

7 Recommendations

The findings provide valuable insights into the adaptive reuse of historical buildings in Egypt, particularly within the context of industrial heritage. Comparisons with existing literature reveal several key themes and implications regarding the significance of such efforts.

Architectural and Cultural Significance

The architectural style of the Seyouf Factory influenced by Islamic heritage, underscores the need for preserving culturally significant structures. This finding resonates with studies that emphasize the role of architecture in shaping community identity and continuity (Elmousalami, 2022). The intricate designs of the factory not only reflect historical craftsmanship but also serve as a reminder of the rich cultural tapestry of the region. The implication is clear: preserving such sites is essential for maintaining a tangible link to cultural heritage, to foster a sense of pride and belonging among the local people (Mohamed, 2024).

Community Engagement and Economic Revitalization

The survey results indicate that 57.1% of residents are dissatisfied with the infrastructure of the area and highlight a critical need for improvement. In parallel, the preference of 43.4% of respondents for transforming the factory into a cultural center illustrates a strong community interest in preserving historical significance while addressing modern needs. This aligns with research that suggests community involvement is vital for successful heritage preservation initiatives (Amin, 2016). Engaging local stakeholders not only fosters a sense of ownership but can also lead to economic revitalization by creating jobs and attracting tourism, as noted by Cooper *et al.* (2015). The implication is that adaptive reuse projects that prioritize community needs can enhance both economic viability and cultural appreciation.

Environmental Sustainability

The environmental improvements observed post-modification reflect a growing trend in industrial heritage projects that prioritize sustainability. Findings indicating that 66% of respondents rated the condition of the buildings as moderate suggest that while there is potential for improvement, there is also acknowledgment of the positive changes already made. Research indicates that adaptive reuse can significantly reduce environmental impacts by minimizing waste and utilizing existing structures (Velenturf and Purnell, 2021). This emphasizes the importance of integrating sustainability into heritage conservation efforts, which not only benefits the environment but also enhances the quality of life for residents.

The research illustrates the multifaceted benefits of adaptive reuse of historical buildings, including cultural preservation, community engagement, and environmental sustainability. By aligning revitalization efforts with community needs and historical significance, such projects can play a pivotal role in fostering economic growth and enhancing cultural identity. The implications of these findings underscore the necessity of collaborative approaches that involve local stakeholders in the decision-making process, ensuring that the benefits of preservation are realized not just for the site itself but for the broader community.

8 Conclusion

This research highlights the architectural significance of industrial sites and advocates for their adaptive reuse. Key findings indicate that the factory represents industrial architecture from the late 19th and early 20th centuries, characterized by unique architectural elements that hold significant preservation value.

Community engagement is a vital component, as surveys reveal strong interest in repurposing the factory as a cultural center, based on an analysis of the building's facades that connect to Islamic architecture. This underscores the need for collaborative efforts among stakeholders to foster a sense of ownership and support. Additionally, the findings demonstrate that adaptive reuse can contribute to local economic development by creating job opportunities and attracting tourism while preserving historical significance, thereby enhancing the factory's role in shaping local identity. The issue of environmental sustainability is also addressed, with

modifications to the factory improving conditions and aligning with broader environmental goals.

The results also highlight the advantages and disadvantages associated with the factory; advantages include its unique architectural design and high historical value, while disadvantages encompass challenges related to renovation costs and building maintenance. It is essential to consider these aspects when contemplating the adaptive reuse of the factory.

Future perspectives emphasize the importance of collaborative efforts between local stakeholders and government entities to ensure the preservation of industrial sites and their integration into contemporary urban development, finally enhancing local identities and contributing to sustainable growth.

9. References

- Zhang, J. et al. (2022) 'Stewardship of industrial heritage protection in typical Western European and Chinese regions: Values and dilemmas', *Land*, 11(6), 1–16. Available at: <https://doi.org/10.3390/land11060772>.
- Yan, M., Li, Q. and Zhang, J. (2023) 'Rethinking industrial heritage tourism resources in the EU: A spatial perspective', *Land*, 12(8), 2,14. Available at: <https://doi.org/10.3390/land12081510>.
- Reuso, 2024. "Industrial Heritage Preservation and Adaptive Reuse: Kombinat Case Study," *Journal of Urban Studies*, 12(4), 45-62, October.
- Eber, W. (2020) 'Potentials of artificial intelligence in construction management', *Organization, Technology and Management in Construction*, 12(1), 2053–2063. Available at: <https://doi.org/10.2478/otmcj-2020-0002>.
- Loures, L. (2008) 'Industrial heritage: The past in the future of the city', *WSEAS Transactions on Environment and Development*, 4(8), 687–696.
- Nocca, F., Bosone, M. and Orabona, M. (2024) 'Multicriteria evaluation framework for industrial heritage adaptive reuse: The role of the "intrinsic value"', *Land*, 13(8), 1266. 5,16. Available at: <https://doi.org/10.3390/land13081266>.
- Ranasinghe, R., Gangananda, N., Bandara, A. and Perera, P. (2021) 'Role of tourism in the global economy: The past, present and future', *Journal of Tourism and Economic Studies*, 15(2), 25–40.
- Loughran, K. (2018) 'Parks for profit: The High Line, growth machines, and the uneven development of urban public spaces', *City & Community*, 17(2), 105–125. Available at: <https://doi.org/10.1111/cico.12050>.
- Spielvogel, J.J. (2005) 'The Industrial Revolution and its impact on European society', *Western Civilization. Volume C, Since 1789*, 583–608. Available at: <https://webpages.cs.luc.edu/~dennis/106/106-Bkgr/20-Industrial-Rev.pdf>.
- Hassan, T.H., Almahayitah, M.Y. and Saleh, M.I. (2024) 'Sustainable stewardship of Egypt's iconic heritage sites: Balancing heritage preservation, visitors' well-being, and environmental responsibility', *Heritage*, 7(2), 737–757. Available at: <https://doi.org/10.3390/heritage7020036>.
- Allgood, K., Haraguchi, N. and López-Gómez, C. (2024) 'The New Era of Industrial Strategies: Tackling Grand Challenges through Public-Private Collaborations', *World Economic Forum*, (January), Paper No. 33.9,17,27,33 . Available at: https://www3.weforum.org/docs/WEF_The_New_Era_of_Industrial_Strategies_2024.pdf.
- Loures, L. (2008) 'Industrial heritage: The past in the future of the city', *WSEAS Transactions on Environment and Development*, 4(8), 687–696.
- Oevermann, H. (2020) 'Good practice for industrial heritage sites: systematization, indicators, and case', *Journal of Cultural Heritage Management and Sustainable Development*, 10(2), 157–171. Available at: <https://doi.org/10.1108/JCHMSD-02-2018-0007>.
- Nocca, F. (2017) 'The role of cultural heritage in sustainable development: Multidimensional indicators as decision-making tools', *Sustainability*, 9(10) 1882.4,24, 25. Available at: <https://doi.org/10.3390/su9101882>.

- Mfon, I.E. (2023) 'Aesthetic considerations in architectural design: Exploring pleasure, arousal, and dominance', *International Journal of Research Publication and Reviews*, 4 (August), 923–935.
- Jóźwik, R. (2024) 'Architectural and urban changes in a residential environment—Implications for design science', *Sustainability*, 16(10),18. Available at: <https://doi.org/10.3390/su16103987>.
- Elshahawy, M.I. (2024) 'Economic analysis for the most important products manufactured from Egyptian resources', *Journal of Economic Studies*, 18(3), 50–70.
- Shafiq, J. (2014) 'Architectural elements in Islamic ornamentation: New vision in contemporary Islamic art', *Art and Design Studies*, Vol. 21, (August), 11–21. Available at: <https://core.ac.uk/download/pdf/234685881.pdf>.
- Husni, M.F.D. (2024) 'Authenticity in Islamic sacred spaces: Case studies of distinctive regional mosques', *Journal of Socio-Cultural Sustainability and Resilience*, 1(2), pp. 127–140. Available at: <https://doi.org/10.61511/jscsr.v1i2.2024.770>.
- Zhong, N. and Sun, X. (2024) 'Analysis of Islamic cultural architecture in Xinjiang: Historical evolution, artistic features, and influence on modern architectural design', 6(11), 99–102.
- Wang, Y. et al. (2024) 'Analysis of multi-dimensional layers in historic districts based on theory of the historic urban landscape: Taking Shenyang Fangcheng as an example', *Land*, 13(11), 1736,21-27, Available at: <https://doi.org/10.3390/land13111736>.
- Abdullahi, Y. and Embi, M.R. (2015) 'Evolution of abstract vegetal ornaments in Islamic architecture', *Archnet-IJAR: International Journal of Architectural Research*, 9(1), 31–49. Available at: <https://doi.org/10.26687/archnet-ijar.v9i1.558>.
- New Jersey Department of Environmental Protection (2017) 'Art Deco & Art Moderne Architecture'. Available at: https://www.nj.gov/dep/hpo/1identify/nrsr_17_Jan_ArtDeco.pdf.
- Gosudarstvennyĭ Ėrmitazh (2011) 'Architecture in Islamic Arts: Treasures of the Aga Khan Museum', *Journal of Islamic Architecture*, 12(4), 100–115.
- Goudarzi, M., Bemanian, M. and Leylian, M. (2020) 'Geometrical analysis of architectural drawings in the Shah-mosque Isfahan', *Curved and Layered Structures*, 7(1), 68–79. Available at: <https://doi.org/10.1515/cls-2020-0007>.
- Marteddu, A. et al. (2018) 'The University of Auckland Clock Tower East Wing: A new lease of life', *Proceedings of the 2018 Concrete New Zealand Conference* [Preprint], (October). Available at: <https://search.informit.org/doi/abs/10.3316/INFORMIT.387105682705691>.
- Cooper, R., Timmer, V., Ardis, L., Appleby, D. and Hallsworth, C. (2015) 'Local Governments and the Sharing Economy', October. Available at: https://www.onearthliving.org/wp-content/uploads/2022/09/LocalGovernmentsSharingEconomy_Report_2015.pdf.
- Weiss, D. and Wurzel, U. (1998) *The Economics and Politics of Transition to an Open Market Economy: Egypt*. Paris: Organisation for Economic Co-operation and Development, Vol. 5.pp. 45-68.
- Velenturf, A.P.M. and Purnell, P. (2021) 'Principles for a sustainable circular economy', *Sustainable Production and Consumption*, 27(1),1437–1457. Available at: <https://doi.org/10.1016/j.spc.2021.02.018>.
- Lin, X. et al. (2024) 'Cultural routes as cultural tourism products for heritage conservation and regional development: A systematic review', *Heritage*, 7(5), 2399–2425. Available at: <https://doi.org/10.3390/heritage7050114>.
- Elmousalami, H.H. (2022) 'Multistage optimization for sustainable zero energy residential buildings on the hot arid climate', 6(3), 298–318.
- Mohamed, S.F. (2024) 'Integrating vernacular designs of mashrabiya to promote sustainable architecture: Insights from an experiment in Egypt', X(X), 1–20.