Managing the Architectural Heritage of Tripoli, Libya: Case Study of the Red Castle

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Abstract—The Libyan heritage buildings are currently facing a number of crises that pose a threat to their structural integrity, functionality, and overall performance. One of the challenges pertains to the loss of community identity, which has arisen due to the lack of awareness and unconscious behavior of the residents. An additional issue arises from inadequate site management practices, including the implementation of modern techniques and innovative building materials that are incompatible with structural elements, resulting in the deformation of certain sections of the buildings. The security concerns of the city, along with the ongoing civil conflict, fostered a conducive environment for violations, resulting in the vandalism of certain monuments in the city. However, the degradation of this valuable heritage is mainly attributed to the city's neglect and pollution. The elevated groundwater level resulting from pollution has led to erosion in the building's foundations. Mitigating these negative consequences through strategic interventions and rehabilitation is required to preserve this treasure. In order to assist the local community in recovering from those crises, this paper stated a viable strategy for promoting preservation efforts that aimed at safeguarding the heritage sites while also providing guidance to decision-makers and the local community on how to avoid these crises, preserve, enhance, and recognize the significance of the Libyan heritage.

Keywords—Cultural heritage, historical buildings, Tripoli's Old City, Red Castle, crises, preservation.

I. INTRODUCTION

TRIPOLI is the capital of Libya located in the north-east of the country. It is one of the largest cities in terms of population as well as one of the largest industrial and commercial communities. Despite being a remarkable urban development and one of the oldest cities in the nation, the city's spatial planning still adheres to antiquated practices. The ancient city is recognized as a significant commercial hub; it covers around 47 hectares. It is located on the North African Mediterranean coast at latitude 33° N and longitude 13° 10′ E. It lies in the farthest north of the Jefara plain, between Al Khoums (121 km to the east) and Zwara (113 km to the west) as shown in Fig. 1.

With a long history of exchanges and cross-cultural influences, Tripoli is considered one of the lands that hosted various civilizations [16]. The city has been shaped by various civilizations and empires, leaving behind a rich historical legacy, each of which contributed to the current shape of the city and the references of its inhabitants, concerning architecture, urban design, and relationship with nature [1], [2]. In recent times, the old city of Tripoli has faced challenges due to urbanization, neglect, and conflicts. However, efforts have been made to preserve and revitalize its historical and cultural heritage, and it remains an important tourist destination. Since 2000, the old city has been abandoned at an increasing rate. The political uncertainty after 2011 also accelerated the decline [9], [16].

II. HISTORY OF THE URBAN CENTER

Tripoli was known as Oea and was first found in the 7th century BC by the Phoenicians. It came under the control of Carthage and later became part of the Roman Empire. Under Roman rule, Oea flourished and became an important Roman city. They built notable architectural structures, like as baths, theaters, and temples. After the fall of the Western Roman Empire, the city came under Byzantine control and continued to be an important regional commercial center [16]. The Arab Muslim armies led by the general Amr ibn al-As conquered Tripoli, marking the beginning of Arab rule in the region. The city became an important center of the Umayyad and Abbasid Caliphates, known as "Tarablus al-Gharb" or Tripoli of the West [16]. In the 16th century, the Ottoman Empire gained control over Tripoli. The city became the capital of the Ottoman province of Tripolitania. During this period, many of the old city's architectural landmarks were built, including mosques, palaces, and public buildings. While, in 1911, during the Italian-Turkish War, Tripoli fell under Italian control, significant urban development took place as illustrated in Fig. 2, including the creation of new districts outside the old city walls, land lines, street lights, water tank and number of schools were built [2], [16]. Thereafter, Libya gained its independence from Italy in 1951, and Tripoli became the capital of the newly established Kingdom of Libya. Today, the old city of Tripoli stands as a UNESCO World Heritage Site, showing a unique blend of architectural styles and cultural influences from different periods of its history. It serves as a testament to the city's rich past and continues to be a vibrant neighborhood that attracts visitors from all around the world [9], [16].

III. THE HERITAGE VALUE

The heritage value of a city refers to the cultural, historical, architectural, and social significance attributed to its tangible and intangible heritage. It encompasses the unique characteristics, assets, and narratives that contribute to the city's identity, sense of place, and collective memory. In the context of the old city of Tripoli, tangible and intangible heritage refer to different aspects of its cultural and historical significance.

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Fig. 1 Tripoli, old city, and the castle locations [Author's collection]
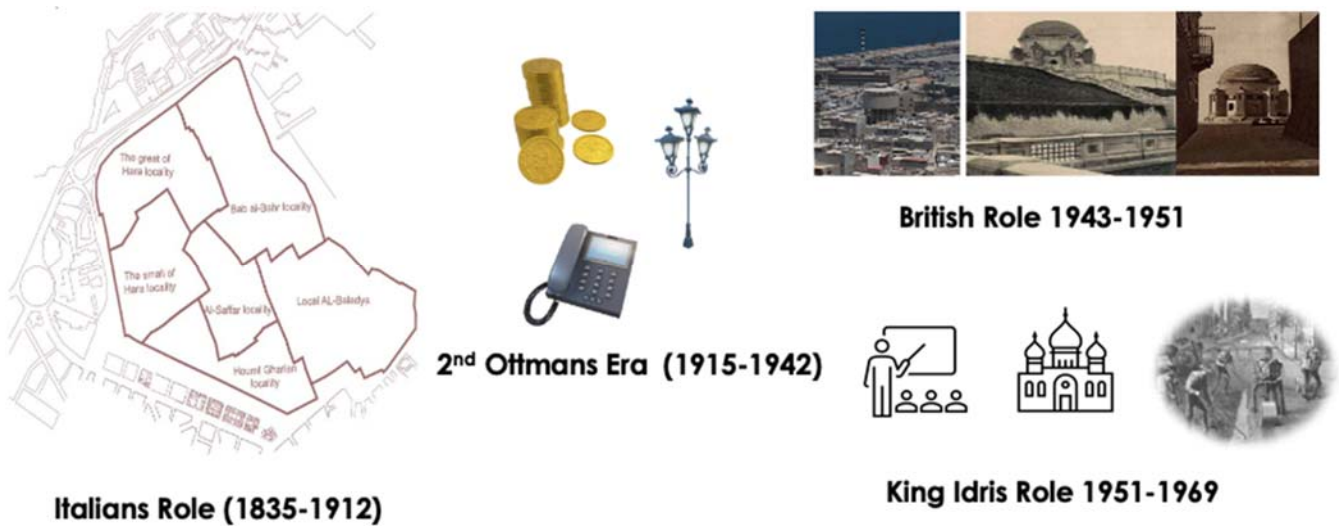
Fig. 2 Community development during the different eras

A. Tangible Heritage

Tangible heritage refers to physical, material, and visible aspects of the old city that can be observed, touched, and experienced. In Tripoli's old city, tangible heritage includes:

- *Architectural Structures:* Historic buildings, mosques, palaces, houses, city walls, gates, and landmarks like the Red Castle (Al saraya al-Hamra) and the Arch of Marcus Aurelius.
- *Urban Layout:* The layout of streets, alleys, squares, and public spaces that have evolved over time, reflecting the city's historical development.
- *Artifacts:* Objects of cultural, artistic, or historical significance such as archaeological artifacts, traditional crafts, pottery, textiles, and decorative elements found within buildings [2], [14], [16].

B. Intangible Heritage:

Intangible heritage refers to the non-physical and non-material aspects of the old city's cultural identity and traditions. It encompasses the knowledge, practices, expressions, and beliefs that are passed down from generation to another. In Tripoli's old city, intangible heritage includes:

- *Traditional Crafts and Skills*: Traditional skills and craftsmanship, such as metalwork, wood carving, ceramics, weaving, and embroidery, that have been practiced for centuries.
- *Cultural Practices and Rituals*: Traditional ceremonies, festivals, music, dance, and other performing arts that are deeply rooted in the local community.
- *Oral Traditions and Language:* Local dialects, storytelling, folk tales, proverbs, and other forms of oral traditions that contribute to the cultural identity of the community.
- *Culinary Traditions*: Traditional recipes, cooking techniques, and local gastronomy that reflect the region's cultural heritage.
- *Social Customs and Practices*: Traditional social customs, etiquette, traditional costumes, and social gatherings that shape the community's way of life.

Preserving both tangible and intangible heritage is crucial for saving the Libyan identity, maintaining the authenticity and cultural significance of the old city [2], [14], [16].

IV. THE ARCHITECTURAL STRUCTURE

The traditional architecture of Libya reflects a long-standing

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knowledge of the natural and social environments. Similar to other traditional cities, Tripoli is distinguished by the simplicity of its architecture and construction techniques. The city's unique identity was established by employing local construction materials such as stones and bricks for erecting walls, gypsum for roofing, and palm trunks for structural support. A compact building system that adapts to the environment and satisfies social and economic demands has been generally considered a reflection of a profound social and environmental consciousness in Arab-Islamic society [11], [14], [17]. The city has a network of narrow, winding streets and alleys, interspersed with open squares and courtyards. The layout reflects its historical development and the influences of various civilizations that have shaped its identity. The key architectural characteristics of the city are illustrated through its narrow streets. This narrowness provides shade and shelter from the sun and creates a sense of quietness and closeness within the urban fabric. The city exhibits a mix of traditional architectural features drawn from Islamic, Ottoman, and Mediterranean styles, such as whitewashed facades, decorative details, and characteristic arches and domes. The open squares and courtyards serve as gathering spaces and social hubs. They are surrounded by historic buildings, mosques, cafes, and shops, creating vibrant areas for community interaction [1], [2]. This archeological site includes a number of historic landmarks and architectural elements, such as the Arch of Marcus Aurelius, a well-preserved Roman monument, and the Red Castle (Assaraya al-Hamra), which stands as a prominent citadel and will be discussed later in this paper as a case study. Mosques, such as the Gurgi Mosque and the Ahmed Pasha Karamanlli Mosque. The enclosed walls which served a defensive structure in the past, the arched gateways and watchtowers provided a sense of historical significance and defined the boundaries of the old city [11]. In general, the urban structure of the ancient city of Tripoli presents a fusion of diverse architectural designs, curving alleys, significant heritage sites, and lively communal areas. It reflects the city's rich history and cultural heritage.

V. RESEARCH PROBLEM: DEFINING THE CRISES

This paper will address the crises which has emerged clearly over the decades in Libya, and the consequences of these crises in terms of claims that have greatly affected the survival and sustainability of the Libyan heritage. This article will seek to diagnose those crises, define them accurately, and thus propose appropriate solutions. It is about bringing this historical site back to life in order to remind the Libyan people about their heritage and strive to preserve it from extinction. This is the focal point of this study.

A. The Impact of Crises on the Community

Through reviewing all the aspects in the literature, it was found that the heritage of Tripoli's old city is impacted by three main crises: neglect, pollution, and security concerns as shown in Fig. 3. These crises pose significant challenges to the preservation and protection of the historical site. The three crises are defined below; in terms of the way they impacted the community.

1) The Economic Impact of Neglection

Neglected heritage sites often face a lack of funding and the resources necessary for their preservation. The limited financial support has prevented the implementation of necessary restoration projects in the old city and eliminated maintenance, which has contributed to deterioration. Lack of awareness associated with the heritage sites has led to a loss of connection with cultural heritage, resulting in a diminished sense of identity among community members. All this has negatively impacted tourism and caused a decline in tourism, economic opportunities, and the overall development of the community.

2) The Environmental Impact of Pollution

Pollution is considered a crisis resulting from negligence, which have detrimental effects on both the environment and the preservation of cultural heritage. Lack of maintenance and neglect of historic buildings lead to the deterioration of building materials, resulting in the release of particulate matter and pollutants into the air. This has contributed to poor air quality, affecting the health of locals and visitors as well as the integrity of the architectural structures themselves. Inadequate waste management and neglecting the old city's infrastructure, such as sewage systems and drainage, resulted in water contamination affecting both the environment and the heritage structures as the ground water level rises and erosion is caused. Visual pollution is also contributed to the degradation of the overall appearance and authenticity of heritage structures.

3) The Social Impact of Security Concerns

Starting in the 1930's, under Italian influence, the old city texture was abandoned at an increasing rate until 2009. The political uncertainty after 2011 also accelerated this decline, and the city started to lose its identity [17]. With the lack of local security regulations and enforcement, the old Tripoli city became vulnerable to violations, unauthorized and destructive activities that compromised its heritage value. A favorable environment was created for violations, which led to damage to some of the city's monuments.
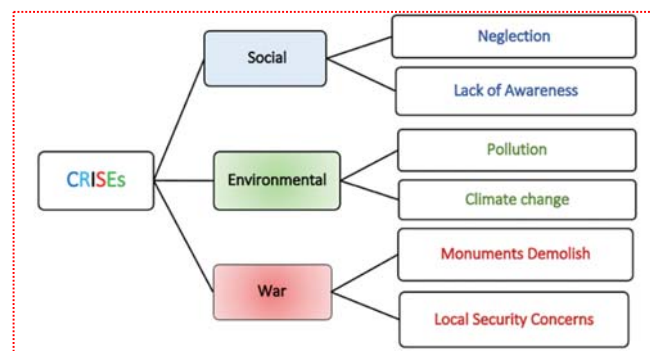
Fig. 3 Diagram of the crises that affected the community

B. Potentials for Serving the Community

Following the possible strategies that will be stated later in this article, the community will recover from the crisis in three

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aspects:
1) Economical Way
- Offering financial support through renting the venues and yards for traditional or cultural events.
- Using some buildings of the castle adaptively as a residence to host tourists and any other visitors.
- Involving local private business in the restoration phases of the structure.
- Using the squares and corridors to hold bazaars and local festivals with a charging rate.
2) Social way
- Using courtyards for workshops to let social interaction and knowledge exchange, to establish specific standards that eliminates the building collapse and develop conditions for sustainable heritage tourism.
3) Environmental way
- Using the city incomes to manage and repair water and drainage systems and control waste will eliminate pollution.

VI. THE CASE STUDY: THE RED CASTLE

A. Study Motivation

Due to its historical significance, the Red Castle is used a case study in this paper and adaptive reuse is proposed for its rehabilitation. The primary challenge that may face the adaptive reuse is the lack of previous studies that have suggested to reuse the of the buildings of the castle and repurpose them accordingly with the surrounding neighborhood. Furthermore, there are no statewide regulations in Libya that pertain to the adaptive reuse or repurposing historical buildings. Therefore, the purpose of this article is to ensure that the castle's archeological value will be preserved while also being put to use by the local community in promoting the area's rich heritage. Fig. 4 defines the borders of the case study area.

Fig. 4 The case study area [Author's collection]

B. History of the Structure

Tripoli castle earned the name "Red Sarraya" due to its color. The castle stands in the northeastern region of the historic Tripoli city, affording it a vantage point overlooking the city's seaport. This strategic location rendered it a valuable asset for safeguarding against attacks and incursions. The castle has undergone various modifications in accordance with the prevailing regulations and temporal environments. The castle holds significant archaeological value in Tripoli due to its ability to offer an overview of various historical periods. According to [1] and [4], the oldest existing building is attributed to the Spanish incursion in 1510.

In 1551, the Ottomans regained control over Tripoli following the arrival of Spanish forces. The castle was always used as a residence for the ruler. The Ottomans prioritized fortifying the castle as a means of safeguarding the city and consolidating their authority against potential incursions and uprisings [17]. Throughout the Karamanli era, the castle persisted as the residence for governance, as Karamanli mixed various buildings and exhibited an interest in decorations in the mosques and halls of the castle. The castle served as the Italian government's administrative hub during their occupation of the city. The visual illustration in Fig. 5 is showing one of the alleys with the Red Saraya during the period of Italian occupation. Subsequent to Libya's independency, the castle repurposed to house governmental bodies that are dedicated to the preservation and study of Libya's archaeological and historical legacy. In addition, the castle showed in Fig. 6 served as a venue for multiple museums, such as a museum dedicated to Roman artifacts and another one for natural history exhibits. In 1983, the various museums in Libya were consolidated into a single institution known as the Red Sarraya Museum, which presents the country's history across different times according to [13].

Fig. 5 One of the narrow paths within the Saraya during the Italian occupation [1]

Fig. 6 A seaside view of the Castle [1]

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C. Architectural Characteristic

The castle laid out to a total area of 1300 m² and is a rectangle in shape, with four separate sides. The Northern-east side measures 115 meters, while the Northern-west side spans 90 m. The Southern-west side measures 130 m, and the Southern-east side measures 140 m. The castle reaches an elevation of 21 m [1], [13]. It consists of a series of buildings that have accumulated over time and was the place of the rulers of the city. The most prominent classification of the castle buildings recorded back to the 1950s according to Spanish design as presented in Fig. 7.
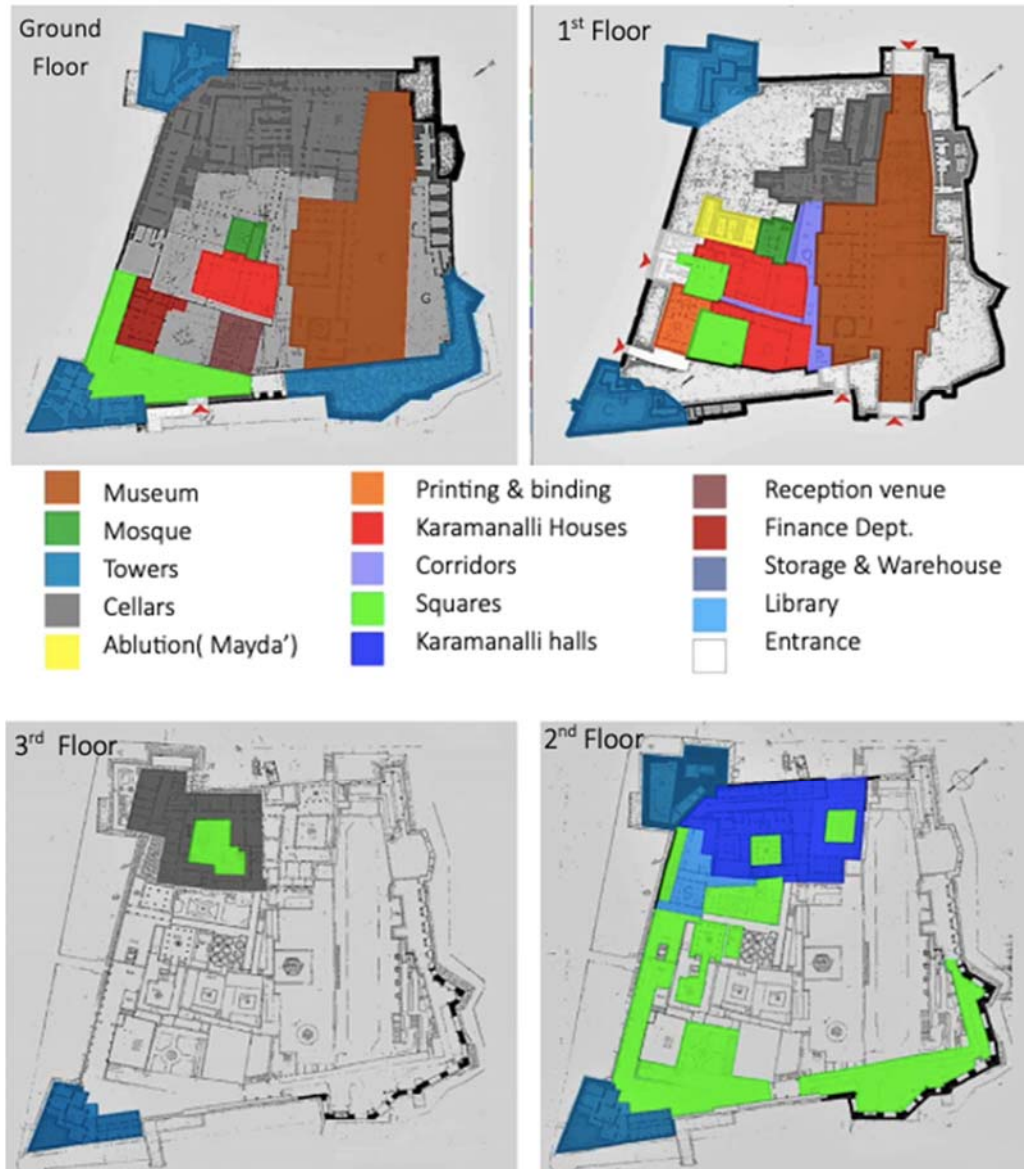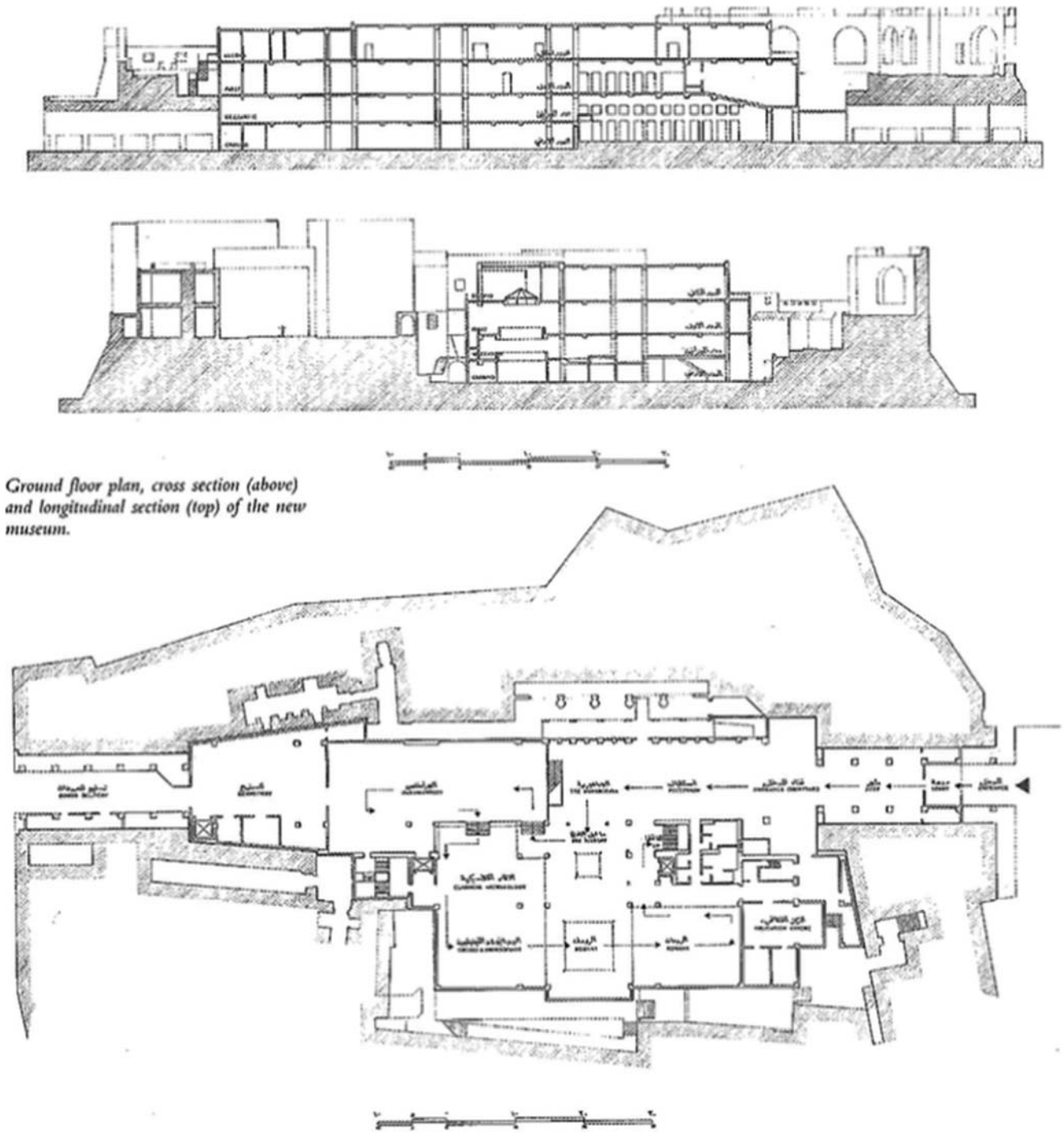

Fig. 7 Castle plans and their spaces functions [6]

Although these buildings were spread randomly without special arrangement, today they represent Tripoli Castle in its known form. The structures that remain in good condition and are suitable for adaptive reuse include:

The Museum: It was built in the early 1980s at the site of the old museum, opened to the public in 1988, and became the only part of Al Sarraya used to display archaeological objects until its closure in 2014 due to security concerns. Figs. 8 and 9 illustrate the plan area, a cross section, and the architectural elements of the new museum, respectively.

St. George's Tower: Fig. 10 illustrates one of the most visible and changing parts of the castle, it was built within the Spanish fortifications in the castle and used as a historic manuscript house. It is now the place of the Archaeology Ministry of Tripoli.

Karamnali Halls: Also known as the castle palace, they are square-shaped building surrounded by residences and offices. It represents the governor's residence, which is located in the middle of the castle on the southwest side, as presented in Fig. 11.

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Ground floor plan, cross section (above)
and longitudinal section (top) of the new
museum.

Fig. 8 Plan and Section of the national museum [17]

St. Barbara's Square: The door that leads to it was the main entrance to the castle during the Spanish role, facing a square-shaped building as Fig. 12. The square used as an Italian occupation administration and currently used as a VIP lounge for the castle visitor.

The castle mosque: is one of the oldest buildings in the castle. Back to Arab-Muslims' rule, the building in Fig. 13 was used as a gathering place to discuss community affairs with the city rulers. It was then converted to the Catholic Church during

Spanish rule, thereafter returned to being a mosque in subsequent eras. Fig. 12 shows St. Barbra Square [1].

D. *The Current Situation*

The castle consists of a series of buildings, most notably the Museum of Red Sarraya, the Mosque of the Castle, and St. George's tower, as well as basements, warehouses, etc. While museum activity has moved to the new museum building, most of the buildings have been in the administrative activity of the Archaeology Department offices. Since the 1940s, no

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restoration work was performed in the structure causing parts of the castle to be demolished.

Fig. 9 Architectural elements of the museum [1]

Fig. 10 An external view of St. Gorge Tower [1]

Fig. 11 Karamanalli Halls [1]

Fig. 12 St. Barbra Square [1]

Fig. 13 The Castle Mosque [1]

VII. REHABILITATION STRATEGY

There are numerous methods exist for defining the term of "historic preservation" such; "Historic preservation is the practice of protecting and preserving sites, structures or districts which reflect elements of local or national cultural, social, economic, political, archaeological or architectural history." [10]; however, the most common ways are; restoration, rehabilitation, renovation, and adaptive reuse which is proposed for this case study.

A. The Adaptive Reuse

The historical buildings are today regarded as art treasures; they have inherent worth and serve as reminders of a city's culture and diversity. One of the methods of preserving historic structures is to adapt them to modern purposes. The adaptive reuse of historic structures is seen as critical to comprehensive government planning and national growth. Countries may preserve and protect the value of old buildings while providing economic benefit for the present and future via built heritage adaptive re-use strategies [10], [12].

Most of the ancient buildings have been destroyed by time or

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nature, but the ones that are still standing are testaments to the political, social, and cultural heritage of their locality. In this regard, rehabilitation tactics are an integral component of modern architectural practices, serving a bridge between the past, present, and future by allowing for the endless use of old buildings while also keeping its rich cultural and architectural heritage [5]. Moreover, any restorative measures carried out on historical buildings should adhere to specific guidelines to ensure the preservation of their cultural significance and intended purpose, while also enabling their utilization in a manner that is advantageous to the public and encourages a recognition of their historical value [3]. As a result, governments in modern nations have released both broad and detailed recommendations for restoring historic buildings in a manner that honors both the building's past and its present context [8]. According to [5], Adaptive reuse is a technique for preserving a historic building by placing it in a new setting that preserves its worth and makes it useful to the surrounding community. However, when restoring a building, it is important to keep its original nature, analyze the requirements of the community, identify the limitations imposed by the current structure and achieving the objectives of preservation and repurposing. In addition, architects and developers face some obstacles throughout the restoration planning and implementation phases, such as adhering to preservation regulations and building requirements and incorporating contemporary utilities into pre-existing structures. Building structural problems may also arise if the structure is not designed to support the loads of the proposed restoration work [7].

B. The Proposed Strategies for the Castle

The unique architecture and historical significance of the castle makes it an important structure deserving of recognition. Looking at castles around the world, it is found that most of them were used as museums covering historical and cultural landmarks for their people [15]. Some of them were used as art museums, others as private museums, and the same is the case for the Tripoli castle. It includes a number of museums to introduce Libyan history. These museums include historical costumes, fabrics, handicrafts, coppers, furniture, jewelry, prominent and historic figures of different ages, Libyan arts, historical documents and manuscripts, historical photograph etc. Based on these uses, proposals of re-using the castle buildings as exhibits, museums, or hotels according to their type, size and current function are suggesting the following.

- The Libyan National Museum
- *CU[1]:* The building designed to be a museum.
- *PR[2]:* The building should retain its function, and in the event that the National Museum did not return, the most appropriate employment is to be a museum for the military history of Libya.
- St. George's Tower:
- *CU:* The house of historical manuscripts and the place of the Antiquities Department in Tripoli.

- *PR:* The building should remain as a center for historical manuscripts, plus the maps and models of Libya while remaining an office for the Antiquities Authority.
- Karamanlli Houses:
- *CU:* The museum exhibition halls.
- *PR:* The suggested reuse of buildings is, as models for the Karamanlli period by reviving the lifestyle that prevailed in the Karamanlli period, such as furnishings, clothes, daily necessities, and even the rituals of public and private events.
- Al-Karamanli Hall:
- *CU:* The warehouses and stores of the Antiquities Authority.
- *PR:* The size and configuration of the building can be used as a historic hotel or as a private hotel with limited occupancy and at specific times of the year.
- The castle Library:
- *CU:* A storehouse for antiquities, historical manuscripts, and the Antiquities Library
- *PR:* The library is an active part of the castle buildings at the present time, but it lacks the element of technology, updating materials. Rearranging the place and adding rare books that recorded the Libyan history in different languages will raise its importance and encourage readers and researchers to visit.
- The Binding building:
- *CU:* The workshop for binding and preserving manuscripts.
- *PR:* The building needs renovation in the materials and machinery used while retaining its function, which is considered an important function and serves the current and proposed functions of the castle buildings.
- Cellars/vaults:
- *CU:* Archaeological remains and prison that are used as place for cooking and keeping supplies.
- *PR:* After researching its history and restoration, it is possible to return some of the holdings that date back to the period of its establishment and can be used in tourist tours.

The rest of the spaces in the castle, including the *squares* and *corridors,* can be used as temporary exhibitions to hold artistic, historical, or social events related to the castle or the old city with a charging rate. The Reuse may require major operations that will create job vacancies for the local private business. However, the restoration should begin with the detection of the condition of the structures and the extent of damage to its elements due to time factors, then planning begins for its restoration in an accurate scientific manner, accompanied by plans for reuse of the targeted areas, so that the clarification of the basic structure of the works required in accordance with the standards laws and regulations is taken into consideration. That will help the castle to regain its splendor and steadfastness for years, decades, or perhaps centuries and in this sense, re-appraising the standards and regulation towards the sustainable heritage tourism.

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[1] CU is the Current Use of the Building.

[2] PR is Proposed Reuse.

VIII. DISCUSSION

The purpose of this article is to ensure the castle's archeological value preserved while also being used by the local community in promoting the area's rich heritage.

By repurposing the function of the structures, their architectural, historical, and cultural value can be retained, ensuring that future generations can appreciate and learn about their history, and this contributes to treat one of the crises impact previously mentioned i.e., loss of community identity.

Regarding the existing pollution that site is already suffering of, the adaptive reuse is also environmentally sustainable. It reduces the demand for new construction, which can consume significant resources and generate a large amount of waste. By repurposing existing structures, adaptive reuse promotes waste control and minimizes the environmental impact associated with demolition or new construction.

As the site is neglected and there is no financial support for rehabilitation, rehabilitating the heritage buildings of the castle through adaptive reuse can be more cost-effective than constructing new buildings. Existing structures often have unique architectural features, solid foundations, and durable materials that can be utilized, reducing the need for extensive new construction. This can lead to considerable cost reductions in contrast to constructing a new structure.

Adaptive reuses contribute to the revitalization of neighborhoods and to the community itself. By repurposing the castle buildings to new functions such as hotels, libraries, office spaces, visitors will be attracted to the area and that will stimulate economic growth, create job opportunities, and enhance the community identity. Furthermore, by adapting the existing structure to accommodate new functions, the building can serve contemporary needs while still maintaining its historic character. This flexibility ensures that the building remains relevant and adaptable to changing societal requirements over time. However, there are some challenges that may face the adaptive reuse of the Castle which is the lack of the repurposing regulations in Libyan historic buildings. In many countries, there are regulations and policies in place that encourage or require the preservation and adaptive reuse of heritage buildings. These regulations aim to protect cultural heritage and promote sustainable development practices. Choosing adaptive reuse aligns with these regulations can facilitate the approval process for rehabilitation projects.

IX. CONCLUSION

The old city of Tripoli's architectural features, influenced by Arab-Islamic, Ottoman, and Mediterranean styles, contribute to its unique identity and charm. However, issues like loss of community identity, inadequate site management, neglect, and pollution threaten the safety, use, and effectiveness of Libya's historic structures. Neglect, lack of maintenance, and awareness of heritage contribute to deterioration, loss of authenticity, and limited funding for preservation efforts. Visual pollution and security concerns pose significant risks to Tripoli's heritage, causing damage to historic buildings and restricted access for preservation and restoration efforts. Preserving both tangible and intangible heritage is crucial for maintaining the authenticity and cultural significance of the old city.

Applying common rehabilitation methods including restoration, rehabilitation, renovation, and adaptive reuse can help mitigating the impact of the crises. However, adaptive reuse involves preserving historic buildings while analyzing community need and offering alternative designs that achieve the refunctioning purposes. Adaptive approach will effectively recover Al-Sarraya from its crises and promote potentials to help its community through balancing heritage preservation, community needs, and saving cultural uniqueness.

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