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Yasser Mahgoub · Nicola Cavalagli · Antonella Versaci ·
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Cities' Identity Through Architecture and Arts

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Editors

Cities' Identity Through Architecture and Arts

A culmination of selected research papers from the second version of the international conference on Cities Identity Through Architecture and Arts—2nd Edition (CITAA), Egypt 2018, and the international conference on Conservation of Architectural Heritage—3rd Edition (CAH), Egypt 2019

Springer

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ISSN 2522-8714 ISSN 2522-8722 (electronic)
Advances in Science, Technology & Innovation
IEREK Interdisciplinary Series for Sustainable Development
ISBN 978-3-030-14868-3 ISBN 978-3-030-14869-0 (eBook)
https://doi.org/10.1007/978-3-030-14869-0

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Series Editor Preface

Every city has its valuable and unique identity that is revealed through its physical and visual form. It is seen through the eyes of its residents and users where the collective memories of their residents and users are being shaped. The robust identity of the city comprises the physical spaces and the images that were shaped through clues of memory, which in turn affect the tourism, education level, cultural level & economic prosperity in addition to other aspects. Consequently, one of the main qualities and assets of the city is its identity, and of course this in turn will increase with the multitude and diversity of the identities of the whole city.

Cities' identities are constructed and developed over the time, from physical, cultural and sociological perspective the identities are incessantly evolving. This book explains how architecture and arts are the embodiment of the historical, cultural and economical characteristics of the city. It presents how cities' memories play a vital role in protecting the physical and nonphysical heritage of the city. Furthermore, this book explains the transformation of cities and urban cultures, and investigates new approaches developed in, both, contemporary arts and architecture, which continue to be produced in various directions and consumed, putting forth new ideas.

This book will help interested readers in the field of cities' history, and how technical and political processes in addition to religious aspects affect the development in the city over time. It covers a huge variety of topics such as the conservation of the cultures and the identity of the city through the designing and planning processes. It discusses the different ideologies, and approaches of a more sustainable city, through retaining its identity as well as how strategies can be developed so cities can advertise themselves in the global market. Discussed is also the significance of recalling the city's identity and developing it into the culture.

This book will benefit a variety of users in the field of city planning, urban design, architecture and arts whether academically or professionally. It will be promoted in several faculties among professors and through online channels such as emails, social media and so on. Additionally, it will be recommended to postgraduate students and interested readers.

Cairo, Egypt — Mourad Amer

Scientific Committee

Preface

Intended to be a guide for academics, scholars and interested leaders, this book was designed to critically assess implications related to the preservation and management of heritage, Urban Planning and City Branding. The notion of Identity in the urban context, known as urban identity, is further explored as a mechanism characterizing and materializing our environments, cultures and societies.

A discussion of how our histories have shaped our present and future, gifting us and our cities their current identities, is discussed in this book. A number of strategies and approaches that closely assess and challenge social-environmental values, perceptual matters and behavioral and physical attributes are introduced through a navigation across international case studies.

This book is a culmination of selected research submitted to the international conferences on Cities' Identity through Architecture and Arts—2nd Edition and Conservation of Architectural Heritage—3rd Edition, both of which were organized by IEREK–International Experts for Research Enrichment and Knowledge Exchange–and presented a platform where scholars from all over the world gather in one venue to discuss shared cultural, historical and economic issues. It showcases research submitted to and presented during the conference by international authors. The conferences, were a distinct opportunity for them to share their thoughts with leading scholars and professionals in the fields of architecture, arts, conservation and planning.

Comprehensive in its approach, the book represents a major contribution to various sectors of architecture, geography and urban design and planning and, more importantly, does not neglect the behavioral sciences and socio-psychology (e.g. social implications, identity etc.).

The researches in this book are directed towards those who are actively engaged in the decision-making processes and towards a heterogeneous audience who has an interest to critically examine all the new literature available in the field.

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Acknowledgements Special thanks are in order to the editors of this book and to all the authors and co-authors of the chapters who have now successfully and collectively provided the academic community with unique and increasingly valuable literature. We would also like to thank the scientific committee of reviewers who helped us select these papers and the editors of this book. Lastly, special thanks go to the IEREK team for supporting the publication of the best research papers submitted to the conference.

Contents

In recent times, attempts to save our built heritage from rusting into oblivion, a dangerously rising phenomenon, and the homologation of scientific research in the field are give hope to the preservation of our past, and all that it encompasses, for future generations. Therefore, the preservation of our heritage represents an essential requirement to confirm the sense of attachment with our history and roots which is fundamental to our existence. In this perspective, historical architecture represents one of the most important tangible evidences of a community's history. The technological development which characterizes the last decades allows the world to consider increasingly innovative methods in maintaining and operating historical architecture, as well as making accessible the advanced tools required to achieve the proper preservation of materials and structures and related community identity.

In that sense, the chapter titled "Stabilization of the Ancient Serapeum at Saqqara—Strengthening Proposals Using Advanced Composite Materials" is an example of the best solution research in the strengthening process of architectural heritage, also considering advanced materials. In their work, The authors, after a presentation of the case of study and its criticalities, the authors illustrate several available approaches for the consolidation of the vaults, with specific comparisons to the works made in the past and highlighting the benefits of the technological development.

Similarly, in the work presented in the chapter titled "Structural Analysis and Safety Assessment of a Historic Hydraulic Structure in Egypt", the authors show how a suitable scientific approach allows us to obtain significant results through the assessment of a historic hydraulic infrastructure, which is currently in operating conditions. In particular, the authors present eometrical and material surveys of the structure, material testing results and numerical simulations carried out through a finite element approach to evaluate the stress state in different loading conditions.

This section of the book does not neglect the role of public spaces as functional systems for cities and the existing links between elements of cultural heritage and cultural memory rooted in those spaces. In the chapter titled "Trends of Contemporary Art in Innovative Interior Architecture Design of Cultural Spaces", the author highlights the role that culture spaces can play in preserving elements of a community's living culture as cultural heritage consists of not only people's collective memories and history, but also everyday experiences.

On that same note, the chapter on "Why Does Revenge Challenge Conservators More Than Avaton?" illustrates a stimulating debate related to autographic and allographic works, starting from two museum reinstallations of artworks, *Avaton* by Nunzio in 2007 and *Revenge* by Vascellari in 2018. After a detailed analysis of the cases of study, the authors focus the attention on architecture and restoration processes, encouraging interesting considerations.

Enna, Italy — Antonella Versaci
Perugia, Italy — Nicola Cavalagli

Structural Analysis and Safety Assessment of a Historic Hydraulic Structure in Egypt

Gehan A. Hamdy, Tarek S. El-Salakawy, Mohie-Eldien El-Mashad, and Reem M. Elwan

Abstract

Egypt has a large irrigation network with a huge number of hydraulic structures that were constructed in the nineteenth and twentieth centuries and have an important economical and heritage value. Many of these hydraulic structures suffer from increasing traffic loads, adverse environmental conditions, and lack of maintenance leading to material deterioration and structural damage. Concerns regarding the safety and serviceability of these important structures necessitated structural assessment activities currently going on within a national project for safeguarding the old irrigation structures. This paper presents the condition assessment and structural analysis of a typical example of old hydraulic structures in Egypt. Al-Shaala head regulator is an 80-year-old masonry head regulator located on Al-Bohia Canal in the Nile Delta. Its current condition is studied including site investigation, identification of the building materials, determination of the actual deteriorated material properties, and estimation of the current loading conditions. A numerical study is performed to evaluate the structural behavior in order to assess its structural efficiency and safety margin and decide if strengthening is required. Numerical modeling using finite elements and nonlinear structural analysis is performed using commercial program under the applied and the worse expected loading cases. The obtained results regarding stresses, deformations, and cracking within the structure indicate overall stability and safety of the structure in its current condition. High stresses were shown to occur at certain locations in the wing walls.

Keywords

Condition assessment • Historic • Masonry • Hydraulic structure • Finite elements

1 Introduction

Barrages and regulators are structures constructed across a river to raise the upstream water level in order to allow water to get diverted through a side or else to control the downstream water discharge (Novak, Moffat, Nalluri, & Narayanan, 2007). The irrigation network in Egypt is one of the world's largest surface irrigation networks in the world, conveying about 55.5 billion m^3/year of water into a dense network of waterways branching from the Nile river, including over 40,000 km of hierarchically classified canals: principal, main, branch, and distributary canals (Abu-Zeid & Rady, 1991, 1993). Control structures on the Nile include the High and Old Aswan Dams, many barrages, and regulators that stabilize the water flow and water level in the canals (Ashour, El Attar, Rafaat, & Mohamed, 2009). Hundreds of hydraulic structures constructed in nineteenth and early twentieth centuries of stone and brick masonry in addition to plain or reinforced concrete are still in service and are subjected to higher and more frequent traffic loads. The old masonry arch roadways were not designed to perform under the load levels typical of modern vehicles; some of them still perform well while others experience various forms of distress. Additionally, many of these structures are suffering material deterioration, aging, increased loading, environmental effects, and other adverse actions. Concern regarding the safety and serviceability of these important structures has led the Ministry of Water Resources and Irrigation and the Reservoirs and Grand Barrages Sector (RGBS) to undertake a national project for evaluation and rehabilitation of 150 of Egypt's heritage hydraulic structures.

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Y. Mahgoub et al. (eds.), *Cities' Identity Through Architecture and Arts*,
Advances in Science, Technology & Innovation, https://doi.org/10.1007/978-3-030-14869-0_1

This paper addresses condition survey and structural assessment and analysis of an old irrigation structure in order to properly predict the actual behavior under expected loadings taking into account the deterioration in strength of the masonry material. An example of a typical old regulator in Egypt is studied; Al-Shaala head regulator constructed in 1940 and located on Al-Bohia Canal at km19.00. Numerical modeling is made by finite elements nonlinear analysis using commercial software ANSYS v.19 (ANSYS, 2018). The finite element model and nonlinear analysis parameters are described; the numerical results are presented in terms of deformations, and stresses and are discussed.

2 Structure Description

The studied structure is the head regulator of Al-Shaala Canal, constructed in 1940. Al-Shaala is a branch canal which branches from Al-Bohiya Canal at 19 km from its start. Al-Bohiya main canal branches from the Tawfiki principal canal (Rayyah), which starts downstream the huge Delta Barrage north of Cairo (El-Assiutty, 2003; Ashour et al., 2009). Al-Shaala Canal is a small 12 km long irrigation canal with no navigation, which conveys irrigation water to about 17,000 feddans (1 feddan = 1.038 acres). The water slope does not exceed 100 mm/km. (i.e., 1:10,000), and the expected discharge of water through the regulator is about 6 m^3/sec during peak discharges (2003). Al-Shaala head regulator has two gate openings of 6.00 m width separated by a masonry pier; the pier and wing walls support a masonry arch bridge with 8 m wide roadway. All the supporting elements (piers, abutments, arches, and wing walls) are built using clay bricks; the plain concrete apron raft is founded on the canal bed. The upstream and downstream views of the regulator are shown in Fig. 1, together with plan, longitudinal section, and cross section.

3 Field Investigation and Material Testing

Site investigation was carried out for Al-Shaala head regulator within the RGBS national project for assessment of Egypt's major hydraulic structures. Visual inspection was made for the regulator accessible elements to identify and record visible damage and material deterioration; no problems related to local scour due to the erosion effects of water have been detected. Also, inspection of the substructure and its foundation was made through obtaining soil samples for evaluation of basic soil strength parameters (density, cohesion, and angle of internal friction) as well as sampling of the existing structure (masonry or plain concrete) for further structural analysis (RGBS, 2014a). Three boreholes were executed at the site with depth 16.00 m through the left abutment, pier, and right abutment of the hydraulic structure. All boreholes started from the bridge floor level, penetrating the pier and abutment material, floor, and the soil underneath. The drilling equipment comprises of a rotary drilling rig in order to obtain masonry and plain concrete cores and soil samples for classification and laboratory testing. Samples were retrieved using either split-barrel sampler/spoon or single-core barrel. Standard penetration tests (SPT) were performed in the location of each borehole by using a standard split-barrel sampler, to be used as a guide for the in-situ strength of the formation. Groundwater was encountered in the boreholes at a depth varying between 2.15 and 2.20 m from the bridge floor level. Disturbed and undisturbed soil samples were placed in plastic bags and/or waxed aluminum foil in core boxes and returned to the laboratory to be visually classified and the borehole logs prepared in accordance with the ASTM specifications after obtaining laboratory tests results, including the SPT records.

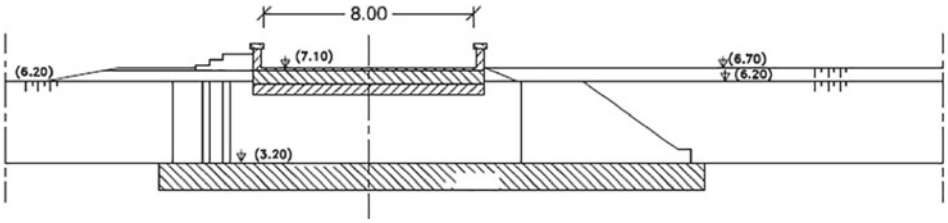
The geological profile drawn through the three borings is sketched in Fig. 2. Based on laboratory and field tests results, no problematic soil formations such as collapsible or swelling soil were detected that may present threat to the structure foundation or superstructure. It was recommended that the transmitted stresses from the structure at the foundation level (bottom level of plain concrete) should not exceed 0.225 N/mm^2. Formations at the site of the regulator can be summed up as follows (RGBS, 2014b).

- Layer (1): An asphalt layer on bridge floor level with 0.15 m thickness followed by crushed limestone layer to 0.25 m depth.
- Layer (2): Red bricks layers extend to a depth between 4.15 m and 4.20 m.
- Layer (3): Plain concrete layer followed the red bricks having thickness ranging from 0.75 m to 0.80 m.
- Layer (4): Silty clayey, clayey-sandy silt, and clayey-silty-sandy layers follow the plain concrete layer down to a depth ranging between 11.00 m and 13.00 m.
- Layer (5): Siliceous silty sand/siliceous sandy layers extend till 16.00 m depth.

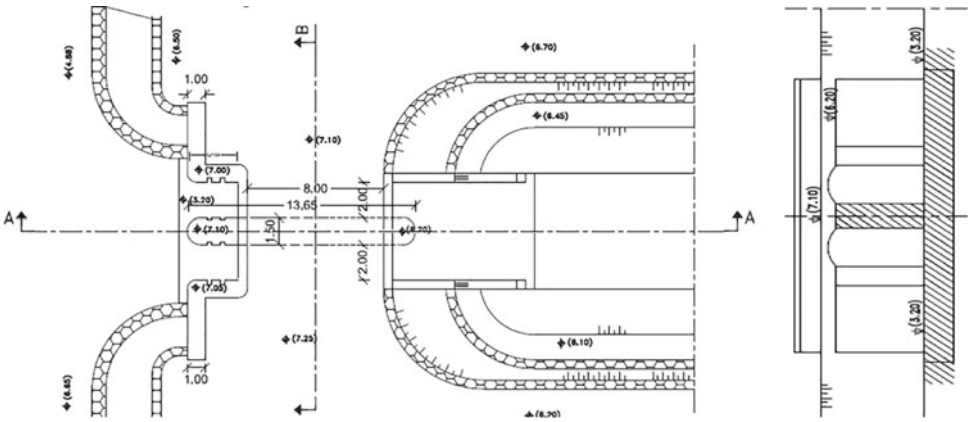
The core samples extracted from the abutments and piers are shown in Fig. 3. A total of 15 cylindrical samples were prepared from the extracted cores, Fig. 4, and tested under compression in accordance with the Egyptian specifications, as shown in Fig. 5. The test results are given in Table 1. The cylinder concrete strength f_{cy} is determined using the

Fig. 1 Al-Shaala head regulator

(a) upstream view (b) downstream view



(c) longitudinal section



(d) plan (e) cross section

correction factors given by ACI 214.4R-2010, (2010) considering the following four correction factors: $F_{L/D}$: due to length-diameter ratio; F_{Dia}: effect of core diameter; F_{mc}: effect of moisture content of core sample; F_D: taking into account the damage associated with core drilling process. The in-situ equivalent cube strength f_{cu} is then estimated considering the traditional correlation: $f_{\text{cu}} = 1.25\ f_{cy}$. The results of testing of core samples are given in detail and analyzed in Table 1 and are summarized in Table 2.

The test results indicated that:

- The unit weight of dry bricks' samples (12 samples) varies from 1.63 to 1.93 t/m^3 with an average value of 1.76 t/m^3.
- The brick compressive strength (12 samples) varies from 24 to 142 kg/cm^2 with an average value of 64 kg/cm^2 and standard deviation of 29.7 kg/cm^2.
- Considering criterion reported by ACI 214R-2, the strength of subject brick is 43 kg/cm^2, and the allowable brick strength can be reasonably considered 13 kg/cm^2.
- The unit weight of concrete samples (three data) varies from 2.28 to 2.78 t/m^3 with an average value of 2.45 t/m^3.
- The concrete compressive strength (three data) varies from 267 to 372 kg/cm^2 with an average value of 311 kg/cm^2 and standard deviation of 54 kg/cm^2.
- Considering criteria reported by ACI 214R-2, the strength of concrete is 267 kg/cm^2, and allowable concrete strength can be reasonably considered 65 kg/cm^2.

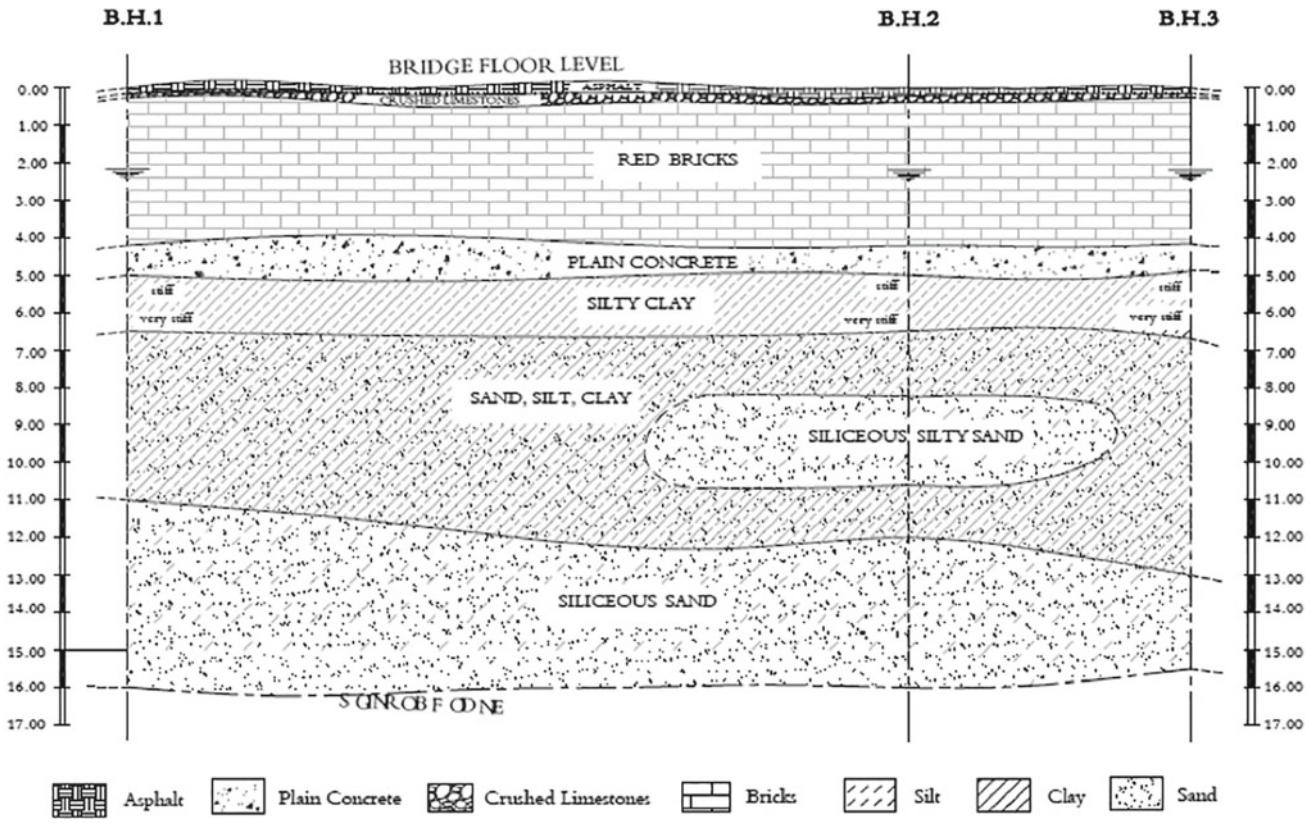


Fig. 2 Geological profile through the boreholes (RGBS, 2014b)

Fig. 3 Red bricks and concrete cores extracted from boreholes

Fig. 4 Extracted core samples prepared for compression testing (15 samples)

4 Structural Analysis

4.1 Approaches for Numerical Modeling and Nonlinear Analysis

In order to study the structural behavior of the regulator under the acting loads, the whole structure was numerically analyzed using the finite element method. The complex irregular nature of masonry construction makes accurate structural analysis a challenge. Mathematical models are powerful tools that predict the actual performance of the structure, yet they rely on the accuracy of the information provided by field experimental investigations and the engineering assumptions for numerical analysis. Several methods and computational tools are available to simulate the structural response; the most used assessment methods are overviewed by Gibbons and Fanning (2010).

To represent the heterogeneous and anisotropic nature of masonry construction using finite elements, different modeling strategies may be followed that are reviewed and compared by Roca, Cervera, Gariup and Pelà (2010).

Fig. 5 Laboratory compression tests made for the core samples

Table 1 Details and analysis of compressive strength tests results on core samples (RGBS, 2014a)

Sample No.	Boring No.	Depth (m)	Material	Dimensions (mm)			Core strength (N/mm^2)	Correction factors					
								Comp. strength (N/mm^2)					
L	D	L/D	$F_{L/D}$		F_{Dia}	F_{mc}	F_D	f_{cy}	f_{cu}				
1	1	0.25–1	Brick	82	98.8	0.83	11.4	0.846	1.02	1.09	1.06	11.4	**14.2**
2[a]		0.25–1		75	98.8	0.76	3.2	0.822	1.02	1.09	1.06	3.1	**3.8**
3		1.0–2.0		151	98.0	1.54	4.5	0.976	1.02	1.09	1.06	5.2	**6.5**
4		2.0–3.0		172	98.5	1.75	5.7	0.993	1.02	1.09	1.06	6.7	**8.4**
5		3.0–3.8		95	98.7	0.96	4.6	0.876	1.02	1.09	1.06	4.8	**6.0**
6		3.8–4.2		174	99.0	1.76	2.9	0.993	1.02	1.09	1.06	3.4	**4.3**
7		4.2–5.0	Conc	171	94.3	1.81	18.0	0.996	1.03	1.09	1.06	21.3	**26.7**
8	2	1.0–2.0	Brick	94	90.0	1.04	4.5	0.895	1.03	1.09	1.06	4.8	**6.0**
9		2.0–3.0		125	91.6	1.36	4.8	0.954	1.03	1.09	1.06	5.5	**6.8**
10		3.0–4.2		84	98.9	0.85	5.7	0.848	1.02	1.09	1.06	5.7	**7.1**
11		4.2–5.0	Conc	56	91.0	0.62	31.2	0.801	1.03	1.09	1.06	29.8	**37.2**
12[a]	3	1.0–2.0	Brick	162	96.6	1.68	1.7	0.988	1.03	1.09	1.06	20	**2.4**
13		2.0–3.0		173	96.8	1.79	3.0	0.995	1.03	1.09	1.06	3.6	**4.5**
14		3.0–4.2		183	96.3	1.90	4.8	0.999	1.03	1.09	1.06	5.7	**7.1**
15		4.2–5.0	Conc	162	96.8	1.67	20.2	0.988	1.03	1.09	1.06	23.6	**29.5**

[a]Defected core samples

Table 2 Summary of material properties as determined from tests (RGBS, 2014a)

Material	Unit weight (kN/m^3)	Compressive strength (N/mm^2)				Tensile strength[a] (N/mm^2)
		Maximum	Minimum	Average	ACI 214R-2	
Clay bricks	17.6	14.2	2.4	7.01	4.30	0.43
Concrete	24.5	37.2	26.7	31.13	26.7	2.67

[a]Tensile strength is assumed to be 10 % of compressive strength

Discretization of the structure can be performed using (i) detailed micro-modeling, (ii) simplified micro-modeling, (iii) macro-modeling where masonry is modeled as an isotropic continuum material characterized by different nonlinear softening laws in tension and compression (Roca et al., 2013). Comparison of the three modeling strategies for masonry conclude that the macro-modeling approach is more practice oriented due to the reduced time and memory requirements as well as a user-friendly mesh generation, and describes the structural behavior with acceptable accuracy (Lourenço, 2002), and it was used in the present study where masonry is modeled using a smeared crack approach.

Alternatively, Oliveira, Lemos and Lourenço (2010) used the rigid block limit analysis method to investigate the load-carrying capacity of masonry arch bridges. The discrete element method (DEM) provides a tool for the study of failure mechanisms involving the masonry discontinuities, and interface or the rock mass joints. Bretas, Lemos, and Lourenço (2014) used DEM for static, dynamic, and hydro-mechanical analysis of masonry gravity dams;

application was made to study the seismic behavior of Lagoa Comprida Dam in Portugal, a 28 m high masonry dam with a length of 1200 m constructed 1912–1967. Several continuous and discontinuous models were developed to assess the main failure mechanisms, including overstress, partial, and global sliding and overturning; the results were compared to illustrate the strengths and drawbacks of each approach. Pulatsu, Erdogmus, and Lourenco (2018) modeled a historic masonry arch bridge, the Donim Bridge in Turkey, using DEM; a three-dimensional model was made using discrete blocks and back-fill material is generated as a continuum mesh, based on plasticity theory. The load-carrying capacity and related collapse mechanisms are investigated and are validated with previously published experimental work as well as field tests.

Fanning and Boothby (2001) employed finite element analysis (FEA) for numerical modeling and nonlinear analysis of stone masonry arch bridges using commercial package. The material properties were assumed based on visual observations of the material and construction of the structure; three-dimensional nonlinear finite element analysis enabled good predictions of the actual behavior of the masonry arch bridge, compared to the results of conducted field testing. Cito and Woodham (2014) studied a two-span masonry arch bridge using a finite element analysis (FEA) commercial software. The bridge was modeled using 3D linear model and 2D linear and nonlinear models adopting a smeared crack approach. The numerical models were calibrated and compared based on a field load test by comparison of displacements and strains at specific points along the span direction. The 2D linear model, though requiring less modeling and computational effort, may lead to erroneous predictions of the stress levels in the bridge, especially for loads approaching the ultimate capacity of the arch, and was thus considered to provide appropriate but conservative rating as it requires maximum stresses to be below allowable stress values. The 3D linear model requires higher modeling and computational costs but provide more realistic stress distributions than a linear 2D model as it accounts for the transversal (i.e., perpendicular to the longitudinal span direction) component of the structure, capturing the three-dimensional behavior of the bridge. The nonlinear 2D model employed nonlinear material formulations for the fill and the masonry provided more accurate prediction of the stress levels and rating results, in spite of the higher computational cost of a nonlinear analysis and the difficulties of calibrating nonlinear material parameters. Kamiński (2018) compared two numerical approaches for assessment of masonry arch bridges: the ultimate limit state and the limit analysis commonly used in load-carrying capacity evaluation of various structural systems are described, and their potential and effectiveness in application to masonry arch bridges are discussed. Analyses were carried out based on finite element models taking into account nonlinear material properties as well as geometrical nonlinearities related to contact problem between structural components.

4.2 Finite Element Mesh

A three-dimensional finite element model was made for the whole regulator structure using the commercial software ANSYS v.19 (ANSYS, 2018). In the three-dimensional model, the masonry components (arches, abutment, wing walls, and piers) are represented through macro-meshing strategy using solid elements SOLID 65 to define the individual blocks and zero thickness joint elements at their interfaces (stone-to-stone joint type), which are shown in Fig. 6.

4.3 Material Properties

Laboratory tests were made on cores extracted from the regulator elements, and the determined material properties are listed in Table 1. The material properties of masonry adopted in the analysis are as follows: masonry compressive strength (f'_m) = 4.3 MPa; modulus of elasticity (E_m) = 995 MPa; weight density = 18 kN/m^3; major Poisson's ratio = 0.15. Tensile strength is assumed to be 0.1 f'_m = 0.43 MPa as suggested by several references and codes (ECP-204, 2005). The stress–strain relation for masonry is adopted from the literature described in previous work (Kaushik, Rai, & Jain, 2007).

4.4 Loads and Load Cases

The loads acting on the regulator structure were calculated according to Egyptian code (ECP-201, 2012) and can be listed as follows.

1. Dead load: the own weight of the structural element and the fill material till road surface.
2. Live load: pedestrian and vehicles loads on the road and bridge.
3. Water static pressure on piers, abutment and raft, calculated for the upstream and downstream from the equation:
   $P_w = \gamma_w * h$ where: γ_w = 10 kN/m^3 and h = depth of water.
4. Earth pressure: static earth pressure on abutment and wing walls, calculated as

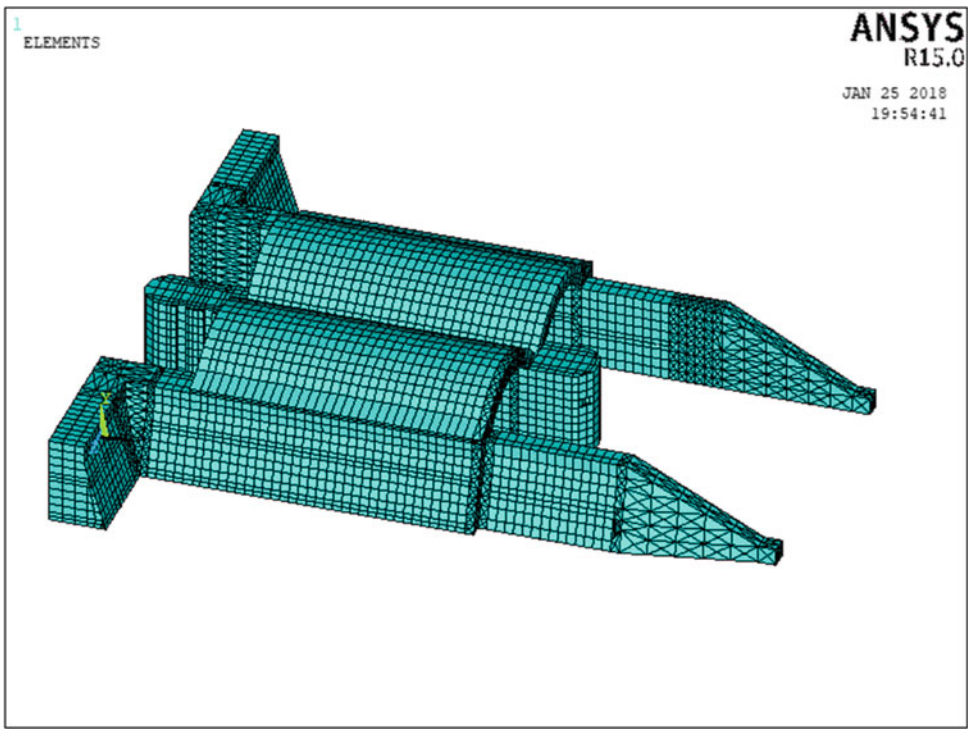


Fig. 6 Three-dimensional finite element mesh of the regulator

$P = \gamma_s * h_s * k_a\ k_a = (1–\sin\phi)/(1 + \sin\phi)$.
where: γ_s = soil density, h_s = depth of soil column and $\phi = 45°$

5. Surcharge: Surcharge of about 1.0 t/m^2 distributed on soil behind the wing wall due to effect of traffic was taken into consideration for earth pressure calculation.

No flooding wave or dynamic effects due to water flow are considered. Control structures on the Nile River including the High and Old Aswan Dams, many barrages, and regulators stabilize the water flow and water level in the canals (El-Assiutty, 2003, Ashour et al., 2009). Also, Al-Bohia and Al-Shaala canals are small branch canals and are not navigation canals; the water slope is very mild (about 1:10,000), and the water speed is very low.

The regulator is subjected during its lifetime to construction or maintenance condition, operation condition, and 'taharek' condition. Also, a case was considered where deterioration of masonry material was assumed to be 40% of its original properties (Elwan). The two load cases considered are:

Case (a): Construction case: the applied loads on 2019 the regulator are the own weight, the filling above the arch, and the back filling on the side which represent the lateral earth pressure without water.

Case (b): Operation case: the applied loads on the regulator are maximum water level, live load, and earth pressure with the ground water pressure. Maximum upstream water level (6.20) and downstream water level (3.00).

4.5 Nonlinear Analysis Parameters

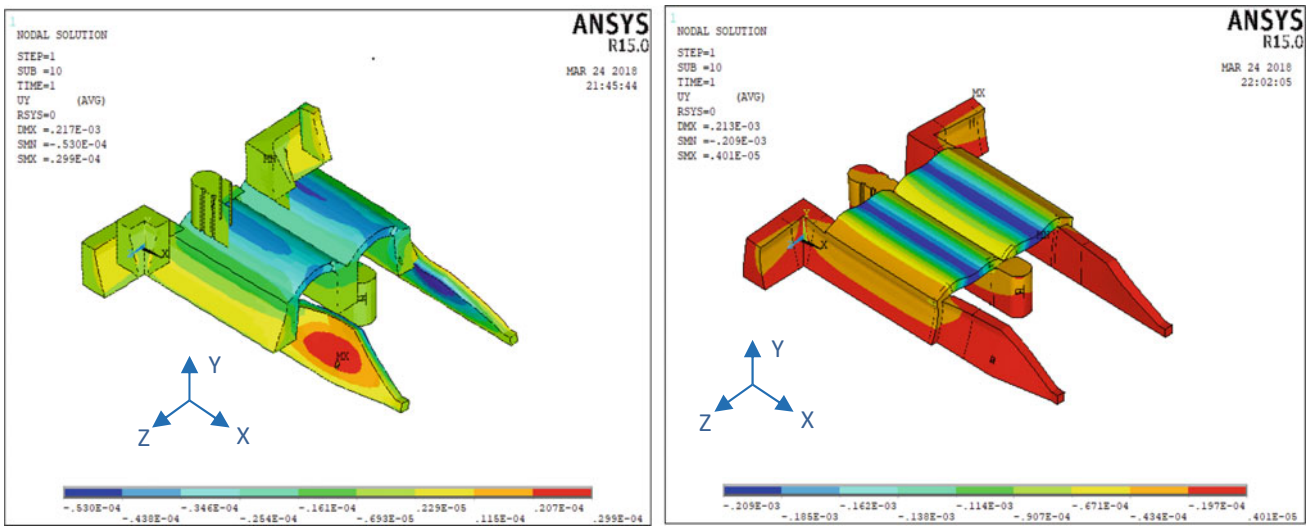
The nonlinear analysis parameters adopted are defined in the software as follows:

- Shear coefficient along opening cracks (ShrCf-pO) = 0.2.
- Shear coefficient along closed cracks (ShCf-Cl) = 0.8.
- Tension limit, cracking limit (UnTensSt) = 0.43 MPa.
- Compression limit, crushing limit (UnCompSt) = 4.3 MPa.

5 Numerical Results

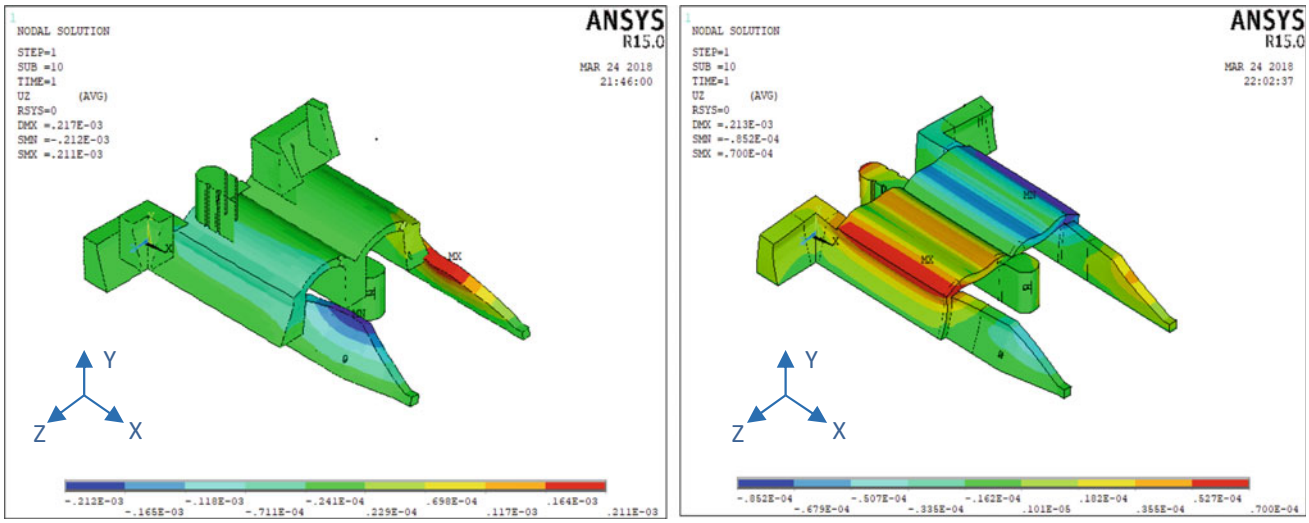
The results obtained from the nonlinear analysis regarding deformed shape in y- and z-directions and stresses in y- and z-directions due to the studied load cases are shown in Figs. 7, 8, 9, and 10.

During construction or maintenance case (a), the wing walls are subjected to vertical surcharge and earth pressure from one side with no water pressure, thereby causing deformation in *y*-direction of maximum value 0.03 mm and 0.05 mm in the exterior and interior sides, respectively (Fig. 7a), and stresses in *y* direction have maximum value in tension and compression equal to 147 and 200 kPa, respectively (Fig. 9a). Since the experimentally determined average compressive strength and the calculated average tensile strength for the regulator brick masonry are 4300 and



Case (a) construction Case (b) operation

Fig. 7 Deformed shapes in *y*-direction (vertical direction)



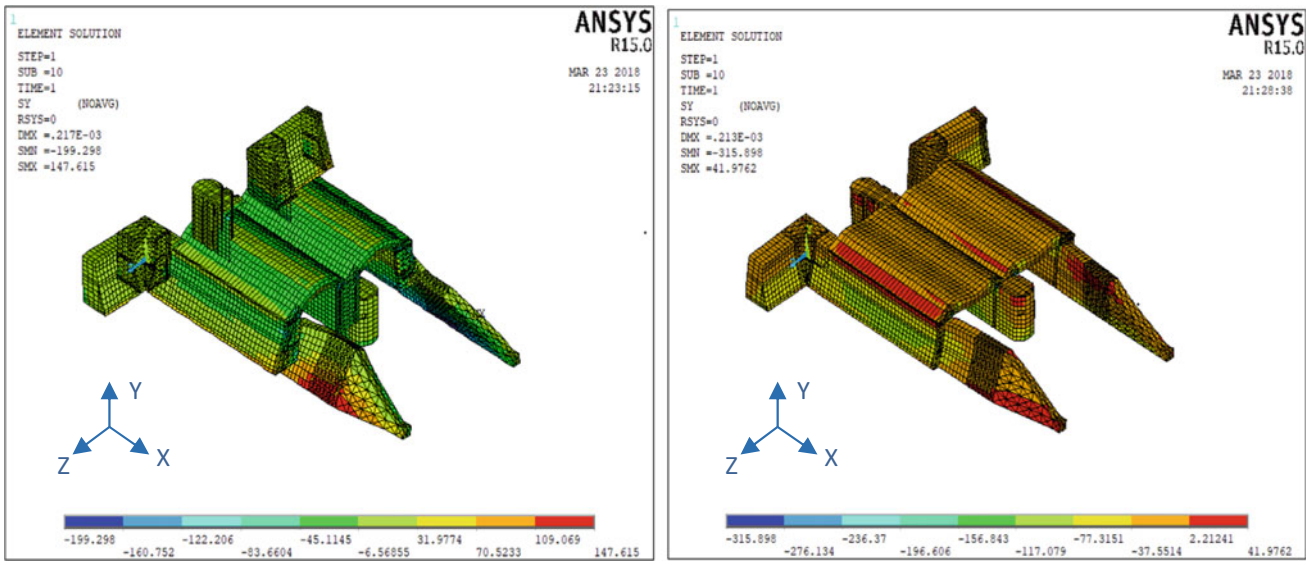
Case (a) construction Case (b) operation

Fig. 8 Deformed shapes in *z*-direction (lateral or transverse direction)

430 kPa, respectively, the stresses are therefore considered much lower than the limit for safety.

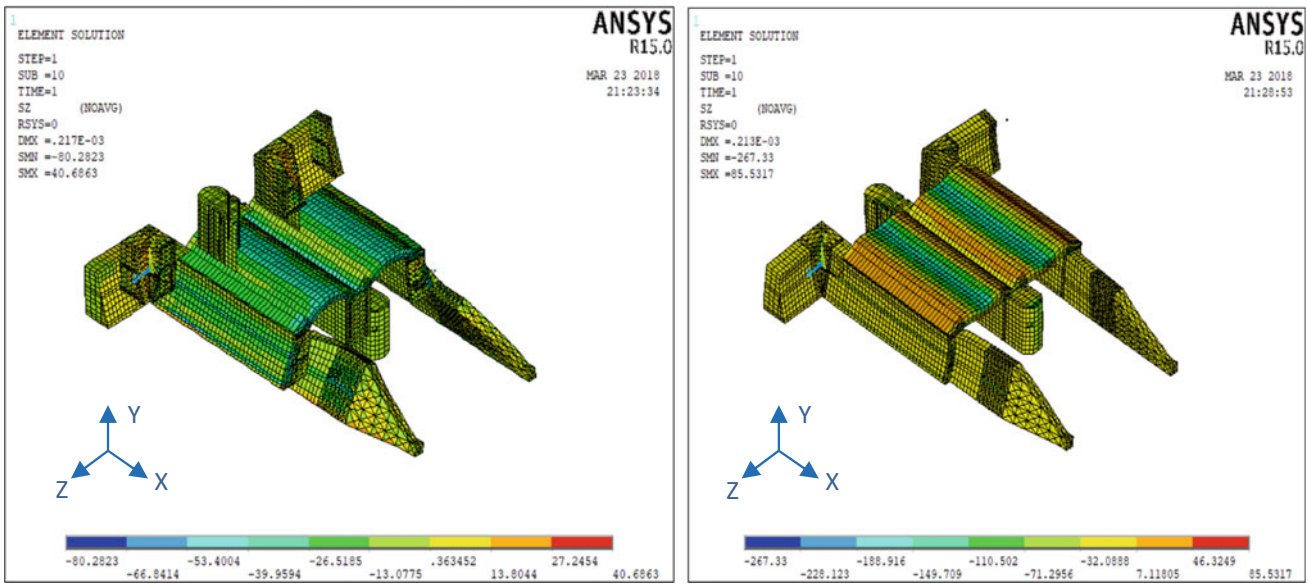
For the operation case of loading (b), the applied loads on the regulator are maximum water level, live load, and earth pressure including ground water pressure. The numerically obtained deformation of the in *y*-direction has maximum value of 0.02 and 0.203 mm downwards in the wing wall and arch, respectively (Fig. 7b). The deformation of the wing wall in *z*-direction is 0.07 and −0.085 mm (Fig. 11). Stresses in y-direction have maximum value in tension equal to 42 kPa and in compression equal to 267 kPa in the wing wall, as shown in Fig. 9b. In the *z*-direction, stresses in the wing wall are subjected to lateral earth pressure from the outside and water pressure from inside, which reduce the stresses to be 3 and 91 kPa in tension and compression, respectively, Fig. 10b.

By applying reduction of the mechanical properties of the masonry material, the deformation of the wing wall



Case (a) construction Case (b) operation

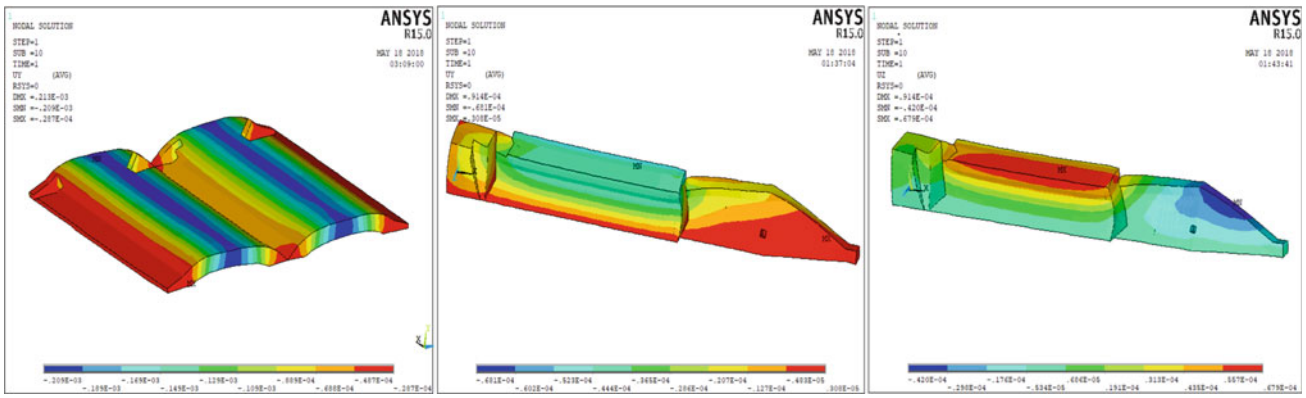
Fig. 9 Stresses in *y*-direction (vertical direction)



Case (a) construction Case (b) operation

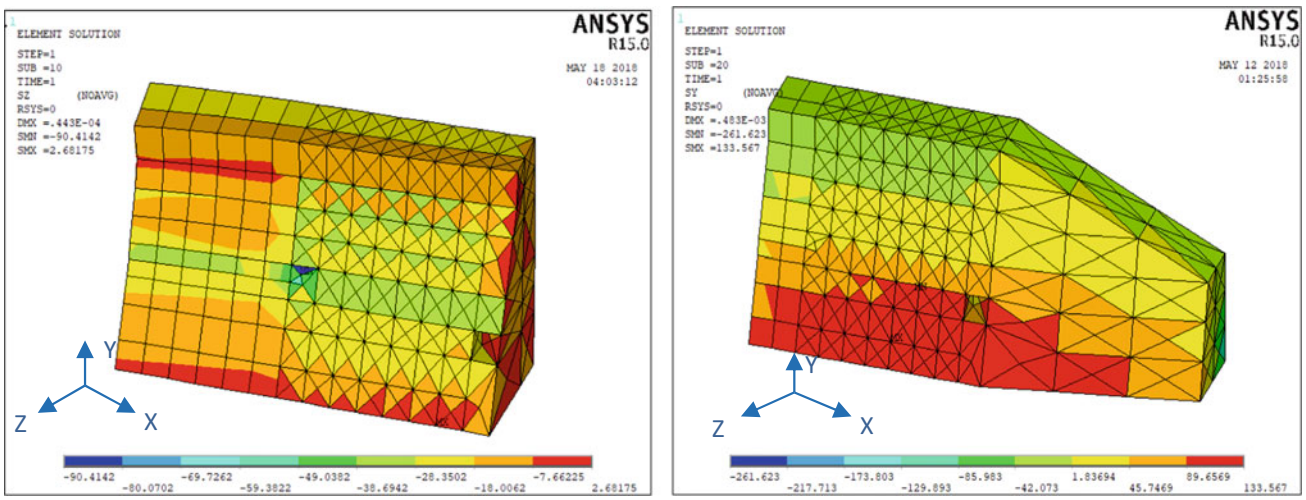
Fig. 10 Stresses in *z*-direction (transverse direction)

downstream in *y*-direction increases to reach 0.0504 and −0.143 mm, respectively. In the wing wall, the stresses in *y*-direction increase to reach 134 and 262 kPa in tension and compression, respectively, as shown in Fig. 12. Additionally, stresses in the pier upstream around the gate increase to 160 and 768 kPa in tension and compression, respectively, and cracks appeared concentrated around the gate, Fig. 13. The extreme stresses at some selected points are given in Table 3 for the different studied cases of loading. Based on the results, it is observed that all tension and compression value is in allowable tension 425 kPa and compression 4250 kPa value, and the regulator is safe under the studied cases of loadings.



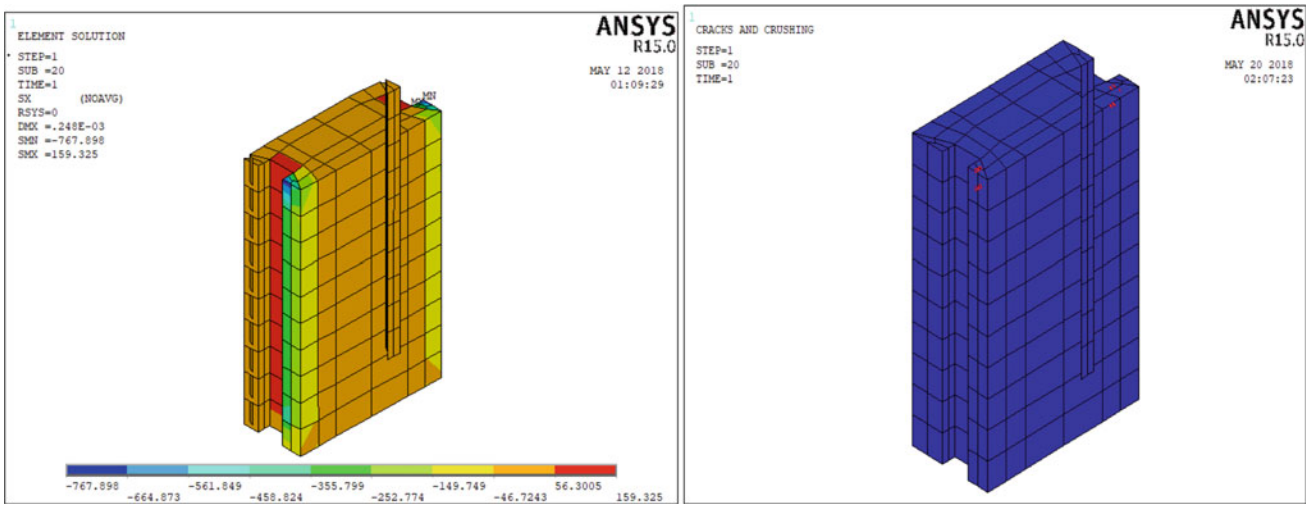
(a) arch (b) wing wall in y-direction (b) wing wall in z direction

Fig. 11 Deformed shape of arch and wing wall for operation case



(a) stresses in z direction for operation case (b) stresses in y direction for deterioration case

Fig. 12 Stresses in the wing wall of regulator



(a) stresses in x-direction (b) crack pattern

Fig. 13 Stresses and crack pattern in the upstream of the pier for deterioration case

Table 3 Extreme stresses at some selected points in the regulator

Point	Location	Stress direction	Stresses (kPa)		
			Construction	Operation	Deterioration
1	Arch bottom	Z	22.115	82	22.43
2	Arch top	Z	–31.66	–103.63	−86.47
3	Wing wall outer side	Y	143.349	12.156	133.56
4	Wing wall inner side	Y	−55.73	−62.95	−217.7
5	Pier bottom	Y	–30.35	−137.21	−126.9
6	Pier side	Z	1.08	16.76	9.36
7	Arch soffit at connection with wing wall	Z	−27.7	48.5	4.56
8	Gate connection	X	6.28	60.6	159.325

6 Conclusions

The existing old irrigation structures in Egypt, constructed 100 to 200 years ago, are of considerable economical as well as heritage value. Most of them are still in service and are subjected to adverse environmental and loading conditions. This paper presented numerical study of a typical old masonry regulator to properly predict the actual behavior under the existing loadings taking into account its current materially degraded condition.

A three-dimensional finite element model was made for the historic masonry regulator through the macro-modeling approach using the commercial software ANSYS; the exact geometry and current condition of material properties were represented. Nonlinear analysis was carried out to evaluate the structural behavior under two loading conditions: the construction and operational load cases.

The numerical results indicate that the stresses in the regulator due to the applied loads show high values at some locations but are within the allowable limits. The numerically predicted deformations are also within the acceptable limits, and no cracks were observed. However, the local damage observed in specific parts of the regulator should be represented using more sophisticated damage models. Also, failure state limit analysis should be carried out as extension to this work, for assessing the actual fatigue capacity and for evaluating the residual service life.

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Stabilization of the Ancient Serapeum at Saqqara—Strengthening Proposals Using Advanced Composite Materials

Gehan A. Hamdy

Abstract

This paper presents structural strengthening solutions for the rock-cut tunnels and burial chambers of the ancient Serapeum at Sakkara, Giza, Egypt, which date back to the thirteenth century BC. The heritage ancient monument has recently shown severe deterioration, and strengthening was needed to provide support against cracking or falling of some stone fragments off the roof or walls probable to occur in case of excessive deformation. Different strengthening systems for tunnel and burial chambers are presented using fiber-reinforced polymer (FRP) products. Externally adhered FRP fabric and strips, FRP bars, and grids are utilized which have small thickness and thus provide larger clear space and less interruption of view and passage of visitors, and are thereby expected to provide better esthetics, serviceability, and usage of the monument. Additionally, FRP panels and sections are also proposed as strengthening systems for parts of the tunnel. In addition to high structural efficiency, this strengthening solution causes minimum intervention and alteration to the monument appearance, and being non-invasive and reversible, it conforms to the world regulations and recommendations for conservation of heritage structures.

Keywords

Conservation; historic; strengthening • Composites • FRP laminates • FRP sections

1 Introduction

The "Serapeum at Saqqara" is a world-acknowledged heritage monument regarded as a unique cultural and engineering marvel. It has recently suffered severe deterioration (Mathieson, Bettles, Dittmer, & Reader, 1999; Davies, Smith, & Frazer, 2006). Concerns about the safety of that invaluable monument have demanded initiation of a national salvation project to preserve the historic value of the monument. The restoration project involved survey, diagnosis, analysis, execution, and monitoring phases (Emam, 2006).

This paper is concerned with the interventions needed for structural strengthening of the Serapeum tunnel and chambers. It presents the outcome of a study conducted in order to suggest and design the required structural strengthening (Hamdy, 2008). The following sections present the proposed strengthening schemes utilizing advanced composite materials, namely fiber-reinforced polymers (FRP), which have recently gained wide acceptance in the field of historic restoration and were reported to provide several advantages over traditional techniques in many cases.

Fiber-reinforced polymer (FRP) composites have proved efficiency for structural strengthening due to the advantages of these systems from the structural and constructional points of view (Triantafillou, 2005). FRP sheets or strips are externally bonded and perfectly attached to plane or curved surfaces. Strengthening is achieved through the high stiffness of FRP, which provides confinement and converts stresses causing lateral deformation into tangential tensile stresses in the FRP sheet or strip (Valluzzi, Modena, & De Felice, 2001). Due to the perfect contact and bonding with all points of the surface, effective load transfer and efficient stress redistribution within the strengthened structure take place (Capozucca, 2007). By limiting the possibility of lateral deformation, enhancement of the strength and mechanical properties is achieved (Bati, Rovero, & Tonietti, 2007). In addition, FRP possess high residual strength and well responds to the application of cyclical loads, such as

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Y. Mahgoub et al. (eds.), *Cities' Identity Through Architecture and Arts*,
Advances in Science, Technology & Innovation, https://doi.org/10.1007/978-3-030-14869-0_2

vibrations and earthquakes; thus, the carrying capacity is increased, and excessive deformations due to vibrations or seismic action are avoided (Balsamo, Battista, Herzalla, & Viskovic, 2000).

Due to the structural and constructional advantages, FRP was used successfully as external reinforcement for deteriorated or damaged rock-cut tunnels and concrete tunnel lining. In Japan, many of the existing railway and infrastructure tunnels are cut in low strength strata or intersected by many faults and showed significant deformation and stresses on tunnel linings and therefore needed repair. Carbon fiber sheet products were preferred over conventional methods such as rock bolts, shotcrete-based linings, and extensive steel framing because of ease and speed of application in addition to structural efficiency (Wu, Wang, & Iwashita, 2007). Two plies of CFRP sheets were applied in the longitudinal and transverse directions to repair an existing concrete lining of Ichnose Tunnel in Shikoku and Yamaki Railway Tunnel in Tottori. CFRP was used in 1992 to repair a cracked portion of the concrete arch of Nikkureyama highway tunnel in Gunma, in order to prevent further damage and exfoliation of concrete due to increase in rock pressure from an expansive mudstone layer and to strengthen the lining to support the anticipated increases in rock pressure over the next 20 years; the area of retrofit measured 9 m across the arch and 40 m in length. Retrofit of Ningyotoge Tunnel in Okayama was done in 1993, where the arch region of a section had been weakened by swelling and deformation of the side wall, which was in contact with a layer of metamorphic rock, using CFRP sheets for enhancing capacity of the arch to absorb increased bending moments and to prevent further cracking and exfoliation of concrete (Karbhari, 1998). A study by Asakura, Ando, Omata, Wakana, and Matsuura (1994) confirmed the effects and countermeasure of FRP sheet and back-fill grouting in strengthening the tunnel lining. FRP grids, such as NEFMAC, have also been used for reinforcement of tunnels in Japan (Karbhari, 1998). Hara (2014, 2015) proposed use of FRP corrugated panel for reinforcement of an old rock tunnel about 10.5 m diameter, where the original concrete lining was deteriorated and damaged. Using transparent FRP corrugated sheets will enable observing further new cracks and small movement of rocks and concrete and therefore monitor and maintain the tunnel.

Use of non-traditional materials, such as FRP composites, for retrofit of heritage structures was addressed by international charters. The Charter of Venice (ICOMOS, 1964) states that "where traditional techniques prove inadequate, the consolidation of a monument can be achieved by the use of any modern technique for conservation and construction, the efficacy of which has been shown by scientific data and proved by experience." ICOMOS recommendations (Article 3.7) states that "the choice between traditional and innovative techniques should be weighed up on a case-by-case basis and preference given to those that are least invasive and most compatible with heritage values, bearing in mind safety and durability requirements" (ICOMOS, 2003). Article 3.10 states that "the characteristics of materials used in restoration work (in particular new materials) and their compatibility with existing materials should be fully established, including long-term impacts, so that undesirable side-effects are avoided" (ICOMOS, 2003). The CNR DT-200 declares that interventions with FRP on monuments and historical architecture have to be justified as indispensable for the building, and the respect of the principles of restoration has to be guaranteed (CNR-DT200, 2004).

FRP systems have been applied worldwide for retrofitting of historic structures (Triantafillou & Faradis, 1997; Baratta & Corbi, 2012). FRP laminates were used to provide confinement to a stone masonry column in Palazzo dei Celestini, Lecce, Italy, built in the sixteenth century which showed wide vertical cracks that threated crushing failure; FRP rods were inserted as dowels to increase the effectiveness of confinement (La Tegola, De Lorenzis, & Micelli, 2000). In San Giorgio Church, Lecce, Italy, differential settlement caused damage to the arches and vaults and high stress levels in the masonry walls, creating a possibility of local crushing. FRP laminates were applied in the internal side of the vaults to bridge the existing cracks; due to the very small thickness of the laminate, no sign of intervention was visible on the surface after plastering (La Tegola et al., 2000). FRP laminates were applied for the 700 years old San Francesco Basilica in Assisi, Italy, after the 1997 earthquake caused large cracks and permanent deformation in the vaults. Because the internal surfaces of the vaults were covered by precious frescoes, it was decided to use aramid and glass fibers bonded with epoxy resins around a wooden core as very thin ribs on the extrados of the vaulting, and also pins made of aramid fiber and epoxy resin were driven into the masonry (Balsamo et al., 2000). The cathedral of Arequipa in Peru, built in 1629, was rehabilitated after the extensive damage caused by an earthquake in 2001, where the bell tower was severely damaged and in unstable equilibrium condition; CFRP strips were used for confinement of the central core of the masonry tower (Torrealva, Blanco, Tumialan, & Nanni, 2003). Unbonded FRP tendons were used to apply circumferential prestressing to the external walls and the exterior of the dome of Church of Panaghia Faneromeni in Egion, Greece (Triantafillou, 2004). Consolidation of a very depressed brick masonry vault of the central hall of the thirteenth century Villa Bruni in Padova, Italy, included FRP strips repair of the main cracks at the intrados and extrados of the severely cracked vault (Valluzzi, Da Porto, & Modena, 2004). The capitals of the columns of the thirteenth century Palazzo della Ragione in Padova, Italy,

were confined using CFRP strips, in order to replace or integrate the existing metal rings (Valluzzi, Modena, & De Felice, 2014). Intervention with FRP was made in the church of S. Maria in Organo in Verona, Italy, which dates back to the sixth to eighth centuries, and was rebuilt after an earthquake in 1117. The main vault was stabilized using CFRP strips applied on new masonry portions (ribs and side-walls) connected to the surface of the existing masonry, so that any removability problems would not affect the original material. FRP composites were also used to improve the overall behavior of the vaults of the church of S. Corona in Vicenza, Italy, built in the thirteenth century. Interventions to improve the seismic capacity combined local injections, partial rebuilding, repair of cracks in masonry, application of steel ties at various levels as well as reinforcing the cross-vaults in the naves at their extrados with 20-cm longitudinal CFRP strips to improve collaboration among cross-vaults (Valluzzi et al., 2014). FRP was used for retrofit of the medieval bell tower of Santa Lucia's Church, Ancona, Italy. A tie system made up of vertical, horizontal, and diagonal FRP sheets was applied to the inner masonry walls to enhance the seismic capacity of the structure. Surface treatment with sand gave the FRP an appearance more compatible with the original masonry. The intervention was considered "reversible" because the applied FRP can be removed by an air jet (Cosenza & Iervolino, 2007).

In Egypt, externally bonded FRP laminates were also used for stabilization of two 800 years old brick domes in Cairo, Egypt: El-Eini dome and Soudon dome (Mahfouz & Rizk, 2003). The historic domes showed vertical cracks penetrating in the body of the dome. The large number and width of cracks necessitated confining by carbon FRP sheets on the exterior of El-Eini dome and on the supporting vertical wall. The strips were covered by crushed brick mortar to maintain the original color and texture of the historic dome. The external surface of the historic brick dome of Sodoun had artistic carvings; so a stitching repair method was applied on the interior of the dome using both U-shaped CFRP sheets and CFRP-laminated inserts (Mahfouz & Rizk, 2003). FRP was also for repair and restoration of the St. Peter's Church in Cairo, Egypt, built in 1911 and having a historic and artistic value, which was subjected to terrorist bombing in December 2016. CFRP laminates were adhered to the exterior of the brick masonry walls for consolidation and strengthening (MasterBuilders, 2018).

The above applications show that FRP has a great potential for use in retrofit of historic structures; however, many aspects related to its durability and compatibility with the traditional materials are to be resolved, especially due to the use of resins as bonding system. In the following sections, several alternatives for stabilization of the Serapeum at Sakkara using FRP systems are proposed and discussed.

2 Historical Background and Description

The term "Serapeum" refers to the catacombs and religious structures associated with the burial of the Apis bulls and their subsequent worship as Osorapis, i.e., Osiris-Apis, a divinized form of the Apis bulls (Renberg, 2007). The Serapeum at Saqqara, located on the west bank of the Nile near the ancient Memphis (currently Giza) in Egypt, dates back to the thirteenth century BC, when the Egyptian king Ramses II (1279–1253 BC) ordered excavation of a main tunnel and subsidiary chambers or catacombs to contain large granite sarcophagi (burial boxes) which held the mummified remains of the sacred Apis bulls together with thousands of inscribed objects, and was repeatedly enlarged by succeeding kings until the Greco-Roman period about 30 BC (Martin, 1981; Thompson, 1988). It was first discovered in 1850–1852 by Auguste Mariette, a French Egyptologist (Dodson, 2000). A second area of the Serapeum underwent excavation beginning in the 1980s (Mathieson et al., 1999). The entrance and interior view of the ancient tunnels and burial chambers are shown in Fig. 1. The layout of the ancient tunnels and burial chambers are shown in Fig. 2. The main tunnel corridor is approximately 203 m long, 2.3–2.8 m wide, and 4.75 m high; 30 burial chambers are carved on both sides of the main tunnel; side tunnels are also present with no chambers (Davies et al., 2006) (www.soul-guidance.com/houseofthesun/serapeum.html).

3 The Restoration Project

Deterioration of the Serapeum at Sakkara was reported by excavations carried out in the 1980s and continued until it reached a dangerous condition (Mathieson et al., 1999; Sayed & Rohl, 1988). The observed deterioration and potential risk of probable cracking or falling of some stone fragments off the roof or walls necessitated restoration of the monument to preserve the historic value of the monument. Scaffolding was made and stone pillars were erected at several locations to provide temporary strengthening for the roofs and sides of the main tunnel, as shown in Figs. 3 and 4. The Egyptian Supreme Council of Antiquities (SCA), the responsible authority for the archeological sites in Egypt, started a conservation strategy in 2001 to salvage and consolidate the Serapeum. Systematic investigation of the monument was conducted and included historical, geological, geotechnical, and structural survey, field research and laboratory testing, rock mechanics study, diagnosis, and safety evaluation. Field survey indicated that increase of irrigation water in the neighboring heavily cultivated land and poor drainage (major irrigation structures constructed in the last century changed the seasonal plantation and

Fig. 1 Entrance of the Serapeum and interior view of corridor and burial chambers

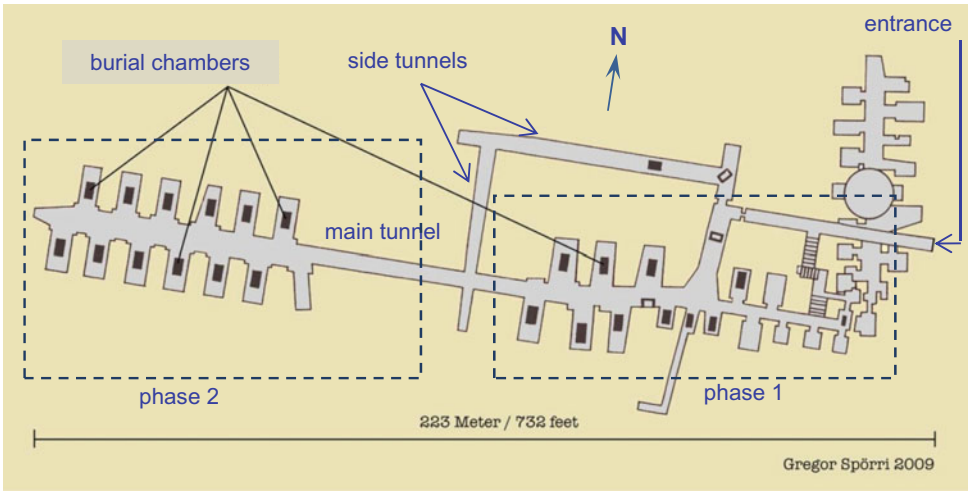


Fig. 2 Layout of Serapeum tunnels and burial chambers (https://www.soul-guidance.com/houseofthesun/serapeum.html)

irrigation scheme adopted for thousands of years to be all year round) caused rise of groundwater level in the whole area and increase of salts seepage in the soil. The geotechnical investigations showed that the tunnel and burial chambers are carved in a soft layer of shale within the limestone rock mountain, as shown in Fig. 5 (Emam, 2006). This layer of shale with lime content has tendency of swelling by wetting, and seepage of groundwater induced swelling of this layer causing the cracks and defragmentation observed in the Serapeum rocks, Fig. 4. Nearby military training fields caused vibrations and disturbance of the weak soil layers; the recent increase of cracks in the rock and crack width can be attributed to this activity. The salvation and restoration project started with scaffolding of the burial chambers roofs, safeguarding the stone sarcophagi using cork and wood planks, documenting the existing cracks, monitoring crack development in order to detect active cracks, and producing risk zones map. Also, dehumidification devices were installed to reduce humidity is regarded as the major cause of the shale deterioration and disintegration.

Monitoring of the existing cracks for several months showed that the cracks were not currently opening or extending, so there was no threat of major collapse (Emam, 2006). Preservation and protective actions were decided to be made to consolidate the tunnel and chambers roof. Injection of polymer grout into the cracks in the rock tunnel and chambers roof and sides was made by manual injection with pressure 2 bar to a depth of 0.25–0.30 m; details of the injection work is described in the report presented by the main consultant (Emam, 2008). The grouted rock is also regarded to act as a stiff roof layer or element for the tunnel and chambers. Requirement to strengthen the tunnel roof and walls to minimize or eliminate threats in case of excessive rock deformations, repeated vibrations, or overstress was emphasized.

4 Problem Statement

Debate started between the archeologists and engineers regarding the most suitable method to strengthen the roof and walls, and whether or not to use steel scaffolding and steel anchors to support the ceiling of the tombs; also UNESCO experts' advice supported the engineers' opinion to use steel scaffolding. During the years 2001–2010, steel frames were designed and constructed in some chambers to provide support against any probable cracking or falling of some stone fragments off the roof or walls. The steel frames were assembled in the workshop, imported to the site, carried

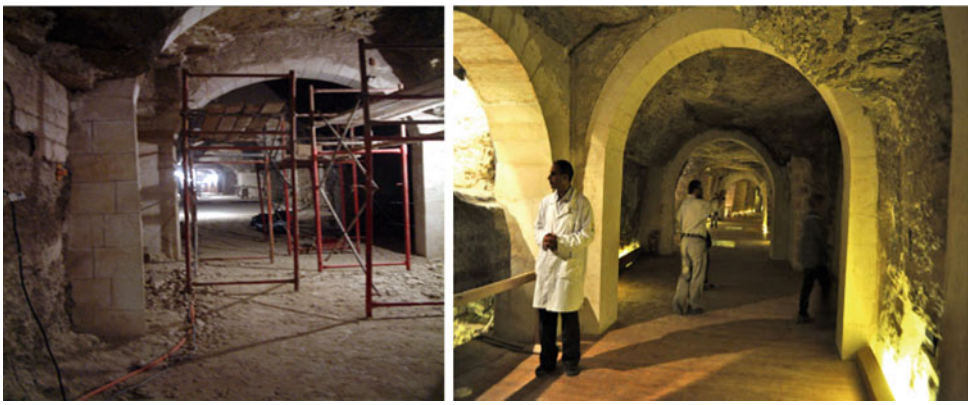


Fig. 3 Main corridor with protective scaffolding and previous restoration works

Fig. 4 Observed deterioration and cracks in the roof of the main corridor

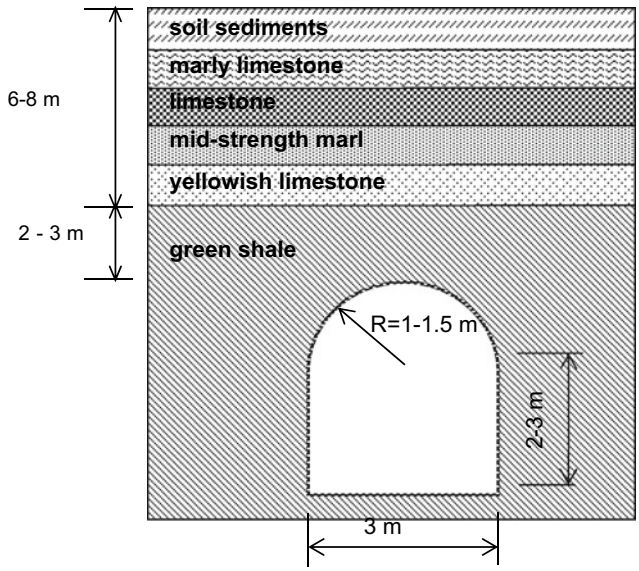


Fig. 5 Soil profile and approximate dimensions of the rock-cut tunnel and chambers (Emam, 2006)

down into the tunnels and fixed to the previously constructed concrete bases. Transverse steel beams were then placed to connect the frames together at their bases level, and other steel beams were placed over the frames and topped with flexible fillers to support the roof (Emam, 2008). Due to the frames bulk size and massive weight, the process of transporting them down the tunnels required a lot of time and manpower, but cannot be avoided as the steel frame fabrication requires sophisticated equipment and techniques that could not be provided inside the tunnels. This rendered the construction to be slow and tedious. Moreover, after the construction of the steel frames in some of the burial chambers, it was observed to notably decrease the space and clear height, which will affect the view and enjoyment of the visitors. Some of the steel frames erected in burial rooms are shown in Fig. 6; the frames considerably reduce the space, obstruct the view, and hide the rock surface. Concern aroused about the subsequent strengthening phases. The main corridor having average width 2.50 m and average height 3.40 m and very narrow burial rooms are shown in Fig. 7, where concern arises about limitation of clear space and obstruction of movement and sight continuity. It is important to mention that the tunnels and chambers sides and roof have no paintings, carvings, or hieroglyphs, just the natural rock surface.

For the previous reasons, there was a need to use an alternative strengthening method for the tunnels that provides more clear space for passage and sight, in addition to sufficient strength, efficiency, durability, and ease of construction (Hamdy, 2008, 2014). The Supreme Council of Antiquities (SCA) in Egypt has imposed that the retrofit solution chosen must comply with the international codes and regulations for historic monuments restoration. It should not cause damage, invasion, or alteration to the monument, its construction should not induce vibration, and it should be reversible (CIB, 2010, ICOMOS 1964). ICOMOS

Fig. 6 Steel frames erected in the burial chambers

Fig. 7 View of the corridor of phase 2 and two narrow burial chambers requiring restoration work

Recommendations for the analysis, conservation, and structural restoration of architectural heritage recommends Article 3.9 that "where possible, any measures adopted should be 'reversible' so that they can be removed and replaced with more suitable measures when new knowledge is acquired. Where they are not completely reversible, interventions should not limit further interventions. Except in cases where urgent safeguard measures are necessary to avoid the imminent collapse of the structure, those urgent measures, however, should when possible avoid modifying the fabric in an irreversible way" (ICOMOS, 2003).

5 Structural Strengthening Solutions for the Serapeum Using FRP Systems

In the following sections, several alternatives are presented for strengthening of the serapeum roof and walls utilizing FRP, as shown in Figs. 8 and 9. Similar FRP materials and techniques have been successfully applied for strengthening rock-cut or concrete tunnels, as described in published literature.

5.1 First Alternative: Using CFRP Strips

The strengthening proposed for the tunnel is by adhering carbon FRP strips on the curved surface of the rock using polymer mortar, as shown in the left photo in Fig. 8. The width, thickness, and spacing of the strips vary at different locations in the tunnel according to the strengthening demand so to withstand the expected loading conditions at this location. At most locations, it will be required to provide transverse FRP strips and additional anchoring at the strip ends due to the deteriorated structural condition of the rocks. Testing for substrate bond strength should be made before application using non-destructive tests to ensure the capability of the strengthened surface to withstand the force transmitted to the adhesively bonded FRP strips. After completion, the FRP strips will be covered by a layer of mortar made by adding crushed rocks to the binding mortar. Having similar color and texture as the original rock, the FRP strips will not be visible. This strengthening scheme has advantages of minimum thickness, fast and easy construction, and non-visibility. However, it is invasive to the monument as some leveling of

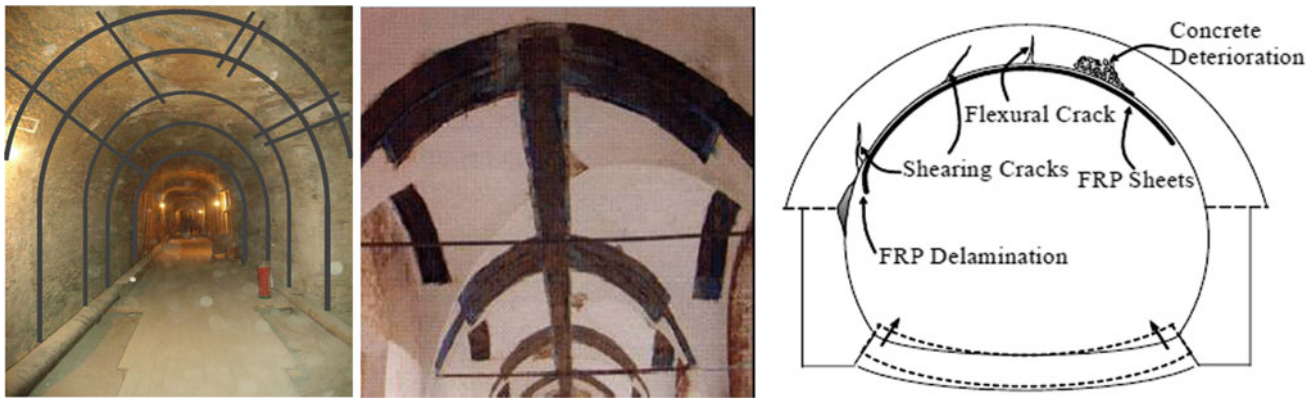
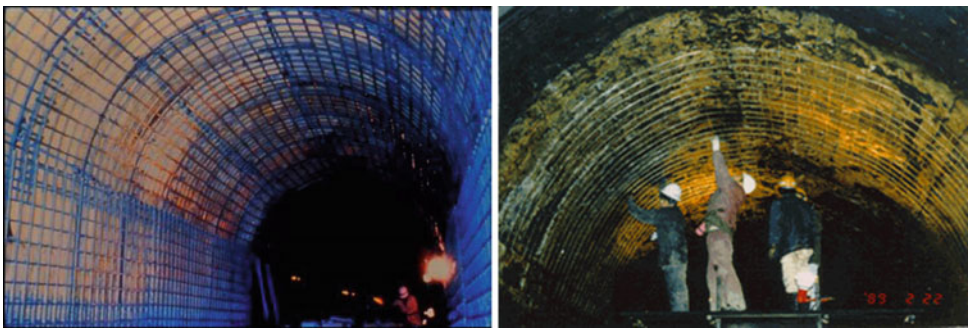


Fig. 8 Proposed FRP strengthening scheme for corridors using FRP strips, FRP sheets applied on vault in Italy (La Tagola et al. 2000) and for strengthening concrete lining of rock-cut tunnel in Japan (Asakura et al., 1994)

Fig. 9 FRP grids proposed as reinforcement for the narrow parts of the tunnel, NEFMAC grid applied for retrofit of a rock-cut railway tunnel in Japan (Karbhari, 1998)



the rock is needed before application of the strips, and it changes the surface texture and appearance of the natural rock. If the applied strips are required to be removed, this can cause damage; thus, it cannot be considered as completely reversible. However, invasion to the monument can be minimized to be only at very limited selected locations where there is risk of falling rock fragments.

5.2 Second Alternative: Using FRP Sheets

Another strengthening scheme proposed for the narrow chamber roofs consists of glass FRP sheets externally bonded to the natural irregular rock surface using heritage-approved mortar (to be site-tested for strength and compatibility with the substrate and FRP system). This strengthening system was previously applied on the interior of the brick vaults of San Giorgio Church, Lecce, Italy (La Tegola et al., 2000), shown in the middle photo of Fig. 8. CFRP sheets are applied widely for strengthening of tunnel lining in Japan. A study by Asakura et al. (1994) confirmed the effects and countermeasure of FRP sheet and back-fill grouting in strengthening the tunnel lining, as shown in the right photo of Fig. 8. A thin coating layer made of a compatible mortar with added crushed stone is to cover the adhered FRP to have similar color and texture as the original rock. The proposed system has the advantages of being only millimeters thick, perfectly conforming to the corrugated surface of the rock and not requiring leveling of the rock, thus minimizing damage or alteration of the monument surface. It has the disadvantages of invasion to the monument authenticity and masking the original natural rock. It was also reported in the literature that externally adhered FRP sheets are reversible and can be removed by a hot air jet (Cosenza & Iervolino, 2007). It is again noted that the Serapeum tunnels and chambers sides and roof have the natural rock surface with no paintings or carvings. The suggested strengthening is to be limited to few locations in some chambers where the rock surface suffered already from extensive damage and requires repair measures.

5.3 Third Alternative: Using GFRP Grids

For parts of the tunnel with higher risk, a strengthening system is proposed that consists of a grid formed of glass FRP bars connected together and attached to the rock by special clamps and anchoring fixtures. Grid-type elements, such as NEFMAC or New Fiber Composite Material for Reinforcing Concrete, are made from glass, aramid, or

carbon fibers impregnated with a resin system, such as polyester, vinylester, or epoxy to form a grid. Figure 9 shows NEFMAC grids used in Japan as reinforcement for a shotcrete lining in an underground oil storage facility in Kagoshima and for rehabilitation and repair of a rock-cut railway tunnel by using pre-stapled NEFMAC grids to form lining or reinforcement (Karbhari, 1998). The bars size and spacing vary from one location to the other according to design requirements. This technique has the advantages of being less invasive for the monument and being reversible, though it is visible and therefore less esthetic.

5.4 Fourth Alternative: Using FRP Structural Sections

For the tunnel passage, the strengthening frame system is composed of glass FRP sections or panels assembled inside the tunnel and joined by special clasps or FRP bolts. FRP corrugated panels having dimensions 900 by 1800 mm and GFRP thickness 3.3 mm were proposed for reinforcement of an old rock tunnel about 10.5 m diameter where the original concrete lining was deteriorated and damaged; anchor bolts at spacing 400 mm connect the FRP corrugated sheet to the rock behind the concrete lining, Fig. 10 (Hara, 2014). The FRP panels suggested presently have dimensions 0.8 m × 1.60 m and 0.15 m thickness and are made of glass FRP plates 6 mm thick plates having tensile strength 120 MPa and elastic modulus 9 GPa. The lightweight FRP panels are easily handled and assembled inside the tunnels and can be made to fit as closely as possible the variable profile of the tunnel interior cross section as shown in Fig. 11. The panels are cut to adjust the required dimensions, placed 1.50 to 2.0 m apart, and are anchored by special connectors to the tunnel walls, or fixed to a base and connected to each other laterally by longitudinal FRP beams. At certain locations, another strengthening frame system is to be erected; frames made up of pultruded GFRP I-beams 0.30 m deep are placed assembled and placed at 2.0 m spacing, shown in Figs. 11 and 12. The natural rock surface is visible between the frames. The erected FRP panels and frames are clearly visible and interfere with the view of the tunnels and chambers. However, the advantages of this system are providing the required protection against expected static and dynamic loading conditions and allow more clear width and height of tunnel than the steel frames previously erected at other locations. The most important advantage of the system is that it can be possibly removed without damage to the monument; i.e., it has the merits of reversibility and minimum invasion.

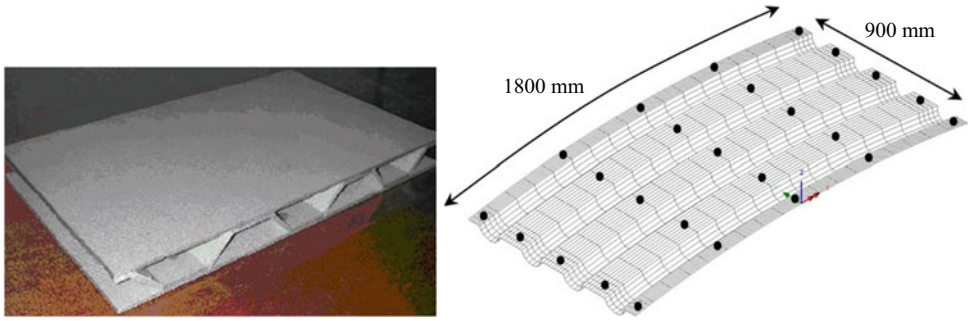


Fig. 10 GFRP panel for strengthening and FRP corrugated panel used in Hara (2014)

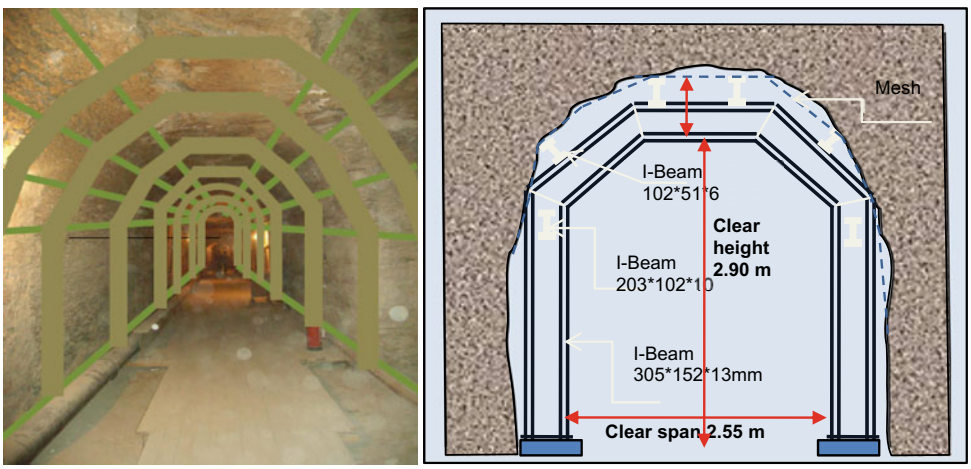


Fig. 11 Proposed strengthening techniques using FRP panels and FRP frames

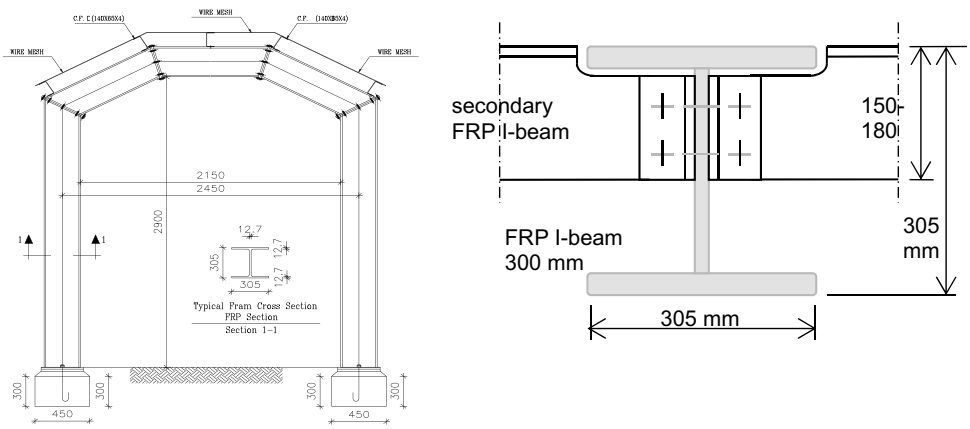


Fig. 12 Dimensions of the frame made of FRP pultruded sections

6 Structural Analysis

Structural analysis was carried out of the whole tunnel using finite element analysis; the rock material properties were assumed based on the observed present condition, and assumptions were made for worst-case loading conditions. The suggested reinforcing elements at the different locations were added to the numerical model; structural analysis was carried out for the strengthened tunnel sections and showed the safety of the strengthened structure.

7 Conclusion

This paper presents solutions for stabilizing and strengthening the ancient Serapeum at Sakkara, Egypt. The strengthening schemes utilize various FRP commercially available products such as sheets, strips, bars, panels, and pultruded cross sections specified at certain locations to suit the strengthening demands. The advantages of the presented strengthening methods may be summarized as follows:

- Structural efficiency due to high strength of the FRP panels and frame systems and the adherence of FRP sheets to the strengthened surface which ensures efficient load transfer and stress redistribution.
- Increase of the load-carrying capacity of the structure, avoiding disintegration and spalling of the rock surface and assuring the pursued safety conditions, provided by all the suggested systems.
- Lightweight and ease of installation of all the proposed FRP strengthening systems leads to reduction of construction time and manpower.
- Design flexibility due to choice from a variety of available FRP products and possibility of system tailoring and possibility of integration of several systems through careful design.
- Enhanced functionality due to minimized thickness of the FRP sheets or strips system and its adherence to the irregular rock surface of the tunnels which provides more clear space and height of the tunnel interior, this invasive and irreversible solution is limited to severely deteriorated and narrow sections.
- Esthetic appeal of the monument as it avoids obliteration to the visitors view and motion.
- Conforming to the world regulations and recommendations for historic conservation such as low invasiveness and reversibility for FRP panels and frame systems.

Due to these advantages, and especially for providing more clear space inside the tunnel for access, motion, and view of the visitors, the proposed strengthening solutions utilizing FRP are believed to be suitable for the unique nature of this ancient monument and its historic value. However, the characteristics of materials used in the suggested restoration work and their compatibility with existing materials should be fully established. Checks and monitoring during and after the intervention should be carried out to ascertain the efficacy of the results. An efficient monitoring system should be implemented to record changes in deformations, cracks, and temperature of the FRP system and the retrofitted structure. This monitoring should be given particular attention, in order to obtain information about long-term behavior of the strengthening procedures which will help in the development of standardized guidelines and techniques for maintenance and rehabilitation of cultural heritage using advanced FRP composites.

Acknowledgements The restoration project of the "Sarapeum at Sakkara" was carried out by the Supreme Council of Antiquities, Egyptian Ministry of Culture, during the years 2006 till present. The presented investigation was conducted within the author's work as consultant for the main contractor of the restoration project.

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Trends of Contemporary Art in Innovative Interior Architecture Design of Cultural Spaces

Hala Hassanein

Abstract

New trends in designing cultural spaces have applied to visualize futuristic ideas in interior architecture designs through contemporary art. Interior architecture design is always drawn inspiration from the arts; thus, the correlation between trends of contemporary art and interior architecture design has found in many applications of artists' works that assist designers to translate their works with design language through characteristics of simplicity, harmony, and economic balance. Contemporary art is a part of a cultural dialogue that can be concerned with the expression of the personal and cultural identity of the community. Effective design for cultural spaces is achieving it in variety of innovated ideas that can bring together the technology of interactive virtual arts to serve its purpose as well as new materials in use. Away from contemporary art, contemporary architecture is the twenty-first-century art that could be in different forms and varies from the style of postmodernism to the style of high-tech one that currently widely in used. The aim is to shed light on newest trends of contemporary art and its role in designing culture spaces as in elements of floors, ceiling, walls, furniture, and lighting of interior architecture design through selecting number of applications and cases studies worldwide and performing extensive comparative study to serve the purpose and to capitalize on the trend and employed in the creation of design solutions flexible to adapt diverse spreads spatial cultural activities taken as a base or guide to interior architecture designers to follow and reduplicated in their hometowns.

Keywords

Contemporary • Geometric trend • Simplicity design • Economic • Technology • Interactive virtual arts • Environmental materials • Sustainability

Alphabetical Abbreviations

CNC	Computer Numerical Control
GFRC	Glass Fiber Reinforced Concrete
GFRP	Glass Fiber Reinforced Polyester
LED	Light Emitting Diode
MDF	Medium Density Fiberboard
MOCA	Museum of Contemporary Art
MOCAPE	Museum of Contemporary Art and Planning Exhibition
UNT	University of North Texas
VIP	Vacuum Insulation Panel

1 Introduction

Culture is a set of practices, which, in their performance, produce meanings, values, and subjectivities, as well as adaptable, flexible, and ever evolving rather than fixed and bounded. This definition expresses the transient and flexible nature of culture (Kreps, 2003). Culture does not consist of things that we can count or measure; it consists of shared ideas and meanings (Delaney, 2004: 70). So, from historical point of view culture spaces should acknowledge the importance of preserving elements of a community's living culture because cultural heritage not only consist of people's collective memories and history but also everyday experiences that existed through innovative interior architecture design for such cultural spaces the core of our paper. Cultural influences on design in the way that history and beliefs

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Y. Mahgoub et al. (eds.), *Cities' Identity Through Architecture and Arts*, Advances in Science, Technology & Innovation, https://doi.org/10.1007/978-3-030-14869-0_3

influence society. It must consider communication and the key user experience: how cultural spaces work; how they deliver a message; how individuals respond; and even how people move around space and interact with objects or people.

In Egypt, interior architecture designers had used the concept of contemporary art in their design for cultural spaces as a ramp toward the international and strongly focused on the national aspect through history, traditions, and national culture. Egypt has numerous stunning contemporary art cultural centers and museums including: Cairo Opera House (1869), Gezira Center for Modern Art (1986), Mahmoud Mokhtar Museum/Cultural Center (2006), Al Masar Gallery (2008), Darb 1718 (2008), Zamalek Art Gallery, Khan El Maghraby, The Center for Documentation of Cultural and Natural Heritage—CULTNAT, and 15th May Contemporary Art Center. As example from the cultural spaces, we have selected the example of "The Center for Documentation of Cultural and Natural Heritage—CULTNAT" (CULTNAT, n.d.), (Fig. 1a and b) located at the smart village to applying latest technological innovations in various fields of documentation, cultural heritage, and Egypt's natural heritage. CULTNAT has been building databases that cover the diverse fields of Egypt's huge heritage, gathering massive amounts of data, applying, and creating advanced technology, and employing qualified human resources.

CULTNAT has a set of exhibitions and projection, panorama screens displaying all the center's projects for public visits as shown in Fig. 1c.

It also publishes materials in print and CD format, most notable of which is the series of archaeological atlases that contain invaluable maps, locations, and descriptions of the archaeological sites in each governorate. Recently, Egypt is close to announce and launch its first Knowledge City in the "New Administrative Capital at Cairo" to open by 2019. The city of Knowledge is recognized as one of the top 10 innovative and creative hubs in the world.

Purpose/Emphasizing

The paper is emphasizing on focus searching, studying, and analyses of potential trends of the contemporary art as new "tool" for interior architecture design of cultural spaces. Thus, that is to arriving to create, innovate art works that affect the transfer of contemporary art to the public via introducing hi-tech approaches in the simplest ways through the visual vision as a goal of conveying its message and educating its audiences.

Our main emphasizing will depend on analyzing various new technology trends and techniques for designing the cultural spaces. Thus, an overview and analyses over different new design approaches will be conducting along with selected local, regional, and international cases studies to demonstrate the effect of contemporary art into the design process of cultural spaces.

Expected outcome is to have an overall achieved enhancement and recommendations for designing new ideas in an innovative manner to use in design and manufacture of materials as an ideal criteria for our local interior designers and as a guide for making a scientific curriculum to keep updated with what is new using hi-tech communications in this specific category of cultural spaces through number of worldwide previous designs experiences.

Methodology

Based on contemporary art trends that will be selected later-on in the study and are in-deep relation with interior architecture, the methodology depends on number of selective worldwide implementations, descriptive approaches through a brief review of experiences for designing newest, innovated ideas used in the designs by obtaining, analyzing various techniques, trends, and methods that expressing innovative spatial for culture spaces.

We will identify the significance effect of contemporary art trends into the designing process for cultural spaces to ensure achieving the purposes that interior designers set forth and to gain its realization through its impact and

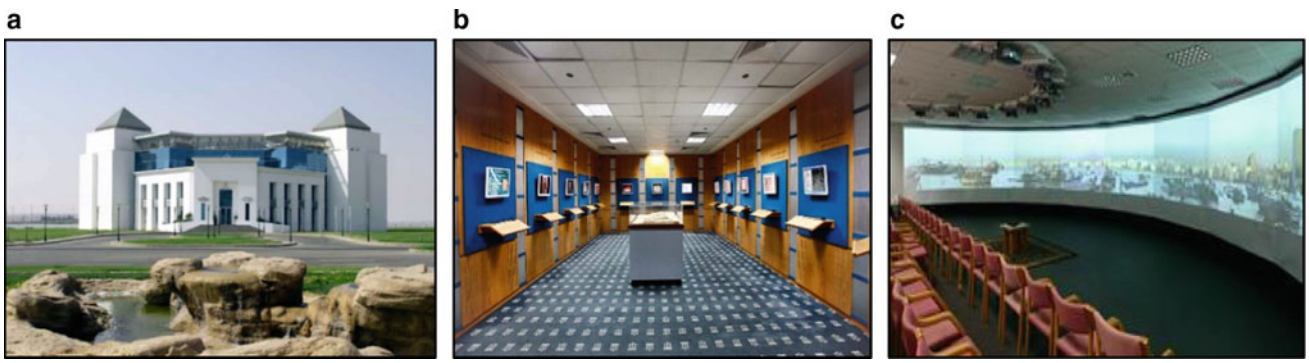

Fig. 1 **a** Façade of CULTNAT Center, **b** inside One of its Art Halls, **c** panorama Cultural Hall

applications selected worldwide to serve the purpose of the study. Accordingly, that will include different fields of applications of contemporary art of graphic work, sculpture, drawing, and the extent of the use of technological means in their application and translation into elements of interior architecture design. To achieve the concept of innovation, we will taking a conventional, comparative approach with emphasis on integrate technical aspects of modern technology for designing cultural spaces with focusing in the goal of creating smart and connected the public to these cultural places. As well as, in-depth analysis to provide an accurate and objective picture of current available patterns of contemporary art with its newest trends by cross a comparative study while examining and analyzing all selected cases studies and its applications to measure its effect on the interior design for these type of cultural spaces.

Therefore, we will identify examples from the newest ideas, innovated applications worldwide and formulate, suggest generic findings and recommendations based on our study review to analyses its effective interior architecture design aspects that could influence developments of innovated and futuristic cultural spaces. Last but not least, the possibility to create, adopt, and set a criteria or a guide for designing cultural spaces that our interior designers can reduplicated in their hometown since these applications of contemporary art trends are not in much familiar within our region.

Study Structure

The following criteria, guiding approach to achieve innovative interior architecture design of cultural spaces, as shown in Fig. 2 are set by the researcher, to demonstrate gathering basic four components of themes, elements of art, trends of contemporary art, and designing cultural spaces, and elements of interior architecture design are incorporated to achieve best practice consideration for innovated design of cultural spaces as output from this consolidation process.

2 Themes and New Ideas

Themes are concerned with the art materials used, associated art movement and style of artwork predominates in the theme list. Thus, we have selected the herewith example of "*Novopecherska School at Ukraine*" that expressing effect of the theme in that create, imagination for the public to receive and read the concept of the design idea. Therefore, placing a tree beside the wall containing variety of bright colors making a colorful visual reception by the user consideration that these colors on wall are as form of fruits of that tree:

Novopecherska School at Ukraine (Design Boom, Miguel Chevalier, 2016)

One of the most cutting-edge designs in the education sector that properly reflects the concept of theme is "Novopecherska School at Ukraine" as striking interior architecture design forms spark collaborative learning and intellectual growth. It was designed by Dream Design (a Ukraine Firm) that won IIDA Global Excellence Award. The design was in a playful, color-saturated interior created by the designer to express art in the designing process.

As shown in Fig. 3a, a tree sculpture in white-painted medium density fiberboard (MDF[1]) reaches almost from floor to ceiling in the airy, soaring lobby. Colorful beanbag chairs dot its floor, and a grid of 60 small canvases, printed in folkloric patterns, hang on a wall. Their palette repeats nearby on the students painted lockers using variety of bright colors such as red, yellow, green, purple, and many others that are integrated in the lobby as shown in Fig. 3b.

2.1 Activity Graphics

A cultural facility or a space, and particularly in these areas focused toward teaching students for providing basic knowledge and education, is a method for successfully engaging different student's groups to knowledge, learn, and act as one to receiving or conveying the target message of information to all members by mixing activities, branding of the university with graphics.

2.2 Photographic Images

The use of large format digital prints is another method to add color and graphic imagery to cultural spaces as follows:

San Francisco Museum of Modern Art (SFMOMA) (Snøhetta, SFMOMA museum, Architect magazine, 1995)

It designed by New York and Oslo-based Snøhetta with local firm EHDD that completed in 1995. The project was new expansion to the existing-one that designed as a melding of the two structures that expressing the identity of modern art in interior design of the museum to attract visitors by using bright colorful lines, and themes to express the concept of photographic images as shown in Fig. 4.

[1]**MDF**: Medium Density Fiberboard.

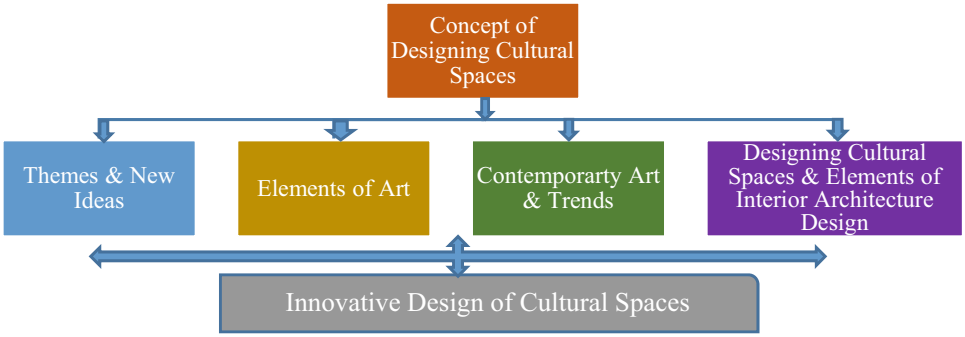

Fig. 2 Concept of designing cultural spaces

Fig. 3 **a** A tree sculpture in the soaring lobby, **b** students painted lockers

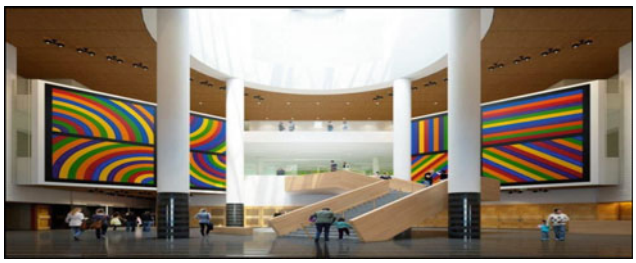

Fig. 4 Entrance of SFMOMA Museum

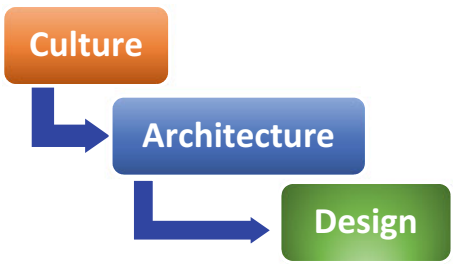

Fig. 5 Triangle of common space *(Illustrated by the researcher)*

The wood, glass, dark granite, and terrazzo staircase design links the Haas Atrium at the existing third street entrance to the new art court, which will house museum admissions. The design also calls for additional seating in the atrium.

3 Elements of Art

The triangle of a space is consisting of three components (culture, architecture, and design) as shown in Fig. 5 that are serving together in designing process of the cultural space.

In relation to a space, common elements of art are including the following nine elements: line, shape, form, texture, color, tone, sound, light, and time. As shown in Fig. 2, six of these elements are much deeper closer in relation to the field of innovative interior architecture design that should be considered while performing our study. The remaining three elements as of tone, sound, and time of elements of art are irrelative to the designing process accordingly, where properly excluded from the Fig. 6.

This above correlation of art elements in the connection of culture and technology along with side-by-side elements of interior architecture design is revealing our main concern of contemporary cultural spaces. Therefore, since design must be understood, related elements are the actual things added to a design while the principles are organizing these elements in the design taken as a whole to communicate something or conveying a message to the audience. Elements and principles are the tools through which we can communicate in general.

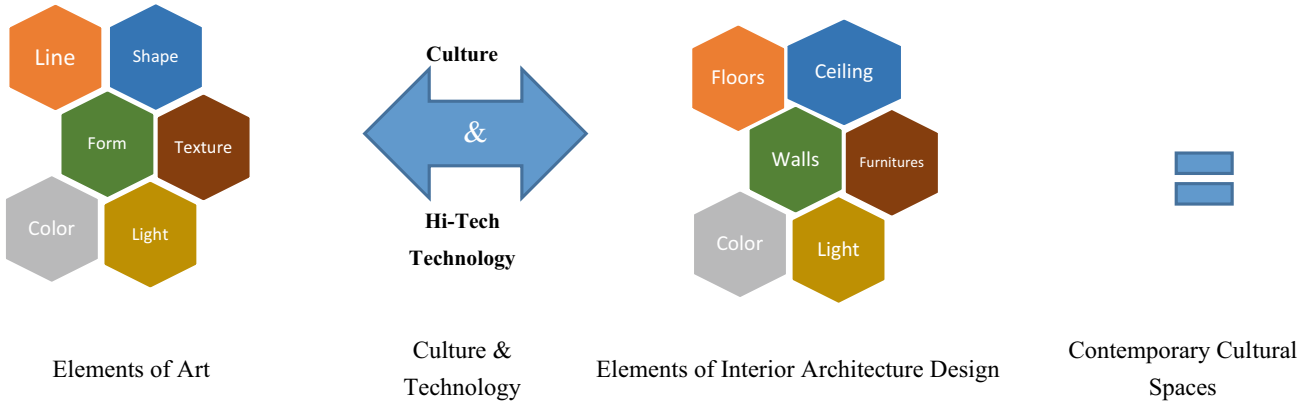

Fig. 6 Correlation of art elements, cultural, and technology with interior architecture design basic elements *(Illustrated by the researcher)*

Elements of interior architecture design for all public and cultural spaces are the ingredients of art and principles are the techniques for combining them correctly. So by identifying elements of art and principles, we will have a perfect recipe for contemporary cultural spaces that will meet any critic's aesthetic tastes as well as to enhance the user experience.

These components are used collectively during the creation process guided by the principles of design to produced high output value added as contemporary cultural spaces.

4 Contemporary Art and Trends (Contemporary Trends in Art | the Canadian Encyclopedia, n.d.)

Contemporary art is the art of today that resets the link between art and the reality in an aesthetic manner as part of a cultural dialogue that concerns number of frameworks such as cultural identity and the community taken as whole.

4.1 Trends of Contemporary Art

This main part of trends of contemporary art is so important and crucial to the paper since all selected case studies in the study will be analyzed and categorized based on the trend type of contemporary art. So, when traditional art forms were no more concern for the interior designers interests, contemporary art explored the link between means and ends to restore the connection between art and "reality" in its aesthetic manner. Contemporary arts have number of variety trends based on its application, nature, purpose, and intended use of it. These trends that abstracted from the Canadian Encyclopedia by Charlotte Townsend-Gault are considered as simple language that transfers current features and modern tools of the age into aesthetics visual arts for the audiences. Since there are many types, list of trends, we have selected the following seven trends that are in-close relation with interior architecture design that will be examined and analyzed during the section of case studies.

The seven trends are as follows.

4.1.1 Trend of Conceptual Art (Modern Movements and Styles, Conceptual Art, n.d.)

It is art in which the concept or an idea involved in the work take precedence over traditional aesthetic, technical, and material concerns. So, the idea is the main issue in which design of art will be based totally on such specific idea. In other words, conceptual art is a movement that prizes ideas over the formal of visual components of works. Conceptualism took myriad forms, such as performances, happenings, and ephemera during the period from mid-1960s to the mid-1970s that conceptual artists such as Jackson Pollock and Andy Warhol, for instance, produced their art works that completely rejected standard ideas of art.

4.1.2 *Trend of Environmental Art* (Cultural Center Jean Marie Tjibaou—Data, Photographs and Plans—WikiArquitectura, 1998)

Today's designers are exploring a new understanding of the environmental art from the point of view of the combination of ecological and cultural connotation and characteristics, more rational thinking and evaluation to understand the reality of the urban environment. Integrated social and ecological approaches developed as an ethical, restorative stance emerged in the 1990s. The trend is main direction of the development of environmental design which is to create a comfortable and pleasant ecological system to protect the integrity of the urban culture, environmental art and ecological coordination, integration of the spiritual content of history, and urban culture. Environmental design in the new century, the development of urbanization, how to make more

rational development of civilization and the rich connotation of urban environmental art, and to build a more rational urban culture, these become the artist must consider.

4.1.3 Trend of Minimalism Art (Stewart, 2018)

Minimalism in visual art generally referred to as "minimal art," literalist art, and ABC art and is also important to the visual arts and design. The term minimalism is also used to describe a trend in design and architecture, where in the subject is reduced to its necessary elements.

That trend asks artists, designers, and architects to break things down into their essential elements using simple forms to produce harmonious work. This movement was established most strongly with American visual arts in the 1960s and early 1970s by number of prominent artists such as Donald Judd, Agnes Martin, and Frank Stella.

4.1.4 Trend of Performance Art (Appleton, 1996)

It origins were back to 1910s, and the modern movement was in the 1960s. It involves four basic elements: time, space, the performer's body, and a relationship between performer and the audience. Such trend is applying in designing the cultural spaces through interaction via creating a positive relationship between people's existence and the design itself. For building and its interiors as concept of performance art are all internal finishes, windows, doors, fittings, and equipment that interact with the beneficiary.

So, for cultural spaces, materials need to be robust to counter abuse, easy to clean, offer minimum maintenance and be suitable for functions.

4.1.5 Trend of Technology Art

The twenty-first century is an era which integrates technology and art together. Technology is properly defined as any application of science to accomplish a function that emerge, different ways to creatively interact and collaborate arise with them. It can be most broadly defined as the entities, both material and immaterial, created by the application of mental and physical effort to achieve some value.

4.1.6 Trend of Installation Art

As mentioned in art history website, its origins in the 1960s but grew to greater prominence during the subsequent decade. Installations are site-specific in that they are design to exist only in the space for which they created, appealing to qualities evident in a three-dimensional immersive medium. It invariably refers to interior installed works, and exterior pieces are referred to as land art. Installation artworks have been constructed in exhibition spaces such as museums and galleries, as well as public and private spaces.

4.1.7 Trend of Abstraction Art (Livneva, n.d.)

Abstraction emerged at the turn of the twentieth century and focuses on exploring color and form. It is a departure from reality which releases the creative energy of people and provides them with the freedom to explore their minds and emotions in a way which was impossible in traditional styles of art. The abstract is an expression connecting the feelings and vibes than the usual perception of realism. Unlike other trends, abstraction does not portray objects as they appear in real life. Before the emergence of this style, artists focused on illustrating human civilization and the world of nature. Abstract artworks experiment with the use of texture, tone, and light perception. Through abstract works, artists express their feelings rather than certain objects or scenes.

4.2 Contemporary Interior Architecture Design (Richard Meier and Partners Architects, 1997)

The common interior design styles are contemporary, country, eclectic, rustic, and traditional. We will be focusing on the contemporary style. Both of contemporary art and interior architecture design offering important elements that useful to understand artistic installations focused on representing art forms. There are seven major design trends for contemporary art design that could be summarized and one for "New Trend of Bioclimatic Design" as follows.

4.2.1 Pioneers of Future Design

Two examples herewith for that trend design is Louis 1. Kahn (1901–74, born in Estonia) and Cesar Pelli (born in Argentina) were architects whose work had a special concern for interior space. We have selected the following for each of them:

a. ***Louis 1. Kahn (ArchDaily, n.d.)*** was deeply concerned with expression of materials and with the way in which light reveals form and creates the nature of interior spaces.

As shown in Fig. 7, Kimbell Art Museum at Fort Worth, Texas, USA, was designed by Louis Kahn who has become a pioneer destination for all who are interested in modern architecture. The element of natural light is the focus of the design and creates elegant spaces that are perfectly suited for the art that it houses.

b. ***While Pelli*** is a far worldlier figure, a maker of gigantic projects where interiors seem to be a by-product of massive building structures.

Fig. 7 Roofs and interiors of Kimbell Art Museum—USA

Fig. 8 World Financial Center, Battery Park City, NY—USA

Examples of his works were, "the US Embassy" in Tokyo as rectilinear mass clad in mirror glass and aluminum building, the other one is "the Museum of Modern Art" in NY then, the work of "Winter Garden, World Financial Center" in Battery Park City—NY. In that last one, interior structure as shown in Fig. 8 offers a huge space that can be used for concerts, exhibitions, and others. When not so used, it forms an atrium circulation space from which there is access to surrounding spaces, colors come from floor patterns, painted columns and the green of trees.

4.3 Hi-Tech Design

4.3.1 Architecture Technology Design

There are numerous types of technologies systems in these regards, we will be addressing those that are much in relation to the field of interior design as follows: multimedia, digital technology, thermoelectric conversion systems, electromechanical, 3D parametric programs as well as 3D printer techniques.

Mori Building Digital Art Museum (Tokyo) (Griffiths, 2011)

New art museum has opened in Tokyo that visitors are invited to touch the art as the worldwide largest dedicated to digital, interactive art. The museum is a partnership between "Mori Building," a developer, and "Team Lab" an art collective that combines science, contemporary art, technology, design, and images of the natural world. The museum's five different spaces are on permanent display, though the nature of digitized art means the installations will be constantly changing that blend into one another over five different zones.

Three of these five zones are: "Borderless World," the first zone, is an interactive digital landscape where visitors are encouraged to create their own path. People walk through digitized waterfalls, "touch" luminescent birds and saunter through computer generated forests and fields as shown in Fig. 9. The second zone is the "Athletics Forest," a zone intended to train the brain's spatial recognition abilities and get people moving. Third one is "Future Park" as shown in Fig. 10 that was designed for children. The park has kids interact with the art through various activities, such as an aquarium teeming with digital fish designed by the kids themselves and a musical wall that plays sounds upon touch.

4.3.2 Postmodernism Design

The term postmodern would seem to identify any work that post-dates the style now called modern but, in current use, it identifies a direction that is a part of the continuing development of modernism. Robert Venturi (born 1925) developed the theoretical basis of postmodernism while Michael

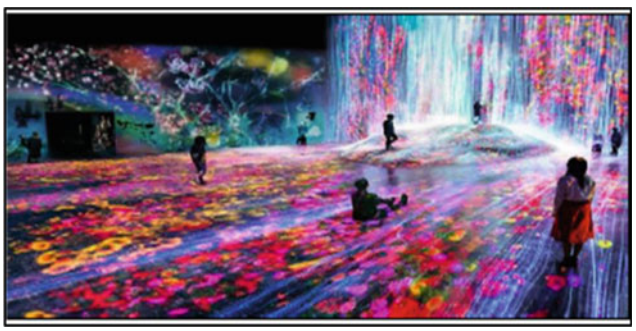

Fig. 9 Digitized waterfalls at Mori Art Museum

Fig. 10 Digital Art Museum—Tokyo

Graves (born 1934) and Philip Johnson were continued the path of the modernism in number of their innovated projects. Ettore Sottsass (1917–2007), the leader of the group, along with his associates Andrea Branzi, Aldo Cibis, Marco Zanuso, and others broke away from mainline modernism by designing furniture, textiles, decoration, and playfulness in bright color, decorative surface pattern, and shapes that have been employed serving the function and characteristics of the design.

4.3.3 Late-Modernism Design

It describes work that does not imitate that of the modern pioneers, but that moves ahead in ways in which they might have been expected to develop their ideas if they were still actively involved in the designing process. The work of I. M. Pei (born 1917) as his career moved onward, be thought of as late-modernism.

"The Country Library" at Columbus, Indiana as shown in Fig. 11, is a simple rectangular block of bricks with glass at the entrance. As well as "Pyramid Louvre Museum, Paris 1983–9" as shown in Figs. 12 and 13, that the public space acts as a new entrance to the many traditional spaces that make up the famous museum. Glass and metal structure have come to be recognized as a great success common in use for designing most of innovated cultural spaces.

4.4 The Revival of Tradition

The criteria for this trend are the effort to produce new work based on classic principles. The most extreme form of this Neoclassicism appears in the work of Allan Greenberg (born 1938) and Robert A. M. Stern (born 1939) who was usually through of as a postmodernist.

4.5 Deconstructivism (Deconstructivism—New World Encyclopedia, n.d.)

In architecture, also called deconstruction, is a development of postmodern architecture that began in the late 1980s. In contemporary art, the two aspects of modern art as minimalism and cubism have had an influence on deconstructivism.

"Arthouse Café" in a Gallery (Hangzhou, China) (Ho, 2011)

Joey Ho designed the "Arthouse Café" as presented in Fig. 14 on the top floor of a three-story building. As a result, movement of human body through this graphically active space ("moving triangle") will generate a non-determined concept in which spatial and body boundaries between the café and users.

Fig. 11 Surround area of Louvre Museum

Fig. 12 Pyramid Louvre Museum

Fig. 13 Inside Pyramid Louvre Museum

Triangular window pierce the faceted that fold around as indicated in (Figs. 15 and 16) the "Arthouse Café" is constructed with minimal use of materials for a new landscape. Inspired by geometry and using triangles as blueprint, "moving triangle" concept is manifested by placing triangles in three-dimensional form to surround the whole sitting area.

Fig. 14 Triangular window layout

Fig. 15 Wall and roof of the Café

Fig. 16 Side of Arthouse Café

Slight changes of simple lines construct the character of the cafe which brings every individual into a new geometric context.

4.6 New Trend of Bioclimatic Design

Bioclimatic is a sector of architecture that dominated by the principles of ecology and sustainability. It is concerned with the relations of climate and living organisms through its integration with the site. The aim of bioclimatic architecture is to create urban areas and buildings that were designed to fully cover their energy requirements without induce environmental damage. For design point of view, that trend is driven, inspired from the concept and form of organic cells of human and plants.

Shanghai Natural History Museum (China) (ArchDaily, 2015)

The Shanghai natural history museum is a museum dedicated to natural history in China designed by Perkins Will. The building includes number of spaces as exhibit, outdoor exhibit garden, theater, and long tall atrium with natural light that was inspired by the cellular structure form of plants and animals.

As shown in Figs. 17 and 18, overall shape of the building organization is inspired by the nautilus shell. The oval courtyard pond provides proper cooling for the place. Rainwater is collected from the roof and stored in the pond along with recycled water. All the energy features are part of exhibits which explain the story of the museum.

5 Designing Cultural Spaces and Elements of Architecture Design

The design process of cultural spaces in relation to the community's cultural characteristics depends on number of considerations that affect the design elements that include civilizational and historical factors, cultural and social heritage, environmental factors of the site, and modern technological factors. We will start with the fundamental rules for designing cultural spaces (i.e., exterior and interior) that requires special attention to serve the consideration and characteristics of the designing process taken as a whole:

Fundamental Rules for Designing Cultural Spaces

As suggested guide by the researcher, our local designers should consider the following generic rules when approaching designing exterior and interior spaces for innovated cultural buildings/spaces.

Fig. 17 Interior design of Oval Shape as Nautilus Shell

Fig. 18 Exterior of Shanghai Natural Museum

Designing Exterior Spaces

- Design should be in a creative manner that allows flexibility to incorporate new tools and technologies of the future and to design large inviting entrance plaza with shaded areas for sitting purposes.
- Use of cement-based, "green" materials and sitting the building to take advantage of the prevailing climatic conditions and the natural flow of air and light.
- Respect to natural resources and local products as well. Natural sources consideration includes a system for geothermic exploitation, green roof, large plantations in the surrounding space with fruitful green areas.
- Be conscious to all the threats of environmental when choosing materials and performance of energy sources.
- It is recommended to add or install temporary or permanent works of art that expressing the culture nature.
- Output from the design should expressing simplicity, aesthetics and in functionality manner as well.

Designing Interior Spaces

- Using all applicable tools of modern era, ideas, technologies, untraditional materials to express the cultural identity for the place.

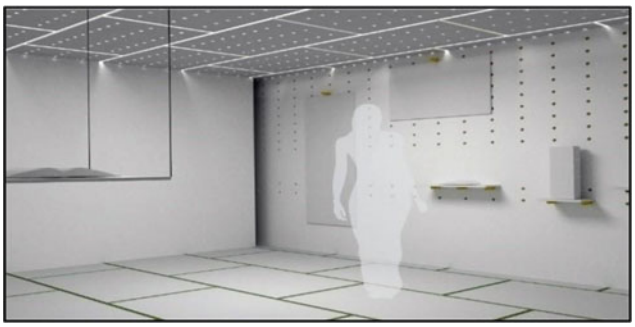

Fig. 19 Trend of multi-purpose design approach

- Use of energy-saving light fixtures and finishing materials that are hypoallergenic to prevent dampness.
- Sealing windows and especially treating the glass to minimize damage to the materials from natural light. Interior Architecture designer should use and place some plants, garden and green areas and/ or patio just next to services areas while in exterior areas.
- Provide efficient thermal insulation of the foundations, basements, roof, walls, and windows which helps to reduce energy cost. Designing the windows, ceiling heights, and ventilation openings, and positioning the spaces within the building so that they will be most compatible with its objective environmental conditions.
- Allow flexible expansion and adaptations for all spaces of the place according to the specific needs and based on the best and effective utilization of the cultural space.

As an application of above rules regarding designing interior spaces, we noted these rules were properly applied in an example that we have chosen serving the use of technology which is the "Multi-Purpose Interior Design Approach," ArcHitects (ArcHITects srl—Piantini/Pasini, Milan, Italy, n.d.). Italy had designed the following project that stems from the need to characterize the target cultural space through the use of it. The project is designed and characterized by a collection consisting of video, artist books, and works in mixed media.

As shown above in Figs. 19 and 20, installed surface is set up to support space through hanging up necessary media tools and video projections. All walls and ground are from same material and color for the consistency aspects. The design goal is maximum freedom of space exposure for its activity and purposes as well.

5.1 Interior Architecture Design Best Practice Considerations

The following three crucial elements of environmental, interaction, and technology are the main hypothesizes, (Fig. 21), which produced a unique structure for

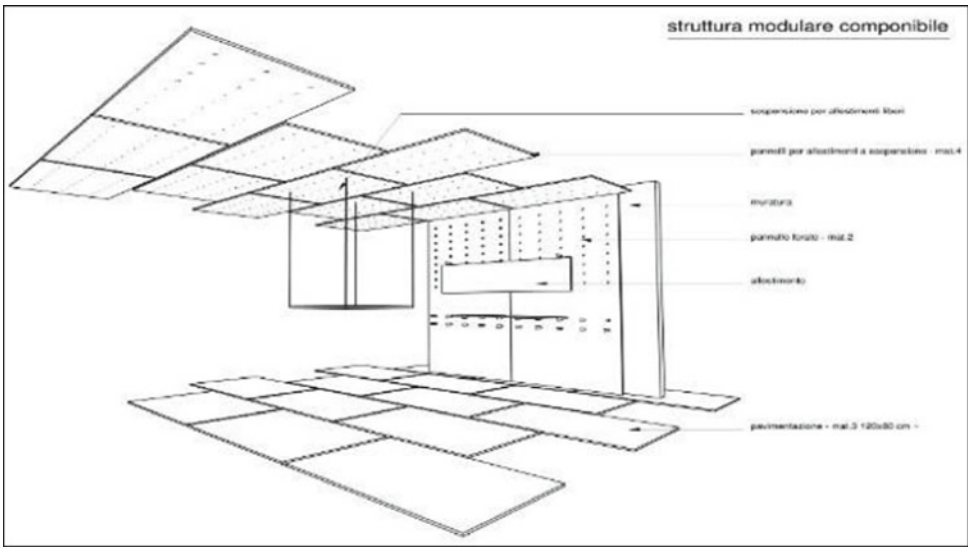

Fig. 20 Detail layout of installation and design components

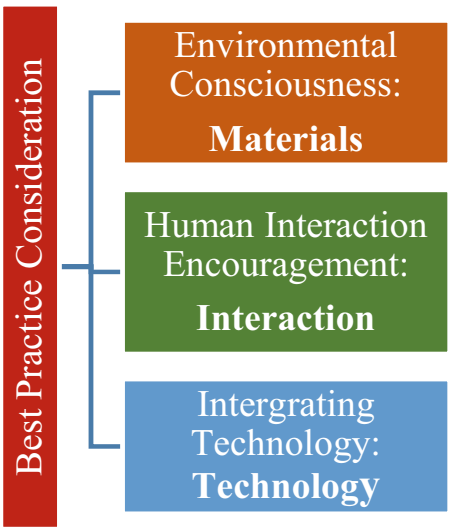

Fig. 21 Elements of best practice consideration

well-designed cultural spaces through using friendly materials, conveying its intended message to the public as kind of interaction and applied technology in all aspects of the design:

- Environmental consciousness

Materials: Traditional materials were used in unconventional forms and shapes in terms of modern form and composition and use of finishing materials that are hypoallergenic and treated to prevent dampness. Paint on walls, furnishing, and fittings should be environmentally friendly. Later, we will present some selective basic materials that are commonly in use for designing cultural spaces of which have environmental consciousness such as wood, bricks and limestone, glass, metal and stainless steel and some new hi-tech and nanomaterials.

- Human Interaction Encouragement

Interaction: The design of the cultural spaces should facilitate and encourage communication between people to convey the message from the cultural space to them. Many of these users are attracted to the cultural spaces not only because of the resources of knowledge it offers, but rather by communicating with like-minded people, from whom they can obtain professional assistance and enjoy an interdisciplinary exchange of ideas.

- Integrating Technology

Technology: In the digital revolution era, information technology and hi-tech tools play a dominant role in the activity of cultural spaces both in terms of the resources and services its offer to users. Therefore, the manner of integrating the technology in interior design for cultural spaces should comprise a major element in its conception.

5.2 Importance of Interior Design Elements to Culture Spaces (Griffiths, 2011)

The following subsections of interior architecture design the best practice considerations based on elements of interior architecture design (i.e., floors, ceilings, walls, partitions, furniture, lighting, colors, and materials). Some of these elements will be illustrated herewith.

5.2.1 Ceilings

We have selected the herewith example to illustrate this concept:

UNT Student Center of North Texas (USA) (Will, n.d.)

University of North Texas (UNT[2]) Student Center of North Texas was designed by Perkins Will firm in 2016. It was the best of year-winner for mixed activity, branding, and graphics in interior architecture design for UNT Students Center. Colored LED[3]s beacons of UNT's Mean Green shine through the fritted glass window walls of new towers, which were added at points of entry.

As shown in Fig. 22, the lyrics of the university fight song appear inside, with brushed-aluminum large letters set into the three layers atrium's white terrazzo flooring. That is also where the words of the university values statement shoot down from the ceiling. Attached to stainless steel aircraft cables, most of the letters are clear green acrylic. It used thicker white acrylic for the key words such as access, sustainability, and excellence to reflect the values concept.

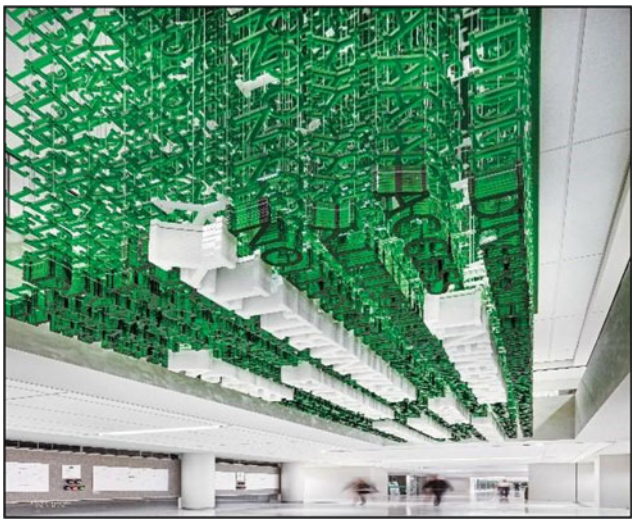

Fig. 22 Ceiling of the main entrance

5.2.2 Furniture and Partitions

Furnishing and Partitions Elements in "Onassis Cultural Center Lobby" (Athens) (Onassis Cultural Center Lobby — Diver city Architects, 2013)

The usage of furnishing as one of internal architecture design elements is to solve the spatial space for a number of different activities depending on the beneficiaries use and was influenced by the trends of contemporary art in terms of line, shape and mass. Thus, furnishing offers a transition in form and scale between an interior space and the individual with cultural preferences and stylistic considerations. Diver City Architects and Manos Vordonarkis redesigned the element of furniture in the entrance and lobby as shown in Fig. 23. The design and its interiors were done to transform the lobby into a "unique tiny shelter" as a perception of sea-ship within the city serving for its identity. The design creates relationship between three key characteristics: the physical space, the digital experience, and a series of specially curated, satellite events in a unity manner.

Fig. 23 Main reception area

The choice of dark-coated steel plates for the partition installations as shown in Fig. 24 is consistent with the clients' desire and their interactions activities as application of trend of performance art in furniture design for its informality of geometrical sculpture, flooring design patterns and human interaction as shown in Fig. 25. Materials used are white marble, reflective glass, and stainless steel. The combination between 3D simulation software and hands on architecture tools in designing the center presented perfect combination and the goal of design has been achieved.

5.2.3 Lighting (GmbH, n.d.)

For cultural spaces such as galleries, museums, and others also, lighting function is crucial requirement that should be serving the purpose of illumination these type of spaces as planned.

The following theoretical model of lighting functions as shown in Fig. 26 helps to evaluate the quality of lighting as

[2]**UNT**: University of North Texas.
[3]**LED**: Light Emitting Diode.

Fig. 24 Dark sculpture shelter

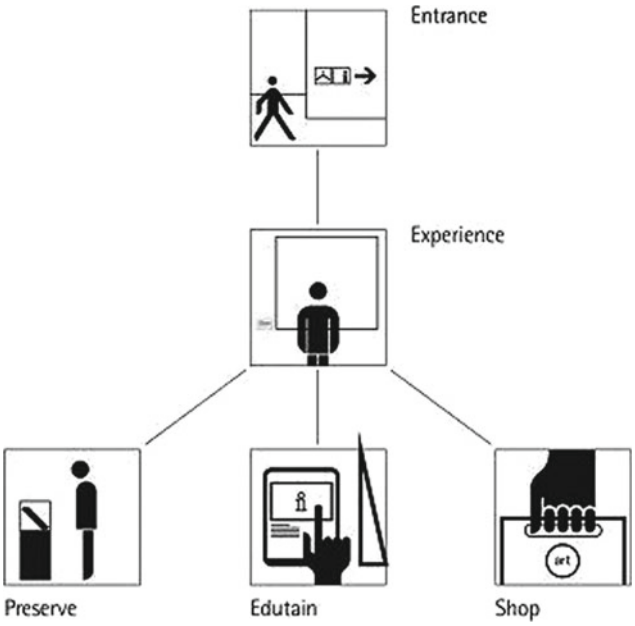

Fig. 26 Theoretical model of lighting functions (ERCO.com)

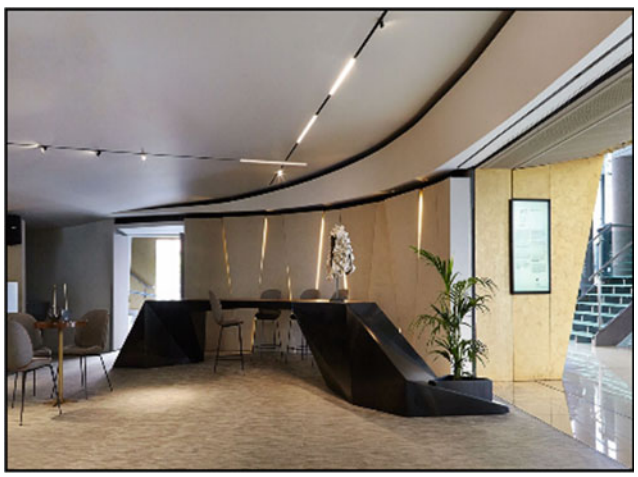

Fig. 25 Sculpture unit of furniture

Fig. 27 Direct lighting for the entrance zone (public)

number of zones as of entrance, experience that then separated into preserve, selection, choose and then to shop or marketing the product.

Therefore, the light function is design based on the activity of the individual into the cultural space. First, as shown in Fig. 27, entrance zone has its specs and features of light necessary for its purposes that are in direct manner. Then, zone of experience which needs focus toward the different artworks or cultural objects is shown in Fig. 28.

Third is how to distribute light in both of conserving and discovering zones that finalizing the individual activity as shown in Figs. 29 and 30 with regard to efficiently and precisely illuminating contemporary art as noted while viewing number of locally and international cultural spaces.

We have found that spotlights, focal, floodlights are most flexible and common efficient lighting tools for the effective presentation of these public spaces as shown in Figs. 31 and 32. The most effective key issue is to serve the factor of economic effectiveness along with the design effectiveness in alien and harmony manner as well.

Fig. 28 Focal lighting for the experience zone

Fig. 30 Spotlight/flooding for discovering zone

Fig. 29 Indirect light for the conserving zone (private)

Fig. 31 Tools of spotlights and floodlights

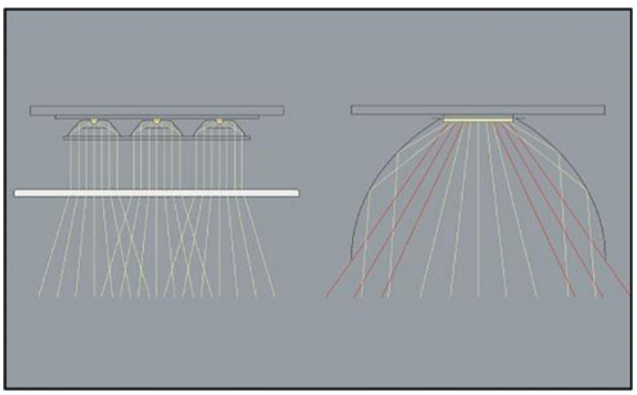

Fig. 32 Effective distribution of lights (preciseness)

Interactive Light Installation in Public Spaces

As one example for light application in designing public or cultural spaces, we have selected the following example:

"Milan's UniCredit Pavilion" (Italy) [7]

"Miguel chevalier" brings his latest generative and interactive virtual reality installation to Milan, presented within the city's UniCredit pavilion as part of the exhibition "onde pixel." The technical product was done by Voxels Production. Among the works presented at the UniCredit pavilion, the star is "onde pixel" a huge flooring carpet of light spanning 20 square meters that fill the floor.

As shown in Fig. 33, the designer was inspired by abstract and kinetic artworks these graphic scenes, composed of thousands of shapes on the floor, as music plays in the surrounding atmosphere. Sensors allow the work to react to the motion of visitors.

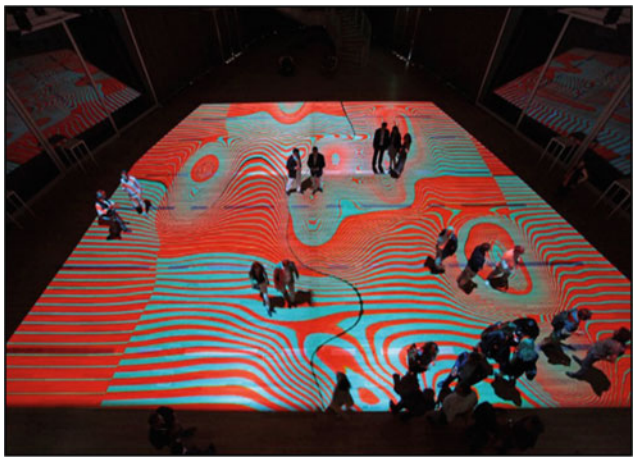

Fig. 33 Interactive light installation in UniCredit Pavilion—Italy

5.2.4 Colors

"Olathe Community Center" (USA) (Richard Meier and Partners Architects, 1997)

The color of interior architecture design is a communication device that creates character and identity by developing a story unique to the place. The brightly colored walls at Olathe Community Center (Fig. 34) serve as an effective way in finding tool, guiding people through the building by marking circulation and identifying destinations.

The graphic application of color on large wall areas of cultural spaces is a striking and economical way to visually enliven and energize large volume spaces and expansive walls.

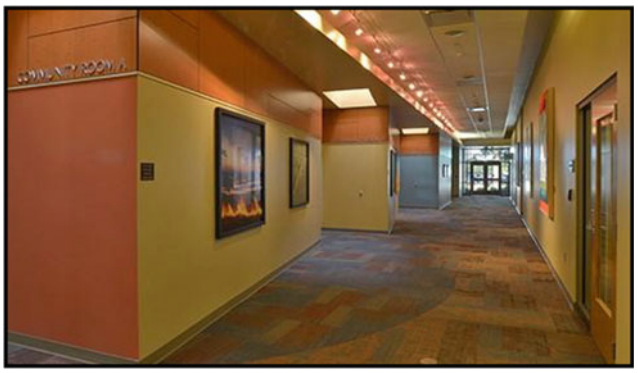

Fig. 34 Olathe Community Center, Kansas—USA

- As a natural material, wood can create the ecological and natural beauty of the interior atmosphere.
- As a sustainable material, wood can embody the social beauty of the cultural connotation in interior design.
- Wood can show the unique artistic beauty and humanity beauty by its design, color, texture elements, etc.
- Wood, with wooden building and wood products as the carriers, emphasizes the modeling beauty in the interior space through statuary art, three-dimensional construction art shaped by its rich modeling features.
- Rosewood and other valuable timbers can enhance the sense of value of interior space.

We have selected two examples for using wood material as main basic element of interior architecture design:

(a) First example of using wood in cultural spaces is that one that is a gorgeous timber cultural center modeled after Cree longhouse, Canada:

5.2.5 Basic Materials

Common Interior Materials in Designing Cultural Spaces

There are numerous types of materials which are using commonly in designing culture spaces including wood, metal, natural or artificial bricks, ceramic, glass, plastics, limestone, clay, natural rubber, linoleum, cork and others. Here, we will focus on the most common in use for designing cultural spaces as wood, bricks and limestone, metal, stainless steel, and glass which noted in most common cultural spaces worldwide as follows:

(a) ***Wooden Materials:***

As stated in "The Application of Wood in Modern Interior Design," the characteristics as well as cultural significance of wooden for contemporary art interior design are mainly includes following pinpoint aspects of advantages:

Cree Cultural Center, Quebec, (Canada) (Zimmer, 2016)

It designed by Rubin and Rotman Architects draws from the traditions of native peoples in longhouses called a shaptuan to create a modern center for cultural celebration. Wooden shelled building of the center referring to traditional Cree culture, which is common for living in small villages. The design for the museum and the meeting place done through, vernacular architecture along with modern green implementation around the surroundings as a gorgeous design and layout for this type of cultural place in Canada.

As shown in Fig. 35, the open plan also allows the structure to serve as a multi-purpose center for the community. The ground floor is an open wooden shell as shown in Fig. 36 that boasts exposed curved beams and an entrance as shown in Fig. 37 that evokes a traditional shelter. Local wood materials were use throughout to symbolize consumption. The ground floor doubles as a community center for storyteller events and the elderly's use.

Fig. 35 Façade of Cree Cultural Center

Fig. 36 Wooden Shell—ground floor

Fig. 37 Inside the Community Center

Historical artifacts and cultural traditions of the Cree people displayed in a museum section on the lower levels, preserving local folklore and history. Offices for both the band council and museum administration are also on the lower floors.

(b) The second one for innovated application of wooden materials is also a winner that was done in Cultural Center Jean Marie as follows:

"Cultural Center Jean Marie in Tjibaou" (New Caledonia) (Cultural Center Jean Marie Tjibaou—Data, Photographs and Plans—WikiArquitectura, 1998)
It is located in Noumea, capital of New Caledonia (Fig. 38) and completed in 1998; the architect was at the White House receiving the prestigious Pritzker Prize. It was designed by the architect Renzo Piano joined "Pacific and Modern Cultures" for promotion of Kanak Culture and dedicated to the memory of the political leader Jean Marie Tjibaou (Fig. 39).

The concept and design of the Cultural Center Jean Marie Tjibaou in Noumea in New Caledonia were generated by the need to maximize ventilation in a humid climate. The project builds on the topography of land, vegetation, and the breeze from the lagoon to create rising air currents, which are then removed by extraction towers, with the distinction of being the highest building on the top of the hill (Figs. 40 and 41).

Fig. 38 Façade of Cultural Center—New Caledonia

Fig. 39 Living people as Cree Cultural

As shown in Fig. 42, the cultural complex is composed of ten wooden houses made by wood mainly from young palms, all in different sizes and functions and built from iroko wood as well as glass, steel, and bamboo. These are grouped into three villages. First one shown in Fig. 40 is designed for the use of exhibition that could be used as temporary or permanent basis of activity per the demands. The second group of huts is divided spaces administration, research, library, and a conference room as shown in Fig. 41. Finally, other studies contain cabins for traditional activities such as music, dance, painting, and sculpture. The materials used are wood, steel, glass that all provide perfect materials to the interiors that serve the purposes of the center. The roof was done based on using direct skylight through a screen of laminated wood to provide nature light and as ventilation via wind to push hot air and in accompanying with bamboo walls which filtering the light all over the space.

(b) ***Bricks and Limestone Materials***:

"Phoenix Garden Trust" (London) (Griffiths, 2011)
East-London firm Office Sian Architecture Design had designed the building and its interiors for the "Phoenix Garden Trust" (Modern movements and styles, Conceptual Art, n.d.). The structure also incorporates materials including the brick exterior walls and arched doorway.

In Figs. 43, 44, and 45, the selective brick was chosen to match the existing low walls lining the garden. Above the brick, a limestone cornice inscribed with the name of the garden references. Therefore, environment, surrounding, culture, and city climate are all basic elements for perfect designing for cultural spaces.

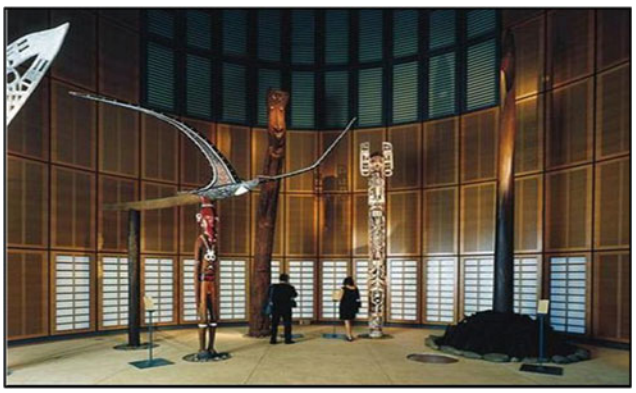

Fig. 40 Main exhibition (Auditorium and an Amphitheater)

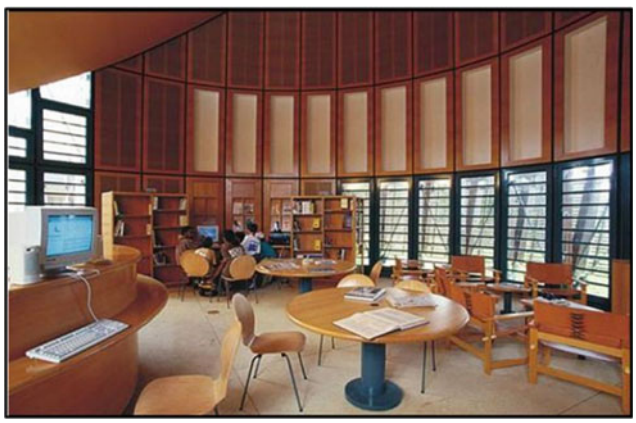

Fig. 41 Area of administration, research, and library

(c) ***Metal and Stainless Steel Materials:***

"Getty Center" (USA) (Richard Meier and Partners Architects, 1997)
Generally, stark, sleek, minimalist, and metallic materials are fitting right with contemporary design that the best metal finishes for this design types are nickel, stainless steel, and chrome. While metallic touches incorporated with accessories, fixtures, furniture, and mirrors, we have selected the following experience to highlight the usage of metal and stainless steel. The "Getty Center," Los Angeles, is a unique museum that incorporates the modern design of architect "Richard Meier" as unique design and wide-open spaces. As shown in Fig. 46, the complex of forms is all wrapped in gleaming titanium metal, stainless steel along with its metallic accessories. The internal spaces reflect the external forms. "Meier" has exploited the potential computer-aided design to make these freer forms possible.

In the Museum, clear sight lines between interior and exterior spaces as shown in Fig. 47 allow visitors to move in and out of the five gallery pavilions. The many exterior walls of glass allow sunshine to illuminate, add intrigue, and texture to the interiors. A computer-assisted system of louvers and shades adjusts the light indoors. As shown in Fig. 48, the paintings galleries on the museum's upper level are all naturally lit with special filters to prevent damage to the artworks.

(d) ***Glass Materials:***

"MOCAPE, Shenzhen's Museum" (China) (Coop Himmelblau| architecture and design news and projects, n.d.)
In China, Coop Himmelblau organization is a cooperative architecture design firm primarily which is located in Vienna, Austria, in 2017, has completed MOCAPE,[4] "Shenzhen's Museum of Contemporary Art and planning

[4]**MOCAPE**: Museum of Contemporary Art and Planning Exhibition.

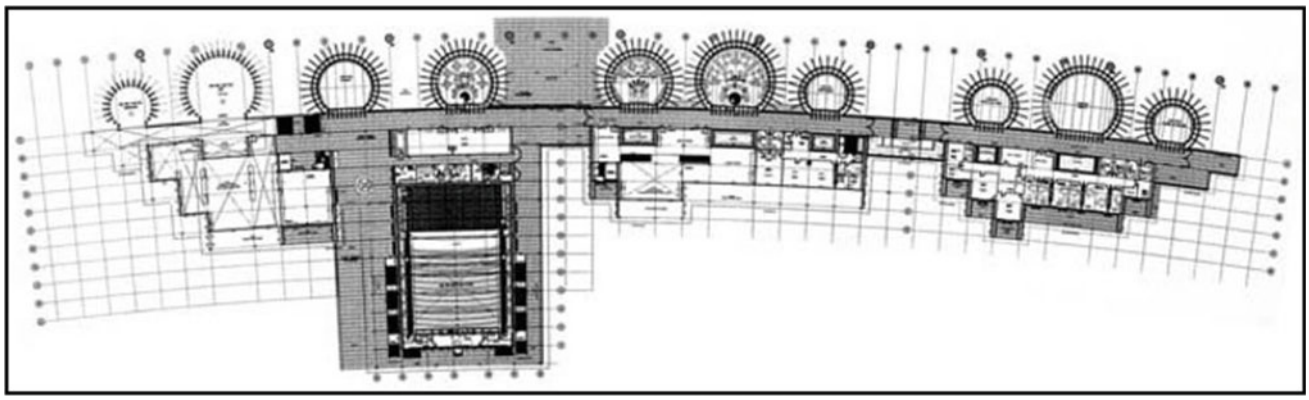

Fig. 42 Master site plan for the Cultural Center Jean Marie

Fig. 43 Phoenix Landon Community

Fig. 45 Open area to the garden

Fig. 44 Side layout of Phoenix Center

Fig. 46 Museum entrance at Getty Center

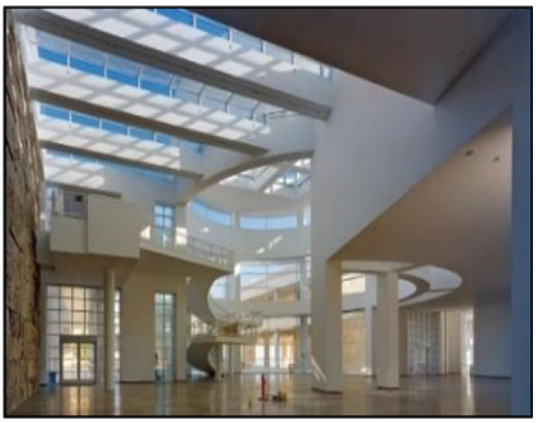

Fig. 47 Main hall of the museum

Fig. 48 Exhibition hall of art

exhibition." The building's skin includes an outer layer of natural stone louvers as shown in Fig. 49, and the climate envelope made from insulated glass. Emerging this surface remains structurally independent from the mounting framework of the museum buildings, enveloping the two institutions, the cloud, the plaza, and the multifunctional base.

The transparency of this façade and the interior lighting concept allow for a view from outside through the exterior envelope deep into the volume of the space, thereby particularly accentuating the shared entrance and circulation space between the two museum volumes. At the same time, the building skin also allows unhindered view from the inside on the cityscape while giving the visitor the impression of being in a pleasantly shaded outdoor area—an impression enhanced by very wide spans which allow for completely open, column-free and flexible exhibition halls with heights ranging from 6 to 17 m. The building combines two independent institutions, the museum of contemporary

Fig. 49 Main building of the museum

art (MOCA[5]), and the planning exhibition as a cultural meeting point and a venue for architecture exhibitions. The development includes a shared lobby as shown in Fig. 50, multifunctional exhibition halls as shown in Fig. 51, auditorium, conference rooms, and service areas to be used by both institutions.

5.2.6 Hi-Tech Interior Materials in Designing Cultural Spaces

The concept of "nanotechnology" (Omar, 2016) is the study of the controlling of matter on an atomic and molecular scale, while "nano-architecture" is the conversion of architecture in the new nano-revolution in the twenty-first century.

Thus, "nanotechnology + plus architecture equal = nano-architecture." The benefits are reduction in weight, in the number of production stages, efficient usage of materials, reduced need for maintenance, energy and reduced CO_2 emissions. Three examples of using nano-materials into the design of cultural spaces are Thermal Insulation: Vacuum Insulation (VIPs[6]), Solar Protection for Walls that integrating electro chromatic glass in interiors, last but not least solar wind hybrid street lights surrounding the cultural spaces of "The Bibliotheca Alexandrina" (Egypt).

Results of Study Structure

The analytical study herewith of the four criteria concept as a guiding approach to achieve innovative interior architecture design of cultural spaces and as set earlier in our study structure is taken based on number of selective examples to demonstrate implementing these concepts in detail, and comparative analyses documenting how these components were property immerged and interacted together in a perfect manner to produce the best designing approach revealing

[5]**MOCA**: Museum of Contemporary Art.
[6]**VIP**: Thermal Insulation: Vacuum Insulation.

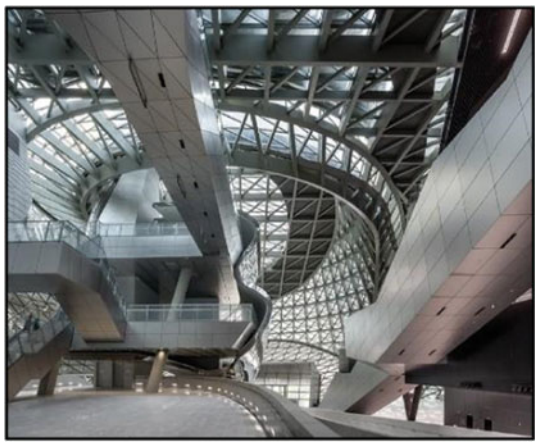

Fig. 50 Interior design of the lobby

Fig. 51 Internal multifunctional hall

innovative design output for cultural spaces. So accordingly, we have analyzing and summarizing the results as follows (Table 1).

Above analyses' applications were selectively chosen from worldwide cultural centers based on methodology that properly combines themes, or new innovated ideas with art elements associated with modern trends of contemporary design accompanying with elements of internal architecture design that were always depend on key components of surrounding cultural, society interaction, and the environment. The result of these comparisons concluded efficient access into innovation and creativity in the design of contemporary cultural spaces that identity's bears the spirit of modernism and technological techniques used in the designing process for these spaces.

6 Selective Case Studies

Based on the results of study structure, we have selected number of local, regional, and international cases as selective examples of experiences in designing innovated cultural spaces that were affected by relative trends of contemporary art.

These are extracted to highlight case studies which have chosen from Egypt, Kuwait, Norway, Canada, and Azerbaijan. The aim is to study, analysis, and document the interior design concept, procedures, and approaches taken to design, create, develop, and innovate these spaces for the cultural purposes.

7 "The Bibliotheca Alexandrina—BA" (Egypt) (SSH—Sheikh Jaber Al-Ahmad Cultural Center, n.d.)

Applied Trends of Conceptual, Technology, Installation, and Abstractions Arts

The library as shown in Fig. 52 was reborn in October 2002, and a vast complex where the arts, history, philosophy, and science come together. It had been designed by Snøhetta Hamza Consortium (Bibliotheca Alexandrina, 2001).

The new Bibliotheca Alexandrina (Bibliotheca Alexandrina, n.d.) was designed to have all renewable energy resources as shown in Fig. 53 that comprises a main reading space, six specialist libraries, and three museums, seven research centers, three permanent exhibition areas, and various galleries and exhibition halls. The tilting disk is surrounded by a circular wall comprising four thousand carved granite blocks that earned the library the title of the Fourth Pyramid. The main reading area is one open space, "where past, present, and future symbolically connect in a singular open space" (Snøhetta). From a technical point of view, several advanced technologies were employed in the design, especially, related to the piling, diaphragm wall, and the construction of the roof. It contains other cultural and educational functions including a planetarium, several museums, and conservation facilities. It is, however, also a connection between contemporary "Hieroglyphically, Arab and Islamic societies" to the past and the future through its wide resources, creating a window for the world and for Egypt and its neighbors.

As shown in Figs. 54 and 55, the structure is half buried in the site, with three of its floors are below sea level. Exterior aluminum surfaces are naturally anodized, with stainless steel fixings. The steel is hot-dip galvanized. The

Table 1 Details analysis of concept of designing cultural spaces

Selective best practice design applications	Themes and new ideas	Elements of art	Contemporary art and trends	Elements of interior architecture design
"UNT Student Center of North Texas" (USA) Page: 11	*Branding and graphics*	*Line, Form and Color*	*Conceptual Art*	***Ceilings, and Materials (Aluminum)***
"Onassis Cultural Center Lobby" (Athens)—PAGE: 11	*Geometrical sculpture expressing City's Identify*	*Line, shape, Form, and Color*	*Conceptual, Installation, and Performance*	***Furniture, Partitions, Floors, and Materials (Dark-Coated Steel)***
"Milan's UniCredit Pavilion" (Italy) - PAGE: 13	*Interactive Virtual reality Flooring Installation*	*Light, Shape, and Color*	*Technology, and Performance*	***Floors, Interactive Lighting and Materials (Fiber -Glass)***
"Olathe Community Center" (USA)—PAGE: 13	*Guiding Approach by Colors*	*Line, and Color*	*Minimalism Art*	***Walls, Floors and Materials (Coating Colors)***
Cree Cultural Center, Quebec (Canada) PAGE: 14	*Traditional Cree Culture*	*Line, Shape, and Form*	*Conceptual Art*	***Ceilings, Walls, and Materials (Wood)***
Cultural Center Jean Marie in Tjibaou (New Caledonia) PAGE:14	*Identity and Traditional of Kanak Culture*	*Line, Shape, and Form*	*Conceptual, and Environmental,*	***Ceilings, Walls, Partitions, Furniture, and Materials (Iroko Wood—Bamboo, and Glass)***
"Phoenix Garden Trust" (London) —PAGE: 15	*Use of Surrounding Environment Culture to Express City Climate*	*Line, Form, and Texture*	*Conceptual, and Environmental,*	***Walls, and Materials (Bricks and Limestone Cornice)***
"Getty Center" (USA) PAGE: 15	*Modernism Approach of Using Metallic with Elements of Interior Design*	*Line, Form, Texture, and Light*	*Technology, and Minimalism*	***Ceilings, Walls, Floors, Materials (Metal, Nickel, Stainless Steel, Chrome, and Mirrors)***
"MOCAPE, Shenzhen's Museum" (China) PAGE: 16	*Idea of Transferring Outside Natural Environment into the Design*	*Line, Form, Shape, Texture, and Light*	*Abstraction, Installation, and Technology*	***Ceilings, Walls, and Materials (Stone, Glass, and Metal***

Fig. 52 Buidling of the Bibliotheca Alexandrina

Fig. 53 Bibliotheca Alexandrina Renewable Energy Resources

Fig. 54 Half buried building structure in site

Fig. 55 Exterior hieroglyphically gray granite

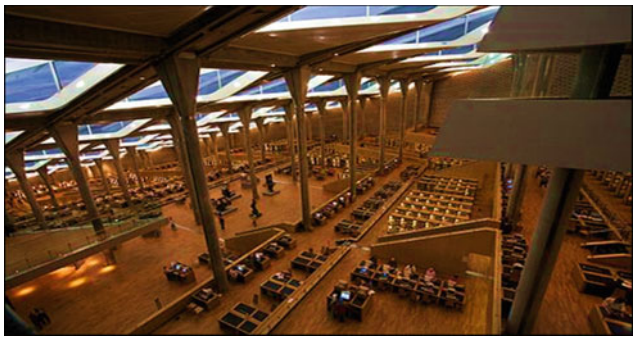

Fig. 56 Main library interior design

granite panels were quarried by splitting the rock, creating the wavy texture to the panels. The designs on the panels were traced by computer but carved by hand. Basic finish materials include stone, wood, stainless steel, aluminum, glass, and concrete. For exhibit hall, it walls were made from gypsum board walls as below, light gray with special tracks for hanging exhibition hooks, provided. Materials chosen are durable and require little maintenance. The hall had different types of materials (i.e. wood, metal, and ceramic).

Fig. 57 Lighting systems in ceiling roofs

For interior design and furnishing as shown in Figs. 56 and 57, the finishes in the public areas are perforated aluminum or timber panels for the walls, granite tiles, or timber for the floors. The furniture in the library was donated by the Norwegian government and is mainly of wood, simply finished, and designed for comfort and durability. Balustrades are of glass with stainless steel handrails. Corrugated metal sheets beneath the floor finish allow for maximum flexibility and accessibility for electrical wiring. This was the first time that this system was used in Egypt, and it was found to be highly appropriate and efficient.

Case Review and Analytical Procedures

The herewith table is to measure the effect of contemporary art trends into the design process as given in Table 2:

Trends of contemporary art of conceptual, environmental, technology, installation, and abstraction trends were interacted within the design process. Thus, it has been concluded that only five trends out of seven were accomplished in the design as well as engaged to serve the prime goals as planned for. All materials used were enabling and providing the concepts of flexibility, efficient in use, environmental and in effective economical manner as well.

7.1 "Cultural Center of Sheikh Jaber Al-Ahmad" (Kuwait) (SSH—Sheikh Jaber Al-Ahmad Cultural Center, n.d.)

Applied Trends of Conceptual, Technology, and Abstractions Arts

Sheikh Jaber Al-Ahmad Cultural Center is one of excellent cultural buildings as shown in Figs. 58 and 59. It is as a showcase performing number of contemporary art trends that affect its design. SSH company is the architecture and

Table 2 Table of contemporary art trends and materials used (Illustrated by the researcher)

Type of art trend	Conceptual art	Environmental art	Minimalism art	Performance art	Technology art	Installation art	Abstraction art
Design concept aapplied	*Historical Culture in shape of modernism*	*Naturally, green materials, equipment are properly utilized*	*Minimalism in Visual Art*	*Interaction Human with the Art*	*Integrated Methods of Technology*	*Site-specific that they are design and exist in space*	*Artwork that reshapes the natural world*
Achieved and implemented	*Yes*	*Yes*	–	–	*Yes*	*Yes*	*Yes*
Not applicable	–	–	*N/A*	*N/A*	–	–	–
Elements of interior aesign	***Floors***	***Ceilings***	***Walls***	***Partitions***	***Furniture***	***Lighting***	***Colors***
Application of materials used	*HDF Wood–Timber Wood–Granite Titles–Ceramic*	*Glass reinforced Concrete–Stainless Steel–Double–glazed glass panels*	*Pre–Cast Concrete Walls–Gray Granite Panels*	*Wood timber panels–Stainless Steel*	*Wood–Metal–Stainless Steel*	*Daylight–Artificial Direct–Indirect–Fixed–Movable*	*Aromatic and Earth scheme colors of Metallic–Gray, Brown*

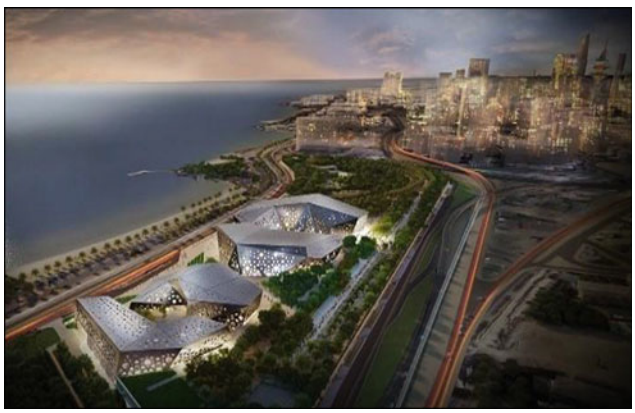

Fig. 58 Overall

Fig. 60 Islamic design style for walls

Fig. 59 Islamic reception area

Fig. 61 Side, round Islamic walls

designer for the center as one of the leading master planning, infrastructure, and building designs in the Middle East. The design was done by Sebaa Orabi that its vision was to explore the heritage of Kuwait and as a leading social and creative for the region.

The center consists of theater, music center, conference halls, library, and all the other administration and serving spaces such as offices, restaurants, and parks.

The design inspired by Islamic architecture as shown in Figs. 60 and 61. Designers Jassim Al Nasrallah and El Seed were engaged to create a unique image of calligraphy designs that were done through handmade sculptures, carved stone, and graphic prints. Another aspect is to exploring the beautifully designed interiors at the food court as shown in Fig. 62 while the key buildings of the theater quarter as shown in Figs. 63 and 64 are include theater, music center, library, conference halls as well as the park.

Fig. 62 Food court of the center

Fig. 63 Main theater center

Fig. 64 The National Theatre Building

Walls, floors, and roofs of the center as basic elements of interior architecture design are designed based on the Islamic identity reflecting its nature on the design to achieve the three achievements of environmental consciousness, human interaction encouragement, and finally technology integration. The use of black marble was done with handmade, sculptured calligraphy characters in cast aluminum. Most types of materials used in interior design of the center are wood, metal, stainless steel, marble, ceramic, glass, plastics, cork, and many others as well.

Case Review and Analytical Procedures

The herewith analyzing table measuring the effect of contemporary art trends as shown in Table 3:

Trends of conceptual, environmental, technology, and abstraction are properly interacted within the design process to serve the prime goal of the center in a modern and futuristic manner as well. All materials used were enabling and providing the concepts of flexibility, efficient in use, environmental and in effective economical manner as well.

7.2 "Vennesla Library and Cultural Center" (Norway)

Applied Trends of Conceptual, Environmental, Technology, and Abstractions Arts

The "Vennesla Library and Cultural Center" (Figs. 65 and 66) designed by "Helen and Hard" is a multi-level public facility in Norway, serving as a spatial connector between an existing community house, learning center, and a public square, the design is a direct result of the synergetic coupling of structures, manifesting as a series of gradually shifting ribs that provide structure in addition to furniture and storage for technical devices.

Table 3 Table of contemporary art trends and materials ised *(Illustrated by the researcher)*

Type of art trend	***Conceptual art***	***Environmental art***	***Minimalism art***	***Performance art***	***Technology art***	***Installation art***	***Abstraction art***
Design concept applied	*Islamic Culture*	*Naturally, green materials, equipment are properly utilized*	*Minimalism in Visual Art*	*Interaction Human with the Art*	*Integrated Methods of Technology*	*Site-specific that they are design and exist in space*	*Artwork that reshapes the natural world*
Achieved and implemented	*Yes*	*Yes*	–	–	*Yes*	–	*Yes*
Not applicable	–	–	*N/A*	*N/A*	–	*N/A*	–
Elements of interior design	***Floors***	***Ceilings***	***Walls***	***Partitions***	***Furniture***	***Lighting***	***Colors***
Application of materials used	*Wood–Marble–Ceramic–Porcelain*	*Glass–Stainless Steel–Aluminum–Gypsum Boards–Prefabricated Timer Glass*	*Gypsum Board–Timber–Aluminum–Concrete*	*Plastics–Wooden Panels–Metal–S. Steel*	*Wood–Metal–Stainless Steel–Plexi glass*	*Daylight–Artificial Direct–Indirect–Movable*	*Natural for exterior and bright colors for interiors as gold–black–gray)*

Fig. 65 Façade of Vennesla Library and Cultural Center

Fig. 66 Back Façade of The Library and Cultural Center

The new library comprises a library, a café, meeting places and administrative areas and links an existing community house and learning center together. All main public functions have been gathered into one generous space allowing the structure combined with furniture and multiple spatial interfaces to be visible in the interior and from the exterior.

This was achieved by a large glass facade and urban loggia providing a protected outdoor seating area.

The designer developed a rib concept that combines a timber construction with all technical devices and the interior. Library consists of 27 ribs made of prefabricated glue-laminated timber elements and CNC[7] cut plywood boards. These ribs inform the geometry of the roof as well as the undulating orientation of the generous open space with personal study zones nestled along the perimeter; see Figs. 67 and 68.

For Figs. 69 and 70, each rib consists of a glue-laminated timber beam and column acoustic absorbents which contain the air-conditioning ducts and bent glass panes that serve as lighting covers, and integrated reading niches and shelves for the readers to reduce energy in the building.

Case Review and Analytical Procedures The following analyzing table measuring the effect of contemporary art trends as shown in Table 4:

Four trends as indicted above were accomplished and properly accounted for serving the prime goal of the library and its purpose in a modern and futuristic manner. Materials

[7]**CNC**: Computer Numerical Control.

Fig. 67 Side ribs in the library

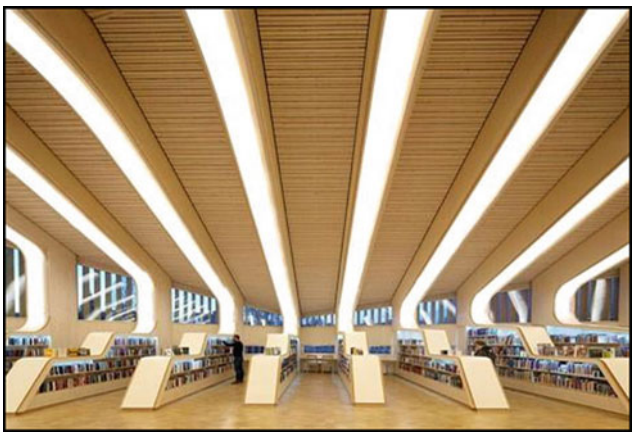

Fig. 68 Roof and floor of the library

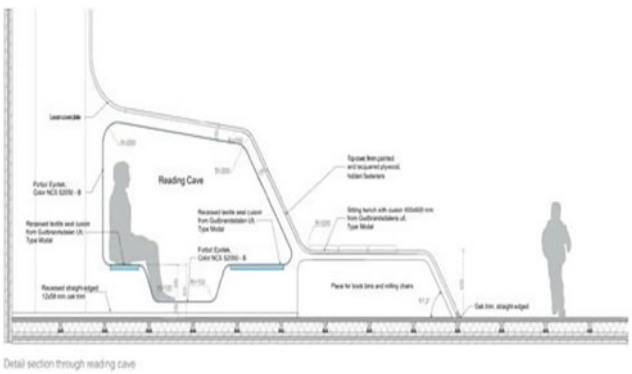

Fig. 69 Interior rib design and contents

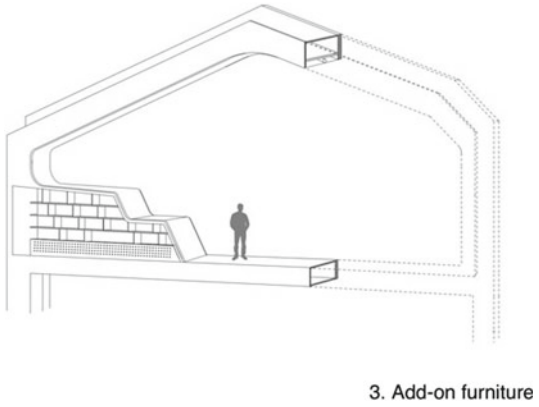

Fig. 70 Detail working for designing the rib

used were installed providing the best practices for each elements of interior design to achieve its goals of function-ability and in cost-saving in another manner.

7.3 "Outma Sqilx'w Cultural School" (Canada) (Hildebrand, 2013)

Applied Trends of Conceptual, Environmental, Minimalism, Installation, and Abstractions Arts

The goal was to create a contemporary space that captivated students using today's technologies. It was designed by Peter Hildebrand, Iredale Group Architecture with views over Skaha Lake, and Lake Okanagan.

The space is clad in alternating bands of painted drywall surfaces and light wood slats, which roll down from the ceiling to become seating around the edges of the space. The entrance as shown in Figs. 71 and 72 appears to have opened within the crevasse of two shifting geological forms.

The classrooms (Fig. 73) outside each classroom are a bench and bulletin board with the lockers, and each classroom has an outdoor learning area facing the city and lake view as shown in Fig. 74, as an artistic interpretation of the facility.

Case Review and Analytical Procedures

The following analyzing table measuring the effect of contemporary art trends as shown in Table 5:

Four trends of contemporary art were fully applied and implemented since surrounding environment was basic elements in the design as well as incorporated interior design materials that serving the combination of contemporary art

Table 4 Table of Contemporary art trends and materials used (Illustrated by the researcher)

Type of art trend	***Conceptual art***	***Environmental art***	***Minimalism art***	***Performance art***	***Technology art***	***Installation art***	***Abstraction art***
Design Concept Applied	Contemporary Culture Art as conceptual design aspect	*Naturally, green materials, equipment are properly utilized*	*Minimalism in Visual Art*	*Interaction Human with the Art*	*Integrated Methods of Technology*	*Site-specific that they are design and exist in space*	*Artwork that reshapes the natural world*
Achieved and Implemented	*Yes*	*Yes*	–	–	*Yes*	–	*Yes*
Not applicable	–	–	*N/A*	*N/A*	–	*N/A*	–
Elements of interior design	***Floors***	***Ceilings***	***Walls***	***Partitions***	***Furniture***	***Lighting***	***Colors***
Application of materials used	MDF Wood–Corrugated Metal Sheets–Ceramic	Glass–Stainless Steel–Aluminum–Concrete–Prefabricated Timer Glass	Gypsum Board–Laminated Timber–Concrete	Plastics–Wood–Metal–Stainless Steel	Wood–Metal–Stainless Steel	Daylight–Artificial Direct–Indirect	Natural colors for exterior and for interiors as white–gray–light brown

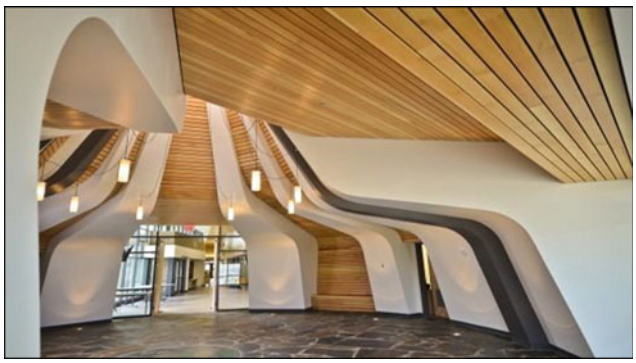

Fig. 71 Main entrance for the project

Fig. 73 School classrooms

Fig. 72 Roof and imbedded lighting system

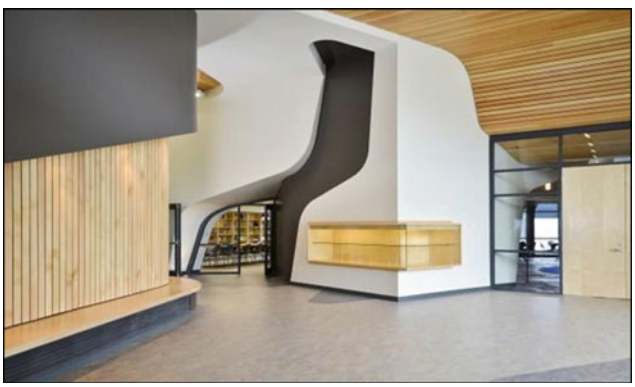

Fig. 74 Waiting area in front of classrooms

Table 5 Table of Contemporary art trends and materials used (Illustrated by the researcher)

Type of art trend	***Conceptual art***	***Environmental art***	***Minimalism art***	***Performance art***	***Technology art***	***Installation art***	***Abstraction art***
Design concept applied	Contemporary Culture Art as conceptual design aspect	*Naturally, green materials, equipment are properly utilized*	*Minimalism in Visual Art*	*Interaction Human with the Art*	*Integrated Methods of Technology*	*Site-specific that they are design and exist in space*	*Artwork that reshapes the natural world*
Achieved and implemented	*Yes*	*Yes*	*Yes*	–	–	*Yes*	*Yes*
Not applicable	–	–	–	*N/A*	*N/A*	–	–
Elements of interior design	***Floors***	***Ceilings***	***Walls***	***Partitions***	***Furniture***	***Lighting***	***Colors***
Application of materials used	MDF Wood Sheets–Ceramic	Wooden Slats and Panels–Concrete	Alternating bands of drywall–Light Wood slats	Wood Panels–Meta–Stainless Steel	Wood–Metal–Stainless Steel	Daylight–Artificial Direct–Indirect	Natural and bright color in flooring, walls and ceilings

Fig. 75 Main Façade of the center

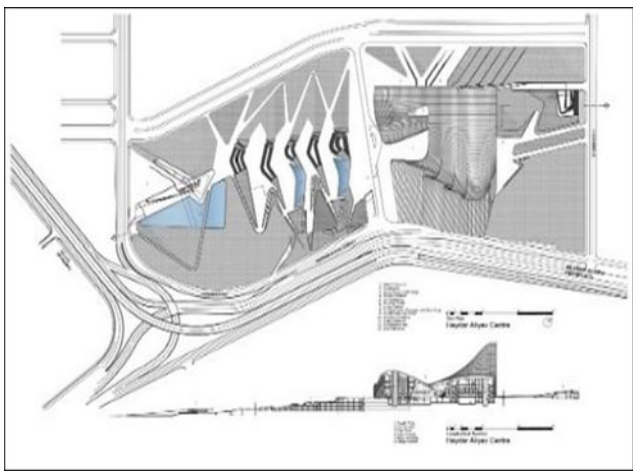

Fig. 76 Site plan for the project

trends and the design along with the best functional materials used.

7.4 Heydar Aliyev Center—Baku, Azerbaijan (Zaha Hadid, 2013)

Applied Trends of Conceptual, Technology, Installation, and Abstractions Arts

The center takes its name from Heydar Aliyev (1923–2003), the national leader of Azerbaijan who led the country—from 1969 to 1987, when it was part of the Soviet Union, and from 1993 to 2003 as an independent nation and is considered the founder of modern Azerbaijan. "Zaha Hadid Architects" was the designer of the Center as following a competition in 2007 and that was completed in 2012. As shown in Figs. 75 and 76, the center was designed in consolidation manner that to presents the nation's culture that was taken from the Soviet era, Islamic calligraphy and along with the elements of traditional Azeri architecture.

It is a multifunctional venue which accommodates a 1000 seat auditorium, temporary exhibition of art, science, history spaces, conference center, workshops, a museum, music concerts, theatrical performances, screenings, educational activities, and special events.

The space frame system that is famous for its fluid shape enabled the construction of a free-form structure that the array of column-free functional spaces of the center is enclosed by a free-form curvilinear envelope, and the skin is supported by a load-bearing structure constituted by a complex ensemble of concrete elements and steel frames which saved significant time throughout the construction.

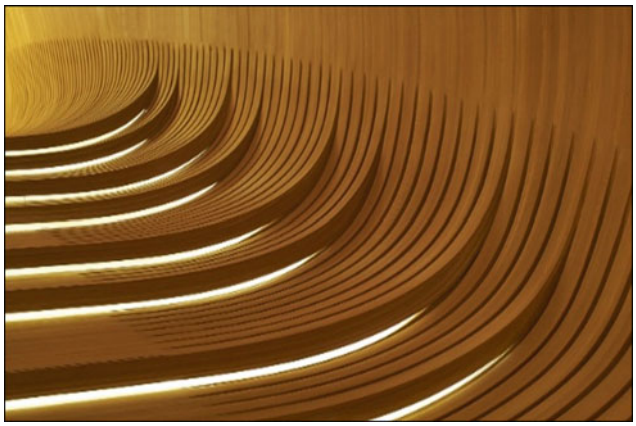

Fig. 77 Seams finishes by hi-tech cladding materials

Fig. 78 Multifunctional inside hall of activities

Interior design was done to properly targeting the direct expression the beauty of dynamic sculpture in the multi-functional activities hall shown below herewith, (Figs. 77 and 78).

The interior design of the center was designed by Architect "Thierry Beillevaire for Creative Architecture and Urbanism Studio" as shown in Figs. 77 and 78. Glass fiber reinforced concrete (GFRC[8]) and glass fiber reinforced polyester (GFRP[9]) were chosen for ideal cladding materials. The interior design was done with the conceptual idea of seashells and its foundation by using hi-tech software application to create that unity in form and beauty as well (Fig. 79).

The interior was designed to enable surfaces to twist to transform the walls into ceilings in a form of unit-ability. The center ground floors were in number of lobby spaces around the space to serve various types of usages. Floors in

[8]**GFRC**: Glass Fiber Reinforced Concrete.
[9]See Footnote 8.

Fig. 79 Views of the theatrical activities

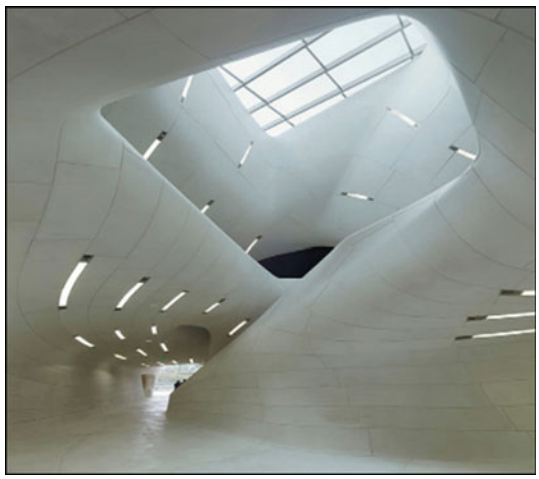

Fig. 80 Interior Grand Hall

Fig. 81 Views of museum galleries

Fig. 82 Waiting area for visitors

Fig. 83 Reception direct lighting

Fig. 80 are designed to connect ramps and walls in form of continue twisting to create form of endless white landscapes. As shown in Fig. 81, light systems were used in many forms and types that using the daylight element and others as well based on activity and nature of the space to place on Figs. 82 and 83.

For windows, lights as shown in Fig. 82 enable the designer to use the volume of light to be in used. During the night, the center is transforming gradually to match the connection between its interiors and exteriors and (Fig. 84) illustrated the concept in furnishing its interiors based on a manner that consists with the overall planning of the place.

Case Review and Analytical Procedures

The following analyzing table measuring the effect of contemporary art trends as shown in Table 6:

Fig. 84 Design furnishing element

From the above table, six trends of contemporary art were fully applied and implemented that serving the combination of contemporary art trends and the design as well as all the materials used was providing the best implementation based on the function-ability and flexible based on its durability with less maintenance cost incurred.

8 Research Findings and Recommendations

As illustrated above during our research and reviewing processes over some selected worldwide examples as best practice designing experiences for cultural spaces in-line with our understanding of basic trends of the contemporary art and its effect into interior architecture design, we have summarized the findings and recommendations for the benefits of our local interior designers as a guide that perfectly will fits with prime goals they have placed as follows:

- Interior architecture designers in creativity and aesthetically should provide positive assurance that their design has been take necessary steps to ensure proper functioning and maintenance concepts to reduce their costs.
- Interior architecture designers should start with the concept of activity based planning. So, defining the activity and its related function of the space or cultural spatial is a crucial process in effective designing process.
- Be always connect with the community in a manner to allow direct connection with the public to increase interaction feature.
- Among with our selected applications and worldwide implementations as above, it is very important the process

Table 6 Table of contemporary art trends and materials used (Illustrated by the researcher)

Type of art trend	***Conceptual art***	***Environmental art***	***Minimalism art***	***Performance art***	***Technology art***	***Installation art***	***Abstraction art***
Design Concept Applied	Contemporary Culture Art as conceptual design aspect	*Naturally, green materials, equipment are properly utilized*	*Minimalism in Visual Art*	*Interaction Human with the Art*	*Integrated Methods of Technology*	*Site-specific that they are design and exist in space*	*Artwork that reshapes the natural world*
Achieved and implemented	*Yes*	*Yes*	*Yes*	–	*Yes*	*Yes*	*Yes*
Not applicable	–	–	–	*N/A*	–	–	–
Elements of interior design	***Floors***	***Ceilings***	***Walls***	***Partitions***	***Furniture***	***Lighting***	***Colors***
Application of materials used	Wood–Marble–Ceramic	GFRC–GFRP–Stainless Steel–Aluminum–Concrete	GFRC–GFRP–Aluminum–Glass	Glass–Stainless Steel	Plexi Glass–Textiles–Stainless Steel	Day lighting–Artificial–LED–Optical fiber	White–Gray–Black–Brown

of inspiration of cultural and civilizational features of the place and its translation to the public in contemporary design methods to architecture elements of floors, ceilings, walls, and furniture that were merged and applied.

- Interior architecture designers must know how to visually render their plans with drawings, computer-aided design software or scaled models so a client can see and accept the designer's ideas. They must know how to create a desired look and feel through the use of colors, lights, furniture, flooring, and fabrics, as well as how to artfully arrange these elements.
- Must also read blueprints and know city building codes to maximize the safety of their designs. Thus all of our selected applications, the designers were properly interacted with their clients and also in connection with all requirements as set by the concerned bodies in a form of innovation and futuristic manner.
- Attention should be given to provide focusing on effectiveness and sustainability of the design such as good ventilation, proper access to daylight and outdoor spaces, and ensure using friendly materials.
- The use of simplicity in the design lines, specific colors and appropriate colors of the idea with the use of modern materials that converted into a creative work of art in a manner of innovation and futuristic as well.
- Finally yet importantly, it is our recommendation that more specific guidelines should be properly documented such as identification of cultural, civilizational and societal identity of the space based on environmental considerations, determination of spatial space activities and related components for its potential user requirements, and overview latest trends in interior design for these types of spaces and its implementations worldwide.

Therefore, these guidelines should be considered to set out certain principles for the selection and planning of these spaces that includes the concept, theme, and the designing process. That should be undertaken by level of governmental bodies such as universities, faculty of fine arts, and other in-kind concern parties for the benefits of interior designers and to the professionalism as a whole these specialized studies and guidelines are so important to be properly documented.

9 Conclusion

The relationship between trends of contemporary art and interior architecture design is the main concept and approach in designing cultural spaces of which has grown during the beginning of this decade and that contemporary art is becoming recognized as an essential component, innovated style for designing cultural spaces. Art and interiors are inextricably linked in complex aesthetic and emotional ways when joined together. Thus, to demonstrate tangible value for cultural spaces, successful interior designers shift the conversation toward the role interiors play at a strategic level. This means emphasizing not only how cultural space will look or be in function, but also how people connect to it emotionally.

Moreover, creativity in designing modern cultural spaces depends on two important points as of human culture, spatial identity and implementation of means, methods in hi-tech applications in producing electronic designing programs accompanying with the modernism construction approaches that using environmental developed materials. Then, the main element that connecting these two key points is that the new,

futurist trends in arts incorporating with principles of art design to achieve the target conclusion of creativity and innovation in designing the cultural spaces. Therefore, the design tools of color and graphics and their implementations along with hi-tech materials and various trends of contemporary art that are newest, innovated and futuristic are all great to help shape spaces and create unique and expressive cultural facilities that truly represent their location. It is so crucial to use unique, modern approaches of nano-materials, nanotechnology, and hi-tech materials and related approaches that are strategically placed in the design, as well as all other elements of interior architecture design with their direct intervention with contemporary art will not only help to draw patrons into the said cultural space and navigate them throughout it, but also serve to establish a tide connection between them.

Obtained results from our comparative study over examples, and applications revealed that the key trends that often in use while designing the cultural spaces and as per discussed in the different trends of contemporary art, are: the trends of conceptual, environmental, minimalism, and abstraction arts that are all in a solid connection with the technology trend. These trends are in growth and deriving distinctive identity that strongly expresses; human cultural, society as well as allowing human interaction with each element of interior architecture design of; horizontal, vertical levels, lighting, and colors drawing together an innovated piece of painting work that the human element is a crucial one with related philosophical concept of designing cultural spatial differing from any other buildings.

Such growth enables our local designers to realize its impact that the practical aspects, functional needs, and its visual impact is increasingly to become the primary language through characteristics of simplicity, harmony, economic balance and access to work the technical to the basic elements of form, color, and geometric surfaces in designing interior spaces and its engagements as new approach in designing concept as well as basic criteria and a guide to be reduplicated in Egypt and the Middle East.

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Why Does *Revenge* Challenge Conservators More Than *Avaton*?

Sophie Lei

Abstract

In this paper, I compare two installations' processes: *Avaton* (2007) by Nunzio and *Revenge* (2007–2018) by Vascellari, to claim that to take into account architecture, through the theoretical lens of (Goodman, Language of Art: An Approach to a Theory of Symbols, Bobbs-Merrill, Indianapolis, 1968) and (Genette, Immanence et transcendance, Seuil, Paris, 1994), and their distinction between autographic and allographic works, might help to understand the difference between the copies of an installation (when the second version of a work is not accepted as authentic) and its instances (when the second version of a work is considered as authentic as the preceding ones). In other words, while conservator Laurenson (2006) compared installations to musical compositions, through the prism of Goodman, in this paper, I claim that installations are rather close to architecture, through the prism of Genette, following conservator Caianiello (2013). Indeed, Goodman and Genette did not write especially about installations, and thus, it is useful to create a bridge between an art form they already investigated. Here, it will be demonstrated that architecture is best suited to creating that bridge, allowing to answer the following question: why was it less problematic for conservators to reinstall *Avaton* than *Revenge*?

Keywords

Installations • Architecture • Conservation • Museum • Contemporary Art

1 Introduction

On the one hand, observations, carried out between 2017 and 2018, in *MAXXI*, the Italian National Contemporary Art Museum, Rome, reveals a case where the artist wanted to reinstall his work, and conservators accepted the new version without raising any concerns nor controversies. On the other hand, there is a case where the artist wanted to reinstall his work, introducing changes, and conservators were not enthusiastic. These two cases will be described to show the diversity of situations: in October 2017, *MAXXI* decided to show again one of the works from its collection, that is, *Avaton* (2007) by Nunzio (Fig. 1). Composed of different elements in burned wood, the work is a monumental and harmonious semi-circular sculpture. It rises in space, impenetrable like a wall, extending for 2 m in height, 7 m in length, and 1.60 m in depth. Thus, it obliges the viewer to engage physically through peripheral vision and memory. The reinstallation of the work was not particularly problematic: the original material had been kept in the museum depot, in suitable plastic packaging, and the artist, thanks to his memory, managed to reassemble his installation in two days, with the help of two of the museum's technicians. On the contrary, in June 2018, *MAXXI* decided to reinstall *Revenge* by Vascellari, and several of the artist's decisions greatly challenged the approach of conservators. The work consists of a high wall of varnished and combusted wood, in which more than 50 amplifiers, of different sizes, are embedded within (Fig. 2). To reinstall *Revenge*, the artist had to transform his work according to the dimensions of the museum. It was not a question of remaking a new semi-circular wooden wall, but to adapt the existing structure to the new space of the museum. Moreover, he reinterpreted his work, since he refused to install again some elements, he changed the lighting at the entrance and inside of *Revenge*, and he chose to perform outside the museum, instead of where the installation was. These two cases beg the question: Why was it less problematic for conservators to reinstall

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Y. Mahgoub et al. (eds.), *Cities' Identity Through Architecture and Arts*,
Advances in Science, Technology & Innovation, https://doi.org/10.1007/978-3-030-14869-0_4

Fig. 1 **a–d** Installation of *Avaton*, October 2017, *MAXXI*. © Sophie Lei 2017

Avaton than *Revenge*? To answer this question, I will analyze Laurenson's theory (2006), conservator, in which she explains, based on Goodman's theory (1968), philosopher, that installations are very close to musical compositions, instead of sculptures. In this way, my claim is: it is more useful to rely on architecture, because of the strong site-specific nature of some installations.

2 Laurenson's Proposition for Installations: A *Continuum* Between Sculpture and Music

Laurenson (2006), conservator, used the distinction between autographic and allographic works, elaborated by Goodman (1968), philosopher, and the ontological significance of the musical score, developed by Davies (2001), philosopher, to explain how installations must be approached by conservators, that is, differently from sculptures and similarly to musical compositions provided with a score. In other words, for Laurenson, installations are closer to allographic works than autographic ones.

2.1 Unique Objects

Sculptures, as traditional objects, can be studied through scientific methods, establishing their state through their physicality and avoiding any interpretation. Indeed, any irreversible change, in comparison with their original state, is a loss that compromises their authenticity, because their materiality contains traces of their history of production, that means they are not fake (Laurenson, 2006, 4). Thus, Laurenson introduced Goodman's distinction between autographic and allographic arts, to explain the difference between forgeable and non-forgeable arts: certain works, like sculptures, are liable to be counterfeited, they are

Fig. 2 **a–d** Installation *Revenge*, June 2018, *MAXXI*. © Sophie Lei

autographic. On the contrary, for other works, like musical compositions, it does not make sense to speak of counterfeit or authenticity, because they can exist in an unlimited number of copies, each equally valid, which establishes them to be allographic.

2.2 State Versus Identity

Laurenson claimed that there is an inseparable link between the ontology of the work, and the conceptual framework is used in conservation. Indeed, conservators generally approach installations as if they were autographic, that is, unique objects, created by the artist, at some point in history, like sculptures. However, conservators' notion of the material state of the object is not suitable for allographic works, because their authenticity resides elsewhere than in their physicality, that is, in their identity (idem, 4). In other words, for Laurenson, installations do not have their authenticity in their materiality, but in other elements peculiar to their 'identity,' which must be determined by the artist. Thus, installations are closer to music performances, provided with specific work-determinative instructions, like a score, that must be followed to experience the work in an exhibition space. These instructions are not standardized as in musical scores; however, they may also contain more or less important details of the work defined by the artist. Laurenson employed the same vocabulary as Davies to explain that the work-determinative instructions of an allographic installation must leave a gap between the notation and the presentation: they can be 'thick' or 'thin' in defining the work constituent properties. Indeed the part of indeterminacy in the phase of realization of the installations is a fundamental part of their identity (idem, 5). For Laurenson, certain installations are allographic works because the artist was able to make a distinction between constituent and contingent features in plans, that is, works defining properties and properties that could change. Thus, the artist's choices

determine where an installation is on the *continuum* between autographic and allographic work (idem, 6).

2.3 Back to the Cases

While this analysis is useful for understanding why it is generally difficult for conservators to face reinstallations in the museum, it is not possible to say precisely the reason why the reconstruction of *Avaton* was not a problem while *Revenge*'s reinterpretation was more controversial for conservators. In both cases, the artist was present but no assembly instructions were available. However, while *Avaton* has hardly varied, *Revenge* has changed to fit the space of *MAXXI*, a very different space from that of the Venice Biennale, where it had been first installed in 2007. For Brunetti, conservator, it is obvious that this second installation allowed the artist to identify the strengths of his work and to remove less important elements. Thus, the artist had the opportunity to identify the work-defining properties of *Revenge*, that is the features that could vary and the ones that must stay. For example, Brunetti insisted on the importance of the wooden structure painted and burned by the artist, and the loudspeakers all coming from different musicians dear to the artist: they cannot be replaced and must be present from one installation to another. On the other hand, the sarcophagus inside the wooden enclosure has not been repositioned. The lamp at the top of the wall was replaced by two floating lights at the entrance of the tunnel and inside the enclosure. In other words, it appears that certain elements have remained the same, others have evolved, while others have not been reproposed by the artist. However, for Brunetti, the big challenge of this installation is that there are no fixed preliminary instructions to follow from one reinstallation to another. Thus, what will happen when the artist is not there to guide the rebuilding of his work in the museum? Brunetti said that she is particularly worried about not knowing in advance exactly the defining properties of the work: what must stay and what can change. Differently, during the reinstallation of *Avaton*, the numbers that the artist had put on each of the wooden rolls to allow its reinstallation had disappeared. However, this did not prevent the artist from reinstalling his work thanks to his memories even if it was not possible to check if each level of wood has been replaced identically to the original: not an important detail for conservators of the museum as it did not dramatically change the form of the work. It is all about space and site-specificity, and it has an impact on the autographic and allographic distinction. Indeed in most of the cases, site-specificity is an essential part of the installation identity. This is why, after explaining the main lines of Goodman's theory, it will be possible to claim that architecture seems to be a more adequate art for the study of the conservation of installations, like Caianiello (2013), art historian, already suggested for media art installations (Caianiello, 2013, 215).

3 Goodman's Distinctions

At this point, it may be useful to explore a little bit deeper the vocabulary of Goodman to better understand the theory referred to by Laurenson. Indeed, only when this theory is explained, will it be possible to bring architecture properly into the argumentation, to claim that this art is more suitable when considering the conservation of installations, and their reinstallations, than a *continuum* between sculpture and music as Laurenson suggested.

3.1 Autographic Versus Allographic

For Goodman, autographic works, like paintings, are liable to be counterfeited: they are said to be autographic. Each one exists only in one instance and cannot be redone even once without the new version being a fake. Its identification then depends on the history of production and the fact of having been produced by a certain artist in certain circumstances (Goodman, 1968, 113). For other artistic productions, like a literary text, a poem, a novel, a musical composition, and a theater play, it does not make sense to speak of counterfeit or authenticity: they are non-autographic. Indeed the presence of a 'notational system' with a correction rule allows them to be reproduced in an unlimited number of copies each equally valid. The executions can vary but they are all authentic, because all that matters is their sameness of spelling, that is, the correct order of each symbol (an alphabet letter or a musical notes) in the notational system (idem, 116). The system of notation makes it possible to identify the constituent (required features) and contingent (limits of permissible variation in each) properties of a work. Concomitantly, the notational system provides a test of correctness of spelling (for texts, scores, and plans), and a test of compliance (for performances) establishing that an object has the constituent properties of a work, which already presupposes the next distinction, between one-stage and two-stage work. Only those performances correspond to or 'comply with' the score count as performances of that work, although there is no value judgment involved (idem, 186). In this spectrum, music and painting end up as diametrically opposed. Music, being allographic, its notation system allows for different authentic instantiations of a work. Painting, being autographic, its non-notational dense representation, and does not allow for any kind of authentic secondary copies. Indeed, in painting, it is not possible to determine the constituent and the contingent properties, because no feature can be regarded as non-significant.

3.2 One-Stage and Two-Stage

Goodman also made an additional distinction between one-stage art and two-stage art independent of whether an art form is autographic or allographic (idem, 114–115). For Goodman, all the arts whether autographic or allographic may have one or two stages, and in his theory, it is possible to identify three levels of differentiation: allographic and autographic works, unique and multiple works, one-stage and two-stage works. Thus, the singularity or the multiplicity of an art object, and the number of stages of production, do not make it possible to find a line of demarcation between the autographic and allographic arts. The division between one-stage and two-stage works concerned the phases in which an artwork is produced. The end product of one-stage arts is the result of just one step during the process of creation. Some allographic works like poems and novels are one-stage works. What the writer produces is conclusive. This is also the case for autographic works like paintings; no matter how many drafts or sketches are directly created on the canvas yet what the painter produces is ultimate and unique. A two-stage artwork consists of two phases, where the second step is a derivative of the first one. The end product of two-stage arts is the result of a two-stage process. Some allographic works like music are two-stage works. The composer does the work of writing the score and the performance is the end product. In this case, the work is actually done when the score is executed by someone else and what is experienced is the performance. Also some autographic artworks are two-stage and produce multiple objects during the second phase of production. Here, the essential point is that certain autographic works consist of several objects. The possibility of this type of works to exist is linked to the presence of two stages in their production history. The first one is a singular object, like the printing plate, and the second one produces multiple objects, like the prints in etching. The unique object obtained in the first stage is therefore the instrument of production of the multiple objects produced in the second stage (idem, 115).

4 Considering Architecture

At this point, Laurenson's position and Goodman's theory have been clarified. Now, it is possible to claim that it is more useful for conservators to use architecture as a support for the study of installations, while maintaining Goodman's theoretical framework referred to by Laurenson in the field of conservation. Indeed, Laurenson wrote that installations are somewhere in a *continuum* between sculpture (unique autographic one-stage work) and musical composition (multiple allographic two-stage work). However, to choose architecture is already to take into consideration that an installation may be a mixture, that is both autographic and allographic (Caianiello, 2013). Indeed, Caianiello, art historian, explained that media art is in a gray area between the autographic and allographic arts. This is the reason why they would be very close to how Goodman considers architecture. Thus, after describing the peculiarities of architecture, this paper will explain in what way they shed light on the problem raised in the introduction: why the reinstallation of *Avaton* did not pose any problem to the conservators whereas that of *Revenge* challenged the museum?

4.1 Autographic Versus Allographic: An In-Between Position

As installations, architecture as a whole presents autographic forms, allographic forms, and also mixed forms, both autographic and allographic. According to Goodman, architecture can be classified under both categories. It is in an in-between position. Architecture can be considered partly autographic and partly allographic, and the author expressed this double nature of architecture by accentuating the fact that an exact reproduction of the *Taj Mahal* would only be a copy, while on the opposite tract, this process has no effect on the identity of housing sprawls throughout suburban areas (Fig. 3). Indeed, some buildings are identified by their history of production as autographic works, like the *Taj Mahal*, while other buildings are identified by means of a notation as allographic works, like the Smith Jones duplex n 17 (idem, 220–221). Following Goodman, in architecture, a notation was developed to assure the correct transition from design to construction, in a process in which several people intervene (idem, 220). Thus, architecture is a two-stage art, because, first, it is necessary to design a building, and then to actually build it in a second phase, which implies two phases in the construction process. Then if architecture is considered autographic, every refabrication that accurately follows the plans would not be the original, while if architecture is considered allographic, every refabrication that follows the plans would be another authentic instance of the work. In other words, if architecture can be compared to music, which is the paradigmatic example of notational systems in art, however, they remain diverse.

4.2 Collective Conventions

In the footsteps of Goodman, Genette (1997), theorist, also highlighted the existence of a strong dichotomy between potential reproducibility and actual limitation in the construction of architectural works (Genette, 1997, 97). In other words, some architectural works are allographic in their first phase of production, that is, provided with a plan that allows

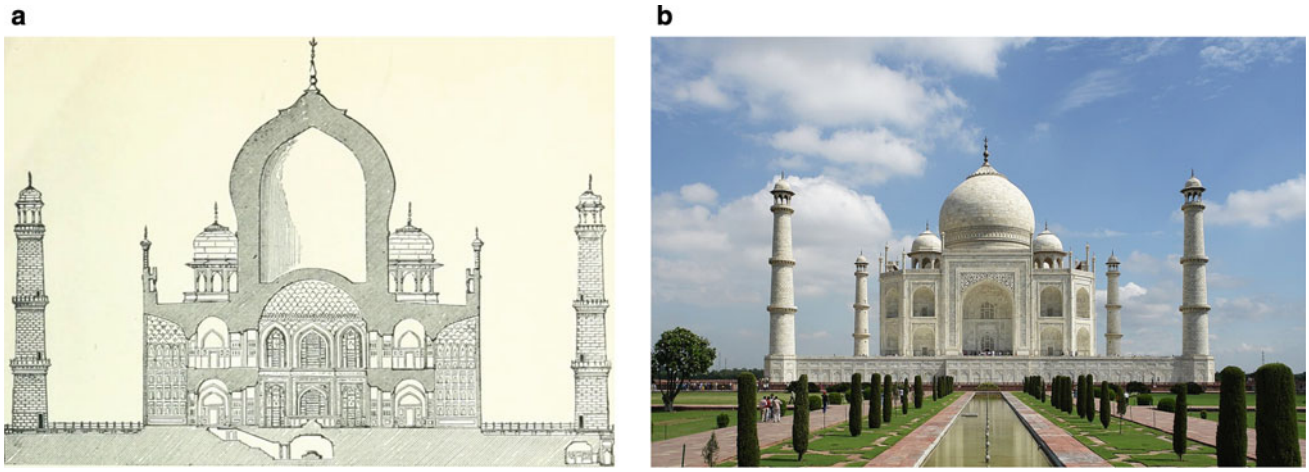

Fig. 3 **a** Taj Mahal section; **b** Taj Mahal © Yann Forget 2010

to reproduce them, and at the same time, autographic in their second phase of execution, that is, identifiable by their history of production once they are built. For example, Mies van der Rohe's *Seagram* (Fig. 4), and Wright's *Guggenheim* (Fig. 5), in New York, are masterpieces of modern architecture, provided with detailed plans. However, they have been produced only once, so as to avoid compromising their masterpiece status. Today, they are still identifiable thanks to their history of production. Thus, for Genette, an architectural work is considered autographic or allographic according to conventions, and not necessarily because plans are available (or not) to build a new authentic version of the same construction. In other words, with architecture, Goodman and Genette argue that in most practices the limitations are voluntary, that is, conventional.

4.3 Restoration

It is also possible to develop the theme of architectural restorations in relation to the Goodmanian distinction as Laurenson did for installations in relation to sculpture (unique autographic one-stage work) and music (multiple allographic two-stage work). Indeed, 2014, architecture philosopher claimed that the restoration intervention depends on how architects and restorers assess the ontological status of the original work. She explained that an architectural work considered to be autographic cannot be restored like an architectural work considered to be allographic. Indeed, in the first case, the history of production is relevant and an archeological restoration, also called purist restoration, is more suitable. An archeological restoration contends that any substitution or addition has to be visible to avoid any pretense of authenticity and, thus, the missing parts must be clearly discernible from the old existing ones. For buildings considered as allographic, an integral restoration can be carried out. The architectural work is then completely restored, that is, the missing and damaged elements are repaired or reconstructed following the notational system. Such a restoration intervention could not be done for autographic buildings because it implies replacing, adding, and eliminating some traces of its history of production. On the contrary, because the history of production is irrelevant for allographic works, Capdevila-Werning suggested that buildings entirely restored have to be taken as another instance of the work (2014, 92).

4.4 Site-Specificity

Lagueux (1998), architecture philosopher, argued that in most cases site-specificity is an essential part of a building identity. In other words, even if very precise plans are available, a new iteration in another place would not allow to maintain the identity of the building. Thus, what makes the authenticity and the identity of a building in contrast to that of a musical composition is the fact that in some cases location can be considered a constituent element of the architectural work. For Lagueux, the site-specificity of buildings is the reason why architecture can hardly be allographic like musical works created to exist in different contexts. For example, this is the case for Wright's *Fallingwater House* in Pennsylvania (Fig. 6) or Borromini's Church of *San Carlo alle Quattro Fontane* in Rome (Fig. 7) both of which take advantage of a particular context and depend on it (Lagueux, 1998, 23).

Fig. 4 Seagram © Tom Ravenscroft 2009

Fig. 5 Guggenheim © Jean-Christophe Benoist 2012

4.5 Back to the Cases

Architecture can help in understanding the question posed in the introduction: why could *Avaton* be rebuilt without conservators raising any objections, while *Revenge*'s reassembly was more problematic for them? For Brunetti, conservator, the wooden structure of *Revenge* is strongly site-specific, and to remake it in another space considerably changes its shape. Indeed, the wooden wall is adapted to all dimensions of the room, which is not a problem for *Avaton*, which was not changed in the move. Indeed, the work was merely reinstalled in its original form. On the contrary, in the case of *Revenge*, the artist had to dramatically change his work, in order to fit it into the available space. As a result, the reinstallation was all about space and site-specificity, and this had a definite impact on the distinction between autographic and allographic work. For *Revenge*, the wood panels contain valuable information about the history of the work. Moreover, they contain also traces of the hand of the artist, who painted and burned the wall himself, in 2007, for the exhibition at the Venice Biennale. That is the reason why, for its reinstallation in the museum, the structure was carefully divided again, by the artist, and rebuilt to fit the space of the museum, smaller and wider than that of the Venice Biennale. In this case, the first location was considered a relevant feature of its history of construction, but, at the same time, site was not an indispensable requisite for the reinstallation of the work. What is also interesting is the fact that, there were no plans or specific assembly instructions for this reinstallation to the *MAXXI*, but, yet, it did not prevent anyone from rebuilding *Revenge*: social conventions of the artworld have overcome the first apparent non-feasibility of the reassembly of the work, allowing it to once again impressively take its place in the museum. However, for conservators, the problem persists, because the artist wants to be present at each reinstallation; he hopes to reinterpret his work each time. It is this aspect that makes *Revenge* more challenging for conservators than *Avaton*. Thus, it requires reassessing the contribution of the Goodmanian distinction that does not provide any answers for this kind of evolution, while keeping as support architecture however.

5 Conclusion

This article has answered the question of why it was less problematic for the conservators to reinstall *Avaton* than *Revenge*? In addition, it has been shown that using architecture as a comparison, instead of a *continuum* between sculpture and music, is more appropriate to allow the correct study of the conservation of installations while maintaining Goodman's theoretical framework as cited by Laurenson. Some works are autographic and cannot be reconstructed without the new version being considered a copy while other works are allographic where each new version is considered as authentic as the original. In choosing to use architecture, it has been possible to take into account key elements of the installations such as their fabrication which relies on the unfolding of a collective work often embodied in conventions, their site-specificity, and their materiality. It is also possible to emphasize that like architecture, installations

Fig. 6 **a** *Fallingwater House* ⓒ Dnoahg 2017; **b**

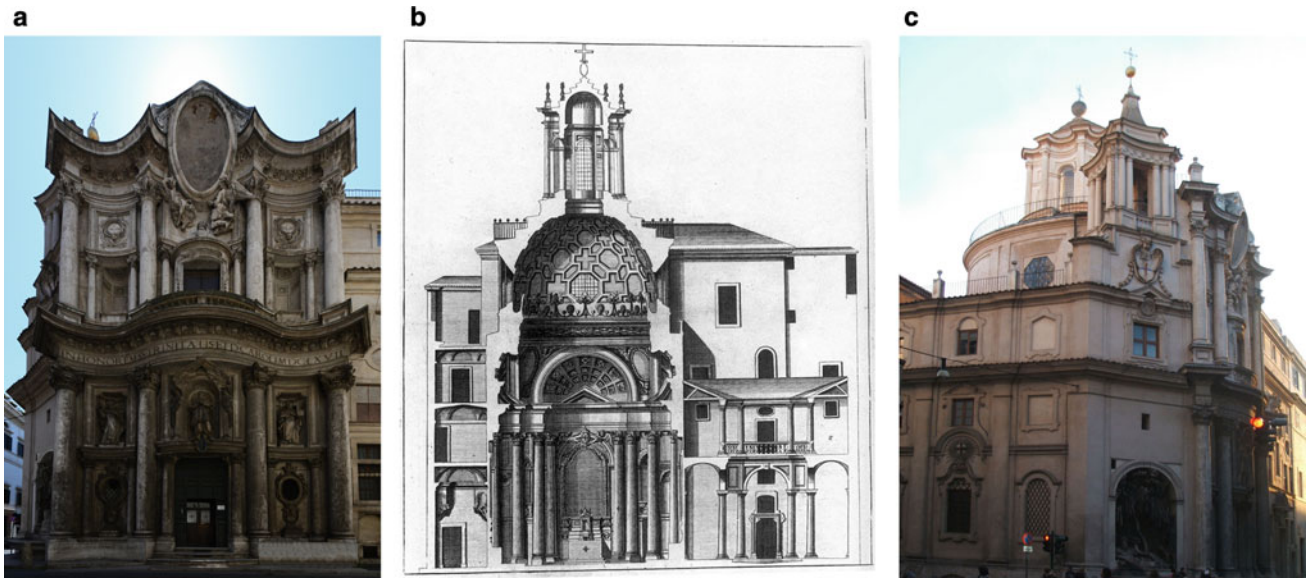

Fig. 7 **a–c** *San Carlo alle Quattro Fontane* © Sophie Lei 2017

require the investigation of the notion of the artist's intent. These works, like *Revenge*, are processual and each one should be considered as deferred art that requires the notion of authenticity to be investigated on an individual basis.

Acknowledgements I would like to thank the H2020 Marie Skłodowska-Curie action NACCA (New Approaches in the Conservation of Contemporary Art) for supporting and financing this research, my supervisor Professor Renée van de Vall from Maastricht university for her advice on the philosophical part and my supervisor Professor Maria Segarra-Lagunes from Roma Tre university for her advice in conservation of architecture, I would also like to thank the *MAXXI* museum in Rome for allowing me to write about these cases, particularly conservator Simona Brunetti for answering my questions and sharing her expertise with me. I am also grateful to the artists Nunzio and Nico Vascellari for inviting me to follow the reinstallation of their works *Avaton* and *Revenge* in the museum.

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Before arriving at a city, one has preconceived images generated by history books, traveller accounts and photographs—and more recently media and Internet sites. A personal experience with the city's spaces, architecture and people alters dramatically these preconceived images and creates a sense of identity that is unique and different than that of other cities. In this part of the book, the authors focused on ancient cities in Pakistan, Palestine and Egypt to understand how architecture and spaces provide a context for interaction between the city and its people, as illustrated in history and traveller books as well as personal experiences.

For one, the chapter titled "Quest for Latent Habitats" discusses Lahore, a city of thirteen gates, that has been described by many travellers and historians as a city of rich architectural context and spectacular artistic expression. The city has a unique relationship between spaces and people that preserved the social behaviour through generations. The authors used photography and literature to discover the essence of the city's identity and understand the nature of spaces that gives it distinct stature of architectural practice among the great cities around the world.

Similarly, the chapter titled "Travel Literature Illustrations and Topography and Their Role in Documenting the Islamic Arabic Identification and the Geopolitical Alterations of Jerusalem City" discusses Jerusalem, the pivot of the Arab–Israeli conflict, that has been the centre of attention for more than two millennia. Numerous historical events, traveller accounts, maps, drawings and photographs have been contributed to the creation of diversity of images about the city. The authors question the role played by these documents in the geopolitical alteration of its identity as Islamic Arabic city. The authors stress that these illustrations and topographical maps are considered as scientific, artistic and aesthetic documents as well as informative profound insights into the history and the identity of Jerusalem.

The chapter titled "The Deepground: A Proposed Fourth Layer in Creative Cities to Represent Silent Identities" discusses Egyptian cities and how they face deterioration in the creative expressions of their heritage buildings, that the author considered as silent identity. Cairo, Aswan, Alexandria, Giza, Port Said and Luxor are assessed as real creative or non-creative cities through the study of the interrelationships between heritage age and divergence of creative levels. Barriers preventing the achievement of creative levels and saving their silent identities are identified.

Cities are, and will continue to be, an attraction of human existence and activities. For many centuries, their identities are conveyed by travellers and historians to people in other parts of the world. Creative cities succeeded in maintaining a positive relationship between its spaces and people, while endangered cities are experiencing deteriorated expressions of their silent identities. Lessons from ancient cities are valuable for the establishment of more creative cities.

Cairo, Egypt — Yasser Mahgoub

Quest for Latent Habitats

Abdul Majid and Muhammad Isfandyar Khan

Abstract

This paper concentrates on the diverse heritage of Walled City of Lahore (Pakistan). A city that has evolved from Kot (the first walled settlement on the bank of River Ravi) to a city of thirteen gates (Peck in The architectural heritage: Lotus collection, Lahore, 2017). A city that has seen different rulers with different ideologies and ethnic backgrounds. A city, the history of which has been written by many historians and travelers, some describing it as a city of art and craft, some describing it is as a city of trade. These attributes of the city have given it rich architectural context. Thirteen gates, mosques, temples, haveliyan, landmarks of profound architectural practice and spectacular artistic expression. To discover the relation between the city's architectural spaces and its people, we used photography and literature. Photography, a medium to document the essence of the city and understand the nature of spaces that gives it distinct stature of architectural practice among the great cities around the world. To understand how these spaces have preserved the social behavior through generations and to learn the relation between a city and its people, we took up the task of describing the Walled City of Lahore as had Italo Calvino in his magnum opus Invisible Cities.

Keywords

Sustainable architecture • Communal spaces • Ecotourism • Climate change

1 Introduction

What is the city but the people?

- William Shakespeare.

The human mind with all its complex faculties and cognitions has demonstrated its need for another thought unparalleled with its own and slightly washing off-shore. From biblical verses to koranic proclamations, it certainly seems that the creator did not want a single entity to adventure through lengths of vast plains, rivers, mountains, seas, oceans, plateaus, etc. From evolutionary standpoints, there are classifications into groups and packs to further explain the workings of the specie. Man has been described as a social animal, a type that reflects on its daily pursuits and discusses them with its mates to further fortify its viewing of the world. This sentience and existentialism draw a wider audience that is then categorized into targeted groups labeled under religion, sociology, psychology and economics. To understand a city, one must thoroughly look into the aforementioned typologies.

Breaking it down into several cores, a city is not just a piece of land that is inhabited by human beings. It is also not the routes that these social beings take every day and certainly not the buildings that they sleep, work and rejuvenate in. Most would argue that that is exactly what a city is. We would then pose the question what is a city without its creators. A city is a construct of human desires and wants that are manifested in the form of an architecture that impresses upon congruency with the minds of the many. A city is a social order, transparent and alluding to a collective wish. The human factor if extracted out like a genetic code is extracted out of a DNA-ribbon without altering the overall composition of the matter; would result in a conurbation vacant of purpose; the residue of an abandoned dream.

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Y. Mahgoub et al. (eds.), *Cities' Identity Through Architecture and Arts*,
Advances in Science, Technology & Innovation, https://doi.org/10.1007/978-3-030-14869-0_5

As has the animal kingdom done before and continues to do so it is quite apparent that an imperatively inevitable colonization of species is necessary. It is felt somehow that the psychology is implanted with a directive to carry out the task of socializing. If Freudian interjections are to be taken into consideration, it narrows down to a sexual feat carried out in the most humble of ways and most innocent of minds. The human intellect can sometimes be quaintly placed at shoulder's length with the peacock's display of its feathers; a giant mating ritual (Crichton 1974). From life then is carved a new milestone and a tombstone placed over an ailing head. Such is the circle of life.

Within this circle a taxing and sometimes rewarding experience is that of the many roles that the human form goes through and that too not in the physicality of its existence but on a very phenomenological foundation; from a son/daughter to brother/sister to husband/wife to father/mother. This constant ascent to reach the end of the top rung of a withering ladder is kaleidoscopic and illusive; the ladder does exist as we slowly descend down toward declivities resisting the urge to let go. In it, a mass hysterical like feat is accomplished that can be defined as habitat. Habitat is scientifically defined as an ecological or environmental area that is inhabited by a particular species of animal, plant or other types of organism. Since we have already declared man as a social animal, the definition is applicable to define a human being's environmental area. As opposed to an animal, however, the human being has a much more sophisticated habitat to live in which is not merely confined to hunting, ingesting and defecating or the reproductive progression; it has a wider philosophically demanding lifestyle where baser needs are heightened to reach an exciting new level described as 'want'. Wanting for more than what is needed has been a thorough drive toward achievements and accomplishments as is sinfully described by global capitalists. This is somewhat true quintessentially but not successfully edifying when charged with an ethical question. Fatally abstemious is true for no man with a lust for life. Habitats are accordingly built around this dilemma that further raise ontological debates and accelerate the formation of other schools of philosophy.

Our search is for these latent habitats via the tool of architecture and the manuscript of the human intellect. Architecture has endlessly acted as a measure of human progress, psychology, sociology, phenomenology, causality and epistemology. This ability is then utilized rather in touching promiscuity and in ways the vistas of the archaic and the modern are maintained in a symbiotic shell of creative vision. The embryo that is extracted from the result of this unison of ideological connotations from within the womb of architectural practice is then incubated into a modern policy of understanding the workings of a city. Such is the role of architecture and such is the role of the human mind that maintains a philosophical agenda of such kind. For an architect of course, this stands the test of time and reason but for the layman, the affected or the cog in the machinations of the grand design it is a mere reminder of his identity; for people are defined by the clothes that they wear and the way they talk and the way that they walk but that is on an individual level. Any effort to collectively define a certain group is mostly placed on the weary shoulders of the city.

Our paper deals with these cities within a city and can be rightly defined as a quest for latent habitats. The natures of a collective group of people living within a city adapting to its ways or out-rightly redefining its edges both programmatically and philosophically. This sometimes almost maddening chase had many hurdles to compete with in order to make this study a successfully executed mission. For the very reason, an imaginary boundary was created for our sake and for the regular functioning of our minds; this can be defined as the Walled City of Lahore, which if photographed from a thousand feet above the ground is a landmark in itself. But apart from the architecture of the city there are the groups of people varying in attitudes and whims and passions but possessing an underlying basic instinct reflective of the place they have grown accustomed to. The medium of collecting and identifying these textured ethos was selected to free ourselves further. The camera, our artificial lens in a real world served as a subservient companion and in many cases as an able warrior against our wishes. For all intents and purposes, it was an endearing replica of our eye and perfect recorder of our vision.

Our vision was never dearth of challenges as we progressed onward to a treacherous course that would later on reveal itself. The perilous path was treaded with precaution but not without wit. The course was made easier by enriching our minds with Italo Calvino's classic 'Invisible Cities'.

The book served as both our bible and Grey's anatomy. The classic is a fictional dialogue between the legendary conqueror Kublai Khan and the mystic Marco Polo and his journeys through unknown lands made familiar by experience and patience but most importantly by the will to know more. The premise takes place in the court of the king who summons the Venetian traveler to travel through his empire and gather his observations to be placed within the hands of the emperor. Khan's pensive quality had a genuine poignancy to his ways. At points, it would feel like a whiff taken in to dull that longing sensation of familiarity. The ruler of several kingdoms vulnerable to the essences of cities within. It also raises the question of the nature of his rule; a king never bows down to the will of the people and rarely pays heed to the inner working of a society not unless the society is working to overthrow the monarchy which is a difficult task in itself. Here, we are however finding one of the most prolific of conquerors questing to know more of his subjects and his kingdom (Calvino 1997).

Marco Polo on the other hand is described as a man obsessed with wanderlust but not free from the ability to keenly look at the world. In this case, he is seen as both loyal subject of the king and a wayfaring stranger to different communities. Polo's observations serve as the spine of the book and are magnanimously beautiful and gaudy in its content. Khan at points interjects claiming that Polo's accounts are of the same city and the many habitats within it. Although Polo actively denies it, his imagined cities and their details are very much similar to his hometown Venice. The underlying message is exactly this: Polo's re-counting or inventing these arbitrarily named cities invisible to the emperor are a collection of multitudes of habitats within the city of Venice lacquered by philosophies of life very much different from each other (Calvino 1997).

Our quest has been fairly simple in proportions, if one was to compartmentalize the many aspects that blaze through the entirety of the process in unison. There was a simple wish that would turn into a dream which would then evolve into an endless pursuit for discovery: Nature of spaces. It begins with a clear view of the human psyche, an embedded genetic code that insinuates its existence in a timely fashion a nature that is an amalgam of a generation of a diverse past populace. It is then after a process of intrigue and acutely ambitious search for resonating qualities that a kaleidoscope of multiple dimensions of the human mind was explored. This framework, this filter of sorts was then applied to the oculus through which the question came into existence. If a space was to respond as a human mind, the trigger of sensory cues would then form its nature (Lynch 1960). To experience this wide spectrum of sets of nature, we were driven toward the Walled City of Lahore; a cocktail of the new and the old, of scorn and remorse, of touched happiness and what not; the map provided us with many opportunistic attempts at discovery. Walking through the crowded streets lined with stacked houses canopying an array of aesthetic imprints, we almost felt like travelers blindfolded throughout the journey to the place scurrying through the streets with newfound vision. Reflecting and sometime brooding over our inability to sense the many natures that a street possessed we almost felt like Marco Polo who would walk the same way as, finding entry in many courteous households where attempts at studying spaces were fairly successful. He would then spend his nights confiding in his travel diary which would later on be read out to Kublai Khan by the traveler himself, narrating all the accumulated observed statistical data but once demanded by the emperor to build on the true nature of the many locales that seemed familiar, Marco Polo built on castles of desires a horizon of reality. This however was also an intention, an artist's wish to bring the two together in a historical meet up; reenacting all that Polo experienced, voicing his personal travels through the exchange of dialogue between Polo and Khan. Italo Calvino's Invisible Cities presented itself as the precedent through which we were able to experience an imagined state in reality's thumbprint.

Lahore has a rich history embroiled by invaders turning into masters and the ruling class toiling the proletariat to amass the formers' goods. This interwoven fabric accounts for the troubling state that the city is in. For all intents and purposes the public, a categorical haze, finds itself blinded into committing to the procurement of whatever the market has in store for them (Nevile 2006). This undying chase surpasses the greater good concept and narrows down the scope of realistic approaches toward a collective benefit. This, if not individually, collectively bludgeons the city's character and charm. The Lahori we once knew has devolved into a self-centered egomaniac who finds himself to be righteous in every which way even if his actions disturb the community's well-being. The question, however, is: where is that community? Lahore is ever growing, much faster than it ever was and during this undefined course that it has embarked on it breaks off a good number of humanistic bonds that are the core essence of the social phenomenon. During such times, to be born into a middle-class household is a curse to say the least; there is the continuous fear of standing in queue with the lower middle-class and an underlying wish to settle down in the same street with the bureaucracy but to avoid the former and achieve the latter involves risks that are considerable in nature. This eternal gap among the three core classes is increasing by the minute and shall continue to do so until or unless a revolution makes its way through clobbering the entire system. For now, however, one can only witness the catastrophe that is taking place and turn the other cheek. For architects this comes with a price as they work on thinning the boundaries among the classes and bridging the gaps left by previous generations. There was a time when a city's future was prophesized by its architects, town planners and urban designers but that is not the case here anymore. Lahore rests at the gallows waiting for one final blow. To salvage our city from this class dividing web of flyovers, dearth of greenery and haphazard development, this project works as a very rude awakening toward establishing an identity that was stolen by the whims of rulers and leaders exercising their control (Peck 2017).

The Walled City of Lahore, the city's aging epitome of successful implementation of withholding cultures provided with many opportunities that can be listed down to fundamental paradigms of a certain people and their everyday lifestyles. A clustered web of honey-combed houses and marketplaces molded by two invisible hands sculpted out of the plains of Lahore marked by thirteen gateways that once marked the periphery of the city, The Walled City or as it is known locally as 'Androon' relies mainly on the reigns of a fleeting horse of historical conjecture pacing toward a loss of identity and culture. The Walled City was the brainchild of

the fiercest of the Mughal Dynasty, the king who attained the throne earlier than he reached puberty. Androon served as an ideal location as the king's landing at the banks of the virile river Ravi. It would soon grow out as a city named after the famed Hindu prince Loh-Awr to Lahore incubating a plethora of different religions and cultures (Peck 2017).

Androon of contemporary times is a reminiscing painting on an exfoliating canvas tarnished by minds of a few reflected on the many; a lullaby that puts the city to a slumber of complacency.

We snaked our way through the nooks and crannies of the area with our cameras dangling around our necks and our feet sore with the labors of the day. The city lavishly unfolded right before our very eyes as a proliferating vision. Marco Polo's many descriptions of his fabled tales of cities presented themselves as precedents of discovery. We found each of them embedded in every cornerstone.

2 Invisible Cities

Dorothea reeks of interbred cultures, hybrids of customs and a diminutive vision. Zaira consists of landmarks that hold value both in context and time. The city of Anastasia makes one complacent over one's shortcomings in perceiving the air of youth that the city aspires to have. Tamara is deceptive. It lies to you in your face of what it has in stores for you. The unforgettable city of Zora is well situated in form and context burning in memory, marked by the many whims that it generates. Despina is a multifaceted city. It encourages you to standby wearisome in the troubling task of deciding upon the truth that this city withholds. Zirma tries desperately to stick in the mind but fails in its redundancies as a catalyst for the formation of new memories. The city of Isaura is divided by passions and fevers that stales the community of progress. Maurilia although is a changed landscape, it however possesses a nostalgia driving force. Everything imaginable is a dream but dreams are manifestations of desires and fears that the dreamer has acquired over time. Cities are the very construct of this lucid imagination that conceal one's desires and fears yet creating something as a branch of these emotions. Zobeide is a labyrinth of connecting spaces that prison your desires into itself. You are no longer enslaved by your wishes and find your course, if reluctantly, in the maze that unfolds. Hypatia stirs the threads of memories and weaves a discourse that is both unprecedented and relinquished from the confinement of memories' stronghold. Armilla is a sensitive pubescent girl who finds it inappropriate to indulge in binging of any sort. Chloe is an ephemeral drama where the stage is flooded with props and the set immaculately distinguishes itself within seconds in the many centerfolds of the play. Valdrada is a host to duplication and the duplicity that results from it. It is a reflection of what is and what should be. Olivia is a city shrouded in a cloak of laconic sarcasm that laughs in the face of reality and turns the other cheek to encompass a much larger lie that it already is. The city of Sophronia is an exemplification of duality, a common ground between two extremities of entertainment. Eutropia is a cluster of nomadic goals and ambitions that begin with a certain point in life and end at the same and a burst of newfound hopes turns the wheel of life once again. Zemrude gets its form from the mood of the beholder, if pensive enough to observe it shall open up a plethora of details, remain nonchalant to the works of man and nothing should seem uncanny. Algaura is a city inflated with a pompous sense of punctuality and discipline but the very air that fills up this bloated character is a shade of words that either fulfill your desires or nip you in the bud for deceiving yourself into believing it. Octavia is a tensile fabric of elemental providence, a web of illusory works of craftsmanship that dodges the very eye that believes in solidity of form. Ersilia is much like Octavia, a labyrinth of strings that vocalize their individual purposes as the viewer digs deeper into the Rabbit hole. Baucis is invisible to the naked eye and requires close inspection due to its ethereal form and even lighter aspects. Leandra, is ruled by the scrutiny of the old and the vigor of the young. They work hand in hand in dealing with life's most stifled of problems. Melania is an incessant dialogue that spews from mysteries involving the many roles of people in their lives and the aftermath of conflict that occurs amongst them. Esmeralda is a delicate recollection of a beautiful memory known for its fluidity of notion and nuance. Phyllis is a constant longing for surprises, quenching the visitor's thirst with its mysteries. Pyrrha is a guarded vessel of serenity that embosses its glimmer on to everything that witnesses it in all its awe. Adelma is a dismal account of what could have been Hades' underworld lined by the dead. Eudoxia is a winding network of routes inspired by the fruits of its loins. Moriana's essence can be determined by the 'two faces of the same coin' analogy where on might be similar to the other but can never truly experience its depth. Clarice is a glorious star of a city speared by penumbras of darkness and sullied dreams. Eusapia is a happy bloke who knows nothing more about life than he knows about death and embraces both equally as a holistic experience. Beersheba is a receptacle for the defecation of useless human agenda which exists alongside a much more focused but short-lived happiness. Leonia is dressed in the finest of forms, flagrant in its appeal yet hollow form the inside. Irene is the shimmer of twilight that masquerades as the break of dawn in a valley of newfound emotions. Argia is an earth mound of desires and passions that suffocate the otherwise airy annotations of life. Thekla is a derivation of the starry night sky constantly in struggle of achieving perfection. Trude is a terribly long expanse of forged memories. Olindia reproduces its details in

the minutest of ways possible. Laudomia is crammed with wisps of sprawling populace of toil, anger and illusions. Perinthia is a call of the gods from heavens above. Procopia is a fortress of brittle foliage that sheaths many a sharp fingers pointed in its direction. Raissa is a saddening embodiment of depression and unease tumbling down to the belly of a hearty human concoction. Andria is a geometric paradise directed by the stars that encompass the dark skies that find traveler's longing for their return in the night. Cecilia is a hidden legend, sordid as myth yet profoundly exquisite in actuality. Marozia is an impulse, a drive that makes one do the unfathomable. Penthesilia is known for its omnipotent spirit. Theodera defines the Darwinian theory of survival of the fittest where one specie surmounts another due its strength. Berenice propagates falsehood, it rewards the most trivial of efforts with golden approvals.

3 Invisible Cities of Lahore

City of Chik'ha

After a journey of a week through the mountains the traveler reaches mouth of a valley. On its declivity, he sees houses stacked one over another with no streets between them. There is no space to move about the city. The first generation of inhabitants were born inside these walls and they remain there for rest of their lives. The only way the inhabitants learn that they are part of a clique is through the windows in their houses that open into the valley (Nevile, 2006). They, through these windows know the whole city and every person of it.

They produce, by themselves, in their houses everything they need. They communicate and share goods through a basket attached to a rope that they drop off their windows (Fig. 1).

City of Festivities

When you first travel to the city, in the horizon, you see the skyline that was the construct of a people that once inhabited it. You see craft of wood in their windows and the detail in the arches that repeat themselves. It almost seems as if a lifetime has been spent to perfect the skill. It is hard to imagine the genius of the very first craftsmen, who became the benchmark for their successors.

You must not be deceived by what the city appears to you in the light of day for to understand it you must wait till

Fig. 1 City of Chik'ha with its different modes of commune

night comes and when you have dinner and go back to your hotel room; sitting in the balcony still trying to understand the silence of the city you will hear a child shout, "*Wo agaya*"; you see him pointing into the empty sky where if you follow his arm length toward his finger tip you will see hidden behind it a teardrop in the sky. Once his chant is complete you hear a roar of festivity flowing through the roofs, the balconies, the streets all in a wondrous state of happy commotion. You have arrived in the festive city of moon (Nevile, 2006).

When the time of festival of moon ends people will abandon the city and move to another that awaits them. To mark their coming, the city invites them with colors, here they celebrate the festival of colors. The houses here have different shades. Looking down into the street you will see people chasing their peers with painted faces eager to paint them with their colors.

If you spend a year with them you will see all the festivities oozing out of the city's core. You will see people waiting for the moon and open their windows to let the moonlight in so the celebration could begin, you will see people running around the streets their fists clinched struggling to hold powdered pigments, you will see people blowing their horn and chanting *Bokata* once their kites have been cut by their fellow neighbors, you will see people raising their flags on their roof and off their balconies (Fig. 2).

City of Empty Spaces

The traveler finds it peculiar to take an alternate course when the city is right there, complete in its construction, complete in its resources. His convoy believes it to be an arduous task to take the route and suggests to go by it, around it or any other outcome but taking the obvious course. Why was it being deemed as fag was unfathomable to him and wished to find the possible cause. His fact finding journey began by going through the streets of the city where his belief was further fortified for it seemed as the best course of action. The streets were lit, the houses lined at the edges, immaculacy at its finest. His curiosity evolved into a vehement

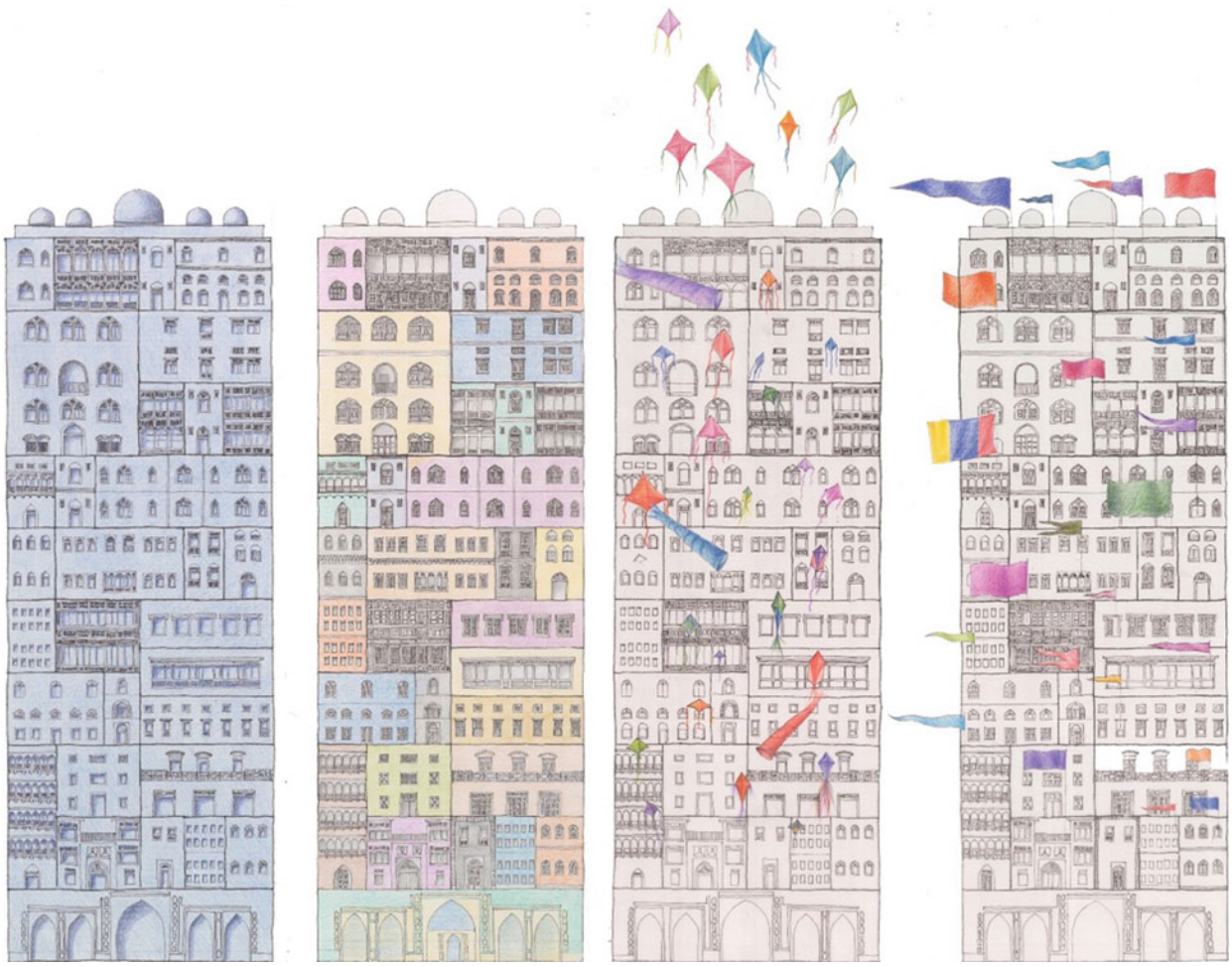

Fig. 2 City of festivities and their celebratory techniques

search for existence of the residents (Nevile, 2016). The city stood, in all its glory and perfection but without its core reason, the people. Vacancy bled through the walls, through the balconies, through the windows and engulfed the air. Frantic and anxious but determined to find the cause the traveler ran through the entirety of it only to be fooled by non-existence at ever other corner. Something however rested in the heaviness of the air that had surrounded him, a familiarity, a warmth, an invitation of some sort. The emptiness that had filled the city and his heart was injected by a feeling of an age long connection. It seemed the city had been left to live (Fig. 3).

City of Two Gods

The traveler at his last camp before reaching the city sees in the horizon a corridor of towers reaching toward sky. He cannot, from that distance, understand the nature of the edifice. Inquiring his fellow traveler he learns that those are the manifestation of desires, of the city's people, for reaching a god that lives above the sky. By the time, they reach the city the traveler cannot distinguish streets from streets, buildings from buildings; they repeat, gyrate around one another, incomprehensible by the traveler. He, while trying to find his way through, meets a man, who is devoted in his cause of finding happiness within oneself, opinions of fellow men mean nothing to him; what truly matter are commandments of a god that lives below the ground (Morgan 2007). He, from the devotee, learns, to find where these gods are he will have to navigate the way around the city by understanding the path of the sun, the moon and the pattern of stars. The god below the ground lives around every other corner of the city, whereas the god above the sky lives only up there but you see the towers all around the city that mark his presence. The god below the ground, paradoxically, once believed in the god that lives above the sky and happened to be obedient to him. Attainment (procurement) of some attributes of the god above the sky by someone on the ground elects him as ideal to lead. By his return into the ground he, by his peoples' consent becomes the guardian angel (salvager, advocate) of the faith in the god above the sky.

City of Varying Harmonies

While traveling through the vast lands and crossing rivers, you might come upon a freshly cut trunk of a tree. While

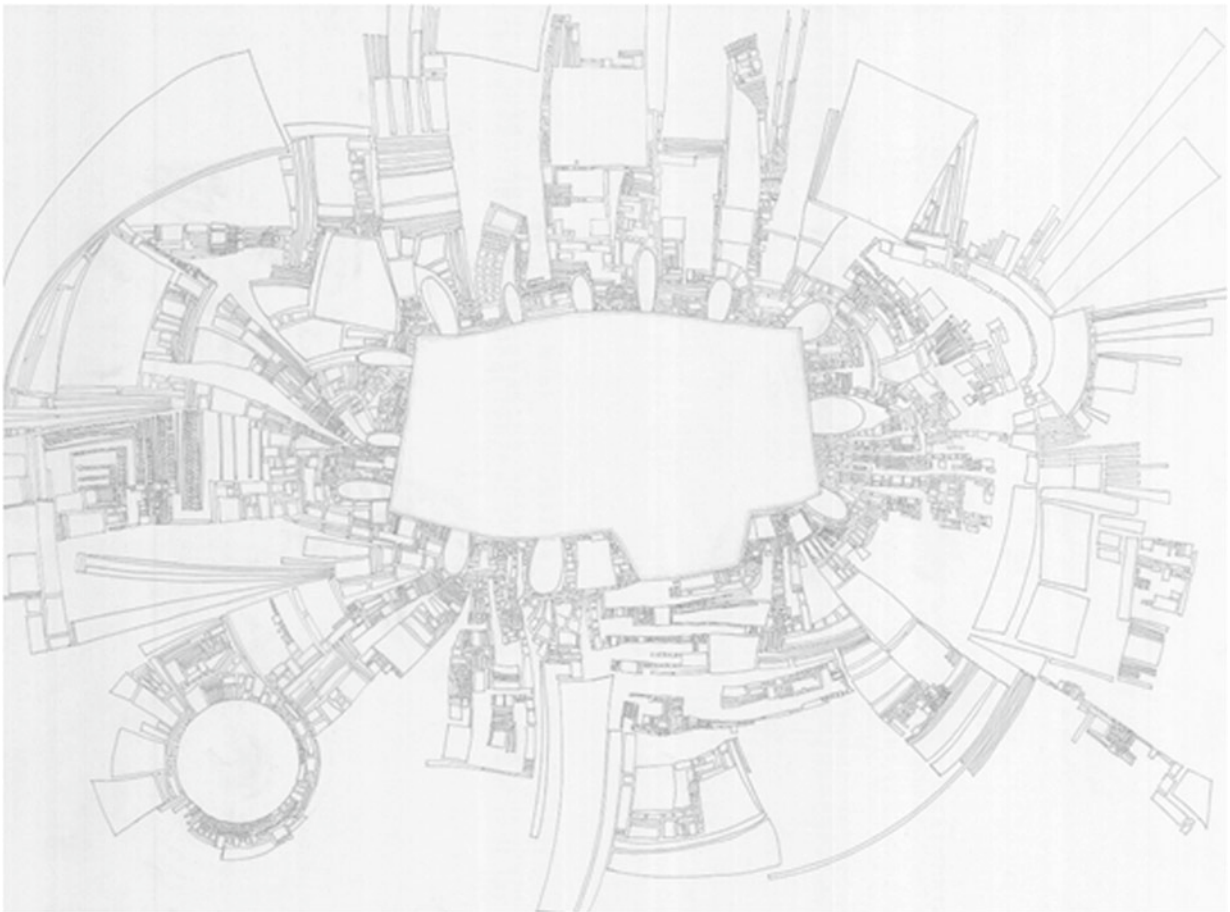

Fig. 3 City of empty spaces with its vast expanse of abandoned structures

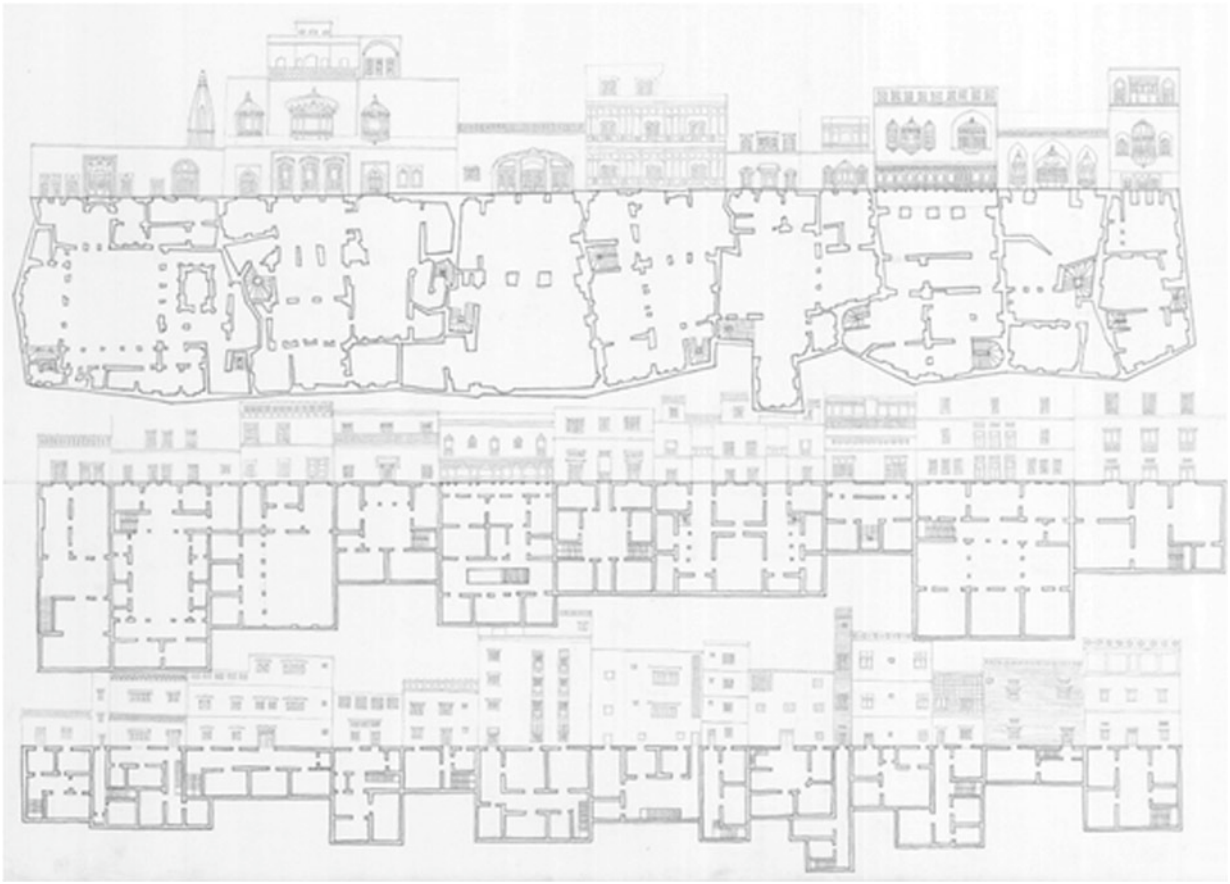

Fig. 4 City of varying harmonies and its planar/sectional treatment

trying to figure out its age from its growth rings you slowly start to perceive houses, buildings and street circling in concentric circles. The streets so thin, they spread through the buildings like venation of a leaf. This, you realize, is a city and the patterns of its expansion is contained in concentric circles, similar to the trunk of the tree, but the circles of the city differ from one another in color, shape and material. What you learn, from wondering about differences between the circles is that they celebrate freedom, desire and skills of the people who formed them. If you concentrate on a circle, to discover more and you see it varying in design it is defined by the harmonies of diverse desires (Fig. 4).

4 Conclusion

The city presented our lens a picture that we were to paint in our minds and in our hearts as we came to terms with our never-ending quest. Cities within a city, hidden from plain sight but not free from the observant eyes of the ever-pondering minds of architects. Under the layer of superficiality and slightly below the endometrium of the city soared a spectrum of varying ideas sometimes anomalous to each other but at others gripping each other from falling apart.

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Travel Literature Illustrations and Topography and Their Role in Documenting the Islamic Arabic Identification and the Geopolitical Alterations of Jerusalem City

Reem Wagdy Moustafa Kamel Abd El-Raoof

Abstract

Travel literature book illustrations and topography have greatly contributed with their historical voyages, descriptive maps, by providing us with an essential spatial context, and realization of historical events. They are concerned with description or specific drawing of places and their topographical features, more specifically surveying of cities, monuments, architecture, historical places, and landscapes, specially, what has been executed as an expression of Jerusalem, which has been the subject of study by many artists, orientalists, geographers, etc. Hence, the research problem is determined in response to an important question, what is the extent of the role played by travel literature book illustrations and topography in documenting the Islamic Arab identification and the geopolitical alterations of Jerusalem city? The aim of the research is to emphasize that the role of travel book illustrations and topography was not only to depict the historical and geographical reality of Jerusalem, but also to document cultural backgrounds and historical events, and to reveal the true identity of the city which is the pivot of the Arab–Israeli conflict, as well as biases and geographical and political convictions it has suffered throughout history. The importance of research lies in the fact that these illustrations and topographical maps are considered as scientific, artistic, and aesthetic documents as well as informative profound insights into the history and the identity of Jerusalem. They help to reveal the artistic and cultural convictions and orientations of cartographers and topographical illustrators. The researcher applies here the historical analytical approach to observe this phenomenon and stand on its dimensions. Furthermore, the research found a significant result indicating that these illustrations and topographical maps were considered as a visual dictionary recording the important historical events in the life of Jerusalem city, the constantly changing geographical reality, and the point of view of artists and illustrators who have prepared it.

Keywords

Travel literature • Illustrations • Topography • Manuscripts miniatures • Documentation • Islamic Arabic identification • Geopolitics • Alterations • Maps • Jerusalem • City

1 Introduction

As a general rule, illustrated books which contain a sequence of images, illustrations, and maps as a visual commentary on text act as a mirror reflecting historical events and social, geopolitical, and cultural changes, etc. are employed in order to serve instructional, documentary, decorative purposes (Harthan 1981, p. 7F). When we discuss travel literature which is concerned with narration, expression of adventures and highlighting of many insights about economic, political, and social nature of a region, and topography literature which concentrates on description or fine drawing of places, and their superficial features and the illustrations and maps related to them, and the atlases and guide books which have emerged from them; it is in the sense that they are a recording of events, personalities, points of view, and feelings of the author during his journey (Porter 1995, p. 132F).

However, the situation is relatively different with the city of Jerusalem, which has occupied a religious status and a particularly aesthetic model over the ages. As a matter of fact, this small, remote city has formed a little attraction for many travelers, authors, and artists. However, the strong religious spiritual longing of its pilgrims is what gave us early perceptions of that city. This religious inspiration has

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Y. Mahgoub et al. (eds.), *Cities' Identity Through Architecture and Arts*,
Advances in Science, Technology & Innovation, https://doi.org/10.1007/978-3-030-14869-0_6

always had an impact on miniatures, book illustrations, and even scenes of complementary maps. Few artists embarked on a long and perilous journey to Jerusalem during the Middle Ages and Renaissance. On the other hand, the majority resorted to the descriptions of the Bible, historical accounts, and visions and views of travelers and trailers who added their perceptions and observations. Nevertheless, early pilgrimage and migrations from Europe to Jerusalem were in search for rich sources of information about historical events, geography, fauna and flora, various cultures, religious practices, customs, and languages. Unfortunately, pilgrims' and immigrants' itineraries, maps, and guide books were distorted by inaccurate observation, hearsay, deliberate exaggerations or fabrication, or religious preconceptions. Because Muslim and Jewish prohibitions were against engraved images, the majority of maps and illustrations were made by Christian pilgrims. They, nevertheless, provided us with insights into the history and topography of Jerusalem city (Osher 1996, pp. 19–21).

These illustrations and topographical maps are considered a means of documenting the geopolitical alterations that occurred in Jerusalem and a confirmation of its Arabic identity. If we want to define the concept of Arabic identity, it is not considered a religious Islamic identity; because it dates back to the pre-Islamic appearance. Historically, it witnessed the emergence of Arab Christian kingdoms and presence of Arab and Jewish tribes. However, today most Arabs are Muslims with minorities adopting other religions, mostly Christianity (Robinson 1999, p. 76; Berkey 2003, pp. 42–44). This means that Arab Islamic identity is the essence of Jerusalem which adapted Islam, became the representative identity of the origin of its culture. Though the three monotheistic religions unanimously agreed on its sacredness as a historical religious repository, the city witnessed early and still continues to witness conflicts that transcend the political, religious, and national dimensions to deeper and farther conflicts concerning the city's functional significance that are linked to its role as a city with an Arab Islamic cultural stock whose function is to speared the Arab Islamic Message. The location of Jerusalem from Palestine is among the most important reasons for the outbreak of historical conflicts. The Arab-orient and Jerusalem have formed part of it and remained a distinctive geo-strategic and cultural location. The geopolitical conflict over Jerusalem is at the forefront of political, religious, economic, and other cultural conflicts and the like. The geopolitical conflict is the one that is based on grasping the geography of the place because of its geopolitical importance, which ensures the superiority and the predominance of the power that prevails in the same place controlling its distant functions (Murad 2009, October, p. 2). To make this clear, we must recall a historical summary of the political and geographical alterations that occurred in this city as a result of the multiplicity of governments and political forces.

2 Historical Roots and Geopolitical Alterations of the City of Jerusalem

The city of al Quds was known as Jerusalem, which dates back to pre-biblical times and long before the Jews settlement around 5000 years BC, long before the Bronze Age. The first mention was made in 2000 BC in the execration texts of the Middle Pharaonic Kingdom under the name Rusalimum, and it was mentioned in the letters of Amarna of the fourteenth century BC as Urušalim. Jerusalem means the place of the god Salem, god of dusk, in the Canaanite religion. The origin of the word came from the letters S-L-M, from which the Arabic word peace or shalom is derived. In Arabic Jerusalem was known as al Quds or the Holly Sanctuary (Millis 2012, p. 6).

2.1 Geopolitical Alterations of the City of Jerusalem in Ancient Times

It is believed that the first settlement was near the spring of Gihon. The Canaanites built huge walls to protect water channels in the seventeenth century BC. Between 1550 and 1400 BC, Jerusalem became part of the new Pharaonic state. During the twelfth century BC, a series of attacks on the Egyptian force in the Late Bronze Age known as "sea people" led to the eclipse of Egyptian power. Jerusalem was then known as Jebus and was ruled by Jebusites or the Canaanites 400 years, until it was occupied by King David or Dawood in the Islamic tradition, making it the capital of the United Kingdom of Israel (1003–970 BC) and Judah later. The first temple of the Jews was built by his son King Solomon (died 930 BC) in the tenth century BC on Mount Moriah or Zion and remained established until the Babylonian king Nebuchadnezzar II (634–562 BC) besieged the city between (587–586 BC). This is evident in the miniature "The Siege of Jerusalem by Nebuchadnezzar" by The French painter Jean Fouquet (1420–1481) from the French translation of the original manuscript of the Roman Jewish Historian Titus Flavius Josephus (37–100 BC) which was executed by Tempera technique between the years 65/1470–1476, see (Fig. 1). He completely destroyed the city and prevented the Jews from entering it for fifty years. In 7/538 BC, Babylon fell in the hands of the Persian King Cyrus the Great (576–530 BC), who allowed the return of the Jews to Jerusalem and the reconstruction of the temple, which was completed in 516 BC, during the reign of King Darius I (522–486 BC). In a miniature of the French Bible, King Cyrus is seen confirming his promise to a group of Jews to build the temple again. The miniature was executed by Tempera in France in the sixteenth century, see (Fig. 2) (Millis 2012, pp. 6–20; Rosovsky 1996, pp. 11–14; Catane 1984, p. 209).

Fig. 1 Miniature entitled "The Siege of Jerusalem by Nebuchadnezzar" by the painter Jean Fouquet**,** tempera, 1470–1476 (Millis 2012, p. 19)

Fig. 2 Miniature from the illuminated manuscript of the "French Bible," tempera, France, the sixteenth century (Millis 2012, p. 21)

2.2 Geopolitical Alterations of the City of Jerusalem in the Classical Era

When the Macedonian ruler, Alexander the Great (356–323 BC) conquered the Achaemenid Persian Empire between 335–330 BC, Jerusalem and Judah fell under the Greek domination and the Hellenistic influence. In 198 BC, Ptolemy V Epiphanies (204–181 BC) lost them in his struggle with the Seleucids led by Antiochus III (222–187 BC). In 70 CE, the Romans led by Emperor Titus Flavius Caesar Vespasianus Augustus (39–81 CE) besieged Jerusalem, which was dominated by the fanatic Jews since 66 CE, and destroyed its walls except the outer wall, which was later known as the Western Wall, and the Temple was set on fire, see (Fig. 3). The Roman Emperor Publius Aelius Hadrianus Augustus (76–138 CE) rebuilt the city following the Roman style. It was called Aelia Capitolina in 135 AD, and the neighboring provinces were called Syria—Palestine as an alternative to Judah. This was in an attempt to prevent the Judaization of the country. The Jews could no longer control the city until 1948. He also built a large temple of god

Fig. 3 Miniature from the illuminated manuscript illustrating Titus Flavius Josephus brought before emperor Titus during the siege of Jerusalem in 70 ad, tempera, the medieval ages (Millis 2012, p. 29)

Jupiter Capitolinus, which later became the Church of the Holy Sepulcher. Thus, the rule of the city remained, until the seventh century AD, between the Roman, Byzantine and Sasanian Empires. In 638 AD, the Islamic conquests and caliphate domination extended to Jerusalem. Until the Crusades, Jerusalem remained under Arab sovereignty (Millis 2012, pp. 26–29; Der Crabben 2011, p. 2F).

3 Jerusalem's Topographical Illustrations and Maps in the Middle Ages (476-Beginning of 15th Century)

The Holy City of Jerusalem in Judaism, Christianity, and Islam has been and continues to be the focus of numerous volumes, history chronicles, biblical exegeses, itineraries, and diaries. Actually, many of these contained maps and scenes of the city itself (The Jewish National and University Library and The Hebrew University of Jerusalem 2005, p. 1). The Bible states that the city was first mapped in compliance with the orders of the prophet Ezekiel. The later medieval practice of placing Jerusalem at the center of the world's maps also came from the book of Ezekiel: "This city of Jerusalem I have set in the midst of nations, with other countries round about her" (Osher 1996, p. 12). The maps of Jerusalem were usually drawn and engraved on vellum, and few of them were produced in the form of a wall and a floor mosaic. We saw in its first map known as "the map of Madaba" a mosaic floor designed to decorate the land of a Byzantine church around 570 AD in Madaba, Jordan. It is considered a guideline for establishing geographical regions and borders. It was depicted in the form of pictures: plains, hills, valleys, villages, cities, walls, houses, and a wonderful plan of the city in the middle (Fig. 4) (Arad 2012, pp. 264–268; Atlas Tours 1997–2013, p. 1). Most of the maps of this city were not created for a utilitarian purpose, as in the case of modern maps. They were not drawn to help travelers find their way, and the city was not depicted as it actually was. Rather, it served as a medium for conveying information and a viewpoint rather than as a purely geographical feature. This role has distinguished many maps of Jerusalem. Maps have appeared in many editions of the historian Titus Flavius Josephus, the Bible, Bible exegeses, and historical chronicles related to the search for the Holy City, its temples, its shrines, and other sites. Christian pilgrims needed maps to travel and to record their opinions and stories. The historical pilgrimage of the Roman Empress Helana (44/250–330 AD), the mother of King Constantine (4th Century AD), and her visit to Jerusalem and sponsorship of many churches has encouraged many to follow suit. In fact, a small number of Christians visited the city because of the distance of Jerusalem, the journey's costly expenses, dangerous nature, and its being under the Islamic rule, which was considered hostile to Christianity. These factors have encouraged the use of maps as an alternative to their visit. Many impressionistic descriptions of the city created by European Christians reflect its image which was imprinted in the hearts and minds of European Christian map makers; therefore, it was less descriptive of the mundane city (The Jewish National and University Library and The Hebrew University of Jerusalem 2005, p. 1).

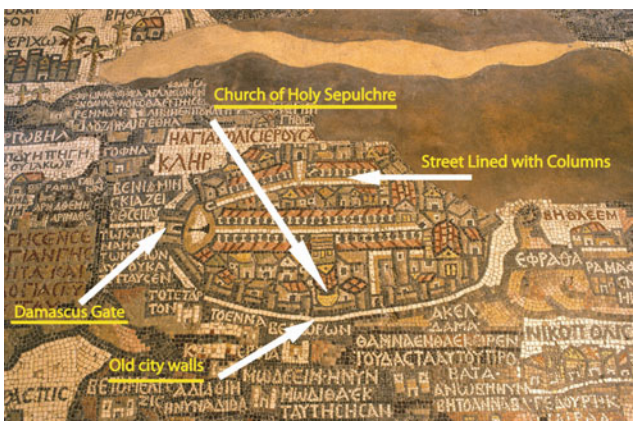

Fig. 4 Mosaic Map of Madaba, decorating the floor of the Byzantine church, Jordan, 570 AD (Millis 2012, p. 25)

During the Middle Ages in Europe, the church absorbed the role of the artist and manuscript in the maintenance of the Christian religion. Thus, the Bible was written in a manuscript form, and the artist of the Middle Ages was able to accomplish his achievements in the field of illuminated manuscripts, (Cleaver 1963, p. 26F) which included miniatures, initial letters, and decorative borders applied on the vellum and the parchment (Chilvers 2005, p. 294). Until the end of twelfth century, most books were produced in the monasteries by clergymen and monks in what was known as the tradition of the scriptoria (Harthan 1981, pp. 6–14). The medieval artist was concerned with the issues of pure design and decoration (Benton 1966, p. 1095). Although many Islamic societies practiced this art, Europe possessed the most sophisticated tradition (Encyclopaedia Britannica 2017, p. 1), and gradually the manner of patronage changed from church to aristocratic class and kings. This led to the change of the scope and the subject of the books produced (Harthan 1981, p. 48). In the Islamic world, the manuscripts of Quran were the most commonly produced and decorated in the ninth and tenth centuries. At that time, Muslim artists were preoccupied with translating the Greek Scientific research, and employing their miniatures to interpret these technical and scientific texts, while the thirteenth century witnessed a boom in representative painting and many fields of illustrated books in literary, historical, epic, and lyric poetry (Bloom and Blair 1997, pp. 193–197). Nevertheless, how were the manuscripts and maps drawings in the early

period of Islam, the Crusades, and the Mamluk rule, as it was a period of geopolitical change for the city of Jerusalem? This is what we will know in later points.

3.1 Manuscripts and Maps of Jerusalem in the Early Islamic Period (640–1099)

The city of Jerusalem was one of the first conquests of the Arab Islamic Caliphate in 638 AD. The command of the army was taken over by the Arab commander Abu Obeida bin al-Jarah, who named Jerusalem "Ilya" in relation to its Roman name. However, its name later was changed to Jerusalem and has remained as such to this day. After the Caliph Omar bin al-Khattab (584–644) had received it, he prayed in the Temple Mount. Actually, 500 years had elapsed when he allowed the Jews to return to Jerusalem. Figure 5 illustrates a nineteenth-century colored Metal Line Engraving print, showing the entry of Omar bin al-Khattab to the city of Jerusalem. Then, he laid the foundation stone of the Dome of the Rock, which was actually built by the Umayyad caliph Abd al-Malik bin Marwan in 691 AD. It was narrated that Prophet Muhammad ascended to heaven from its location into a night trip on Al-Buraq (Millis 2012, p. 34F). Figure 6 demonstrates a miniature of the manuscript "Mi'rajnama," carried out by the Iranian painter Ahmad Musa (active under the Mongol sultan Abu Sa'id (1316–1335) in Tabriz, Iran, between 1317 and 1330, which describes The Prophet Muhammad (PBUH) sitting with the Abrahamic prophets in Jerusalem (Okasha 1981, p. 136F).

The Dome of the Rock was built to be a refuge for pilgrims and not a worship mosque and its round shape was to rival many Christian domes. The English historian and architect Keppel Archibald Cameron Creswell (1879–1974) mentioned in his book "The Origin of the Dome of the Rock" 1924, "those who built this shrine used measurements of the Holy Sepulcher, until it became an architectural model of the temple churches throughout Europe.` Moreover, Fig. 7 illustrates a cross-section of a detailed sketch of the Dome of the Rock from "Kirchliche Baukunst des Abendlandes" published in Stuttgart according to Verlag der Cotta'schen Buchhandlung between 1887–1901, a book of the German art historian George Dehio (1850–1932) and the German historian and architect Gustav Von Bezold (1848–1934), executed earlier in 1833 by the English topographical artist and architect Frederick Catherwood (1799–1854), the first Western artist to undertake a detailed study of the Dome of the Rock (Millis 2012, p. 50F). In (Fig. 8), we see an illustration of the Church of the Holy Sepulcher from the book entitled "Nouveau Dictionnaire Encyclopédique Universel Illustre" by the French historian and geographer Jules Trousset (1842–1905), executed by wood engraving according to La Librairie Illustriée in Paris between 1885 and 1891(Old Book Illustrations 2018, p. 1F). The city of Jerusalem flourished under Umayyad (650–750) and Abbasid rule (750–969), and many Arab geographers like the Persian Abu al-Qasim Ibrahim Muhammad al-Karkhi (died in 957 AD) and Mohammed bin Ahmed Shams al-Din al-Maqdisi, of Palestinian origin (45/946–991/1000), devoted their pages to describing Jerusalem. Regardless of this, the early Islamic period was marked by the absence of maps

Fig. 5 Printed illustration of the entrance of Caliph Omar bin al-Khattab into Jerusalem, AD 638, metal line engraving, the nineteenth century (Millis 2012, p. 34)

Fig. 6 Miniature from the manuscript "Mi'rajnama (Book of Ascension)" carried out by Ahmad Musa, Tabriz, Iran, (1317–1330) (Okasha 1996, p. 142)

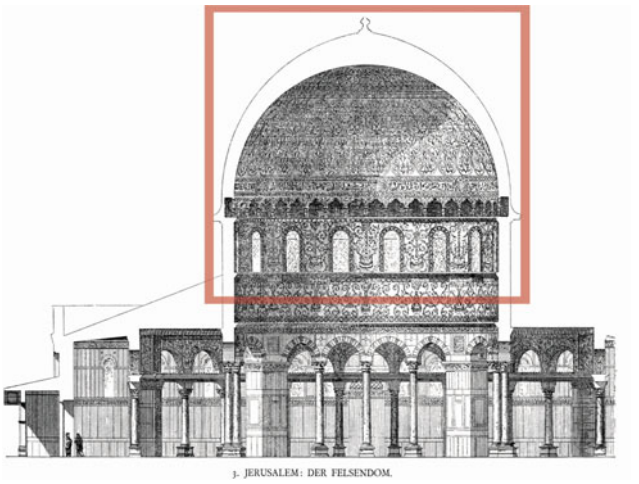

Fig. 7 Detailed sketch cross-section of the Dome of the Rock from the book "Church Building in the West (Kirchliche Baukunst des Abendlandes)" by George Dehio and Gustav Von Bezold, executed earlier in 1833 by Frederick Catherwood, Verlag der Cotta'schen Buchhandlung, Stuttgart, (1887–1901) (Millis 2012, p. 51)

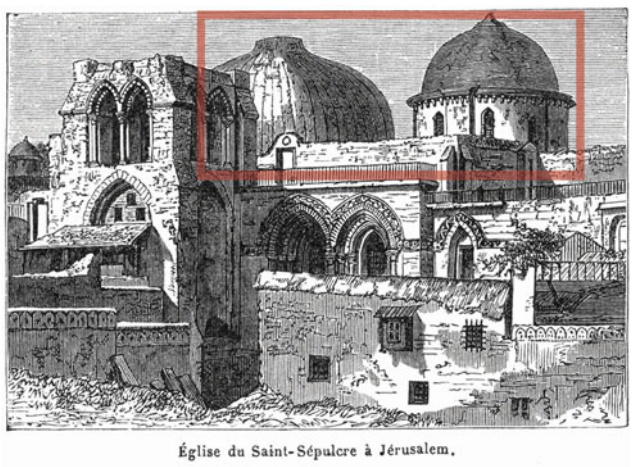

Fig. 8 Illustration of the Holy Sepulcher Church from the book "New Illustrated Global Encyclopedia Dictionary (Nouveau Dictionnaire Encyclopédique Universel Illustre)" by the geographer Jules Trousset, wood engraving technique, La Librairie Illustrie, Paris, (1885–1891) (Old Book Illustrations 2018, p. 1F)

illustrating the city of Jerusalem, despite the Arab researchers' knowledge of cartography (The Jewish National and University Library and The Hebrew University of Jerusalem 2005, p. 1). Since the eighth century and under the Abbasid Caliphate and due to the manufacture of paper, the first maps and travel guides were produced. What prompted Arabs to pay attention to the study of geographical phenomena and mapping them was the opening of roads and post stations, which led to the need of determining the distances and conditions of travel, pilgrimage, the direction of the Qiblah, timing of prayer, requesting Knowledge, and the Islamic conquests, as well as the movement of trade (Al-Hassani and Jackson 2011, pp. 248F, 252, 370).

Maps were drawn so that the north would be at the bottom and the south was at the top of the map. Perhaps this was due to the importance of the south as the direction of Qibla, also the east came at the left and the west at the right of the map. Arab geographers focused particularly on drawing urban sites and land and sea routes that connect them, especially Mecca, which occupied the center of the world map and was drawn as a round shape, and comparing locations of the cities with each other in a holistic view. However, these maps were not characterized by scientific accuracy and limited their interest in the representation of geographical scientific facts. The regional maps described cities in a geometrical form of planning, which did not care about the real shape of the city and the region (1001 Inventions 2018, pp. 1–12; Ayyubi 2002–2018, p. 8). The few visions of that period were the works of contemporary Christians such as Archulf Bishop of the French province of Jules who lived in the late seventh century. He was the first traveler to Jerusalem in 670 AD, and accurately drew its churches and described the Mosque of Omar bin al-Khattab (Shalem 1997, p. 2), noting the importance of the Middle East after the emergence of Islam. The Irish Saint Adomnàn (624–704) collected the tales of his travels about the city of Jerusalem and other places in Palestine, in three volumes known as "De Locis Sanctis" and published them in Northumbria in 698 AD, see (Fig. 9) (Hoyland and Waidler 2014, pp. 788–799). Nevertheless, during that period small schematic depictions of Jerusalem appeared on a few maps of the Holy Land, and the world maps drawn in Europe by Christian cartographers who expressed their religious understanding of the city as the heart of the world. This concept is known in maps as O-T or (Orbis Terrarum) where the world appeared as a round disk divided by oceans and rivers in a T-shaped fashion. The vertical arm of the letter "T" represents the Mediterranean Sea and Africa to the right and Europe to the left, and the horizontal line of the letter forms the Nile River on the right, also the Don River and The Black Sea are on the left, Asia takes the upper part. Jerusalem is placed in the center near the sub-point of the sea and rivers (Rosovsky 1996, p. 353). This perception is based on the interpretation of prophet Ezekiel's verses (5:5 and 12:38).

We conclude that this concept was in the Jewish tradition and in the descriptions of the Bible, and these powerful religious influences are what caused some cartographers to intentionally place Jerusalem in the center of the world. This type of map has been common for hundreds of years and has spread throughout Christian Europe during the Middle Ages and reached the peak of its artistic development. It was known for its richly decorated details in the thirteenth century (The Jewish National and University Library and The

Fig. 9 Map of Jerusalem from the manuscript "The Holly Sites (De Locis Sanctis)" by the author Saint Adomnàn, based on a sketch of Archulf, Northumbria, 698 AD (Tobler 1858, p. 27)

Hebrew University of Jerusalem 2005, p. 1). The map of Hereford Cathedral, one of the largest world maps, was executed on vellum by the British scholar Richard of Haldingham, known as Richard De Bello (1260–1305) in 1290. This map demonstrates Jerusalem in the heart of the world and the Holy Land occupies about a sixth of the world's surface. Actually, it depicts many events and holy sites; hence, the Christ is portrayed at the top of the map passing judgements and the angels leading the sinners to Hell, and the place of the crucifixion of Christ, etc., see (Fig. 10) (Osher 1996, p. 26). In a book entitled "Description of Syria and the Holly Land from AD 650 to 1500" by Guy Le Strange, published in 1890 in London, a map displays the city of Jerusalem, as described by Arab geographers such as Mohammed bin Ahmed Shams al-Din al-Maqdisi between 958 and 1052, see (Fig. 11) (Le Strange 1890, p. 83).

In terms of the geopolitical alterations of the city, due to the expansion of the Byzantine borders within the Levant in the early eleventh century, the Muslim rulers' permissibility of Christian presence in the Middle East began to weaken. During the reign of the Fatimid caliphate, Al-Hakim bi-Amr

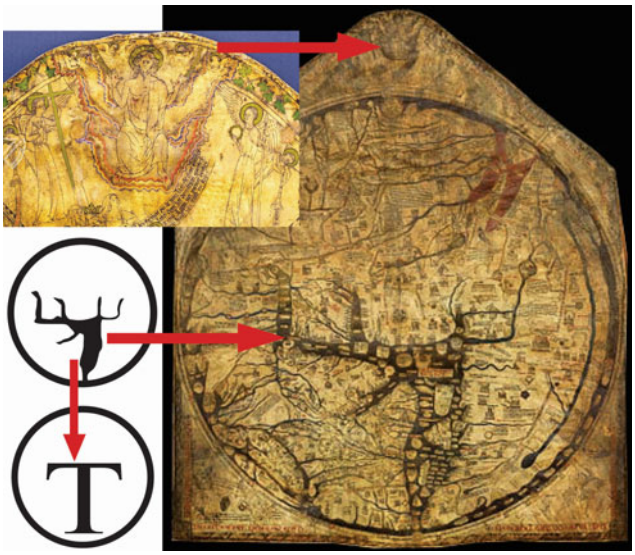

Fig. 10 Hereford Cathedral Map of Jerusalem, by the artist Richard De Bello, executed on vellum, 1290 (Osher 1996, p. 26)

Allah al-Mansur (985–1021) ordered the destruction of all churches. In fact, the earthquake of 1033 AD also destroyed the Al-Aqsa Mosque (Millis 2012, p. 40F; Elad 1999, p. 42; Ma'oz and Nusseibeh 2000, p. 137F; Join-Lambert 1958, p. 209F). It is the largest mosque in Jerusalem and its many architectural styles indicate the diverse influences of many trends that ruled Jerusalem throughout the ages. (Millis 2012, p. 35). Between 1070 and 1071, the Turkish prince Atsiz bin Avaq al-Khwarizmi (died 78/1079) besieged the city of Jerusalem and became formally affiliated to the Abbasid caliphate under the leadership of Abu Sa'id Taj ad-Dawla Tutush I the seljuk (died 1095), who gave the city another Seljuk ruler, Zaheer-ul-Daulah Artuk Beg, following his death the regoin witnessed a period of unrest beginning in 1091, until the end of the struggle by the Fatimids in 1098 again with the advent of the First Crusade (Basan 2010, pp. 85–91).

3.2 Manuscripts and Maps of Jerusalem During the Crusades (1099–1187)

Before we delve into the illustrated history of Jerusalem during the Crusades, here, we must refer to a larger umbrella that included the art of the Crusader manuscripts, which is the Crusader art that undoubtedly had a presence not only from the thirteenth century but also from the twelfth century. It was a religious and secular art made for crusader patrons and clients from 1098–1291, who had come with the crusades or were among those who settled there and were pilgrims, knights, nobles, bourgeois, merchants, or monks who came to the East or were born there and lived in the crusader

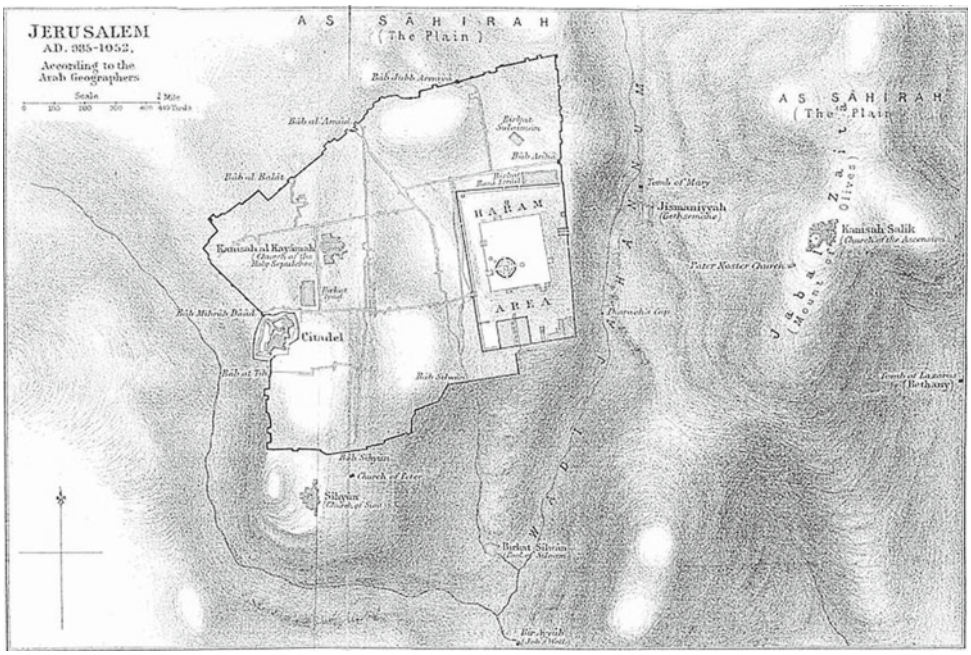

Fig. 11 Map of Jerusalem from the book "A Description of Syria and the Holy Land from AD 650 to 1500" by the author Guy Le Strange, London, 1890 (Le Strange 1890, p. 83)

states like Jerusalem and Antioch, etc. The manuscripts of that period were distinguished by their religious themes associated with the life of the Christ, the Gospel, and the Psalter. One of the most important manuscripts in this period was the manuscript of Queen Melisenda Psalter (1139), which contained images depicting the entrance of the Christ into Jerusalem, see (Fig. 12) (Folda 1995, pp. 15, 137, 140).

In terms of the city's political and historical situations, the repeated killings of Christian pilgrims and the defeat of the Seljuk Turks of the Byzantine Empire and Pope Urban II's dream of restoring the glory of the Roman Catholic Church are what led to the First Crusade (1096–1099). The Crusaders besieged Jerusalem in 1099. As a matter of fact, this can be seen in details portrayed in a miniature of a medieval manuscript in France 1474, by the French monk and writer Sebastién Mamerot (born 1418) entitled "Les Passages Fait Outremer", a description of the battle and siege. When the city fell, the Crusaders looted it and destroyed the Jewish synagogues and Islamic mosques, see (Fig. 13). Thus, Jerusalem became the capital of the Kingdom of Jerusalem. Then, the Christian Western settlers restored the shrines associated with Christ's life, while the Islamic shrines on the Temple Mount, such as the Dome of the Rock and the Al-Aqsa Mosque, were converted for Christian purposes. However, after the Muslim invasion of Edessa town, a new French-German Crusade led by Bernad of Clairvaux (1090–1153) was launched, but it failed. The city grew up at that time and was filled with soldiers, merchants, bars, and immoral things, until the Arab leaders began to prepare for the recovery of what was taken from them by force.

Fig. 12 Miniature depicting the Christ entry into Jerusalem from the manuscript of "The Queen Melisenda Psalter," tempera, 1139 (Folda 1995, p. 140)

In 1187, the Muslim Kurdish leader Saladin Yusuf, son of Ayyub, won the combat of Hittin and invaded the city of Jerusalem. Figure 14 illustrates a miniature of an illuminated

Fig. 13 Miniature from the manuscript "Overseas Voyages (Les Passages Fait Outremer)" by the monk Sebastién Mamerot, tempera, 1474 (Millis 2012, p. 36)

Fig. 14 Miniature illustrating Sultan Saladin's occupation of Jerusalem from the decorated manuscript "The Chronicle of David Aubert" by the artist David Aubert, Paris, the Third Crusade, the fifteenth century (Millis 2012, p. 39)

manuscript entitled "The Chronicle of David Aubert" of the fifteenth century in France, expressing Saladin's occupation of Jerusalem and the surrender of the Crusader Noble Balian of Iblin (1143–1193), handing over the keys of David Tower to Saladin. This led to the Third Crusade (1189–1192) in which King Philip II (1179–1223) joined King Richard I (1157–1199) and the Roman Emperor Frederick I (Barbarossa) (1122–1190). It ended with a peace treaty in which Saladin allowed pilgrims to pray in Christian sacred places. In the middle of the first decade of the thirteenth century, the Crusades dewindled; Christian Europe pursued the approach of exploiting discord and disagreement among Muslims after the death of Saladin, with the failure of the Fourth Crusade (1202–1204) to usurp both Egypt and the Holy Land. In the Fifth Crusade (1217–1221), the Australian and Hungarian armies joined the King of Jerusalem and the Prince of Antioch to restore Jerusalem and confront King Al-kamel Mohammed bin al-Adel (1177–1238).

The Sixth Crusade (1228–1229) was led by the Roman Emperor Frederick II (1190–1250). According to the Treaty of 1228 with King Al-kamel Mohammed bin al-Adel, the city was handed over to the Crusaders, provided that no walls or fortifications would be built in parallel to the strip connecting it to the beach (Millis 2012, pp. 36–41). In (Fig. 15), there is a miniature from the manuscript of "Nuova Cronica" of the Roman historian Giovanni Villani (76/1280–1348) executed between 1341 and 1348 in Italy, illustrating the negotiations of King Al-kamel Mohammed bin al-Adel with Emperor Frederick II (Rea 2013–2019, p. 2). Until 1244 Jerusalem was officially ruled by the Christian kingdom, then the city fell back into the hands of the Khwarizmian Turks. They perished the greater part of Jerusalem's Christian and Muslim population, prompting Europe's response to the Seventh Crusade (1248–1254). However, the New Forces led by Louis IX (1214–1270) did not achieve any success. The Sultan Salih Najmuddin Ayoub, son of King Al-Kamel Muhammad bin al-Adel (1205–1249) began launching armed campaigns, raiding

Fig. 15 Miniature of the manuscript "Modern History (Nuova Cronica)" by the author Giovanni Villani, unknown artist, Italy, the Sixth Crusade, (1341–1348) (Rea 2013–2019, p. 2)

Christian societies, classifying prisoners and training them as soldiers in the service of the Sultan, and he called them the Mamluks. This military force was used by the Sultan to eliminate the Khwarizmians and to return the city of Jerusalem to the Egyptian Ayyubid rule in 1247 (Millis 2012, pp. 39–42; Jones 2010, p. 44).

At the level of maps, dozens of maps from the Crusades period, as well as those from the thirteenth and fourteenth century, remained. Each map was identified by the place where it was found. Many of them came in the style of circular O-T maps and depicted Jerusalem in a circular shape, divided by streets into a cruciform pattern, portraying the city with its walls, five doors, churches, castles, temples, etc., including what was planned to a high degree, and what was detailed and varied in a technical quality. Figure 16 shows a map of the twelfth century's Den Haag, depicting the Crusader aims to control the holy sites of Judaism, Christianity and Islam, in Jerusalem, Palestine, in particular, and the Middle East in general. However, among the Crusader maps of the rectangular shape—different from the above mentioned, is the map of Cambrai which was carried on parchment with colored inks during the twelfth century. Jerusalem appeared here in a diamond-shaped rhomboid form, but the map provided us with factual information about some of the city's civic features, such as gates and streets, churches, and mosques, distinct with its details, as an attempt from its cartographer to create a realistic picture of the city, see (Fig. 17) (Rosovsky 1996, pp. 353–357). One of the most important books that contain maps describing the Holy Land and the planning of Jerusalem was written by the Venetian cartographer Marino Sanuto (1260–1343) entitled "Liber Secretorum Fidelium Crucis" presenting the story of his travels to Pope John XXI in Italy (1321–1323). Through the planning of Jerusalem city, a point of view can be formed about it as seen by the writer in the early fourteenth century, who explained that the southern wall encircled all the western hill or Mount Zion including the monastery of St. Mary and the site of the tombs of King David and King Solomon, see (Fig. 18) (Watson 1912, 1918, pp. 245, 252).

It can be concluded from the above that the maps of the Crusades period and the late Middle Ages contain some factual information, perhaps as a result of direct observation. Nevertheless, it is certain that some of the maps drawn in Europe and others painted in Jerusalem itself were fictional and based on biblical texts. Some of these maps faced the East, as was customary in that period (The Jewish National and University Library and The Hebrew University of Jerusalem 2005, p. 1). This may be due to pilgrims' arrival from the edges of the Mediterranean Sea. Their first vision of the city was from the east, and the opposite view was the

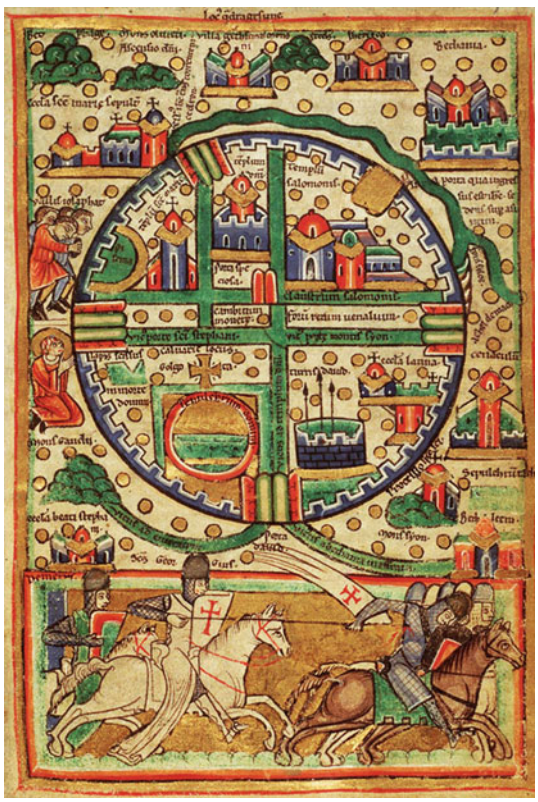

Fig. 16 Map of Den Haag of the holy Jewish, Christian and Islamic religious sites in Jerusalem, Palestine, and the Middle East, the twelfth century (Millis 2012, p. 38)

Fig. 17 Map of Jerusalem executed on parchment with colored ink, unknown artist, Cambrai, France, the twelfth century (Galor and Bloedhorn 2013, p. 127)

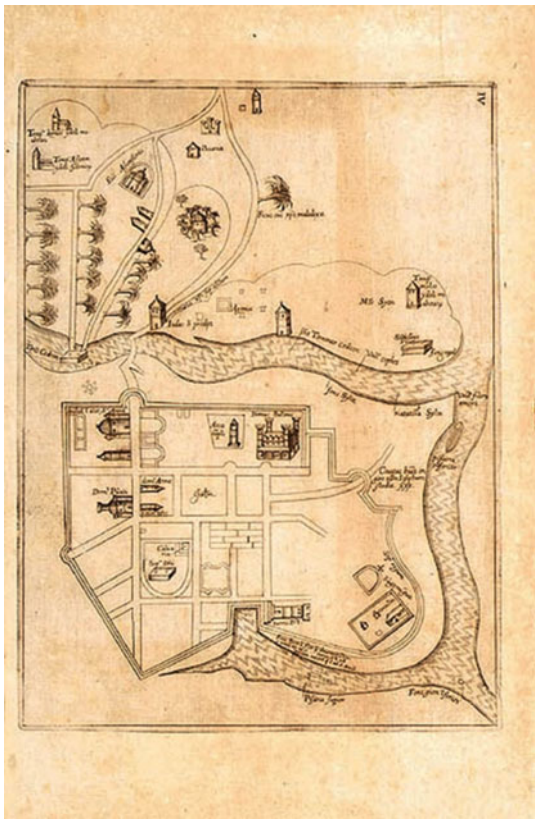

Fig. 18 Map of Jerusalem by the cartographer Marino Sanuto from the book "Secrets of Faith in the Cross (Liber Secretorum Fidelium Crucis)" (1321–1323) (Rosovsky 1996, p. 363)

West represented by the Mount of Olives, the traditional site, where it was believed that the Christ will watch the city, (Osher 1996, p. 8). On the other hand, many were directed to the west and drawn from the distinctive point of the Mount of Olives. In fact, some maps confirmed the Christian doctrine and faith, ignoring the Islamic rule of Jerusalem while others depicted mosques and crescents, etc. (The Jewish National and University Library and The Hebrew University of Jerusalem 2005, p. 1).

3.3 Manuscripts and Maps of Jerusalem During the Rule of Mamluks (1260–1517)

After the failure of the Crusades against Jerusalem in 1244, the city became under the control of the Mamluk rule from 1260 until 1516. In this period, Jerusalem maintained a great religious significance for the three monotheistic religions, but at the strategic, political and economic levels it was a marginal one. This is in addition to the beginning of the continuous Jewish presence in Jerusalem. In a miniature of the manuscript entitled "Advis directif pour faire Le Passaige d' Outre Mer," we were able to know the status of Jerusalem during the Mamluk period (Millis 2012, p. 42). The miniature was executed and translated in 1455 by the French architect Jean Miélot (died in 1472) from the book of the German monk Bardchard of Mount Sion (unknown date of birth and death) entitled "Descriptio Terrae Sanctae," where we see a scene of Jerusalem and at the base of the miniature, the sea border and the remains of a Crusader fortress with a large tower followed by a city with many minarets appear. This portrayed place may be Ram Allah, and on the right is definitely Bethlehem with the basilica which distinguishes it. Jerusalem appears from the western side, where we can see The Dome of the Rock with its octagonal shape, and an imaginary bulbous dome. On the right side stands Al-Aqsa Mosque, looking like a church. On the left side appears the Holy Sepulcher with its open dome and its fences, as well as King David's Tower with its four towers is shown and the Dome of the Ascension dominates the Mount of Olives, to which a meandrous road leads to it, see (Fig. 19) (Join-Lambert 1958, p. 1F). The Spanish traveler Marco Polo (1254–1324) visited Jerusalem during the Mamluk period between 1271 and 1295. Two miniatures of the illuminated manuscript "Livre des Merveilles du Monde" famous for Marco Polo Travels by the French artist Boucicaut Master (worked between 1400 and 1430), depicted his starting to travel from Venice to Jerusalem and the gathering of pilgrims in front of the Holy Sepulcher Church see (Fig. 20). The book on the stories and travels of Marco Polo was written by the Italian writer Rustichello da Pisa (lived in the late thirteenth century) in Venice 1300 (Millis 2012, p. 41).

The Mamluk period also witnessed the publication of the first travel guide to the Holy Land, entitled "Peregrinatio in Terram Sanctam" in 1486, written by a German priest of the Mainz cathedral known as Bernhard Von Breydenbach (1440–1497). The Dutch artist and printmaker Erhard Reuwich (1445–1505) executed his illustrations and maps based on the woodcut technique. The book includes a map of Palestine with a scene of Jerusalem in the center as a folded page, see (Fig. 21) (Millis 2012, p. 45). This book will make us see what happened in the Renaissance age, which witnessed many developments and discoveries. The most important of which was the invention of the printing press, and the increase in the number of books on the Holy Land and Jerusalem maps, included in groups of general maps, atlases or in books containing city plans (The Jewish National and University Library and The Hebrew University of Jerusalem 2005, p. 1). This was accompanied by the emergence of new geographical concepts that changed the extent, measurement, and shape of the world, leading to the neglect of maps depicting Jerusalem as the heart of the world (Osher 1996, p. 24).

Fig. 19 Miniature of a view of Jerusalem City from the manuscript "Advice to the Overseas Travelers (Advis directif pour faire Le Passaige d 'Outre Mer)" from the book "Descriptions of the Holy Land (Descriptio Terrae Sanctae)" by the monk Burchard du Mont Sion, the illuminator Jean Miélot, tempera, 1455 (Millis 2012, p. 42)

Fig. 20 Miniature of "Pilgrims in Front of the Church of the Holy Sepulcher" from the illuminated manuscript "Book of Marvels of the World (Livre des Merveilles du Monde)" by Rustichello da Pisa, by artist Boucicaut Master, tempera, Venice, 1300 (Millis 2012, p. 41)

4 Jerusalem in the Early Era of Books, Printed Maps and Ottoman Rule

With the introduction of printing into the field of book illustrations and manuscripts in the fifteenth century, illuminated books in Europe became out-of-date. (Osborne 1975, p. 560). Conversely, the printing techniques and potentials that they brought about have had the greatest impact on the books accompanied by illustrations and maps depicting the city of Jerusalem and the Holy Land in particular. The discovery of Johannes Gutenberg (1397/1400–1468) of Movable Metal Types, created the need for woodcut prints, which is considered as one of the relief printing techniques, to accompany printed texts (Dalley 1980, p. 76). In the light of the flourishing of the paper industry in Europe, less than ten years after the publication of Johannes Gutenberg's Bible printed books continued to appear in Germany, and the most famous of which was "Liber Chronicarum Mundi," best known as "The Nuremberg Chronicle" by German writer Hartmann Schedel 1440–1514). The German painter and engraver Michael Wolgemut (1434–1519) draw the wood block designs which were printed by the German woodcutter Anton Koberger (1440–1515) based on the woodcut technique and the book was published in Nuremberg in 1493 (Harthan 1981, p. 62F). This book contains the first imaginative printed view of Jerusalem depicted as a city with its circular walls and six doors, dominated by the Temple of Solomon. In another scene from the same book, the city was portrayed but with an emphasis on the Islamic holy places, where minarets were shown carrying calves on their tops, see (Fig. 22a, b). It is noteworthy that few artists embarked on long and dangerous trips to Jerusalem during the late Middle Ages and the Renaissance to map the Holy City. The majority resorted to descriptions of the Bible and historical records and the visions of travelers and narratives supplemented by their own imaginations. The most common scene of Jerusalem depicted the top of the Mount of Olives overlooking the city from the east, provides us with a view of the Temple Mount and other holy sites.

A map of the Holy Land which was published in 1475 in Germany, illustrated in a book entitled "Rudimentum Novitiorum", was considered the first modern printed map because it was not derived from classical sources; rather, it was based on medieval observations. In addition, it is not in the circular schematic format characteristic of medieval maps, although it is directed toward the east and Jerusalem occupies the heart of the map. We see the control of Jerusalem as a city with circular walls overlooking the Mount of Olives, in a bird's-eye view; to its right is the city of Bethlehem. Gaza is in the lower right corner, at the base of the center is the port of Jaffa, Acre lying on the left of

Fig. 21 Detailed map of Palestine with a view of the city of Jerusalem from the travel guide "Journey to the Holy Land (Peregrinatio in Terram Sanctam)" by Bernhard Von Breydenbach, the printer Erhard Reuwich, woodcut technique, Mainz, 1486 (Osher 1996, p. 22)

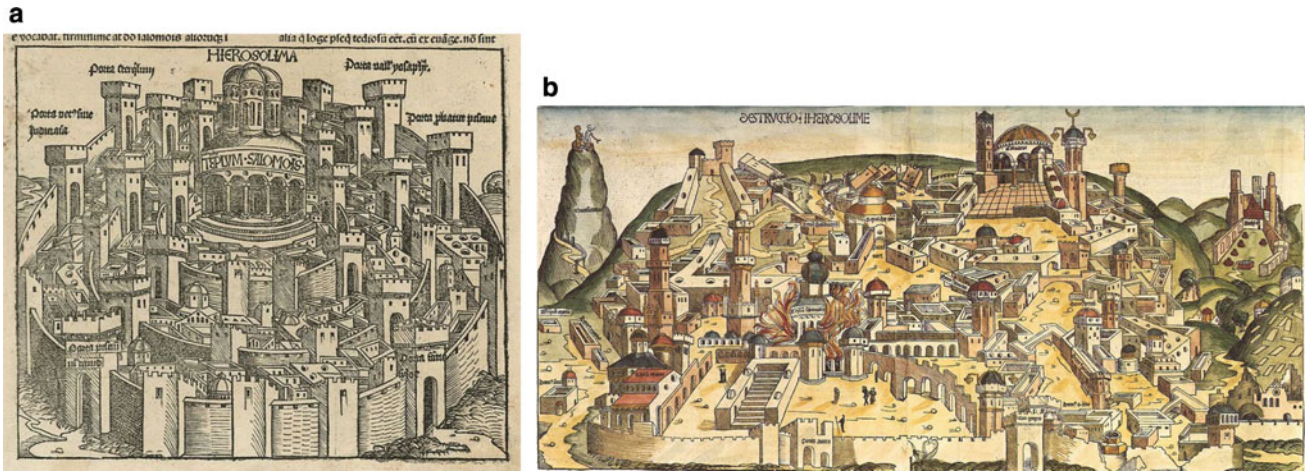

Fig. 22 **a** Fictional scene of the city of Jerusalem from the book "The Nuremberg Chronicle (Liber Chronicarum Mundi)" by Hartmann Schedel, the painter Michael Wolgemut, the printer Anton Koberger, woodcut technique, Nuremberg, 1493 (Harthan 1981, p. 63). **b** Descriptive woodcut illustration from the above-mentioned book depicting the holy places of Islam where crescents mount their minarets, hand colored (Osher 1996, p. 11)

Jerusalem, and Damascus is at the upper left. The topographical features are portrayed with infinite precision, and cities and towns are depicted as hills. The map was executed with woodcut technique, and manually colored by the German printer Lucas Brandis (1460–1480), in Lübeck, Germany. The map derived its geographic information from a map dating back to the thirteenth century by the pilgrim Burchard of Mount Sion, see (Fig. 23) (Osher 1996, pp. 10, 14, 19).

Approximately, 300 maps of Jerusalem were produced between the end of the fifteenth and the beginning of the nineteenth century; most of which were not drawn or printed in Jerusalem itself. Actually, most of them depicted the city from the east with a diagonal bird's-eye perspective presenting a panoramic view of the city. In the sixteenth and seventeenth centuries, some maps of Jerusalem were invented in Italy and the Lowland, while many maps were printed in France and England during the seventeenth and eighteenth centuries, (The Jewish National and University Library and The Hebrew University of Jerusalem 2005, p. 1) which can be seen and noted from the models referred to in the following points which reveal also the evolution of printing techniques.

Thus, they showed a shift from the relief printing to the intaglio printing techniques, as an alternative to the implementation of book illustrations and maps in the sixteenth century, and their control in the Baroque era at the beginning of the seventh century, and the combination of them in the Rococo era in the eighteenth century, giving them a linear approach, more details and a variety of tonalities (Harthan 1981, pp. 140–143). This is in addition to the emergence of more techniques and print methods such as the planographic lithography, discovered by the German playwright and actor Aloys Senefelder (1771–1834) in Munich in 1798 (Sachs 1954, p. 241). In the mid-eighteenth century, we see how the need for book illustrations and maps has increased, and became more difficult for professional painters to face resulting in the emergence of designers-artists who have good knowledge of intaglio printing techniques, as reflected in their fine-detailed designs. At the end of the eighteenth

Fig. 23 Map of the city of Jerusalem from the book "Rudimentum Novitiorum" by the printer Lucas Brandis, woodcut technique, Lübeck (Germany), 1475 (Osher 1996, p. 14)

century, book illustrations and maps became at their most prosperity phases between 1790 and 1840, under a constellation of illustrators-artists such as the English artist Thomas Bewick (1753–1828), who in 1770 revived relief printing by his discovery of the wood engraving, which provided illustrations and maps with more details and models of fine and cross-hatching to obtain shadows under a wide variety of intaglio printing techniques, where the technique of aquatint was used to depict the transparent effects of water colors and execution of landscape, as well as topographical illustrations and travel books (Cleaver 1963, p. 228; Harthan 1981, p. 156F; Olmert 1992, p. 239). Before we proceed in the evolution of printed book illustrations and maps that described the city. It is worth highlighting the status of Jerusalem under the Ottoman rule, which have the greatest impact in highlighting the role played by maps and printed book illustrations in documenting geopolitical events and the Arab Islamic identity of the city.

4.1 Illustrations of Printed Travel Literature Books and Maps Under Ottoman Rule (1517–1917)

In 1517, Jerusalem and its suburbs fell and remained ever since and until 1917 in the hands of the Ottoman Turks. Their reign, especially the reign of Sultan Sulayman the great son of Salim Khan I (1494–1566), whose reign and the rule of his successors of the Ottoman sultans had a period of prosperity and religious peace, witnessed many expansions beyond the walls of the Old City (Cohen 1989, p. 1F). At the level of Ottoman miniatures painting, the Ottoman sultans took care of epics, which excessively praised the feats of the Ottoman ruler and his predecessors. The most important of these epics was the history of the Ottoman dynasty of five volumes by the Persian historian Arifi (lived in the sixteenth century). The fifth volume of 1558 displayed the reign period of Sultan Sulaiman the great, known as "Suleymannama or History of Suleyman." The miniatures of this volume illustrated scenes of the Ottoman army's siege of the cities, and reflected the Ottoman interest in painting the topography. Undoubtedly, the reason for Ottoman interest in topography is their military regional ambition as a result of their intention to open and conquer the main lands of the Roman Empire. The Ottomans were also interested in world geography, and the science and art of cartography that became apparent in workshops and courtrooms, where artists incorporated topographical details into illustrations of their books, i.e., painting of their miniatures. The sixteenth century witnessed the flourishing of single pages as works of art rather than in the form of illustrated books as they were common and were traded everywhere for their low price and cost. On the other hand, illustrated books were considered a high-cost artistic goal. By the seventeenth century, illustrated books or miniatures became less important in the Ottoman Empire because of the large and complex sizes of paintings, which made it impossible to portray them on the same pages of the book. Hence, they were generally depicted on separate sheets and then pasted into books. Figure 24 demonstrates a miniature of the city of Jerusalem and the sanctuaries of the companions, the Al-Aqsa Mosque and the Dome of the Rock in geometric topographical shape, combined between the horizontal and vertical projection.

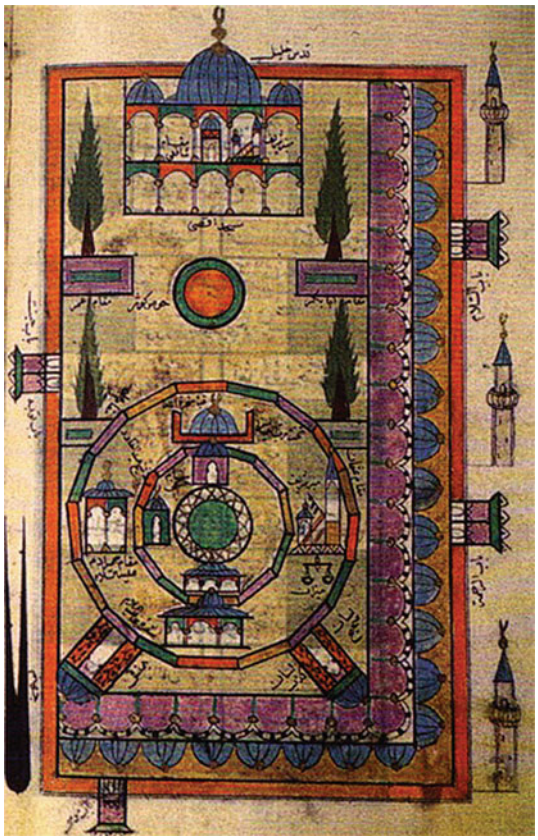

Fig. 24 Miniature depicting the city of Jerusalem and the area of the Haram and its doors and the layout of the Dome of the Rock, the seventeenth century, Lübeck (Germany), 1475 (Anon. (n.d.) [Online]

To sum up, the art of miniature painting in the Ottoman era did not achieve the same high status it had acquired in Persia or Moghul India. Thus, the quantity and quality of manuscripts and miniatures were withered, especially after 1650, when the imperial support of the royal court workshops weakened. It is surprising that the great invention of the printing of Movable Metal Types, which revolutionized the production of books in the fifteenth century in Europe, did not have the same direct and immediate impact on the Islamic lands. Perhaps the practical and cultural factors played a role in this. Actually, it was difficult to design the face of the Arabic letter; because of its continuous characters and their shapes of them change frequently according to their positions in a word. The appreciation and respect that Arabic calligraphy reserved, especially the writing of God's words, was also a reason for considering this as a desecration of the sacred. Nevertheless, one of the first printed books of the world of geography was by the scholar Abu Abdullah Muhammad bin Muhammad al-Idrisi al-Hashemi al-Qurashi (1099–1160). The first printing presses in the Islamic lands were run by Christian missionaries, and the first printing press was run by a Muslim based in Istanbul in the early eighteenth century when the Ottoman printer and historian Ibrahim Müteferrika (1674–1745) used copper plates to print engraved maps. Soon, he started printing books with Arabic letters, executing numerous historical, geographical and chronological books, which were sometimes illustrated by maps and intaglio prints. However, with the advent of lithography printing in nineteenth century, it became possible to reproduce the extended manual calligraphy and printing spread further, especially in the second half of the nineteenth century, when its spread was linked to the idea of Arab nationalism among a number of Muslim peoples, who were unable to read without their native language (Bloom and Blair 1997, pp. 342–360).

Back again to the situation of maps and book illustrations of Jerusalem, as we have already mentioned that in the era of printing, city maps were included in many books and atlases either alone or accompanying the margins of large maps. One of the most representative maps of this period is what appeared in the book or atlas entitled "Civitatus orbis Terrarum," whose six editions completion started from 1572 to 1617. Mapping drawings of this atlas were carried out by both the German topography geographer Georg Braun (1541–1622) and the Flemish cartographer Franz Hogenberg (1535–1590) by the copper plate engraving technique, and they were manually painted. More than a hundred cartographer and artists, most notably the German painter Georges (Joris) Hoefnagel (1542–1600), participated in the execution. The map of Jerusalem was published in the second edition in Cologne 1575, and appeared as a contemporary scene of the city in a decorative pattern, as seen from the east with the eye bird perspective, based on a painting by the artist Domenico Dalle Greche (1543–1558) who visited the Holy Land in 1546. On the right side, there is a key of the map in the form of a cartouche with forty-eight points indicating the most important Christian traditions and sites. However, this map showed the dominance of Islam during this period through the addition of the characters in the foreground and the emergence of many minarets topped with tents, especially the Dome of the Rock (Historic Cities 2017, p. 1F; Barry Lawrence Ruderman Antique Maps INC 2017, p. 1). This map was also used as an illustration; to commemorate the rebuilding of Sultan Suleiman's Great Walls of the Old City, see (Fig. 25) (Millis 2012, p. 51).

In the era of printing, maps can be divided into two basic types; *the first* is the historical-imaginary maps, which reflect the vision of the Bible and its concept about the Old City of Jerusalem, and *the second type* is the realistic maps which represent the image of the city recently or in our time. Both types or styles contain geo-information combined with Christian ideological messages that have been transmitted through the artistic illustrations in maps (Rosovsky 1996, pp. 366–371). An example of the imaginary type is the map of the Christian German monk and writer Kruik van

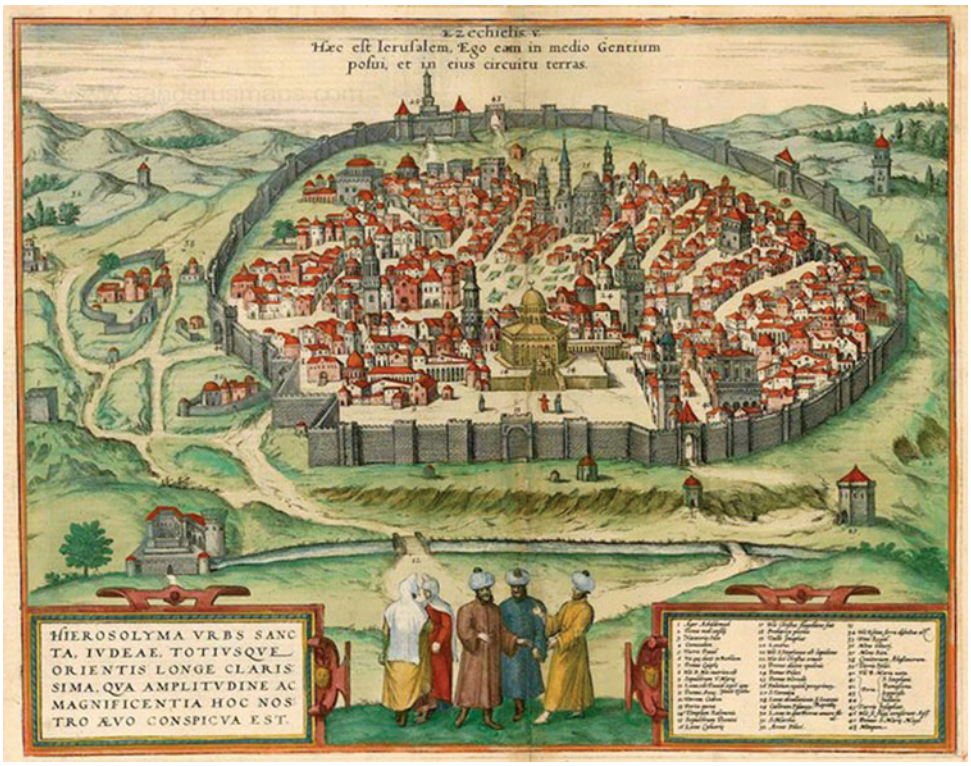

Fig. 25 Map from the Atlas of "Cities of the World (Civitatus Orbis Terrarum)," a scene based on the drawings of Domenico Dalle Greche, the painter Georg Braun, the printer Frans Hogenberg, copper plate engraving technique, Cologne, 1575 (Millis 2012, p. 51)

Adrichem (1533–1585) entitled "Jervsalem et suburbia eius sicut tempore Christi floruit," published in his book "Jerusalem … et suburbanorum … brevis descriptio" in Köln 1584. It was carried out on the basis of the copper plate engraving technique and manually painted, with an imaginary layout of the city and its environs oriented eastward with the eye bird perspective, containing inscriptions and small drawings to create a detailed conception of the physical features and their associations with historical events. Its significance was representing the city and its suburbs in the time of Christ as it identified and depicted more than two hundred and seventy sites of the Old and New Testaments. In addition, it identified the fourteen stations of the Cross. The author's detailed studies of the Gospel, the writings of Titus Flavius Josephus and the stories of early pilgrims enabled him to produce one of the most influential maps of the Holy Land in the sixteenth century without visiting it. As a matter of fact, it contained information that was widely disseminated and remained the most reliable evidence of the city of Jerusalem until the nineteenth century archeological revolutions, see (Fig. 26) (Osher 1996, p. 10F).

As for the realistic maps, they were represented in their best form in the maps of the above-mentioned book "Peregrinatio in Terram Sanctam" in 1486 of priest Bernhard Von Breydenbach, review (Fig. 21), as well as in the 1639 map of the Italian writer and Orientalist Franciscus Quaresmius (1583–1650), "Novae Ierosolymae et locorum circumiacentium accurata imago," carried out by the copper plate engraving technique. Definitely, it has been a source of inspiration for many years. The Dome of the Rock appeared in its octagonal shape in both maps, see (Fig. 27). By the end of the sixteenth century, a new scientific form of maps began which had margins and was associated with the general development of science, travel, and modern mapping, distinguished by the diminishing of figurative elements which were replaced by symbols such as letters and numbers characterizing buildings, site extensions and details of landscapes in explanatory titles on the margins of the map. It was also characterized by using the perspective of the vertical eye of the bird and the development of the techniques of shading and drawing lines and images accurately to depict the topographical relief. However, the map was directed to the north instead of the east (Rosovsky 1996, pp. 371–374). This can be seen clearly in the map of the French diplomat Louis Des Hayes Courmenin (1592–1632) from the court of Louis XIV, distinguished by accuracy and loyalty to reality presenting Christian sites by their names; however, it did not completely refer to the crescents or the Islamic sites. This map was published in the pages of his book in France about the story of his travels on 21/1624 and printed by the technique of copper plate engraving, see (Fig. 28) (Levy-Rubin 2017, p. 2F). In this period of the history of the city, i.e., the seventeenth century there were many descriptions, most of which were written by travelers, not as pilgrims as usual. This is called travel literature. The most important work of this period was the English traveler

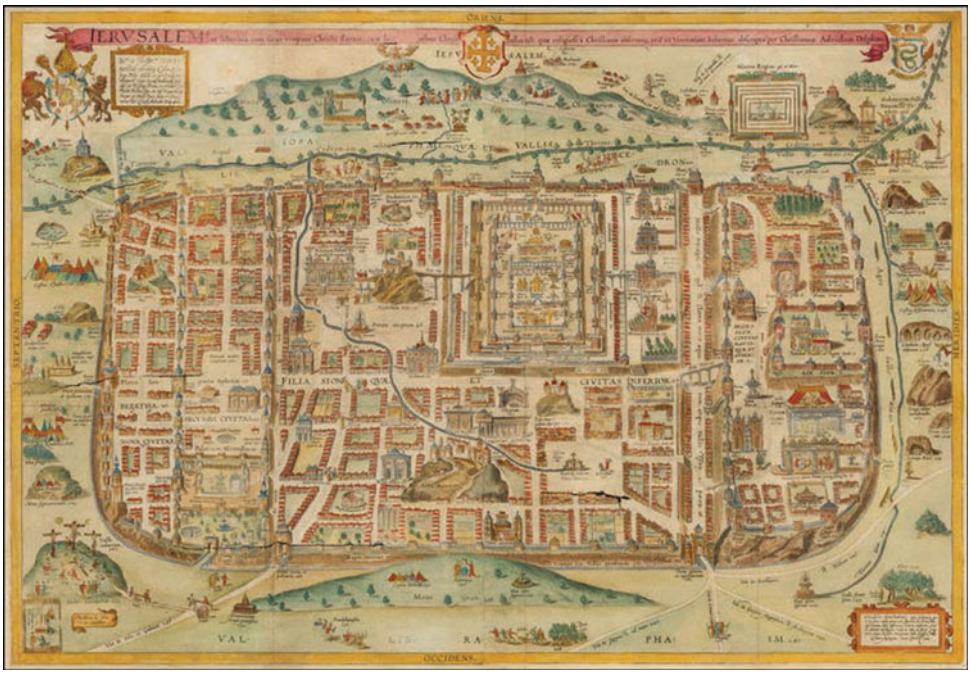

Fig. 26 Map of "Jerusalem and Its Suburbs as at the time of the Appearance of Christ (Jervsalem et suburbia eius sicut tempore Christi floruit)" by Kruik van Adrichem, from his book "Jerusalem and its Suburbs brief description (Jerusalem … et suburbanorum … brevis descriptio)," copper plate engraving technique colored manually, Köln, 1584 (Osher 1996, p. 10)

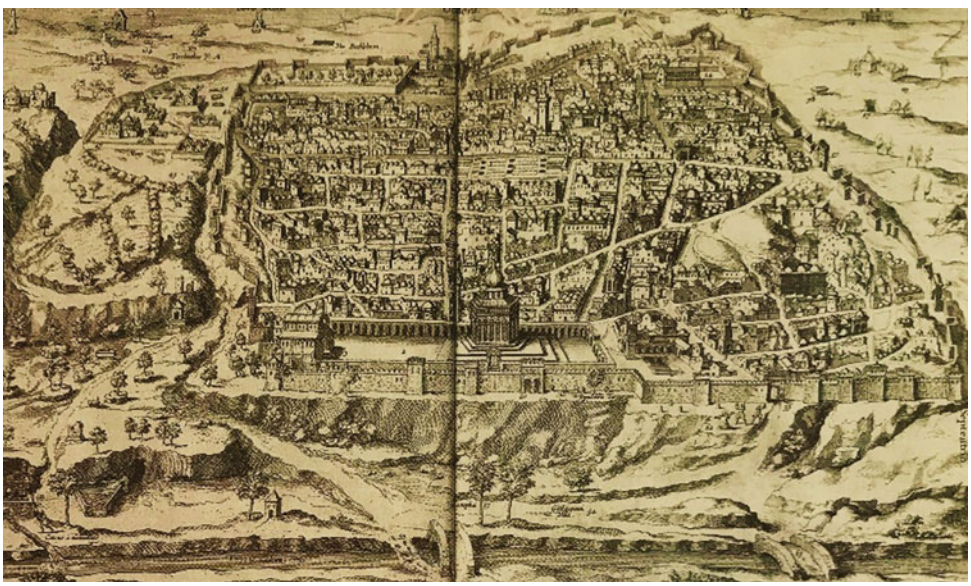

Fig. 27 Franciscus Quaresmius map of "Modern Jerusalem and the precise image of the surrounding (Novae Ierosolymae et locorum circumiacentium accurata imago)," copper plate engraving technique, 1639 (Rosovsky 1996, p. 368)

George Sandys (77/1578–1644), who toured the Middle East, including Palestine and Jerusalem between 1610 and 1611. The text of his first book included a collection of wood cut prints, copied from sketches executed by the Flemish artist Johan Zuallart (without a date). Although the prints were far from the drawings, they gave an interesting idea of the buildings of Jerusalem at the beginning of the seventeenth century (Watson 1912, 1918, p. 268). In 1673 an edition, entitled "Travels containing an History of the Original and Present State of the Turkish Empire," was published in London by Williams Publishing House. It carried out the illustrations applying the copper plate engraving technique, illustrating several architectural studies and plans for the most important Christian sites of worship. As the English traveler talked about the Jews in his book, he also mentioned the Palestinians but did not express the same sympathy with the Jewish culture. Therefore, their scenes were empty of figures, containing few houses. The culture of life did not appear in prints of the Holy Land. The interpretation of this vacuity and the lack of population and housing reflect one of two things: either it was a false appearance or expression, in the sense that it hoped for the

Fig. 28 Map from the book "The Story of Louis Des Hayes Courmenin," Louis XIV Court, copper plate engraving technique, 21/1624 (Levy-Rubin 2017, p. 3)

Fig. 29 Two opposite pages of the book "Travels Containing the History of the Original and Current State of the Turkish Empire" by George Sandys, copper plate engraving technique, Williams, London, 1673 (Wolfe 2010, p. 2)

evaporation of Palestinian life, or a true socio-historical representation of a place that generated a series of spectral landscapes, see (Fig. 29) (Wolfe 2010, p. 2).

In 1698, the first direct illustration of Jerusalem was executed by the Dutch traveler Cornelis de Bruijn (1652–26/1727) when he visited the city as an artist not as a pilgrim. Due to the exactness of his sketches, they were considered of a significant historical value. This scene was drawn as a sketch of the Ottoman period, during which foreigners were regarded as strangers and viewed with skepticism, and the execution of the engraved image was forbidden. Figure 30 shows a facsimile of the sketch executed with the copper plate engraving technique from the book "Reizen van Cornelis de Bruyn door de vermaardfte deelen van Klein Asia…..Mitfgaders de voornaamfte steden van Aegypten, Syrien en Palestina" (Osher 1996, p. 20). In 1737, the British traveler Richard Pococke (1704–1765) visited the city and recorded what he saw in two volumes entitled "Description of the East, and Some Other Countries." The second volume, published in London between 1743 and 1745, contained a folded map of Jerusalem, as well as many important scenes of buildings in the city, such as the Holy Sepulcher Church. The book combines architectural designs with scenes of interior architecture. This part of the book is entitled "Palestine or the Holy Land" as a kind of recalling the challenges faced by the region of many different names, see (Fig. 31a, b) (Wolfe 2010, p. 2).

This was the situation in the eighteenth century, as for the nineteenth century its importance lies in its achievements in the field of illustrations in general and travel literature illustrations in particular. Moreover, a change occurred to the maps of Jerusalem; to become artistic illustrations of landscapes without measurements or an accurate perspective, depicting scenes, and sites of different historical eras side by side, combining the representation of real sites with the concepts of the Bible associated with them, due to their popularity and fame (The Jewish National and University Library and The Hebrew University of Jerusalem 2005, p. 1). More importantly, it is characterized by the diversity of its relief, intaglio, planographic printing techniques, and the attention to color. In addition, some events occurred such as the discovery of photography, and there were subsequent attempts and many experiments to find ways to accelerate the process of printing plate production. Furthermore, another achievement was the growth and increase of the Orientalism movement, which was interested in studying all the cultural structures of the East from a Western point of view in the colonial era between the eighteenth and nineteenth centuries, as the Palestinian author Edward Wadai Said (1935–2003) stated in his book "Orientalism" 1978.

In 1806, the famous French writer François-René de Chateaubriand (1768–1848) visited the city. He was the last traveler to see the Church of the Holy Sepulcher in the medieval period before it was burned and destroyed in 1808. The city has deteriorated during the eighteenth century (Watson 1912, 1918, p. 274F). In 1832, Furne published in Paris an important volume of his "Oeuvres complètes," which included in its pages a description of his journey from Paris to Jerusalem and his return again and illustrations of the French artist Tony Johannot (1803–1852). One of which expressed a natural view of Jerusalem and the region which

Fig. 30 Facsimile of a sketch executed by copper plate engraving technique from the book "Travel of Cornelis de Bruigen from the most famous parts of Asia Minor… along with the main cities of Egypt, Syria and Palestine (Reizen van Cornelis de Bruyn door de vermaardfte deelen van Klein Asia …Mitfgaders de voornaamfte steden van Aegypten, Syrien en Palestina)", Delft Netherlands, 1698 (De Bruyn 1698, p. 280)

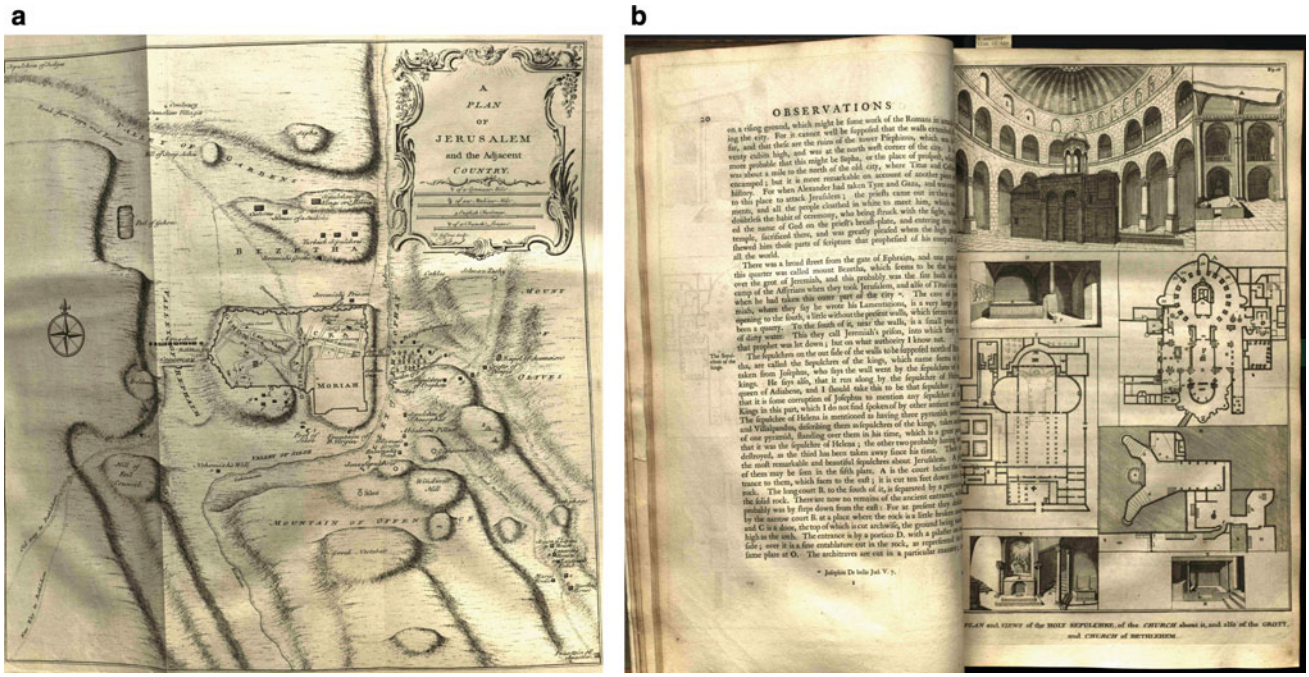

Fig. 31 **a** Map of "Description of the East, and Some Other Countries" by Richard Pococke, Chapter entitled "Palestine or the Holy Land," (1743–1745) (Wolfe 2010, p. 2). **b** Architectural planning and scenes of Interior design of the Holy Sepulcher Church from the above-mentioned book (Wolfe 2010, p. 2)

included Al-Aqsa Mosque and the Dome of the Rock. Many prints of this book were executed by Jean-Baptiste Marie Auguste II Blanchard (1792–1849) with applying the steel engraving technique, see (Fig. 32) (Oeuvres complètes-Edition-Originale.com 2018, p. 1). In 1818, the English writer and artist Henry Light (without a date) drew a scene of Jerusalem from the balcony of the monastery of the Latin monks, overlooking the Mount of Olives. Actually, it was carried out by Charles Theodosius Heath (1785–1848) using the copper plate engraving technique, and narrative details of fine washes, as a foldable illustration on the page opposite to the frontispiece in his book "Travels in Egypt, Nubia, Holy Land, Mount Lebanon, and Cyprus, in the year 1814" published in London by Rodwell and Martin, see (Fig. 33). The book of "Notes, During a Visit to Egypt, Nubia, the Oasis, Mount Sinai and Jerusalem" by the English traveler Frederick Henniker (1793–1825) was published by the British publishing house John Murray in London. In 1823, we see a folded view of the city of Jerusalem, which can be used by the traveler to find places due to its accuracy was executed by the aquatint technique, see (Fig. 34) (Wolfe 2010, pp. 1–3).

After Jerusalem became under the rule of Egypt in the era of Muhammad Ali Pasha the Great (1769–1849) from 1831

Fig. 32 Landscape of Jerusalem, the area of Al-Aqsa Mosque and the Dome of the Rock from the book "The Complete Works (Oeuvres complètes)" by François-René de Chateaubriand, the artist Tony Johannot, the engraver Jean-Baptiste Marie Auguste II Blanchard, steel engraving technique, Fourne Publishing House, Paris, 1832 (Oeuvres complètes-Edition-Originale.com 2018, p. 1)

until 1840, when the British forced him to hand it to the Ottoman Empire after his defeat, the foreign missions and negotiations began to seek a foothold in the city. In the 1840s and 1850s, international forces began a violent struggle in Palestine in search of their protection of religious minorities in the region (Millis 2012, p. 49; Kark and Oren-Nordheim 2001, pp. 26–30). In February 1839, the British artist and orientalist David Roberts (1796–1864) visited Jerusalem, and he drew directly all the sites and landmarks of the city. This resulted in three volumes entitled "The Holy Land, Syria, Idumea, Arabia, Egypt, and Nubia," published between 1842 and 1849, according to the English publisher Francis Graham Moon (1796–1871). The illustrations were executed in water and oil colors, and the sketches with the pen and ink tool. The Belgian lithographer Louis Haghe (1806–1885) executed each print of these illustrations in two colors and completed the rest Colors with manual coloring (Bourbon 1999, p. 20F). His scenes of Jerusalem are rich in their domes, minarets, hills, valleys, surrounding mountains, castles, and fortresses, see (Fig. 35) where a scene of the Mosque of Omar (the Dome of the Rock now) can be seen topping the Mount Moriah, visited by the artist on his condition in 1022, which was inspired by the architecture of the Holy Sepulcher Church (Culliford 1989, p. 137). The style of the artist is representative of the tradition of the architectural and topographical realism, and we notice that his figures were characterized by an emotional character, and were designed to determine the magnitude of the ancient monuments (MacKenzie 1995, p. 49F).

When the motives behind this orientalism are analyzed, we will find the major changes that occurred in Europe in the nineteenth century, such as the French Revolution, the struggle for the balance of powers that ensued, the question of Europe's growing role in the East, as well as the Napoleonic Bonaparte Campaigns (1769–1821), especially on Egypt between 1798 and 1801, appear clearly. An Army of Allied Scientists cooperated and produced the book entitled "Description de l'Égypte" whose production lasted from 1809 to 1828, and its illustrations were carried out by painting mediums and metal line engraving technique. All contributed to the gradual weakening of the Ottoman Empire. As a result, the exploration of new lands and the re-discovery of ancient civilizations began with technological advances and improved travel opportunities for trade and safe shipping. This period was marked by the European voyages, commercial, and military campaigns (Lemaire 2008, p. 7F). Napoleon Bonaparte's misery adventure in the Middle East aroused the European interest in the region with what Jerusalem achieved of a legendary status (Millis 2012, p. 46). All these motives formed the West firm view of the East, and the artist David Roberts is the product of this Western thought. Declaring through his illustrations his rejection of the drawings and prints of the book of "Description de l'Égypte", as being, in his opinion, inaccurate. This made him visit these sites himself to correct them (Peltre 1998–2008, p. 102).

Contemporary critics are split into two parties. Some were supporters of Orientalists Art as being preserving old culture and technically renewing, as they found in the East ancient facts that were lost in their civilizations; therefore, they came to discover the echoes of the world they had lost. Conversely, others considered that the art of Orientalism had ignored the ideological dimension, and considered it an art re-politicized as the American critic and historian Linda Nochlin (1931–2017), and that its works were selected to create oriental types expressing the difference between the East and the West. The expression of the concept of tyranny, brutality, laziness, sensuality, technical backwardness, hopeless faith in destiny, and cultural decadence provided justifications for the colonial rule and its reform program, because these backward societies were more susceptible to the economic, cultural, and political transformations of colonialism. Accordingly, they expressed their disapproval by portrayal of outdated reality. Whatever the divergence of opinions, orientalism must be linked to cultural and historical trends, even if some of them were targeted toward colonial goals. Definitely, orientalist artists cannot escape from getting involved with the political, social, economic,

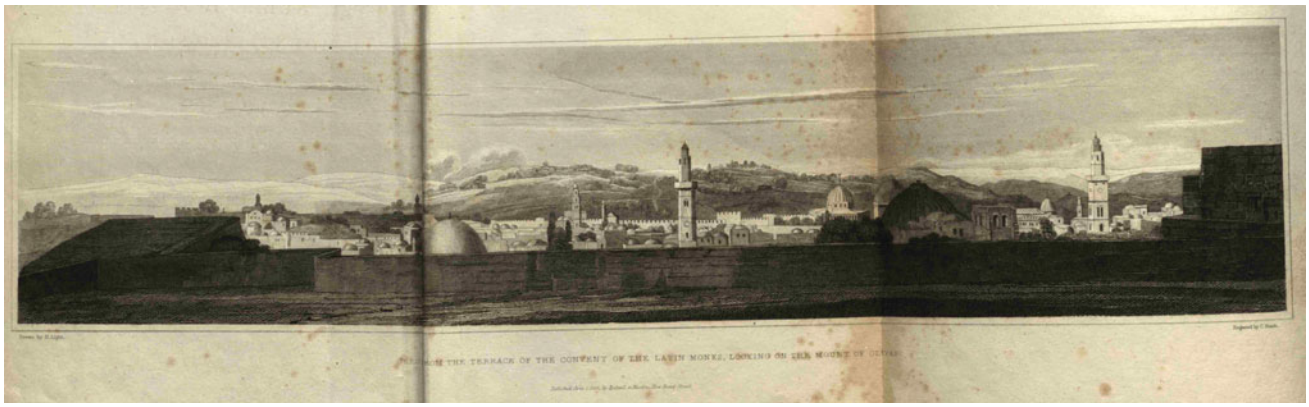

Fig. 33 Scene of Jerusalem from the book "Travels in Egypt, Nubia, the Holy Land, Mount Lebanon, and Cyprus in the year 1814," the engraver Charles Theodosius Heath, copper plate engraving technique, Rodwell and Martin, London, 1818 (Wolfe 2010, p. 3)

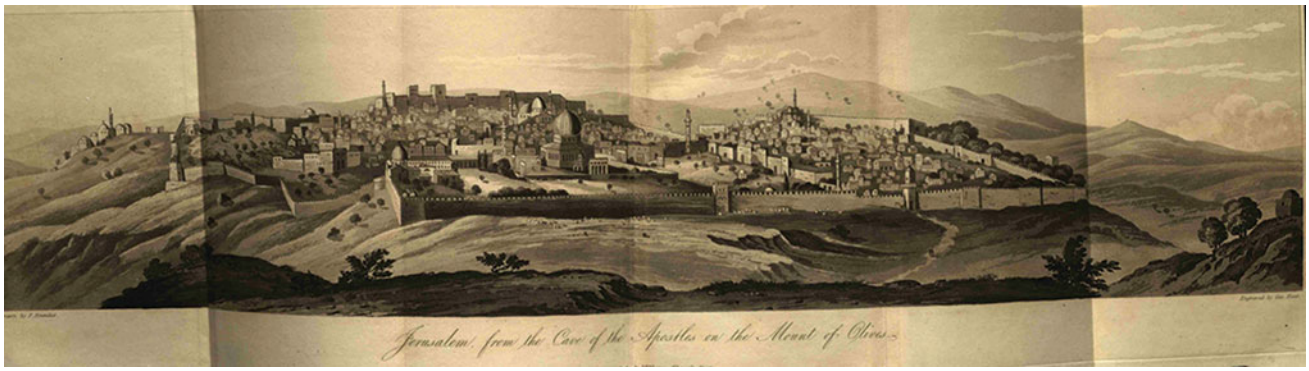

Fig. 34 View of Jerusalem from the book "Notes, during a visit to Egypt, Nubia, the Oasis, Mount Sinai, and Jerusalem" by Frederick Henniker, aquatint technique, John Murray Publishing House, London, 1823 (Wolfe 2010, p. 1)

Fig. 35 View of Jerusalem from the book "The Holy Land, Syria, Idumea, Arabia, Egypt, and Nubia," the artist David Roberts, the printer Louis Haghe, lithography, the publisher Francis Graham Moon, London, (1842–1849) (Culliford 1995, p. 136F)

and intellectual forces in their time, whether negatively or positively. The influx of Europeans into North Africa and the Middle East occurred because these areas are relatively closed, and they have represented an extraordinary range of ancient cultures and the origins of many religions of the world, including their own religions, as well as cultural, architectural, and topographical dramatic features (MacKenzie 1995, pp. 48–50, 54, 67). It should also be borne in mind that the early orientalist generation of topographers and artists emerged in response to the invitation of Khedive of Egypt, Muhammad Ali Pasha the Great, including the artist David Roberts, to record the newly discovered monuments, or accompany scientific expeditions, or depict what the rich sponsors saw during their visits (Gabr 2008, p. 16).

In the book "Walks about The City and Environs of Jerusalem" by the artist William Henry Bartlett (1809–

1854), published by Strahan Publishing House in London in 1845, the artist attempted to follow the evolution of the city since pagan times, recalling its past by studying already existing places, and expressing its current status through a series of selected scenes that bear an explicit reference to the historical illustration of the popular character comparing the present and the past. However, the illustrations came to express magnificent landscape scenes executed by the technique of steel engraving, but they did not reflect the topographic and historical purpose mentioned in the introduction of his book. This is in addition to the preconceived opinions we saw in the writer's description of a Jewish family on the top of Mount Zion. On the other hand, if we look at the illustration we will find a crowd of Arab men. This reflects the disappearance of the Arab experience, which distinguishes the history of Palestine when it is in western hands and reveals the possibility of a dishonest outlook in the illustration that may reflect an imaginary view. Actually, (Fig. 36) illustrates the Mosque of Omar, the Church of the Holy Sepulcher and Jerusalem from above the Mount of Olives and Stephen Gate. The same artist visited Jerusalem again in 1855, and his book, published in London through A. Hall Publishing House, was entitled "Jerusalem Revisited." Unlike the previous book, the illustrations of this book reflect a photographic nature. The researcher believes that it is a reaction due to the discovery of photography in 1835, as seen in the foldable panoramic view of the city, executed by the technique of steel engraving, see (Fig. 37) (Wolfe 2010, p. 3F).

In 1874, in London, the Religious Tract Society published a book entitled "Those Holy Fields: Palestine" by Samuel Manning (1822–1881), which contained a collection of maps, sites, and detailed scenes executed by the woodcut technique, presented in the narrative tradition in relation to the text as was the case and was a familiar style in that period, see (Fig. 38). In this way, the painter portrayed Jerusalem accurately in a more realistic approach, especially in the depiction of its landscapes and its character, revealing its topographical features. (Wolfe 2010, p. 2). In the same year, the first scientifically accurate map executed by lithography printing and manually colored, entitled "Jerusalem Ancient and Modern," was published. In fact, it had been executed before in 1865 by the English General Charles William Wilson (1836–1905) during his visit to Palestine in 1864 and was published in "An Atlas of Ancient Geography, Biblical and Classical," by the English lexicographer William Smith (1813–1893) in London in 1874 (Osher 1996, p. 30). Sir Charles William Wilson made a careful planning of Jerusalem and its adjacent regions, which formed the basis for all the city's plannings since that time, see (Fig. 39) (Watson 1912, 1918, p. 283). Furthermore, he also carried out some important underground excavations around the Haram, which are considered the first serious attempt to examine the topography of the Old City. Thus, the significant changes that occurred in the history of the Jerusalem maps were a prelude to the survey at the beginning of the nineteenth century. Maps from this turning point in history have reflected the use of precise measurements of distances, dimensions, heights, and directions and the application of trigonometry as a basis for mapping (Rosovsky 1996, p. 378; The Jewish National and University Library and The Hebrew University of Jerusalem 2005, p. 2), as seen in the above-mentioned example.

In the middle of the nineteenth century, with the collapse of the Ottoman Empire, the city became stagnant and heterogeneous because of its significances of Judaism, Christianity, and Islam religions. Its population was divided into four communities. The Christians lived in the vicinity of the Holy Sepulcher Church in the northwest, and the Jews were on the slope above the western wall to the southeast. The Armenians lived near the Zion Gate to the southwest. Finally, the Muslims surrounded the Haram al-Sharif or the Temple Mount northeast. Many of the changes and influences that occurred in the middle of the nineteenth century have persisted and remained for a long time. Their consequences can be sensed today due to the Israeli-Palestinian conflict over Jerusalem. *The first* was the delegation of Jewish immigrants from the Middle East and Eastern Europe. *The second* was the European colonial power that also started to look for a place in the city. It was the revival age of the Christian religion and many churches sent missionaries calling for conversion to Christianity among the Jewish and Muslim population, believing that this would hasten the second coming of the Christ. This combination of European colonization and religious fantacism has been expressed in a new scientific interest in the land of the Bible in general, and Jerusalem in particular. Archeological campaigns,

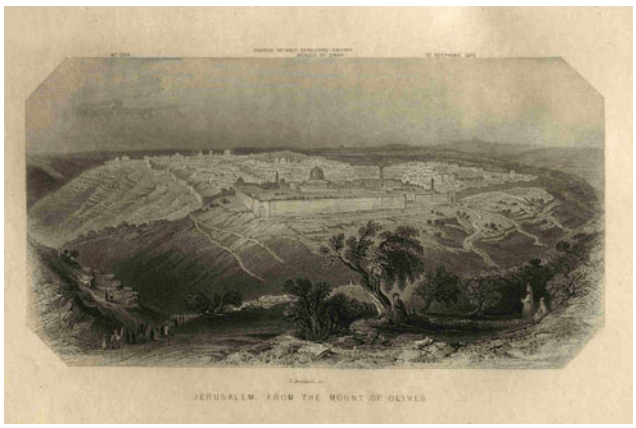

Fig. 36 Landscape from the book "Walks about The City and Environs of Jerusalem" by the artist William Henry Bartlett, steel engraving technique, Strahan Publishing House, London, 1845 (Wolfe 2010, p. 3)

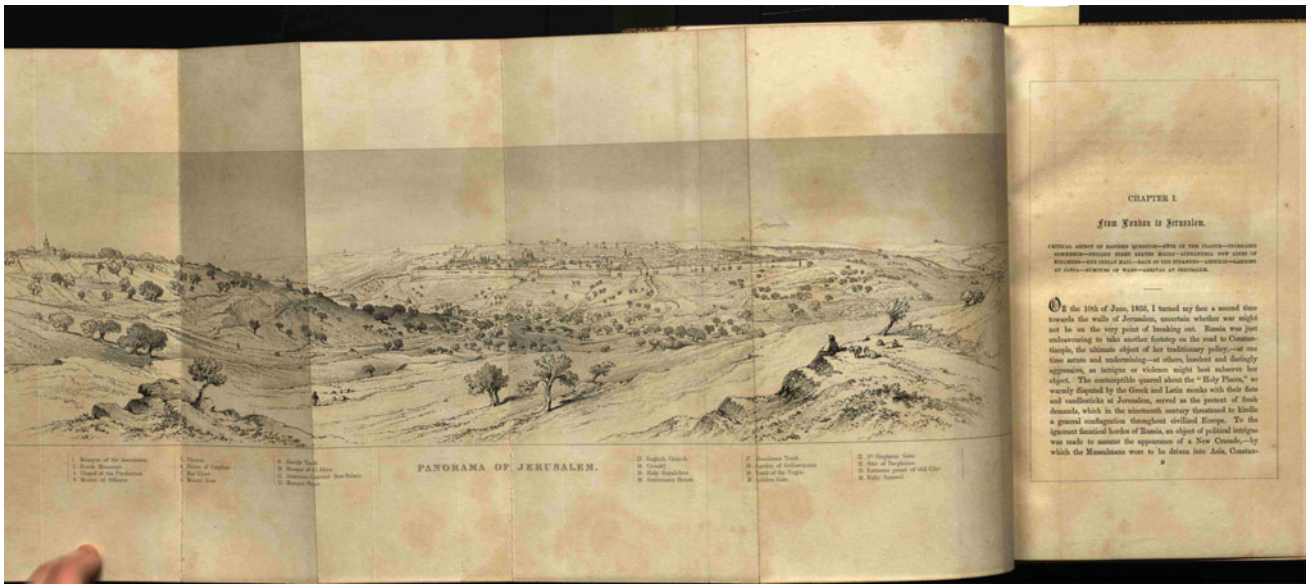

Fig. 37 Panoramic illustration of Jerusalem by the artist William Henry Bartlett from the book "Jerusalem Revisited," steel engraving technique, A. Hall, London, 1855 (Wolfe 2010, p. 3)

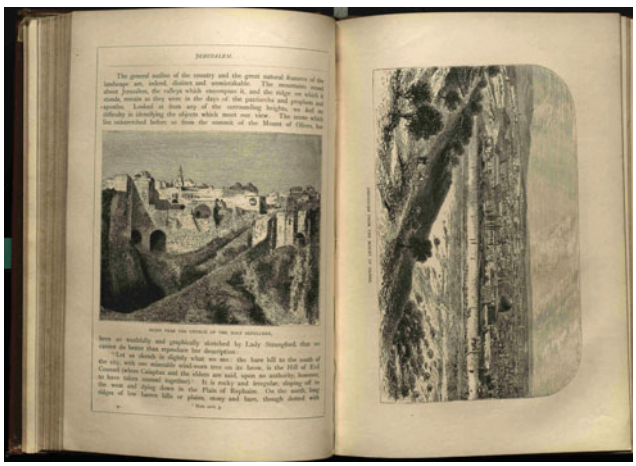

Fig. 38 Illustration of the Jerusalem city from the book "Those Holy Fields: Palestine" by the author and artist Samuel Manning, woodcut technique, Religious Tract Society, London, 1874 (Wolfe 2010, p. 1)

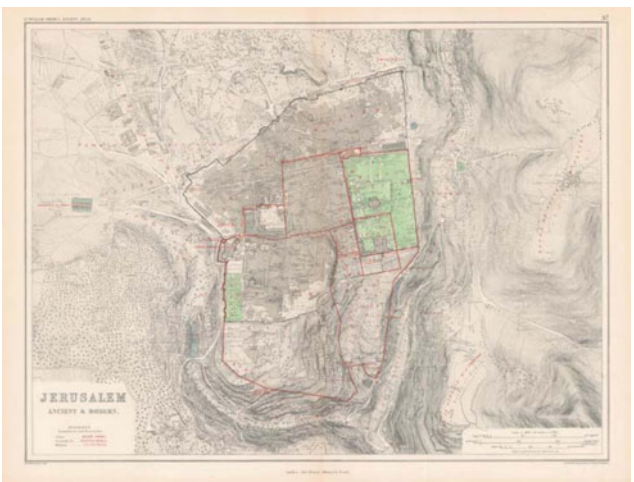

Fig. 39 Map of ancient and modern Jerusalem from the book "An Atlas of Ancient Geography, Biblical, and Classical" by William Smith, the painter Sir Charles William Wilson, hand–colored lithography, John Murray, London, 1874 (Preterist ARTchive 1996, p. 17)

expeditions, travels, etc., have provided many amazing explorations that have led to an increasing interest in the city. In the 1860s, the city was crowded. Construction of settlements outside their old walls began, and the Russian camp was the first attempt at those settlements, hundreds of meters away from Jaffa Gate. Little by little, many of them were created, developed and geographically connected to what was known as the New City (Millis 2012, pp. 52–54; Kark and Oren-Nordheim, pp. 31–76). By the end of the nineteenth century, the Holy Land got much research interest, surveys and monographs interested in studying a specific subject or field (Folda 1995, p. 10). There were also significant political changes with the emergence of political Zionism at the end of the nineteenth century under the European rise of ethnic nationalism and the anti-Semitic massacres of Russia in 1881 through the book "Jerusalem State" by the Hungarian literary critic and journalist Theodor Herzl (1860–1904) published in 1896, who is considered the

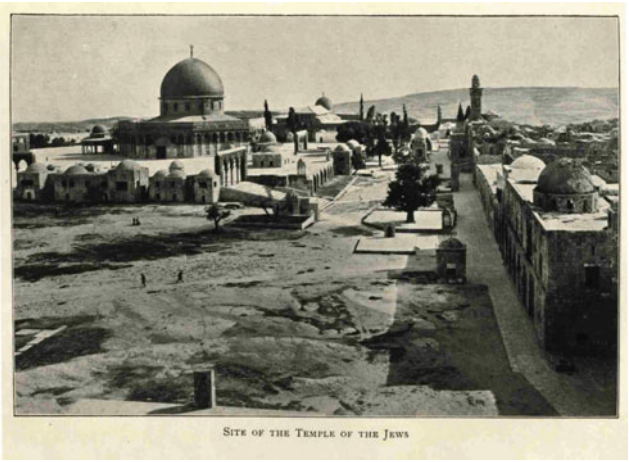

Fig. 40 Photograph of Jerusalem from the book "A winter Pilgrimage: Being an Account of Travels through Palestine, Italy, and the Island of Cyprus" by Sir Henry Rider Haggard, Longman Publishing, London, 1901 (Haggard 1901, p. 270)

Fig. 41 Print from the book "The Holy Land" by John Kilman, Artist John Fulleylove, lithography, "Beautiful Books about the East," Black A. & C., London, 1902 (Wolfe 2010, p. 3)

true father of that state. As a matter of fact, he also supported the idea of Jewish emigration to Zion in particular.

The early twentieth century witnessed the book "A Winter Pilgrimage: Being an Account of Travels Through Palestine, Italy, and the Island of Cyprus" by Sir Henry Rider Haggard (1856–1925), which was the edition of Longman Publishing House in London in 1901. Its illustrations were translated into photographs, although these illustrations were accompanied by comments below the pictures that do not express what they showed. The area of Al-Aqsa Mosque and the Dome of the Rock is quite obvious, despite the fact that the comment on the photograph referred to the location of Jews Temple, see (Fig. 40). This book is classified among the books that look at the mixed identity of Jerusalem, although it is further confused by the author's point of view (Wolfe 2010, p. 3).

As for the book entitled "The Holy Land" by John Kelman (without a date), it was published in 1902 in London as a part of a series published by Black A. & C. Publishing House, under the title "Beautiful Books about the East." It was written with a Christian perspective, accompanied by a collection of illustrations, copied from the paintings of the British artist John Fulleylove (1845–1908) and carried out by colored lithography printing. These were photographic representations of landscape, showing the Arab character in daily life, the clothes, and the customary scene in portraying Jerusalem from the top of the Mount of Olives. Therefore, the background is a representation of the Dome of the Rock and Al-Aqsa Mosque area, see (Fig. 41) (Wolfe 2010, p. 3). The period of Ottoman rule was rich in artistic production of maps, books of travel and journeys, and was full of political events and wars, especially the First World War, after which geopolitical changes occurred and affected the city of Jerusalem and marked the fall of the Ottoman Empire in 1917.

5 Jerusalem Maps and Book Illustrations During the British Mandate and World War II

The Middle East remained in a precarious state. The collapse and defeat of the Ottoman Empire were followed by the division of the region between France and England. After the end of the First World War (1914–1918), Palestine became officially under the British Mandate and protection. Jerusalem became an international zone under French, British and Russian's control, after the empowerment of the League of Nations in 1922, which was the first international security organization to maintain world peace, until such time when it can stand once again. Actually, this continued from 1923 until 1948. As the British Mandate has been in the scope of implementation, the Jews wondered exactly what the national homeland of the Jews which was promised by the Balfour Declaration of 1917. Arthur James Balfour (1848–1930), Prime Minister of Britain between 1902 and 1905. England's response was that it would be in specific parts of Palestine. Until World War II, this problem kept poisoning British-Arab–Jewish relations in Palestine.

Furthermore, the escalating immigration of non-Jews and Jews, especially between 1920 and 1945, increased the anger of the Arabs of Palestine (Millis 2012, pp. 66–69).

Between 1927 and 1936, the French historian and archeologist Paul Deschamps (1888–1974) undertook several missions in the East that yielded three volumes, dealing with the systems of fortifications and castles in the Latin Kingdom in the northern and southern cities. His surveys aimed at distinguishing the various stages of construction and identifying the Byzantine, Crusader, and Arab parts of the building model. The French historian provided extensive topographical, geographical, and historical studies. Moreover, his volumes included schematic drawings by French architects such as Pierre Coupel (1899–1983) and François Anus (1897–1961), as well as cartographic material and photographs, which contained valuable aerial views of these fortresses, particularly, the second volume published in 1939 in Paris by the French publisher Paul Geuthner entitled "Les châteaux des Croisés en Terre Sainte. La Défense du royaume de Jérusalem, étude historique, géographique et monumentale," which was co-authored by René Dissaud (1868–1958). He described the strategic importance of the castles surrounding Palestine in Syria, Lebanon, Jordan, etc., and how they formed a network connection through the Kingdom of Jerusalem in addition to its role of protecting coastal cities. Thus, he investigated the defense system of that Kingdom, which was built on the basis of the geography of the region and its mountainous system, associated with hydrography. The aerial photographs, carried out in cooperation with the French Air Force and its photographer, Capt. Petit (undated), were the best way to convey the idea of the troubling saliency covered by these mountain bastions. Figure 42 illustrates the castle of Margat in Syria (Moussé 2016, June 8, pp. 1–6; Folda 1995, p. 12).

Fig. 42 Aerial photograph of the Fortress of the Margat in Syria, from volume II, "The Crusader Castles in the Holy Land, Defense of the Kingdom of Jerusalem, Historical, Geographical and Commemorative Study (Les châteaux des Croisés en Terre Sainte, La Défense du royaume de Jérusalem, étude historique, géographique et monumentale)" by Paul Deschamps, Photographer Captain Petit, the publisher Paul Geuthner, Paris, 1939 (Moussé 2016, June 8, p. 4)

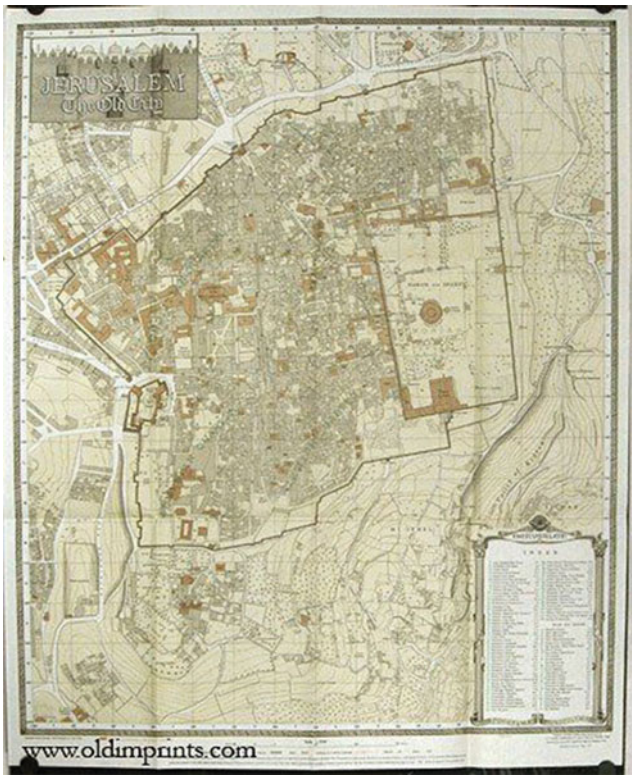

Fig. 43 Map of "Jerusalem the Old City" drawn and printed under the supervision of F. J. Salmon, 1936 (Osher 1996, p. 30)

Among the maps carried out during the British Mandate in 1936 was the map of "Jerusalem the Old City" drawn and printed under the supervision of the Commissioner of Lands F. J. Salmon, as an identical copy to the early Hajj maps and guide maps that we saw before. It is a printed tourist map of the Old City and its suburbs, updated by the Israeli Survey Department at the Ministry of Labor in Tel Aviv in 1975. The walls, gates, holy sites, residential quarters, and other important places are presented and indexed here, see (Fig. 43). When the Second World War ended in 1945, three years remained to complete the British Mandate period, during which the three forces fought for the

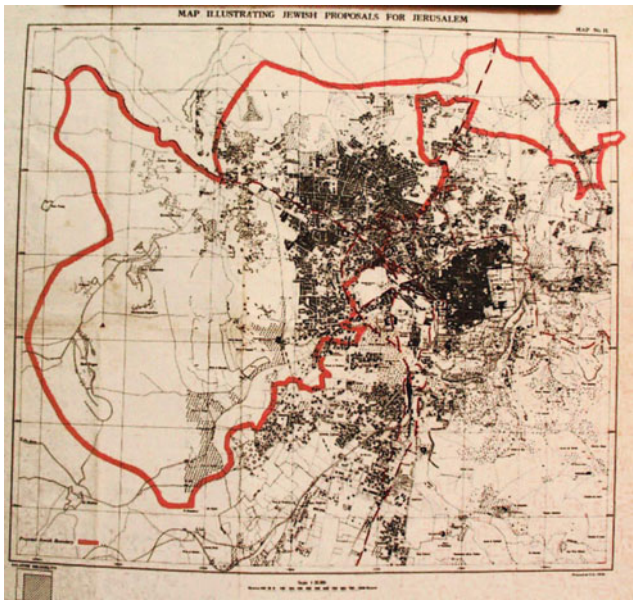

Fig. 44 Map showing Jewish proposals for the partition of Jerusalem from Sir William James FitzGerald's pamphlet, 1945, printed by the Government Printing Office, Palestine, 1946 (Gilai Collectibles 1999–2017, p. 1)

sovereignty of Jerusalem (Osher 1996, p. 30). In a 1945 report and pamphlet by the British judge Sir William James FitzGerald (1894–1989), submitted to the High Commissioner of Palestine on August 28, 1945, printed by the Government Printing Office in Palestine in 1946, he wrote about the local administration of Jerusalem and summarized the history of Jews, Christians, and Arabs. Hence, he proposed a detailed treatise to divide the city between Jews and Arabs, and the report assumed the establishment of an eastern and western administration, each with its consul and governor. A rare map showing the Jewish proposals for the partition of Jerusalem, published by the Palestinian Survey Department in Jaffa in 1936 was attached to the report. Then, it was revised and published again in 1946, see (Fig. 44) (Gilai Collectibles 1999–2017, pp. 1–3).

In November 1947, the General Assembly of the United Nations divided the British Mandate into two states, one Jewish and the other Arab. Jerusalem was under international control and rule as an independent city or what was known as (Corpus Separatum), a Latin term referring to a city given a special political and legal status different from its environment. This is evident in the map of the "Palestine: Plan of Partition" prepared by the United Nations for the Palestine Survey in April 1946, see (Fig. 45). It served as a prelude to the UN General Assembly resolution. In 1948, after the Arab–Israeli war, Jerusalem was divided. The western half of the new cities belonged to the State of Israel today, while the eastern half along the parallel side of the Old City joined the State of Jordan. On December 5, 1949, despite the announcement by the Israeli Prime Minister David Ben-Gurion that Jerusalem was the capital of the State of Israel, which is supposed to mean the western half belonging to it; however, eight days after the Six-Day War in 1967, the Israeli leadership was forced to establish the government headquarter in Tel Aviv. Nevertheless, during the Six-Day War, the Israeli Defense Forces managed to gain control over the eastern part of the city, including its Christian and Islamic sites (Millis 2012, pp. 66–69, 83, 75–77; Ma'oz and Nusseibeh 2000, p. 16F). In May and June of 1967, Egyptian President Gamal Abdel Nasser raised the political temperature with his provocative rhetoric until the setback occurred and the Israeli Air Force carried out pre-emptive air strikes on Egypt and Syria, destroying the air forces of both countries on the ground. In effect, the war ended (Millis 2012, p. 86). In the publisher Wim Van Leer map, executed by colored lithographic printing in Haifa in 1969, the entire city of Jerusalem appears in extraordinary details, which transmits a unified dynamic vital character during the course of development that followed the Six-Day War of 1967, symbolized in the form of construction cranes at work referred to as arrows. In addition, the National Park was also surrounded by the Old City Wall and the local gardens spread throughout the city even to the Knesset building, the Israeli Museum and the Jewish University taking its place in the parks complex in the city center at the left of the map, see (Fig. 46) (Osher 1996, p. 30).

The Basic Law: Jerusalem, the capital of Israel, issued in July 1980, is one of the main reasons why the international community has not recognized Jerusalem as the capital of Israel (Dumper 1997, p. 41). Thus, the international community has been looking at the legal status of Jerusalem to benefit from the partition plan, while refusing to recognize the Israeli sovereignty over the city. The situation of the city, especially its holy places, remains a central issue in the Israeli-Palestinian conflict. The Israeli government approved the building plans in the Old City's Islamic quarter to expand the Jewish presence in East Jerusalem, while some Islamist leaders claimed that the Jews had no historical connection to Jerusalem and that the ancient Western Wall had become part of Al-Aqsa mosque's construction (Ma'oz and Nusseibeh 2000, pp. 17–19). The 2010 Map of "East Jerusalem" showed places where Jews settled in East Jerusalem and the West Bank, with a blue-colored symbol, and in contrast, the Arabs in the same areas, with a green symbol, see (Fig. 47) (Gamal 2019, p. 4). The researcher believes that this map symbolizes the series of annexation measures

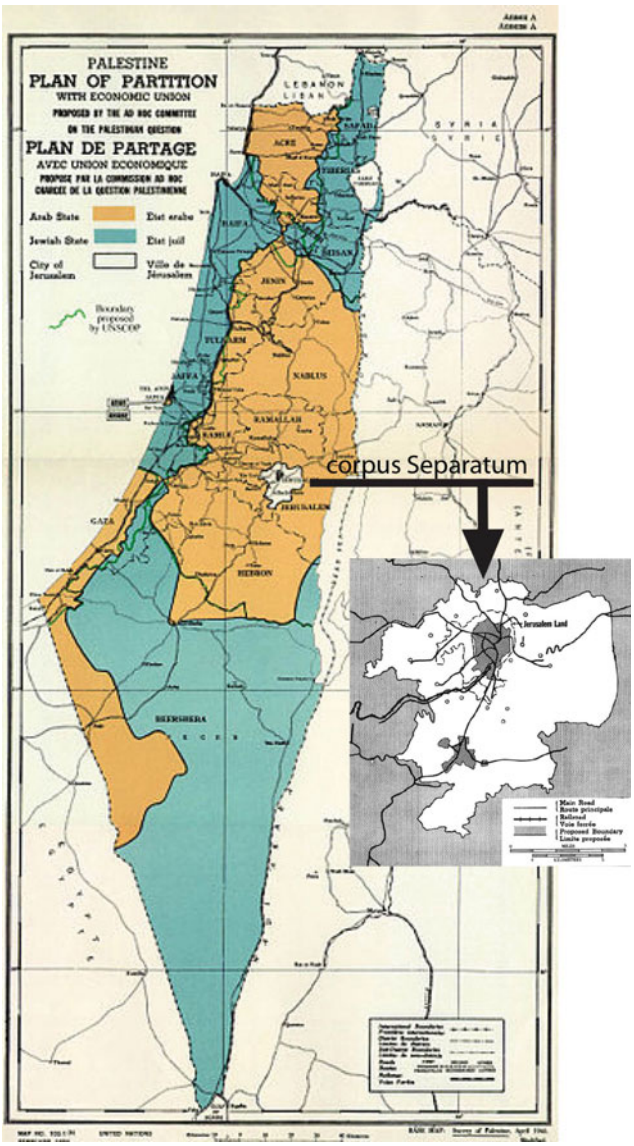

Fig. 45 Map of the "Palestine: Plane of Partition" or the separate body (Corpus Separatum), prepared by the United Nations for the Palestine Survey in April 1946 (Millis 2012, p. 83)

practiced by Israel, which focused on the eastern part of Jerusalem, which was purely Arab before the Six-Day War and devoid of any Jewish presence.

Thus, the presentation of travel book illustrations, and many maps have revealed how Jerusalem was the story of this region and its location within the land of Palestine and its being in the heart of the world and within the vital square that includes Mecca, Cairo, Baghdad, and Damascus, which has witnessed since the dawn of history a fusion of

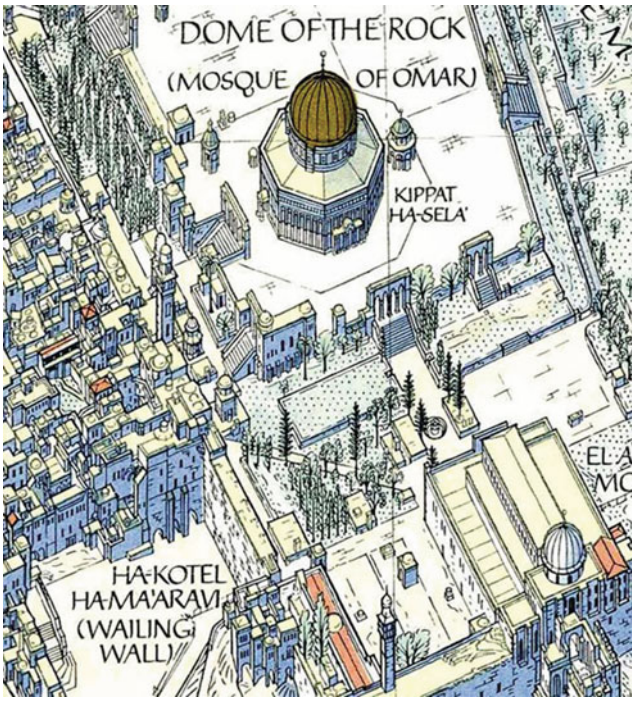

Fig. 46 Detailed map of the publisher Wim Van Leer, colored lithographic printing, Haifa, 1969 (Gilai Collectibles 1999–2019, p. 1)

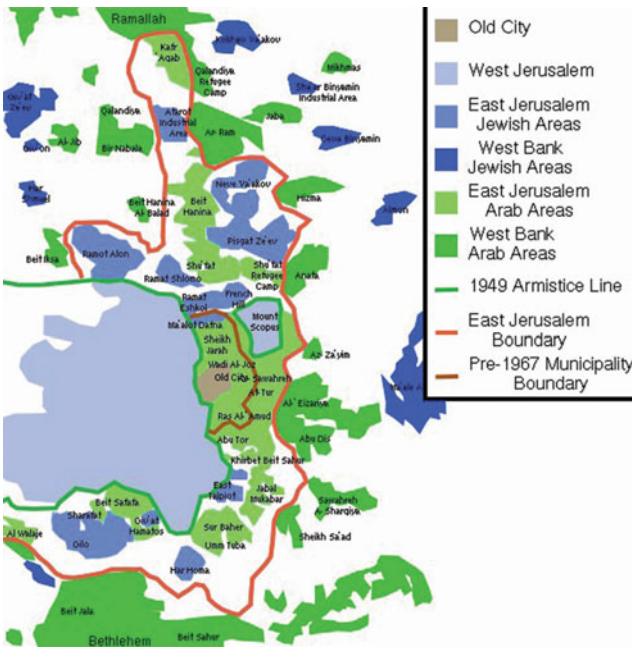

Fig. 47 Map of East Jerusalem, showing the places where the Jews of East Jerusalem and the West Bank were settled in blue and the places of the Arabs in green, 2010 (Gamal 2019, p. 4)

civilizations among the local civilizations such as Pharaonic, Canaanite, and Babylonian, etc., and the immigrant civilizations such as Persian, Greek, and Romanian. These were among the most important causes of the historical conflicts on Jerusalem. The Arab Orient and Palestine have formed part of it, and to this day it has constituted a unique geo-strategic and cultural location. Therefore, it became an early target point for the Zionist movement which has since the 1948 War focused its attention on the control of the city of Jerusalem and judaized it geographically, humanely, and historically (identity and culture) (Murad 2009, October, p. 2). What's more, we have recognized the unique status of the city among the cities of the world, derived from its fateful role as a holy city of three religions and the strong emotional appeal of that city. As a matter of fact, it is the reason for that extraordinary influx of art depictions, journeys, maps, and books. Their strong visual images have provided us with a broad vision of the city, full of events, more geographical knowledge, technical expertise, and cultural backgrounds. This is in addition to the historical and geographical documents. In fact, some of them were centuries old, and some were fictional, or a combination of fantasy and realism, or were treated with a highly idealistic approach based on evangelical translation. Others were objective perceptions derived from historical records and eyewitness accounts; nevertheless, they reflected the ideologies and religious, political, and cultural orientations of their artists and creators. The illustrations of travel books and topographical maps revived this feat, bloody conflict, and fight for that city, which was and will remain, especially after US President Donald John Trump (born 1946) declared Jerusalem the capital of the State of Israel on December 6, 2017. Although this may have revived the geopolitical conflict over Jerusalem, it contributed to understanding the history and geography of Jerusalem.

6 Conclusions

It has become clear that the religious emotional aspect associated with the city of Jerusalem and the colonial ambitions to control the geography of the region were the main reasons behind this extraordinary influx of historical, religious, and exploratory journeys, and artistic and topographical perceptions. In fact, the development of printing technology has also played a major role in the production of the maps of Jerusalem and the growing need for book illustrations since the fifteenth century. In addition, the discovery of photography and lithography in the nineteenth century further supported the documented aspect of travel literature illustrations and topographical maps. Moreover, it has also been shown that travel literature and maps from different eras serve as documents reflecting the ideologies, beliefs, and orientations of their religious, political, artistic, and intellectual innovators about the East in general and Jerusalem in particular. Although some were fictional or were treated optimally based on evangelical translation, some of which were derived from objective perceptions of historical records and observations of pilgrims, travelers and eyewitnesses, and others were a combination of realism and fantasy. These maps and illustrations have provided us with visual images loaded with a vast view on the geography and history of Jerusalem which is full of events, and have revealed the geopolitical conflict around.

Based on the above, it has been found that the illustrations of travel literature and topography have been influenced by religious prejudices, preconceptions, deliberate exaggerations, and inaccurate observations of their cartographers and illustrators. This is in addition to the disappearance of the Arab experience, which characterized the overall history of Palestine and Jerusalem, especially when tracing the travel literature book illustrations, when they are in a western hands and reveal the possibility of an untrustworthy view expressing an artist's point of view. What's more, it has also become apparent that despite the development of the Islamic world in the field of geography, cartography, manuscript books, and miniatures, we have not observed any interest from the Muslim side in documenting the Arab Islamic identity or monitoring the geopolitical alterations that have taken place in Jerusalem. The Muslim artist was preoccupied with artistic issues influenced by his doctrinal concepts based on the common prohibition of the Islamic faith in terms of imitating nature, rejecting engraved images, and questioning the advantages of printing, especially when associated with religious subjects. It was established that while the Islamic State in its early stages was preoccupied with the expansion of its space associated with the spread of the Islamic call and what happened to it concerning the development of the geography of cities was related to this concern, the subsequent lack of interest was due to the weakness of the Islamic state and its preoccupation with itself. Although the period of Islamic rule over Jerusalem extended for considerably long periods, the Muslim artist did not care to document the Islamic architectural presence in the form it had documented the Christian presence which works for the Jewish side.

Furthermore, it has also been shown that the Muslim artist paid much attention to Mecca more than Jerusalem. Therefore, it came at the heart of the maps according to the Islamic faith. Because of the direction of the Qibla, it was the cause for many astronomical studies that appeared in the Islamic manuscripts. On the other hand, Jerusalem was the heart of the world according to Jewish tradition and biblical descriptions. This explains the lack of interest of Muslim artists and cartographers in Jerusalem to its worth. Conversely, western interest in the study of cultural structures in the East has grown, especially after the Napoleonic wars, resulting in many travel literature book illustrations and maps of Jerusalem, of which we have not seen a likeness in the Arab Islamic side, despite its progress in these fields. Due to the fact that most artists and cartographers who executed the illustrations of travel literature and maps were Christians, it was difficult for them to enter the sacred sites of Islam to study them. Rather, if they could enter them, it would be only from outside; however, they are allowed to enter the vicinity of the Haram no more.

Despite the previous conclusion, we cannot ignore the fact that the illustrations of travel literature and topography have reflected the Arab–Jewish-Western conflict from Christian viewpoints loyal to the Jewish side, in attempts to ignore the Arab life with its Islamic sites, the historical fallacies, and the convictions of their creators and politicized artists. Based on this result, the Orientalist artists' passion for recording what they saw and adding what they conceived about the magic of the East, whether it was by inviting exploration or depiction of landscapes, it unintentionally documented the Islamic Arab identity of the East in general and the city of Jerusalem in particular. This is in addition to the geopolitical alterations that occurred to it. Even if it was in the form of culturally diffused oriental types, technologically backward, and socially languid. This made it coveted by the colonial thought and its reform program. Moreover, it has become evident that most of the illustrations and maps have not been executed in their time or at the time of historical and political events, thus losing some of their credibility as they pass on information and complicating the researcher's task in adhering to the chronological sequence when demonstrating models describing or depicting the historical or geopolitical events.

7 Recommendations

The research recommends encouraging researchers to trace the role of the Muslim artist through the drawings of Islamic maps and miniatures, applied in documenting the Arab Islamic identity and monitoring the geopolitical alterations of the city of Jerusalem, due to the scarcity of scientific research on this subject. Furthermore, the study also recommends enriching the Arab library, which lacks studies on the Arab Islamic identity of Jerusalem through analyses, classifications, and collection of maps and book illustrations that prove the Arabs' right of it and reveal attempts to falsify the facts in favor of judaization Jerusalem.

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The Deepground: A Proposed Fourth Layer in Creative Cities to Represent Silent Identities

Mohamed H. M. Khalil

Abstract

The number of creative cities is increasing dramatically and meanwhile, present and potential creative cities face deteriorative creative expressions to their heritage buildings, which are considered in this paper as having Silent Identities. Today's individuals, who are able to defend and express their identities, cause deteriorations to the heritage buildings and endanger their Silent Identities due to several issues related to the divergent levels of creativity identified in this paper. A qualitative methodology was used in this paper to achieve the aim of this research, which is reducing human-related deterioration to present and potential creative cities' Silent Identities. The methodology consisted of a comprehensive literature review to identify the barriers of preventing deteriorative creative expressions through the three existing creative city layers, an investigation to six Egyptian cities to assess the literature theory in real creative and non-creative cities to study the interrelationship between heritage age and divergence of creativity levels, a distribution to a survey questionnaire to investigate the Upperground's involvement and perception to the studied phenomenon, and lastly developing a conceptual framework for present and potential creative cities to prevent deteriorative creative expressions to the Silent Identities. The development of the integrated framework suggested the integration of the Deepground as an independent fourth layer to represent Silent Identities because of the 12 identified barriers that prevent the prevalent layers of creative cities from saving the Silent Identities of their heritage from the expressive identities.

Keywords

Architecture • Cultural heritage • Creative city • Identity • Deepground • Upperground • Middleground • Underground

1 Introduction

The term 'creative city' gained tremendous popularity in the past few decades and is being used since then by cities as a brand for their benefit. Before discussing the role of creativity in such cities, several terms hold the same meaning of a creative city including a cultural city, compact city, knowledge city, world city and endless city (Okano and Samson 2010). Any of these terms requires three main elements to be classified as a creative one: a high concentration of people, a positive image familiar to the other world and a dose of happenstance and luck. In other words, a creative city requires a creative problem-solving approach when it reaches a high concentration such as housing and transport problems and requires maintaining a level of attraction to investors. It is impossible to identify how a creative city would come into existence, but that is related to the essence of creativity in solving problems and challenges on a daily basis (Hospers 2003). The number of creative cities is increasing dramatically since the total number of creative cities has reached 180 cities by 2017, considering that 64 cities were added only in that year (UNESCO 2017). Meanwhile, there is an increasing number of human-related deterioration incidences to cultural heritage in listed Egyptian creative cities and non-creative cities as well (Khalil et al. 2017) that could be classified as creative cities soon due to the increasing number of the listed creative cities and to their rich cultural essence. In general, the creative identity of an individual develops following the interaction between self and others over time, yet the meaning of creativity varies among all individuals because creativity itself is an adopted

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Y. Mahgoub et al. (eds.), *Cities' Identity Through Architecture and Arts*,
Advances in Science, Technology & Innovation, https://doi.org/10.1007/978-3-030-14869-0_7

perspective. Hence, creative identities are heterogeneous and adaptive to specific social contexts that influence their formation (Moscovici 1988). Landry and Bianchini (1995) did not initially raise the role of creativity in cities to the surface to address that creativity has become necessary, but to highlight that it was not essential before.

Although creativity is concerned about producing work that is novel concerning originality and appropriate concerning usefulness, there is no universal definition for creativity since it has several levels recognized as metaphysical, anthropological, psychological and historical (Kronfeldner 2009). At any of those levels, creativity is an expression of the identity, which is a social–psychological self-regulatory construct that can influence behaviour (Adams and Marshall 1996). As it is clear that the divergent levels of creativity lead to various expressions to the diverse identities of individuals, Tajfel and Turner (1979) indicated that identities, which are perceived as different from oneself, are felt dissatisfying. This clash of identities could represent an individual, social group, community or generation or nature. Generations are included in the count because some ancient generations have symbolized their identities into cultural heritage as buildings or monuments that are still present to be used by today's generations. Moreover, natural places have their own identities that are associated with them from the beginning of the creation until now, regardless of any changes they have faced. On another hand, heritage is anything by which some kind of link false or tenuous may be forged with the past (Johnson and Thomas 1998) and most importantly, is considered what creates an identity. Consequently, any identity could be formed by different links from the past that shape it. If a social group or an individual was raised in a place with a Silent Identity, he or she one will defend this Silent Identity somehow since it takes part of his or her own identity. As heritage forms identities, Kotler and Kotler (2004) stated that heritage depicts memories in which it gives an understanding about the past while guiding the present and shaping the future. Yang and Merrill (2018) highlighted that recent research has indicated that both an object identity and location can be processed implicitly without intention or awareness (Deroost et al. 2010; Jiménez and Méndez 1999) in which an implicit memory is considered part of the long-term memory that lasts for a lifetime and hence creates a heritage that shapes an identity. The latter could be a creative identity that requires expression through any level of creativity.

Recent research has highlighted that individuals, groups or communities can express creativity at three different layers in the creative city. Those layers are the Upperground formed by formal firms and organizations, the Underground formed by informal organizations and individuals, and the Middleground that is an intermediate structure linking both the Upperground and the Underground (Cohendet et al. 2010). Individuals, groups and communities identities are divergent and are expressed in different manners depending on the perception of creativity and the formality of the city layer. However, the cultural heritage is considered in this paper as having Silent Identities and cannot defend or preserve themselves since individuals who created them are from the past.

1.1 Research Aim and Objectives

This research aims to reduce human-related deterioration to present and potential creative cities; therefore, this paper has four objectives to be accomplished to achieve the aim of this research. Firstly, investigating the interrelationship between creativity divergence, the role of the existing layers in creative cities, duality and deterioration of cultural heritage and creativity formation to conclude potential barriers at the existing layers for preventing deteriorative creative expressions to the physical heritage Silent Identities. Secondly, presenting and analysing case studies reporting incidences of deteriorative creative expressions at six Egyptian cities' physical heritage, two of them classified as creative cities, in order to potentially make a generalization between two variables. Thirdly, distributing and analysing survey questionnaire data is sent to formal architectural design firms, to investigate the Upperground's involvement and perception of the studied phenomenon and their potential impact. Finally, developing a conceptual framework for existing and future creative cities to prevent deteriorative creative expressions to the physical heritage Silent Identities, whether through one of the existing layers or through proposing a new layer.

2 The Interrelationship Between Creativity Divergence, Creative Cities Layers' Role to Represent Heritage Silent Identity and Heritage Deterioration

Creativity is the ability to produce work that is novel in terms of originality and appropriate in terms of usefulness (Sternberg and Lubart 1999; Boden 2004); however, Noteboom (1999) stated that the interpersonal cognitive distance refined in terms of communicability and novelty is a critical variable. Building on those arguments, it is hard to find an absolute definition for creativity since it is bedeviled by the oft-presumed connection with the exalted states of mind in addition to the working of artistic and scientific genius that is always mysterious. Therefore, there is an excellent chance of which creativity could be associated with metaphysical connotations due to its non-infrequent association with the transcendent. Creativity is situated then between the

psychological or internal to the individual and the sociological or external. It resides in the capabilities of the mind and personal endowments of individuals and is embedded in social contexts that shape its objectives and formality (Scott 2014). Metaphysical creativity, for instance, leads to too much and unnecessary novelty in which its degree of acceptance will become low as its novelty is considered too much to be decodable at the point of perception or it will be accepted on behalf of individuals and groups whose levels of creativity are metaphysical as well. Anthropological creativity is developed in regard to humans as the creator of culture that includes all domains of human activity as entertainment, art, technology, religion, science and language. Such cultures lead to cultural novelties in which individuals add to the world and maintain them socially through transmission across generations by different means as cultural traditions. Novel ideas and behaviours are a means of cultural novelty. Therefore, it can be defined as a human condition that adds something to the world through an activity that cannot be inherited. Psychological creativity is unlike metaphysical creativity that is a mystery, which lies beyond science, but is avoiding copying the traditional form then ignoring originality and spontaneity. Lastly, historical creativity is what may seem psychologically novel for someone while for his fellows, it may be perceived as old (Kronfeldner 2009).

Early works that preceded the concept of the creative city were by Florida (2002) who discussed the rise of the creative class arguing that the '3 Ts': technology, talent and tolerance are the variables that will be used because they were positioned as factors of attraction. The concept of the creative city has evolved based on a similar foundation where it requires a high concentration of people, a positive image and a happenstance (Okano and Samson 2010). According to Cohendet et al. (2010), three social forms, Upperground, Underground and Middleground can help in promoting creativity if they all act together. The Upperground is the upper layer in a creative city characterized by formal organizations, innovative firms, in different areas of specialization that can unite various expressions together through integrating dispersed kinds of knowledge and testing various forms of creativity. Cohendet et al. argued that those firms should find inspiration and creativity from the creative city itself. Most importantly, they are separated from the daily pressure of producing an efficient output for a certain market purpose. The Upperground focuses on formation and exploitation of creative slack then delegate their creative capabilities to the local milieu of the city. Collaboration between the Upperground and Underground is where any creative, artistic or cultural activity that takes place outside of a formal institution or organization is in the Underground layer. Activities that define their identities are arts, graffiti and extreme sports. Their culture lies outside the corporate logic of exploitation and instead, is focused on exploration. The Middleground, on another hand, is an intermediate structure that links both the Upperground and Underground. Therefore, navigating between formal and informal worlds is through promoting mechanisms of exploitation and exploration. Such epistemic communities construct a common structure to permit a shared understanding. However, there is a conflict between either favouring the synergy of individuals' diversity or following procedural authority when making validation. Lange and Schüßler (2018) investigated the Middleground layer in-depth. They investigated how design entrepreneurs playfully used various places to connect individuals and fields of activity together in which those entrepreneurs acted as intermediary actors. The Middleground may be virtual where the actors of this layer are themselves part of the face-to-face Underground of a city. The suggestion was to consider such places that encourage social interaction to encourage the bottom-up exchange without imposing the top-down economic logic. (Faulconbridge 2007; Lange and Schüßler 2018). Finally yet importantly, Cohendet et al. (2010) highlighted that Middleground layer is not solely concerned about transforming creative ideas from Underground to Upperground, but to exploit creative ideas from firms, which is asserted by previous research done by Khalil et al. (2017) about optimizing talents in those formal firms. They noted that cultural and creative industries are responsible for developing novel ideas and solutions. Talents in the Upperground layer fall in one of three categories. For instance, the category of 'distance' has cultural heritage and sustainability irrelevant to artistic works by creative talents, the category of 'artefacts' has cultural heritage and sustainability overlapping with artistic activities in which artistic works bring ideas from the past to solve current problems or provide solutions for the future, and the category of 'justice' has cultural heritage and sustainability as paramount factors that inspire the artistic work (Bennett, et al. 2014).

As formal firms and organizations, the Upperground, are concerned with exploitation unlike the Underground that seeks random exploration, physical heritage in current and future creative cities could be under threat of deterioration as Di Pietro et al. (2018) highlighted that both culture and heritage influence and get affected by individuals throughout daily life. Heritage is what contemporary societies inherit from ancestors and pass to the subsequent generations. It represents the past while being a present use (Tunbridge and Ashworth 1996; Timothy and Boyd 2003). In the Faro Convention of the Council of Europe, cultural heritage could be objects or places that are important because of their uses and due to the different meanings people attach to them (Council of Europe 2005). According to Lazark et al. (2012), several researchers (Arzipe et al. 2000; Klamer and Zuidhof 1999) distinguished between cultural, natural and intangible

heritage following the main classification by UNESCO (1972). Firstly, cultural heritage is a broad and heterogeneous concept that includes monuments, groups of buildings and sites. It is an asset of both historic–cultural and socio-economic significate in modern societies. It is the target for a leisure society and individuals to relax from daily stress, so they meet in a place with a local identity. Secondly, natural heritage refers to ecosystems and geological structures found in nature including even biodiversity elements as flora and fauna. Finally yet importantly, intangible cultural heritage is an open-ended manner as representations, practices, expressions, skills, knowledge, instruments, artefacts, objects and cultural spaces associated in addition to that as communities, groups and, in some cases, individuals recognize as part of their cultural heritage. Considering that the ancestors, who left physical heritage, had their own intangible heritage that culminated in the physical heritage, then today's generations can be considered as having an intangible heritage that should be respected as well. Therefore, today's generations have expressive identities while the identities of the ancestors, that culminated in the physical heritage are no longer expressive, thus, are Silent Identities as called in this paper. Al Rabady (2013) highlighted that the distant and recent duality is dangerously threatening, which asserts on the claimed classification of identities in this research since it results in an identity crisis that supports the previous argument that the universal identity of the cultural heritage is different from individuals' diverse intangible heritage. Universal cultural heritage has little association with the local sense of heritage since it misrepresents ongoing contemporary urban life and cultures. Recent cultural trends encourage creating new cultural forms that synthesize diverse elements of these cultures (Smith 2009). Followed research by Giddens (2013) explained that when it mentioned that modernity has swept individuals from the traditional types of social order because modernity's involved transformations are more profound than prior periods.

Ashworth et al. (2007) stated that ancestors' heritage is present-oriented and consequently is managed and developed in response to the demands and needs of the present and it is open for change and is both a source and consequence of social conflicts. Smith (2006) encouraged indigenous models of creative development in order to stimulate local creativity and distinctiveness instead of relying on external models of art-led creativity, which relates to why such models are not properly working because of the above-mentioned nature of creativity. In order to encourage developing new cultural forms that understand the divergence of creativity and the diversity of identities that have a negative impact on cultural heritage and threaten their Silent Identity, it is paramount to investigate creativity formation. There is a strong relationship between creativity and identity as the latter can be defined as a social–psychological self-regulatory construct, which has the ability to direct attention and influencing behaviour, expressed throughout creativity. It helps in understanding self and creating meaning (Adams and Marshall 1996). The function of identity is to provide essentials for choices making and relationships facilitation with others while reinforcing these choices. Reinforcement of identity is achieved through recognition of otherness, which could lead to distrust, exclusion and distancing from some groups (Douglas 1997). According to Tajfel and Turner (1979), personal identity is a definition of self within certain social identity where social categorization occurs and differentiation between social groups leads to satisfaction and dissatisfaction of particular social identities based on their favourability. However, Ashworth et al. (2007) have stated that identity is neither fixed nor stable, but it is linked to the sense of time and can be revocable and negotiable (Bauman 2004) since identities become linked to virtual or real places when they are felt belonging. The sense of place is then linked with the socially constructed believes and perceptions held by individuals or groups towards a specific place (Rose 1995; Sumaratojo 2004). Each Individual's 'self' usually adopts a creative identity following social interaction with others, considering that the meaning of creativity itself differs among individuals because it is an adopted perspective. This interaction between the individual and others is always diverse because 'others' are always diverse. Hence, creative identities are heterogeneous and adaptive to specific social contexts that influence their formation (Moscovici 1988). Yang and Merrill (2018) highlighted that recent research has indicated both object identity and location can be processed implicitly without intention or awareness (Deroost et al. 2010; Jiménez and Méndez 1999). Explicitly memory has two types: episodic memory and semantic memory based on events and experiences along with facts and concepts, respectively, (Tulving 1972). Consequently, a memory of a place can be recalled through a long-term memory only when the identity of the place is one of the drivers that form an individual identity.

2.1 Barriers of Creativity Divergence at the Three Layers of Creative Cities

The previous discussion indicated that satisfaction is felt for in-group social identity while out-group social identity is not a favourite for the in-group individuals, which asserts this argument as well. Hence, behaviour could be in question as it may affect the heritage of the out-group negatively. Out-groups could be symbolized cultural heritage of ancestors or intangible or tangible heritage of individuals. Following the understanding of the interrelationship between

creativity divergence, creative cities' layers role and heritage deterioration, the potential barriers to preventing deteriorative creative expressions to physical heritage Silent Identities are illustrated in (Fig. 1) and presented in detail with given examples in (Table 1).

3 Case Studies

3.1 Case Study Design

The selection of cases for this study owes to their relevance on the research topic (Flick 2009). According to Glesne and Peshkin (1992), the number of selected cases should be determined through looking at data during analysis and if repetition of evidence occurs without adding new information, the data reaches a satiation point and the researcher should stop selecting more cases for the same point. At this point, data becomes sufficient to explain a specific phenomenon. According to Neuman (2009), sequential sampling is used for gathering cases until the amount of novel information reaches that satiation point, but not until the personal resources diminish. The sequential sampling is mostly used with other sampling methods. The network sampling technique was used as well. According to Neuman, network sampling is a multistage technique that begins with one or few cases that spread out based on links to the initial case even if it became very far from the initial case. In order to make a generalization from the case studies, Yin (2013) mentioned that when replications of the findings of up to fifth samples occur, the results may be accepted for a larger number of similar cases. Yin's case study design approach was adopted to allow constructing validity through a correct measure for concepts and reliability, which is the repeatability of operations of the case study. Validity can be achieved by using multiple sources of evidence, match patterns, build explanations and using replication. The multiple-case studies approach increases external validity while reliability is achieved by using a case study protocol, which is a standardized agenda for researcher's line of inquiry for each case. Zucker (2009) developed a common case study protocol. Purpose and rationale are achieved through the explicit aim of the research, the case study design was achieved at the beginning of this section, data collection was achieved through online sources, and a full description of cases is presented in the following section, using precise sampling techniques allowed focusing the analysis to the main purpose. Besides, findings are analysed according to the aim of this research rigour is established by giving credibility for cases' authors. Six Egyptian cities were selected for study in this research. UNESCO (2017) classified two of them, Cairo and Aswan, as creative cities for craft and fold art as shown in (Figs. 2 and 3), respectively. Regarding the remaining four cities, Alexandria was once described as the 'half-fictional' city where many of its modern heritage was chosen as the location for shooting several movies. Port Said is a coastal city like Alexandria that both lie at the Mediterranean, but Port Said is unique for its simple lifestyle and culture that is predominantly modern. Giza is the third-largest Egyptian city and it lies at the west bank of the Nile River in Lower Egypt near Cairo while Luxor is located in Upper Egypt, but before Aswan that is located after it. Giza, Luxor and Aswan are famous for their heritage that dates back to the ancient Egyptian era. Every one to three cities represents the cultural heritage of a specific age and includes multiple physical heritage. Four to five sub-cases in every city were considered. From Modern Egypt, the heritage of Alexandria and Port Said was selected with five heritage buildings. From the Middle Ages, the heritage of Historic Cairo was selected with four heritage buildings. From Ancient Egypt, cultural heritage from Luxor, Aswan and Giza was selected with four heritage buildings. The selected cities, coding and representation of the Egyptian heritage age until reaching satiation point are presented in (Table 2). The integration of the sequential and network sampling is shown in (Fig. 4).

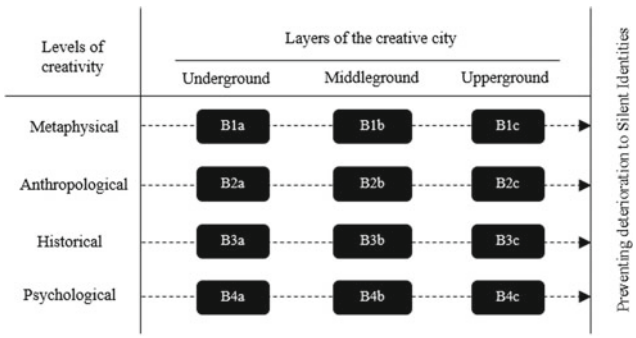

Fig. 1 Barriers to preventing deteriorative creative expressions (Author)

3.2 Cases Description

Cases 1 and 2 discuss the modern cultural heritage of Alexandria, and Port Said cities coded (E-AL) and (E-PS), respectively. Alexandria is in high danger of losing its modern heritage. Several incidences of human-related deterioration to many heritage of different ages were reported recently. Firstly, the Citadel of Qaitbay, which dates back to the Middle Ages, has love stories written on its walls. Moreover, three of the most distinctive villas that date back to the beginning of the twentieth century, the modern age, were completely demolished in 2016. Those villas are Aghion, shown in (Fig. 5), Cicurel that was listed as a

Table 1 Definition and extent of barriers to preventing deteriorative creative expressions (Author)

Barrier number		Definition	Extent
B1	a	(Metaphysical creativity/informal layer)—Lack of formality reduces awareness among the local individuals or groups, which results with deteriorative creative expressions physical cultural heritage For example, expressing self-intangible heritage because self-identity is associated with virtual places, which completely ruins the image of the heritage because the creative expressions are irrelevant	High
	b	(Metaphysical creativity/median layer)—Appears as interference with the transformation of knowledge Upperground and Underground layers depending on the origin of the Middleground For example, the Middleground could be developed from local groups from the Underground, which will have a great potential for divergence when describing creativity	Varies
	c	(Metaphysical creativity/formal layer)—Talents in formal organizations whose identity is formed by metaphysical attachments may affect the creative solutions for the community unintentionally For example, developing creative solutions that have a value to the talent's 'self/and unintentionally ignoring the value of the 'others', depending on employment assessment criteria at formal firms	Varies
B2	a	(Anthropological creativity/informal layer)—The diversity of religious believes, culture and intangible heritage between an individual and another within the community For example, deterioration to non-belonging heritage and attempting to prevail relevant and belonging self-intangible heritage	High
	b	(Anthropological creativity/median layer)—Depends on the origin of the Middleground and as formality varies, the level of control varies as well For example, whether the Middleground accepts diversity or not, there might be deterioration to non-belonging heritage to self	Varies
	c	(Anthropological creativity/formal layer)—The formality of the organization and the clarity of anthropological identity aspects put control over its expression For example, personal beliefs are mostly ignored at formal firms and organizations, therefore forming low threat in the developed creative solutions	Low
B3	a	(Historical creativity/informal layer)—The significant gap between Silent Identities and nowadays generations' identities increases the potential due with informality For example, old heritage will be less deteriorated than modern heritage because the majority agrees that it is old	Varies
	b	(Historical creativity/median layer)—The synergy between formal rules and individuals' diversity reduces its potential due to a common bias For example, old heritage will receive more initiatives than modern heritage because the majority agrees that it is old	Medium
	c	(Historical creativity/formal layer)—The focus on profitability ignores the historical creativity aspects at most formal organizations For example, focusing on profitability will lead to severe deteriorations to modern heritage because the majority agrees it is less critical	High
B4	a	(Psychological creativity/informal layer)—Depending on the origins of the individual whether he or she was raised in the community containing the cultural or not For example, ignoring the value of the physical heritage identity because the individual may not feel it belonging to his identity	Varies
	b	(Psychological creativity/median layer)—Varies among individuals in the Underground and is high in the Upperground; therefore, varies depend on the origin of the Middleground For example, the appreciation of heritage originality will depend on whether the median layer has been formed from the Upperground or the Underground layer	Varies
	c	(Psychological creativity/formal layer)—Has a high potential because of the frequent improper means of relating to Silent Identities, which affect the way the Underground layer perceive and interact with them For example, improperly representing the value of the physical heritage, therefore increasing informal group's chance of deteriorating it	High

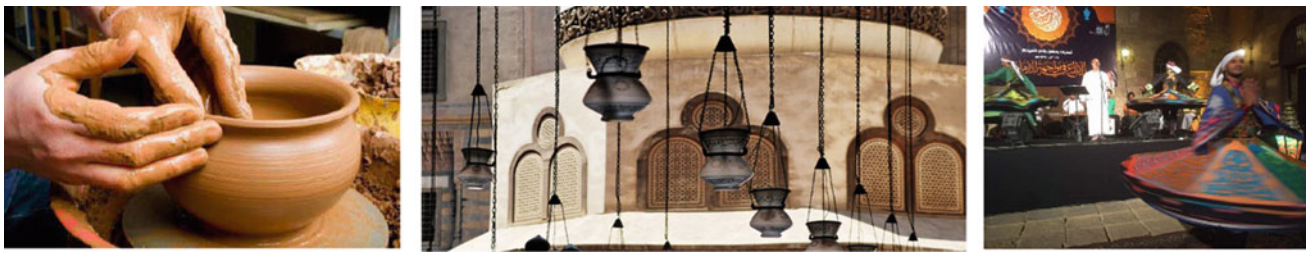

Fig. 2 Examples of crafts and folk arts in Cairo, a creative city (www.unesco.org 2017)

Fig. 3 Examples of crafts and folk arts in Aswan, a creative city (www.unesco.org 2005)

Table 2 Selection and coding of selected Egyptian cities and their cultural heritage (Author)

Country	Code	City	Code	Cultural heritage	Code	Age
Egypt	(E)	Alexandria	(AL)	Citadel of Qaitbay	(CQ)	Modern
				Aghion Villa	(AV)	Modern
				Chicorel Villa	(CV)	Modern
				Lawrence Derrell Villa	(LDV)	Modern
		Port Said	(PS)	American Consulate Building	(ACB)	Modern
		Cairo	(CA)	Al-Darb al-Ahmar	(DA)	Middle
				Bashtak Bath	(BB)	Middle
				Sultan Mahmoud Hospice	(SMH)	Middle
				Ganem al-Bahlwan Mosque	(GBM)	Middle
		Luxor	(LU)	Luxor Temple	(LT)	Ancient
				Karnak Temple	(KT)	Ancient
		Aswan	(AS)	Kom Ombo Temple	(KOT)	Ancient
		Giza	(GI)	Giza Pyramid Complex	(GPC)	Ancient

heritage building in 2008, and Lawrence Durrell that was demolished to benefit from their land in commercial purposes. The same incidence occurred in Port Said when the American Consulate Building, which dates back to the beginning of the twentieth century, was demolished Al-Refai (2018).

Case 3 discusses Middle Age cultural heritage of Cairo city coded (E-CA), specifically the cultural heritage of Historic Cairo that is considered critical evidence of the importance of Cairo in the Middle Ages because of its significant historical morphology and the cultural level. Several incidences of human-related deterioration to the physical heritage of Historic Cairo threatened its existence in the World Heritage List (Farag 2014). Al-Darb al-Ahmar area was deteriorated by thrown wastes beside the historic buildings in addition to street vendors whose tools deteriorate the exterior of the buildings and the visual image of the area. Bashtak Bath that was founded in 1341 was closed for a very long time due to endless human-related deteriorations. Sultan Mahmoud Hospice that dates back to 1750 had reported incidences of urination on its walls in addition to the garbage thrown beside its facades. It is being used as a storage for cars workshops that deteriorated its finishing. Lastly, Ganem al-Bahlwan Mosque had incidences of individuals sitting in front of it to smoke hookah and cigarettes, which spoils the cultural value of the building (Abdul-Aziz

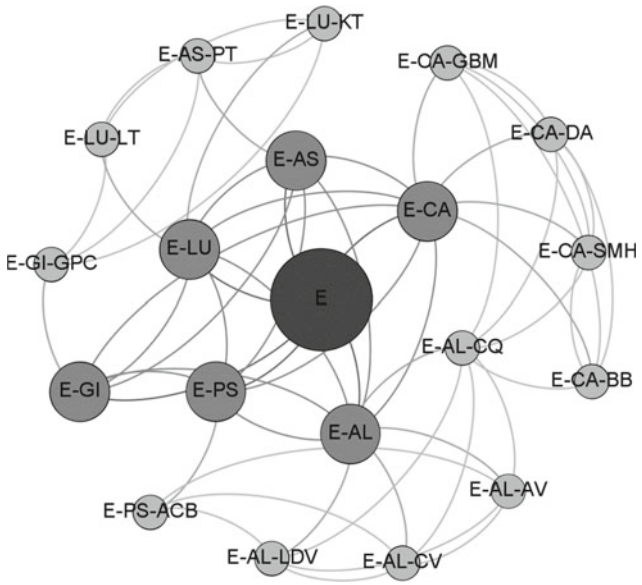

Fig. 4 Network diagram of selected Egyptian cities (Author)

2015). Further intrusive behaviours in Historic Cairo were captured with an example shown in (Fig. 6) while the other incidences reported by others are shown in (Fig. 7).

Cases 4, 5 and 6 discuss Ancient Egyptian cultural heritage of Luxor, Aswan and Giza cities coded (E-LU), (E-AS) and (E-GI), respectively. In Luxor, both the Luxor and Karnak Temples witnessed several human-related deteriorations in forms of writings on the columns of both temples in Arabic, English and Chinese languages and others, as shown in (Fig. 8). Those writings are names of the visitors or symbolization of lover stories between couples. Another incidence occurred at Karnak Temple is when someone attempted to climb a part of it to take a picture where part of this physical cultural heritage got broken. Moreover, garbage was noticed thrown at multiple corners at the temples in Luxor (Ibrahim 2016). In Soto (2009) reported many graffiti incidences at Philae Temple. In Giza, Arabic, Russian and English writings were reported on the interior and the exterior of the Giza Pyramids as shown in (Fig. 9).

3.3 Cases Analysis

The visitors' interaction with the physical heritage in the studied six Egyptian cities resulted with different extents of deteriorations, which are considered creative expressions even though they are threatening the Silent Identities of the studied heritage buildings. The reason is that this research investigates this phenomenon in a non-biased manner aiming to provide an interrelationship between creative expressions, related to how the visitors feel the heritage as belonging, and the heritage age (Table 3) presents the extent of deterioration in every studied case and the achieved number of cases, per a historical period, required to make a generalization. Any ancient heritage with strong memories in the visitors' minds, felt highly belonging, was given 5 points, Middle Age Heritage with intermediate memories was given 3 points, and modern heritage with weak memories was given 1 point. Cities having more than one type were given an average number. With the same rule of making an assumption that should maintain relativity despite the type of method used to analyse the incidences, demolition of heritage was given 5 points as it is the most severe type of deterioration, deteriorative usage of heritage was given 3 points, and deteriorative writings on heritage were given 1 point on average. In (Fig. 10), the case studies' scoring of points is illustrated, considering that Cairo and Aswan are highlighted as creative cities in this chart that revealed homogeneity, which gives a well-established baseline for a framework for current creative cities and the other cities if they could be listed as creative cities in the future. This is because all cities fell under a homogenous line despite their classification, as a creative or non-creative city, which should help in understanding the phenomenon across a wide range of cities, so it can enhance existing creative cities and prepare future creative cities before they are potentially listed in the future. The case studies' analysis resulted in a categorization to users' behaviour, shown in (Fig. 11), through which the deteriorative creative expressions could be understood from the studied cases to aid in decision-making.

Fig. 5 Demolition of villa Aghion (english.ahram.org.eg 2014)

Fig. 6 (Left) Historic Cairo map, (Right) an intrusive lifestyle spoiling urban image (Author)

Fig. 7 (left) Deterioration to Aldarb Alahmar area, (Right) deterioration to Bashtak Bath (www.alwafd.news2015)

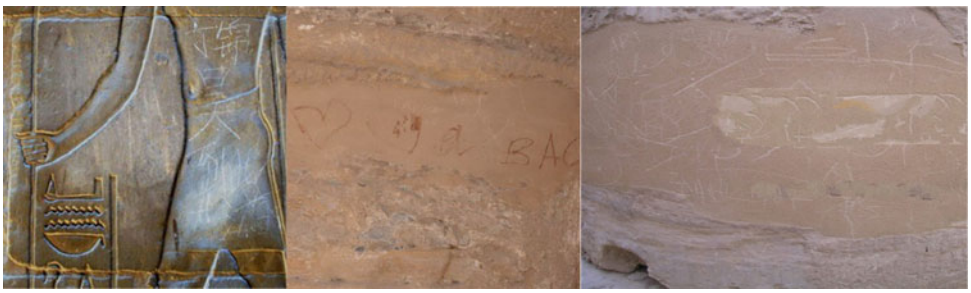

Fig. 8 Deteriorative Chinese and Arabic writings in Luxor (www.independent.co.uk2013; www.yallafeed.com2016)

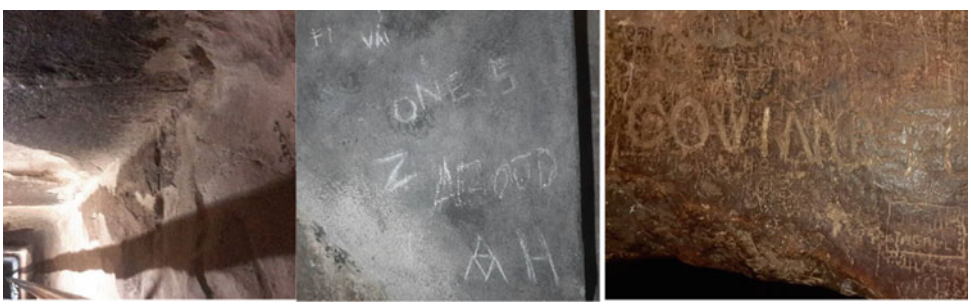

Fig. 9 Arabic, English and Russian writings at the Giza Pyramids (www.youm7.com2017)

Table 3 Extent of deterioration in studied cases and achievement of the requirement for making a generalization (Author)

		Extent of deterioration			Historical period	Cases per period
		Low i.e. writing, graffiti	Intermediate i.e.: intrusive lifestyle	High i.e. demolition		
		(1)	(3)	(5)		
Number of cases per city	Alexandria	1	0	3	Modern	5
	Port Said	0	0	1		
	Cairo	0	4	0	Middle	4
	Luxor	2	0	0	Ancient	4
	Aswan	1	0	0		
	Giza	1	0	0		

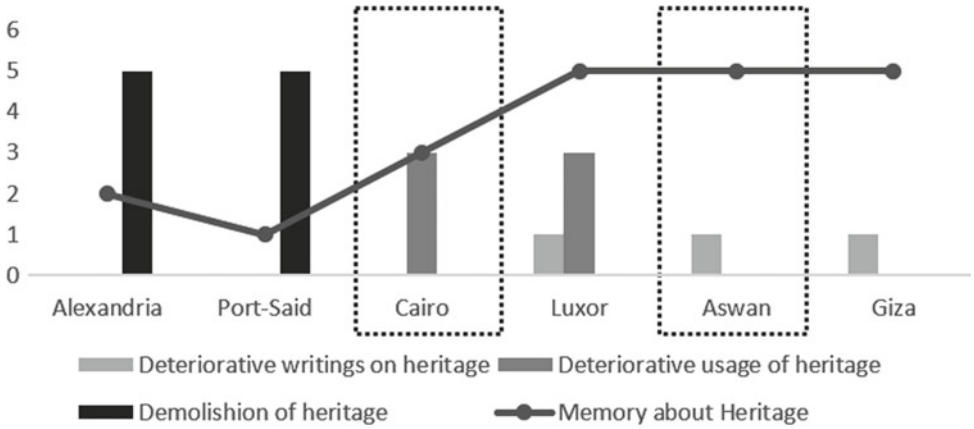

Fig. 10 Case studies scoring of points (Author)

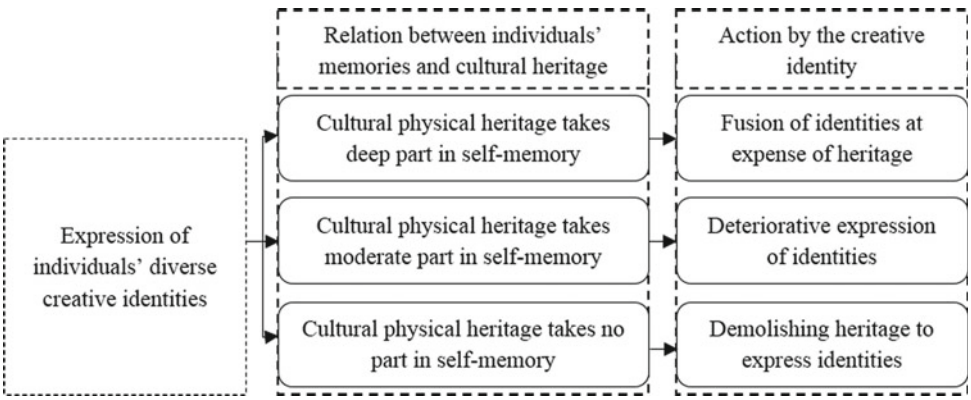

Fig. 11 Relationship between the expression of identities and memory of heritage (Author)

4 Survey Questionnaire Sampling and Analysis

To investigate the Upperground's involvement and perception to the studied phenomenon, a survey questionnaire was designed to be sent to registered Egyptian architectural design firms at the Egyptian Engineers Syndicate (ESS) in the year 2015/2016. The sample size calculation (SSC) had a 50% distribution and 5% margin of error as shown in Eq. (1). Thereafter, the True Sample (TS) was calculated as shown in Eq. (2) where it showed that the TS is 40 architectural design firms out of the registered 44 ones. However, all firms were contacted to assess the phenomenon on a broader scope.

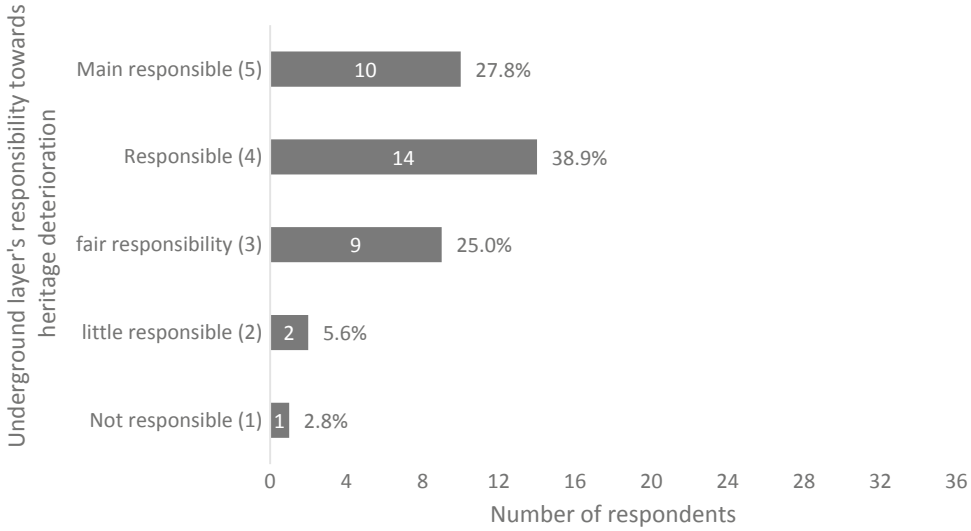

Fig. 12 Respondents scoring (Author)

Table 4 Measure of central tendency, dispersion and percentages of respondents scoring (Author)

Measure of central tendency			Measure of dispersion		Percentage of respondents scoring		
Mean	Median	Mode	*V*	SD	<3	3–4	>4
3.72	4	4	0.35	0.59	0.086	0.628	0.286

$$\mathrm{SSC} = \mathrm{Distribution\ of}50\%/(\mathrm{Margin\ of\ error}\%/\mathrm{level\ score})^2 \quad (1)$$

$$\mathrm{TS} = (\mathrm{SSC} * \mathrm{Population})/(\mathrm{SSC} + \mathrm{Population} - 1) \quad (2)$$

Out of those contacted firms, 36 firms have completed and sent back the survey questionnaire, which resulted in a response rate of 81.8%. According to McNeil and Chapman (2005), a percentage of 30–40% is accepted; therefore, this response rate can be considered. Collected data was analysed qualitatively and quantitatively. The latter was accomplished through using measure of central tendency and measure of dispersion to develop an overview about the typical value of all variables and also to investigate the nature of the data whether it is homogenous or heterogeneous, which was accomplished through calculating the variance (V) and standard deviation (SD) (Bernard 2000). Respondents were asked to rank their perception regarding the responsibility of the local individuals and groups, from the Underground layer, towards the deterioration incidences recorded regarding the physical heritage. They ranked their perception on a Likert scale from 1 to 5 where 1 indicates no responsibility while 5 indicates full responsibility. Out of the 36 respondents, 91.4% have agreed that individuals have a responsibility towards physical heritage deterioration. Figure 12 illustrates the numbers and percentages of respondents while (Table 4) represents the measure of central tendency, the measure of dispersion and percentages of respondents scoring. The analysis indicated homogeneity since values of the measure were close to each other.

Thereafter, respondents were asked about their inner managerial strategies specifically whether architects and designers perceive heritage and sustainability as in one way. 20% of them indicated that sustainability means for them sustaining their employment, profit and art expression, 53.3% indicated that they perceive heritage as an influence for design to sustain the heritage, while 26.7% indicated that heritage is the main reason they use art and creativity for achieving cultural sustainability. Therefore, potential internal barriers could be identified from the Upperground layer itself. However, 33.3% of the respondents mentioned they aim to design creative solutions that recognize the diverse intangible heritage of the public, the Underground, where their aim was to enhance their behaviour towards the heritage, enhance awareness about the heritage and enhance the sense of place attachment towards the heritage. However, this was a noticeably low percentage that, as well, failed to provide successful effective examples. Those who ignore getting involved in such initiatives stated their barriers and they resulted with the following percentages: external pressures (13.6%), difficulty in identifying intangible heritage of individuals (22.7%), high cost of developments (27.3%), prioritizing lands for the commercial and profitable purposes (31.8%) and current strategies that bring back the same deteriorative behaviour (4.6%). Regarding the firms that did not participate in any activities at all, they were asked about

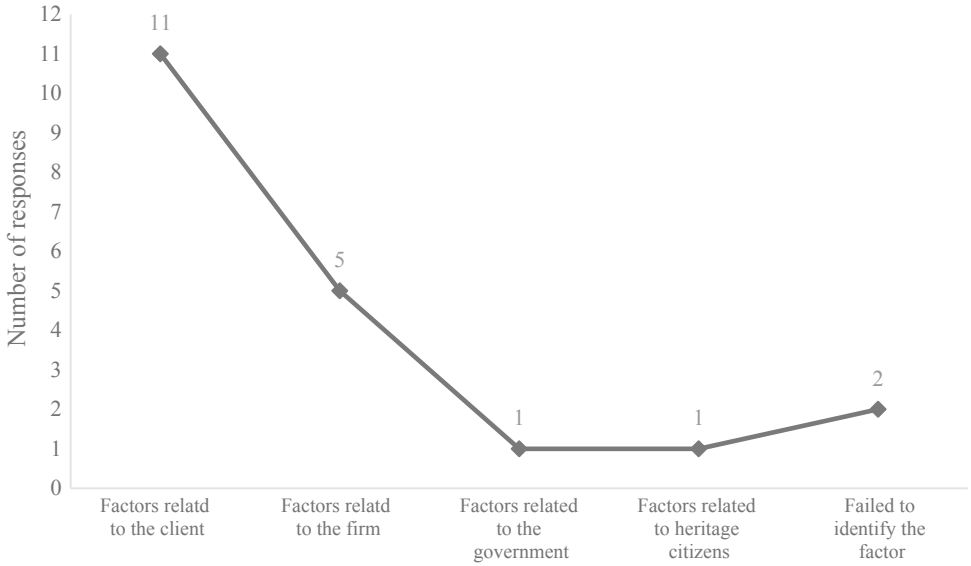

Fig. 13 Scoring of barriers for not working in heritage development (Author)

potential factors that prevented their firm from designing new architectural facilities around heritage sites where (Fig. 13) illustrates the number of the responses.

4.1 A Conceptual Framework: Representing Silent Identities in Creative Cities

The conceptual framework helps in defining the concept, map the conceptual scope, systematize relations and identify gaps in the literature (Rocco and Plakhotnik 2009). In this regard, the reviewed literature indicated that creativity could be thought by many as something definable where its divergence, to this moment, poses a threat because of the unconscious developments in existing and potential creative cities. However, the paper investigated the existing layers of the creative cities and related each layer to the identified creativity concepts in an attempt to identify potential barriers of relying on any of the existing three layers while developing this framework. The existence of the 12 barriers possessed a threat, which was supported by the case studies that indicated recent incidences of deteriorative creative expressions to the heritage buildings of different ages even though deterioration had different extents depending on the age of the heritage. The current gap in the literature is the reliance on the Middleground layer to achieve synergism between the Upperground and the Underground layers, which was reported as not feasible. Having that considered, the Middleground cannot be responsible to achieve synergism between the Upperground and the Underground and between each of them with the physical heritage of different ages whose Silent Identities are endangered because their existence, through the physical heritage, is threatened as well. Moreover, although the Upperground layer understands this problem, it is noticeable that it has its own barriers, besides the identified ones in this paper, that prevent it from representing the Silent Identities.

Consequently, this paper calls for adding a fourth layer in the structure of creative cities to represent those Silent Identities of the physical heritage. Even though such responsible organizations or initiatives may exist, lacking an appropriate structure for creative cities will not solve the problem; therefore, having an updated structure should provide better results and enhanced flow between the creative city layers. Considering that the prevalent layers are dynamic and titled Upperground, Middleground and Underground representing formal, median and informal groups, respectively, this paper proposes the fourth layer that is, unlike the existing dynamic layers, static. Therefore, the proposed layer should be considered as the Deepground where it should represent how heritage forms the base strata for creative cities and that its valuable depth in such cities is static and should not be eliminated as it would ruin the creative cities. The reason is that one of the three elements of the creative cities is to have a positive image and a high concentration of people where deterioration of the deeply rooted heritage will definitely fail to achieve this aim.

The prevailing layers of a creative city Upperground, Middleground and Underground developed by Cohendet et al. (2010) are of the essence and were maintained in this integrated framework as formal, median and informal layers, respectively. However, this research proposed Deepground as a fourth layer where organizations or initiatives in the Deepground layer should adhere to the following criteria:

- Firstly, self-identity must be similar to the identity of physical cultural heritage throughout the rise of individuals in the city containing the cultural heritage or natural heritage.
- Secondly, self-identity may not be similar to the identity of the physical or natural heritage, but the individuals must not have a metaphysical creative identity to ensure prevention of interference or influence of own identity unintentionally. The other levels of creativity are negotiable and could be controlled at formal organizations.
- Thirdly, utilization of talents in creative industries, including architectural firms, could achieve the balance between the expression of self-identity of talents, preservation of the Silent Identities and development of creative solutions for new architectural solutions that should allow expression of creative identities of the Underground layer.
- Fourthly, the diversity of identities could be considered at any stage of knowledge transformation an interaction between a dynamic layer and a static layer.

The relationship between the four layers in this integrated framework is shown in (Fig. 14) where DC means direct connection and BC means banned connection. Consequently, the direct interaction with individuals from the Deepground is by individuals from the Middleground as this layer's role should be made easier because the flow should be enhanced. However, the interaction between the Deepground and the Middleground is based on a prior interaction between the Middleground layer with both the Upperground and Underground layers. The Middleground, Upperground and Underground represent an intermediate structure that promotes exploration and exploitation through the integration of diversity, formal organizations and creative industries focusing on exploitation and informal social groups or organizations focusing on exploration, respectively, (Cohendet et al. 2010). Hence, the Middleground is responsible for investigating and evaluating talents identities at formal creative industries and investigating and reporting on individuals' expressions of creative identities at the Upperground and the Underground, respectively. The knowledge is transformed then between the Middleground and the Deepground to give feedback on findings of the Upperground and Underground and to receive feedback on enhancing identities similarity between the Middleground and Deepground and between Upperground and Underground. Meanwhile, the Upperground and the Underground layers are not detached from the Deepground layer, but indirect exposure to 'others' identities, most importantly Silent Identities, is of the essence to support the role of the Middleground layer. In other words, allowing other medians to express identities should prevent direct creative expression to the heritage. The role of the Deepground layer is of the essence as it encompasses individuals whose identities are similar to the cultural heritage due to being an indigenous citizen without exposure to other identities or their identities lacks creative expression. The optimum case is when utilized talents at the Upperground layer can make a balance in their developmental solutions to achieve synergy between the representation of Silent Identities, preservation of self-identities and development of solutions for the Underground layer to express own identities away from the heritage in collaboration with the Deepground through the median layer.

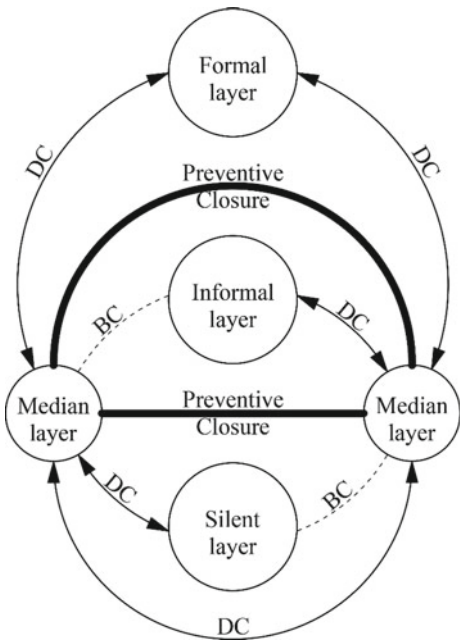

Fig. 14 Integrated conceptual framework for creative cities (Author)

5 Conclusion

The concept of creative cities came after the arguments about the creative class and its relation to the economic condition. Three elements were viable at that time including talent, technology and tolerance where those have not changed much for creative cities which aim to maintain a high concentration of people, a positive image and a dose of happenstance. Considering that heritage is a static element in existing and potential creative cities, the paper tackled the literature gaps to solve the problem of deteriorative creative expressions at the expense of the heritage whose Silent Identities are endangered by the creative identities of the Underground. Knowing that the Upperground is having its own challenges to develop effective creative solutions for such problems (Othman and Khalil 2018a), the Middleground has been suffering to achieve synergism (Cohendet

et al. 2010; Lange and Schüßler 2018). Novel strategic approaches were presented by Othman and Khalil (2018b), aiming to resolve more identified barriers at the Upperground. Having 12 additional barriers identified in this research, an update of the anatomy of the creative city to encompass the fourth layer to represent heritage Silent Identities is of the essence. The Deepground layer, presented in this paper, aims to enhance the flow between the other layers to achieve mutual benefits for the three dynamic layers and the deeply rooted static heritage.

This framework, though is conceptual and yet to be fully developed, is a seed for required future research essential required to preserve the image of the creative city and maintain tourism to have a high concentration of people without ruining the heritage. Not only do existing creative cities need this framework, but potential creative cities require appropriate preparations before they get included in the creative cities network. Selecting Egypt as the location of the case studies did not possess a barrier because it studied heritage buildings with different ages and the analysis allowed making a generalization. Should any other creative city, existing or potential, have a heritage of any age, those findings and this proposed framework will be found useful because no heritage age or type of deterioration was left unstudied in this paper. However, it is recommended that future research carry additional empirical studies to investigate this conceptual framework in live situations and recommend further guidelines if any were not in the scope of this research so that the update to the structure of the creative city becomes comprehensive and thoroughly effective.

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Historical Urban Landscapes and the Development of Urban Public Spaces

This part of the book is concerned with the development of public spaces in the urban environment, be it through the redeployment of historic urban landscape or through public arts.

The first chapter titled "Historic Urban Landscapes and Archaeological Sites: Perspectives and Directions" deals with archaeological sites as an integral part of urban landscapes. The main aim of the chapter is to analyse and evaluate archaeological sites from the perspective of landscape architecture with a view to providing a new approach to the concept of heritage preservation through landscape planning and design strategy. Using a study from New Delhi in India, in which the focus will be on Shahjahanabad (Old Delhi) the research makes use of a detailed analysis of the old city's urban form and its elements. This will provide a better understanding of historic landscapes, archaeological sites, concept of architectural heritage and the bodies involved in its administration. This is complemented by an empirical research in the form of interviews and surveys of heritage professionals and local residents. The findings of the study will help formulate some recommendations to deal with heritage sites as parts of overall landscape strategies.

The second chapter titled "Redeveloping the Historic Urban Ensemble: The Case of the King Abdulaziz Historic Center, Arriyadh Saudi Arabia" looks at the evaluation of the tangible and intangible experiences of the historic urban ensembles using as a case study the King Abdulaziz Historic Center, Riyadh, Saudi Arabia. The conservation of historic urban districts increasingly depends on landscape design strategies to devise the tangible and intangible experiences of historic urban ensembles of buildings. This approach offers to balance the conservation and development paradigm. The case study is evaluated in order to identify ways by which the landscape design strategy can lead to a synthesis of movement and perceptual experience (tangible) while facilitating social co-presence (intangible). Space syntax methods and ethnographic observations capture both the tangible and intangible qualities of this historic site and highlight how designs enabling visual expressions of cultural identity and spatial use patterns are key factors affecting the success of historic conservation and redevelopment outcomes.

The third chapter titled "The Influence of Public Art in Developing Chinese Urban Public Space: Current Trends and Future Directions" delves into the role of public art in developing urban public spaces in China. The chapter aims to analyse the development of public art in the urban contexts of the Metropolises of Beijing and Shanghai with a view to identify the developing trends of public art in Chinese cities. It starts by looking at how the rapid urban development and continuous infrastructure improvements can shape a unique culture for a city and present a new challenge that has been attracting considerable interest from many urban developers over the past few years. The development of public art within the context of mainland Chinese cities has been analytically explored. The findings put forward a number of potential approaches to encourage the implementation of public art policies in China. This can lead to the development of public art and its prosperity that sustains cultural diversity.

The fourth chapter titled "Reviving the Historical Hajj Route in Old Jeddah" in this part investigates the potential to revive the historical Hajj route in Old Jeddah with a view to revitalize the city culturally, socially and economically. The chapter intends to study the current situation of the Hajj route in Old Jeddah to present a strategy to revive it and increase the identity and the sense of belonging in the city. This in turn likely improves the visitors' experience of the city. The role of the city as a major sea trading centre and a gateway to Hajj is analysed. This dual role contributed to a vibrant, diverse and prosperous society and left its mark on the urban fabric. The historic area of Old Jeddah has great importance at the historical, architectural and urban level. Jeddah went through dramatic changes in the last 70 years, after the demolition the old city wall followed by the oil boom, which affected its identity, traditions and lifestyle. The generally poor social conditions in the old city combined with the lack of maintenance and conservation of the buildings contributed

to the negative image of the area and its surroundings and acted as a barrier to consider the urban fabric as something that is valued and needs to be sustained. Lately, this trend seems to be reversed as the local and national authorities as well as the civil society are trying to develop a strategy for the revitalization of the old city. The chapter puts forward ideas on how the community memories from the past, that related physical elements and social interaction, could be revived in order to increase the identity and the sense of belonging in Jeddah city.

Farnham, UK Hocine Bougdah

Historic Urban Landscapes and Archaeological Sites: Perspectives and Directions

F. Fatima

Abstract

Archaeological heritage refers to the past manmade and natural changes in cultural landscape. Tangible and intangible heritage are integral components of cultural landscapes. Archaeological sites not only possess essential information about past cultures, but also ecological and visual qualities. This is how cultural heritage sites enhance the quality and identity of urban as well as rural environments and provide for local resident`s economical wealth and tourism resource. Landscapes around the world are constructs of human beings—through ascriptions of it of mythological creation or through physical actions. In majority cases, archaeological sites and monuments are far away from being integrated into their present day setting. The landscaping or landscape design is one of the most controversial and unsolved aesthetic and functional aspect.

The main aim of this paper is to analyse and evaluate archaeological sites from the perspective of landscape architecture and provision of new approach to the concept of heritage and nature preservation in terms of landscape planning and design principles. It will be achieved first by understanding cultural historic landscapes, archaeological sites, concept of architectural heritage and heritage bodies. The case taken up for study is New Delhi in India in which main focus will be on Shahjahanabad (Old Delhi). The city`s detailed analysis regarding its formation, urban form and other landscape elements will be researched followed by an empirical research in the form of interviews and surveys by professionals and local people. These studies will derive the conclusion.

Keywords

Architectural heritage • Cultural landscapes • Cultural setting • Historic landscapes • Conservation and preservation

1 Introduction

Cultural landscapes are constructed either naturally or by human beings in the past and present, and everywhere in the world. The sites appear in various forms, at different locations and with different attributes. All landscapes reflect the traces of past which are visible as archaeological remains and natural formations, meanings through mythological creations, ascriptions and traditions. All these aspects are of value to the architect, conservation architect and landscape architect. There is a need to protect natural and cultural components which exist at site. It is not always possible to separate "the cultural" from "the natural" since there are significant overlaps. A combination of cultural and natural components on site depicts a wider scope ranging from ecological to archaeological content. This relationship further opens up ways to sustainability. Archaeological sites appear in different forms, some are isolated with no inhabitants while others are continuously occupied by contemporary population. Such sites have completely different and distinct attributes. Recreation and visual amenity concerning the historical and scientific values have played an important role in the development plan of historic sites and monuments. Archaeological sites attract many tourists and hence recognised as important magnet points. This has led to an increase in demand for planning new services and facilities to support the growth. (Arnheim 1974) This has increased the risk of destruction from unchecked development, excessive visitation, inappropriate interventions and new infrastructure systems. Archaeological heritage is a shared resource which needs to be preserved and conserved. There

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Y. Mahgoub et al. (eds.), *Cities' Identity Through Architecture and Arts*,
Advances in Science, Technology & Innovation, https://doi.org/10.1007/978-3-030-14869-0_8

are many archaeological sites in India which have the potential of being restored to their original glory. These sites were sustainable in nature and hence exist till date. Every site has its own genius loci which was kept in mind and designed accordingly, hence, leading to the creation of such masterpieces. Today, maximum attention is put on how to cater to the increasing tourist population visiting the archaeological sites. New additions are being done which are in no way related to the context and history, It is killing the archaeological heritage much faster than we can think. (Cleere 1989).

2 Cultural Landscapes

Landscape has the ability to absorb different meanings regarding culture, time and place and reflect interactions between people and natural environment over space and time. Every generation inherits a landscape and changes it according to the needs, forming an amalgamation of nature, culture, people and practices, thereby creating cultural landscapes. This implies that landscapes are never complete but are always under construction. There are many cultural landscapes which have evolved with time, one example being Varanasi in India as depicted in Figs. 1 and 2. Cultural resources emerge as both material resources and non-material resources such as remains of past cultures and social and historical meanings, respectively. So the cultural resources present the features that have survived from the past and their studies deal with the use in present and future. The ultimate goal of landscaping planning and presentation of contemporary landscapes can be done in two stages—Evolution of archaeological sites and Evaluation of ecological sites. (Conan 1999).

Fig. 1 Sketch of Varanasi Ghat

Fig. 2 Sketch of Varanasi Ghat

2.1 Evolution of Archaeological Sites

All cultural landscapes are historical and thus the factors like time, people and setting can influence the development of historical conditions. The archaeological landscapes embrace slow but continuous and dynamic process due to natural and anthropogenic forces (Jakle 1987). These two major forces cause drastic changes in the pattern of these sites in all aspects. Ancient cultures shaped their associated landscapes and had the knowledge of architectural and spatial planning. (Gilsen 2006–2014).

They took advantage of landscape`s natural barriers to full capacity. Gardens, sanctuaries, monuments, sacred places, monumental structures were the components of open space organisation. For example, siting of cities was done near river plains to have access to water. The use of other geographical features such as hilltops and vegetation was utilised in Acropolis of Athens or Piazza del Campo as depicted in Figs. 3, 4 and 5.

Fig. 3 Piazza Del Campo, Sienna

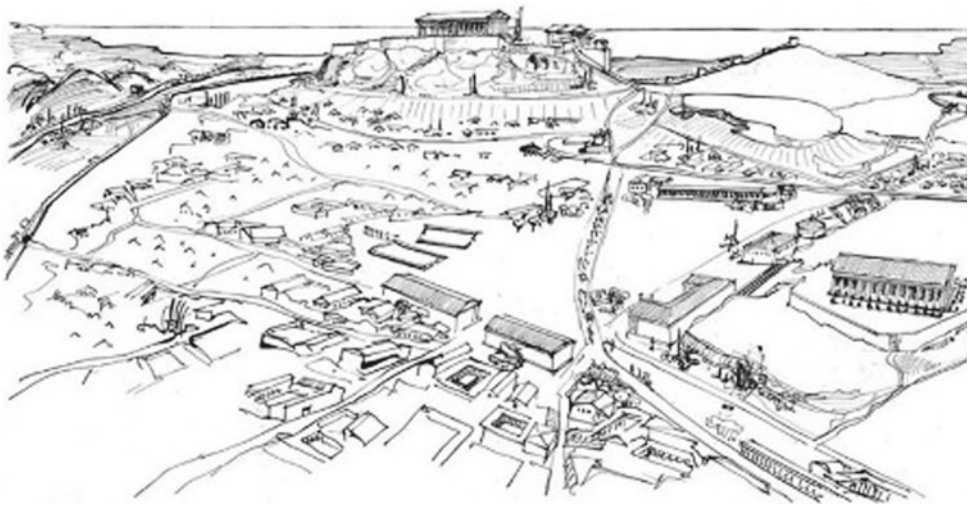


Fig. 4 Siting of Acropolis of Athens

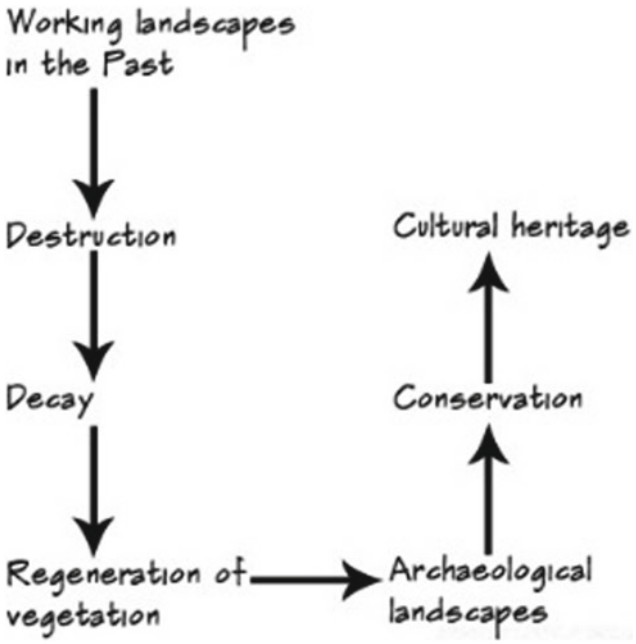


Fig. 5 Evolution of archaeological landscapes

2.2 Evaluation of Landscapes

Landscape database needs to be studied intelligently to extract valuable lessons and information from it. All historical landscapes and sites embrace the interplay of natural, manmade values, aesthetics and associations. Hence, value is a frequently used term in heritage management. Value systems or gradients are essential in planning process and help in ascribing value to sites.

3 Resource Base of Cultural Landscape

Resource base comprises of a wide and varied mixture of past events, folk memories, physical relics, mythologies, personalities, literary texts and the places where they can be symbolically associated. The evaluation of cultural landscapes is necessary to enhance the understanding and identifying significance through values. The value of an archaeological site is the product of past achievements and fracture potential. (Lynch 1971).

3.1 Value Systems

The evaluation of archaeological sites involves the determination of importance and significance of these sites. The evaluation depends on the time period, user, and kind of activity and usability of site. The major factors which affect value systems are social, natural as well as archaeological material and knowledge. (Cooper 1995)Evaluation concept is guided by four criteria's—form, function, familiarity and knowledge as depicted in Fig. 6.

The following factors determine the value of an archaeological site.

- Period
- Rarity
- Diversity (variety of components present)
- Survival
- Potential
- Amenity value

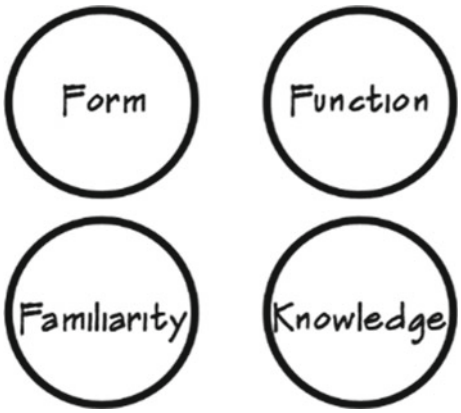


Fig. 6 Evaluation concept

- Documentation
- Group value (association with monuments of other classes and association with other monuments of same class) (Ashmore 1999).

4 Classification of Landscapes

UNESCO recognises certain landscape types in World Heritage List based on the intent, design, natural resource and cultural association (UNESCO, n.d.).

- Designed landscapes constitute the historic parks and gardens where natural beauty is the outcome of careful manipulation of elements. Example—Humayun`s Tomb shown in Fig. 7.
- Organically evolved landscapes

Relict landscapes include tangible and intangible archaeological features. Relict landscapes are those where a process of organic evolution came to an end in the past and is now preserved under secondary vegetation cover. Example—Golden rush lands of Colorado as shown in Fig. 8.

Continuing landscapes are the ones represented mostly by agricultural fields or the ones where the historical practices are still continuing. Example—Terrace cultivation in Vietnam as shown in Fig. 9.

- Mixed sites are the ones with exceptional features of combined works of nature and man.
- Associative landscapes are the ones which possess values deriving from religious, historical, cultural and artistic reflections which help to connect concepts with our perception. Example—Ayer`s Rock in Australia as shown in Fig. 10 and Mt Athos in Greece.(Atkins 1998).

5 Heritage

Heritage is anything that maybe inherited according to Oxford American Dictionary. It is defined as a nation's, state's, etc., historic buildings, monuments, countryside, etc., when regarded worthy of preservation. Cultural heritage encompasses landscapes, sites, historic places, built environment along with biodiversity, past and continuing cultural practices, knowledge and living experiences. Hence, heritage places are linked with people, events, activities, culture, society and economics. Conservation of heritage is important for survival of country`s sense of place, character, sense of belonging, connection with history, traditional knowledge and improving the quality of environment and public realm.

Fig. 7 Humayun's Tomb Garden, India

Fig. 8 Terrace cultivation, Vietnam

Fig. 9 Ayer`s Rock, Australia

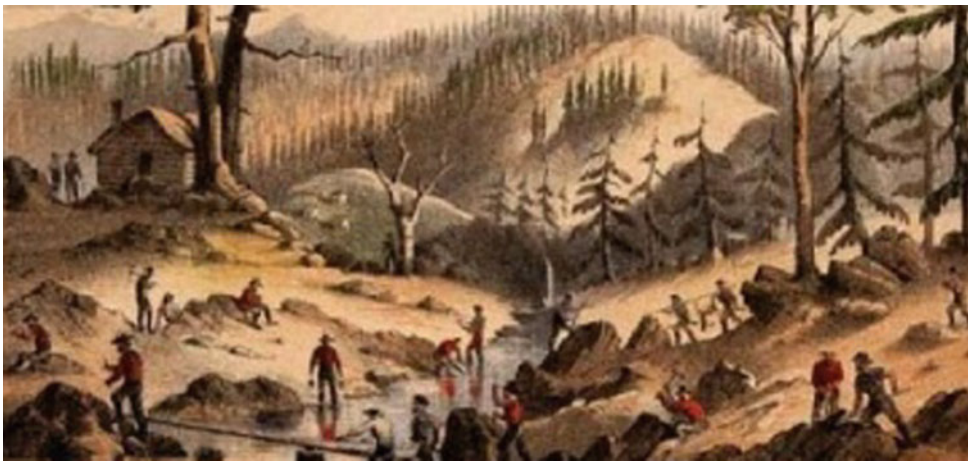


Fig. 10 Gold Rush, Colorado

6 Delhi Heritage

Delhi`s history of almost a thousand years of building has left a very rich legacy of architectural heritage. The diagram below denotes the development that took place in Delhi since eleventh century till date. Delhi is a living city which accommodates the remains of many dynasties. Delhi`s aura of being a capital city dates back to many centuries. It was the capital of significant kingdoms and sub-continental empires which facilitated the development of a cultural synthesis. The uniqueness of the city is defined by its ever evolving morphological and architectural styles which have come up with time as amalgamation of ideas and ideologies. Various cities were built within Delhi by various dynasties as capitals at different times. Shahjahanabad or Old Delhi was the seventh city of Delhi which was inspired and influenced by Iranian ideas of city planning. (Blake 1639–1739). There are six heritage zones in Delhi today

- Central vista
- Chirag Delhi
- Vijay Mandal-Begumpur-Sarai Shahji-Lal gumbad
- Mehrauli
- Nizamuddin and Humayun's Tomb complex
- Walled city of Delhi, Shahjahanabad (Fig. 11).

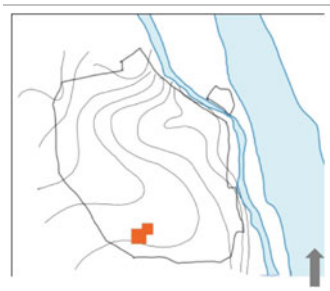
7 Shahjahanabad (the Walled City of Delhi)

Shahjahanabad was the seventh city of Delhi which has seen both glory and destruction in its history. It was plundered and ruined many times only to spring to become the capital of one of the most powerful dynasties. Shah Jahan laid the foundation of Shahjahanabad towards the north of all existing cities of Delhi, much closer to Yamuna in 1639. In the course of development and existence, Shahjahanabad faced many invasions due to which Delhi underwent a cultural and intellectual renaissance (Trivedi).

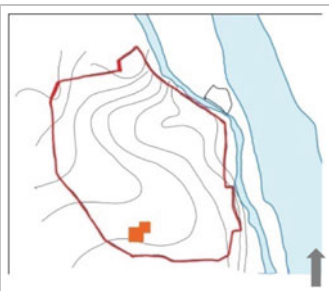
The Mutiny of 1857 gave a blow to declining Mughal Empire and forcing Shahjahanabad to undergo innumerable physical and cultural changes. These changes brought down Mughal rule but the remains of the Empire still exist in the most powerful form possible (Table 1).

A lot of thought was put in selecting the site for the new Capital. The presence of river on one side was the main reason for selection of this site. The initial planning of the city was based on two main thoroughfares which provided virtual experience to the commuters. From these streets emerged the secondary streets which intersected at chowks. The residents of the city were identified through their mohalla. Each mohalla had an enclosed space between residential and commercial buildings having entry to a katra made through a gate. Mohallas had a system of interior courtyards which were not visible from main spine. It was like and introverted garden city. The main mosque or Jama Masjid was built in 1656, 1000 yards southwest of Fort. It was surrounded by bazaar. There were many gardens in Shahjahanabad, namely Roshanara Bagh, Begum Ka Bagh, Qudsia Bagh, Tees Hazari Garden, etc. These were mostly introverted gardens. There was an elaborate system of water channels running throughout the city which was fed by Paradise Canal. These water channels were flanked by trees on both sides creating a microclimate which provided relief from the scorching heat of Delhi.

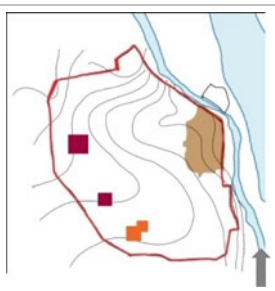
The introduction of railways by British government in 1864 cut a broad swath through the city`s fabric. Since the city was a living city, houses were remodelled, renovated and rebuilt on same foundation and invariably on same



Availability of high lands near river Yamuna and natural protection by mountain ranges nearby made this site suitable for new development



An 8 km long mud wall was built along the periphery and construction of the Red Fort began in 1639
By 1650 the wall was fortified



Construction of Fatehpuri Masjid started in 1650 and a reservoir called hauz Qazi was built for the poor

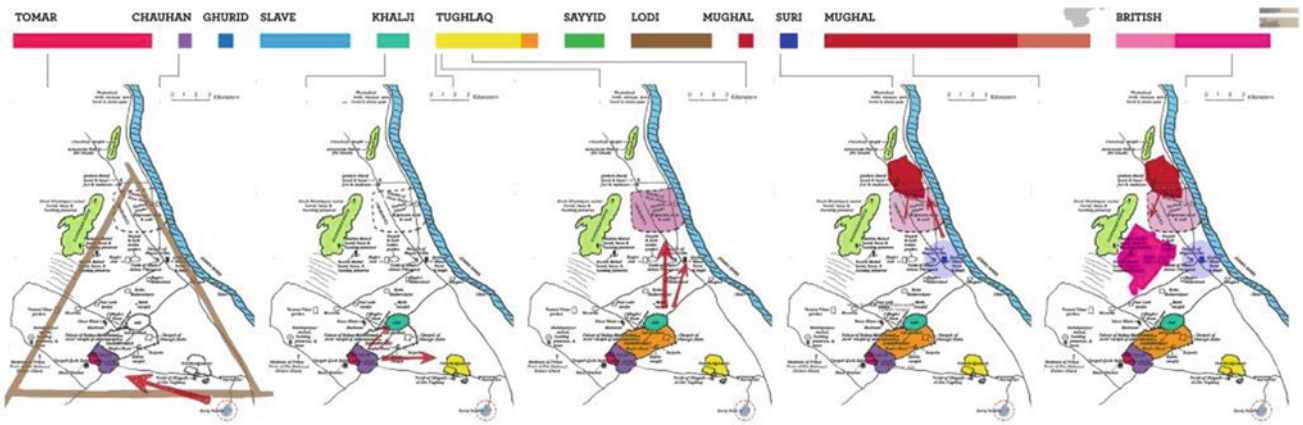
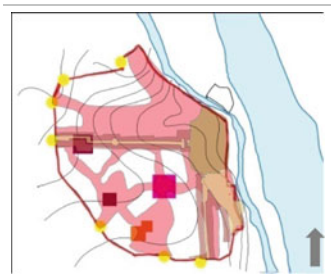


Fig. 11 Delhi through the ages

Table 1 Development in Shahjahanabad

		
The city grew in terms of footprint. There were galis, kuchas, katras which formed a number of mohallas or neighbourhoods	The connections to forts, masjids and gates became the commercial streets such as Dariba Kalan, Kinari Bazar, Khari Baoli, Katra Neel, etc.	There were many types of open spaces in the city like public open spaces, celebration grounds, private courtyards, mohalla courtyards, etc.

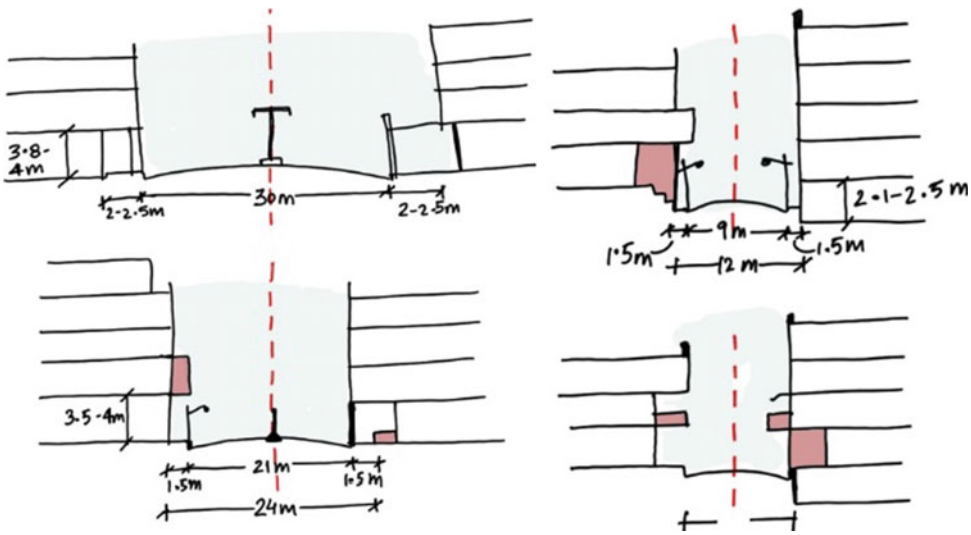


Fig. 12 Present day sections of different streets in Shahjahanabad

footprint. Thus, the city is seen with new structures but the original morphology of the city has remained intact. The rhythm of historic urban landscapes is still maintained by the building lines. Uninterrupted rows of buildings line the main streets and traverse in a similar manner along the kuchas and galis. The original fabric of intricate street facades and deep houses with courtyards for light and ventilation still survive. The Master Plan of Delhi 2001–21 identified this area as a

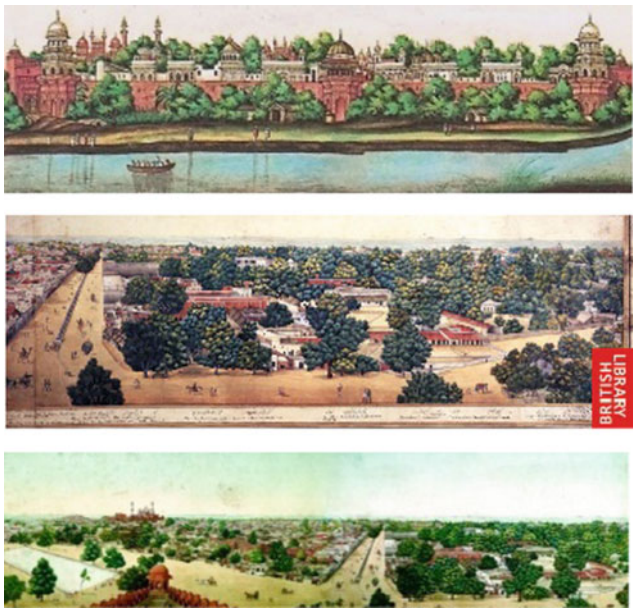


Fig. 13 Old paintings of Shahjahanabad

"Heritage Zone" and special bye laws are framed to preserve what is left of the urban fabric of havelis, bazaars and street patterns (Fig. 12).

Amidst all this, efforts are seen in preserving the historic havelis, fort and Masjid whereas no effort is seen in preserving the landscape of the site. For this, there is a need to understand the conservation of conservation of whole city. For this, a survey is done on professionals and local people of Shahjahanabad to understand the need of protection of heritage and measures that can be adopted to achieve the same (Figs. 13 and 14).

8 Empirical Research and Summary of Key Findings (Professionals)

A survey of 100 professionals was done to arrive at the results mentioned below.

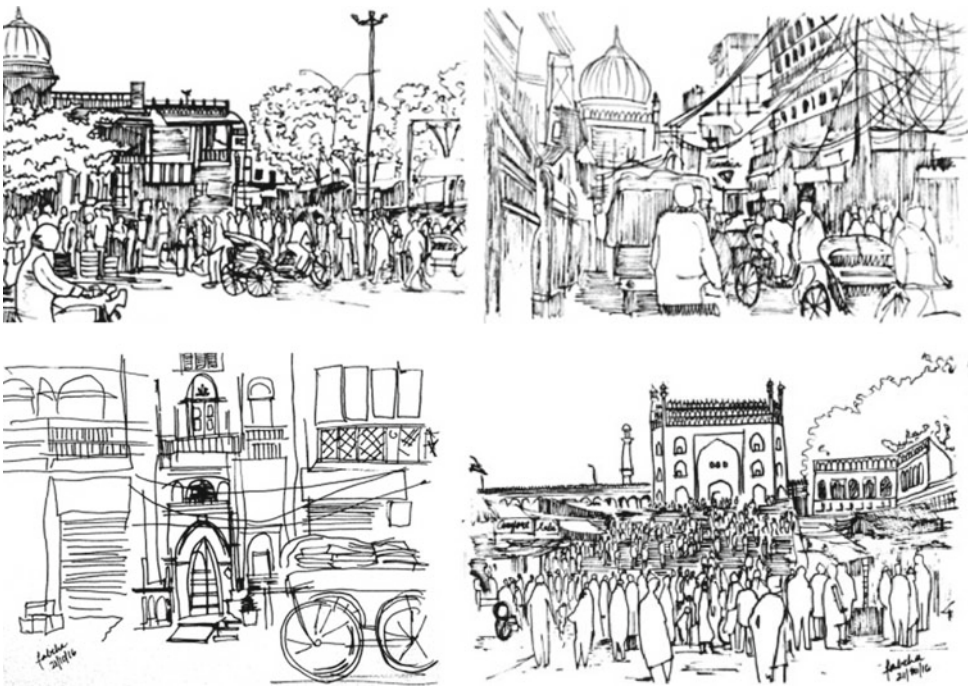
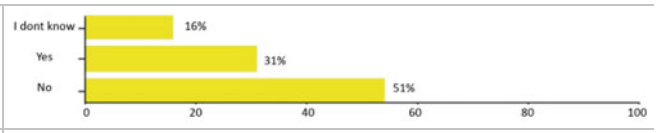
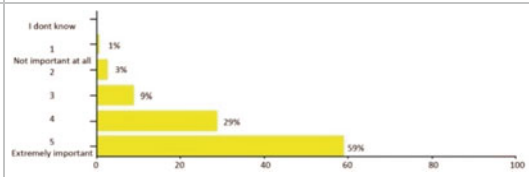
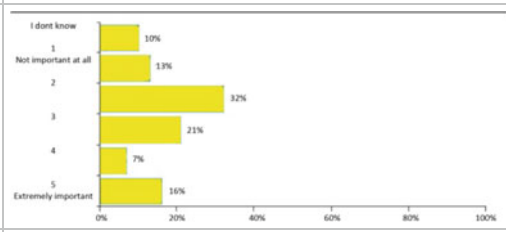
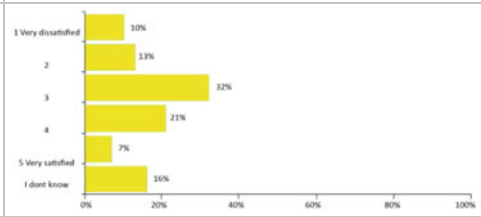
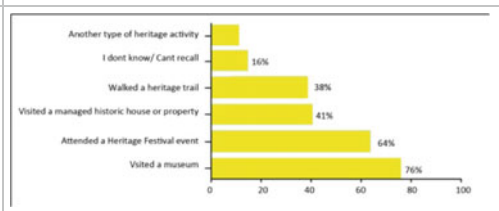
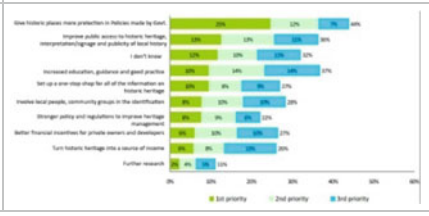


Fig. 14 Present day scenes of different streets in Shahjahanabad

Table 2 Key findings of empirical research (professionals)

Understanding of historic heritage	
Steps for understanding of historic heritage	
Protection of historic heritage	
Caring for historic heritage	
Visits	
Prioritisation	

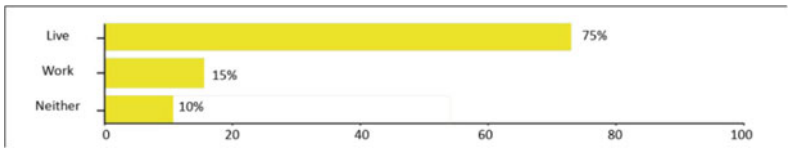
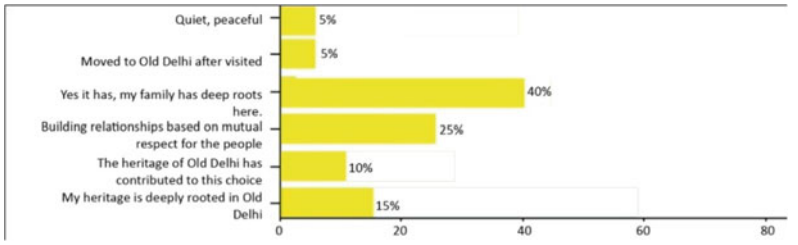
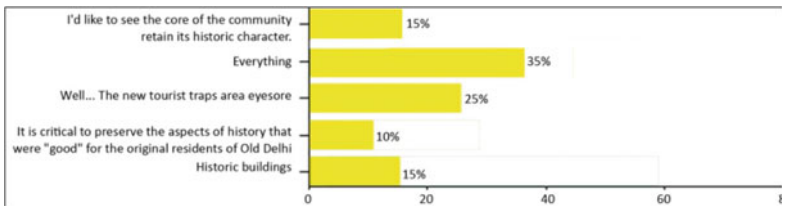
- 1.88% believes that protection of historic heritage is important
- 78% have visited a historic heritage site in the last 6 months, 76% of those visits were to a museum
- 3.54% think historic heritage is not well understood in their area
- 4.48% did not know the level of satisfaction they felt on the way historic heritage is cared for
- The highest-ranking initiative was for giving historic heritage more protection.
- Most people believe the role for caring for historic heritage is the responsibility of a number of parties (Table 2).

9 Key Findings (Local People of Shahjahanabad)

A survey of 100 local people of Shahjahanabad was done to arrive at the results mentioned below.

- 1.75% of people are residents of Old Delhi
- 2.55% of people do care about the heritage conservation
- More than 50% people flaunt the heritage of their place to other people who are not from Old Delhi
- More than 45% of the people do not understand the heritage as a whole (Table 3).

Table 3 Key findings of empirical research (local people of Shahjahanabad)

Likeness towards Old Delhi	
Reasons for settling in Old Delhi	
Understanding of historic heritage	

10 Conclusion

Archaeological sites and monuments are considered as relict scenery in departed landscape. Due to this reason, the concept of plant usage, landscape planning and contemporary design principles have received little attention. The main conclusion of this study is that the archaeological sites are recognised to be integral part of complex and layered cultural landscape which is rich in contemporary values and heritage. Also, it is planning and landscape represents highly developed and consultative value-based conservation. The main goal is to enhance the archaeological-cultural landscape as a whole. The archaeological sites are valuable for their role of education, leisure and tourism. Hence, the cultural heritage is not the domain of archaeological activities alone and cannot be studied from the sole purpose of archaeology.

The archaeological sites are closely associated with the landscape formation as the survival of remains has affected more recent use of landscape. As natural and archaeological remains constitute the archaeological landscape, vegetation and planting patterns on site are important landscape design features which should be examined thoroughly to recreate the same in contemporary context. Landscape design and planning on archaeological sites are initially connected with the understanding and interpretation of the cultural landscape as well as protection of its natural values. In landscape planning and design plants are one of the main components. Although it is not easy to find out or reconstruct the exact appearance, it is possible to create the spatial layout by examining the elements of the surrounding landscape and suggest planning and design patterns that might have been of particular similarity. In doing so, the scale and setting of the site can be better interpreted and consequently it can be perceived by the visitor. Furthermore, it can enhance and protect the visual sensitivity of the key monuments and their setting.

The main intention is to retain the character of the archaeological area and its landscape as well as to provide an appropriate physical setting for the protection and maintenance of the site. Although eroded through the passage of time, the remains and their setting still remain in the landscape; the reconstruction of heritage retains? Minimal and largely conservation-oriented ensuring that their unique significance is not impaired for the future generations. Therefore, the task should be to consider the relationship between the conservation and the presentation of ancient buildings, the preservation of landscape as well as creation of leisure activities. This requires the development of a dynamic view of nature, based on historical perspective, and beyond this some breaking down of existing disciplinary boundaries and attitudes. Balancing management of cultural resources, ecology and heritage conservation is an important task in terms of sustainability which should meet a new form of institutional and constitutional framework; otherwise, the conflicts will continue to arise. The study carried out on Shahjahanabad's cityscape and other elements in detail including the findings from the survey used for the study imply the importance of the city as a whole. There are gaps between policies and actual work on the ground which needs to be bridged so as to help in the implementation of the former in the true sense.

- It is required to properly document the history of landscapes of monuments with the available scripts and paintings.
- It is very much important to research and establish the missing links in historical data available and ruins which will then make much more sense when put together as a whole.
- There is a much-needed revival of the open spaces which used to exist in Shahjahanabad which made writers call it "Eden garden which is populated".

This would mean engagement of people with the heritage and improvisation of the lives of people. This would not just reflect the originality but also help people engage with these spaces. The streetscape of Shahjahanabad and the design of gardens was very much sustainable, and it improved the lives of people in those times. A further study of the various elements of landscape needs to be undertaken based on authentic documents such as various autobiographies and biographies by famous kings and rulers so that they can be implemented. It is recognised that the historical sites are essential parts of contemporary recreation options. Hence, the collaborative scheme seems well suited to the resources and their setting. In this, the landscape architect can be the catalyst to balance the architecture and nature. This can only be achieved by the profession of landscape architecture, being an integral part of the archaeological heritage studies.

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Redeveloping the Historic Urban Ensemble: The Case of the King Abdulaziz Historic Center, Arriyadh Saudi Arabia

Deborah A. Middleton

Abstract

Historic urban districts increasingly depend on landscape design strategies to balance the conservation and development paradigm. This study characterizes the way landscape design may construct tangible and intangible visitor experiences by structuring movement, spatial visibility, and social place making. Ethnographic observation of visitor behavior in the King Abdulaziz Historic Center is linked to space syntax axial and visibility graph analysis (VGA) of spatial configuration and Deleuze and Guattaris' concepts of assemblage and decentered models of productive space. The new and historic building ensembles are found to be activated by the landscape design as a dialogical network and assemblage, enabling visitors to construct unique sequences of spatial exploration and cultural–social experience, organizing milieus and territories to produce culture.

Keywords

Historic building ensemble • Landscape design • Spatial configuration • Spatial use • Space syntax • Urban analysis • Assemblage • Dialogical network • Tangible and intangible qualities • Social co-presence • Visual experience • Deleuze and Guattaris

1 Introduction

Given that planning approaches to heritage conservation are constantly evolving, formulating landscape strategies to mediate a conservation–development paradigm poses a number of challenges. Today, the scale and intensity of new development occurring on the urban fringe or within historic districts is resulting in fragmentation of historic building ensembles and districts (Van Oers 2006; Carbonara 1996). Increasingly, monumental park development schemes are favored as urban design tactics to conserve and revitalize distressed historic urban areas. These urban landscape strategies also aim to avoid the destruction of unique spatial character and identity of the historic urban ensemble and construct new open public space to generate visible cultural vitality (Van Oers 2006; Carbonara 1996). Contemporary planners also favor large-scale projects with a diverse functional mix in order to stimulate social and economic outcomes. This new paradigm requires design strategies that bridge project goals, supporting social place making, cultural memory, architectural identity, and urban sustainability.

2 Reconstructing the Urban Monument Through Landscape and Site Design

In *The Invention of the Historic Monument* (2001), Francoise Choay defines the concept of historic heritage as resources intended for the enjoyment of a community whose scope has been broadened to planetary scale (global) and constructed by the continuous accumulation of a diversity of objects, assembled by virtue of their shared belonging in the past. The construction of monumental form and historic urban space may be viewed as a linear progression of conservational concepts and values. There has been a shift from the appreciation of objects, their restoration and conservation, to the preservation of geographical territory, and the topology of the city, which becomes inscribed by the creation of a chronological framework of inheritance (Choay and OConnell 2001). The historical urban fabric and its uses may be kept alive with an articulation that is compatible with another scale of planning, precisely by means of a plug-in, prosthetic logic.[1] The project of conserving urban heritage is

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[1]Gustavo Giovannoni, inventer of the concept of the historic city, is cited by Choay to have predicted the importance of networks.

Y. Mahgoub et al. (eds.), *Cities' Identity Through Architecture and Arts*,
Advances in Science, Technology & Innovation, https://doi.org/10.1007/978-3-030-14869-0_9

increasingly interwoven with strategic economic development, which builds upon the invention and marketing of a cultural industry (Choay and OConnell 2001).

> An historic city is itself a monument, by virtue of its topographic structure and its scenographic qualities, through the character of its streets and the ensemble created by its major and minor buildings; thus, the same laws of protection, the same criteria of restoration, clearing, repair, and innovation should be applied to it as to the individual monument. (Choay and OConnell 2001)

Today visitors of historic urban places, also known as historic urban landscapes, value the spatial context of rich experiential and functional activities juxtaposed with social place making (UNESCO 2005).[2] This requires designers working to redevelop a historic urban site with architecturally significant building ensemble, to develop integrated conservation and development design strategy. The challenge is to preserve and augment the perceptual structure of the historic architecture ensemble and offer place making to enable visitors to experience tangible and intangible qualities associated with the historic site. In the past, landscape design emphasis was on creating compositions with picturesque qualities that supported the harmonious continuity and consistency of existing buildings, as an integrated singular ensemble. Picturesque design strategies for a building ensemble often focus attention on its architectural details, spatial composition, and visual juxtapositions.

Shifts in contemporary design strategies toward dialogical networks now aim to construct visitor experience and appreciation of the cultural environment. In this design approach, spatial experience of the historic urban site depends upon movement, vision, and place making. Landscape network design strategies perceptually formulate a connected intelligence based on a dialogical exchange (DeKerchove 1998) that engages social and spatial semantics. Green landscapes are viewed as essential to organize the web of relations, constituting a dynamic structure between social–cultural proximity and physical space (Tagliagambe 2008). Inserting pedestrians, a mix of social activities, and place making friendly zones, into sites with historic building ensembles, provide visitors options to formulate a phenomenal structure of experience.

Alternatively others have argued that we experience space through the visual fields they generate (Bada and Guney 2009; Turner et al. 2001; Lars and Legeby 2012). The spatial properties of a landscape will have an impact on peoples' behavior and spatial use, due to both morphological and visual properties (Bada and Guney 2009; Turner et al. 2001; Lars and Legeby 2012). Social interaction has been found to manifest itself in open space where movement and co-presence intersect with the connections between built spatial form and open spaces (Hillier 1996; Turner et al. 2001; Lars and Legeby 2012). This requires designers to provide a diverse range of spatial scales and types, from large group gatherings to intimate spaces for repose and reflection, in tandem with visual affordances structured into the spatial configuration. Yet overdesigning urban space as a series of outdoor landscaped rooms enclosed by buildings creates a fragmentary, unintelligible urban environment (Hillier 1996).

Instrumental strategies often integrate movement with the organization of buildings, function, and open space to create a lively center. Lively urban spaces are attractors for social co-presence and have been found to be a precondition for social interaction, with patterns of co-presence largely resulting from architectural urban designs (Hillier and Hanson 1984; Hillier 1996). Space syntax theory argues that spatial configuration of urban and architectural space should be viewed through a lens of an economy of movement. This type of site design strategy focuses on the configuration of urban space to be highly connected to increase the level of movement integration. This may be achieved with a structure of functionally operative centers or a hierarchy of multiple linked centers (Hiller 1996).

Conserving and giving significance to the tangible, material cultural heritage (objects, buildings, sites, landscapes, and traditions) of urban places is often the first concern of designers who are working to restore fragile urban ensembles of historic buildings. Urban and architectural spatial forms and shapes are environmental cues that appear as various cultural signs according to the context (Monnai and Ikegami 1991). Traditional cultural forms exemplified in historic buildings are often recreated and expressed by the repetition of architectural signs on building elevations or in the formation of a skyline (Monnai and Ikegami 1991). The representation of cultural spatial meaning also occurs in tandem with perceptual design to activate spatial situations (instrumental) or facilitate multiple social and individual co-constructions of historical narratives (dialogical) (DeKerchove 1998; Tagliagambe 2008).

3 Research Aim and Method

3.1 Characterizing Instrumental or Dialogical Approaches in Site Design

Landscape and site design has the ability to generate tangible and intangible spatial experiences of movement, visibility, and social place making. Currently, heritage management practice advocates applying a thoughtful landscape design

[2]The term historic urban landscapes (HUL) refer to 'groups of buildings (ensemble), sites, structures, and open spaces in their natural and ecological context. One aim in regenerating HUL sites is to establish strong social and economic opportunities with transformation potential' (Vienna Memorandum 2005).

approach to redeveloping sites with historic building ensembles (Veldpaus and Roders 2013). In this study I examine how landscape design strategies are used to simultaneously conserve and develop a historic site and construct meaning and social experiences. The aim of this paper is to characterize how landscape design may be used to generate a dialogical relational experience. Saleh and Eben (2003) note that meaning is created through the interplay of spatial zones, public and private distinctions, and physical and imagined boundaries. In redeveloping a historic building ensemble, that mixes contemporary and historic buildings, designers may also select to apply different scales, densities, spatial forms and temporality (Saleh and Eben 2003). Landscape design may also be used to activate and generate meaning (as an intangible quality of place) by assigning significance, and value to thing, functions, styles, and spaces (Abrioux 2003; Maciocco 2008) and by formulating a spatial configuration that structures visibility, and integrates pedestrian movement in relation to the historic building ensemble. The research aim is to understand how landscape design may encode human behavior and spatial perception in a project combining historic and contemporary building ensembles.

3.2 Instrumental and Dialogical Network Design Approaches

Designing from an integration and centrality approach (normative—instrumental) as advocated by Hillier and Hanson (1984), may construct views that make the building—landscape ensemble functionally or complimentary equivalent. This type of normative planning strategy favors a spatial logic of landscape distribution (Talen 2010; Zhai and Baran 2013) that links the realization of economic benefits to the spatial distribution of the sites activity functions, at both local and global scales. Abriouxs' critique of space syntax theory and its analysis methods similarly target its rational 'economical' logic of spatial organization. Abrioux notes that instrumental design strategies such as space syntax favor establishing rational hierarchies of accessibility or structures for movement (Abrioux 2003). Strong urban centers may configure movement along axial avenues or create a hierarchy of subcenters that link back to the main central spine of movement. This approach does not always enable the visitor to co-construct their own historical narratives and often highlights the absence of deeper meaning in user engagement and movement in space instead focusing on the productive nature of built space that is an outcome effect of space and its ability to structure user behavior (Crofts Wiley and Macgregor Wise 2019).

In contrast to this normative–instrumental design approach, contemporary landscape designers seeking to distribute a richer diversity of functions and spatial experience types across the landscape terrain, may formulate a connected intelligence based on a dialogical exchange (DeKerchove 1998; Tagliagambe 2008). Dialogical network design approaches enable users to engage with the historic ensemble and its landscape setting in ways that emphasize their ability to perceptual, and semantically structure their social and phenomenal experiences. Deleuze and Guattari provide us with tools for the analysis of the world as an ongoing semantic construction. They present a similar decentered model in their concept of assemblage and define historical conjunctures to be inscribed not only in the affective territories in which people live out the possibilities of their lives, but also the condition of possibility for acts that produce milieus and organize spatial territories to produce culture (Crofts Wiley and Macgregor Wise 2019).

Designing from a dialogical approach may functionally and stylistically differentiate spatial land uses and generate or dissolve contrasts by using overlapping functions or assign new functions with contrasting terms (DeKerchove 1998; Tagliagambe 2008). Applied in the context of the site interior of a historical building ensemble complex, a dialogical design strategy is an alternative to establishing a hierarchical spatial system or a layout with axial centrality that may in turn establish a dominant perceptual field. By using a dialogical network approach, urban and landscape designers tactically interconnect the mixed-use program to formulate a web of movement and situated experiences within a varied landscape design. The forming of subspaces within a larger landscape field may be used to form discursive situations or contexts that become activated through spatial movement, social co-presence, and spatial use. This enables visitors to experience the tangible spatial composition and construct intangible experiences of place as a dialogical narrative, co-constructed from the perception of historic and contemporary urban landscapes, building ensembles, and the semiotic system of signs in order to generate a spatial milieus of social–cultural experience.

Designing a dialogical network in contrast to an instrumental site design approach necessitates synchronizing movement and visual affordances with spatial enclosure, openness, expansiveness, and permeability and offering choices and freedom of directional movement.

3.3 Applied Research Method

In this study, a morphological analysis of landscape site design aims to contextualize the spatial structure within the social and cultural context of use. Instrumental and dialogical network design strategies are two approaches to organizing movement, visibility, and social co-presence on the interior of a large urban historic site. The research intention is to (1) characterize the landscape design approach as an

(i) *instrumental* or (ii) *dialogical relational* design strategy; and (2) assess the strategy for its ability to generate tangible and intangible spatial experiences of movement, visibility, and social place making in an urban ensemble of new and historic buildings.

Using axial analysis and visibility graph analysis (VGA), two space syntax analytical methods, the assessment of spatial configurational properties of the historic built and landscaped environment is undertaken. The VGA approach describes mutually visible locations in the spatial layout and correlate these to relationships of spatial configuration, movement, and visibility (Turner et al. 2001). The spatial configuration of the site plan and its landscape design is examined by identifying the formal properties of axiality and center formations imbedded on the site. Both approaches use Depthmap software. In this study the VGA graph is overlaid with the landscape plan and its building arrangements, (historic ensemble and new development) to identify distinctive patterns of co-visibility, often aligned as a generative property of social copresence. The location of observed social activities and movement was aligned in relation to the axial line structure and VGA results. In both results, strongly integrated spaces are indicated by red hues and are characteristic of an instrumental organization. This is in contrast to graphs with dark–medium–light blue and green colors that indicate low spatial integration of movement or covisibility, which may indicate poor centrality in the spatial organization of the site. Site observations occurred in the late morning to early afternoon and at evening times and focused on identifying social use patterns of individuals and groups. Observation of space use during day and evening times reveals patterns of high and low co-presence and situated spatial occupation and movement.

4 The King Abdulaziz Historic Center (KAHC), Arriyadh Saudi Arabia

4.1 Problem of Capital Image Formation

MEDSTAR 2030, the most recent development plan for the capital city of Saudi Arabia, states 'Arriyadh is perceived as comprising isolated unfinished communities disconnected from its historical heart' (Arriyad Development Authority 1997). The MEDSTAR 2030 vision aims to position Arriyadh to become a lively city that reflects the actions and life of its citizens. Recommendations focus on improving urban form and capital image through the creation of sub-urban centers, protection of natural wadis, and the establishment and definition of urban gateways, edges, and the creation of linkages. The MEDSTAR 2030 report notes that future urban design solutions should provide clearly identifiable central areas, skylines, and streetscapes and provide for greater pedestrian emphasis with an increasing focus on urban form for capital image. The KAHC was envisioned as a cornerstone development to bring the past and present together in a meaningful way while providing green space to the city (Arriyad Development Authority 1997).

Inaugurated in January 1999, the KAHC project incorporates conservation and new construction, and redevelops the site into an urban garden landscape. The project aimed to (i) preserve and augment perceptual structure of the building ensemble; (ii) establish and coordinate multi-dimensional development; (iii) restore the HUL site integrity beyond its picturesque qualities; (iv) establish social place making set within a richer functional and activity zone matrix (Speer and GmbH 1996). The project occupies approximately 36 hectares of land, containing an extensive setting of open space, public squares, landscaped parks, and gardens, envisioned to impact and transform the center of Arriyadh over a period of 50 years (Arriyadh Development Authority 1997).

4.2 Organization of the Historic Building Ensemble

The former al Murabba Palace compound, is an ensemble of mud buildings situated originally within a walled area, surrounded by date palm trees, desert open space and small gardens. The architectural significance of the site is high as it was the first palace of King Abdulaziz after unification of the Kingdom of Saudi Arabia. The redevelopment approach required developing guidelines and building regulations to rehabilitate and modernize the historical buildings in the area to preserve the spatial character (Arriyadh Development Authority1997). Buildings originating from 1950 to 1980 that encroached on the historic palace and its original building ensemble were demolished (Al-Solaiman 2016). A new mixed-use program was defined containing libraries, multiple museums, office space, archives, public mosques, on-site visitor center, occupant and visitor parking, and gardens. Car parking was anticipated to be a high-impact function with a negative perception in relating to green parks and open spaces (Speer and GmbH 1996) (Figs. 1 and 2).

4.3 Early Site Design Concepts

An early concept divided the historic ensemble surrounding territory into small urban blocks to be developed in two phases. Phase I concentrated on the main cultural ensemble and parks, and Phase II developing possible future high-density on the periphery of the site. Clearly an instrumental strategy, the site design position a linear central plaza as the dominant open space, with a secondary series of sub-center building clusters. The design created a hierarchy

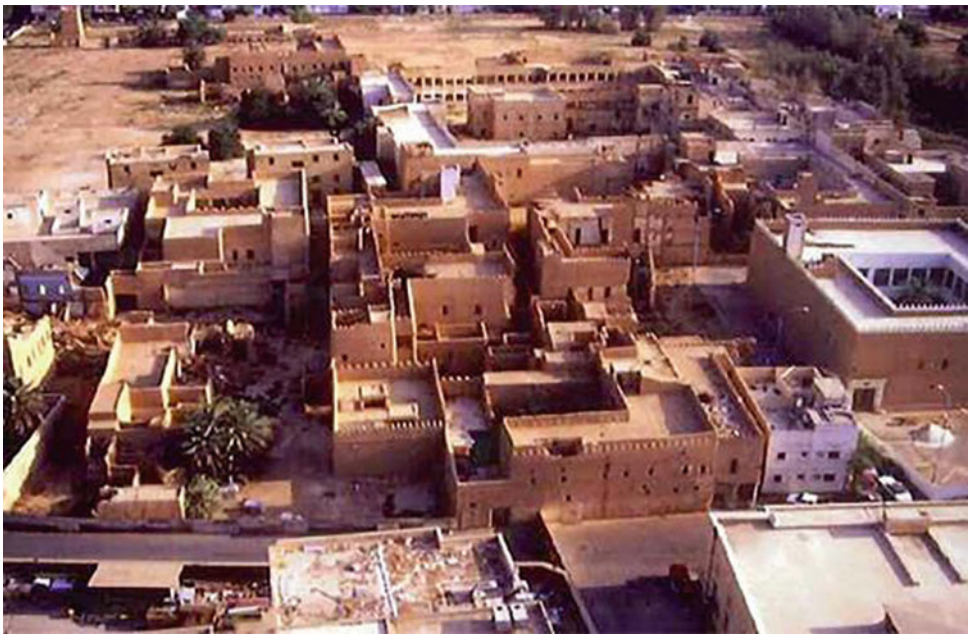

Fig. 1 Pre-intervention condition areial view of palace building ensemble with 1950's–70's buildings

Fig. 2 Views of the restored palace building, landscape design focus is on the hardscape ground plane

of spatial partitions separating the surrounding urban fabric from the historic site. The early landscape design composed a series of small squares surrounded by new office and commercial buildings. The landscape design was not unified and consisted primarily of hardscape elements. There is a noticeable absence of solar shading strategies in the Phase I and II design concepts. The spatial composition is established as a fishbone structure with a central axial spine of open space connecting to secondary squares and plazas. The Phase II plan incorporate three gateway entrances oriented toward the surrounding community fabric. The newer development surrounding the site presents a distinctly different morphology and effectively consumed the cultural character of the historic ensemble. It may also be noted that

there is an absence of open air car parking on the site. This strategy was subsequently modified to formulate a monumental park accessible to the whole city (Speer and GmbH 1996).[3]

4.4 *Implemented Site and Landscape* Design

The implemented landscape design concepts' aim was to recreate the natural landscape of berms and stone outcrops with oasis clusters indigenous to the Najd region. The final landscape design connects movement, visual, social, and spatial events and establishes an environment with semantic potential. A diversity of hardscape and softscape materials are used in tandem with intensive and extensive landscape planning. The landscaped grounds cover 360,000 m^2, integrating contemporary buildings and historical palaces through a system of pedestrian circulation. Some renovated buildings apply traditional Najd design motifs and establish a modern synthesis of materials for preservation of architectural character.

The integrated development approach augments the restoration of the existing historic building ensemble with new development (Speer and GmbH 1996). Five architectural developments, constructed simultaneously, compose the KAHC project. These developments are the restoration and development of al Murabba Palace; creation of a central plaza, a new National Museum; preservation of the King Abdulaziz Research Centre Darat; and the King Abdulaziz Mosque (Fig. 3).

The KAHC gardens were conceived to host celebrations, festivals and official major events, ceremonies, and community activities. The historic palace area maintains its original character with a synthesis of restrained landscaping, covered and open walkways, and intensive palm groves. The system of the KAHC parks includes five principal gardens, each with an area of between 20,000 and 30,000 m^2. Together they create a valley and small hill topography that surround the central plaza and the main buildings of KAHC. A sixth central park is styled as a contemporary Al-Andalus garden and incorporates long vistas, fountains, and palms groves that contrast and compliment the elevation of historic architectural ensemble. The central park section has an area of 15,000 m^2 and separates the National Museum from the historic building ensemble (Aga Khan Award for Architecture 2004) (Table 1).

5 Findings

5.1 Landscape as Mediator in Historic Architecture–Urban Ensemble Regeneration

Landscape design is used to synchronize the tangible and intangible experience outcomes, through an application of instrumental and dialogical design approaches. This section examines the design outcomes of landscape spatial form and identifies characteristics of instrumental and dialogical design as expressed by spatial organization and visibility structures in the sites global system of spaces. The phenomenal experiences of openness and enclosure, co-visibility, and social co-presence on the site, are factors that relate to cultural values, and afford place making for intangible experiences.

Reviews of the project highlight how the KAHC has shaped an architectural and urbanism, which organizes political, social, and ritual actives into an appealing built form and urban landscape (Saleh and Eben 2003). One perception of the KAHC site is that it is defined by boundaries, both physical and imaginary (Saleh and Eben 2003). A physical boundary in private space or public buildings that are physically separated and distinguished from its surroundings (Saleh and Eben 2003). Meaning on the site is generated through spatial zones, public and private distinctions, and physical and imagined boundaries. The mix is contemporary with historic buildings established in different scales, densities, forms, and temporality. The building ensembles orient visitors to an image of place where meaning grows from personal patterns of behavior, experiences, preferences, and the particular culture (Saleh and Eben 2003). Fragments of experiences are selected for their significance with the intangible experience of the physical environment and its meaning, valued on the basis of how people perceive them (Saleh and Eben 2003).

The resulting analysis reveals a combination of design strategies applied in order to activate and connect the historic urban open landscape with the architectural developments. These strategies involve a varied landscape grammar that combines historic and new architectural ensembles, formal public plazas and playful squares, grassed and gravel parks, palm groves, open undulating masses of grass, sand stone, and water. While it is designed to generate spatial connectivity, movement, and visual permeability, and construct opportunities for social co-presence, the design fails to establish a center or hierarchy of spatial centers. It is an urban oasis that also does not connect with the surrounding residential and commercial communities well due in part to its monumental scale.

[3]Collaborating architectural firms, Ali Shuaibi, Beeah, and Rasem Badran were responsible for the urban design master plan, with landscape architecture designed by the German firm BW + P Abroad, working with members of the Albert Speer and Partners team. Buro Happold was responsible for the urban and landscape infrastructure design (Albert Speer and Partner 1996).

Fig. 3 Aerial view of KAHC © Arriyadh Development Authority

Table 1 KAHC landscape project (Speer and GmbH 1996)

KAHC landscape project data	
Total area (including buildings)	360,000 m^2
Total soft landscape area	141,000 m^2
Total hard landscape area	121,250 m^2
Total area of lawn	38,250 m^2
Total number of trees	6,025
Total number of shrubs/ground cover	6,300/156,500
Total construction costs	SR 565 million
Total landscape construction costs	SR 132 million

5.2 Surrounding Urban Context

Today Arriyadh's population is estimated to be 4 million people with economic surveys revealing the city to be one of the largest business centers in the Gulf region. The King Abdulaziz Central Park and Murabba project aims to re-establish the historic urban center within the rapidly expanding city. The goal was to create an inviting, open, and accessible complex, which would be integrated within the urban fabric of Arriyadh. The KAHC site is highly visible, located adjacent to the Grand Mosque, Justice Palace, the central Souq, and the Governor of Riyadhs' offices yet the historic city center with its traditional urban fabric has become peripheral with the expansion of urban development toward the north. A major avenue, King Saud street runs through the complex, connecting it to adjacent districts. Landscape and site designers were instructed to maintain a sensitive scale corresponding to the palace site, while integrating the monumental site with the surrounding street network. The redevelopment guidelines and building regulations focus was on rehabilitating and modernizing the palace complex to preserve its special historic character and political significance (Speer and GmbH 1996).

Larger urban areas surrounding the King Abdulaziz Historic Center include traditional narrow streets, and dense aggregations of mud buildings, souq markets, and large cemetery spaces. These elements pose challenges to the municipality in organizing a new urban environment due to their permanent functions and historical nature. The traditional physical environment is seen as an emergent form imbedding social rules and social-behavioral norms, while establishing cultural meanings. Al-Hathloul (1981) argues that in the case of Saudi Arabia, it is the legal structure of behavioral conduct and the social conventions of the traditional settlement that maintained a settlements social–cultural continuity. Yet the rapid pace of social and spatial transformation in Saudi Arabia presents many challenges to maintain and reproduce the historic urban spatial conditions. New residential developments are needed in the area that has surrounding pockets of earlier informal settlements. Infrastructure for water services, sidewalks and expanding roadways also poses challenges to integrating the KAHC development with adjacent community districts. While the conservation of traditional urban districts often reflects strategic concerns for continuities of identity as an expression of past forms of social organization and cultural

production there is a pressing need also to create liveable communities with access to green infrastructure and socializing spaces. Urban and architectural space is frequently seen to represent meaning of a subject, such as a place or people Al-Hathloul (1981) (Figs. 4 and 5).

Guidelines established to orient the redevelopment of the KAHC site toward these goals and pose multiple challenges to realizing the MEDSTAR 2030 vision. The design outcome of the KAHC project is found to establish poor connectivity with the surrounding fabric due to the high-speed bordering highways and boulevards. The sites monumental scale provides green space to the urban center yet there is a lack of connectivity through the park to other surrounding neighbourhood districts, resulting in the KAHC site becoming a self-contained destination. The project does not construct a strong integrated center within its territory, or in the global system of urban spaces that surround the site. There is also an absence of subcenter formation within the urban fabric, due to poor integration of street patterns surrounding the site. The surrounding urban fabric also contains functions that are unable to be transformed such as historic cemetery positioned to the east of the site, as well as multiple mud urban districts which present challenges to the municipality to identify ownership for appropriation, urban upgrading, and management. Linking the KAHC site with other new green areas such as Kasr Al Holkm and Salam park is envisioned to form a green network for the city, but as of yet this has not manifested in redevelopment schemes (Fig. 6).

Fig. 4 KAHC axial R3 (local urban fabric)

Fig. 5 Aerial view of urban fabric and KAHC (google earth)

5.3 Landscape Design in the KAHC

The implemented landscape design encourages pedestrians to explore the entire, park and museum historic building complex, and this network of pedestrian walkways activates the spatial organization. The site design is characterized by a correlated structure of landscape and urban space organization. The intended center of the development is positioned between the new Research Center Darat and the new National Museum. A rich variety of pedestrian walkways and plazas integrates cultural buildings and smaller parks and establishing multiple centers for social life (Fig. 7).

Three squares identified as the Northern Square, Eastern Square, and Western Square, also referred to as Midans, are positioned at each of three entrances of the site and have a combined area of 2 ha (Speer and GmbH 1996). The development was intended to establish public green space for the city and initiate spatial regeneration by creating connectivity across different spatial zones within the historic city center. A new National Museum, covering 29,000 m^2, is positioned directly to the east of the main square (Speer and GmbH 1996).

Fig. 6 Pedestrians enjoying the King Abdulaziz palace building ensemble

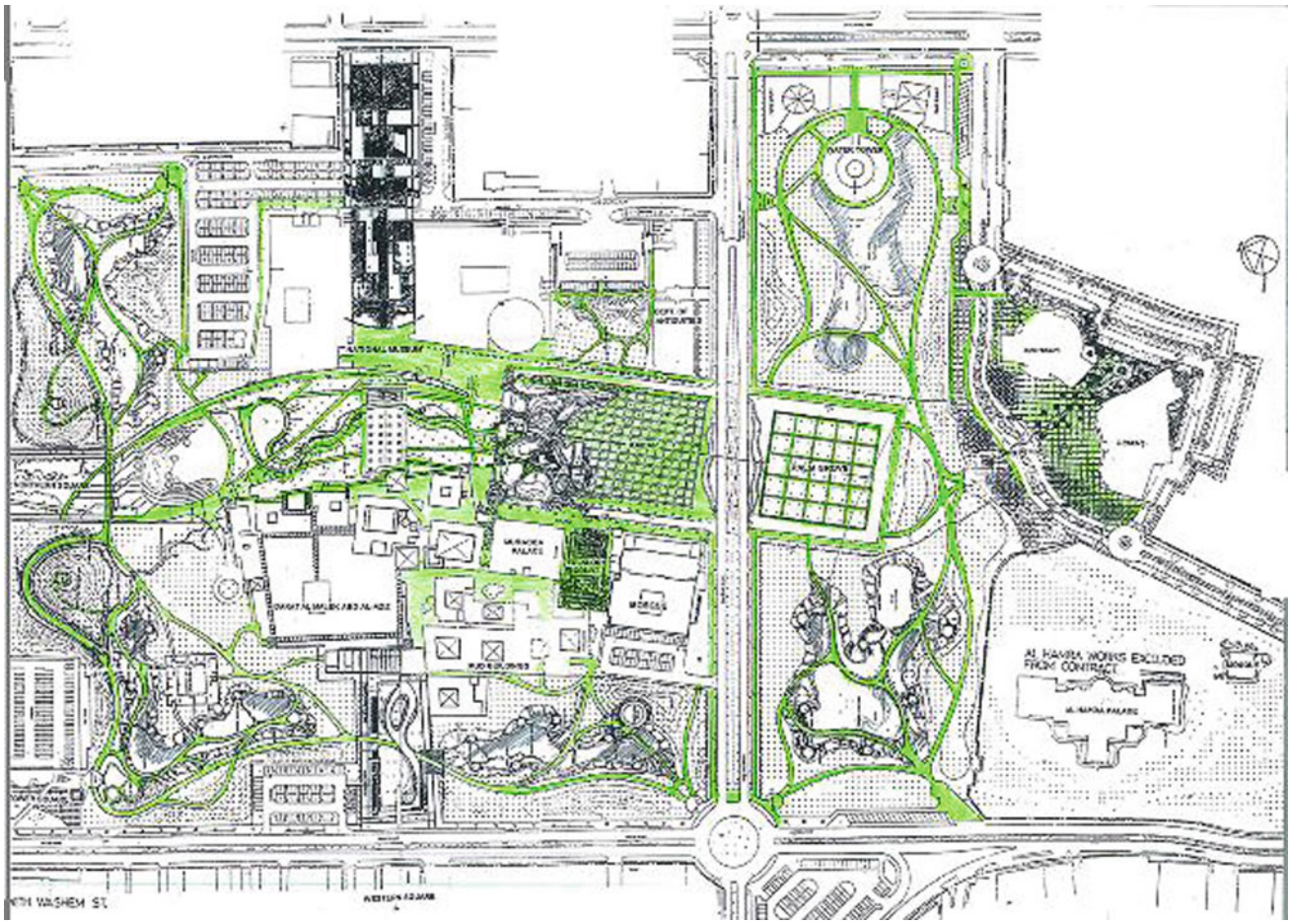

Fig. 7 Pedestrian walkways and open plazas KAHC (© BW+P Abroad)

5.4 Movement and Spatial Organization

Pedestrian movement is structured in three ways, in plazas and squares, in open landscape space set under tree canopies, and in the spatial experience between buildings as experienced in a corridor with constrained visibility. Examining the implemented KAHC site landscape plan, two distinctive movement structures, one for vehicle access and parking, and

the other for free pedestrian movement are seen. Re-stitching strategies are used across intended central area to connect the new museum with the historic palace ensemble, and enable diverse choices for visitors to move across the site and into open space areas. Re-stitching as a design tactic induce movement by involving major or minor re-alignments of pedestrian paths and their pattern of connectivity. Re-stitching may also increase spatial permeability and frequently involves the integration of large and small centers or nodes, followed by the recalibration of the axial path into smaller shorter fragments. As an instrumental design tactic, re-stitching can increase a historic districts spatial permeability (Middleton 2012). It is a strategy that may also formulate an over arching network of local sub-spaces related through axial linkages, as a global system of new spatial relations. Observations in the KAHC site highlight visitor use in many areas in the evening time, with higher user engagement and counts. Day time access and activity is minimal. Visitors are moving and situated in various types of spaces, both softscaped and hardscaped areas, and throughout the open lawn and rock outcroppings. The distributed organization of primary and secondary functions and activity spaces establish multiple dispersed spatial centers, with numerous path connections establishing linkages to functions on the site. Landscape design in this context seeks to establish semantic potentials for the engagement of multiple visual, social, and spatial events (Fig. 8).

The axial analysis of the KAHC site interior (Fig. 9) reflects a low level of spatial integration, with centrality and connectivity of sub-spaces across site not strongly indicated. The organization of the KAHC parks movement structure also does not establish a strong sense of integration or connectivity. This is indicated by the absence of red or orange line segments. Strong integration (red and orange line segments) reflects greater connectivity in the path system with the longest lines in the system typically containing more connections.[4] The darkest red lines signify the strongest points of integration, with the darker blue lines highlighting weak integration of adjacent spaces, or accessibility with movement paths to the larger spatial system. In the KAHC site, the most integrated spaces are the two large squares (midans) at the street edges on the lower left and bottom of Fig. 9. Interestingly, the axial analysis graph does reveal an even distribution of spatial areas with high axial line intersections, suggesting the presence of a diffuse network of sub-centers. Yet these are not expressed visually in the development. The landscape architect instead of conceptualizing an integrated and correlated structure of landscape and urban space organization that focuses on the instrumental reordering of spatial fragments to establish centrality, the applies a dialogical network design approach that formulates a web of social and spatial place making and visual experience.

5.5 Visual Structures Shaping Spatial Perception

A number of design techniques shape the visual experience of the site. Typical use of perspectives along long axial corridors of movement turn into sweeping scenic montage with a range of spatial depths. The rhythmic undulation of spatial sequence seen in Fig. 10 reflects a carefully planned landscape morphology that enables a multiplicity of individually sequenced spatial experiences. Together movement and scenographic place making form a dialogical narrative that realizes the stitching the new and old building ensembles. Interestingly, the structure of co-visibility experiences found across the site is hierarchically structured as a variable experience of wide openness, punctuated by the distribution of spatial zones with an even structure of decreasing visual permeability.

The VGA graph reflects a modulating field and interplay of openness and enclosure. This is interpreted to reflect a series of convex spaces set out as a node structure. This is indicated by a sequencing pattern of aqua and progressively darker blues of open spatial areas that surround the building masses. This pattern may be interpreted in the context of open space structured to reflect cultural values of privacy and enclosure in recreational use of outdoor spaces by families. The repeated distinctive patterning of light, middle, and dark blue hues as seen in the VGA graph, indicate open spaces that are visually enclosed, (surrounded with progressively darker hues) to signify limited visual transparency between spaces that structure private spatial experience. Studies using VGA analysis have found that the darkest blue areas are more segregated spaces from the open and centrally visible areas indicated by color hues of yellow and orange, with red indicating spaces with the highest degree of co-visibility in the spatial system. In the historic palace building ensemble, the perceptual structures are shallow in depth with views terminating into enclosing building facades. The visual structure of this space is indicated by darker shades of blue.

Overall the spatial organization creates a limited structure of visual permeability within the monumental park site. Two areas demonstrate high visual integration shown in yellow/red. These areas are identified as two prominent entrances to the new National Museum. The connective path network in the areas adjacent to the historic Murabba palace buildings demonstrate a high degree of visual privacy that is commonly found in Middle Eastern and Arabian settlement morphology. The growth of trees and shrubs further limits a

[4]For more information on space syntax theory and methods, please see Hillier and Hanson, 1984.

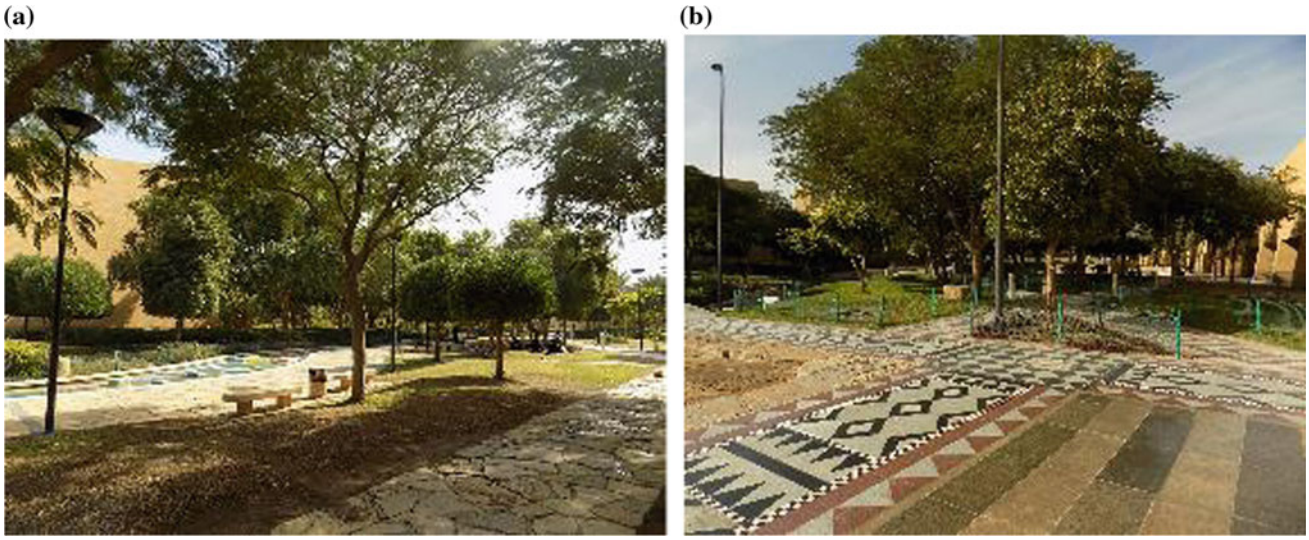

Fig. 8 Paths are structured in the open space between the new Museum and historic building ensemble

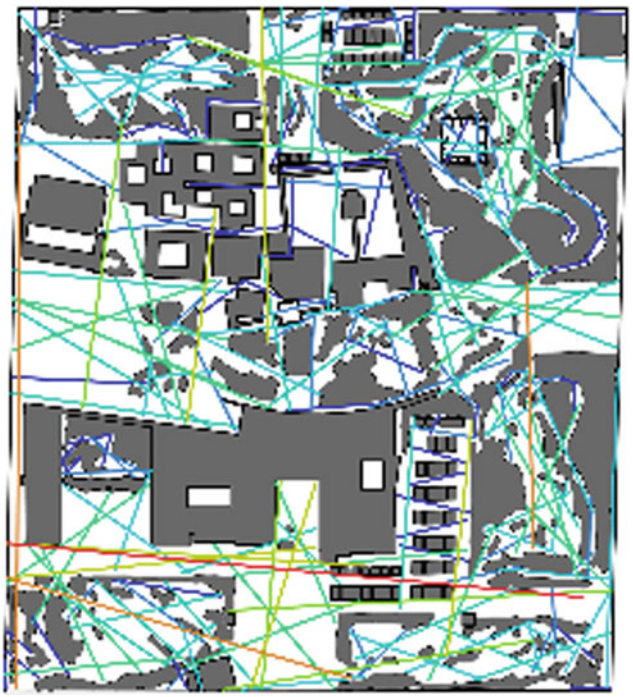

Fig. 9 Axial R3 graph of KAHC site interior

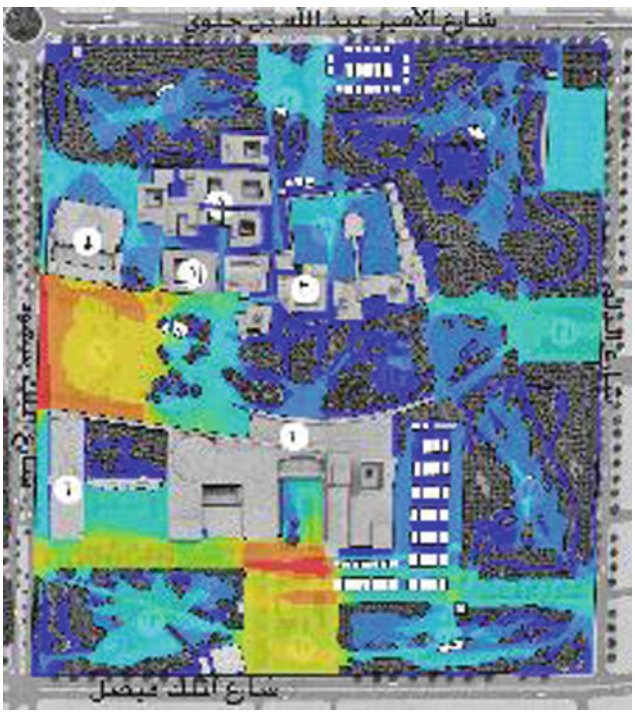

Fig. 10 VGA Co-visibility analysis

holistic perception of the main corridor between the new and historic building ensembles.

5.6 Identity as an Experience of Nature

The park landscape also constructs a variety of distinctive spatial and textural environments. Cultural motifs and tree plantations shape the visitor experience of a Saudi Arabian themed landscape. Together the materials present opportunities to imagine and visualize a distant past historic time. These landscaped areas are inviting and are frequently used for picnicing in the evening times. The scale and variety of natural scenes encourage visitors to disengage from the surrounding harsh urban environment, yet are difficult to distinguish in low (night time) light exposure (Fig. 11).

Softscape elements are used on the surrounding edges of the historic building ensemble and in close proximity to new

Fig. 11 Spatial variety and articulation with land forming and vegetation construct an indigenous nature experience

development. Indigenous qualities of local materials such as sandstone, palms, grass berms, and water are partnered with hardscape squares and walkways as dominant design elements governing the formation of landscape as place. The harder building ensemble areas are contrasted with a large diversity of open green spaces planted with indigenous trees, shrubs, ground cover, lawn, and palm trees that create distinctive scenic places across the KAHC site. The main design elements are hardscape elements of pathways, seating, and architectural lighting and play areas for children. The landscape patterns form cultural context of discovery for all ages. Insertions of foreign garden enclaves are also apparent such as the Andalusian courtyard with fountains and palm groves. Water forms a key design element in the park but is limited in its use across the site to specific positions on the site and near the new National Museum (Fig. 12).

5.7 Observation of Social Co-presence

How visitors experience the KAHC landscape is strongly shaped by ethnic, cultural, and climatic features. Observation of daytime usage of the park site is minimal and limited to administration facilities and offices. Infrequent visitors during the day may be picnicking expat families or visitors to the new National Museum. Social gathering patterns in the park peaks during evening hours, activated with lower outdoor temperatures. It is observed that spatial use is poorly integrated with the parks rich visual diversity due to poor lighting and way finding. This observation reveals a landscape and site design oriented toward daytime usage. The most used spaces are adjacent to the new and conserved buildings, as they are illuminated with architectural lighting. It is common to see families engaging in social lounging located near building entrances, or sitting in darkness in the gardens.

As a cultural expression, sitting outdoors amongst buildings with picnics and children playing resonates with the intangible values and practices of Saudi Arabian society. A strong connection of KAHC visitors to the buildings, both new and historical, is seen to be structured by gender and age group. The challenge for designers of arid urban landscapes is to activate their designs in the evening hours without flooding the site with harsh stadium lighting solutions while establishing an inviting and safe built environment. The distribution of building and activity functions on the site encourage visitors to engage in exploration and discovery. A number of visitors are strongly situated due to the intensive family picnic context and age range of children which poses difficulties for single parents to explore the large-scale site and natural environment (Fig. 13).

The design strategy for the KAHC monumental park and open spaces is characterized by its spatial and visual configuration, and its ability to compose spaces for co-presences and socialization. It is observed that the narrative representation of identity in KAHC is constructed through the composition and layering of views, different spatial environments – from intense natural areas to formal gardens, palm groves, and child play spaces. The site design encourages users to experience spatial juxtaposition with the visual qualities of space experienced through pictorial frames, enclosed spaces, and sequential flows. The interpretation of traditional architectural forms and details, are combined with distinctive open spaces that provide opportunities for a visitor to engage with the site over time in order to develop a reflective experience with deeper social–cultural meaning. Integrating landscapes and open spaces in the redevelopment and restoration of historically significant urban sites is an easy and attractive strategy with positive sustainable social and environmental outcomes.

This analysis of the KAHC design raises a larger practical design implication for our persistence in assuming the notion

Fig. 12 Sandstone berms and grassland oasis contrasts

Fig. 13 (**a**) Night time use and social activities in the KAHC Midan with new National Museum in the backbround and (**b**) contrasting use during the daytime

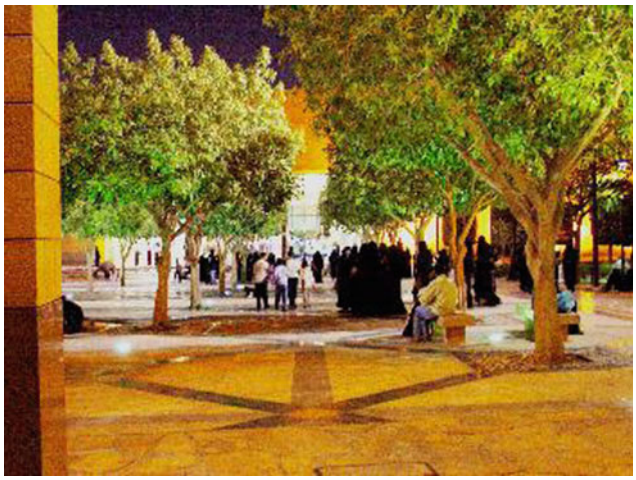

Fig. 14 Social behavior in open space

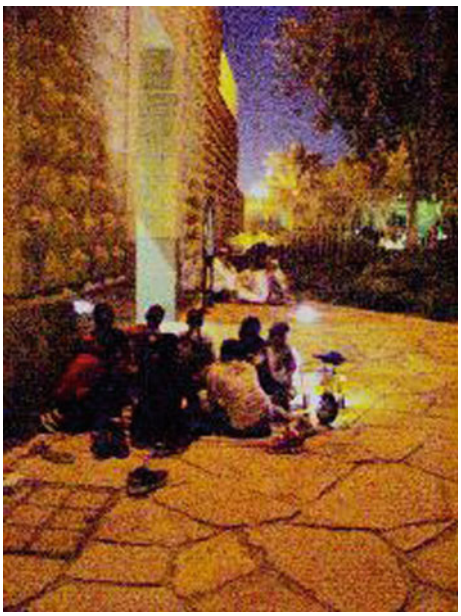

Fig. 15 Social grouping around buildings

of a dominant role for centrality in good urban fabric and landscape design composition. The poor results of centrality and integration observed in the space syntax analysis highlight the challenge facing landscape architects and planners to establish an alternative paradigm to spatial organization. This case study suggests that semantic articulation combined with a distributed network of spaces may be useful to formulate meaningful visitor experiences and provide opportunities for spontaneous social place making. Visitors are attracted and physically attached to the historic and new building ensembles. Future designs for similar sites should structure semantic narratives spatial experiences in ways that may enable visitors to continually change their experience with the historic site over time (Figs. 14 and 15).

6 Conclusion

This analysis highlights how instrumental and perceptual facets of design strategies may enable essential critical reflection at early phase project development. At the heart of the KAHC project is the opportunity created by the landscape designers, enabling visitors to co-construct meaning and participate in a living historic city through their daily experiences in a dialogically designed landscape network. Comparatively, examining only two spatial design approaches as undertaken in this study does not express the holistic experience of the KAHC park site and landscape design. The sequential narratives and visual structures presented by the conjunction of historic, modern, and variable landscape architectural form, and natural material choices, are rich in cultural meanings and phenomenal experiences. The landscape design is grounded in the regions natural landforms while celebrating public and ceremonial place making in the city.

Managers and planners working in historic urban districts must choose to either, focus on the integration of spaces and optimization of pedestrian movement, working from a conception of 'economical' basis of accessibility (Abrioux 2003), or select to design an architectural urban landscape synthesis that enables a cultural patterning of spatial behavior and dialogical co-construction of historic narrative and meaning. Deleuze and Guattari present through their concepts a decentered model of space as a productive act of enunciation that acts to produce milieus, organize milieus to produce territories, and semiotize milieus and territories to produce culture (Crofts Wiley and Macgregor Wise 2019). The mixing of semiotics in building and the landscape produce the expression and signs of space as enunciation. In contrast, a site and landscape design strategy based in space syntax theory, concentrates on space and user behavior as an affect, evaluating design outcomes with the concepts of integration, connectivity and centrality. The KAHC development maximizes the re-imaging and construction of a tangible spatial experience by focusing on the reconstruction of historic buildings, and through the rearticulation of synthesis and historical conjunctures. 'It is an expression that defines not only the affective territories in which people live out the possibilities of their lives, but also the condition of possibilities, as well as the limits of political struggle' as stated by Deleuze and Guattari. The KAHC project demonstrates a spatial model of culture and power, that sees culture and power as an active agent in the production of places and spaces, and historical memory. At the same time demonstrates the control of the landscape and urban designer of historic sites, to structure concepts of territory, assemblage, control, and becoming, that present challenges to the assemblage homogeneity (Crofts Wiley and Macgregor

Wise 2019), and co-construct a variable spatial assemblages in order to challenge the discourse of centrality and integration. The process of setting goals to be achieved in master planning thus celebrates historic urban conditions and addresses the need for social transformation and life to inform the site over time.

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The Influence of Public Art in Developing Chinese Urban Public Space: Current Trends and Future Directions

Han Cheng and Julian Worrall

Abstract

With rapid urban development and continuous infrastructure improvements, shaping a city's unique culture has become a new challenge that has attracted considerable interest from many urban developers over the past few years. Amongst a large number of strategies to develop an authentic urban culture, the use of public art is a promising approach. The paper aims to analyse the development of public art in the urban contexts of the Metropolises of Beijing and Shanghai, seeking to identify the developing trends of public art in Chinese cities. The development of public art within the context of mainland Chinese cities has been analytically explored. The findings put forward a number of potential approaches to encourage the implementation of public art policies in China. This can lead to the development of public art and its prosperity that sustains cultural diversity in China.

Keywords

Public art • Urban culture • Urban development • China

1 Introduction

Public art in China is being used in urban culture development as an essential means of cultural expression. As a carrier of urban culture, public art can express the concept of society's public life by creating vibrant spaces in Chinese cities (Weng 2009). Public art is the only art that can affect many people anytime, anywhere in urban space (Sitte 2013). It can achieve political didactic functions and create symbolic value and identity of the city, which plays a key role for the central government to achieve the development of urbanization and the cultural sector by political leaders in Mainland China. The development of public art in China has followed a different path to that of Western countries. In the 1950s to the late 1970s, China has broadened the scope of its art policy (Zheng 2017). As such, public art has been enriched and developed during the application and exploration of urban development (Wang 2007). Consequently, the development of public art in contemporary China is perceived to be still at a preliminary stage, but it is gaining momentum (Wu 2015). This demonstrates the inconsistent relationships between public art and the city as well as the relationships amongst the artists, spectators, urban policymakers, and citizens in China. Subsequently, this paper would provide suggestions towards the enrichment of public art and the growth of urban development in Chinese urban space. For this study, public art will be analysed in terms of relationships between local identity, local community, and local culture in Chinese urban space. The association between planning frameworks and creative strategies of public art will be explored and interpreted in the context of Chinese urban development.

Scholarship in this field, while limited, is increasingly focusing on the planning system and policies of public art in China. They are geared towards advancing urban entrepreneurialism through building the city image, which may, in part, be due to the change in orientation of Chinese leadership goals towards economic stability (Zheng 2017). However, no study has yet been undertaken to identify the relationship between public art, local identity, local community, and local culture in China's urban development. Correspondingly, this research aims to elucidate these relationships and proposes a range of approaches that can be employed in order to encourage the development of Chinese public art. The outcome of this study can potentially pave the way towards understanding the trends of the

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Y. Mahgoub et al. (eds.), *Cities' Identity Through Architecture and Arts*,
Advances in Science, Technology & Innovation, https://doi.org/10.1007/978-3-030-14869-0_10

development of Chinese public art and urban development. Moreover, the results can lead to devise a theoretical basis to guide the innovation in Chinese urban development.

2 Research Background

Public art is determined by the relationship between the artists, the public and the artwork. Hutchinson (2002) defined public art as "*work created by artists for places accessible to and used by the public*". He also outlines four stages involved in public art: (1) putting some art in some public place; (2) "negation", which is the realization and undoing of its vacancy; (3) the unity of the first two stages; (4) transformative practice, which includes transforming the possibilities of what public art might be. Moreover, Sun (2005) identified the four characteristics of public art: (1) public art is placed in public spaces and open for the public; (2) public art presents the local culture and/or history; (3) the audiences are specific or non-specific community and/or social groups; and (4) the funding of public art is mainly sponsored by the government and/or donations from the society (including private sectors or a third party). These findings are evolutionarily significant, supporting the hypothesis that the form of public art directly effects the future shape of local identity and local community, which will continue to reshape urban culture and urban landscape of global cities (Deaton 2015). The presence of public art leads to enhance the excitement of city spaces, which may also contribute to make the cities more pleasant places with vibrant culture (Motoyama and Hanyu 2014).

The evolutionary history of public art indicates that it can engage public dialogue and community, attract attention and economic benefit, connect artists with communities and enhance public appreciation of art (Hutchinson 2002). The development of urban public art has brought new vitality to the development of urban culture. Public art, while showing the distinctive local characteristics, can build the "city image" (Mccarthy 2006). Recent studies on public art in China provide evidence that public art is adapted to the urban space for urban development, such as in the process of updating the official guidelines of *The Eighth Five-Year Plan for Shanghai Urban Sculpture* (Shanghai Municipal Sculpture Commission 2006), which may also benefit building the "city image". Urban public art has the potential to become a unique symbol of a city, in the manner of the Great Wall in Beijing and the Opera House in Sydney. The visual art forms of these cities carry their own cultural significance, making them become symbols and landmarks of the cities.

According to the report "Towards an Urban Renaissance", chaired by architect Lord Rogers, achieving the revival of the city is to create a city of high quality and lasting vitality that people expect (Urban Task Force 2003). Cities in developed countries around the world are experiencing cultural renaissance after urban transformation (Posie 2001). The revival should solve the problems faced by urban transformation caused by industrial transformation, which is a comprehensive rejuvenation of social life, urban environment and urban culture (Hsing 2010). Urban revitalization and urbanization seek to comprehensively improve and develop a region by solving urban problems and contradictions. Public art changes with the development of urban form, according to the dynamic development process of urbanization. However, there is a lack of specialized urban sculpture construction management regulations in many Chinese cities. Since the open-door policy in China in 1978, the overall level of urban sculpture management cannot adapt to the development of the rapid development of urban sculpture construction, as urban sculpture construction management lags. Zheng Jiashi, Shanghai Nanjing Road in Shanghai City Sculpture Committee administrator, specified that: The progress of urban development from the early commemorative sculpture to today's cultural exposition of public art is changing dramatically. However, the national and states' policies and management still need to be improved (Liu 2015). As a result, this could interrupt the resonance between public art, urban planning and urbanization in China's urban space.

The report of the "Proposal on Sculpture Construction in Key Cities of China" submitted by the China Artists Association in 1982 was approved by the central government (Wang 2007). Accordingly, the central government allocated 500,000 yuan of special funds each year to support the promotion of urban sculpture in the cities. The organization of the National Urban Sculpture Planning Leading Group was established to manage the initiatives. Through the support of the policies, organizations and funds, the National Urban Sculpture Art Committee was established under the planning organization. The visions and goals are integrating sculpture into urban planning and building the relationship between sculpture and the city. According to the plan, the sculpture began to return to the urban space, which led "urban sculpture" becoming the main body of urban space. This is the process by which the sculpture leaves the "frame" and moves towards "public".

3 Methodology

This study adopted a systematic review to approach the existing body of literature through the keywords defined for this paper. Various databases such as Web of Science, Taylor and Francis, Science Direct and Google Scholar have been utilized to shape out the primary databases. During the initial screening process, more than one hundred papers were identified. They have been further analysed based on their

abstracts and conclusions in order to eliminate those with minor relevance. In addition, observation and documentation are engaged with the cases in Beijing and Shanghai in order to analyse the study. By gathering of case-study information through observation and documentation, 2D and 3D architectural diagrams were drawn and analysed to engage with the study (see Figs. 6 and 7). By integrating, comparing and analysing the two cases from Shanghai and Beijing, the mentioned objectives of this paper are addressed. The two cases' analysis and the study of public art and urban sculpture development characteristics are conducted in order to interpret the urbanization of Chinese metropolis. The findings and results will be presented along with accompanying conclusions through theoretical paradigms.

The study attempted to review and critically analyse Chinese public art characteristics. The research developed the theory and hypotheses for China's public art and relative to urban development through theoretical paradigms and by deductive methods (Cheng, 2016). The content analysis and the study of China's public art development characteristics are conducted in order to interpret the development of Chinese urban transformation (see Figs. 1 and 2).

Fig. 2 Conceptual model: evolutionary cycle

4 Implication from Study of Public Art in West for China

In regard to the policy report of the 18th National Congress of the Communist Party of China (Hu 2012), public art projects have mushroomed across the urban space in China, in order to promote and speed up the development progress of urbanization. During China's urbanization, sculpture themed parks, like Shanghai Jing'an Sculpture Park and Beijing International Sculpture Park, etc. within multiple public artworks, were built and redesigned in urban space. This could enrich residents' life and active urban public space by connecting different urban functional areas for multi-purposes.

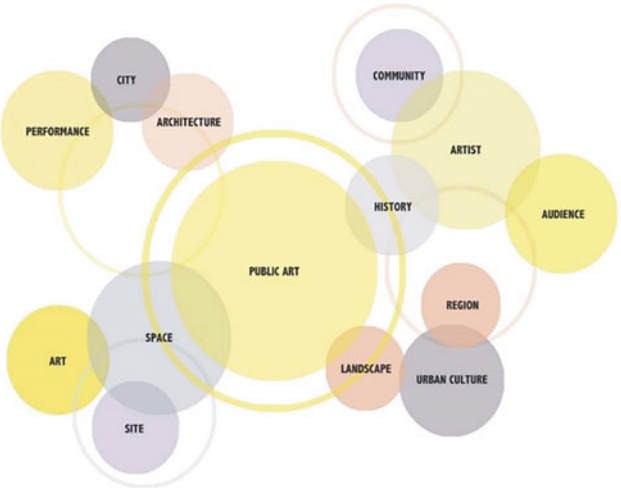

Fig. 1 Analytical diagram capturing relevant aspects of public art

4.1 Public Art Reflecting Local Identity

Public artwork has positive influence on the local community and tourists, so the local identity and social activities can be reflected by public art and build social engagement (Hutchinson 2002). The audience and community's engagement or participation with the artists and the local public art projects may be a solution to change and reconfigure their city and to improve their urban space (Mould 2014). Contemporary public art projects involving partnerships between local communities, artists and urban policy-makers offer exciting possibilities to create vibrant and active urban public space with community identity (Zebracki 2017). For example, the College Hill Bear Trail (see Fig. 3) sponsored by the Knight Foundation US shows that public art can make a significant impact on the perception of a place by understanding and building the relationship between public art and the audience. Such approach potentially illuminate public art could reflect and integrate with local identity to understand the demand of the community. For instance, in early 2004, Shanghai promulgated the Master Plan of urban sculpture and set up the city Sculpture Committee in various districts. According to "Shanghai City Sculpture Master Plan 2004–2020", by 2020, Shanghai will

Fig. 3 College Hill Bear Trail, USA

Fig. 4 The Bund Bull in Shanghai's Bund Financial Square

build 100 important urban landscape sculptures, 50 sculpture concentrated display areas (see Figs. 4 and 5), as well as including 5000 residential areas, industrial enterprises and street sculpture sketches, in order to gradually form a Shanghai city image (Hong 2014).

Moreover, public art initiatives in Chinese urban space can also demonstrate the social purpose of the policymakers. Substantial evidence from the UK suggests that policymakers could be more engaged in the social change of the locality and explore more ways to activate sponsorship (Zebracki 2017). This could have been mostly incited by advocating collaborative grassroots art production beyond formalized art market parameters (Zebracki 2017). The outcome of this cooperation can potentially lead to the conformity between public artworks to the rational exertion and beneficial integration of these elements and add to the aesthetic value. Beijing International Sculpture Park is in the downtown of Shijingshan District of Beijing, which is Beijing's largest sculpture theme park (see Fig. 6). It is a public

Fig. 5 Light of the orient on Pudong new area century square

welfare nature infrastructure invested by the local government of Beijing and organized by the District Green Bureau. The project was built in 2002, and the middle part of the project is under new construction since 2016. The redesigned sculpture park will be commenced in May 2019. The sculpture park is designed as a multifunctional urban public space, including diverse public artworks, which are designed by international and domestic artists from more than forty countries. The purpose of the project is to improve the urban environment, and promote the development of the surrounding real estate industry (Yan 2008). The site is in a busy residential area surrounded by newly developed residential buildings, business buildings, government administrative organizations, and Beijing's largest graveyard. New residential buildings were built on the south. The Beijing Babaoshan graveyard, which is located in the north of the site, is in the process of being moved out of the inner city for optimizing regional functions due to the new urban planning policy of Beijing Shijingshan District Planning Bureau (Construction Plan of Urban Planning System in Shijingshan District, 2016). Accordingly, the new functional area will be built in the north of the sculpture park after the displacement. The sculpture park would boost the development of the new project in the future to achieve dynamic urban space. As a result, this suggests that policymakers could be engaged in the social initiatives of the locality and explore deeper ways for activated spectatorship in China.

4.2 Public Art Engaging with Local Community

The evolutionary history of public art suggests that it can engage public dialogue and community, attract attention and

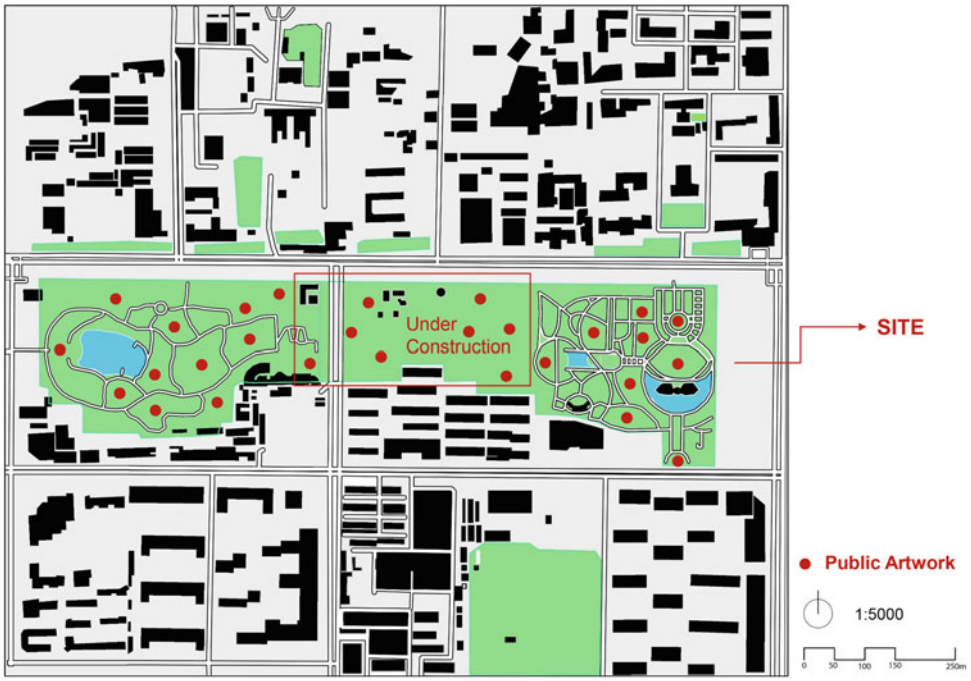

Fig. 6 2D site analysis: the urban context of Beijing International Sculpture Park

economic benefit, connect artists with communities and enhance public appreciation of art (Hutchinson 2002). Becker (2004) proposed that the public is the final beneficiary of public art. The emerging movement in China's urbanism has shown that public implementation and involvement are the key characteristics of public art initiatives (Silva 2016). In China, public art and sculpture gradually move towards outdoor urban space, integrating various artistic forms and categories by engaging with the local community and the audience (Wang 2008).

Shanghai Jing'an Sculpture Park is located on Beijing Road West and Chengdu Road North in the inner city of Shanghai. The park was commenced in October 2007 and open for the public. The project was designed as a leisure space for the people, embellishing the city with dynamic cultural atmosphere (Jing'an Sculpture Park 2017). This government invested public infrastructure activates different functional areas in the urban space of the city (See Fig. 7). The artworks in the park can active the spaces by connecting the surrounding business area, residential area and other functional areas in the city. The aesthetic value of public artworks in the urban context enhance the attractiveness of the space in Shanghai. According to the site analysis, new residential buildings were built around the site adjacent to the traditional residential blocks in downtown Shanghai by activating the urban space. Accordingly, the local economy and urban environment are promoted as it enhanced the collaboration between the related municipal departments and urban entrepreneurs in the building industries. Regarding the statics of Anjuke, an influential real estate agent in China, the value of the surrounding real estate property in 2019 is increased by 360% compared to the data in 2009 (Anjuke 2019). As a result, the public artworks and the sculpture park are conceived as both an economy-boosting driver and urbanization catalyser for the Chinese central government's cultural policies.

The sculpture parks in China can provide the general public with recreational and art-inspired activities, creating a model of the integration of green park space and cultural facilities in the downtown area of Chinese urban spaces. For instance, multiple art exhibitions (e.g. City Unbounded Exhibition) are held in the park in different periods (see Fig. 8) in Shanghai's Jing'an Sculpture Park. Students' exhibitions from universities can be seen in the park (see Fig. 9), in which way the young designers in the universities have can build a connection between their artworks and the audience in public. The role of artists and planners is to harness the enthusiasm and creativity in ways that are equitable, effective and locally appropriate (Finn 2014). This implies public art can engage with the local community within some parameters, which may result in numerous benefits from innovative solutions to a more engaged citizenry. For example, 120 volunteers from China and Japan helped put up temporary classrooms made of paper tubes after an earthquake destroyed Hualin Elementary School in Chengdu China in 2008 (see Fig. 10). The artists engaged

Fig. 7 3D site analysis: the urban context of Shanghai Jing'an Sculpture Park

Fig. 8 City unbounded exhibition in Shanghai's Jing'an Sculpture Park

Fig. 9 Students exhibitions in Shanghai's Jing'an Sculpture Park

Fig. 10 Public art project: building Hualin Elementary School, China

with the local community to solve the problem with the community-orientated public art project. This project demonstrated how the flexible, responsive nature of community-orientated initiatives can provide effective disaster relief to cities in times of need. As a result, public art initiatives in China can contribute to solving urban problems in urban spaces by engaging with the local community.

4.3 Public Art Representing Local Culture

Public art could be something more than mere art with specific art styles, but also can generate a moment of public pedagogy (Ding and Schuermans 2012). In China, public art should be diverse and inclusive in urban public space regarding to the multi-culture and local community, which makes its expressive methods capable of being developed

(Wang 2009). The emergence of new public spaces in Chinese cities has resulted in creating space for a wide range of public activities, such as diverse consumption activities and leisure activities. The social purpose of public art in China is associated with local history and culture and has become a hot topic in China's urbanization. In global context, public art can boost local economy by generating cultural tourism (Hutchinson 2002) and even transfer a cultural shift in urban policy (Currier 2008). As an illustration, the Crown Fountain Millennium Park project in Chicago (see Fig. 11) designed by Jaume Plensa shows that public art can create a vibrant culture and active public spaces for the residents in the city. This has bearing upon the increasing autonomy of local municipal and cultural policy in China. According to the research, the central government of China has decentralized power to local states, and municipal governments permitted district authorities to possess greater autonomy in order to achieve economic growth (Zheng 2017). For instance, as the only large-scale space for green space, shopping plazas, entertainment and leisure, Beijing Xidan is a diversified commercial zone on Chang An Street. The Xidan Cultural Square, which was a dynamic urban space with public artworks (see Fig. 12), is under new construction (see Fig. 13). During the transformation process, Xidan Cultural Square will add cultural attributes while incorporating the original commercial functions and integrate into the essence of Beijing's "three major cultural belts" to display the cultural essence of Beijing: the Great Wall Cultural Belt; Xishan Yongding River Cultural Belt; and Grand Canal Culture Belt (Chi and Gao 2018). Current policies cover cultural industries and urban development with an emphasis on the entrepreneurial functions of cultural assets (Jin and Otmazgin 2014). This suggests that public art in China can represent local culture and promote the development of local cultural industries. This, in turn, may instigate the exploration of the relationship between public art and local culture in China.

Fig. 11 Crown Fountain Millennium Park in Chicago, USA

Fig. 12 The old look of Beijing Xidan Cultural Square, CHN

Fig. 13 The Beijing Xidan cultural square under new construction, CHN

5 Discussions and Conclusions

With the rapid development of Chinese urbanization, the requirement for planning and management of urban public artworks is increasing. The approaches of development strategies could be applied for Chinese urban public art: (1) accomplishing the urban public art plan, consummating the related management mechanism; (2) optimizing the management system and perfecting the urban public art policies and regulations.

In the process of urban public art development, the construction of urban public art is speeding up (Yu and Wan 2015). By engaging with the urban spaces, public art could optimize the city image and improve the city's living environment for the residences, which would contribute to the development of urbanization in China (Jiang 2016). As a result, the management mechanism and planning theories of

urban public art should be continuously improved and finalized, in order to achieve the resonance between urban public art and urbanization in Chinese urban spaces. In addition, the City Public Art Committee should be formed to ensure the overall planning and management of urban public art effectively, in which way the long-term development of public art and urban sculptures could be under professional guidance.

The various cultural contexts, urban landscapes and historical backgrounds in China contribute to the diversity of public art in urban public spaces. Consequently, the understanding of the unique local culture and local community where such spaces exist should be the starting point for public art projects and policymaking. Thus, vibrant urban cultures and landscape can contribute to the representation of the local community and identity in China. Public art has the characteristics of diversity and pluralism in both cultural and aesthetic forms, which are identified with the integration and permeation of regional culture into public art projects. Public engagement and participation in public art projects can help reflect the local community and identity. Consequently, the community and audience engagement with public art initiatives in urban spaces can become an important and integral part of urban development. Public art projects, as a feature of social and cultural development, have influenced developing trend in Chinese art practice generally. As a result, public art in China tends to generate positive and reinforcing relationships in urban space through spatial method, instead of creating isolated artworks.

Public art can be a vehicle to deliver local culture representing the local identity and community. The core concept of public art can also be a servant to steer the culture of community towards further cultural enrichment. Notwithstanding the progressions made in Chinese public art, it is yet to be fully fledged and requires significant investment to be made in this area. In the progress of Chinese urban development, the demand for public art is rising. As there are different functions in urban public space, the local culture in specific regions and the public artworks can be engaged with the urban landscape. In addition, public art can help solve local problems in the urban development in China. By making a relationship between urban development and local community, public art can become an interdisciplinary outcome of local culture and urban development. Meanwhile, public art can help recover the relationship between urban landscape and specific audiences. As a result, public art will play an important and positive role in the process of urban transformation of Chinese cities.

Acknowledgements No conflict of interest.

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Reviving the Historical Hajj Route in Old Jeddah

Marwa Abouhassan

Abstract

Jeddah's prosperity was based on two distinct and sometimes overlapping roles. It was a major Red Sea mercantile center between the Indian Ocean trade routes and the Hejaz region and beyond. Secondly, it acted as a gateway for pilgrims to Makkah who arrived by sea. Both of these contributed to a vibrant, diverse, and prosperous society. These two twin strands, trade, and pilgrims were reflected in the urban fabric. The historic area of Old Jeddah has great importance at the historical, architectural, and urban level. Jeddah went through dramatic changes in the last 70 years after demolishing the old city wall and oil booming which affected the identity, traditions, and lifestyle. The generally poor social conditions in the old city combined with the lack of maintenance and conservation of the buildings contribute to the negative image of the area and its surroundings and mitigate against the urban fabric being seen as something that is valued and needs to be sustained. Currently, Jeddah Municipality in coordination with the Saudi Commission for Tourism and Antiquities (SCTA) and the civil society participation try to make a strategy for the revitalization of the old city. The paper aims to study the current situation of the Hajj Route in Old Jeddah to present a strategy to revive it and increase the identity and the sense of belonging in Jeddah City that will help the tourists to have a pleasing experience. As a part of these efforts, the paper will recognize the existing situation in the urban pattern of the historical Hajj Route in Old Jeddah. After analysing and defining the results, the paper will explain how we could revive the community memories from the past that related physical elements and social interaction to increase the identity and the sense of belonging in Jeddah City.

Keywords

Revitalization • Historical places • Old Jeddah • Identity • Urban development

1 Introduction

On the eastern shore of the Red Sea, Jeddah was an important port for trade and goods coming from the Indian Ocean to Makkah. The prosperity that this trade brought led to the development of a multicultural city between the sixteenth and the early twentieth centuries, which attracted merchants from the Maghreb, Arabia, and as far afield as India and Southeast Asia. Jeddah devel oped a distinctive architectural tradition and mixed with other traditions from other trade routes. The pinnacle of its prosperity was at the end of the nineteenth century when the opening of the Suez Canal and the introduction of regular steamships extended the trade north to Europe. The wealthy merchant who benefited built elaborate, seven-story tower houses, with windows shielded by pierced and fretted wooden screens known as Roshan. Jeddah had since the fourteenth century and maybe earlier acted as a port for pilgrims visiting Makkah from India, and North, East and West Africa. This role expanded significantly in the late nineteenth century and is reflected in the accommodation then offered by the city for as many as a 100,000 pilgrims a year.

2 Research Objectives

The main goal of this paper is to study the current situation of the Hajj Route in Old Jeddah to present a strategy to revive it and increase the identity and the sense of belonging

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Y. Mahgoub et al. (eds.), *Cities' Identity Through Architecture and Arts*,
Advances in Science, Technology & Innovation, https://doi.org/10.1007/978-3-030-14869-0_11

in Jeddah City that will help the tourists to have a pleasing experience. This goal is coming from the Saudi 2030 Vision to enable and improve the tourism in KSA to compete internationally and by promoting the National Arab and Islamic heritage of the Kingdom.

To fulfill this goal, the paper will summarize the objectives as follow: first to study the existing situation in the urban pattern of the Hajj Route; second analyze this route to know what are the strengths, weaknesses, opportunities, and threats affecting it; and third to set some recommendations that present a strategy to revive the Hajj Route with its important buildings and activities to improve the visitors' experience. These recommendations will be integrated with the heritage tourism plan in Saudi Arabia.

3 Methodology and Tools of the Study

The research methodology is a case study research method that depends on the qualitative techniques by using different tools as site visits, site observation, conducting interviews with visitors and citizens, and existing data from previous reports and studies.

The study focuses on how the urban built environment is integrated with social dimensions to increase the identity and the sense of the place which will help to revive the Hajj Route.

The research starts with the literature review that illustrates Historic Jeddah, the Gate to Makkah, and the Hajj Route. After that, the research will study and analyze the current situation of the Hajj route in Old Jeddah which will be the case study. The paper will be ended with the recommendations and conclusion to revive the Hajj Route and make it as a tourist and social route.

4 Literature Review

4.1 Brief History

Historic Jeddah played a great role being the gate to Makkah for Muslim hajj reaching Arabia by boat, and then it was made the official port of Makkah at the seventh century AH by the 3rd Caliph Othman ibn Affan. This annual Muslim pilgrimage (Hajj) gave Historic Jeddah a distinguishing feature where Muslims from all over the world worked and stayed, which helped in adding to the city's development and thriving (Fig. 1) (2016).

As a stop along the religious "tour" with easy access by plane, boat, and car, Jeddah and its culture, food, architecture, and lifestyle have been greatly impacted. All of that was related to the pilgrimage which has extremely helped in defining Jeddah's identity. Today, the old city represents a small though fundamental entity within greater Jeddah, with about 1/100th of its overall population residing there (Bokhari 2006).

The link with Hajj is also very evident in the urban structures which appear in the traditional souks located from West to East, from the sea to Makkah Gate. Also, it appears in the Ribats and the Wakalas that used to host the pilgrims (Buchan 1996).

In the architecture, you can realize it in the architectural features of the facades, in the internal structure of the houses and in the very social fabric of the city, where Muslims from all over the world worked, moved, and lived together. All of these elements, intangible and tangible, demonstrate the long-lasting and strong connection between the urban structure and pilgrimage which is an example of the diversity in the culture created by this important religious event in the whole Islamic world (Bagader 2018).

Historic Jeddah shows the prospering of the trade from the Indian Ocean to the Red Sea after the Suez Canal was opened in 1869 which introduced the steamship that connected Asia and India with Europe (Fig. 2). This encouraged many merchants to build many houses full of architectural features, and also it led to developing many mosques and souqs. Moreover, the increase of seagoing boats permitted to increase the number of pilgrims who are making the Hajj to Makkah, which led to provide more accommodation facilities for these visitors. (Ashworth and Larkham 2013).

4.2 The Architectural and Urban Identity of Historic Jeddah

Historic Jeddah represents a unique evolution of architectural tradition along the Red Sea. The courtyard house is typical in the Muslim world and testifies to the privacy of the family, positioning the courtyard in the middle of the home and surrounding it with the rooms. However, due to limited land and climate conditions (heat and humidity), Historic Jeddah breaks with this tradition, featuring coastal homes characterized by imposing towers decorated with large wooden windows (Roshan) (2016) (Fig. 3).

The United Nations Educational, Scientific and Cultural Organization (UNESCO) assign Historic Jeddah in the World Heritage Site due to its magnificent development of the architectural style, its historic and symbolic role as a gate to Makkah for many Muslim pilgrims and its preserved urban fabric as elements of its outstanding universal value. Historic Jeddah's tower houses are unique because of their large and complex wooden casements, or Roshan. This feature illustrates the evolution of the lower coral houses that populated many of the other cities on the two coasts of the Red Sea since the sixteenth century. Around the tops of many Roshans were ornate units called Rafrafs. The Rafraf

Fig. 1 Historic Jeddah, gate to Makkah. *Source* Al-Ban (2016)

Fig. 2 Ways to Makkah from various parts of the world. *Source* Ashworth and Larkham (2013)

stands forward on brackets and is frequently ornamented with a fringe of flat wooden details around the perimeter. Their primary purpose is practical (to cast shade on the upper part of the Roshan), but they often serve as exterior decoration (Saudi Commission for Tourism and Antiquities 2013).

The play of colors, styles, and carved wooden ornamentation and latticework of Roshan façades contributed to a distinct visual character of the city (1994). The projected bay windows and the openness of the carved wooden patterns animated a unique dialogue between the interior of the house and the urban spaces beyond. It created a fine and interesting line between the privacy and the publicity of the house Historic Jeddah, which is a traditional urban environment with its traditional souks, retail shops, popular restaurants, street food vendors, and small cafes. It is considered as a pleasant environment where workers from all over the world sell their products to non-Saudi and Saudi customers in traditional crowded souks. Away from the attraction of the tourist, Historic Jeddah transmits the image of the commercial city and pilgrimage used to be (King 1998).

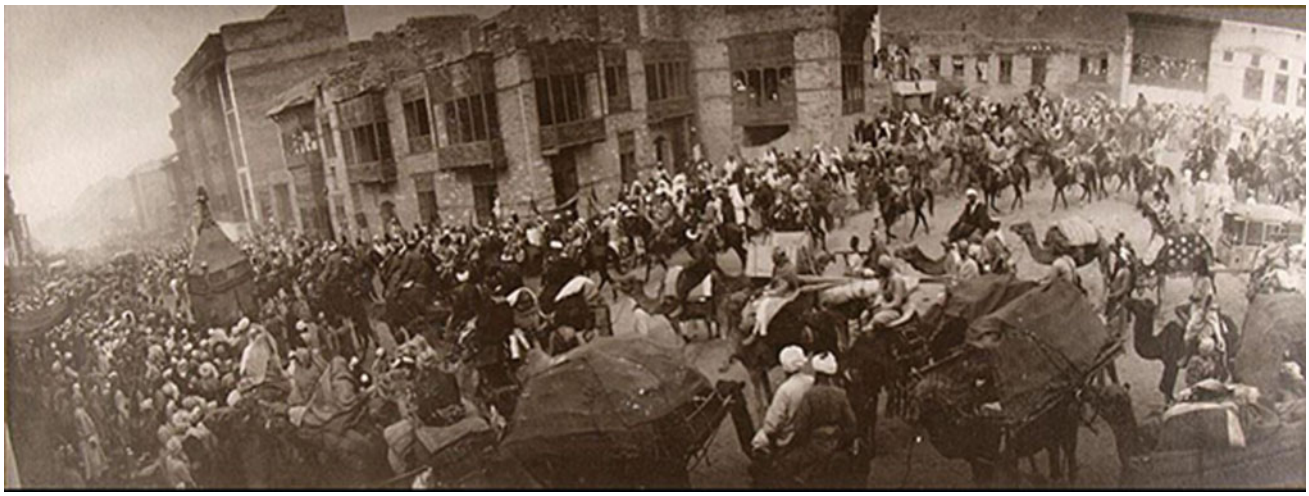

Fig. 3 Historic Jeddah represents a unique evolution of architectural tradition. *Source* Al-Ban (2016)

The houses in Historic Jeddah have not been ultimately changed by some modern additions and conversion, and the "Roshan tower houses" are generally good conserved. The function, role, and most of the original features of historic mosques have been conserved. Minor maintenance in other buildings has only been subject to the established wooden beams and the original masonries to conserve the overall originality of the site. Historic Jeddah will be conserved and rehabilitated to bring back its importance (Fig. 4). (UNESCO 2014).

4.3 Sense of Place and Place Attachment

People are active shapers of their environment (Twigger-Ross and Uzell 1996), and they perceive places in various ways. They prefer places that make sense to them, and they feel attached to or become dependent on places such as home. People are the creators of places, and sense of place is personally and socially constructed. That means place meanings can be influenced by many personal and social attributes (in addition to physical settings) such as

Fig. 4 Roshans examples. *Source* Researcher

culture, gender, activities performed in a place, individual preferences, social position, age, and feelings (Lewicka 2011).

Scholars have identified constituents of "place" such as meanings, activities, physical setting, self, and others. For example, people form personal impressions of a spatial setting which varies with experience and the context of the space (Mandeli 2008). Spatial configurations, forms, materials, colors, and lighting can influence how we perceive a place. Also, an artifact's physical attributes such as shape, color, and complexity and its symbolic attributes such as the meanings it elicits can influence how we appraise the setting (Gustafson 2001).

A sense of place is defined by Steele as "an experiential process created by the setting, combined with what a person brings to it" (Steele 1981). On the other hand, place attachment is defined as a bond to places based on thoughts and emotions, and it is a complex, dynamic experience.

Belonging to place is in a level higher than a sense of place. From the point of environmental psychology, the place belonging is referred to the person's cognitive relation with an environment or a certain space. Among the factors enhancing the sense of belonging to place is the interaction of individuals with each other by making attractive spaces, the presence of dwellers can be more pronounced in the public sphere of neighborhood through the prediction of space, equipment, and furniture for using different social groups and encouraging them to sedentary activities, such as sitting, standing, and reducing their speed (Sarmast and Motavasseli 2010).

4.4 Protection and Management Requirements

In order to provide the legal basis for Historic Jeddah protection, the Saudi Ministers Council has set the New Museums, Urban Heritage and Antiquities Law by the Royal Decree Number (M/3) issued November 2nd, 2014.

The local branches of the Jeddah Municipality and SCTA are responsible for the daily management. Their crew is responsible for supervising protection, cleaning, maintenance, and presentation of the site. On the other hand, the Interior Ministry is taking charge of the social well-being of the citizens and the arrangement of security in the area with coordination of Police and Civil Defense. The traditional mechanism, based on the figure of the Umdah, allows engagement of all owners' associations and merchants in the property management. The Jeddah Municipality in 2011 ensured the conservation of the Site Universal Value which is confirmed by the new Urban Regulation that set strict obligations and precise for the buffer zone and its property (Bagader 2018).

The new Urban Regulation specifies official rules and standard that can be used on site. The involvement of owners and merchants in the revitalization and restoration projects will help to tackle many significant threats to the property. This will reduce any negative development which could affect its integrity and authenticity (Daghistani 1991).

Jeddah Municipality in coordination with the Saudi Commission for Tourism and Antiquities (SCTA) and the civil society participation set the overall strategy for the preservation and revitalization of the area. They developed a detailed conservation strategy to find out how the massive, long-term conservation project, through conserving and stabilizing the historic buildings and generating new uses, will be approved and resourced. Also, it should be supported by detailed surveys and analysis of the properties (Jeddah Municipality 2018).

5 Case Study Analysis

5.1 Location

The case study is part of Hajj Route, which is located in Historic Jeddah. It starts from Bab Albunt to Bab Makkah. The length of the route is 930 m (Fig. 5).

This route includes very important building like Nassif House, Nour Wali House, Mimar Mosque, and Almaghrabi Masjid. And also different souqs like Souq Qabel, Souq Al Alalwi, and Souq Bab Makkah.

The route has a significant urban pattern consist of narrow pedestrian paths and collecting nodes (Fig. 6).

Fig. 5 Case study location. *Source* Researcher

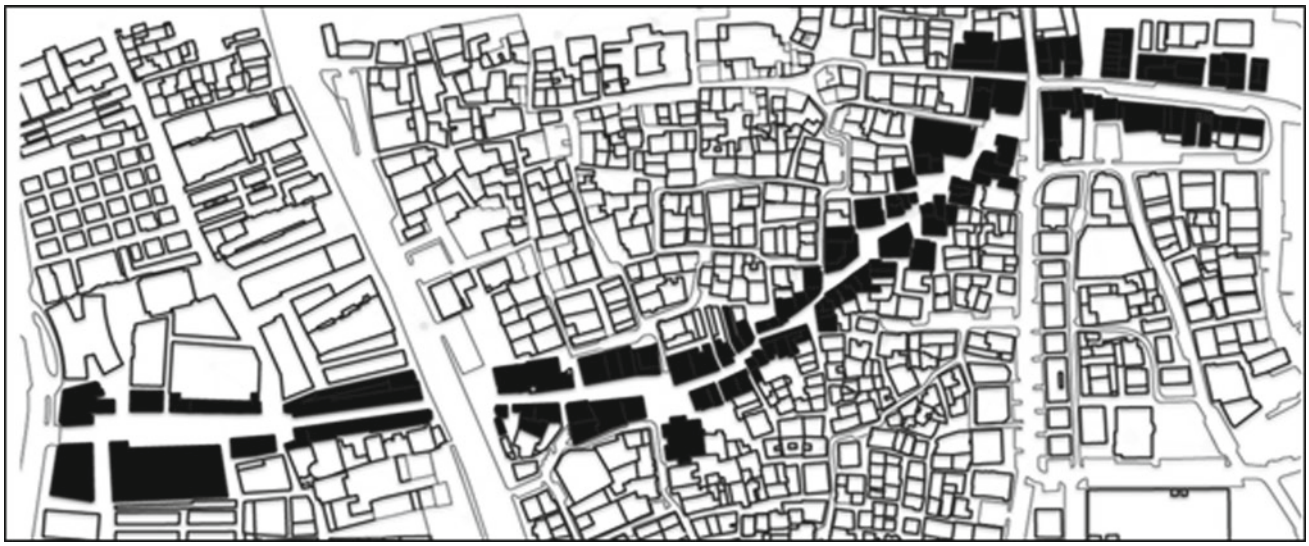

Fig. 6 Case study urban pattern. *Source* Researcher

5.2 Existing Conditions

- Buildings Uses

The majority of the ground floor buildings was used as commercial space. There in a variety of markets and shops selling different products. Some of the products include food, spices, carpets, rugs, jewelry, souvenirs, incents, and much more. There are also few museums throughout the route that attract people and bring a story from the history to the site (Fig. 7).

The buildings containing more than one floor typically have residential housing above the first floor commercial space. There are also some offices above the commercial spaces on the first floor. It is uncommon for commercial buildings to be above ground level, the 32% of buildings, which makes up the commercial typical floor, are all first-floor buildings (Fig. 8).

- Buildings conditions

The majority of the buildings throughout the route are in moderate condition. Since the site has been named a UNESCO world heritage site, there have been some renovations and reconstructions of existing buildings. But, until now there are 31% of the buildings with poor condition which need an urgent work to revive the route (Fig. 9).

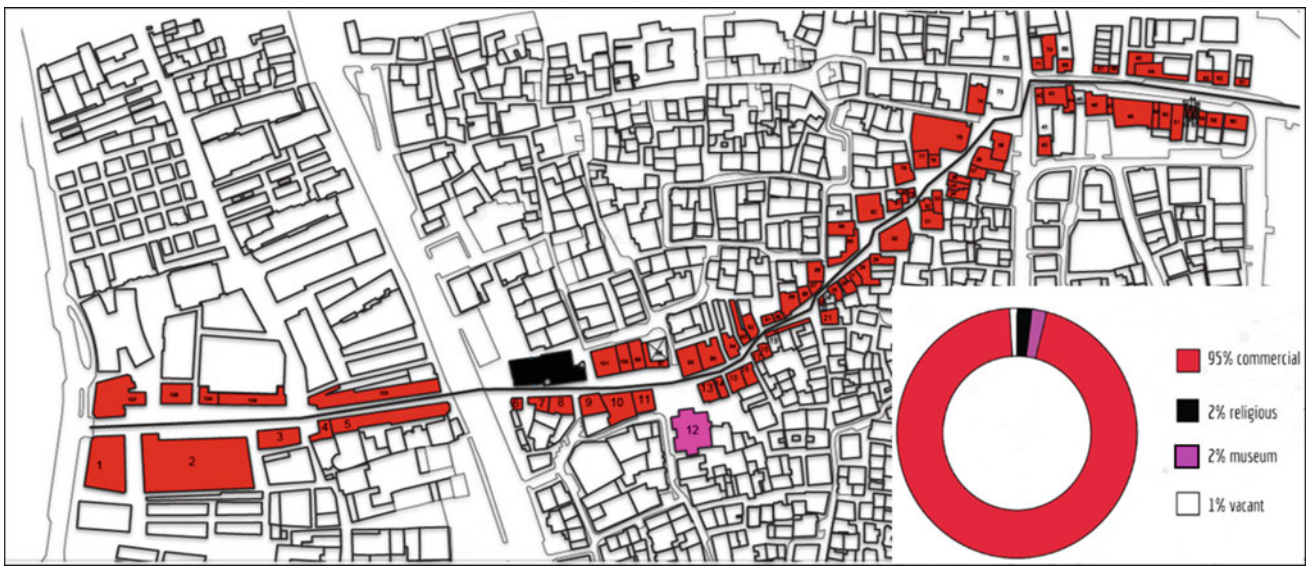

Fig. 7 Ground floors buildings uses. *Source* Researcher

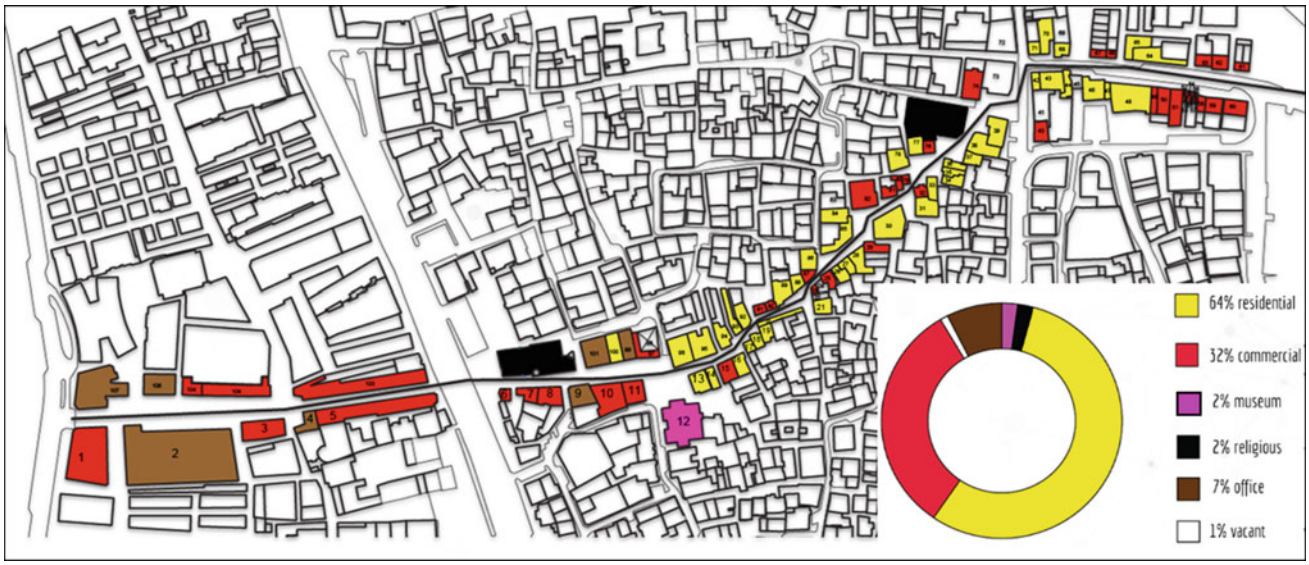

Fig. 8 Typical floors buildings uses. *Source* Researcher

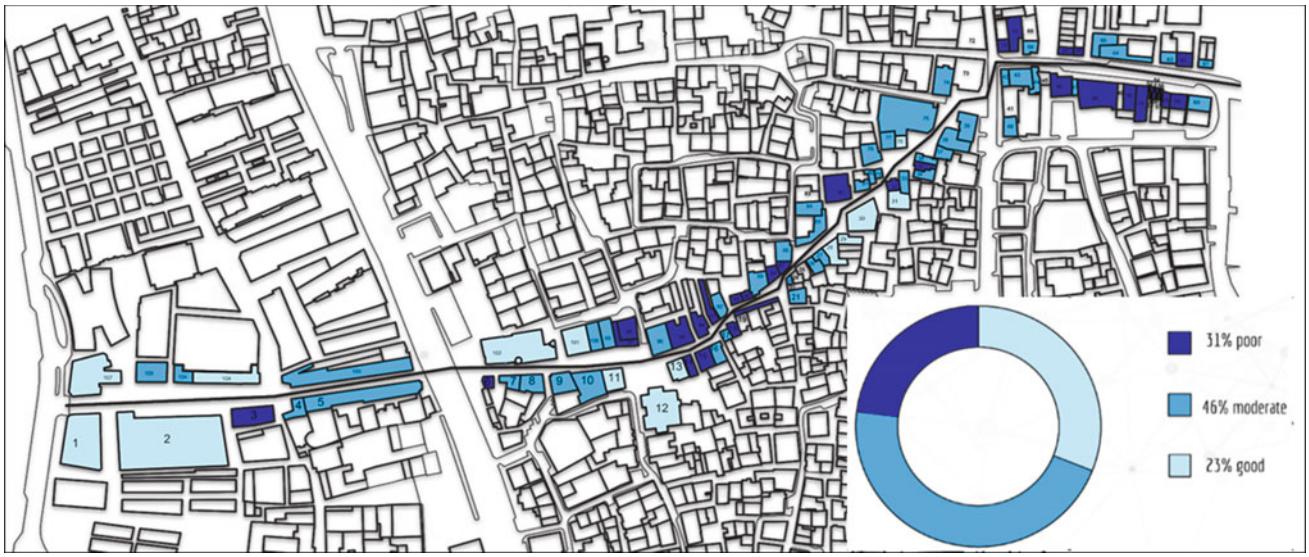

Fig. 9 Buildings conditions. *Source* Researcher

- Buildings Heights

Most of the buildings are 1–2 floors. There are a few buildings reaching above 6 floors that stand out compared to the rest. There is a mix of building heights throughout the path that changes the sense of enclosure a person has while walking through the route, with the scenes around constantly changing from different perspectives (Fig. 10).

- Users' questionnaire

The researcher has visited the case study at different times during a week and a random sample of 100 pedestrians was selected to participate in the research (Figs. 11, 12, 13, 14, 15, 16, 17 and 18).

The questionnaire shown in Fig. 11 was administered to them.

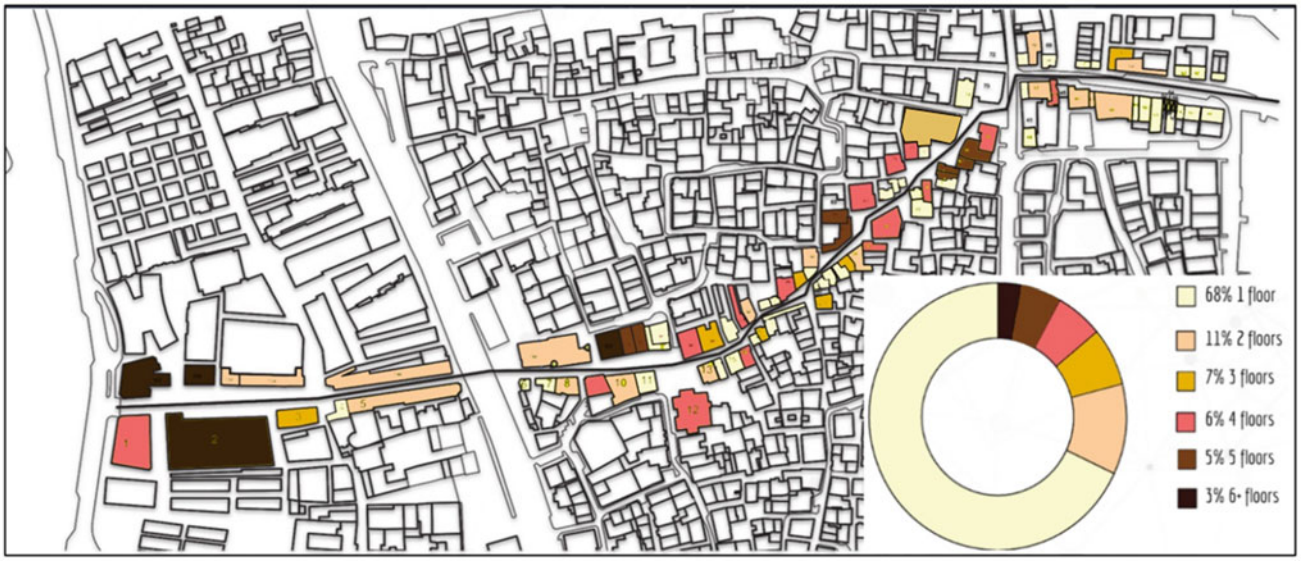

Fig. 10 Buildings heights. *Source* Researcher

5.3 Existing Conditions Analysis

The information from the previous survey and users' questionnaire was analyzed in order to identify the strengths, weaknesses, opportunities, and threats for the route.

Strengths:

- The route has an important historical value.
- There are many important heritage buildings increase the value of the route.
- The urban pattern of the route provides good open spaces.
- The route has some religious and commercial activities (Fig. 19).

Weaknesses:

- Many heritage buildings are in poor conditions.
- No maintenance for the architectural elements of the buildings.
- Many people do not know the importance of this route and its significant historical value.
- The route has bad urban design elements (Fig. 20).

Opportunities:

- Conserving the facade of the existing buildings to create inviting and socially active route.
- Reusing the heritage buildings to represent the history of the route.
- Adding more activities in the open spaces to increase the sense of belonging.
- Improving the urban design quality of the route to increase the walkability (Fig. 21).

Threats:

- The collapse of heritage buildings for their poor condition.
- Ruining the traditional urban pattern if we will not revive it.
- The lack of awareness of the owners with the importance of the route leads to a lack of interest in its revival.
- The cost of reviving the route may be high, so investment should be encouraged (Fig. 22).

5.4 Recommendations to Present a Strategy to Revive the Historical Hajj Route

- Create a healthy, safe, active, and sustainable path (Fig. 21) by:
  - Increase the green spaces and outdoor seating areas.
  - Reuse the heritage buildings to be as exhibitions and museums to present the history of the route.
  - Adding more activities in the open spaces to increase the sense of belonging.
  - Improve the quality of the sidewalks/paths and pavements.
  - Increase the degree of cleanness of sidewalks/paths.
  - Adding more public services.

Questionnaire

Part 1: General Information:

- Name (Optional): .....
- What is your gender? ☐ Male ☐ Female
- What age group best describes you?

☐ <18 ☐ 19-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60-69 ☐ > 70

- Are you: ☐ Citizen ☐ Tourist
- How often do you walk in this route?

☐ Every day or nearly every day ☐ A few times a week ☐ Rarely

- What are the reasons for your walk?

☐ Going to house ☐ Going to a specific place (Mosque, office, etc.) ☐ Shopping ☐ Walking and Enjoying

- How long (in minutes) is your usual walk?

☐ Less than 30 minutes ☐ 30-60 minutes ☐ 60-120 minutes ☐ More than 120 minutes

Part 2: People's Evaluation of urban design quality of the route:

Evaluation is five-scale measurement ranging from strongly disagree to strongly agree with number three as the neutral point. (1-Strongly Dislike, 2- Dislike, 3-Neutral , 4-Like, 5- Strongly like)

	1	2	3	4	5
1. Impact of valuable buildings on attracting you to visit the route					
2. There are exhibitions and museums to represent the history of the route					
3. Do you like to visit the commercial areas in the route?					
4. Effect of the activities in the route on encouraging you to walk in the street					
5. The width of the sidewalks/paths enough for users to walk					
6. Quality of the open spaces in the route					
7. Are the sidewalks/paths lighted for use at night?					
8. The green and shaded area are sufficient					
9. The quantity of street furniture in the route					
10. Quality of the sidewalks/paths and pavements					
11. The degree of cleanness of sidewalks/paths					
12. Quantity of public services (public toilets, phone cabinets,..)					

Fig. 11 Users' questionnaire. *Source* Researcher

- Reviving the commercial façade of the route (Fig. 22).
- Create a reviving strategy to improve the appearance of the existing buildings to create inviting and socially active route. This strategy could be implemented by refurbishment, restoration, or reusing the buildings according to the case of each building (Fig. 23).
- Attracting more people to the area by providing different activities and workshops (Fig. 24).

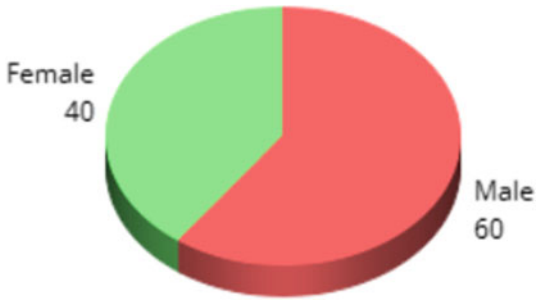

Fig. 12 Participants' gender *Source* Researcher

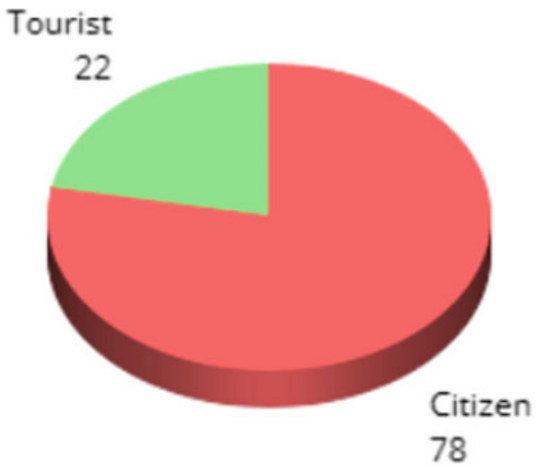

Fig. 13 Participants' origin *Source* Researcher

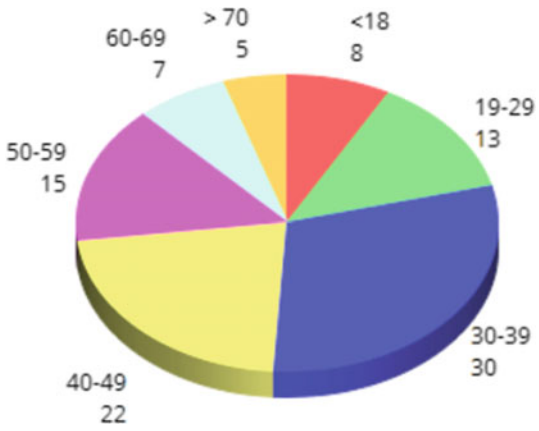

Fig. 14 Participants' age *Source* Researcher

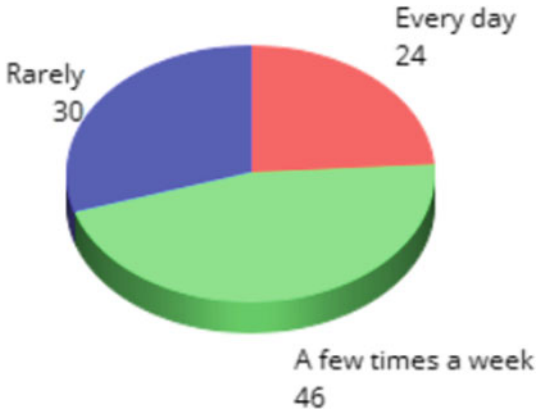

Fig. 15 Frequency of using the route *Source* Researcher

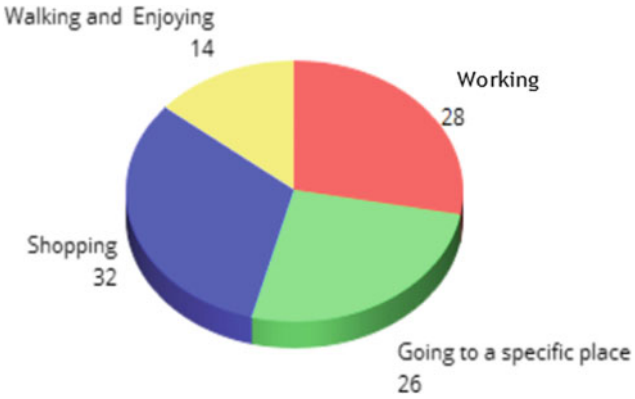

Fig. 16 Reasons for walking *Source* Researcher

Fig. 17 Duration of the walk/week. *Source* Researcher

- Creating better quality open spaces, upgrading the streets, and the infrastructure to increase social interactions that can lead to a feeling of a sense of belonging towards the place (Fig. 25).
- Increase the knowledge of the people about the importance of this route and its significant historical value by reusing some spaces as exhibition areas and museums to represent the history of the route and represent the old traditions (Fig. 26).

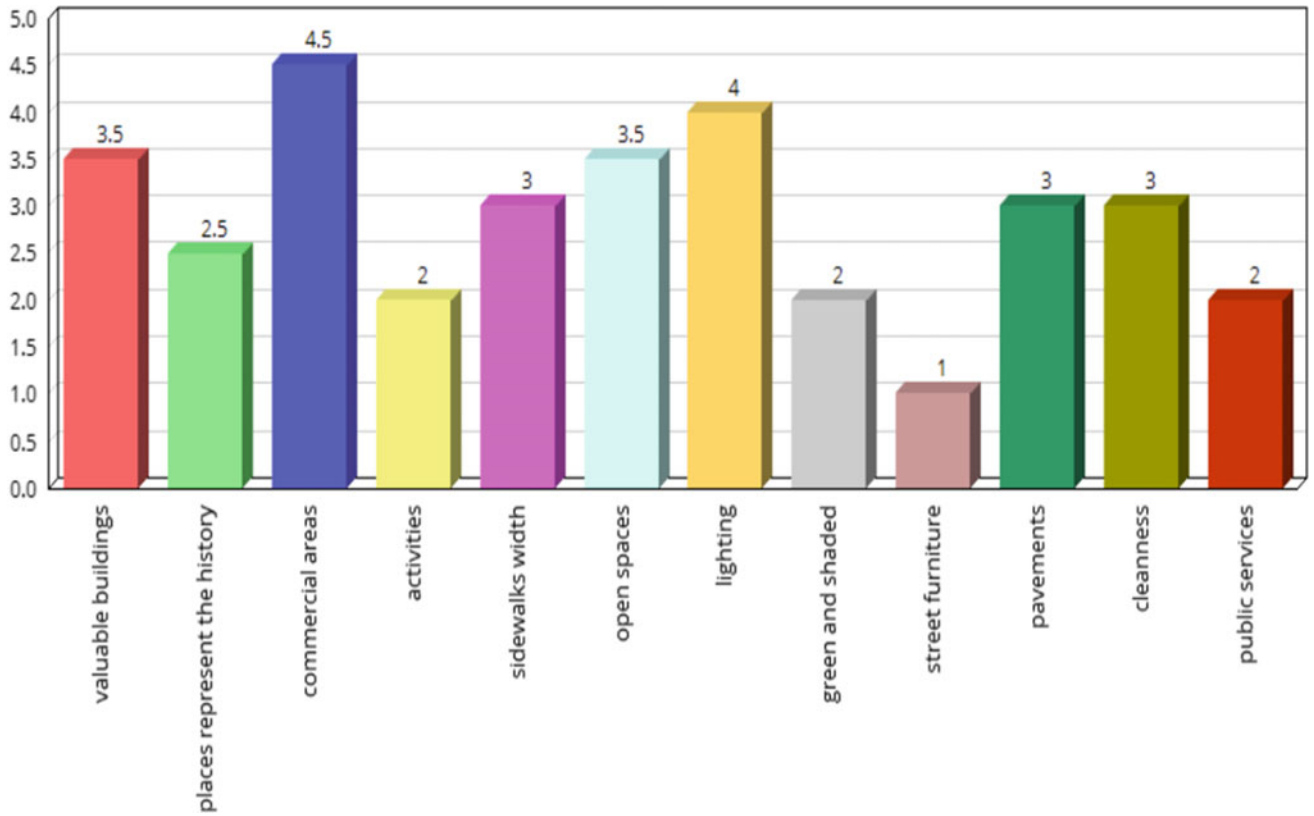

Fig. 18 Evaluation of route's urban design elements by participants. *Source* Researcher

Fig. 19 Case study strengths. *Source* Researcher

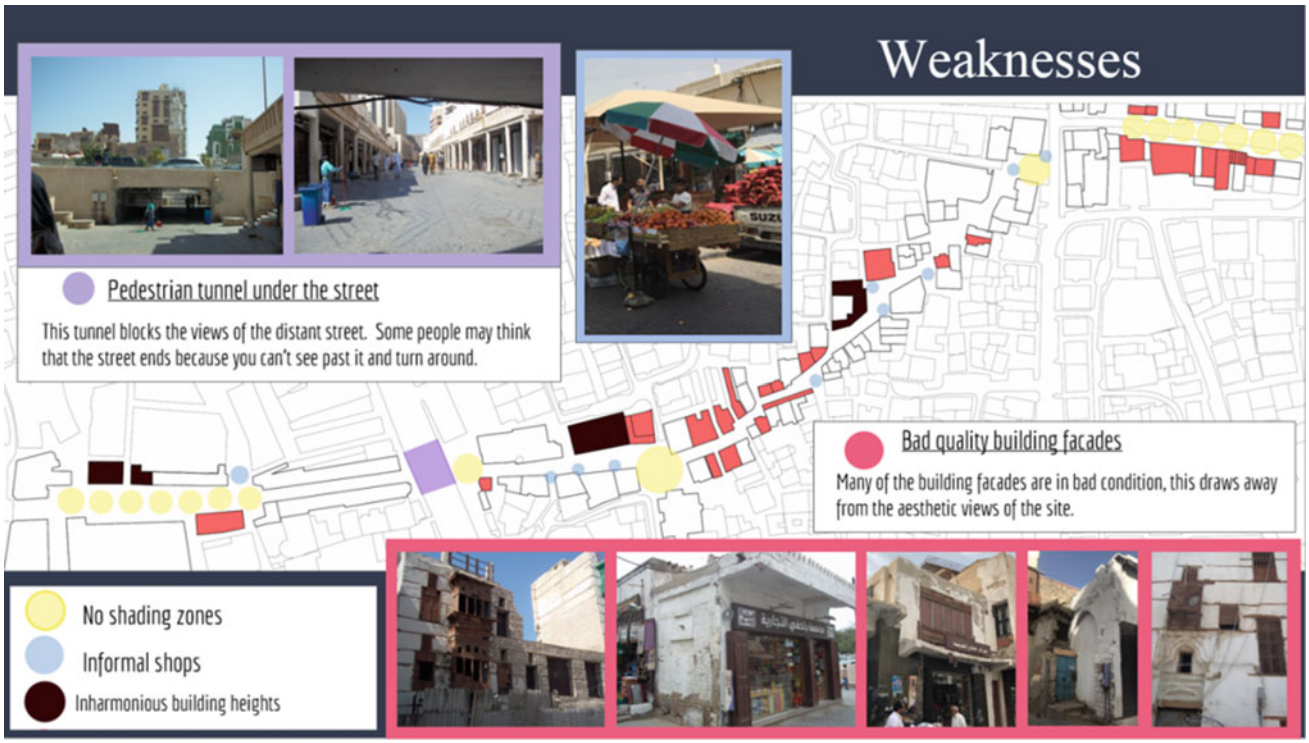

Fig. 20 Case study weaknesses. *Source* Researcher

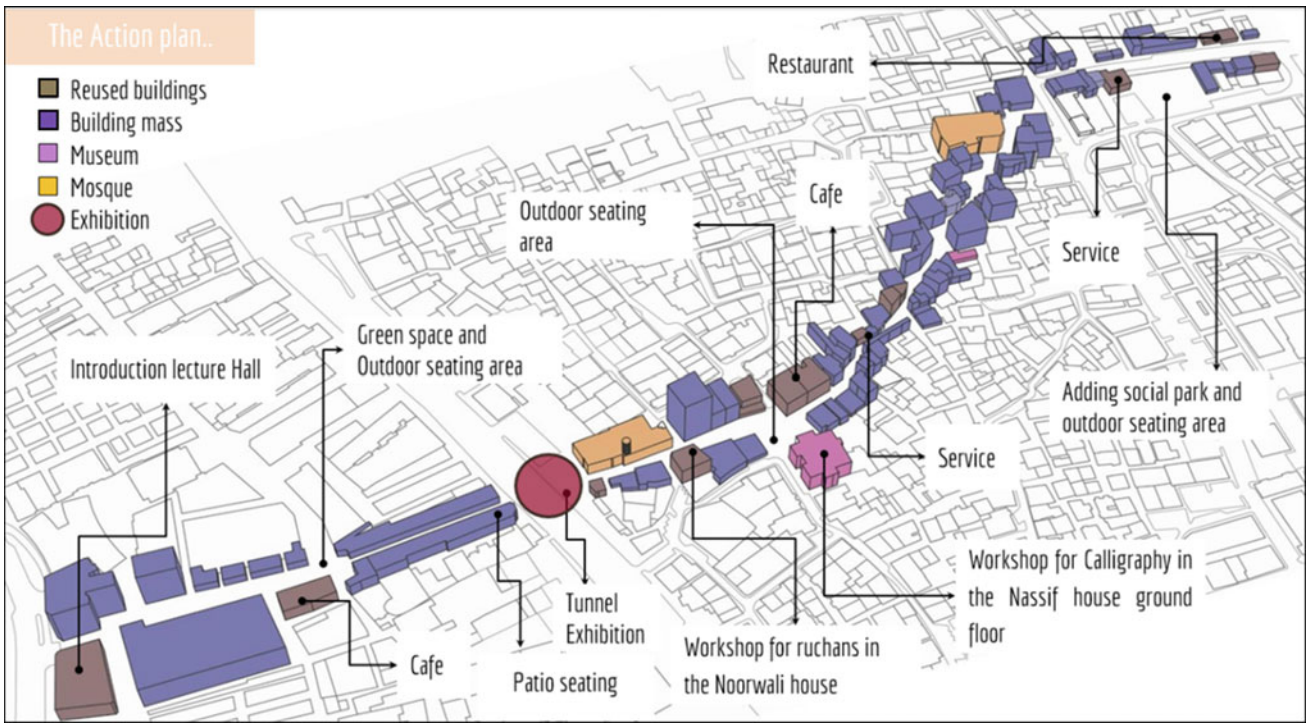

Fig. 21 Create a healthy, safe, active, and sustainable route. *Source* Researcher

Fig. 22 Example of reviving the commercial façade of the route. *Source* Researcher

Fig. 23 Existing buildings needing refurbishment. *Source* Researcher

- The budget of reviving Hajj Route is recommended to be obtained from both private and public sectors to cover the renovation for the historic buildings and the upgrade of the streets, infrastructure, and open areas.
- Holding annual or biannual festivals in open spaces would attract funding for reviving the route in addition to increase the income and jobs for the residents. This would convince the residents of the importance of the revival project for the route (Fig. 27).
- Reuse the heritage buildings to revive them by adding social interactive activities, and this will make the visitor not only visit the Hajj Route but also interact with its buildings to increase the sense of belonging (Fig. 28).

Fig. 24 Providing different activities and workshops. *Source* Researcher

Fig. 25 A suggestive impression of upgrading the streets and the infrastructure to increase social interactions. *Source* Researcher

Fig. 26 Reusing some spaces as exhibition areas to represent the history of the route. *Source* Researcher

Fig. 27 Holding annual or biannual festivals in open spaces. *Source* Researcher

Fig. 28 Reusing the heritage buildings to accommodate social interactive activities will help their revival. *Source* Researcher

6 Conclusion

Jeddah's prosperity was based on two distinct and sometimes overlapping roles. It was a major Red Sea mercantile center between the Indian Ocean trade routes and the Hejaz region and beyond. Secondly, it acted as a gateway for pilgrims to Makkah who arrived by sea, which gave the city its significance in the Islamic world and the Hejaz region. However, after the city wall was demolished (1947) the city has suffered from deterioration and decay. The Saudi build-heritage conservation changed from complete neglect during the oil boom years of the 1970s to recent attempts to inscribe different sites on the UNESCO world heritage list to encourage tourism in these historic sites. Finally, the core of the Historic Jeddah area today is on track to be conserved and rehabilitated in a good way.

Hajj Route is a very important part of Historic Jeddah. The connection with Hajj is also very clear in the urban structure of the Route. Also, its found in the traditional souks running from West–East, from the sea to Makkah Gate. The social fabric of the city was affected by Hajj, where Muslims from all over the world lived, mingled, and worked together, also in the architecture, notably in the facades. This route, although it has many strengths and opportunities (heritage buildings, place identity, unique urban fabric, etc.) but from the survey and the interviews we found that it is suffering from weaknesses and threats (building falling, bad quality of open spaces, not enough activities, etc.) which make only 22% of visitors are tourists who came to visit this route. From the interviews, we found that most of the visitors dislike (green and shaded, public services, street furniture, activities) so the route needs an urgent strategy to be revived.

Thus, an integrated strategy is required that involves the government agencies and stakeholders, not only to safeguarding and intervene in reviving the physical fabric of Hajj Route but also to provide a plan to create a user-friendly heritage site. For example, providing better accessibility for all people with disabilities and elders, using the opportunities offered by new technologies, enhancing public transportation around the site to connect it to the entire city. According to facilities and services, providing sufficiently the quality and presence of complementary or secondary tourist services such as restaurants, hotels, exhibition halls, and cafes have to be attractive. It is recommended to host several cultural events of regional and local appeal such as the annual festival of Historic Jeddah to attract the people and to increase the identity and the sense of belonging in Jeddah City.

From the research, we found that creating better quality open spaces, upgrading the streets, and the infrastructure will increase the place belonging by increasing the interaction of individuals with each other by making attractive social spaces. Also, reusing the heritage building to revive them by adding social interactive activities and this will make the visitor not only visit the Hajj Route but also interact with its building to increase the sense of belonging.

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Nowadays, research in the field of cultural heritage can strongly benefit from new forms of collaboration and interdisciplinary exchange that aim to overcome the traditional academic and disciplinary contexts to include new issues related to the cognition, management and enhancement of our cultural heritage. The consolidated skills of IIT in the field of 3D digitalization, machine learning, molecular sciences and nanomaterials can prove to be of great value, but they need to be consciously integrated into dynamic processes that must always put at the center of every interest, man, his identity, and his well-being.

In this sense, the chapter titled "Theatrics' of Urban Open Spaces: Exploring the Metaphorical Sense of Identity of a City's Heritage" invites to meditate on the respect of those elements that define the cultural landscape and landscape of urban memory—the so-called syntax—in order to not eroding the identity and heritage value they embody. Similarly, in the chapter titled "Colonial Railway Station: Heritage that Transformed the Identity of Lahore", the authors draw the reader's attention to heritage as the best expression of the identity of a city.

It is inevitable that new approaches and practices have developed for dealing with heritage in the planned development context. Furthermore, current planning practices call for an application of a variety of diverse approaches at once. In the chapter titled "The Power of the Pop Up: Creative Engagement and Rediscovering Our Architectural Heritage", the authors encourage new ways for heritage professionals to work with non-professionals in rediscovering the past, engaging with the present and safeguarding the future.

The book further delves in this section into the topic of planning for sustainable transportation systems in historic cities and heritage sites. In the chapter titled "Renovation of Nile Cornish and Ancient Touristic Market in Aswan City; Attempt to Solve the Public Transportation Problem", the authors propose new strategies for the improvement of transportation systems and infrastructures respectful of the city heritage. All works of great value seek to propose solutions to solve contemporary problems without affecting the cultural heritage of humanity but rather enhancing it.

Enna, Italy — Antonella Versaci

Theatrics' of Urban Open Spaces: Exploring the Metaphorical Sense of Identity of a City's Heritage

Samhitha Bydar Shubhashchandra and Sandhya Rao

Abstract

Bengaluru, earlier *Bendakaalooru,* (Bendakaalooru, meaning land of boiled beans in kannada language, was a name coined to bengaluru as suggested by a very interesting myth associated with the name origin for the city.) was one of the key trading centers of the South during the pre-colonial era. The idea of a town structured around *Pettah* (Pettah is a connotation used for market area in a city. Pettah was used as well. But Pete is more common amongst the natives of the land who converse in Kannada Regional language.), *Kote* (Kote is a connotation used for Fort. It is more common amongst natives who converse in Kannada Regional Language.), *Kere* (Kere—is a kannda origin term; meaning lake or a tank. Each lake or tank bund was differentiated based on if it was naturally formed or built to form a tank.) and *Totha* (Totha—is a Kannada origin term which means a garden or a nursery of plants. Usually, the natives housed all the plants at a place and nurtured them in order to protect the species that was indigenous to the area.) was an unquestionable matrix of natural occurrences and cultural practices. These urban elements that define the cultural landscape and landscape of urban memory—called *"The Syntax."* The syntax has a direct response on to the built morphology configuring that lay of land giving necessary order in space. The community/settlement aligned themselves carefully along the syntax micromanaging the system, establishing a symbiotic relationship between the two. Every stage of development imposed alterations to the already existing syntax and each of these added a layer of new structure to the settlement as well as a new genealogy to the growth of the city. Despite the development, it is the resilient nature of the established systems that has survived the changes and till today, it is visible through the layers of unrecognized patterns as an outcome of disorderly outgrowth of the city. The key proposition of the paper argues the importance of the syntax in defining the spatial elements that is unique to the city of Bangalore and to acknowledge this as the most powerful single determinant of the urban environment. If one were to ignore reading the syntax unfolding the layers, the consequences will be irreversible eroding the identity and heritage value it carries. Hence, the paper questions how one should address this issue of merger of the past imprint and the future plans for the settlement, without the loss of the base identity. Ultimately, the findings offer a new insight into how to preserve the identity of a place and enable one to appreciate the skill it took to carefully conceive a system for land and thus to conserve.

Keywords

Syntax • Cultural landscape • Cultural imprint • Planning • Resilience

1 Overview

The study is about the city-scape of Bangalore and it is also about the power of the configuration of urban elements—*The syntax*—to determine the nature of a place and the eyes through which it is seen. The syntax in this context is a term used to define the cultural landscape and the landscape of urban memory that is tied up to the geography of this city that includes *Pettah* (market), *Kote* (Fort), *Kere (*lakes and tanks), and *Totha* (gardens and parks). This syntax which

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Y. Mahgoub et al. (eds.), *Cities' Identity Through Architecture and Arts*,
Advances in Science, Technology & Innovation, https://doi.org/10.1007/978-3-030-14869-0_12

was created historically formed the functional system (Hillier 2007) of the city. The syntax is superimposed on the virgin land when Bangalore was put on the world map between late 1700 and early 1800 (Mathur and Cunha 2006) by Kempe Gowda, a local ruler under the Vijayanagara Kingdom and given a new language for the inception of the city. Subsequently, changes in the administrative powers from the Vijayanagar Kingdom to Badami kingdom to Hyder Ali and Tippu Sultan and, finally under the British rule, imposed alterations to the already established syntax and every stage of progress enunciated the past with a new skin of elements. The resilient nature of the established system is what has survived these changes and the traces of which has over time become an everyday vocabulary of inhabitants.

Bangalore caught up with the accelerating development and complex problems the city is occupied with, and these layers are taken for granted today in administration, planning, policy-making and in everyday conversation. Most urban studies during the 80s and 90s concerned itself with themes like industrialization, global economy, socio-political parameters, infrastructure provision, etc. (Srinivas 2004). The lens for viewing the urban context with respect to the cultural landscape, i.e., syntax laid down by our predecessors is overlooked. The shifting boundaries and increasing population have had the town planners' work hard toward imposing visions that are developed for other countries. While doing so the planning ideas to bring order into the city structure have proven to be more of a failure than making a sensible vision for the future.

Our most critical area of ignorance is as a result of three consequences. First is with the understanding that in this city, there is a relationship existing between the built and the syntax where the former is a direct response to the later. The way we organize the systems into a configuration in response to the lay of the land is the key, both to the built form of the city and how we function in those engraved spaces. The syntax is generally taken to be that last act of settlement, associated more with Imageability than as a necessary order in space. Not only is it infrastructural that deals with assembling of buildings/spaces, nature of the built environment, it also goes further down articulating the lay of the land that is essentially in continuous change. Second, within our city's administrative structure, the planners who are more concerned about the urban functions are operating at regional scale dealing with the socio-economic, political and infrastructural dependencies whereas urban designers, historians, conservationist are operating at a micro scale dealing with built forms and spatial systems in direct response to the syntax. The two groups operate independently wherein the former while laying out their agenda would not get into the urban area in which we live nor would they involve the latter group members during the formulation process and vice versa. This gap in the administrative structure does not allow either to apply oneself to the need to understand the city as a functional whole. Lastly, raises the concern of analytical tools or methodology set by the designers to analyze this city. If we approach a designer for an analysis of their proposals to urban area, we find it alluring that the designs that talk about the creation of the rich, complex and response to historical context are arrived based on little analytical endeavor to understand how the syntax and physical city of the past gave rise to such spaces. As a result, today the syntax of this city appears for the most part to be rather a disorderly outcome of the long history of incremental changes which accumulated over time to produce unrecognizable patterns. Only when one sees through the development of the syntax over time, will they be able to appreciate the skill and power it took to carefully conceive a system for land.

The key proposition of this paper begins by properly exploring the beginning of the core of Bangalore city and the creation of the various components of the syntax through time. The study in this context highlights the influence of the changing rulers and administrative capitals on the syntax and how these added a layer of new structure to the settlement as well as a new genealogy to the growth of the city. Also, how each of these distinct layers is been reasonably understood to accurately judge the built heritage of the historic center. In the next section, the paper continues to explain the consequences of ignorance in reading the syntax during the incremental growth of the city under three identified issues:

- First, relationship between the built and the syntax`` widely acknowledged that we must base our design decisions on a more secure understanding of the existing relationship.
- Second, the gap in the administrative structure: the need to understand the city as a whole rather than in fragments and
- Third, the use of the right analytical tool: sensitive responsive proposals that will aid in carefully conceiving a system for the future.

The conclusions of the investigation argue the right time in development to be when we see the city as a whole, a place where every urban planner and urban designer have to revisit their toolkits and incorporate advances in the tools we have for seeing the city. Any later, the change will be irreversible. Also, the syntax of the city is to be understood as the principal generator of the spatial configuration, to be the most fundamental and a powerful determinant for any future development of this city.

2 Contextual Brief

Bangalore, the capital city of Karnataka state in Southern India, having an estimated population of 11.8 million is today the third most populous city in India (India 2011). The city caught up in the Web of growth and development, what was once planned as a trading center of Southern India has today manifested into a pivot of technology and development. The historic core of this city is subjected to a fundamental dilemma of unique challenges due to growing pressure and the social demand to conserve the cultural heritage.

Kempegowda 1, who was the local military chief of Vijayanagar Kingdom, founded Bangalore during 1537 (Srinivas 2004). At that time, the city was organized as a complex of Pettah (market), Kote (Fort), Kere (lakes and tanks), and Totha (gardens and parks), four elements together formed the syntax; a center for spatial organization of the city. Pettah (Market) is the main trading center surrounded by a mud wall and a moat or a ditch within which one could see the residential and market spaces This matrix of settlement and market is referred to as the city. Kote (Fort) was an oval structure built to the south of the Pete surrounded by Stonewall and a moat within which military-related activities were housed. Together, Pete and Kote formed the epi center of the settlement, the point from which the city grew (Figs. 1 and 3). Today, Pettah and Kote are the Centeral Business District (CBD) of Bangalore. Kere (Lakes) is the most crucial elements of the spatial order of the city. The tanks were constructed by Kempe Gowda 1, as a water harvesting structure, where water from one tank would feed into another as a series of the network. This formed a web of the blue network across the city of which few have survived till day. The tanks fed the horticultural land and were also the main source of water for the settlement both within and outside the Fort. The water from the lake also fed the moat (Srinivas 2004, p. 38). The Fort and the city were surrounded by five main tanks that formed an interconnecting ring. Last is the totha (Gardens and parks). Vast extents of horticultural lands with its villages predominantly inhabited by the gardener community surrounded the Fort and Pettah where variety of fruits, vegetables and flowers were produced (Rao 1985, as cited in Srinivas 2004). These four physical elements together were conceived as an interconnecting and interdependent system that set a language for making of the place (Fig. 2).

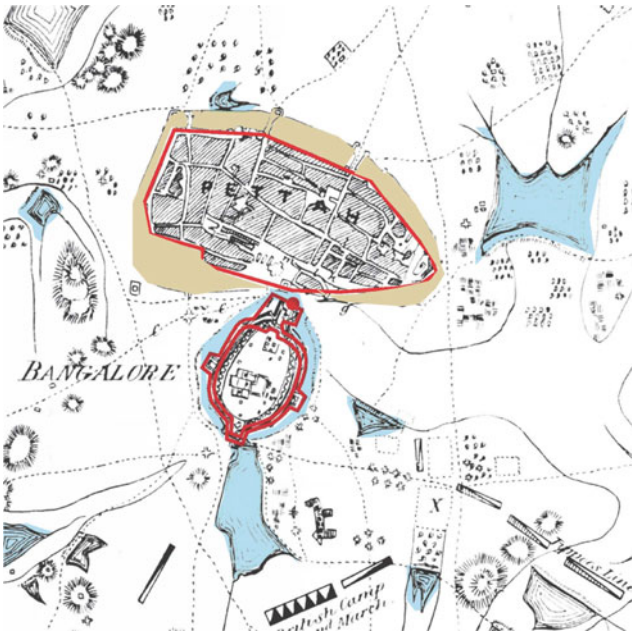

Fig. 1 Digitally enhanced and modified image of the plan showing the *Kote, Pettah, Kere, and Totha*—The urban elements that formed the syntax (Reproduced from map showing the position of the British Troop around the Pettah, March 1791, British Library, Add 18109-d as cited in Mathur and Cunha 2006, pp. 24–25)

Fig. 2 A portion of digitally enhanced map of Bangalore in the 1800s, showing Pettah, Kote, Kere, and Totha (Reproduced from Colin Mackenzie's Mysore Survey (1799–1808) the British Library IOR X/2126 as cited in Mathur and Cunha (2006), pp. 73)

3 Development Character

As much as it is about the seeding of the syntax, it is also about the virgin land described by the European travelers as open horizon (Mathur and Cunha 2006), that added its own dimension to the beginning of this city. As a response to the topography, the ridge that separated the two watersheds *Arkavathi*[1] and *Pinakini*[2] was chosen by Kempe-Gowda to build this city, unlike other settlements that were being established on the highest point. The then town consisted of mud Fort with settlement inside, quadrisected by the two main streets along North–South and East–West direction, with the walkable system allowing unrestricted access between quarters. These quarters were further compartmentalized based on the economic activities, like the grain market, rice market, commercial market, jewelry market, and so on. Surrounding the Fort wall having many gates was a moat, cultivation land, forest, shrines, and water bodies interwoven with the Fort and the communities through an established hierarchical relationships. With respect to planning, the presence of a single central temple at the core does not seem to be the character of this urban pattern. The settlement was organized around tanks instead of the river, Fort as a center instead of the temple and internal trade routes instead of a merchant town, the usual possible variations of spatial organizations of cities in southern India. Within the mud wall, one could see co-existence of residential and market areas where the typologies of built accommodated living, selling and storing units and in some selected cases a workshop or training/manufacturing areas were added (Figs. 3 and 4).

The temples were constructed as a number of smaller shrines spread across the settlement dedicated to the local goddess worshipped by individual merchant community. These traditionally built types naturally stimulated a community-scale arrangement, which coincidentally indicated an influential formulation of multi-functional community spaces. The natives, however, typically bore a dominant impression of cultural practices, which mostly involved rituals and sacred ceremonies traditionally celebrating the ancestors and the protector deity of the region (Srinivas 2004). One such festival would be the Bangalore *Karga*,[3] the

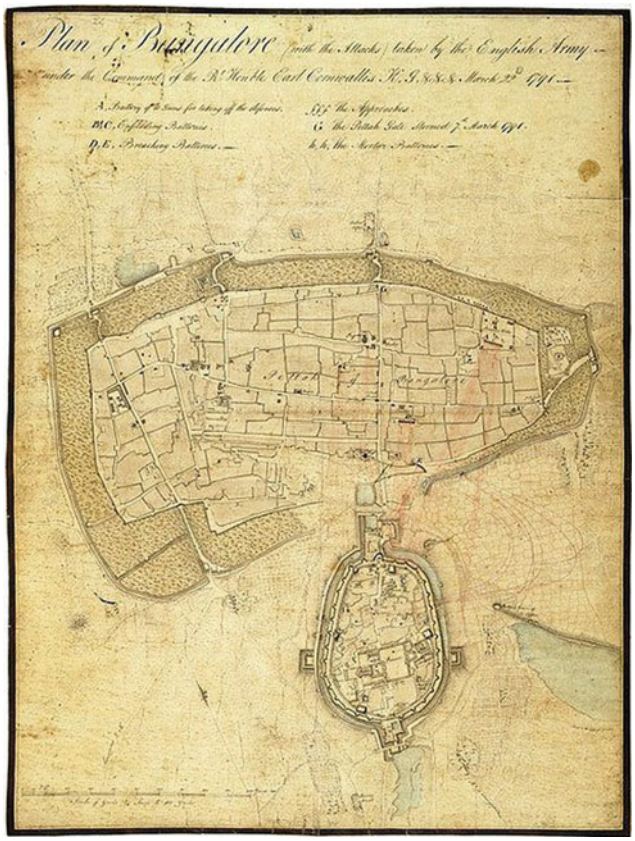

Fig. 3 Plan of Bangalore 1791, by Robert Homes showing the Pettah and the Fort (Reproduced from The British Library, Add 18109 as cited in Mathur and Cunha (2006), p. 36)

city's oldest festival celebrated by the *Thigala Community*,[4] where the deity of the goddess is taken on a procession starting from the lake through the Pete. It is a nine-day festival celebrated till date by the city (Unnikrishnan and Nagendra 2014). The green and blue network of the place was regarded as the key generator of activities and the local communities carefully aligned themselves to these cultural imprints. Therefore, a typology evolved organically from not just their specific needs but also by the communal practices of the local people. The structuring elements of the syntax positively exerted a significant influence on the socio-economic, political and religious practices of communities and therefore defining the cultural landscape of Bangalore.

After the succession of Kempegowda 1 by Kempegowda 2 during the seventeenth century, a new stone Fort wall was added around the existing mud wall and a mosque—Jumma Masjid came into existence within the Pete (Srinivas 2004).

[1]Arakavathi and Pinakini: They are two rivers of southerns India, originating in the Nandhi hills in chikkaballapura distric of Karnataka, and the river flows through the bangalore city. Eventually reach Bay of Bengal as the Kaveri in karnataka and Ponnaaiyar in Andra Pradesh.
[2]See Footnote 1.
[3]Karaga, the annual festival celebrated in bangalore by the Vahnikula Kshatriya community. "Kara" meanng hand, "ga" meaning "that which is held," which refers to a water pot in Kannada, official language in Karnataka.
[4]Thigala Community are social group occupied in Karnataka and Tamil Nadu. The community settled in Bangalore during the sixteenth century. The cast is traditionally occupied with gardening of flowers and vegetable as their livelihood.

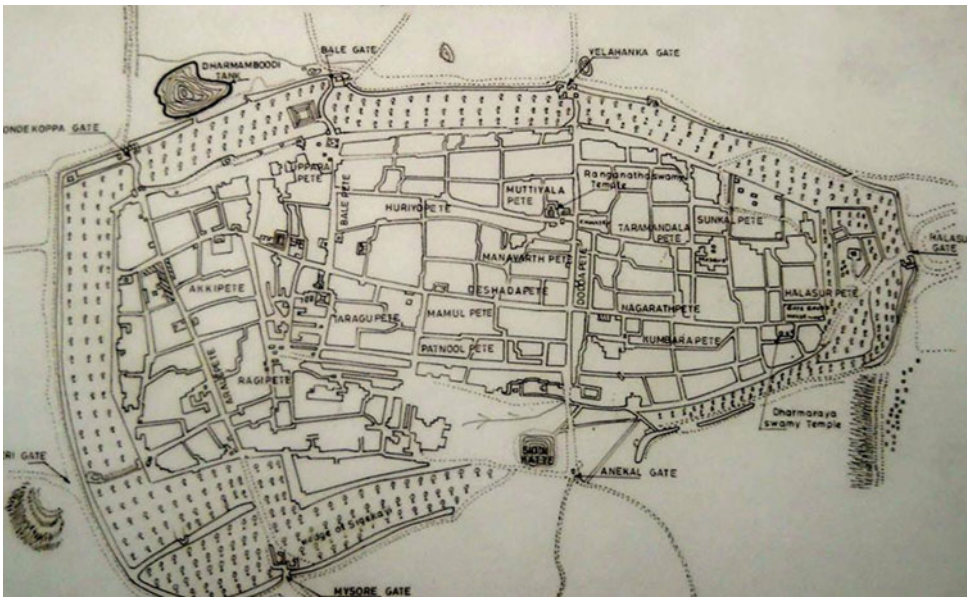

Fig. 4 A portion of map of Bangalore showing Kempegowda Fort, settlement pattern, mud wall, moat, lakes (Reproduced from Intelligence records of colonel read, 1791, as cited in Nair (2005), p. 39)

Fig. 5 Remains of part of the Kote/Fort wall as of today Shows the Northern Gate of the Kote that once connected the Pete

Fig. 6 Tippu Sultan's Summer Palace that once was the center of the Kote, today stands alone admist the development

A Second oval Fort was constructed to the south of the old Fort (Pete) having a foundry for manufacturing the cannon and other military equipment. By 1791, a palace was built (Srinivas 2004). During the Hyder Ali's period, the oval Fort was rebuilt with stone and was converted into a military base for the Anglo–Mysore war. During the wars and after the British's capture of Tippu Sultan, the Fort wall was breached and was extensively damaged. Slowly, by the nineteenth century, the moat was filled up giving way for houses, roads, gardens, etc. The oval Fort was brought down as the city expanded from this center. Today, one can still see a part of the Fort wall and the palace that survived the wars and development pressure while rest of the syntax layers are visible in traces in similar form on the new footprint of the city. It is the resilient nature of the established system and their interdependencies that have survived these changes and has become an everyday vocabulary of inhabitants (Figs. 5 and 6).

4 The Genealogy of the City and Its Resilient Nature

"Bangalore" or "Bengaluru," from the inception of the city during the fifteenth century up till the formation of the first planning boundary in the mid-nineteenth century and till date, had many influences from the various rulers and administrative capital centers. Each of these added a layer of new structure to the settlement as well as a new genealogy to the growth of the city. The city that is referred to as the Fort

settlement between fifteenth to early eighteenth century is now one of the fastest growing metropolises in India (India 2011). The city that is in constant pressure for rapid development has over decades neglected this syntax layers that forms the main artery of the city for its functioning. At every stage of development, the progress enunciated the past with a new skin of elements while some efforts complemented the syntax and some merely destructed the earlier imprint. Thus, the built morphology of this historic center is constantly under reaction and response mode. As a result, every complex layer of development implemented on any part of the urban area would inevitably generate an associated reaction of identical nature in the core and across the city. As the city stands today, the established syntax that once defined the cultural landscape of the place is eroded, eroding the identity and heritage value carried along with it. The consequences of ignorance in reading the syntax during the incremental growth of the city are explained within three identified issues.

4.1 Acknowledging the Existence of the Syntax

Cities are a large collection of building held together by space defining elements that are unique to its place. In some, it might be the topography, and in few, the natural settings (Hill stations, port cities, inland etc.), while in some, it might be the complex network of spaces engraved by man (New York, Los Angeles, etc.). In Bangalore, it is the syntax that is unique to the city. After mid of nineteenth century, when the city began to expand under the city administration, the Kote, Pettah, Kere, and Totha began to be engulfed by the development. The Kote was no more in existence except for a part of the wall and the palace that survived. The gardens, the gun houses, the axis, and the settlements housed within are wiped out by the new bigger footprints of the institutions. The moat around the Kote and Pettah is filled up and made as a primary road (Fig. 7). The Pete shifted from being a residential and commercial-mixed settlement to a predominantly commercial zone. The typologies that were the symbol and reflection of people, their communal practices and lifestyle slowly gave way for structures that were a direct response to the planning building laws and to the increase in Land value. Today, only traces of the old typologies have survived that gives us a glimpse of our past. The Kere that once dotted large area of Bangalore city is left with only a few dots on the map today. The lakes and tanks that were the social, religious, and communal spaces for the settlements are today landfilled areas with high-density residential developments. The five large lakes that formed the interconnected ring around the Pete and Kote vanished when the feeder systems, moat, and the Fort wall vanished. The gardener's community and the villages settled around the lakes and, who were dependent on the lake were displaced, breaking all the complex network of interdependences that the syntax had established (Fig. 8). Totha or the horticultural lands and the gardens built by Hyder Ali and developed under the British rule had many exotic varieties of fruits, flowering plants, and trees that were brought from the outside country by these rulers. As the city expanded after mid of nineteenth century, the horticulture lands that surrounded the Kote and Pete in vast extents gave way for planned residential layouts. As the years progressed, the city once called "The Garden City" because of the green cover lost a majority of the green in the name of infrastructure development. Today, only Lalbagh or the Red garden built by Hyder Ali and Cubbon Park built by British commissioner Sir Mark Cubbon (Srinivas 2004) survive.

The four elements that formed the syntax and the people laid down a strong grid for city's structural system that allowed for strong intangible and tangible networks to be established. While the Fort protects the settlement and their activity, the Pete builds its network with the outside world

Fig. 7 "Plan of Bangalore" 1791 by Robert Homes, British Library as cited in Sharma (2016) p. 101 superimposed on the existing Bangalore map, showing the traces of Kote and the palace that has survived and engulfed by the development. Drawn by Madhav Sharma

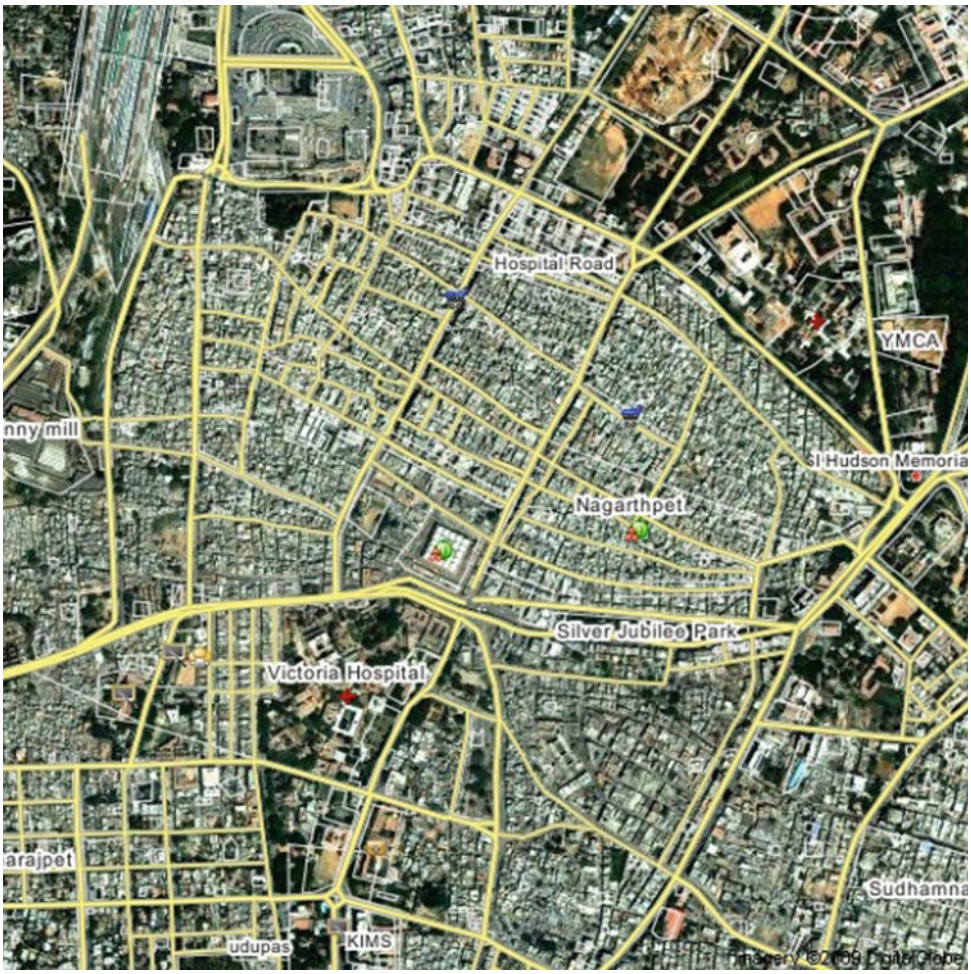

Fig. 8 Google Earth Image of the existing Pettah and Kote area in Bangalore showing the development engulfing the syntax, while still retaining the shape and form of the extent of Pettah and Kote in 1791 Refer Fig. 3

by the socio-economic activities. The lakes and tanks that form interconnected blue networks feed the moat and settlement depended on it for daily and agricultural activities (Unnikrishnan and Nagendra 2014). Also, the tanks and lakes become the centers for all religious activities and nodes around which temples are built along with the associated activities. In turn, the settlements are responsible for maintenance of these lakes and tanks. The horticultural land surrounding the Fort, Pete, and the lakes depends on the settlement for its maintenance and growth while the settlement is dependent on it for survival. The syntax formed an intangible ecosystem of its own, a principle generator, enriching the significant influence it had on defining the landscape of the city. Their interdependencies are so closely interwoven that if any one of them seize to exist, the chain breaks. But at the same time, the membrane of the syntax is elastic enough to engulf any new element that becomes a part of this cultural landscape and that respects the existing system. Hence, it is clearly understood that in this city, there exists a relationship between the built and the syntax where the former is a direct response to the later and both are in continues react and response mode. In our case, as of today, the former situation is pronounced once the syntax is objectified and considered as the last act of settlement, ignoring the relationship that is created amongst them, posing critical issues for the city's future development. Hence, throughout the history of city's incremental development, one can see that over time the haphazard growth produced patterns that are neither geometric nor functional, eroding all the cultural landscape, urban memory, sense of place and meaning the city had once established. As inhabitants of the place, as responsible designers, we need to identify and understand the importance of the syntax as a principal generator of space. The relation established with new elements that have been imposed and those to be imposed in the future will be the determinant factor and hence calls attention for conserving it. As Hillier (2007, p. 247) states, "The structure of urban grid considered purely as a spatial configuration is itself the most powerful single determinant of urban movement".

4.2 The Problem of Part to Whole

At one level, the city is struggling to acknowledge the existence of the systems laid out by our predecessors and at another level, one can see the gap in the administrative structure that is not allowing one to apply oneself to the need to read and understand our city as a functional whole. After the withdrawal of the British troops and setting up of Bangalore city cooperation in the years 1949 (Palike 2016), the city expanded its boundary in all cardinal directions. The Kote and Pettah area then came under the control of Bangalore Municipal cooperation whose responsibility is to look into orderly growth and regulating the development laws for the city, viewed the systems of our landscape as objects of visual and historic significance. By 1961, the city had experienced rapid development in the last 2 decades and during when Karnataka Town and Country Planning Act of 1961 was drafted, to provide for a regulated growth and development with an aim to direct the future growth (Government 1963) of the city. Planning Regulatory bodies were responsible for preparing of a development plan for the entire area which mainly operated at a regional scale. This group only focused at the regional scale, analyzing the urban functions. Most of their attempts to understand the ways in which the city works dealt mainly with the physical aspects of the city like the infrastructure, movement, land use patterns, land values, zoning, etc. Since this group operated at far above level, most of the interventions were superficially laid down barely getting down at urban area level where people lived. It is at this urban area level that one would see the real meaning of relationship that existed between syntax, people, and landscape that we have been most concerned about.

On the other hand, when most of the urban studies during the 90s and later concerned itself with topics like industrialization, global economy, urban sprawl, infrastructure, there were small voices of concern being made theoretically by many designers and academicians on preservation of the past, legibility, cultural values, people, and their practices (Srinivas 2004, p. xxi). These groups of architects, conservationists, and urban designers are the people who work at smaller scale directly with individuals, settlements, and urban areas. Their conceptualization and interventions were as a direct response to understand the spatial quality and hence place-making. While the urban designers have narrowed down their focus on spatial configurations, architects and conservationist are focused on individual buildings. Both the groups though talk of recreation and conserving of rich heritage and living history, they somehow overlook the existence of the traces of the syntax as their starting point for preserving the living heritage. More often than not, the visions placed forward under the name of place-making are at the expense of recreating global images that contradicts what the city needs. This leaves their efforts as a weak endeavor to understand how the syntax and the people as principle generator of the past gave rise to what is present today as the place.

Within the struggle between parts to the whole, what most of them are ignoring is the role of communities and settlements toward making of a city in the past. As discussed earlier, there were specific groups of communities who were assigned to maintain the lakes, tanks, and the gardens in the city. One such community is the Thigala Community; horticulturists by profession were assigned to maintain the gardens as well as the lakes and tanks that linked the gardens. Similarly, there were different communities like the trading castes, weaver's castes, dyers community, oil producers to name a few, who were responsible for regulating and maintaining their designated sectors and their temples, respectively. These communities carefully aligned themselves to these cultural imprints which overlapped with the green and the blue networks of the city (Figs. 4, 9 and 10). This macro management of the syntax by the community at

Fig. 9 Painting showing the community life of the people of Pete and their established relation with the Kere and Totha (Reproduced from Harvard University, Houghton Library, pga_ms_typ_55_26_2180)

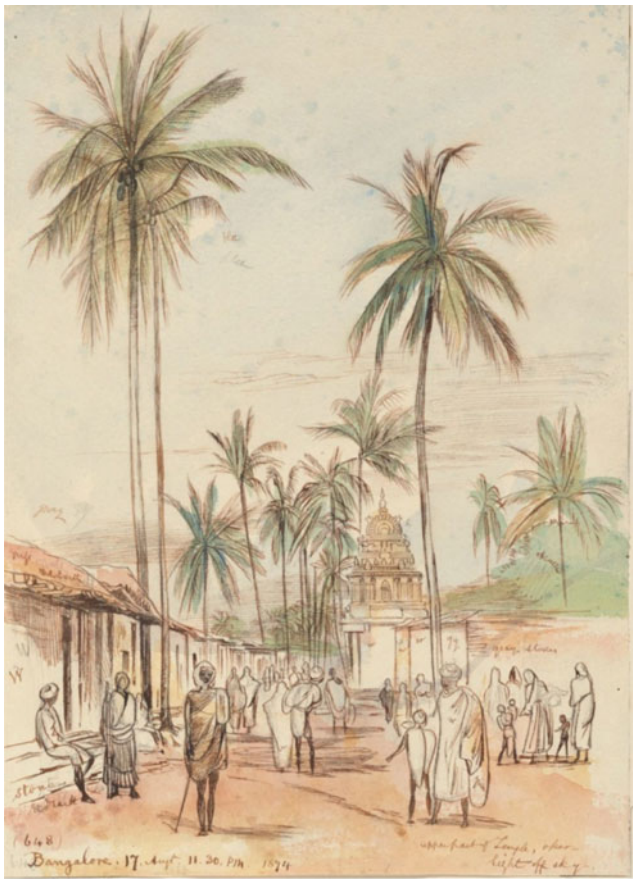

Fig. 10 Painting showing the community life of the people of Pete and their designated religious centers (Reproduced from Harvard University, Houghton Library, pga_ms_typ_55_26_2183)

the urban area level has a direct impact at the city level. Any imbalance in the system at the city level is immediately reflected at the area level, which the community would act upon as a response. This react and response nature that exists between the community and the syntax and, the resilient nature of the interdependences is what has been completely removed in today's scenario.

The compartmentalization that has developed over the years within our administrative structure is only increasing the gap between the two groups, planners, and designers operating at two different levels. The ignorance of the existence of the role of community that one should have identified from reading our past has only increased the deep split that exists between the two. Decentralization of powers and assigning macro-management of urban elements in an area to the communities is one of the ways by which the problem between parts to the whole can be bridged. Also, the urban planners, designers, conservationists should come in terms to understand that though conserving the fragments of our physical environment such as a building or set of buildings in memory of our past is important, the real heritage that this city needs to conserve will be this intangible cultural network of the syntax with its people. The desire to address these issues as a whole and not as a top-down process or vice versa would prove to be positive for reviving and preserving this unique cultural landscape of Bangalore.

4.3 The Use of Right Analytical Tool Kit

The question one should ask would be from where should one start their study and how should one analyze and assess the configuration of the urban elements? It is clear to us that an urban area in any city is dynamic and is subjected to changes. At every stage in development, it becomes crucial for the designers to modify the tools developed to analyze. As the new layers get added the older ones are untraceable. Designers more often rely on the aesthetic or the functional value of the place, objectifying the existing complexities to be the simplest thing that appears at the first glance. The problems are studied with a preconceived conceptual scheme in mind, which will be a direct influence of global images. When the city is studied with such pre-decided solution-based ideas, shallowness is seen in their random attempt to pretend to resolve the issue of conserving the urban elements. As a result, the gap in the interpretations has distanced itself from any attempt to conserve what is actually necessary.

Conservationists, designers, and urban designers in Bangalore talk of conserving the unique heritage of the city and to preserve its identity and their association with the place. Various attempts by individuals are proposed or implemented at various parts of the city, but most of it would be at an individual building level. If we look to a designer for an analysis of their proposals at urban area, we find it alluring that the designs that talk about the creation of the rich, complex, and response to historical context are arrived based on a little analytical endeavor. In most of the cases, the analysis would be independent of the proposals and in few, one would find only records of physical documentation of building or settlements or an urban area that is shelved and not acted upon. There has been no attempt by the designers to identify the existence of the syntax and its interwoven dependencies with the city as a whole. There are attempts by an individual or by consultants to study the four elements, Kote, Pettah, Kere, and Totha as independent entities but either the study has been a part of academic research or shelved as reports or design proposals that have been submitted without any prior analysis.

There are structured methodologies developed by individuals or urban consultants for the documentation of a place, i.e., at urban area level or at a city level. Even at the academic level, the students are asked to directly come up with a proposal without any prior analysis or engagement with the city or the students are exposed to extensive documentation tools for area study. But the question one should ask will be what

after documentation? The studies generally end with documentation and rarely has there been an attempt to establish the right tool to analyze that will transform the entire documentation and analysis process into a feasible design outcome. Without the right tools for design, documentation and mapping remain as a meaningless exercise by itself.

Thus, there has been no single attempt to identify the value of the syntax as a whole, the right methodology, and analytical tools and no proposal developed as an outcome of the above two processes. Establishing the right processes for an understanding of the place, space, and context, with right question and a strong tool of design for analyzing and describing the urban form is a necessity for developing design models for our city in the future. All we need is a sensitive responsive proposal that will aid to carefully conceive a system for the future.

5 Conclusion

Incremental growth and adaptability are the fundamental characters of any city. What is also fundamental is acknowledging the truth that our interventions can only be based on our understanding of the city. This understanding comes when a series of superimposed layers of interventions are unfolded carefully to reveal the unique urban elements that make the cultural landscape of a place. These urban elements show clues of the hidden order and interdependencies that gives a distinctive texture to a settlement. This shows that the historic layers provided the foundation for subsequent growth. When the basic urban grid for the city is taken for granted by the authorities and the inhabitants and, the deficit in understanding of this system, results in the destruction of earlier imprints of this city. It is also to be understood that these elements are tied up to the landscape of the city that includes the public realm, the sacred, markets, landmarks, and built form of the city. Hence, it becomes essential for one to reflect upon the nature of the city and should never understate the meaning, identity, and structure embedded within the historic core of every city. The evolution and ordering principals of any city largely dictate how the subsequent growth of the area can be instantly comprehensive. Therefore, we should always respect the unique formulation of their various morphological layers along with cultural imprints and accommodate them in the planning systems.

Most often, the planning systems that most of our historic city would have established will remain the model that will usually accommodate all the changes that the city would undergo, hence exhibiting one of its strongest characters of resilience. It is this resilient nature of our historic cities that stood the test of time revealing traces of it to our present generations. The proposals, policies, and the rigid framework that is set out for our cities today should typically be overridden by the prior methods for our cities to grow with a positive future. Also, it is time for every designer and urban planners to revisit the toolkits used for analyzing the city and incorporating advances to their tool kit of design that is developed as a direct response to the unique character and identity of the place. A standard tool kit such as zoning regulations used as one of the tool for determining a regulated growth across cities takes one on the negative path disregarding the unique history, culture, landscape, and contextual influences that a particular city is exposed to. As a result, one can see the collateral damages that any city in the world is facing as explained using Bangalore city and its unique cultural landscape as a case study. This will be crucial for any city to adopt as the right methodology and deeper understanding of the place will enable one to appreciate the skill and power it took to carefully conceive a system for land and thus to conserve.

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Colonial Railway Station: Heritage that Transformed the Identity of Lahore

Naubada Ali and Zhou Qi

Abstract

The best expression of the identity of city or an area is through its heritage, and this paper explores it in the context of Lahore. Lahore was an important historical city even long before the Mughals. The subsequent rulers and their respective heritage give the Lahore an imminent status in terms of architecturally rich city. British were the last ruler of Lahore from 1849 to 1947. The city kept on receiving the special attention even during the British Raj, for being the provincial capital. It soon became the hub of the huge railway network and the keystone for growing economy of a large area. The focus here is to study: why the heritage and identity are significant to the city; how Mughals and British gave the identity to the city through architecture interpreting their vision and expressing their power; and how railway station transformed the already existing identity of Lahore. In addition, why it is still important to retain the identity alive not only as tangible assets but also building intangible heritage. To explore answers to these questions, the study is organized around multiple data sources including archival research, primary and secondary sources. The facts collected were analyzed to confirm that indeed it is true that identities of the cities were transformed in the past and it is possible for the city to hold multiple identities at a time. Among different heritage buildings, railway heritage is neglected especially in Pakistan. It is very essential to bring awareness about revolutionary changes brought by the railways and to protect the identity of the city.

Keywords

Heritage • Identity • Railway station • Lahore • Architecture

1 Introduction

The city irrespective of its size and historic importance has some heritage values encoded in its urban setting (Sadowski, 2017), which is the comprehensive picture that highlights the traditional architecture and the changes in the style of architecture. The heritage and identity are a long process that undergoes historical changes and results in diverse culture that conjures up the historical and social values among the residents of that environment. It is not as simple and straightforward as it might first appear, the concept has several meanings depending on the context. The concept of community in relation to its heritage has been studied and criticized in many different ways since 1960s (Mydland & Grahn, 2012; Waterton & Watson, 2010). Not only heritage has many shapes and sizes but identity also represents in different human attributes, such as society, linguistic, belief, and historical narratives. Only a part of identity and heritage refers to build heritage that forms a direct connection with the communities. The connections between 'heritage,' 'identity,' and 'place' help shape the sense of belonging and purpose (Păcescu et al., 2016). As Breakwell (Breakwell, 1983) said that places are significant sources of identity elements. Particular aspects of identity, derived from places we belong to, arise because places have meanings that are significant to us. Places also represent personal and social memories because they are positioned in the socio-historical matrix of intergroup relations. Being old does not make the urban space a cultural heritage or generate the sense of place, but its contribution to the shaping of a cultural identity does. Shankland (Shankland, 1975) also highlighted significance of identity of place as the magical power of past does not

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Y. Mahgoub et al. (eds.), *Cities' Identity Through Architecture and Arts*,
Advances in Science, Technology & Innovation, https://doi.org/10.1007/978-3-030-14869-0_13

exist only 'in the intrinsic beauty of what is being preserved, but above all in the identity they confer.' Kevin Lynch contributed to the idea of identity as a place distinct from other places due to the unique, vivid, memorable, or its own different character (Lynch, 1984).

The architecture and built environment have great impact on the lives of the people. Similarly, the change in social setup or administrative organization has an impression on fictile structure of identity. The architecture has always been the solid standing symbol of culture and memories, and it was adopted as a substantial medium to represent the power by the ruling authorities. They transformed the existing identity of the city and expressed their vision through the architecture. Most of the time the ruling powers also imitate some architectural style of previous ruler that has already served as the symbol of power. In a country like Pakistan, there is not one single heritage or easily demarcated identities. The cultures, languages, and heritages of Pakistan are multiple, diverse, and dynamic. Lahore is among those cities of Pakistan that has experienced different imperial courts with their own identities. An essential feature of colonial heritage is that it is still alive in Lahore. It is a sequence of uninterrupted history after the Mughals with its originality still intact. The Lahore was historically important city but with the development of railway system it got a new identity. Lahore was not only among those few cities where railway was introduced earlier but also chosen as the headquarter of North Western Railway. It should be considered as the responsibility of man to preserve the identity of heritage because once lost it cannot be reversed. In fact, it is true that, one of the most destructive crimes by man is to ruin his inheritance. The paper is based on the case study of Lahore that has experienced different ruling powers in the past. The focus here is to study why the heritage and identity are significant to the city. How Mughals and British gave the identity to the city through architecture interpreting their vision and expressing their power. How railway station transformed the already existing identity of Lahore. In addition, why it is still important to retain the identity alive not only as tangible assets but also building intangible heritage. To explore answers to these questions, the study is organized around multiple data sources including archival research, primary source, and secondary source. The facts collected were analyzed to confirm that indeed it is true that identities of the cities were transformed in the past and it is possible for the city to hold multiple identities at a time. Among different heritage buildings, railway heritage is neglected especially in Pakistan. It is very essential to bring awareness about revolutionary changes brought by the railways.

2 Significance of Built Heritage and Its Role in Giving Identity to the Urban Context

The word heritage is a general term that encapsulates all things related to collective memory including built environment, local traditions, language, and places of memory that can recall specific historical events. Heritage is not only the narrative of historical events but also the predictor of future. Heritage therefore is a fundamental element of identity that conditions all other elements. It is considered 'the key factor in creating representations of place as a core attribute of identity' (Ashworth et al., 2007). There are three core features that can highlight the architectural identity of the city, i.e., the physical appearance, activities and function, and symbolic representation of that building. This identity takes shape and develops in the historical flow. Therefore, the civilizations ever born, lived, and collapsed there contribute to that identity (Kandemir, 2017). Along with architectural heritage, cultural heritage is also crucial for the identity of an area or community. According to the framework of the urban fabric, cultural heritage is those buildings that are important for locals being representative of their past and historical events. It does not mean that built heritage must be beautiful buildings with some exceptional values but instead it can be a small vernacular building that has some significant historical, cultural, or archeological values. It is the basic component of identity that treasures different human experiences. Apart from the cultural, another very closely linked heritage with the built environment around us is social heritage. It deals with the lives of people in the form of customs and traditions prevailing in the society and their effects on the individuals. Building forms and planning play a vital role in execution of these traditions. Today, these heritage buildings stand to keep those forgotten stories and traditions alive. Therefore, build heritage has a strong link with the cultural practices and the social life of the community and the outlook of their future. As Jawaharlal Nehru once said, 'We have to earnestly look ahead to the future and strive to preserve our heritage. In both the past and the present, we should find inspiration to draw a better future for all. For ignoring one's past is ignoring one's roots.' Built heritage is the most important cultural asset that is the evidence of cultural development over the time. As transformation does not occur in a day or a month, it is a long-term process and to transform the identity, the new building must have greater impact on the lives of people in term of its locality, usage, and architecture. This perception of relation between the cultural heritage and community agree with Smith's argument that 'heritage is a cultural process' (Smith, 2006).

3 Historical Processes that Shape Architectural Identity of the City

The old Lahore was irregular trapezium in shape with its longest side toward the north as shown in (Fig. 1). The city is over two kilometers in length and above one kilometer in breadth, including the fort in its northwestern corner. The historic city has circumference of seven kilometers with 13 gates interspersed magnificently (Nadiem, 1996).

It was among those few cities which remained the center of attraction by all the rulers. The exact era of origin of the city is not known but different historians discussed this place in their writings (Latif, 1892). Mughals were the first who gave it the magnificence and grandeur of a royal city, and this glory continues to the Sikh period (sixteenth to eighteenth century). Abul-Fazal recorded the following description of Lahore, during the reign of Akbar, in the Ain-e-Akbari.

> Lahore is a very large and populous city. The fort and palace are of brick and lime, and when this city was for some time the seat of government, many other capital buildings were erected and gardens laid out with taste and elegance (Raza, 1988).

It had enjoyed huge attention and remained the capital of Punjab Province for centuries. The main focus of the Mughals was always on the constructions of Royal Forts, tombs, mosques, and gardens. The first evidence of mud fort was in 1021 when Mahmud of Ghazni invaded this area. Its foundation was laid by the great emperor Akbar and was almost completely rebuilt in seventeenth century (Ruggles, 2011). Every successor ruler modified or built new structure and added to the grandeur of the Royal Fort. It has 21 monuments and most distinguished is Alamgiri gate that was built by Aurangzeb in 1673 (Fig. 2a). The other renowned structure was Sheesh Mahal (Palace of mirrors) built during the reign of Shah Jahan. It was decorated by mirrors and white marble as shown in (Fig. 2b).

Within the walled city, the fort was the only structure that marks the historical events of Mughal and Sikh rule and remained the emblem of rise and fall of many rulers for centuries. Although gardens and Badshahi mosque were also constructed later and gained much attention, the identity of the city remained linked to Lahore fort. Initially, it was the only huge structure that occupied the largest portion within the walled city and people had to move toward it for all the orders and commands. The course of history changed with the annexation of the Punjab by the British in 1849. They start their rule in Lahore and found some magnificent architecture and artistic tradition to follow. The British, like the Mughals and the Sikhs earlier, had taken the fact of Lahore strategic location into consideration while constructing their administrative machinery. Lahore soon became the foremost official, educational, banking, and railway center in the Province (Government Punjab, 1927). The railways have revealed as the engine of change and proved to be the birth and growth of modern Lahore (Kerr, 2007). As the British had their own ideas about building design, they bought with them an entirely different style of architecture and termed as colonial architecture, and it is completely different from what is already prevailing in Lahore. So, toward the latter half of eighteenth century, the

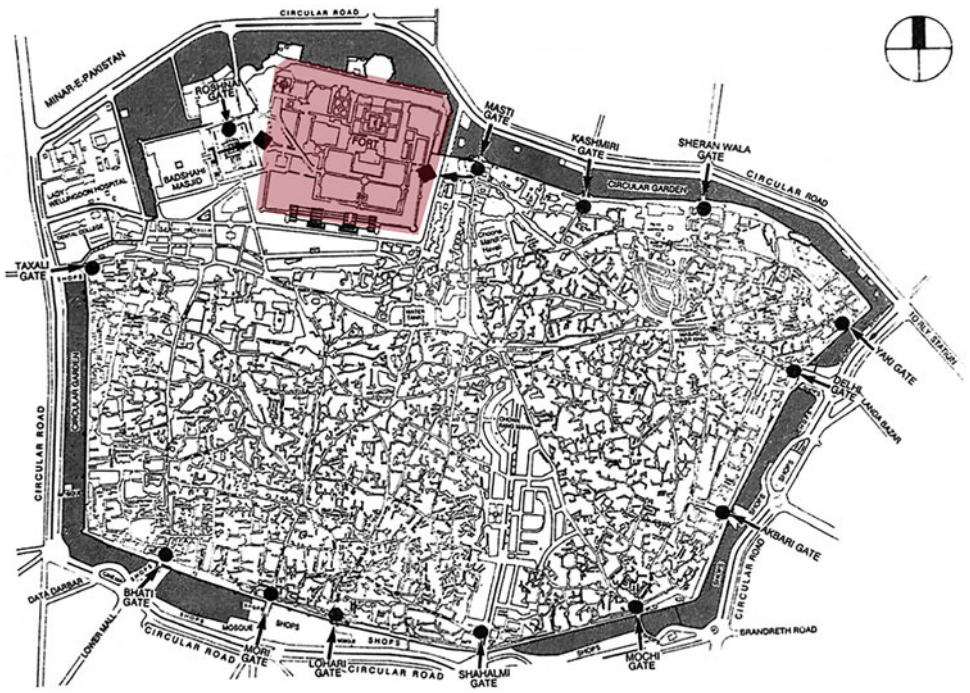

Fig. 1 Map of old Lahore showing the shape of city and the highlighted area represent the Lahore Fort (render by the author)

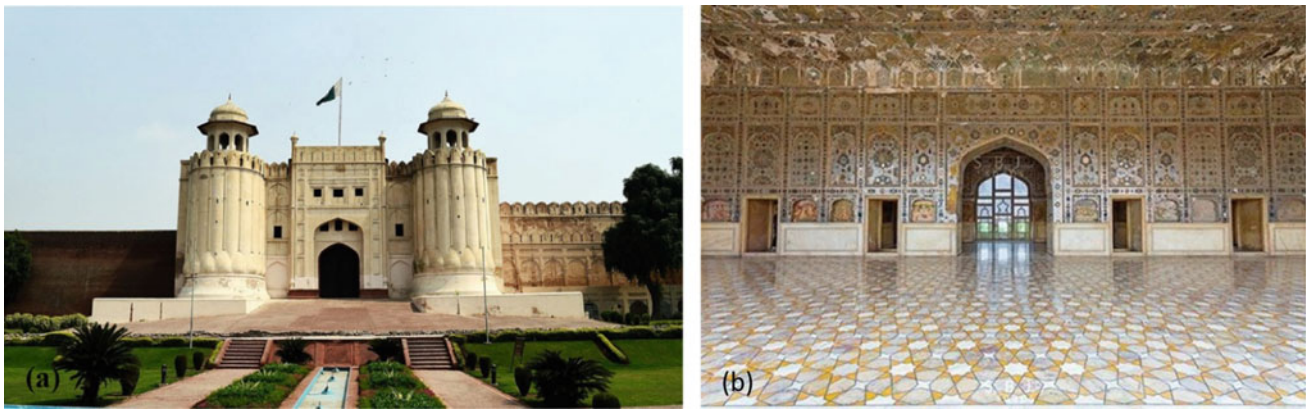

Fig. 2 **a** Alamgiri gate of Lahore Fort. **b** Sheesh Mahal decorated with mirrors and white marble

Fig. 3 Picture of Lahore railway station taken on the visit of by Sir Louis and Lady Dane in April 1911 (Glover 2008)

architectural ideals of Europe began to be introduced in Lahore. Among all the conversions, the most astonishing was the construction of the Lahore Railway Station. It was constructed shortly after the Indian Mutiny 1857. The Lahore station was built during a time when the foremost priority of the British was to protect the British civilians and troops against any future 'native' uprising. 'It looked like a fortified medieval castle, complete with turrets and crenelated towers, battered flanking walls, and loopholes for directing rifle and canon fire along the main avenues of approach from the city' (Glover, 2008). The Lahore Railway Station crenelated towers, battered walls, and loopholes are clearly visible in the station's parapet (Fig. 3). The picture was taken during the visit of Sir Louis and Lady Dane in April 1911. Dane was Lieutenant Governor of the Punjab from 1908 to 1913.

The railway station got the attention of print media as well. The popularity and the excitement of the people for the new building and mode of transportation are worth watching. One such example is the pictorial depiction of event in Illustrated London News when Governor General of India arrived at railway station. It was founded by Herbert Ingram on May 14, 1842; it was an illustrated magazine and is the finest pictorial example of a historic social record of British and world (Fig. 4). As Lynch said the unique physical qualities that render the landmark are 'memorable in the context' (Lynch, 1960). The building is designed by Mr. W. Burton, C. E., and constructed by the late Mahomed

Sultan, the great contractor to the Department of Public Works. The foundation stone was laid by Sir (afterward Lord) John Lawrence, Late Lieutenant Governor of the Punjab, in 1859, and in 1860 the first train from Lahore to Amritsar was ran for public traffic. The whole building is a castellated and is one of the finest, as well as the most substantial specimens of modern brick work in the country. The total cost was nearly five lakh rupees.

4 Transformation of Identity: Railway Station Emerged as New Identity

Buildings erected under the British Raj, wrote Emerson in 1884, 'for any purpose connected with the natives, whether for administration, education or charity, should show a distinct British character, at the same time adopting the details and feeling of the native architecture, and suiting it to the particular requirements of the case' (Metcalf, 2002). The railway station resembles, in appearance, one of the forts of the country, and is, in fact, a fortified position, provided with the means of defense in case of emergency. The defensive arrangements consist of bastions at the angles with 'keeps' or towers, above them, which command the several approaches and provide for a flanking defense of the curtains or outsides of the station, which also are loop-holed for musketry fire over the surrounding neighborhood. This fire can be further strengthened from several towers and turrets which overlook and command all surroundings in the immediate vicinity of the station. These arrangements appear to be all that is necessary to secure the station against an attack with small arms or against a sudden rush, and further to provide for the refuge of the railway staff and others in any time of danger.

The Lahore Railway Station was first purpose-built imperial British building. 'The site selection for railway in Lahore was dictated by various factors including its strategic location, safety and security, availability of land, and protection from floods. Location of the Lahore Railway Station became the focal point for a vast network of new roads linking other settlements of the city. The main roads were connected with each other through secondary roads and the first time, the urban landscape of Lahore expanded on a large scale' (Khan, 2013). Figure 5 shows the location of railway station with respect to walled city and Lahore fort. All the major road networks headed toward the station, the iconic building of that era.

Heritage buildings are the representative of culture, aesthetic, building techniques, and life style of a certain period. The construction of the Lahore Railways changed the course of history and also appearance of Lahore urban life. The railway has reached its peak in popularity, expansion, and richness in architecture during the nineteenth century. Lahore being the headquarter of the North Western Railway Administration, there was huge railway staff which forms a very important part of the population of the town. These railway colonies were developed away from local settlement and grouped around or near the railway station. Institutes were also built for the recreation of the staff that depicted the cultural life of that era (Ali & Qi, 2019). Largest railway locomotive workshop was built near the station, and along with Anglo-Indians, hundreds of local men were also

Fig. 4 Arrival of the Governor General of India at the Lahore Railway Station illustrated London News, 1864

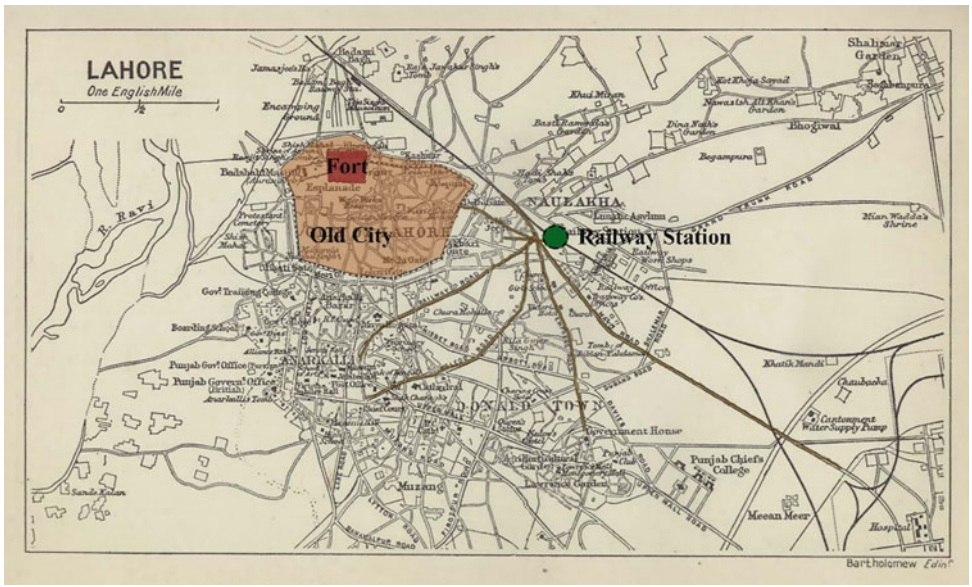

Fig. 5 Strategic location of Lahore Railway Station with all the main roads heading toward it (render by the author)

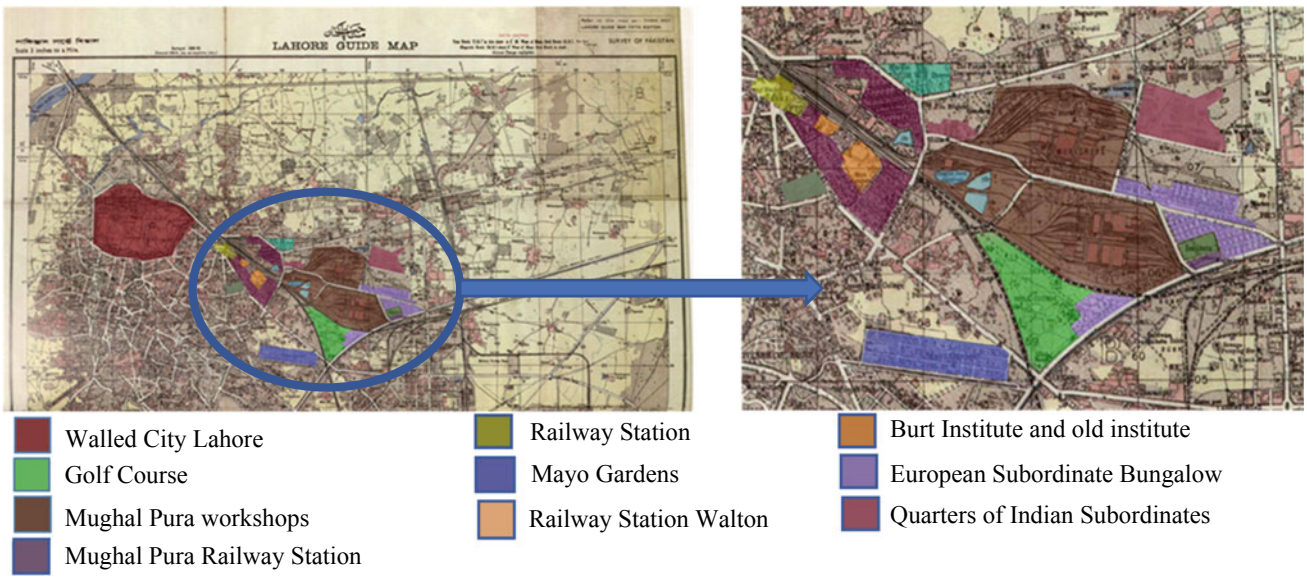

Fig. 6 Map of Lahore 1950–1951 showing walled city, railway station, and the area occupied by railway department (rendered by the author)

employed that resulted in huge population directing toward the station. In setting the railways, the British used their technology and design techniques that were different from what was already prevailing in the city. Railway station truly act as the gateway to the new developments and process and took the city to new level of popularity and progress. Soon railway became the fourth largest settlement of the city (Fig. 6). Hence, it will be true to say about Lahore Railway Station what Meek has said that the station to the modern city is like what the gate had been to the ancient city (Meeks, 1995).

5 Discussion

An old historical city which held a significant character and identity for centuries needed a strong influence to suppress the value of Royal Fort. British were successfully able to do that. The main reason was the revolutionary impact of railways on the technology, construction, and the urban expansion of cities. Although railway station was built outside the walled city for defensive purpose, it has directed the growth of city parallel to its tracks. It soon became the

focal point as all the population headed toward it as the main source of transport. Today both the iconic identities stand still at their location depicting the glorious eras of the rule. It is very essential to keep the identity of the area alive not merely in the form of preserving an old building but to give benefit to the community. It could be seen as a 'soft' value, though which cities can have a unique identity different from other cities to attract global markets. Along with the built heritage, memory and identity related to railway station should also be kept intact as they form the core urban identity of the area. Even today, sit with an old man and he has so many stories related to the railway station. These memories either the narratives or the written material available should be highlighted to keep the heritage more than a building. Regeneration is also a way to reinforce cultural heritage distinctiveness. Planning is required to promote the cultural heritage both the tangible and intangible due to their significant rule in shaping cities. The association with these buildings should be recognized as human need. It will help us to develop an environment in which places are for man to enhance their experiences. The ultimate goal of all the strategies is to make the citizens feel pride on their heritage and culture. This can be achieved through active community participation in heritage and cultural activities.

6 Conclusions

The heritage, both tangible and intangible, is the great asset for any community or city. The protection of these historical identities is very significant. These heritage buildings and historic environments should be protected as they are the fundament of knowledge, past experiences, and cultural values. At present, Lahore is representative of three different eras of rule with distinctive identities. In a transforming city like Lahore, it is difficult to maintain a single identity it has changed in the past and will keep on changing. There is no drawback in moving forward but the core essence of identity should be kept alive. The understanding of cultural heritage among the locals should be promoted so that it becomes a social process instead of just a physical object that is preserved. Although government has declared it protected but presently its importance has been relatively lower because present generation is unaware of history behind its construction, the role played by the railway station, and the tracks in the expansion of the city. Only the protection of heritage building is not sufficient but in fact special attention should be given to retain their identity as well. It can be done through proper planning and implementation of strategies. It helps us to understand how we use to shape our environment in the past and how we live today. It establishes a link with the past and maintain sense of identity and place. Failing to preserve heritage is breaking one's identity and cultural origins. Hence, the protection and preservation of cultural heritage in all its forms is an obligation for future generations.

Acknowledgements This work was supported by the National Natural Science Foundation of China (No. 51778123). We thank to Southeast University Nanjing, China; Pakistan Railway; Pakistan Archives Department for their support in data collection.

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The Power of the Pop up: Creative Engagement and Rediscovering Our Architectural Heritage

Kathryn Best

Abstract

The concept of the pop up has been popularised in the worlds of art, design, retail, restaurant, and business enterprise, and in the retail context alone, it is currently estimated to be a USD $50 billion industry. A pop up describes a business or event that is set up quickly, for short-term operation, in a temporary location. It can last for one day or several weeks and typically disappears as quickly as it "popped up". As a concept, it is used by companies to build interest in branded products and services, by artists and designers to host gallery-like exhibitions and events, and by popular culture influencers to promote unique environments and experiences. Pop up retail began extending into other genres around 2009, when the pop up restaurant—temporary restaurants popping up in various locations—began growing in public interest and frequency. This chapter presents three "cultural pop ups" from the worlds of archaeology, cultural heritage, and contemporary architecture (pop up museum in Libya, pop up exhibition in the Netherlands, and pop up architecture in United Arab Emirates) with suggestions for how the pop up concept could be applied to the context of architectural heritage. When approached from the perspective of creative engagement, the opportunity exists to disrupt routine ways of relating to archaeology and architecture and encourage new ways for heritage professionals to work with non-professionals in rediscovering the past, engaging with the present and safeguarding the future.

Keywords

Creativity • Pop up concept • Engagement • Archaeology • Architecture • Heritage

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1 Introduction

Initially, popularized by retail, restaurant and business enterprises, and art world interventions, the concept of the pop up is currently estimated to be a USD $50 billion industry within the USA retail context alone (Hartjen, 2018). A pop up describes a business or event that is set up quickly, for short-term operation in a temporary location. It can last for one day or several weeks and typically disappears soon after its initial appearance. Pop ups are most frequently used by companies to build interest in branded products and services. They are also used by artists and designers to host gallery-like exhibitions and events, and by popular culture influencers to promote unique environments and experiences.

Pop ups are of particular interest to young people and in terms of audience engagement, various companies and entrepreneurs, exhibitors, and event hosts are keen to utilise the pop up because of its powerful appeal to new generations and wider audiences. In the world of retail and commerce, where start-ups and solo-preneurs compete for attention with global brands and Fortune 500 companies, a great creative and innovative idea can lead to a great pop up that stands out from the crowd. "Whether it's out of necessity or creativity, popping up shop outside the confines of the traditional is completely in line with pop up culture… With a little bit of creativity, the possibilities are endless… Often the concept for a pop up store morphs and takes on a whole new dimension which is all part of the nature of pop up shops, and very often the creative inspiration leads to something greater down the line" (Sugar, 2016).

Inspired creativity, endless possibilities, experiential engagement, and going outside the confines of tradition make pop up culture worthy of attention and further investigation by the architectural heritage community. According to the Nomura Research Institute, we now live in "an age of creativity", a period characterised by constant innovation (Lyons, 2015), and pop ups present a particular type of audience engagement that could help architectural heritage

Y. Mahgoub et al. (eds.), *Cities' Identity Through Architecture and Arts*,
Advances in Science, Technology & Innovation, https://doi.org/10.1007/978-3-030-14869-0_14

professionals co-create, collaborate and connect with new audiences in general and young people in particular—the next generation leaders of architectural heritage initiatives, archaeological excavations, site protection, preservation and conservation projects, and cultural outreach experiences of the future. The quick, short-term and temporary modus operandi of the pop up offers the host an opportunity to experiment in new ways, at lower costs, with the benefit of flexibility and the added element of surprise. For heritage professionals, the opportunity exists to experiment with the use of pop ups, on site and off site, in entirely new and innovative ways, whether as a way to facilitate new forms of community engagement, or as a method to explore problem-solving ideas and solutions for financial, site or regional challenges. If two ways to increase innovation are to enable collaboration and enhance diversity (Amabile & Khaire, 2008), then the pop up becomes particularly timely when considering the heritage leaders and workers of the future, with their different needs, experiences, desires, and motivations for how they might want to want to learn, engage, connect with, and protect cultural heritage projects in the age of creativity.

The Nomura Institute's proposition, that creativity is the next economic activity that is replacing the current focus on information, effectively places creativity in the category of historically significant paradigms that have shaped human economic history from the beginning of time (Nomura Institute, 2003). Historically, agriculture, industrial production, and information were the dominant spheres of human economic activity—and the next one is creativity (Nomura Institute, 2003). Howkins (2013) refers to this age of creativity more specifically as the "creative economy" which is driven by the growing power of ideas—and how people make money from ideas. "Twenty-first century industries will depend increasingly on the generation of knowledge and ideas through creativity and innovation" (Howkins, 2013). Further, Florida (2012) recognised the growing economic and sociological impact of creativity and coined the term "the creative class" to refer to an increasingly influential segment of society who draw their identity and values from "creativity". Members (such as scientists, engineers, architects, educators, writers, and artists) are "those whose economic function is to create new ideas, new technology and new creative content" (Florida, 2012). Florida views human creativity is the ultimate economic resource, and asserts that having a vibrant creative class adds to a community's well-being (Florida, 2012). Lyons (2015) looks more specifically at the work patterns of a new young generation of creatives. "A generation made up of multi-taskers motivated by collaboration, recognition, transparency and flexibility… these individuals look for fulfilling experiences rather than strict career paths" (Lyons, 2015). They also look for "applied creativity", which requires discipline, training, and preparation, and which Lyons describes as a process of generating ideas that "allows team members to rapidly build on each other's ideas, postpone critical judgment and build creative prototypes repeatedly and efficiently… It incorporates differing perspectives and areas of expertise—precisely the needs of this new, multi-skilled generation" (Lyons, 2015).

Creativity and innovation are incredibly important to both individuals and organisations today, as a means of generating revenue and growth, evolving to compete and collaborate, and adapting to reinvent, survive and thrive amid challenging economic times. The interesting times in which we live have been triggered by significant changes in economic, political technological, environmental and societal conditions that are forcing "business as usual" to change. Institutions and governments are having to adapt and evolve their strategic vision, rules and regulations, ethical policies, economic models and operational structures, while simultaneously learning to adapt to new forms of creative, social, and technological engagement that allow people to connect, share, collaborate and communicate in new ways.

The appeal of the pop up to new generations and wider audiences is one that also allows space (conceptual, physical, mental, and financial) for heritage professionals to engage with non-heritage professionals in understanding the lives, cultures, identities, and legacies that each are dealing with. If heritage shapes the identity of future generations by connecting them with the lives, traditions, and culture of their ancestors (CAH, 2018), then pop ups could prove to be a flexible and affordable way to assist in developing new strategies and practices for creative engagement, for awareness-raising and fund-raising, and for stimulating new ideas, over and over, for the conservation and protection of architectural heritage during the complex times in which we live. Cultural heritage protection needs new generations to engage in taking care of their historic and cultural heritage—and their legacy to future generations. Since architecture presents a chronology of human civilization and existence, from monuments of the past to the buildings of today, it can help us understand the life of humans in the past and present, and help us decide what kind of legacy we want to leave behind in future. In this sense, the process of conserving architecture is, in fact, "the process of conserving the existence of humans themselves and their identities, culture and traditions to future generations as a guide for their architectural (and other) endeavours" (CAH, 2018).

Design is one approach to inquiry and action among many used by humans to engage with the world (Neilson & Stolterman, 2003) and in any area of research where the focus is on creative practice, creative thoughts, creative acts, and creative engagement, the validity (scientific or otherwise) needs to be determined in different ways, and using different standards. Research is the search for new

knowledge, and each discipline has its own preferred theoretical and practical methods for achieving this goal. Ruecker & Robert-Smith (2018) point out that "the majority of sciences develop new knowledge or understanding in a sequential manner, with new, valid theories either displacing old theories or else filling in their gaps. The humanities, on the other hand, enrich the understanding of an object of study (for example an historical event) by making valid examinations of it from different perspectives or lenses. The epistemological model is aggregative rather than sequential. Social sciences use both approaches". Looking specifically at design research, Ruecker & Robert-Smith (2018) elucidate that "design research has an epistemological mode that differs from those in the sciences, social sciences and humanities, but is shared with some aspects of other generative fields such as engineering and computer science". In their view, "in order for a creative act to serve as a research outcome, it must demonstrably add to or improve what is understood by people with expertise in the field, and it must demonstrably yield new insight to the knowledge base of a field". Ruecker & Robert-Smith (2018).

This chapter introduces the concept of the pop up followed by three case studies about "cultural pop ups" from the worlds of archaeology, cultural heritage and contemporary architecture. Suggestions are then offered for how the pop up concept, as a form of creative engagement, could be applied to the context of architectural heritage. It may be that pop ups do not directly "yield new insight into the knowledge base of the field", however, the three case studies presented, each with their own rationale for engaging the pop up concept, may indirectly go some way towards creatively disrupting and positively encouraging new ways for heritage professionals to engage with non-heritage professionals in the rediscovery of architectural heritage by wider audiences.

2 The Concept of the Pop up

What is a pop up? The phrase pop up means "to appear in a place or situation unexpectedly" (Collins English Dictionary, 2018.) and as a concept has been purposefully applied to serve retail, restaurants, businesses, and creative enterprises. Pop ups are used by companies to build interest in branded products and services, by artists and designers to host gallery-like exhibitions and events, and by popular culture influencers to promote unique environments and experiences. In retail, a pop up is: "the practice of setting up temporary retail establishments. Established companies like apparel makers use the method to test markets before establishing permanent stores. Entrepreneurs use pop up retail for seasonal offerings and events. Existing retailers use the method to sell excess inventory, or further the reach of their best-selling inventory" (Business Dictionary, 2018).

Hass & Schmidt (2016) refer to Hutter's (2013) definition of the pop up store—temporary shopping opportunities that display products and services in a surprising way in order to attract the consumers' attention. When considered as a form of art, potential customers can experience "a surprising and exclusive entertainment or supporting program in the pop up store", for example, events including art and music, movies, shows, free food (Hass, & Schmidt, 2016). Nicasio (2014) describe it is a "dynamic and agile retail trend", one that is highly versatile, flexible, adaptable, and particularly popular in urban settings. Holledge (2012) describes the pop up shop as a "retail phenomenon" that makes use of empty retail space, and evidences the locational value of the pop up through expert perspectives: "It adds to footfall and is a welcome addition to business and the appeal of the area" (Simon Pitkeathley, Camden Town Unlimited); "It is useful to show the potential of the area and it helps to stop it looking like a deprived area" (Helen Santer, Waterloo Quarter); "A flourishing high street improves the environment and makes the area more attractive to small businesses and house buyers" (The Architecture Foundation); And finally, pop ups "add vitality to a community and stem the sense of decay that some rundown areas have" (Giles Barrie, Property Week). According to Big Commerce (n.d.), a business wanting to use a pop up can:

- Rent a vacant storefront for just a short period of time.
- Set-up a booth at a craft fair, farmers market, or other event.
- Partner with an established retailer or gallery owner and rent out a portion of their space.
- Sell a wide variety of merchandise or just a small selection.
- Experiment with unusual, creative, or innovative merchandising techniques and experiences to attract passersby.
- Use the space to drive sales and act as additional sources of revenue.
- Test out what it would be like to have a retail location at just a fraction of the cost.
- Gather insight into the marketplace without a large capital investment.
- Use the space as a strategic means of clearing out stock or excess inventory or promoting a new product.

For online retailers, a pop up shop can be "an extra branding tool for retailers that don't normally have a physical store presence" (Big Commerce, n.d.). They use a physical pop up shop as a temporary storefront and short-term retail space so as to reach new customers, test out a physical retail environment, enable customers to experience products first-hand and provide an opportunity to interact with

customers in ways that are unusual for ecommerce-based merchants and that can lead to a deeper level of communication and connection (Big Commerce, n.d.).

Pop up retail began extending into other genres around 2009, when the pop up restaurant—temporary restaurants popping up in various locations—began growing in public interest and frequency (Spiegel 2015). In hospitality, pop up restaurants, also called supper clubs, are temporary restaurants that can operate from a private home, a food truck, a former factory or other similar space, and during festivals. For young culinary professionals, it is a useful way to gain exposure, demonstrate skills or seek investment in a future restaurant or food-related concept. It is also a viable business model to "utilize underused kitchen facilities and experiment without the risk of bankruptcy" and to engage "crowdfunding efforts that offer the short-term capital needed to fund start-up costs" (Pop up Restaurant, n.d.).

In terms of business enterprise, pop ups are popping up everywhere. Wang (2013) asserts that "the real estate industry has experienced a proliferation of ultra-short-term leases for everything from offices to art museums. Valued at USD $50 billion by research firm RetailNext, the pop up applies to virtually every industry, from traditional retail to art museums, celebrity merchandise to online mattress companies" (Wang, 2013). Pop ups tend to appeal to young people, and the "pop up economy" is thriving as retailers of all scales mix real world (physical, experiential) and on line (digital, mobile) retail. It is "young people who crave increasingly novel experiences" with the result that "businesses have shifted their budgets from traditional advertising to brand activation efforts" as a way to reach their target audiences. With the current rise of social media, "these experiences will be documented extensively by consumers and influencers on Instagram or Snapchat, creating an organic advertisement campaign that travels through valuably linked networks" (Wang 2013). According to the Association of National Advertisers (ANA), the market for brand activation in the US will reach USD $740 million by 2020.

From an architecture, art, and design perspective, Griffiths (2012) asserts that the pop up can fulfil many roles (restaurant, retail, arts venue, exhibition, event, or multifunctional space) during its short lifespan and can come in many guises (readymade, latest technology, recycled materials, dismountable, reusable, mobile, temporary, semi-permanent, spontaneous), and sizes (from huge temporary stadia, to tiny transitory event and exhibition spaces, to extensions for existing spaces). Pop up shops, where original home designs could be purchased, were present at the 2017 London Design Festival (Chandler 2017). Pop up architecture can "transform disused sites into venues for an alternative purpose and audience" and can provide a space where "brands are encouraged to express themselves in the way they present their wares" (Griffiths, 2012). Breeze (2011) describes a series of pop up projects in London, United Kingdom, that "temporarily transform various urban spaces in unconventional and unexpected ways, capturing the publics' imagination by offering fleeting reinterpretations of familiar parts of the city that remain beyond when the building is dismantled… It is an inspiring example of what can be achieved by a community without a developer or a large professional team" (Breeze, 2011). For Future Architecture Platform, "the minimal structures of pop up architecture are more flexible and mobile to suit modern urban needs" and can offer "an individual space wherever it is needed" (Radulova-Stahmer et al., n.d.).

In terms of the pop up art exhibit, one of the most recent popular culture trends arising has been called "the instagram museum effect", driven by increased consumer appetite for social-media-perfect experiences. "These temporary art museums often feature lavish artistic decor, interactive installations, and a whimsical theme" designed to provide the perfect backdrop for a photograph or "selfie" and to intentionally generate feelings of "limited edition", scarcity and "mass-clusivity". "People feel more compelled to go to the exhibit if it won't be there in two weeks - and it doesn't hurt if it doubles as a photoshoot set" (Wang, 2013).

The actual origin of the pop up is grounds for speculation. Hass & Schmidt (2016) refer to Hutter's view (2013) that the originator of the pop up idea was Russell Miller, manager of Vacant in Tokyo. In 1999, Miller announced the short-term closure of his shop, and after noticing the immediate and enormous interest in his clothing collections as a result of this announcement, he decided to close the permanent shop and intentionally reopen it in changing places. His idea paid off, and when the store opened for only a few weeks in New York City in 2000, Vacant was able to acquire more customers than ever before (Hutter, 2013, referenced in Hass, & Schmidt, 2016). Nicasio (2014) identifies Target as the first retailer to bring pop up stores to the US with the 2002 opening of a Christmas store at Chelsea Piers, New York City. Amazon and Google have both used pop up stores to sell devices; Warby Parker (eyewear) converted an old yellow school bus into a pop up store that travelled around the country; and the streaming service Spotify has used pop up exhibits to, for example, host the launch of Ariana Grande's new album, Sweetener, so bringing to life an art exhibition and immersive experience of the album—with one room dedicated to each of the ten songs (Pedrosa 2018).

3 Methodological Approach

In order to learn more about the use of the pop up concept in the cultural heritage context, real world examples were identified and documented in three case studies. The case studies were used to capture qualitative evidence and to

underpin the findings and suggestions around the use of pop ups in architectural heritage projects. The author searched for two relevant examples of the pop up in cultural heritage projects and made the selection based on a methodical review of articles and websites documenting their occurrence in the areas of culture, heritage, archaeology, exhibitions and events. In particular, the author was searching for examples that contained sufficient evidence of the connection between temporary projects and activities in the context of heritage where new categories of audient engagement were attempted—audiences that are outside cultural heritage and traditional "fieldwork" settings. The third case study is one in which the author was directly involved as a participant and it is therefore written from direct observation and experience. In this third example, the term "pop-up" was very consciously used by the host institution to promote the event, reflecting a contemporary perspective on the relationship between the appeal of the pop up concept to young audiences, and the mindset of a forward-thinking cultural institution with a regular programme of activities.

4 The Case Studies

The case studies are, firstly, a pop up museum in Janzour, Libya, to explore audience engagement in the context of archaeology; secondly, a pop up exhibition in Leiden, The Netherlands, to explore a traveling exhibition in the context of cultural heritage; and finally, a pop up event in Abu Dhabi, United Arab Emirates, to explore educational outreach in the context of contemporary architecture.

4.1 Case One: Pop up Museum, Janzour, Libya

Libya is a rich country in terms of culture, history, archaeology, and architectural heritage. However, a 2011 UNESCO World Heritage Report recommended that, in the aftermath of political unrest, foreign missions should shift focus from excavation into "assisting Libya with the protection, assessment, documentation, and management of cultural heritage, to be realised through a focus on training and capacity building" (Kane, 2018). Since then, numerous governments, institutions, and communities have been pro-actively supporting the preservation and protection of Libyan heritage.

Will Raynolds (2018) describes how a chance meeting with the Boy Scouts and Girl Guides of Libya (BSGG) changed the life of Suleiman al Magrisi, an electrical engineering student and now troop leader within BSGG in Libya. With 20,000 members, BSGG is the largest civil society organisation in the country, and activities organised for members on a weekly basis include campfires, lectures, events, and field trips—many of which are directly connected to history. However, the ability for BSGG to organise activities was impacted by political turbulence in 2014, and the resulting regional instability lead to the withdrawal of many western embassies and the closure of Libya's museums in order to protect their priceless displays. "For the time being", Raynolds explains, "this material remains safely behind closed doors, but sensible measures taken for protection impede efforts like al Magrisi's to foster pride in Libyan history" (Raynolds 2018). In a joint effort to mitigate this challenge, the Libyan Department of Antiquities (DoA) and BSGG volunteers instigated a series of pop up museums. Inspired by the work of museum exhibit designer Paul Orselli carried out through projects sponsored by The US Department of State and Oberlin College (USA), the joint BSGG-DoA team created "temporary displays and outreach activities to ensure that young Libyans had better opportunities to learn about their history and their role in protecting it" (Raynolds 2018).

With limited budgets and increased responsibilities, and facing many concerns about Libyan sites of antiquity (looting, smuggling, illegal encroachment, damage, assessment and maintenance), the DoA had been "seeking assistance from ordinary citizens willing to work to safeguard Libyan cultural heritage sites for the future" (Raynolds 2018). To this end, Raynolds describes how BSGG are making an invaluable contribution—their members voluntarily support the DoA missions and have the opportunity to work and train alongside archaeologists. In a further boost to the joint BSGG-DoA initiative, a collaborative agreement was made between the US Department of State and the American School of Oriental Research (ASOR) Cultural Heritage Initiatives to sponsor and supervise workshops in Janzour (near Tripoli) and Cyrene (UNESCO World Heritage site). Raynolds (2018) further explains that during the pop up activities, the needs of both BSGG and DoA were taken into account. The Scouts and Guides engaged in "learning by doing" and benefitted from Libyan heritage presentations and training activities offered by DoA staff, while ASOR were able to offset the cost of travel, lodging and workshop equipment—so allowing invaluable archaeological site work to happen (Figs. 1 and 2).

Looking specifically at Janzour, a DoA site archaeologist described how, from knowing nothing about archaeology, 32 scouts from three different regions "gathered at the enclosed compound of the Janzour Museum, pitching their tents next to a complex of Punic and Roman tombs dating from the 1st—fourth centuries AD" (Intisar al Arebi, quoted in Raynolds, 2018). The DoA staff introduced the scouts to Libyan history, to the methods used to uncover and study evidence about the past; to excavation training; to career opportunities in archaeology; and to the importance of their role as protectors of archaeological sites for the future.

Fig. 1 A scout engaged in the training exhibition. *Source* Jansour Pop up, Libya. © Talal Bariun and ASOR, www.asor.org

Fig. 2 Libyan scouts screen cleared debris. *Source* Jansour Pop up, Libya. © Talal Bariun and ASOR, www.asor.org

The three-day event ended with an open house of activities aimed at a broader audience of parents and the public (See Fig. 3). In terms of outreach, the participating scouts made an invaluable contribution through their new ability to introduce archaeology, excavation, and preservation to their own families and communities (Raynolds, 2018). Figures 1 and 2 show the Scouts in action on site—training in excavation techniques and screening cleared debris.

Under the inspiration of Fadl abd al Aziz, the idea was replicated and a second pop up workshop in Cyrene took the

Janzour pop up museum further. Cyrene is a seventh-century BC former Greek, Ptolemaic, and Roman colony and UNESCO World Heritage site that still attracts Libyan tourists and families today. The students were put to work as volunteers who cleaned the site and thereby helped both its routine maintenance and on-going preservation (Raynolds 2018).

A third pop up took the form of a public exhibition at Cyrene with a powerful message: "even though Libyan sites and collections are currently under threat, there is much that can be done to protect them" (Raynolds 2018). BSGG created another pop up within the initial pop up and initiated a five-day celebration of Libyan heritage, with 52 BSGG members from four locations meeting in celebration of Libyan cultural heritage and a chance to work alongside DoA archaeologists on site learning about site clearing, stabilisation, and maintenance (Raynolds 2018). According to Suleiman al Magrisi, the scout volunteers helped the DoA team accomplish in four days what their own team would have needed a month to accomplish. Over the five-day period and with over 30 visitors a day as well as local media attention and interviews, this model of cultural heritage outreach and active volunteerism has great potential at other sites in Libya (Raynolds 2018). Figure 4 shows the DoA professionals in Shahat during the First Exhibition of Retrieved and Received Artefacts.

Perhaps Raynolds (2018) most critical insight is that these partnerships between the DoA (as government employees) and BSGG (as citizens) are a powerful way to build non-political trust with local residents and communities, at a time when political and social tensions increase complications with archaeological site maintenance and preservation.

This initiative connects DoA with the future generations of Libyans—young, budding archaeologists and pro-active public protectors of their heritage. It also connects to broader initiatives, for example, the work of Dr. Susan Kane who has been working with the Libyan Department of Antiquities to train Libyan archaeologists and police in how to protect and preserve their heritage in the midst of crisis and civil war. According to Dr. Kane, "The over-riding concern in Libya these days is security… There is little respect for historical remains that might impede new construction" (Antiquities Coalition, 2018). Creating activities that contribute to capacity-building work for the preservation and protection of Libya's cultural heritage is critical.

4.2 Case Two: Pop up Exhibition, Leiden, the Netherlands

The NEARCH Project is a European-wide cooperation network of 16 partners from ten countries. Co-ordinated by the French National Institute for Preventative Archaeological Research (INRAP), and with a five-year commitment of support from the European Commission Culture Programme (2013–2018), the 13 European research centers, universities, and cultural organisations are committed to exploring "the challenges and consequences of significant scientific and

Fig. 3 On site workshop and open house. *Source* Jansour Pop up, Libya. © Talal Bariun and ASOR, www.asor.org

Fig. 4 DoA Professionals in Shahat. *Source* Jansour Pop up, Libya. © Talal Bariun and ASOR, www.asor.org

professional developments in archaeology and cultural heritage management" (NEARCH, n.d.). The aims of the NEARCH Project are to "explore the various dimensions of public participation in contemporary archaeology and bring to the field, which is strongly influenced by economic and social developments in society, new ways of working and collaborating" (NEARCH, n.d.). Further, five objectives connected to archaeology, artistic creation, heritage management, young professionals, transnational mobility, citizenship, audience, and wider geographical and cultural perspectives are addressed through the five main themes of the project:

- INVOLVING: Archaeology for the community: informing and involving people.
- IMAGINING: Archaeology and the imaginary: crossroads between science and art.
- SHARING: Archaeology and the knowledge: teaching and sharing information.
- INNOVATING: Archaeology in changing economy: towards sustainability.
- CONNECTING: European archaeology and the world: dependencies and mutual development.

NEARCH is an acronym for New ways of Engaging audiences, Activating societal relations and Renewing practices in Cultural Heritage—shortened to "new scenarios for a community-involved archaeology" (NEARCH, n.d.). The Dutch version of the traveling exhibition, Archaeology & Me, was put together by the Faculty of Archaeology at Leiden University. Students co-produced the exhibition for display in Leiden Central Station in May 2018. Through an open competition organised by the NEARCH Project, citizens from 15 European countries were invited to submit drawings, photos, videos and other artistic expressions in response to the question "what triggers archaeology in you?" Over 300 people responded with mainly digital artworks with written descriptions. These submissions were used to form the content of the exhibition and display what adults and children considered to be "fascinating, funny, awkward or aesthetic works about the past and archaeology" (NEARCH, 2018). Figure 5 shows the first edition of the Archaeology & Me Exhibition in Maastricht, while Fig. 6 shows the second edition of the Exhibition in Leiden Central Station.

A catalog was produced to capture the contributions on display in Leiden. In addition to visual art works, the Leiden exhibition catalog included personally written reflections from archaeologists, for example, entry 0005.

The real vision of archaeology by Damaris Lopez Munoz, student of archaeology, Spain: "In this picture I'm working on the Roman excavation Villaricos Mula (Murcia). Normally people have a romantic vision of archaeology, as if we sought treasures. But archaeology is a science, hard work" (NEARCH, 2018).

The Exhibition Brochure for the research partners from Palazzo Massimo Rome, Italy, offers that "Archaeology & Me is not just an exhibition to be looked at, but also requires

Fig. 5 First exhibition, Maastricht. *Source* First Exhibition, Archaeology & Me, Maastricht. © Monique van den Dries. www.nearch.eu

Fig. 6 Second exhibition, Leiden. *Source* Second Exhibition, Archaeology & Me, Leiden Central Station. © Francesco Ripanti. www.nearch.eu

the active involvement of visitors, inviting them to offer their personal answers to the questions and stimuli that they encounter in the show" (NEARCH, 2017). The brochure goes on to describe that: "Of the hundreds of works received, a selection presents the thousands of aspects of archaeology experienced not only as a tourist passion or museum object, but as a bridge between past and present, a reference to personal memories, a source of artistic inspiration, and a harmonious bond with time and nature. The second section… offers the viewpoint of archaeologists, who give their answer, or answers, to the same question…Their considerations describe (the) discipline and its role in contemporary society in a particular historical moment" (NEARCH, 2017).

The exhibition had previously been organised by the other NEARCH/European partners, including Palazzo Massimo Rome (see Figs. 7 and 8) and MECC Maastricht (See Fig. 5). In 2015, when the project was coordinated by The Institute for Cultural, Natural and Artistic Heritage (IBC) in the Region of Emilia Romagna (Bologna, Italy), the competition You(r) Archaeology was opened with the provocation: "What is archaeology? An adventure? A pain in the neck? The appeal of the past, the magic of marvelous sites, the boredom of a dusty museum? Probably all of these together, and still more" (NEARCH, 2015). The NEARCH Project objective for IBC was expressed, on this occasion and in this location, as to "identify new communication strategies and draw up guidelines for a greater sustainability of the discipline, especially at a time when resources are increasingly limited" (NEARCH, 2015). The competition statement continues:

> You(r) Archaeology… has launched in order to analyse how the inhabitants of the European Community perceive archaeology and their archaeological heritage.

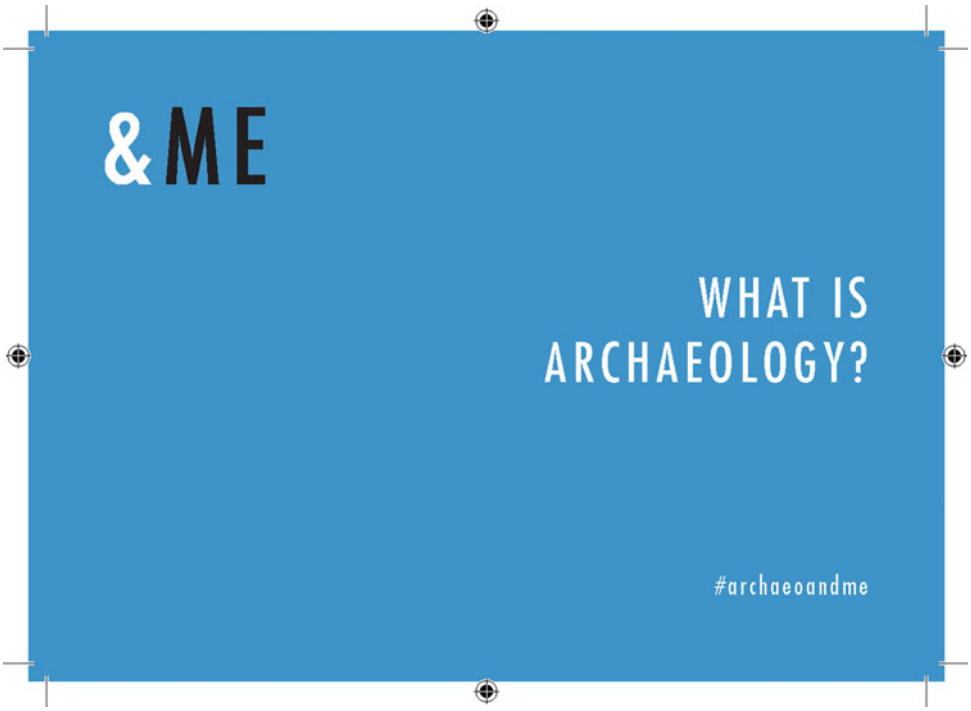

Fig. 7 Exhibition postcard, Palazzo Massimo Rome. *Source* Exhibition Postcard, Archaeology & Me, Rome (Museo Nazionale Romano Palazzo Massimo). © NEARCH (www.nearch.eu)

Fig. 8 Exhibition postcard, Palazzo Massimo Rome. *Source* Exhibition Postcard, Archaeology & Me, Rome (Museo Nazionale Romano Palazzo Massimo). © NEARCH (www.nearch.eu)

Our past and its remnants are all around us and form part of our daily lives, both in a positive way, as a moment of reflection, beauty and discovery, and at times as an annoying hindrance to our activities, as in the case of urban excavation sites.

By taking part in the competition, each one of us can express his or her viewpoint and maybe win a trip to discover extraordinary places or even become a protagonist of an international exhibition (NEARCH, 2015).

The detailed project description explains that the project "introduces views from the "fringes", including other disciplines and professions, various stakeholders and the different cultural communities that now live in our countries". It also highlights "the potential of these interdisciplinary and cross-cultural interconnections in providing new scenarios for research and field activities". And finally, it also "extends

Fig. 9 Louvre Abu Dhabi's "rain of light" © LAD. *Source* Louvre Abu Dhabi's "rain of light" © Louvre Abu Dhabi, Photography: Mohamed Somji

Fig. 10 Pre-event: prototyping in class. *Source* Pop up Architecture, Louvre Abu Dhabi. © Michael Ebner

this approach to archaeology outside Europe, taking into account situations and experiences that can provide new insights and instructive examples of best practices" (NEARCH, n.d.). As well as exploring different dimensions of public participation, the NEARCH project builds on previous European Commission projects such as "Archaeology in Contemporary Europe" (ACE, 2007–2012). This report includes commentary on the challenges faced after the 2008 crisis and the subsequent negative impact on the sustainability of the economic model that supports archaeological activity and the archaeological profession (NEARCH, n.d.).

4.3 Case Three: Pop up Architecture, Abu Dhabi, United Arab Emirates

The United Arab Emirates (UAE) is known for innovation and entrepreneurship, and many iconic architectural landmarks have been commissioned that project the

Fig. 11 Student team, Louvre Abu Dhabi's Park. *Source* Pop up Architecture, Louvre Abu Dhabi. © Michael Ebner

Fig. 12 Participants engaging with the modular units. *Source* Pop up Architecture, Louvre Abu Dhabi. © Michael Ebner

place-making and forward-looking identity of the country—buildings which will, in time, become the region's architectural heritage of the future. The Louvre Abu Dhabi (LAD) is one such landmark building, and it served as the location and inspiration for an educationally-led Pop up Architecture project over a three-day period in November 2018. The overarching question for the whole event was "how do we make places people truly love?" The project was created by a team from the LAD Education Unit working in collaboration with creative director and designer Noa Haim from Collective Paper Aesthetics. Noa's motto for the multidisciplinary approach she brings to her work in creating objects, spaces and experiences with other people is that "everyone can be a designer". The purpose of the project was to "promote awareness about the different creative elements relating to architectural design, and provide an opportunity for different audiences to build constructions inspired by Louvre Abu Dhabi's dome using large-scale

geometric shapes" (LAD Education Unit, 2018). There were two key parts to the project: The University Challenge Day and The Family Day.

The University Challenge Day was the culmination of a prior invitation to architecture and design students from four regional universities to engage with a brief about "The Art of Engineering—Re-Interpreting the Dome". Students were invited to "create the largest pop up structure, inspired by the spherical (floating) Louvre Abu Dhabi dome, using minimal materials (250 modular pieces provided by LAD), and attempt to re-create the aesthetic and poetic visitor experience of the 'rain of light' effect" (LAD Education Unit, 2018). For the Family Day, families, teenagers and the wider public could "take part in a day of collaborative construction in Louvre Abu Dhabi Park, and build new structures inspired by the dome over the weekend supported by University Volunteers" (LAD Education Unit, 2018). Participants were encouraged to make different shapes and structures using the range of material provided. The four large-scale structures that had been built by university students the day before, during The University Challenge Day, were on display in the park over the whole weekend and served to inspire families and the wider public to create their own 3D pop up constructions. Throughout the Family Day and Weekend, each participating university provided ten student volunteers to help support the families and the wider public with their construction activities in the park.

One of the four participating university student teams was from the Design Management Programme at the College of Architecture Art and Design (CAAD), American University of Sharjah (AUS). The team started working on the brief ten days before the University Challenge Day, and they were joined by exchange students visiting AUS from Salzburg University of Applied Sciences, Austria. With a total of 42 students working on site at AUS, the team was subdivided into three teams of 13 students, with each of the three teams competing with the others to generate the best design ideas with smaller scale, cardboard prototypes of the modular units that would eventually be used on the actual University Challenge Day. One winning team would be selected to present their design at the launch of the event at LAD, using a Powerpoint presentation template provided by LAD Education Unit team. The two "losing teams" would become members of the winning team, so creating a mega-team of 42 students who would work together on site in LAD and in competition with the other three universities. From an academic assessment and learning objectives perspective, the students coming from AUS were asked to document their experiences in a report, and to pay particular attention to:

- geometry, design, management, events, culture, contribution, dialogue, and exchange.
- interdisciplinary team working and intercultural learning—insights, roles, challenges, and coordination.
- Managing projects and decision making—process, teams, plans, goals, procedures, priorities, problems.

The main challenges included the practicalities of organisational large numbers of students from four different locations, and maintaining momentum both before and during the main event itself. It was unusually hot weather in Abu Dhabi on the day of the event, however, from a student-learning point of view, each challenge was used as an opportunity to learn about the management of outreach events at cultural institutions. In addition, the rich cultural exchanges achieved through a working collaboration of the Austrian university students with the Emirati university students was a point of great success, and was noted as such in almost all of the student's reflective reports documenting their learning experiences.

5 Findings

Comparing the cases, there are both similarities and differences in the application of the pop up concept to the cultural heritage context. The pop up museum in Janzour (Libya) catalysed wider audience engagement and engaged the pop up concept in the form of a temporary installation that enabled the local community to better connect with site activities, archaeological professionals and the "rediscovery" the history of the site and the region. The main outcomes were increased educational outreach, enhanced cultural pride and a growth in volunteer action for practical on-site preservation. The pop up exhibition in Leiden (The Netherlands) was, by contrast, a traveling exhibition intended to celebrate archaeologically-focused cultural heritage through audience contribution across several European cities. The main outcomes were increased levels of community-involvement, more enriching communication strategies and more sustainable approaches to the field of archaeology as a profession. The third case, the pop up event at The Louvre Abu Dhabi (United Arab Emirates) was more focused on the opportunities afforded by educational outreach in connection to contemporary architecture, as well as the opportunity to experiment with a regular programme of creative and family activities supported by the host institution. The main outcomes were increased awareness of contemporary architecture, and an enriched outreach programme of design-led activities that combined both families and the academic community.

There is much that can be learned about the power of the pop up in the context of architectural heritage, and for this research stage, the author has chosen to focus on the power

of the pop up for creative audience engagement. For each of the cases presented, it would certainly be possible to qualify and even quantify the effect on the context and what "remained" after to pop up (the pop up effect), and clearly learnings gained by the host institutions can inform future iterations of pop up activities. This further investigation will form the focus of future research. The intention behind this research stage was to investigate what the author perceived as the "grass roots" of a transfer of the pop up concept from the world of retail, with its business and marketing focus, to the world of architectural heritage. Was there significant evidence for what might be called a pattern of activity or even a trend? With the focus on sharing insights into creative engagement, and the intention to iterate further research in the future, to follow is an initial categorization around the use of pop ups for creative engagement in architectural heritage projects—an area of research the author believes is rich with potential.

1. Local Engagement. Community outreach as a valuable contribution to the success of architectural heritage. What is the best way to use an architectural heritage pop up to engage local audiences who do not currently participate in preservation activities? How can pop ups engage wider stakeholders in the community, for example, through collaborative projects, relating architectural heritage to contemporary architecture, or encouraging more professional and social interaction between local communities, educators, stakeholders, and field experts?
2. Creative Engagement. Pop ups as new and innovative platforms for connecting architectural heritage to the age of creativity. How can architectural heritage pop ups best attract younger generations and wider audiences, using resources and references from both popular culture and high culture? What new form of public engagement and events can help creatively disrupt the traditional or routine ways we may relate to heritage, archaeology, and architecture?
3. Financial Engagement. Pop ups as income-generating platforms to explore non-traditional funding streams, sponsorship and footfall opportunities, crowdfunding, entrepreneurial thinking, and new relationship building. How can architectural heritage projects gain appropriate financial benefit by adopting or adapting the practices of retail pop ups in the commercial field? In what, other ways can the pop up add value to architectural heritage projects?
4. Educational Engagement. Celebrating the importance of students and learners as the protectors of cultural, architectural, and archaeological heritage sites for the future. Provide training opportunities and skills-learning, in collaboration with local schools, colleges, and universities, that cross disciplines and abilities (artistic, technical, hands on, or intellectual), and that are interdisciplinary (heritage professionals and non-heritage professionals) and intercultural (international exchanges). How can outreach programs, regular or ad hoc gatherings, customised visits and activities, field trips, local history lessons, taster courses and "learning by doing" foster pride in local history and encourage commitment to the conservation, preservation and maintenance of local heritage projects?
5. Next-Generation Engagement. Use the novel and experiential nature of pop ups to build capacity and interest within the next generation of architectural heritage professionals, supervisors, managers, and leaders. Engage children and teenagers in hands on and intellectual activities directly related to preserving the past and safeguarding the future of architectural heritage. Engage youth in a conversation about their future, about inherited culture and about heritage. What do they imagine the world will be like in the future, and how does architectural heritage fit into their vision?
6. Cross-Generation Engagement. Sharing knowledge, experience, expertise and skills, between the young and the experienced, between the heritage professional and the non-heritage professional. Host pop ups with an extended open house of activities aimed at a broader audience of parents and the public. Provide insight into careers and roles within architectural heritage management though short-term placements, internships, and shadowing. Offer pop up careers talks to budding young conservationists, for example, what does an architectural conservationist do? How can young learners be empowered to share more about their architectural heritage experiences with their families and communities?
7. Awareness-Raising Engagement. Use the appeal of the pop up to launch and promote events that will gain wider public interest. Social media storytelling through visually-dominant media content channels (Instagram, Facebook, Pintrest). In depth storytelling through adult and group activities and their public sharing. Consider crowdsourcing or traveling exhibitions to build interest. Consider quick, temporary, short-term, time-limited, exclusive, rare, invitation only or limited-edition events and experiences to create media, local and global interest, for example, guest lectures, celebrity appearances. How can architectural heritage engage the element of surprise in launching a pop up?
8. Unlimited Engagement. Pop up as an infinitely adaptable method for testing the creative potential of any idea with minimal risk. It is in the nature and culture of the pop up to "morph into unexpected ways of being used". Actively catalyse innovative new ideas by engaging the diversity

(of people) with collaborative opportunity (of events and activities). How can we encourage a non-traditional approach to exploring architectural heritage more openly? Are there examples of situations where additional ideas later emerged from experimental exhibitions and events? Could launching a unique experience secure an architectural heritage project the boost of additional attention from new or unanticipated audiences?

9. Community Engagement. Actively engage local and regional communities in protecting, maintaining, preserving, and conserving architectural heritage sites, and in co-creating, collaborating, contributing, or curating the pop up. Consider volunteer programs and programs for community wellbeing and the conservation of their own personal and national history, heritage, identity, and legacy. How can we use the pop up to explore a more entrepreneurial, collaborative, or creative approach to community challenges and opportunities? What programs of activities could encourage civic engagement and the building of non-political trust in areas with social or political tensions?

6 Conclusion

The concept of the pop up, already well known in the contexts of retail, restaurants, business enterprise, popular culture, and art and design, has been gaining increased presence in the fields of archaeology, cultural heritage and contemporary architecture. The aim of the chapter was, firstly, to draw attention to the success of the pop up concept in the fields of commerce and popular culture; secondly, to identify and describe the growing existence of the pop up in the fields of archaeology, cultural heritage and architecture; and thirdly, to suggest the potential for the pop up in the context of architectural heritage management as a platform for creative engagement. Although the use of pop ups in architectural heritage projects is not, as yet, well documented in literature, nine suggestions for how the concept could applied in terms of engagement were made by the author: local, creative financial, educational, next generation, cross-generation, awareness-raising, unlimited, and community engagement. All of the suggestions made were identified within the initial research into the commercial and popular culture application of the pop up, or within the archaeology, cultural heritage and architecture case studies.

According to the findings, the pop up could play an important role for architectural heritage projects, particularly as a means to unlock new and unpredictable forms of creative engagement for heritage professionals and non-heritage professionals, wider audiences, and younger generations. However, the extent to which the concept is further adopted within specific projects and sites, or the level of interest in doing so, is unknown. The results described should be seen as an initial analysis of the pop up in relation to the field of architectural heritage, and not as a final categorisation of pop ups in terms of typology, purpose, relevance, or potential. This further research, as well as more in depth iterative research into the development of more extensive case studies, will form the basis of future investigations into the power of the pop up.

Acknowledgements Thank you to Talal Bariun, Will Raynolds and Michael Danti (ASOR), Monique van den Dries and Francesco Ripanti (NEARCH), Louvre Abu Dhabi Education Unit, Mohamed Somji and Michael Ebner.

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Renovation of Nile Cornish and Ancient Touristic Market in Aswan City; Attempt to Solve the Public Transportation Problem

Abdelaziz Farouk Abdelaziz Mohamed and Rania Emad Abdelhady

Abstract

Aswan is an ancient city in Egypt; it has many potential issues to be a sustainable and advanced city in its region. On the other hand, it has many environmental problems according to the sustainability criteria such as air and water pollution, noisy, and unsatisfied transportation systems. So, this research aims to solve these problems and tries to keep the environment clean and increase the public satisfaction by promoting new and advanced transportation systems and enhancing the infrastructures in Aswan city without compromising the city heritage. The paper case study is renovating the main city Cornish and the ancient touristic market through studying the existing case and presenting a proposed renovation processes which included new public transportation systems according to public questionnaire results. The proposed renovation process is compared with Curitiba and Masdar city throughout their sustainable urban programs especially public transport and mobility systems. These systems will serve the Aswan people and tourists which reduces the people suffering and preserves the city heritage and touristic places.

Keywords

Environmental problem • City heritage • Renovation proposals • Public transportation systems

1 Introduction

The "built environment" is a heavy, fixed thing that is slow and expensive to change (Gleeson et al., 2008). Cities are the focal points and drivers of societal development in all countries. At the same time, they are the largest consumers of natural resources and the biggest resources of pollution and greenhouse gas emissions on the planet. One of the most significant environmental challenges within cities is climate change. A second major concern is the environmental impact of fossil fuel use in cities, especially oil. An oil-based economy and climate change are linked: Vehicle emissions contribute significantly to greenhouse gas emissions and hence global warming (United Nations, (2009). "Nothing else damages the earth's environment more than our cities. As the world's population has grown, our cities have burgeoned, and their impact on the environment worsened." (Rogers, 2008). Cities move forward by establishing a balance between urban activities, quality of life of people and support the nature and biological diversity that is typical. A city's biodiversity is a part of global natural heritage (Sinclair, 2008). So, we have to mitigate these global environmental problems in our cities, and at the same time, we have to conserve the archeolgical places in the ancient cities like Aswan city. The importance of historical sites containing archeological and architectural fabrics has more physical, economic, and social characteristics that differ according to the form and structure of the different sectors of the city. This configuration also differs from one country to another and from one city to another and constitutes the historic environment of the urban content for historic buildings and heritage. The most important issue of urban heritage is preserving the historical elements and environment (Zenati & Zeroual, 2018). Aswan is a historical and touristic city in Egypt, but it has many problems especially in public transportation systems for tourists and its inhabitants.

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Advances in Science, Technology & Innovation, https://doi.org/10.1007/978-3-030-14869-0_15

1.1 Research Aim

This research aims to upgrade Aswan city to be a developed and green city and at the same time conserve the archeological places in order to keep the unique character of the ancient city for the Aswan people and tourists. In addition to solve the public transportation systems problem which is considered one of the main problem of the Aswan city, this research will present advanced and sustainable mobility systems such as monorail and river taxi.

1.2 Reseaerch Methodology

There are several methods used to achieve the research aim and objectives as the following:

- Studying two examples of historical and modern cities such as Curtiba and Masdr cities to conclude the results of their sustainable urban palnning programs.
- Survying the existing case of the selected study ares of Aswan city such as landuse, building heights and conditionsm, and transport and mobility systems.
- Conducting public questionnaire for asking a random sample of Aswan people to reach the acutal problem of their life in the city.
- Proposed a renovation process of urban areas in Aswan such as Nile Cornich, Ancient Tourstic market, and public transport and mobility systems.
- Comparing between the proposed renovation process of Aswan city versus Curitiba and Masdr Cities throughout the sustainability criteria.

1.3 City Development Strategic Plans

With over half of the world's population living in urban areas, a trend displaying no evidence of decline, a blueprint for new urban development which promotes high-efficiency and small carbon footprint will provide valuable insight into potential development approaches for urbanized areas in the future (Girardet, 2008). The situation for developing countries is in many ways more difficult than for developed countries. Not only are there obvious resource constraints but access to basic energy services may be lacking for a significant part of their population (United Nations, 2009). The strategy for conservation of urban heritage fits within the framework of the broader aims for overall sustainable development; it also integrates in the national policies and programs for development and in the urban spatial plans. This allows to preserve "the quality of human environment" and to enhance "the productive and sustainable use of urban spaces, while recognizing their dynamic character, and promoting social and functional diversity." The approach to the historic urban landscape, as defined in the Recommendation of UNESCO 2011, is an important part of the conceptual frame of the present MP and is consistently followed in all parts of the plan. On this basis, emerge the three strategic goals of the modern policy regarding historic cities and towns:

Conservation of the integral urban cultural heritage in the broadened scope of its content, territorial, and temporal scope—as part of the overall urban setting;
Sustainable use of urban heritage in its whole social and functional diversity, recognizing the dynamic character of the living historic town;
Effective management of urban heritage in a manner that contributes to the quality of life and well-being of the citizens; that preserves and enhances the urban identity and that ensures sustainable urban development (Cultural Heritage (NIICH), 2011).

1.4 Curitiba City—Brazil

With nearly 2 million inhabitants, Curitiba is the largest city in southern Brazil, and the city is an important cultural and economic center as shown in Table 1. Moreover, Curitiba is arguably the most "European" and best organized of all big Brazilian metropolitan areas. Curitiba, the capital of Parana state, has less pollution and never-ending traffic jams than other Brazilian cities. Curitiba, located in Parana State, Brazil, has implemented several innovative systems to create jobs, improve public transportation accessibility, promote housing development, and improve waste management (Curitiba, 2018). Curitiba is recognized as the most livable Brazilian city. Since the 70s, long before it became fashionable, the council promoted green policies, often through controversial tax cuts and subsidies. The result has been the creation of 30 parks and urban forests. Meanwhile, a total of 1.5 million trees have been planted to date by local residents along highways. (The 10 Greenest Cities In The World, 2019).

Table 1 Curitiba city description (Curitiba, 2018)

Area (Km^2)	432
Population (Person)	1,879,355 (2015)
Density (person/Km^2)	4,350
Green spaces (m^2/Person)	50 (Curitiba is most sustainable city, 2018)

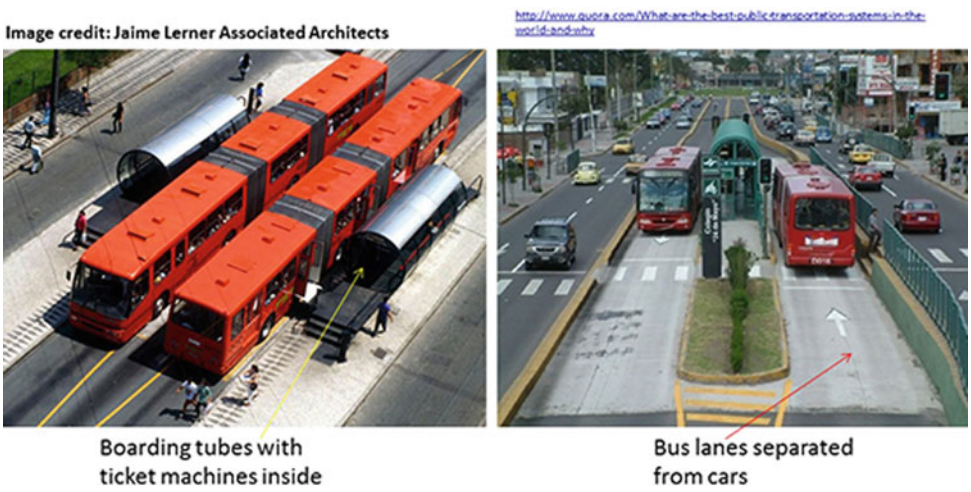

Fig. 1 Bus rabid transit system in Curitiba City (Coolgeography, 2018)

1.4.1 Sustainable Urban Planning (Curitiba City)

After master plan for Curitiba was adopted in 1968, Brazilian Curitiba city has implemented several innovative systems to create jobs, improve public transportation accessibility, promote housing development, and improve waste management. The city has integrated a "radial linear-branching pattern" to protect density by diverting traffic from the city center and protect green areas by encouraging industrial development along radial axes. Curitiba has initiated a bus rapid transit system (as shown in Fig. 1) and established the Curitiba Industrial City (CIC) on the city's west side which has strict environmental regulations and does not allow "polluting" industries. (sustainabledevelopment.un.org).

The benefits of the systems are as follows:

- Reduced transportation time: the per capita income loss due to severe congestion is ~ 11 and seven times lower than in Sao Paulo and Rio de Janeiro, respectively;
- The creation of the CIC has created about 50,000 direct jobs and 150,000 indirect jobs, and about 20% of the state's exports are from the CIC;
- Curitiba's fuel usage is 3% lower than in Brazil's other major cities;
- Improved outdoor air quality and associated health benefits;
- 70% of the city's residents are actively recycling, and 13% of solid waste is recycled;
- Property values of neighboring areas has appreciated, and tax revenues have increased;
- Reduced flood mitigation expenditures by promotion of park development in flood-prone areas (the cost of this strategy is estimated to be 5% lower than building concrete canals). (sustainabledevelopment.un.org)

1.5 Masdar City—Abu Dhabi

Masdar city is being constructed 17 km east-south of the city of Abu Dhabi, Arab Emirates beside Abu Dhabi International Airport. The city project is headed by the Abu Dhabi Future Energy Company (ADFEC) Initiated in 2006, and the project was projected to cost US$22 billion and spent eight years to build. Masdar is a new city which uses the carbon capture facility and a natural gas reformer, reducing CO_2 emissions and increasing oil production (The Economist, 2009). It reduces the carbon footprint by developing in a compact area that allows for easy pedestrian movement and expands the comfort zone of the city through the control of sun and wind to create the highest sustainable quality of life as shown in Table 2. Carefully planned landscape and water features also aid in reducing the temperature and enhancing the quality of the streets (Crampsie, 2008). The climate conditions in Masdar city are similar to Aswan city especially temperature and dust storms regardless that is a new city and Aswan is an ancient city so, we selected it to compare between its smart components versus our renovation proposal of Aswan city such as monorail and river taxi which considered sustainable and smart mobility systems.

Table 2 Masdar city description (Farouk et al., 2013)

Area (Km^2)	6.5
Population (Person)	90,000
Density (person/Km^2)	13,846
Green spaces (m^2/Person)	30

1.5.1 Masdar City Transportation Systems

Cities are increasingly being designed to use energy sparingly by offering walkable transit-oriented options, often supplemented by vehicles powered by renewable energy. Sustainable transport can be presented in replacing cars and fuel vehicles by electric public transport. Masdar city uses more sustainable transport systems which are able to reduce their ecological footprints from their reduced use of fossil fuels as well as through reduced dependence upon car-based infrastructure as shown in Figs. 2 and 3. (Mosaad & Elnady, 2010).

Fig. 3 Smart transportation system, Masdar city (Abdelaziz, 2013)

2 Aswan City

Aswan city is not a developed city, but it has a unique character especially through its history and natural resources such as Nile River, Pharaonic temples, and Fatimid graves. Aswan city is considered as an open museum due to its historical places, so it is the important touristic city in Egypt. Aswan has distinguished places like the High Dam which was constructed in 1960 to save Upper Egypt region from the Nile flooding and product the electricity which covers the percentage of Egyptian energy demand. Aswan city is part of the UNESCO Creative Cities Network in the category of craft and folk art. The Aswan people are benefitting from the tourism activity in the winter season due to its fantastic weather, but it is not existed in the summer season with the same numbers. Aswan people are suffering from the shortage of the infrastructures and public services such as public transportation systems and other civil services. Public transportation system is not existed in the majority city roads, but there are some private transportation systems which are available such as microbus, minibus, tuk tuk, cabout, and tricycle which are not secured and effective. So this research concerns with this problem and try to solve it through asking the stakeholders about the root cause of this problem and what is their requirement and needs in order to upgrade the city services and decrease their suffering.

2.1 Case Study: Nile Cornish and Ancient Tourist Market

Aswan is a city in south of Egypt, the capital of the Aswan Governorate, with population 1.5 million on area 62.726 Km^2 as given in Table 3 (CAMPAS, 2018). Aswan is a busy market and tourist center located just north of the Aswan

Fig. 2 Masdar city, Abu Dhabi (Abdelaziz, 2013)

Table 3 Aswan governorate description (www.campas.gov.eg, 25/11/2018)

Area (Km^2)	62.70
Population (Person)	1.533,238
Density (Person/Km^2)	23,923.44
Green spaces (m^2/Person)	0.7 m^2/person (5.3 m^2/p. including agricultural area)

Dams on the east bank of the Nile at the first cataract. The modern city has expanded and includes the formerly separate community on the island of Elephantine. The case study area is selected as shown in Fig. 4, the Nile Cornish in the west, railways in the east, the main railways station in the north, and El-Gadid street in the south.

Tourist Market: It is considered one of the oldest market in the city of Aswan, which is one of the most famous and oldest tourist and marketing places in the city and does not have a tourism program without visiting this market because of its rare goods and the selection of your needs of a rich collection of Egyptian and African exhibits.

The Old Shawarbi Street is one of the most important streets of the tourist city, and on the quay of the library and the famous school of Akkad in the Nile Cornish in Aswan, which so far holds the legacy of the giant Arab literature from private collections and personal library.

2.1.1 Existing Land Use

The study area consists of residential buildings and commercial buildings—residential by a larger proportion than other types. It also contains commercial and mixed use. There is also a rate of up to 40% of random residential use, and there are slums areas in the south and east areas of the case study zone as shown in Fig. 5. Based on the site investigations, the green spaces ratio in the urban area is 0.7 and 5.3 m^2/person including the agricultural area in the north of the Aswan city which is low ratio according to the World Health Organization who determined 9 m^2/person as a minimum ratio of green area per person in the urban spaces (How much green space does your city have?, 2011).

2.1.2 Existing Building Heights

The status of the touristic market and Cornish that are located in the case study area ranged between one, two stories, or more, and the prevailing rate of height of buildings are four stories which represent 40% of all buildings, and the heights overlooking the Nile are more than four that they reach to six stories as shown in Fig. 6.

2.1.3 Existing Building Conditions

The most common building condition is traditional then the poor condition and small ratio of good buildings as shown in Fig. 7.

Fig. 4 Case study area at Aswan city (Google Earth, 2018)

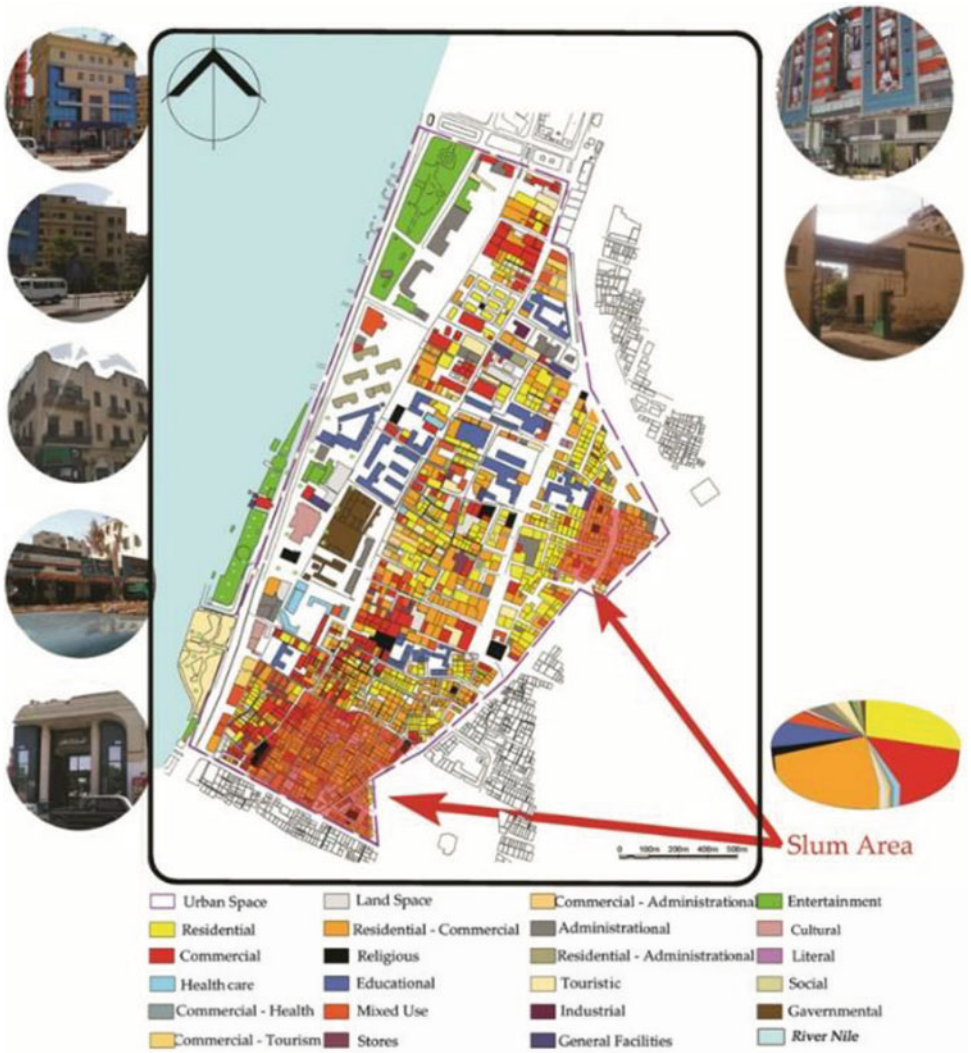

Fig. 5 Existing land use of the case study area

2.1.4 Existing Classification of Roads

The average road widths are shown in Fig. 8 as follows: Cornish road 35 m, collector roads 18–22 m, local roads 10–15 m, and pedestrian 10 m.

2.1.5 Existing Transportations Systems

There are many of existing transportation systems in Aswan roads such as: minibus, microbus, cabout, tuk tuk, and tricycle.

Minibus is a public transportation type which carries 26 persons as shown in Fig. 9, but there is a few number of these minibuses, and human comfort is not existing while sitting in it due to the narrow spaces in seats and corridors.

Microbus is a private sector transportation system which carries 16 persons as shown in Fig. 10, there is a large number of this type, but they are not available every time per day, and they do not reach to the all places and directions in Aswan city.

Cabout is a private sector transportation system which carries approximately ten sitting persons and others are standing on the Cabout stairs. It is unsecured type, and the human comfort is not existing as shown in Fig. 11.

Tuk Tuk is an auto rickshaw that is a common form of urban transport, both as a vehicle for hire and for private use, in many countries around the world, especially those with tropical or subtropical climates, including many developing countries. Bajaj Auto of Pune, India, is the world's largest auto rickshaw manufacturer (Economist, 2009). It carries two persons only, and it is unsecured type as shown in Fig. 12.

Tricycle is a three wheel motorcycle, cargo tricycle which used in carrying people or goods. In Aswan city, it is a private transportation system as shown in Figs. 13 and 14, but it is unsecured type, and human comfort is not existing.

As the previous surveying of the existing public and private transportation systems in Aswan city, the researchers

Fig. 6 Existing building heights in the case study area

asked a random sample of Aswan people about their opinion of these types through electronic questionnaire via social media site with the profile of participates age as shown in Fig. 15. This questionnaire clarifies the Aswan people's suffering and their daily needs in Aswan city.

2.2 Public Questionnaire

The researchers conducted the public questionnaire for reaching to the actual daily problems which the Aswan people faced and asked people about their opinion of the proposed alternatives of public transportation systems. Total people who participated are 113 persons, and the main questions are:

- What is your opinion about the existing transportation in Aswan?
- Are the existing transportation systems secured for you and your family?
- Are transportation suitable for all ages?
- Are the transportation systems responsible for the delay on your work or your children?
- Which is more dangerous tuk tuk or cabout ?
- Do young people prefer cycling?
- From your point of view, what is the appropriate public transportation system for Aswan city please kindly choose one or two system from the following:
  1. Public buses
  2. Electrical tram (ground or monorail)
  3. Metro (underground or ground)
  4. River bus and river taxi
  5. Bicycles.

2.2.1 Questionnaire Results

The majority of people who participated in the public questionnaire believe that the existing transportation systems in Aswan city are not secured and unsuitable for human use. Most people (Approx. 74%) said that the existing transportation is unsuitable. On the other side, 19% of the people said these are good systems, and the minority 7% said these are acceptable systems as shown in the chart nos. 16, 17, 18, 19, 20, 21, and 22.

3 Upgrading of the Nile Cornish and Touristic Market Proposal

3.1 Proposed Master Plan

The research proposal tries to rearrange the distributed land uses to create places with low traffic density, use clean energy, add green areas to control temperature in downtown and use different transportation systems which powered by clean energy to reduce carbon dioxide like monorail and river taxi as shown in Fig. 23. All the archeology places are conserved in order to keep the Aswan unique character. The slums areas are replaced by the new residential, services, and parks which increase the green areas and improve the outdoor and indoor air quality and enhance human health.

3.2 Proposed Land Use

The study area was developed with the aim of increasing the open areas and assembling the residential blocks in the structure of residential compound and allocating the central area for the provision of educational services to cover all educational uses such as basic and vocational educational and academic research. In addition, the area was also allocated to a cultural center named El-Akkad cultural complex. All the old religious buildings located in the area and part of the tourist market are conserved as shown in Fig. 24.

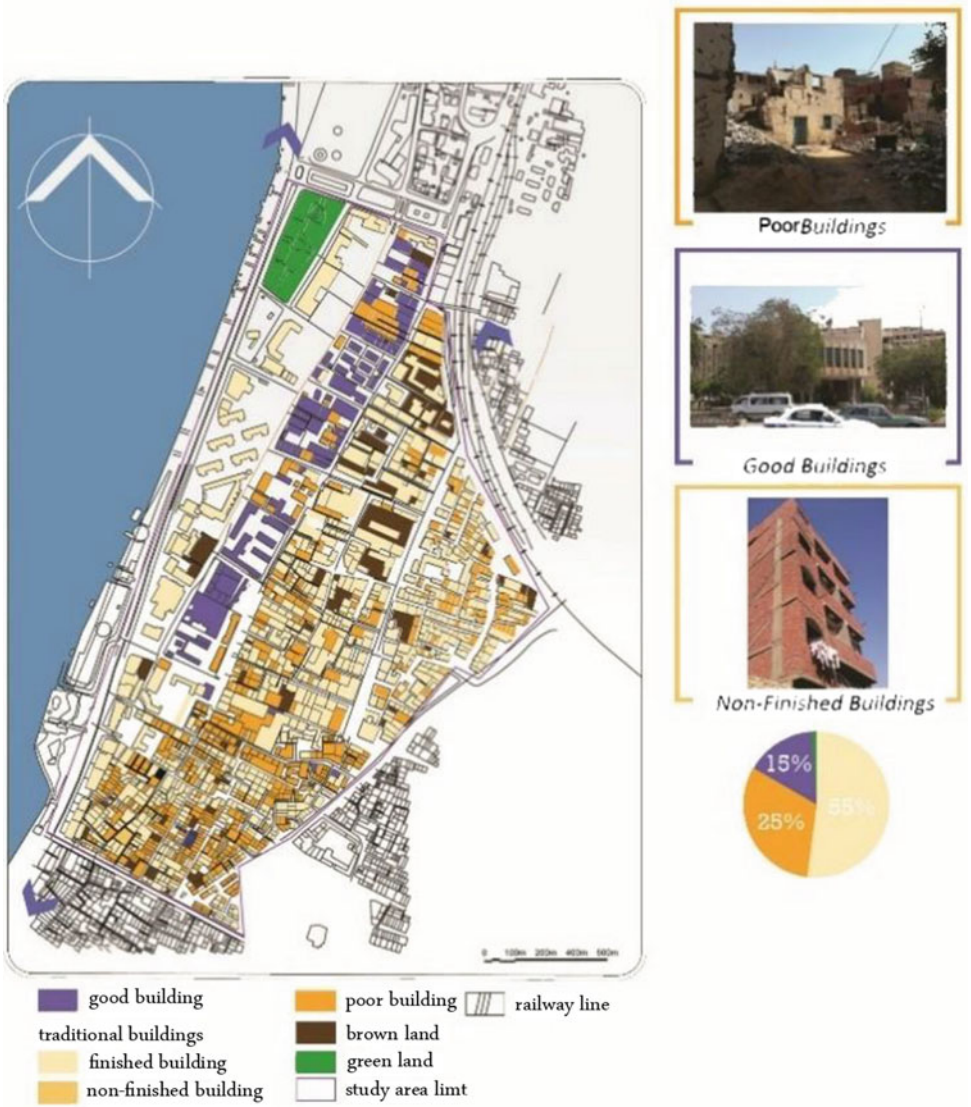

Fig. 7 Existing building condition in the case study area

3.3 Proposed Buildings Heights

The buildings are dominated by the rise of six floors and represented in the residential and administrative buildings as well as the height of the buildings overlooking the main Cornish street three floors as shown in Fig. 25.

3.4 Proposed City Roads

The major road in our proposal is the Cornish road, the el-Hadaden street, and the new street (El-Gadid), and the rest of the roads are divided into local roads and collector roads as shown in Fig. 26.

3.5 Historical and Archeological Buildings

There is number of the historical and archeological buildings in the case study area which are conserved such as: The Catholic Church—the Elhag Hassn Mosque—ElNasr Mosque—and the main railways station.

3.6 Proposed Renewable Energy Usage

Using renewable energy resources at:

- Green roofs are used in new residential and touristic areas.
- Photovoltaic panels are used in new administrative, cultural, and healthcare areas.

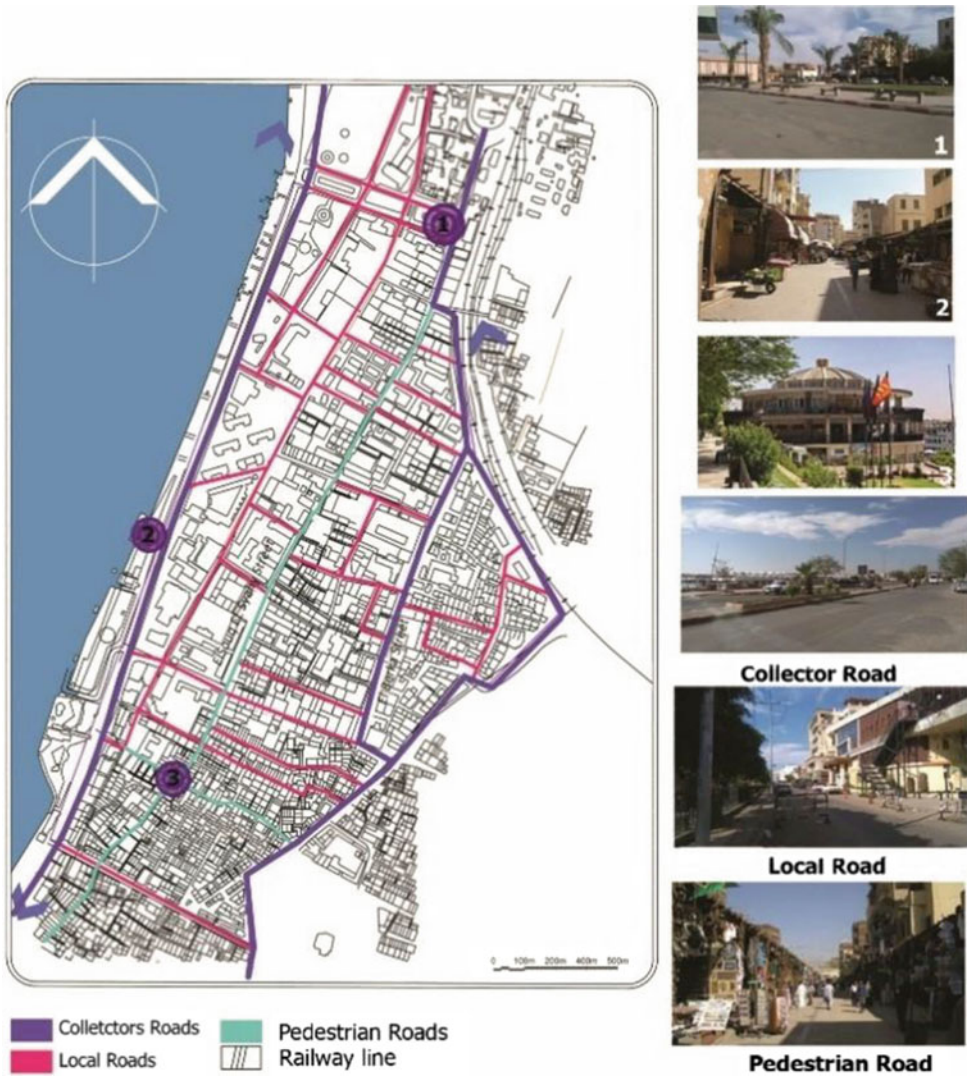

Fig. 8 Roads classification in the case study area

Fig. 9 Existing minibus

Fig. 10 Existing microbus

Fig. 11 Existing cabout

Fig. 12 Existing tuk tuk

Fig. 13 Existing tricycle

Fig. 14 Existing other transportation systems

3.7 Proposed New Public Transportation Systems (Monorail Pathway)

Based on the questionnaire's results, the proposed public transportation systems are the following:

- Public buses which conveys 50 persons for all the Aswan Roads with appropriate time flow.
- Electrical tram which conveys 200 persons, but it needs a wide roads to construct its railways and shaded stations. So, the suspended electrical tram which called monorail is the best solution for these roads with platform stations each one kilometer which starting from the main railways station reaching to the airport in the south and new Aswan city in the north as shown in Figs. 27 and 28.
- River bus and taxi which are touristic Nile vehicles.
- Bicycle track is beside the Cornish pavement for youth and children.
- The proposed Cornish road is divided to tracks for walking, cycling, sitting area, trees, and vehicles lanes as shown in Figs. 29 and 30.

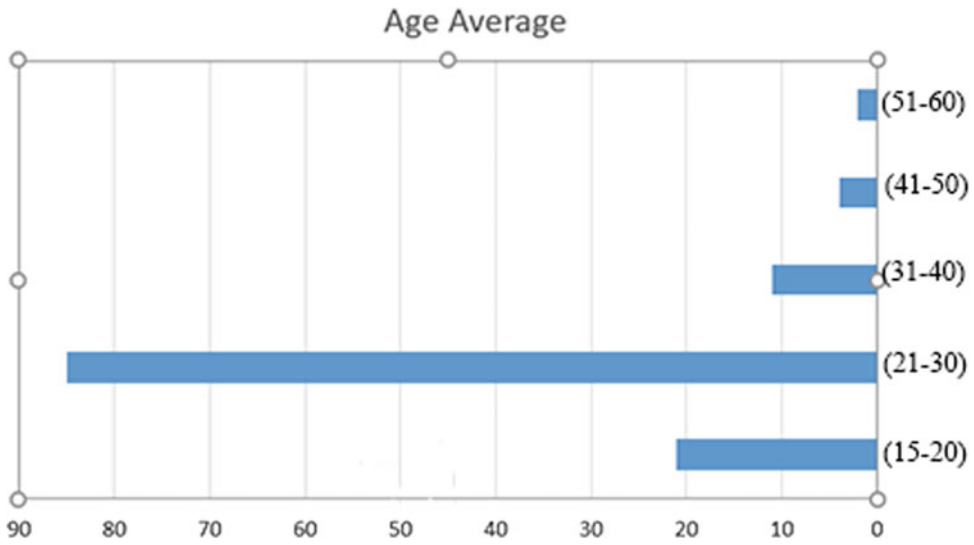

Fig. 15 Questionnaire random sample by age

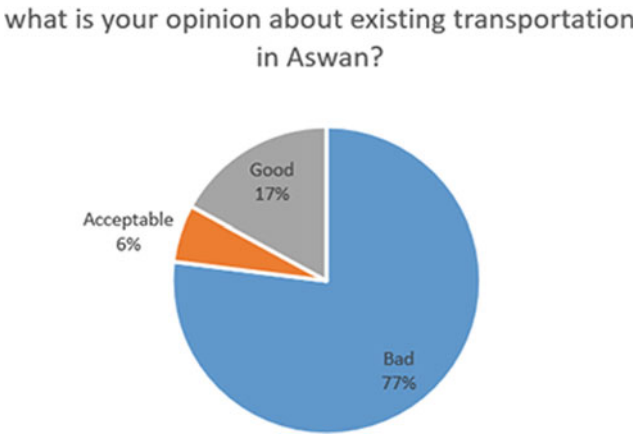

Fig. 16 First question's result

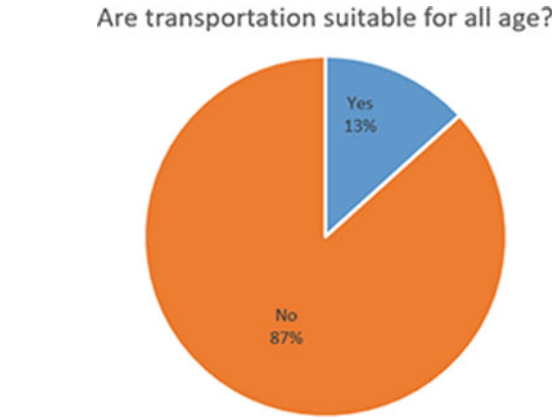

Fig. 18 Third question's result

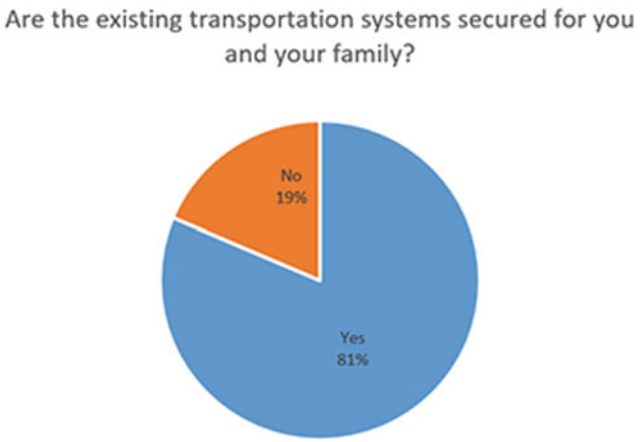

Fig. 17 Second question's result

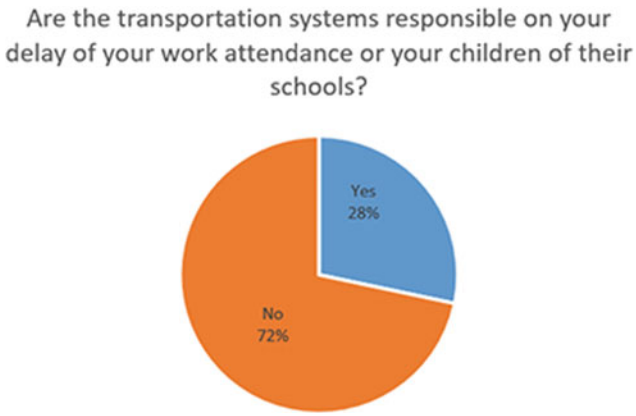

Fig. 19 Fourth question's result

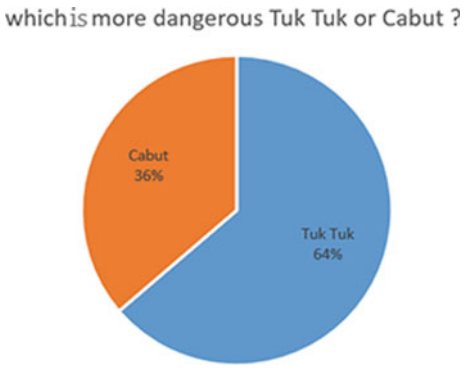

Fig. 20 Fifth question's result

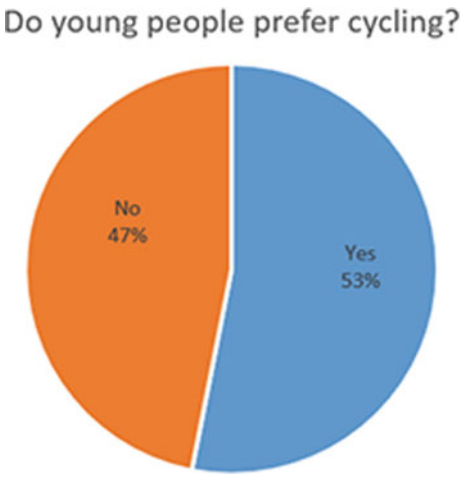

Fig. 21 Sixth question's result

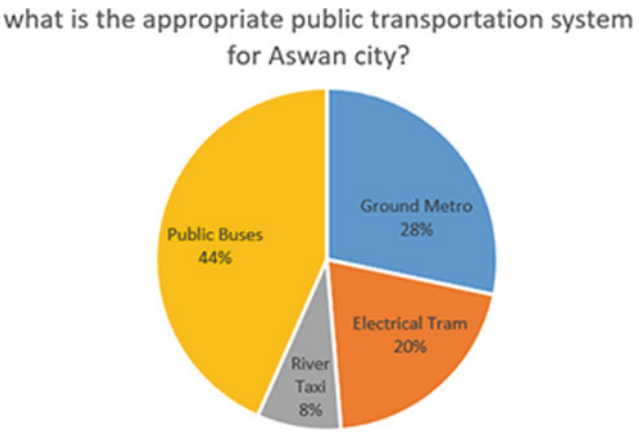

Fig. 22 Proposed transportation systems result

- Shaded walking track in roads and in pedestrian areas especially at the ancient touristic market and other spaces as shown in Figs. 31 and 32.

4 Comparison Between Aswan City Before and After Renovation Processes:

This comparison explains the difference between the existing case study area in Aswan city versus the proposed renovation proccesses throughout the sustainable criteria which are applied in Curitiba and Masdar Cities as given in Table 4. These criteria are sustaniable site and infrastructures, energy effiecency, water and waste management, ecological materials, transport, and pollution (Farouk et al., 2013). Creating jobs is very important criterion in the comparison process.

4.1 The Main Result of the Comparison Is

The proposed renovation processes of the case study of Aswan city are not only to improve the public transportation systems in the city roads but also to protect the environment and human health from the pollution and conserve the historical and archeological buildings and places for Aswan people and tourists as well.

5 Conclusions

This study depends on the lessons learned from the sustainable strategic plans which are applied in Curitiba, Brazil historical city, and Masdar, Abu Dhabi modern city. These examples provide us with the renovation methods and detailed programs in order to determine the residents' problems an how to solve them without any negative impact on environment.

- Sustainable development is required urgently in the Upper Egypt especially in Aswan city through strategic urban plans at present and future. This strategic plan is not only enhancing the touristic facilities but also mitigating the people's suffering in their life.
- This study presents alternative proposals in order to solve the public transportation systems' problem in Aswan city based on the public questionnaire results. The proposed urban planning will protect the touristic places and environment in Aswan for tourists and people.
- The Nile Cornish is a unique place in Aswan, and it should be renovated to be green and smart zone. So, we create a walking, cycling tracks, and shaded sitting area along the Nile River.
- The waterfront area should be kept as the Aswan unique character such as buildings' facades and river activities.
- The ancient touristic market is upgraded through using shaded devices and sitting areas along the market and added services for the market guest.

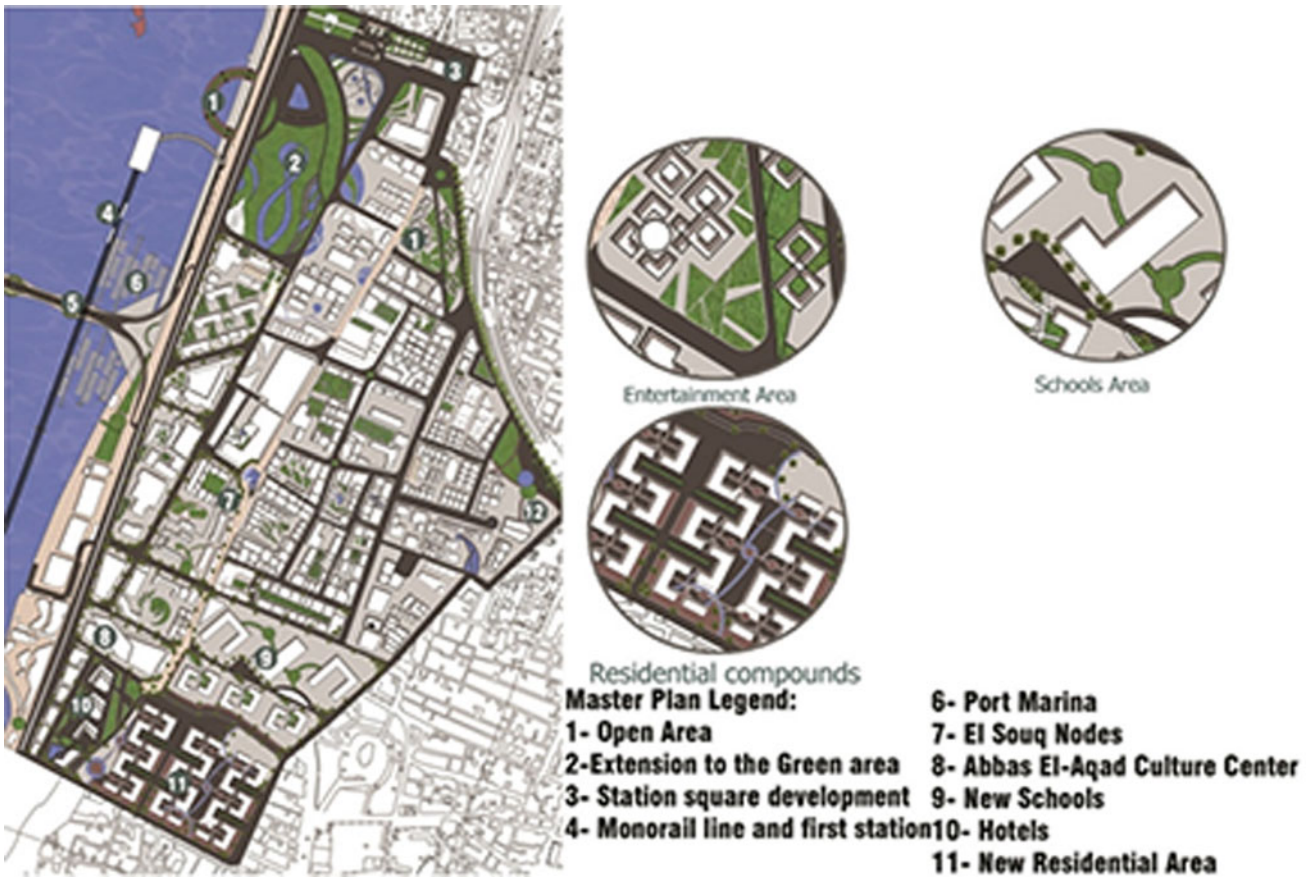

Fig. 23 Proposed renovation master plan

Fig. 24 Proposed case study land use

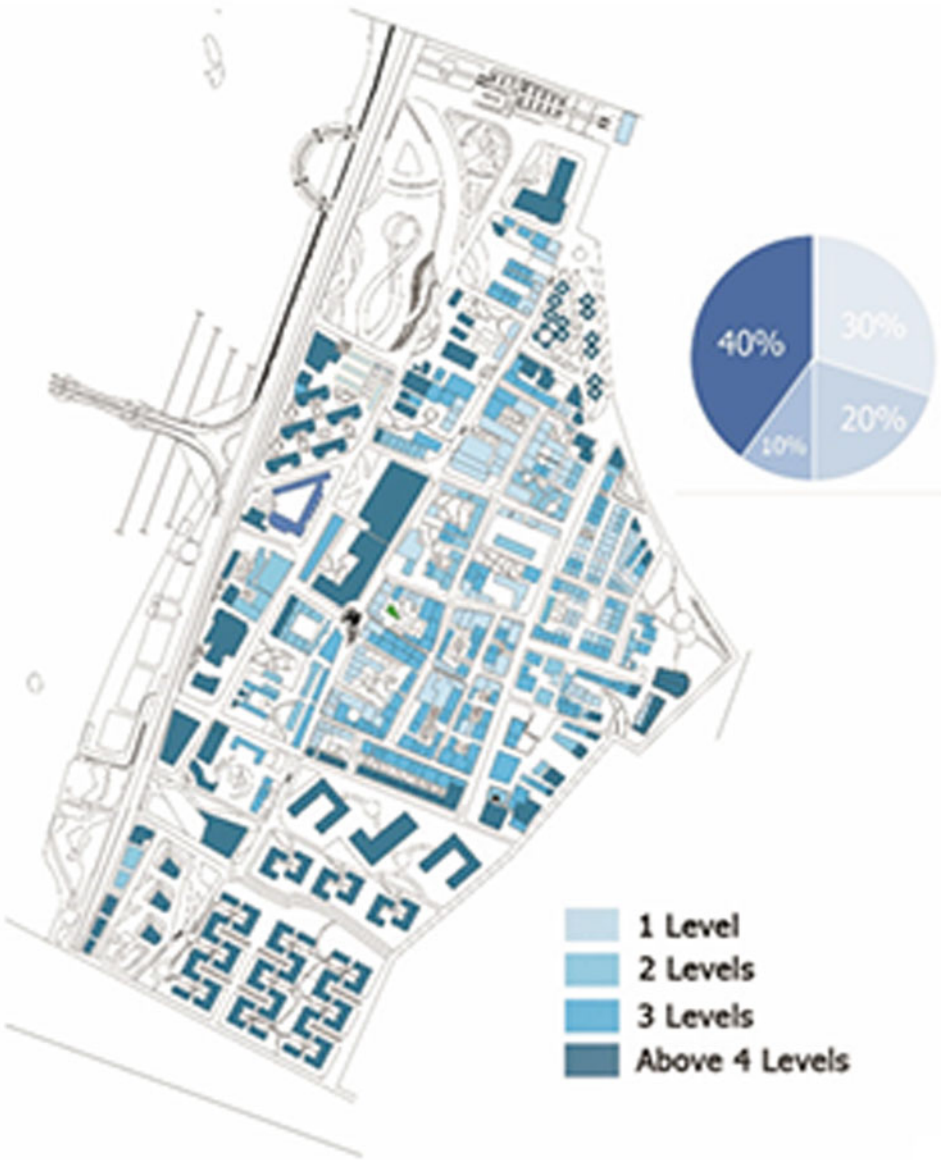

Fig. 25 Proposed building heights

Fig. 26 Proposed roads classification

Fig. 27 Proposed monorail pathway and stations

Fig. 28 Proposed monorail transportation system

Fig. 29 Proposed ground tram

Fig. 30 Proposed the Nile Cornish road profile and shading areas

Fig. 31 Proposed ancient touristic market shading devices

Fig. 32 Proposed the Nile Cornish road profile

Table 4 Comparison between case study area before and after renovation versus Curitiba and Masdar Cities (made by the researchers)

Sustainable criteria	Aswan case study area before renovation	Aswan case study area after renovation	Masdar city	Curitiba city
Sustainable site, smart infrastructures	There is no shaded area or adequate green area, and there is no smart infrastructures	There are shaded areas and narrow shaded and sitting areas in the touristic market and smart infrastructures	Compact pedestrian walkways, narrow shaded streets, landscape, and water features	Curitiba became the most sustainable city (Curitiba is most sustainable city, 2018)
Energy efficiency	Conventional fossil fuel energy resources	Photovoltaic panels and waste to energy resources	PV, solar thermal, wind turbines, and geothermal and hydrogen plant	In 2010, around 50% of total energy in Brazil comes from renewable sources
Water management	Drinkable water is used in irrigation systems and domestic usage	Gray water system is used in irrigation systems	Water derived from a solar desalinization, gray water 80% reused water	Management, drainage and use of urban rainwater, sewage, and water supply should be controlled
Eco-materials	Traditional building materials	Ecological and local building materials	Ecological and local building and low energy embodied materials	Using local and ecological materials
Transport	All vehicles depend on fossil fuel resources	Electrical tram (monorail), natural gas vehicles, biking	Zero-cars, walking, biking, light rail, personal rapid transit	Rapid bus transit system
Waste management	There is no separating, recycling, and reusing	Reducing, separating, reusing waste	Reducing, separating, reusing, compacting, and zero waste	Recycling and reusing waste
Pollution	Air, water, sound, and visual pollution	Green roofs, green area, reducing fossil fuel and CO_2 emissions	Carbon capture facility and a natural gas reformer, reducing CO_2 emissions	In 2007, Curitiba came third on the list of the 15 green cities in the world according to the American magazine Grist
Creating jobs	NA	Getting new jobs	Getting new jobs	Getting new jobs

- The proposed monorail and tram will serve all the Aswan people and tourists which start from the railways station reaching the international airport in the south and to the New Aswan city in the north.
- This proposal for public transportation system will mitigate the people's daily suffering and protect the environment from the air pollution. Beside the monorail, there are different public transportation systems should be used like buses, minibuses, and microbuses with decisive traffic regulations.

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