ARAB ACADEMY FOR SCIENCE, TECHNOLOGY & MARITIME TRANSPORT (AASTMT)

Faculty of Engineering & Technology

Department of Architectural Engineering and Environmental Design

A FRAMEWORK FOR THE COMPREHENSIVE ASSESSMENT OF THE ADAPTIVE REUSE OF HERITAGE BUILDINGS IN HISTORIC CAIRO

By

WALED TAREK ALY SHEHATA

Egypt

Thesis dissertation presented to the Arab Academy for Science, Technology & Maritime Transport in partial fulfilment of the

MASTER OF SCIENCE DEGREE

In

Architectural Engineering and Environmental Design

Supervised By

Lobna Sherif	Yasser Moustafa	Ashraf Botros
Professor of Architecture	Assistant Professor of Architecture	Ph.D. in Architecture
AASTMT	AASTMT	Urban Planning Consultant

Graduation Year
2014

DECLARATION

I certify that all the material in this thesis that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this thesis reflect my own personal views, and are not necessarily endorsed by the University.

(Signature) .....

(Date) .....

We certify that we have read the present work and that in our opinion it is fully adequate in scope and quality as a thesis towards the partial fulfilment of the Master's Degree requirements in

Architecture

From

Faculty of Engineering and Technology (AASTMT)

Date: Tuesday the 3rd of June, 2014

Supervisors:

Name: Dr. Lobna Sherif
Position: Professor of Architecture, Faculty of Engineering and Technology, AASTMT
Signature:

Name: Dr. Yasser Moustafa
Position: Assistant Professor of Architecture, Faculty of Engineering and Technology, AASTMT
Signature:

Name: Dr. Ashraf Botros
Position: Ph.D. in Architecture, Urban Planning Consultant
Signature:

Examiners:

Name: Dr. Ayman Wanas
Position: Associate Professor of Architecture, Faculty of Engineering and Technology, AASTMT
Signature:

Name: Dr. Alaa el Habashy
Position: Associate Professor of Architecture, Faculty of Engineering, Menoufiya University
Signature:

BIOGRAPHY

Waled Tarek Aly Shehata is a M.Sc. Student at the Department of Architectural Engineering and Environmental Design at the Arab Academy for Science and Technology in Cairo. He received his B.Sc. in Architecture from Helwan University, Egypt in 2008, and holds a Post Graduate Diploma in Urban Planning and Management, in ITC Twente University, The Netherlands in 2011. Beside his academic career, he works in architecture consultancy and contracting firms as an architect, urban and interior designer. His research and practice are influenced by his international travels and his time spent in Europe, Russia and Syria. He is generally oriented towards architectural heritage and its current role in sustainable community development, specifically in the Islamic driven urban systems. He can be reached by email at: arch.waleed.tarek@live.com, and on mobile phone: +201020504200.

بسم الله الرحمن الرحيم... وما توفيقي إلا بالله

قال الشيخ رئيس الأعمال بديع الزمان أبو العزيز اسماعيل بن الرزاز الجزري[1] رحمه الله تعالى: *" الحمد لله المبدع صنعه في السمائيات , المودع أسرار حكمه في الأرضيات فهي نسخة من عالم ملكوته و دليل قاطع على جبروته أحمده على ما علم و أستزيده من فواضل النعم و هي مطلوبات الحكم حمدا يماثل بعض احسانه و جزيل امتنانه و الصلاه على سيدنا محمد أشرف نوع الإنسان و على آله و التابعين له بإحسان"....*

و بعد, فيسرني أن أستوحي مقدمة الرسالة من بديع كلامه و لحن بيانه...

إني تصفحت من كتب المتقدمين و أعمال المتأخرين ما سبق من إعادة استخدام المباني التاريخية, و تأملت في مفاهيم تقييم هذه الظاهرة الهندسية , و باشرت تقييم هذه الصنعة برضم من الزمان , و ترقيت في عملها عن رتبة التأويل إلى العيان ... فأخذت فيها أخذ من بعض من سلف و خلف , و احتذيت حذو من عمل ما عرف. و لما لهجت بمزاولة هذا المعنى الدقيق و لججت بمحاولة المجازة و التحقيق رمقتني أعين الظن بالتبريز في هذا الفن العزيز , فمددت يدي إلي أنواع ذوي الهمم الرفيعة لاستطلاع أنواع الحكم البديعة, ليثمر به غرس اعتدادي و يقمر به ليل إجتهادي , فاستنهضت ما قعد من همتي و أيقظت ما رقد من قريحتي و استغرقت الجهد و الجد و استنفذت الوسع و الوجد. و كنت وجدت فريقا ممن خلا من المعماريين و تقدم من المهتمين وضعوا إشكالات و ذكروا إعمالات عن إعادة تشغيل الآثارات , لم يباشروا لجمعها تلخيصا ولا سلكوا إلى تصحيح جميعها طريقا ... و كل علم معماري لا يتحقق منه بالأدلة فهو متردد بين الصحة و الخلل فجمعت فصولا مما فرقوه و فرعت أصولا مما حققوه , ولما وجدت في ذلك من المشقة ما بعد علي الشقة كرهت أن يذهب اجتهادي أدراج الرياح و ينسخ ما عملته انتساخ الليل بالأصباح , فسولت إلي نفسي أن أضع في ذلك تذكارا لمن عنيت ببشر أديمهم و رغبت في تعليمهم ثم إني رفقت بما بهم و هممت بما لهم و تركت ما عليهم... فبذلت من قواتي حسب الإستطاعة و كتبت هذه الرسالة لتشتمل على تقييمات التغيير التوظيفي للمباني التراثية و تدقيقات الحفاظ المعماري للمنشآت القيمة بالقاهرة التاريخية و سبل الإرتقاء الإنساني للسكان بالمناطق الأثرية , واثقا بكرم من يقف عليها من أهل العلم , و قد علم أولو العدل في الحكم أن كلا لما له خلق و منفق مما رزق ولا تألوا نسمة نفعها ولا تكلف نفس إلا وسعها...

---

[1] أبي العز إسماعيل بن الرزاز الجزري. (1200). *الجامع بين العلم و العمل: النافع في صناعة الحيل*. تركيا: فؤاد سزكين , إكهارد نويباور , و مازن عماوي.

هذا العمل أحتسبه فى سبيل الله

ثم إلى أمي و أبي,

و إلى أخواتى , سارة و هبة الله

ACKNOWLEDGEMENTS

The First and Outmost Appreciation and Thanks to GOD...

However resourceful and independent a researcher wants to be, it is nevertheless unavoidable and imperative that he seeks assistance from various professors and colleagues.

Therefore my second gratitude is to my supervisors, Dr. Lobna Sherif, Dr. Yasser Moustafa, and Dr. Ashraf Botros. Thanks to Dr. Alaa el-Habashy for the valuable resources and experiences he provided. Thanks also to Dr. Hatem Ezzat for being an inspiration for creativity and innovation, even though he was not around during my work in the thesis.

Thanks for my colleagues and friends for their assistance and support: Mohammed Mubarak, Dr. Ahmed Ali, Dr. Omar Ewis, Rim Fawzy, Heba Fekry, Rasha el Kheshin, Moataz Aziz, Hossam Hassan, Abdel Rahman Hashem, and Ahmad Borham. Certainly, I can't omit the moral support role of my family, school friends, college friends & colleagues in the Netherlands and Russia who helped me shape my ideas, concepts and architectural critical thinking in the last decade or more.

Last but not least, I would like to thank my superiors at work for their patience and encouragements... Thanks to Ahmad Fawzy, Ahmad Serry, Ahmad Mahmoud, and Rehab Fawzy.

Special thanks to my Grandmother, So'ad, who endured me while working on this thesis. She is a hero for taking on my burden, I should admit.

Cairo,

May, 2014; رجب , 1435

ABSTRACT

In contemporary conservation theory and practice, adaptive reuse is considered to be one of the main strategies for the conservation of architectural heritage. It is often advocated as the most appropriate strategy for the conservation of heritage buildings in Historic Cairo. However, many previous adaptive reuse projects in Historic Cairo have been criticized for failing to achieve the full potentials of the strategy. This thesis argues for the importance of the comprehensive and systematic assessment of adaptive reuse projects of architectural heritage in Historic Cairo and for the need to develop the tools that could permit such comprehensive and systematic assessment. As an initial step toward the development of such tools, the thesis presents an integrative framework generated through an analysis of the relevant literature from diverse fields and areas of research as heritage preservation, post-occupancy evaluation, environmental psychology, urban design, and community development. The proposed framework identifies first what ought to be the main goals or pillars of adaptive reuse projects in Historic Cairo: 1) building conservation, 2) success of new use, and 3) local community development. Then, for each of the three pillars, the framework details relevant assessment criteria. In its conclusion, the thesis discusses implications of the proposed framework for adaptive reuse practice and for future research toward the development of assessment tools.

KEY WORDS

Adaptive reuse assessment, architectural heritage, Conservation, Revitalization, Community development, Historic Cairo

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

1.1. HISTORICAL BACKGROUND

Historic Cairo is a jewel of architectural and urban design and is listed as part not only of the national heritage but also that of UNESCO's World Heritage list (UNESCO, 1979). According to Fowler (1995) and UNESCO (1979), Cairo contains possibly the finest and best surviving collection of medieval monuments and well-preserved urban fabric in the Islamic world. Cairo's historic centre and its buffer zone include no less than 600 classified monuments dating from the 7th to 20th centuries, distributed over various parts of the well-preserved urban fabric. Cairo's civilization had flourished by its vibrant human activities in its built environment.

Till the mid 19th century, obsolete buildings had been adapted for functional adjustments or for the entire change of function, and this processes had not been heritage related businesses phenomenon in Egypt. Physical alterations and extensions were done simply to fit new purposes or to enhance the buildings' status. Bait ar-Razzāz, a house in ad-Darb al-Aḥmar, is an example. It had consisted originally of two separate houses built in the 16th century. These two houses were merged into one bigger house sometime in the 18th century (Morton, 2001), while blocking the huge main entrance from Bab el-Wazir Street leading to one of the houses. Seeking economic income, the house residents converted the now closed entrance hall, along with adjacent two rooms into commercial shops that overlook the street (**Figure 1.1**). This example illustrates that changing the use of buildings from one function to another was done primary based on socio-economic reasons, and sometimes respecting and restoring the exact original form according to Waqf[2] detailed descriptions.

In December 1881, the first call for heritage documentation and conservation in Egypt was initiated when the Khedive Tawfiq established the Committee for the Conservation of Monuments of Arab Art. The committee had registered, rescued, restored, documented, preserved and completed buildings of Islamic & historic value. The work done by the committee can generally be considered the greatest attempt at rescuing historic Cairo ever put into operation between 1890s and 1960s (Hampikian, 2004). However, it is important to highlight that the committee's focus had been on restoration without functional revitalization of valuable buildings into practical purposes (El-Habashi, 2001; 2002 ،مهدى).

[2] Waqf is an inalienable religious endowment in Islamic law, typically denoting a building or plot of land for Muslim religious or charitable purposes. These donated assets are held by a charitable trust that manages any modifications, adaptations, and/or restoration done to the asset.

Since Madrid congress of architects in 1904 that distinguished live heritage and dead monuments, many international charters and regional conferences stressed the importance of utilizing historic buildings into an appropriate function that preserves their authentic characteristics. These charters set out the very basic principles for repairing and conserving heritage while upgrading the local community of the historic districts, and enhancing the liveability of such districts. Indeed, starting from the 1960s, numerous governmental, foreign and privately funded missions participated in the documentation and conservation efforts in Historic Cairo. In addition, the development plans proposed by the UNESCO, United Nations Development Program (UNDP) and several conservation agencies have set an example of successful revitalization (Gharib, 2011). For example, The Aga Khan Trust for Culture (AKTC) acknowledged a bottom-up approach toward the formulation and implementation of policies during revitalizing ad-Darb al-Aḥmar residential quarter. According to(Bianca & Siravo, 2005), this initiative was special in terms of planning to ameliorate the area's social and cultural level while offering residents a wide range of upgraded community services. Khayer Bak complex in ad-Darb al- Aḥmar forms an example for re-use of monuments for cultural and community activities (**Figure 1.2**). The Aga Khan dedicated the building to a local non-governmental organization (al-Mawred ath-Thakafī). That NGO currently uses the building to teach music lessons to local youth.

Other missions had restored heritage buildings that were adapted for reuse (Al-Minabbawy, 1995). For example, in 1987, the Italian-Egyptian Centre for Restoration and Archaeology mission restored al-Sam'a Khānah originally built by Mevlevi Dervishes in the16th century to perform their circular dance, typical of their mystical confraternity. It is currently managed by the Ministry of State for Antiquities Affairs and in use as a cultural space for musical and traditional assemblies and lectures, and contains a museum hall. In April 2013, a random site survey that targeted the adaptively reused heritage buildings in Historic Cairo showed that around 80% or more of these buildings are run and managed by the ministry of Culture, and owned by the Ministry of State for Antiquities Affairs. They offer the citizens of Cairo's, as well as tourists, many cultural events and performances.

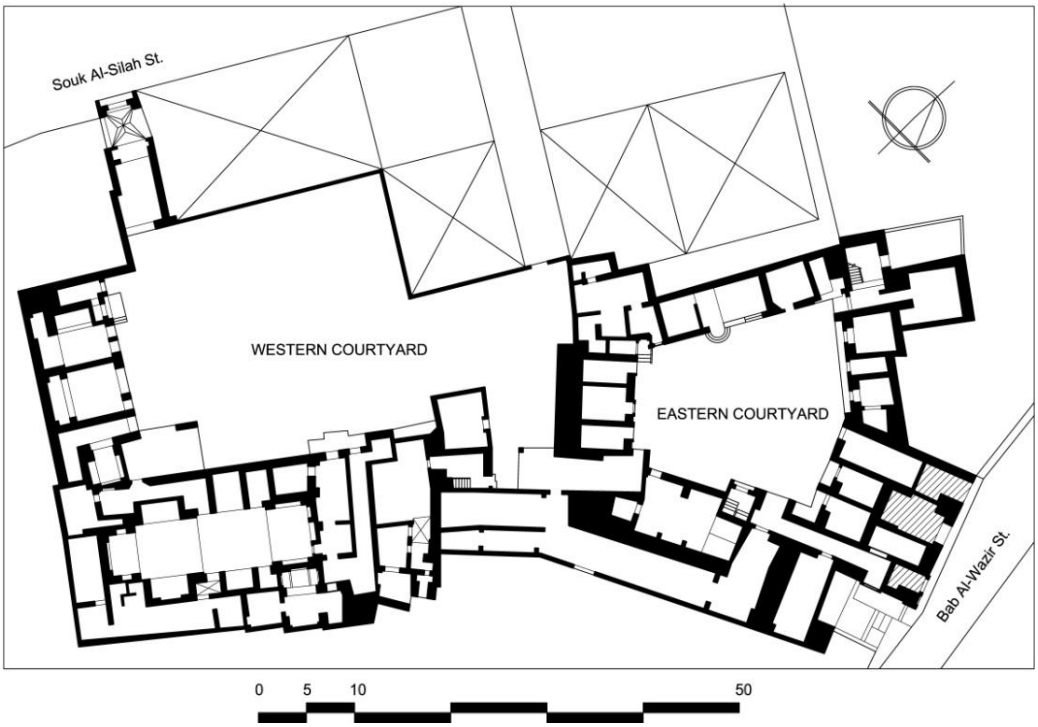


Figure 1.1 Ground floor plan of Bait ar-Razzāz.

The plan is an evidence of the two separate houses before the 18th century, as it was adapted by connecting the two courtyards by an indoor corridor. The hatched three spaces on the east facade represent spaces that were originally the entrance of the East house, that were later converted to commercial shops directly over looking Bab al-Wazīr Street. Adapted after http://www.bonah.org/social/pg/photos/thumbnail/11405/large/.

Figure 1.2 Khayer Bak Complex in ad-Darb al-Aḥmar.

Khayer Bak Complex in ad-Darb al-Aḥmar quarter after restoring the Ottoman house and Sabil at 27 and 25 Bab al-Wazīr Street by the Aga Khan Trust for Culture.

1.2. RESEARCH PROBLEM AND RATIONALE

1.2.1. THE ADAPTIVE REUSE OF ARCHITECTURAL HERITAGE IN CAIRO

Old parts of Cairo still survive today within the giant fabric of the modern metropolis. These districts are not just archaeological ruins or tourist attraction spots; they still contribute and integrate as part of the overall city system. Sixty or more years ago, Cairo's historic quarters have started facing major deterioration symptoms. The increase of population and long government neglect became a great burden on the century-old infrastructure; eventually encouraging squatter settlements and igniting informal industries. This situation together with poor public awareness toward the value of heritage contributed to the overall deterioration facing those areas for years (Gharib, 2011). The conservation and physical upgrading of historic Cairo has been an item on the international and local agendas since the 19th century. Huge economic resources and funds from the local government and/or international organizations have been deployed for both urban upgrading and heritage restoration and preservation. But problems facing heritage buildings in Cairo extend far beyond restoring efforts done to save or freeze individual monuments in a glass box as a museum piece (el Habashi, 2008). Boussaa (2010) stressed that urban conservation is not just a matter of restoring bricks and mortar. Because sooner or later, the deterioration of surrounding urban fabric will reach the "*Frozen*" monument, and cause severe damage (Broto, 2002; Bianca, 2004).

Conservation does not mean that historical districts should remain unchanged (Boussaa, 2010). It means understanding the city as a dynamic process, a structure in permanent and continuous change (Boussaa, 2010). Without the ability to change, a city would die.

> *"A state without the means of some change is without the means of its conservation"* (Edmund Burke as cited in Cantacuzino, 1990, p. 14).

The city is understood to be a unique ensemble that needs to be conserved in its historical integrity (Afify, 2007). This means understanding the city as a dynamic process, a structure in permanent and continuous change. Conservation is about improving and upgrading life of people in historic areas. Urban conservation policies are usually area based, through the designation of conservation areas as a whole, and heritage buildings specifically (Boussaa, 2010; Antiniou, 2004; ابراهيم , 1983). Therefore, the conservation of the historic urban

centre of Cairo should be also planned as integrative revitalization and environmental upgrading projects (Hampikian, 2004; Antoniou, 2004; فريق ميثاق التنمية و العمران , 2012; UNESCO, 1983, p. 26; Afify, 2002).

With conservation in mind, projects for reusing Cairo's heritage buildings are considered as a reverse process for all types of heritage obsolescence (Elkerdany, 2002). Obsolescence is the process of an asset going out of use. It is the transition towards the state of being obsolete, or useless. Obsolete means antiquated disused or discarded, and may provide the impetus to consider either the adaptive reuse of the building or redevelopment of the site (Douglas, 2006). In contemporary conservation theory and practice, *adapting heritage buildings for contemporary use* is a phenomenon which has great significance (Morton, 2001). Adaptive reuse of heritage buildings earned its reputation not only because a symbiotic functional usage in old buildings steps up the maintenance of the structure and as such delays its decay, but also because the resultant functional building is involved in the living context it lies within, not as is seen in buildings that are deserted and disused (Boussaa, 2010).

> *"The fact is that the best of all ways of preserving a building is to find a use for it, and then to satisfy so well the needs dictated by that use..."*
> Viollet-le-Duc (1854), p. 31.

So in face of Cairo's current problems, and due to its wide array of advantages, adaptive reuse is strongly advocated as the most appropriate strategy for the conservation of heritage buildings in Historic Cairo (see for example: Smith, 1988; Afify, 2002; Antoniou, 2004; Hampikian, 2004; Bianca & Siravo, 2005; Fowler, 2011; Gharib 2011). Indeed as previously mentioned in the historical background, many heritage buildings in Historic Cairo have been adapted for reuse, and are used on daily basis. For example, Sabīl-Kuttab Qayetbāy (**Figure 1.3**), originally a water dispensary and a small school on top floor, currently contains a book library, library for children and a studio for the Arab institution for film and TV.

Unfortunately, most projects have failed to achieve the full potentials of adaptive reuse (Ouf 1995; Shehayeb & Sedky, 2002; Afify 2007; Fowler, 2011; Gharib 2011 & 2012). For example, many of these buildings have continued to exhibit deterioration symptoms (Fowler, 1995; Ouf, 1995; Gharib, 2011). Due to the lack of maintenance, Wikālat as-Seleḥdar for instance had continued to face water leakages and crystalline salt formation

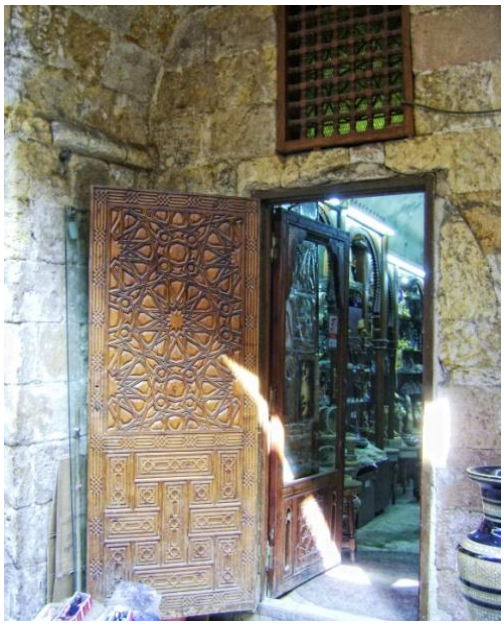
on the building's stones (**Figure 1.4**). Other adaptively reused buildings are unused or under-used (Gharib 2011). Bait ar-Razzāz sets an example of underused conserved buildings. It was conserved for the purpose of reuse by the American Agency for International Development in the period between 2003 and 2007. The building is of high architectural and aesthetical values. Despite the tremendous efforts and budgets of the restoration for reuse, Bait ar-Razzāz is currently unused (**Figure 1.5**). In some cases, people living by heritage experience an ongoing source of psychological stress that affects their well-being (Shehayeb & Sedky, 2002). Many adaptive reuse projects in Cairo ignored the surrounding local community, and acted disregarding their basic demands (Gharib, 2011).


a


b

Figure 1.3 Sabīl-Kuttab Qayetbāy.

Image (a) shows a recent exterior shot of the Sabīl and Kuttab, and Image (b) shows the book library on top floor.


a

b

Figure 1.4 Wikālat as-Seleḥdar.

Image (a) shows the facade wall of a commercial shop in Wikālat as-Seleḥdar with water leakage on its stones. Image (b) shows a zoom image of the crystalline salts forming on the stone, which because of their expanding volume, could break up the materials of the wall, reducing the strength of the material and continuously spill off the surface.

Figure 1.5 The Eastern courtyard of Bait ar-Razzāz.

Although conserved according to high standards and having high architectural and aesthetical value, Bait ar-Razzāz is unused.

1.2.2. CURRENT POLICIES AND REGULATIONS IN CAIRO

The day is long over when any country could afford to isolate its heritage buildings from the daily life of the neighbourhoods in which they are located (Morton, 2001). But still, Egyptian conservation policies have been designed on the fundamental principle to preserve individual monuments without urban revitalization since the 1952's revolution, and especially in the last thirty years (Gharib, 2012); and without addressing area-wide environmental needs (Aga Khan Program for Islamic Architecture, 1985). Generally, the policies have lacked participation of local societies and suffered major conflicts with other civil laws. The Egyptian Antiquities Organization (EAO) (currently the Ministry of State for Antiquities Affairs) recommended that one of the main tasks of the Cairo's Maintenance Agency was to eliminate all trespassing on monuments (Al-Minabbawy, 1995). With that vague definition of *'trespassing'*, local inhabitants were perceived as parasites living in the old city and required evacuation. The policies improperly organized the roles of involved actors and avoided the key role of local communities' participation (Ouf, 1995; 2002 ،مهدى). A mistake had been made when making lists of our heritage buildings and then, for all intents and purposes, minimized their involvement with their surroundings (Morton, 2001). Then the heritage buildings were turned into corpses, dead spaces in the daily life of the street, where nothing useful to the local community is happening. Consequently, after a while, nobody longer cares about these buildings.

This makes neither economic nor social sense. There are economic investments already in our existing buildings. The stones are already in place. It should be encouraged to use and reuse these buildings over and over again. Huge investments were designated for the preservation of empty, isolated, architectural relics of the past, even when of heritage value; while simultaneously, there are deteriorated neighbourhoods and deprived community that have urgent, but yet sustainable need for food, shelter, and jobs. The policies are centralized, unclear, without a consistent direction of revitalization and whole sum upgrading, and rather focused on preservation to control deterioration and override lack of maintenance. The solution of museum commitment, so often adopted, is an easy solution often of little effect (Afify, 2007). There is an overall incorrect interpretation of revitalizing the heritage of Cairo to present a 'restored and kept' methodology in order to *'museumify'* the heart of Cairo (Gharib, 2011; مهدى, 2002). For heritage buildings, and preservation as a field, it is slipping dangerously into obsolescence because our society can only have so many museums and historic tourist attractions.

Law no. 117 of 1983 and its modified law no. 3 of 2010 on the protection of antiquities emphasize the notion of preservation by putting heritage buildings in glass boxes to be displayed to tourists. The very core of that law freezes the historic city without leaving space for innovative interventions. It acts against any efforts for adapting heritage buildings for reuse as part of the process of urban upgrading. According to Gharib (2012) and الدليل (2008), this law follows a top-bottom policy-making procedure, lacking long-term revitalization vision and tends to push for narrow problem-solving methodologies. Since, the policy's objective is not based on a certain ideology except the physical preservation, then revitalization did not have supporting policy guidance or detailed guidelines for adaptation or rehabilitation of the designated historic quarters (Gharib, 2012). Unfortunately, the 1983's law is still active that most of the efforts done recently by the Ministry of State for Antiquities Affairs and any governmental restoration bodies are done according to its articles.

In the last decade, however, there has been a slight shift in what the government officials in the Ministry of State for Antiquities Affairs believe about reusing the listed buildings. According to مهدى (2002), heritage officials became more flexible in accepting the idea of adapting heritage buildings for reuse, only if the new function does not threaten the building's authenticity. In spite of this positive change in attitude towards reusing heritage buildings, there are no parallel developments of locally based rules by the municipality for organizing and managing valuable assets. The current law in action is mentioned in the decision by The Governer of Cairo (2009), it describes the followed urban regulations when building a new construction and adjusting "*any*" existing building in Fatimid Cairo, regardless of its value. In comparison to France, according to Roland Castro (as cited in Zawya, 2014), there are more than fifty laws that classify all the monuments eligible to the government's protection, along with certain conditions that allow a special classification for some, such as a "first class" heritage monument for landmarks like the Eiffel Tower. In the case of a listed monument in Cairo, the decision by The Governer of Cairo law states that a special committee shall be formed under the supervision of the Governor, and in accordance with the Ministry of State for Antiquities Affairs, in order to take decisions about alterations to the heritage site.

Furthermore, only governmental bodies are the ones who have the right to utilize heritage assets for their benefit, and according to their singular perspective. Almost exclusively, the Ministry of Culture is the ministry that has a most of the reused listed buildings reused and

running, while other ministries are rarely involved in reusing heritage buildings. Individuals are not allowed to own, possess, or reuse listed buildings; however, they can use valuable (not listed) buildings with unlimited intervention boundaries regardless their architectural value. Listed buildings do not apply to real-estate laws of supply and demand which restrain any goals of controlled/guided development of the assets. Closely related to these legislative and economic obstacles, there is no tax policy (or any sort of economic incentives) to stimulate private development and investment interest in adaptive reuse.

One of eleven joint projects between the Ministry of Culture (Cultural Development Fund) and the Ministry of State for Antiquities Affairs is Wikālat as-Sultān Qānşuwah al-Ghūrī. It sets an early reuse example in Cairo in 1959 when it was used by artists as a school for handcrafts. Then in 2005, it was re-opened as a cultural centre. Its ground level's open court is currently a platform for cultural events and concerts (**Figure 1.6**), and its first floor is used as governmental offices for both: the Ministry of State for Antiquities Affairs and the Ministry of Culture. The upper housing units in the last three floors are being used as dedicated studios for artists. Despite being an important historical building, it faces deterioration and lack of maintenance. The artists who use the upper three levels of the building do not allow periodic maintenance; to the extent that some of them even had painted the interior walls of the old building with paints that are harmful to the old stones. Although there are signed contracts between the artists and the Ministry of Culture in order to ensure the ongoing of maintenance, neither of them nor the Ministry of State for Antiquities Affairs follows the terms of contracts properly.

Another example of future projects between the ministry of Culture and the Ministry of State for Antiquities Affairs is Wikālat Ūdah Bāshā in al-Gammalīyah Street. It is currently a deteriorated and partially demolished Wikālah; it is divided and used as heavy workshops for metal and leather industries (**Figure 1.7**). According to علي (2010), the ministry of Culture proposed to restore it to undergo multiple-functional adaptations (**Figure 1.8**); the courtyard is planned to be turned into a tourist attraction spot by reusing ground-floor rooms into shops, while the upper floors are designed to accommodate hotel rooms. Furthermore, many similar adaptive reuse schemes for heritage structures in Egypt are being prepared at the moment, following unilateral political decisions.

Figure 1.6 Folklore performance, in Wikālat as-Sultān Qānşuwah al-Ghūrī.

By now it is evident that the process of transformation of already adaptively reused heritage buildings in Historic Cairo had been based on haphazard approaches and to rely on the whimsical decisions of individual officials rather than on technical expertise or scientific knowledge and methodology, and without considering learning from already adaptively reused projects that encountered successes or failures (Gharib, 2011; الدليل, 2008). Many proposals of reusing had been actually rejected by stakeholders only to avoid fuss that might be accompanied with new paradigms of conservation, or in other cases, approved and executed for political reasons. These conflict priorities might form a threat towards preservation of the '*soft values*'[3] which encompass historical, sociological, psychological, artistic, other cultural and even moral and religious *sub-functions*[4]. So there is a gap in the governmental system that, ultimately leads to keeping the adaptively reused heritage buildings unused, miss-used or under-used.

[3] Soft values refer to the intangible values related to heritage such as cultural and spiritual traditions, stories, music, dance, theatre, literature, visual arts, local customs and culinary heritage (ICOMOS, 2007). These values are those associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. These intangible cultural values that are transmitted from generation to generation, are also recreated constantly by communities and groups in response to their environment, their interaction with nature and their history, and provide them with a sense of identity and continuity (UNESCO, 2003).

[4] This term is used by Plevoets and Van Cleempoel (2011a) to refer to types of intangible cultural values that might be embeded in heritage. Although there was no defintion found to explain the exact term 'sub-function' in the context of this thesis, it was worth mentioning it to provide a platform for future investigation about its tangible definition and meaning.

a

b

Figure 1.7 Wikālat Ūdah Bāshā/ Dhūlfiqār

The building is structurally unstable; image (a) of its exterior shows structural consolidations that prevent the facade above the entrance from collapsing. Image (b) is of the interior courtyard showing the partially collapsed upper floors after a fire catastrophe in 2006.

a

b

Figure 1.8 Architectural renderings of Wikālat Ūdah Bāshā/ Dhūlfiqār

The images show the reuse the whole building as a hotel; the courtyard into an open space for hotel guests and tourists; along with shops on the ground floor. Image (a) shows the rendering of the proposal for the courtyard of Wikālat Ūdah Bāshā/ Dhūlfiqār after adaptation for reuse. Image (b) shows the rendering of the proposed Hotel's coffee shop. Images source: El-Rasheedy, M. S. (2012) after the Ministry of Culture.

1.2.3. THE NEED FOR A COMPREHENSIVE FRAMEWORK FOR THE ASSESSMENT OF THE ADAPTIVE REUSE OF ARCHITECTURAL HERITAGE

Globally, as well as in the architectural heritage of Historic Cairo's, there have been many unsuccessful cases where heritage-based regeneration projects have faltered or failed partially or completely (Department of the Environment and Heritage, 2004; Jonas, 2006; Gharib, 2011). The reasons vary considerably and are often complex. Working with heritage assets for urban regeneration brings multiple set of issues to the development process that requires specialist knowledge. Where expertise in any of these areas is lacking or conflicting, projects can fail. Therefore, an integrative and greater understanding of the issues associated with dealing with heritage assets, user needs, and area development can only enhance the success rate of heritage-led regeneration.

The first step of understanding the phenomenon of adaptive reuse in light of the problems of previous adaptation projects in Cairo is to assess previous experiences. The importance of evaluating adaptive reuse projects is evident (Elkerdany, 2002; Fowler, 1995).There is a glaring need to learn from previous projects, either from their mistakes or successes. According to Preiser & Schramm (1997), Voordt (1999), Scadden & Mitchell (2001), Williams (2001), Afify (2002), Duvall (2002), Kamal (2002), Walters & Brown (2004), Hutton (2004), Douglas (2006), Aydin & Yaldiz (2010), Aksah, (2011), Prihatmanti & Bahauddin (2012) and البدري (2004), evaluation of conserved heritage buildings that are being adaptively reused is important and is considered to be a beneficial analysis due to the following benefits:

a) Short term benefits:

- Improves space utilisation based on feedback from users.
- It gives the maintenance manager assisting information for formulating an aftercare strategy for the adapted building.
- Enables building managers to take precautions to provide continuity to the function assigned for the building, or to change the function of existing reused buildings into a more appropriate one.
- Pursuing academic study of heritage assets' conservation and presentation.

- Shows how reused heritage can perform most economically, by saving cost of maintaining and operating facilities over the life cycle.

b) Medium term benefits

- Adds to the state-of-the-art knowledge, local experience and contextual factors.
- On the social level, it surveys the most urgent needs of the population living or working in the project area, and help addressing and integrating as much as possible society's current aspirations and living patterns.
- It investigates the level of attachment of the surrounding community, strong social relationships among local residences and their connections.
- This evaluation examines the retention of intangible values; local values and traditions with historical craft and artisanal roles, the natural sense of belonging and safety to areas of cultural heritage.
- It analyzes the underlying problems and methods of recovering of socio-economic activities. These types of activities usually sustain heritage buildings.

c) Longer term benefits

- It allows designers and decision makers to learn (develop general knowledge) from the past (its positives and negatives/ successes and failures) in order to improve on future projects.
- It helps future adaptation processes in prioritizing the balance between social, environmental, cultural and economic aspects.
- It can help national and local governments and housing organisations to develop an adequate and knowledge-based policy with respect to urban planning and housing.

The problem is that all indicative, investigative and diagnostic assessment models of already used buildings are rare in the Egyptian context. Assessment techniques are not widespread among the Egyptian private or public sector. Even on the global research levels, an extensive review of scholarly literature on adaptive reuse from the 1970s onwards shows that existing assessment models of adaptive reuse projects has generally relied on atheoretical and isolated case study researches (Plevoets & Van Cleempoel, 2011a). In the last three years, Conejos & Langston (2010), Langston, et al. (2010), Langston (2011), Buildings Department of Hong Kong (2012) and many others designed,

developed, and tested numerous methodologies for selecting an optimal/appropriate solution. Their studies were based on either quantitative or qualitative approaches or a mix of both. Although adaptive reuse as an interdisciplinary task, existing studies are mainly drawn from one specific perspective, such as conservation, architecture, socio-urban research or engineering and do not often aim to reach an interdisciplinary audience (Plevoets & Van Cleempoel, 2011a). The lack of a generic framework might lead organisations to conduct only part or few parts of it in their own customised ways which may prevent obtaining optimum benefits of the evaluation (Konara & Sandanayake, 2010). So far, science has not advanced a comprehensive evaluation model to assess issues related to adaptive reuse in an integrated manner to enable an evaluation of specific indicators of adaptive reuse projects.

To assess a project strategically, all factors related to the adaptation process should be considered as part of the evaluation model. This would ensure that the project has met the requirements and goals of adaptive reuse, because the full achievement and implications of the reuse project are revealed (Yung & Chan, 2012). Balancing the achieved goals versus what had been planned or, what should have been planned should be done in a holistic approach, in order to be able to conclude a successful opinion based projects' analysis, and based on existing laws simultaneously (Langston, et al., 2010; Buildings Department of Hong Kong, 2012). Thus it is evident that reused heritage buildings need to be addressed comprehensively and systematically in a theoretical framework.

1.2.4. ROLE AND IMPORTANCE OF THEORETICAL FRAMEWORKS

This thesis is based on advancing a *framework* for the assessment of the adaptive reuse of heritage buildings. A "framework" is a set of basic structures underlying a system, concepts, written text or practices that constitutes a way of viewing reality. It is a conceptual structure intended to serve as a support or guide. Theoretical frameworks explain to what extent a study builds upon existing research or knowledge that are fragmented, and systematically organize them into one integrative body of research. A framework give a clear articulation of the theoretical assumptions or suppositions; the why and how of the research and how to move from simply describing a phenomenon to generalizing about various aspects of that phenomenon. Theoretical frameworks can provide a general, but organised representation of relationships between multiple and

complex entities about a given phenomenon. Having a theory helps specifying which key variables influence the phenomenon of interest, and guide future research to examine how those key variables may or may not differ and under what circumstances (Rapoport, 1985).

As presented in this thesis, the construction of a multidisciplinary framework of assessing adaptively reused heritage is required to advance in the field of heritage adaptive reuse. The framework dwells on time tested theories that embody the findings of numerous investigations on adaptive reuse, in research as well as in practice. Moreover, it establish linkages between key concepts and between distinct but complementary paradigms in the field of reuse, it order, unify, and summarize existing research findings and other relevant materials, as well as identify gaps and provide direction for new research in given contexts. Such a framework would allow for a more theory-based choice of indicators and for the development of tools to evaluate multidimensional aspects of adapting heritage for reuse. These tools are required to assess the current and future reuse projects and to have, eventually, the ability to assess the implications of policies with respect to Cairo's context.

1.3. RESEARCH OBJECTIVES

The general purpose of this thesis is to be educational and informative, aimed at readers who are interested in understanding the collaborative aspects of adaptive reuse, or those who are already involved in the process and find themselves frustrated or curious about other stakeholders' points of view. It will uncover, analyze, and illustrate the fascinating and complex collaborative challenges inherent in the adaptive reuse development process. These challenges can act as a barrier to successful adaptive re-use efforts, ultimately hindering the ability of adaptive reuse to gain wider acceptance as a viable development option. This document will help foster better understanding of both the collaborative nature of the adaptive reuse process as well as the unique view points of the key stakeholder groups in order to encourage a more efficient, effective, and positive process for all.

However, the particular aim of the research is to develop a comprehensive framework for assessing the projects of adaptive reuse of heritage buildings in Cairo. Main pillars of assessment are to be classified in the framework according to the literature. Per each assessment pillar, the assessment criteria are interpreted from the literature as well as from practical experiences. This research aims to specifically mention the methods of assessment and discuss them strategically.

The framework should be comprehensive to address the interdisciplinary nature of adaptive reuse; and systematic to permit the comparative analysis of projects and better inform future ones. This framework can be used as a starting point, for developing the necessary tools that could permit such comprehensive and systematic assessment. It is intended to assist governmental institutions, developers, owners, community groups, practitioners and others in bringing forward successful schemes. This assessment would better support future adaptation measures of architectural heritage that became obsolete.

1.4. RESEARCH QUESTIONS

This thesis aims to answer a main question: When would heritage adaptation project be considered successful in Cairo's historical context?

A list of sub-questions was developed in order to help answer the main question.

- What are the advantages and disadvantages of heritage adaptive reuse projects?
- What are the priorities and goals of heritage adaptation projects worldwide and in Cairo more specifically?
- Who are the main interested groups that deal with heritage?
- Are there any previous attempts of assessing heritage adaptive reuse projects? And if there are, what was their approach to the assessment process? And where do they overlap?
- What are the main pillars of assessing adaptively reused heritage buildings?
- What are the criteria for assessing each pillar?

1.5. METHODOLOGY DESCRIPTION

This research follows an "Inductive process of inquiry" based on creative analysis of the previous literature about adapting heritage for reuse. This research seeks classification of multiple critical factors affecting adaptive reuse of heritage in a specific context.

First, inductive reasoning is followed as a scientific research method. Unlike deductive reasoning, it does not start with a pre-conceived conclusion but with observation and logical argumentation, or as Albert Einstein said: *"If we knew what it was we were doing, it would not be called 'research', would it?"* As the term 'inductive' suggests, it is the method that searches or seeks after systemized knowledge (Groat & Wang, 2002). This

research analyzes multiple issues related to adaptive reuse of heritage projects, by using an extensive literature review as an exploratory system. The strategy of reviewing previous literature is from global to local. The first phase of the methodology seeks to: a) form an introduction to the research; b) identify previous approaches of research and highlight their overlaps in global research paradigms; c) understand practical issues from the field; and d) document key theories and formulate a debate between points of view of conservationists, decision makers, users and architects. According to Groat and Wang (2002), formulating the topic in such a debate as to determine the initial scope of the literature is one of the first creative steps a researcher takes.

Second, research creativity is the ability to derive new implications from existing positions, critique past stances from an awareness of Cairo's specific context. Global adaptive reuse literature are vast, and are related to multiple and overlapping topics. Thus through the analysis and classification of literature, it has been made possible to highlight the adaptive reuse main approaches, and then group every other aspect under the main assessment approaches in the proposed framework. The theoretical framework is generated to serve as guide in research venture; it is the result of conscious negotiation between the existing approaches of heritage adaptation assessment. The literature survey is conducted in order to come up with: a) an extensive review of the literature pertaining to the chosen research topic; b) distil criteria of the theoretical framework for assessing adaptively reused heritage projects; c) comparing the achieved goals versus what had been planned or, what should have been planned for; and d) formulate a judgment based on a case by case, and based on general policies and laws simultaneously as suggested by Langston, et al. (2010) and Buildings Department of Hong Kong (2012). To assess a project strategically, all factors are considered as part of the evaluation model.

Third, the generated framework is explained by discussing the assessment criteria in light of the literature. Specialized literature is searched for being related to theories and strategies that determined how to judge the success or failure of heritage adaptation worldwide. When contradicting with local variables, the assessment criteria are adjusted and developed to suit the context of Cairo. Each indicator for the success or failure is explained on two levels, conceptual and practical. Conceptual discussion enriches the topic with explanations about its origin and definition and brings up relationships to other indicators. Practical discussions bring up example(s) for better explanations of the assessment attributes and serve as a triangulation method. Triangulation is one way to

demonstrate truth value (credibility) of the research. Triangulation involves the use of a variety of data sources, multiple investigators, and a combination of data collection techniques in order to cross-check data and interpretations (Groat & Wang, 2002). Most of these indicators are derived from the literature and previously conducted assessment locally or worldwide in order to support the validity of these criteria.

Although some criteria seem to be of more importance than others, judging the importance of each criterion is not the aim or scope of this thesis. Judging the level of importance of criteria requires in-depth analysis of variables that might vary from case to case, per each building typology or according to the state of the valuable building (El-Habashi & Nada, 2011) and according to feasibility studies.

1.6. THESIS STRUCTURE

Figure 1.9 presents the flowchart of the whole thesis, and is described as follows;

Following the introductory chapter, chapter TWO presents the analysis & classification of literature of adaptive reuse. First, adaptive reuse is clearly defined according to the scope of this thesis. Second, the general advantages and limitations that might be associated with reuse projects are presented. Then, this chapter start analysing existing literature of adaptive reuse globally, and highlight the main goals of reuse. These main goals were grouped into three main "Pillars of assessment". The last part aims to present previous assessment approaches and areas of overlap in adaptive reuse research as indicated by different interested groups and involved parties.

Chapter THREE introduces the assessment framework. This chapter presents an attempt to develop an integrative framework that can be followed when assessing adaptively reused heritage buildings in Historic Cairo. It collects and categorizes the know-how for judging adaptive reuse projects globally and when applicable for Cairo specifically. The assessment criteria per each pillar are explained briefly and rationalized to be of relevance to the framework. Each assessment criterion is discussed strategically and practically.

Chapter FOUR is the conclusion and recommendations chapter. It presents guidelines for assessment of adaptive reuse. It also acts as a guideline for the planning of successful heritage adaptive reuse projects. Finally, the limitations of the framework and implications for future research are presented for interested scholars and practitioners.

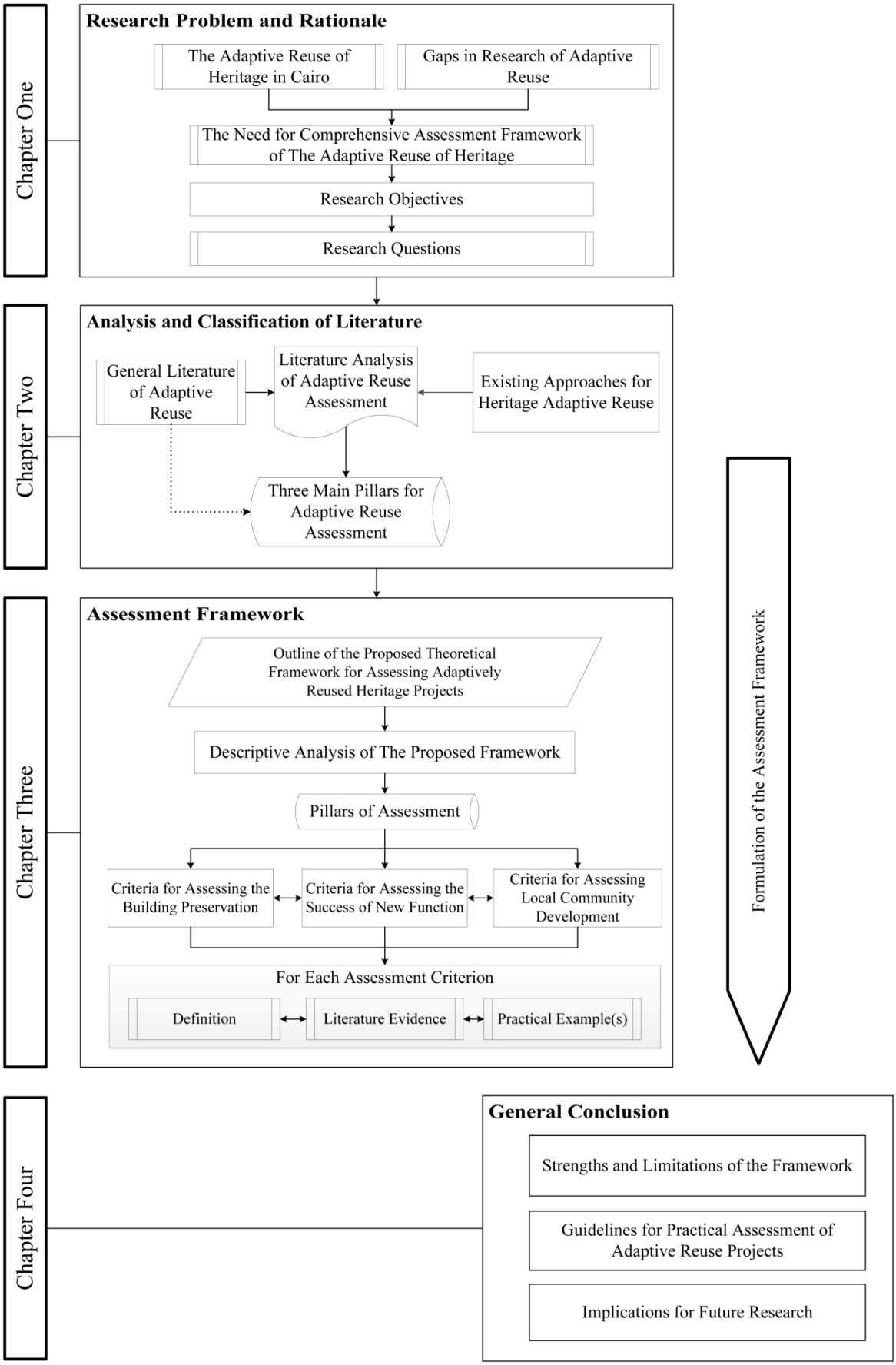


Figure 1.9 Structured flowchart of the thesis

CHAPTER TWO

ANALYSIS AND CLASSIFICATION OF THE LITERATURE

2.1. DEFINITIONS

Due to the inconsistency of literature in using some of the terms that are associated with heritage adaptive reuse processes, it is deemed necessary to articulate the definitions that shall come up in the following chapters. Having the main definitions set in the beginning shall help the reader to easily understand the text, and shall support the consistency of terminology usage in this thesis.

2.1.1. HERITAGE CONSERVATION AND PRESERVATION

According to Australia ICOMOS Incorporated (2000), *conservation* means all the processes of looking after a place so as to retain its cultural significance; while *preservation* means maintaining the fabric of a place in its existing state and retarding deterioration. Preservation is considered one of the strategies of heritage conservation. Thus, the term 'conservation' holds a wider notion than 'preservation', as it just not mean to maintain and freeze the existing state of a place, but also to take the necessary measures to sustain its value and the cultural messages it beholds. Despite that some authors refer to conservation as having the exact meaning of preservation, the two terms will be used in the rest of the thesis according to their definition in Australia ICOMOS Incorporated (2000).

2.1.2. ADAPTIVE REUSE

According to **المورد** (1977) and **مجمع اللغة العربية** (1999), *'Adapting for reuse'* means in Arabic:

الـتَـكَـيِّـف \ الـتهيئة لإعادة الإسـتخدام, أي صار على كيفية معلومة من أجل إعادة الإستخدام

In English 'Adaptation' is derived from the Latin *ad* (to) and *aptare* (fit). According to Encarta English (U.K.) Dictionary, adaptation means something that has been modified to suit different conditions or a different purpose. In architecture, adaptive reuse refers to the process or state of changing to fit a new environment or different conditions, or the resulting change. *"Adaptation means modifying a place to suit the existing use or a proposed use"* Australia ICOMOS Incorporated (2000), article 1. Limited to the context of this thesis, the definition of adaptive reuse is one of many processes of conserving heritage

[valuable/ old/ important/ authentic/ listed/ live heritage/ historical][5] buildings. At this point, adaptive reuse refers to the appropriate functional conversions of **heritage** buildings to suit proposed new uses and coexist in an environment different than the original. It is the act or process of conserving something in being of keeping something alive through either modernization (rehabilitation to the original function), or total conversion to a new function or even a mix between both (Yildirim, 2012).

The function is the most obvious change, but other alterations may be made to the building itself. Adapting a valuable building for reuse can include intensive exterior and interior modifications that are purely aesthetic and/or functional; such as the circulation route, the orientation, and spatio-physical relationships. In some cases the process of adaptive reuse may exceed the boundaries of the existing structure, or it may even necessitate the construction of an annex building depending on the peculiarities of the project (Eyüce & Eyüce, 2010). In other words, adaptive reuse includes any intervention to adjust, upgrade, introduce new services and uses to suit desired functional requirements, while safeguarding the place. The process itself should be applied to the building while retaining its structure, character, original identity and general authentic significance for future generations (Elkerdany, 2002).

2.2. BENEFITS OF ADAPTIVE REUSE

According to Bullen & Love (2010), Department of the Environment and Heritage (2004), adaptive reuse of buildings has been a matter of common sense for centuries in traditional urban centres around the world for its wide array of advantages. Adaptive reuse projects aim to ameliorate the financial, environmental, and social performance of heritage buildings as well as their surrounding community (Rodwell, 2007; Bullen & Love, 2010); there are evident benefits to adaptive reuse projects for all stakeholders. The importance of integrating economic, health and cultural activities in historical areas cannot be overemphasized. Buildings represent such a great economic, social and cultural investment that it would be unwise for the community to waste (Boussaa, 2010).

As a revitalization strategy for heritage buildings, adaptive reuse is important; especially for those buildings which are subject to obsolescence symptoms (Plevoets & Van

[5] Buildings that represent any significance of the above, without any further classification. According to (Athens Charter, 1931), only *Dead monuments* are not related any more to our current culture (ex. the Pyramids) and are difficult to be adaptively reused on regular basis.

Cleempoel, 2011a). Therefore, adaptive reuse of heritage buildings is considered a recommended conservation approach that is applicable when revitalizing authentic fabric. Adaptive reuse is different from restoration or preservation (Clark, 2008); while a restoration or preservation project involves restoring a building to its original state, adaptive reuse actually changes the intent of a structure to meet the modern user's needs.

During the second half of the 20th century architects started to consider working with heritage buildings (Douglas, 2006). Specifically, from the 1970s onwards, adaptive reuse has been a key subject for many conferences on architecture and conservation, resulting in a considerable body of scholarly literature and debates. Master contemporary architects such as Norman Foster, Herzog & de Meuron and Enric Miralles generated some of the most innovative and intelligent conversion works. Adapting old structures for reuse is considered the preferred challenging intervention for architects, where new life emerges in old city neighbourhoods. Today, in conservation theories and practices in USA, UK, Europe, Canada and Australia, adaptive reuse is considered an important strategy and a national issue towards not only the conservation of cultural heritage, but also upgrading the whole socio-economic systems of cities (Plevoets & Van Cleempoel, 2011a). It is foreseen that adaptive reuse is the future of the architectural conservation industry and is an international trend that is likely to continue for the foreseeable future (Langston, et al., 2010).

The following section discusses the grouped advantages of heritage adaptive reuse. They are grouped to be: heritage conservation and presentation, revitalization and upgrading of heritage districts, architectural and technical innovation, economic development, environment enhancement, and cultural continuity: identity and sense of place.

2.2.1. HERITAGE CONSERVATION AND PRESENTATION

Heritage buildings are the spaces that our ancestors lived and worked in. They tell the story of their lifestyle patterns and events. According to leaders and experts in heritage building conservation, adaptive reuse of buildings is often the only way that these historic and aesthetic values can be saved (Buildings Department of Hong Kong, 2012). Heritage buildings that are sympathetically recycled can continue to be used, and safeguarded. The main aim of adaptive reuse is to sustain maintenance of building. Moreover, it appears to be the most effective approach for a self-financing and sustainable form of heritage conservation schemes (Afify, 2002). Afify adds that monuments which have a new

function through adaptive reuse might be better maintained than the ones preserved with no use. Adaptive reuse can also facilitate the conservation of heritage structures that might otherwise fall into disrepair and decay or being rendered unrecognisable, and eventually be demolished. The sustainable functional utilisation of the built heritage can restore and maintain its characteristics, delay its decay, help to ensure its survival and lengthen the life of the asset (Boussaa, 2010; Russell & Moffatt, 2001). Thus, in order to sustain our culture for future generations, it is essential to consider the adaptive re-use of our heritage.

2.2.2. REVITALIZATION AND UPGRADING OF HERITAGE DISTRICTS

Adaptive reuse of heritage buildings contributes to the sustainable liveability of their communities. The restoration of the physical fabric alone cannot help conserve its meaning, but its usage and function which can withstand the other options for urban upgrading. Adaptive reuse synthesizes the lessons of history and reinterprets them in new form that meets the current needs and conditions (UNESCO, 2007 principle 1.1.6). It creates equilibrium between realms and uses both old and new to improve the built environment (Melis, 2010). This process usually introduces much needed facilities and services in the area (Siravo, 2004), in a way that heritage buildings can be brought up to contemporary standards and regulations. Adapting an old building for reuse enables the city to implement code-compliances, as such facilities for disabled access, sound insulation; and fire safety (El-Halafawy & Soliman, 2002; Douglas, 2006, p. 7). Utility keeps the heritage resource sustainable by an adequate adaptive reuse program. The continuous functioning of these areas over a long term revive dormant assets (Buildings Department of Hong Kong, 2012), and ultimately makes them dynamic parts of the present urban environment (Boussaa, 2010). Regaining life in such buildings help in drawing the attention of cultural groups to its historic, cultural, and visual values (Prihatmanti & Bahauddin, 2012), consequently occupying and regaining vitality to valuable areas is evident (Elkerdany, 2002). As well, it can facilitate the revitalization of the surrounding neighbourhood. They continue to be a ‘living heritage” rather than mere historic artefacts.

2.2.3. ARCHITECTURAL AND TECHNICAL INNOVATION

Adaptive reuse projects are not limited by the need for preserving the old, but also they offer a greater understanding of the present (Melis, 2010). On a technical level, adapting

heritage buildings for reuse presents a genuine challenge to architects, designers and engineers to find innovative solutions. Technical and technological upgrading are basic interventions in the process of adapting old building for reuse. Contemporary uses need smart technologies in order to function in an appropriate environment. Introducing electro mechanical systems (HVAC), communication networks and plumbing are examples of technical implementations in adaptive reuse projects.

While aesthetics are certainly subjective, generally, communities desire aesthetically pleasing environs (Bond, 2011). It could also be an opportunity to enhance the architectural and cultural significance and physical character of the heritage structure itself and surrounding buildings (Torres, 2009; مهنا, 2006). On a building's scale, as development pressures increase, more heritage buildings would be reused, producing some excellent examples of creative designs that retain heritage significance. Requiring new work to be recognizable as contemporary is important, instead of poor imitation of the original historic style of the building either by *"Parachuting"* or *"Fake Islamization"* of ancient monuments as Aziz and Shehata (2012) explain it. "Parachuting" is placing a historical architectural morphology in our contemporary times, while "Fake Islamization" stands for copy-and-paste of famous elements from ancient monuments into contemporary buildings exactly as they were manufactured centuries ago.

On a more aggregated scale, adaptive reuse maintains the urban volume and intermediate spaces of historical districts (الدليل، 2008). Conserving the original physical environment with its current uses, or new uses that serves the district assures that the current state of harmony and cognitive homogenous values can be extended for another hundreds of years. These two approaches in adaptive reuse do not respect time changes and technological advancements. The sensitive adaptation of heritage buildings, when combined with contemporary design, can create vibrant and visually exciting spaces that people want to live, work or play in today. Therefore, adaptation projects usually encourage architectural innovation that respects the past, while adding contemporary layer to it carefully (Cantacuzino, 1989).

2.2.4. ECONOMIC DEVELOPMENT

A wisely conceived plan of architectural adaptive reuse is not only limited to cultural or aesthetic preservation, but also integrated into the economic realities of the time. This approach offers a tremendous potential for enriching the lives and opportunities of those

for whom development is crucial for survival, and could become an economic asset with good potential for economic exploitation. A well designed adaptive reuse project would help rejuvenate the economic base of the old part of the city and hence the city itself (Serageldin, 1984; Van Huyck, 1990; Yung & Chan, 2012). Basically, there are economic benefits as a result of adaptive reuse projects that can be experienced by the community, the municipality and the developer.

Keeping and reusing heritage buildings have long-term benefits for the communities that value them (Department of the Environment and Heritage, 2004). Adapting heritage buildings in deteriorated districts break the poverty cycle by providing disadvantaged citizens access to education, training, and work. Owners and business developers can use spaces more efficiently (Russell & Moffatt, 2001), as dead spaces can be utilized. Although creative expansions may allow the building to accommodate much higher densities with the same footprint and infrastructure, this might not be the case in Cairo. Historic Cairo's networks of infrastructure and services are severely deteriorated and need to be maintained regardless any intervention for heritage conservation (Bianca & Siravo, 2005). The rescue and reuse of heritage buildings, together with adjacent buildings on the same site usually focus on providing them with a function in the local community, and offering flexible commercial spaces that serve a variety of purposes-including craft workshops, offices, medical consulting rooms, furniture showrooms, retails spaces and restaurants; all within a range of sizes and level to suit the locality and the businesses that set up or move into them (Rodwell, 2007).

In the case of private developers and business owners, adaptive reuse can insert new uses that have the potential to lessen the economic risk, because uses add value to the city (Melis, 2010). It will attract tenants for occupying the designated premise (Prihatmanti & Bahauddin, 2012). Assigning new uses for heritage buildings can attract tourism industries (يـونس، 2002؛ الـدليل، 2008), along with attractive lifestyle for residential units and compartments. Turning historic districts to attractive city centres has major real state revenues and great tourism income. Nonetheless, there are several financial savings and returns to be made for developers from adaptive reuse of heritage buildings. Energy savings from avoiding constructing new buildings will only increase with the predicted rise of energy costs in the future (Department of the Environment and Heritage, 2004).

Finally, the municipality benefits from the increased property tax that the developed site creates over a vacant site while bearing minimum coasts towards these new facilities, because there is also small or no need at all (in some cases) to extend public infrastructure or services to the site (Wilson, 2010). In conclusion, adaptive reuse is a major vehicle of sustainable economic development in historic areas (Boussaa, 2010; Afify, 2002).

2.2.5. ENVIRONMENT ENHANCEMENT

The supply of older and significant buildings is a source of sound urban ecological regeneration (Kalner, 2004). Adaptive reuse of buildings has a major role to play in the sustainable development of our communities. Adaptive reuse bypasses the wasteful process of demolition and reconstruction. This environmental benefit, combined with the energy savings, carbon emissions reduction, and the advantages of recycling a valued heritage building, make reuse an essential component of sustainable development (Yung & Chan, 2012). By reusing existing buildings, not only we can conserve the history behind it, but also we can retain the original building's "embodied energy". Embodied energy is the energy consumed while producing a building, from the acquisition of natural resources to product delivery, including mining, manufacturing of materials and equipment, transport and administrative functions. By reusing buildings, the demands of embodied energy are reduced.

Furthermore, the envelope of older buildings generally consisting of stronger materials and containing numerous windows, the energy efficiency of the heating and cooling can be improved (Wilson, 2010). Therefore adaptive reuse can usually help to reduce waste from building refurbishments (Prihatmanti & Bahauddin, 2012) making the project much more environmentally sustainable and preserves the natural environment than entirely new construction (Fournier & Zimnicki, 2004). On the city level, the adoption of reuse process for buildings can then contribute to sustainability and climate change through mitigation of CO_2 emissions (Bullen & Love, 2010). As the opportunity to reuse obsolete facilities in the urban core supports sustainability and smart growth initiatives designed to focus redevelopment in inner cities in an effort to reduce urban sprawl (Scadden & Mitchell, 2001). In terms of aesthetic appeal, an enhanced appearance can be achieved for an adapted building. If the work has been designed and undertaken sensitively and carefully, the building should look better than before.

2.2.6. CULTURAL CONTINUITY, IDENTITY AND SENSE OF PLACE

Adaptive reuse takes the idea of conveying history further than just preservation or imitation (Melis, 2010). Adaptive reuse has the ability to preserve ideas from history, facilitate memory, maintain identity, connect the two realms of past, and present and ensures that heritage buildings continue to provide a sense of place for current and future generations. Making an opportunity to engage with the visual connection of the past triggers an emotional and cerebral connection with ancestors, which we crave as human beings because there is comfort and familiarity. Keeping the old buildings as evidence for future generations of how did our ancestors live and work.

> *"Re-use means historical values will be enlivened and history will be rediscovered."* Yildirim (2012) p. 1.

Old buildings usually offer psychological reassurance because of their distinguishing characteristics. Especially in Islamic civilization, the intangible heritage values are, more often, appreciated more than tangible and physical heritage; where the function of the building (symbolic or beneficial) is much more important to Eastern societies than aesthetic, technological, architectural and ornamental elements (مهدى، 2002). That explains theories claiming that our lifestyle might be enhanced not just from the retention of heritage buildings, but from their restoration to be continually used. By revitalizing redundant heritage buildings, there are expectations to bring back the memories (Prihatmanti & Bahauddin, 2012). When adaptive reuse involves heritage buildings, environmental benefits are more significant, as these buildings offer so much to the landscape, identity and amenity of the communities they belong to (Department of the Environment and Heritage, 2004). Within this category there are architectural, cultural and historic benefits of adapting buildings.

According to Melis (2010), a well thought out adaptive reuse of an appreciated building of architectural or historic importance can bring considerable lasting prestige to its owner; but in Cairo, this might not be the case. In Europe and the United States, this phenomenon inevitably has a positive knock-on effect on surrounding properties. This environmental enhancement has a strong influence on the identities of the individual and the larger collective group (Melis, 2010). Retaining and improving the building to highlight its

important features helps to create a diverse community through restoring varying buildings with mixed types and overlapping ages.

Other social benefits of reuse projects include rejuvenating the heritage and cultural values of a building (Wilson, 2010). One major critical community concern is the desire to reduce crime, harassments and other social "problems." Decaying and vacant buildings and lots tend to attract homeless populations and crime. Conservation and adaptive reuse activities (by resisting and reversing decay and reducing vacant lots) can help socially revitalize neighbourhoods (Bond, 2011). When conservation activities have resulted in positive social changes for their neighbourhoods, it has proven very effective in garnering public support for city improvements in general. This kind of conservation activity requires a lot of creativity in planning and support from a variety of key groups in the community, including the police force, building owners, social services, developers, preservationists, and planners.

> *"... Adaptive reuse, therefore, is the most constructive and creative option for the treatment of a historic building; it is the most practical, interesting, creative, and inclusive option for treatment of our otherwise obsolete old buildings."* (Bond, 2011, p. 5).

2.3. DISAVANTAGES AND LIMITATIONS THAT MIGHT BE ASSOCIATED WITH ADAPTIVE REUSE

It is an implicit premise of this thesis that adapting buildings might lead to either success or failure of adaptation principles.

> *"Adaptive reuse is self-defeating if it fails to achieve the benefits of its transformation project"* Department of the Environment and Heritage, (2004, p. 3).

In some cases, adaptive reuse have proven to be unsuccessful, then, other options of intervention might be better (Douglas, 2006; Jonas, 2006). To the extent that the "do-nothing option" might be a preferable solution if any intervention is to have negative impact on the building, new use or the surrounding local community. Most problems of adaptive reuse rise from the new users. So, at the end of the day not all adaptation schemes are either necessary or worthwhile. Accordingly, despite the various advantages of

adapting an existing building, such an intervention might entail a number of drawbacks. Discussing these drawbacks is useful to be able to clearly identify them while applying the assessment framework.

The following section discusses the failures of adaptive reuse projects to be: Endangering authentic fabric, economic obstacles, functional disorder, environmental impacts, technical and legal difficulties, conflicting stakeholders' interests, social considerations, and losing sense of place and identity.

2.3.1. ENDANGERING AUTHENTIC FABRIC

Heritage buildings adaptation might threaten the very core of its principle which is conserving the authentic pattern (Aydin & Yaldiz, 2010). Heavy usage by tourists may endanger authentic fabric (مهدى، 2002). Even in the process itself which entails interior and exterior interventions, there might be defects done to the heritage building intentionally or unintentionally. Intentionally might appear as some sort of sacrifice in order to adapt the physical form of the old building to house the new function successfully. Partition adjustments, technical implementations and environmental controls are examples of intentional interventions done to the building in order to transform obsolete building to function according to today's users. Although technological upgrading is essential, it should be designed and coordinated so as not to hide damage or overwhelm authentic attributes of heritage buildings. On the other hand, errors and mistakes during planning and/or execution phases are considered unintentional threat. Reasons vary, starting from wrong site survey and interpretation, to engineering problems that might be encountered during implementation phases.

2.3.2. ECONOMIC OBSTACLES

According to Douglas (2006), conservation requirements for the adaptation of old buildings may drive up construction costs and operation costs. Douglas (2006) and Yung & Chan (2012) mentioned that the maintenance costs of an old building, even one that has been refurbished, are usually still higher than those for new build. In urban cities with immense redevelopment pressure and high land prices, there is always a high opportunity cost for the conservation of the site compared to developing it to its highest development potential. A heritage consultant raised this issue, *"Adaptive reuse is a very expensive investment, if people only count the economic return and overlook the intangible non-*

economic values, then the economic efficiency seems to equal to zero" (Yung & Chan, 2012, p. 6). While the revenue that can be derived from an existing building may not be as high as that obtained by a modern facility that fully meets the needs of today's building user. Moreover, the energy costs are likely to be higher as it is hard to match the insulation standards of newly built. Some materials required for conservation techniques during adaptation work to match existing are expensive and hard to come by (Douglas, 2006).

2.3.3. FUNCTIONAL DISORDER

There is no guarantee that an adapted building will match the performance of a new purpose built facility (Aydin & Yaldiz, 2010). Contemporary functions of the same building typology of hundreds of years ago (example: commercial markets) are difficult to be implemented in the same spatial configurations. Newer facilities might not coincide with the new organization's usual functions. For example, tourists might find it difficult to communicate and circulate; while daily users of adaptively reused old buildings might oppose workflow flexibility in the old pattern of spatial relations (مهدی، 2002). Restrictions as regards minimum intervention in layout and heights may necessitate compromises and might prevent full satisfaction of the users' needs (Douglas, 2006). That might explain why refurbishment design is considered a problematic operation, especially in the case of medium and large scale adaptations.

2.3.4. ENVIRONMENTAL IMPACTS

The extent to which the heritage buildings can contribute to the surrounding townscape is often overlooked. Not all adapted buildings result in an improved internal or external environment. The appearance or energy efficiency of the refurbished building may not be much better. The use may also not be compatible with surrounding properties in terms of density, waste or nature (Douglas, 2006). Most of the project participants usually relate environmental aspects to the narrow scope of energy efficiency and building performance. It constrains conservation into single building approach with no relationship with the neighbourhood buildings, the street and the entire townscape and district; where in some cases, it would be difficult to ensure that future developments are in harmony with the existing urban fabric (Yung & Chan, 2012). Indeed, old structures with thick walls and tight windows might provide means for decreasing energy consumption in temperature control; however, when choosing an incompatible new function such as offices or

commercial activities, dark spaces with dim natural light might lead to an enormous increase in consumption rates of energy in terms of lighting.

2.3.5. TECHNICAL AND LEGAL DIFFICULTIES

There is no guarantee that the adaptation works will overcome all the deficiencies in performance (Douglas, 2006). Indeed, all existing buildings contain some latent defects that may prove difficult and expensive to resolve. Full code compliance with the building regulations may be difficult to achieve in some older properties. Constructional constraints with some of these buildings, for example, can restrict public accessibility. In addition, modern standards of design in architectural handbooks conflicts with the standards that were used centuries, even decades ago. Obstacles due to these types of restrictions might pop-up. Planning and land use restraints may limit the degree to which a property can be adapted. This is likely to have an impact on the viability of the proposal.

In addition to building regulations, compliance with licensing requirements, planning requirements to get approval for new proposed uses, and compliance with the conservation guidelines also require longer statutory applications to various government departments. Adaptive reuse of built heritage also requires expertise in planning and renovating heritage buildings. As a result, the project cost and time will be increased. Project managers usually comment that there is a lack of expertise in implementing the adaptive reuse of built heritage, either in planning or in the renovation work on site (Douglas, 2006). There is criticism that the selection criteria and their relative importance as stated by the government are not comprehensive. The deals between private developers and the government regarding the detailed arrangements and future operational requirements are almost a ‘black-box’ process. Moreover, it has been argued that the policy for adaptive reuse is not efficient.

2.3.6. CONFLICTING STAKEHOLDERS’ INTERESTS

While the interdisciplinary nature of adaptive reuse makes it an interesting and dynamic process, this can also lead to complications. The individuals who invest their time, resources, interest, and knowledge into adaptive reuse projects are the stakeholders (or “players”) in the adaptive reuse development process. They are typically, but not limited to: building owners, groups of local community, public officials, developers (investors), architects, engineers, contractors, historic preservation professionals, and planners.

Cooperation among the stakeholders while working on various elements and at various stages of the adaptive reuse process is both necessary and practically unavoidable. This has the potential to be a logistical nightmare, then, trying to coordinate the right people at the right time for the right tasks. However, without proper coordination and clear communication among the players, the development process can lose precious time and for developers in particular, time is money. Unfortunately, this can hinder the development process and ultimately deter key stakeholders from specifically seeking out other adaptive reuse development projects in the future. Conflicting interests, motives, and expectations among the players is a threat to adaptive reuse of heritage, threatening to undermine adaptive reuse while holding it back from appreciating mainstream acceptance as both favorable and viable real estate development option (Bond, 2011).

2.3.7. SOCIAL CONSIDERATIONS

On many levels, adapting old buildings for reuse raise uncountable objections and debates about the appropriateness of the new function to the local community. On social aspects, profit-making usually outweighs social concerns in a property driven-market. In large-scale redevelopment, the adaptive reuse of heritage buildings usually creates a new tourist venue. In such cases, it is very challenging to maintain the community's daily life. "Gentrification", for instance, might be a negative consequence of the uncontrolled and sudden social changes that occur while having upgrading projects. Detailed laws and guidelines might overlook the importance of maintaining the right balance of social diversity in heritage districts. On the other hand, a small-scale adaptive reuse project does not affect the social life of the local community as much as a large-scale project (Yung & Chan, 2012). Whether a conservation approach that keeps the original inhabitants in the heritage building is an effective way to enhance the continuity of social life still needs to be investigated.

On a religious-social level, Cairo's community living in historical districts usually notices and discusses any new development inside their neighbourhood. They are also sensitive in terms of accepting reuse projects. On the religious level, it would be a taboo to turn the house of God into other function (مهدى، 2002). Imposing a night club or a bar in the Muslim community is considered illegal in religious rules, even if the laws might allow these functions (Ben-Hamouche, 2012). For example, despite being converted implicitly to residence for low income groups, officially converting mausoleums to be used as cultural

spaces would be perceived by public as imposing on the dead, and therefore not appropriate. On many intervention levels, reuse scenarios of any typology of heritage buildings in Cairo would find a load of objection when deciding to impose outsider community that will benefit from the building reuse plan. Neighbouring community perceive this asset among their possession and ask for direct benefit out of it. That is why successful conservation projects in Cairo that involved community participation were only part of residential rehabilitation and Mosque restoration/upgrading programs (Bianca & Siravo, 2005).

2.3.8. LOSING SENSE OF PLACE AND IDENTITY

Usually owners and tenants tend to be biased towards profit-making, especially in mega cities that are predominantly driven by economic growth and the real estate market. Occupants and tenants may change over time. Sometimes, the new use creates a new sense of place such as a popular commercial zone, however the degree to which this is related to the historical value of the place is questionable (Yung & Chan, 2012). According to Yung & Chan (2012), few adaptively reused buildings are nothing more than keeping the external skin; they are empty space without the original setting and spirit of the place. Moreover, the history of the buildings and the extent to which they are connected to the local people is not easy to trace. Tenants who have been occupying and/or using the building for more than thirty to forty years tend to have a sense of attachment to and identity with the place; they also prefer "to do nothing option" by staying in the old dilapidated buildings as they are, rather than renovation options (Yung & Chan, 2012).

2.4. THEORETICAL DEVELOPMENTS OF ADAPTIVE REUSE ASSESSMENT

The shift towards the conversion to other uses on a regular, larger scale and studying the new terms of building reuse academically has only become an increasing trend within the last few decades. However, altering existing buildings for new functions is neither something new nor contemporary nor is limited to architecture (Eyüce & Eyüce, 2010). Artefacts have been always preserved and reused for other uses that might be different than why they were originally made for (Shopsin, 1986; Eyüce & Eyüce, 2010). It is a practice that has existed as long as buildings and cities have existed. Back then, buildings that were structurally secure had been altered to fit changed needs and wants in a rather pragmatic

way without questions or problems, without heritage conservation as an intention, and without regard for history or character (Plevoets & Van Cleempoel, 2011a). According to Powell (1999), the driving force behind reuse till the 18th century in Europe was basically functional and financial.

2.4.1. HERITAGE CONSERVATION BY ADAPTIVE REUSE

By the mid-19th century, the first ideological opposition appeared in the form of theoretical approaches towards adaptive reuse when Eugène Emmanuel Viollet-le-Duc (1814–1879) recognized adaptive reuse as a way to preserve historic monuments. In contrast, John Ruskin (1819–1900) and his pupil William Morris (1834– 1896) those of the anti-restoration movement, fought against the destruction of the historical authenticity of the buildings in favour of their protection, conservation and maintenance. Ruskin considers preservation for reuse as the most total destruction which a building can suffer (Price, Talley, & Vaccaro, 1996).

In the late 19th century, the conflict between opposing theories on adaptive reuse has been discussed by an Austrian named Alois Riegl (1858– 1905) in his essay *"The modern cult of monuments: Its nature and its origin"*; and by Camillo Boito (1836-1914) in his presented paper *"Practical questions of fine arts, restoration, contests, legislation, profession, teaching"* in which they gave practical guidelines for the restoration of historic buildings (Plevoets & Van Cleempoel, 2012a). Riegl, on one hand, ascribed this conflict in theories to the different values their adherent attribute to monuments. He distinguishes different types of values which he generally grouped as commemorative values (including age-value, historical value and intentional commemorative value) as opposed to present-day values (including use-value, art-value and newness-value). By including the use-value in his assessment of monuments, he introduced a primary model for assessing adaptive reuse processes as an intrinsic part of modern urban revitalization (Plevoets & Van Cleempoel, 2011a). On the other hand, Boito finds that the restoration method should depend on the individual circumstances of the monument. He distinguishes three methodologies which he calls 'archaeological restoration' (for antique monuments), 'picturesque restoration' (for medieval monuments) and 'architectural restoration' (for Renaissance and other monuments). He based his three methodologies according to the age-value of eras that the buildings belong to.

According to Plevoets & Van Cleempoel (2012), Boito's ideas have been the basis for the Athens Charter in 1931, the first international document to promote modern conservation policy after WW I. About adaptive reuse it recommends that: *"the occupation of buildings, which ensures the continuity of their life, should be maintained but that they should be used for a purpose which respects their historic or artistic character"* (Athens Charter, 1931) Article 1. It was till WW II that most theorists (except for Riegl and Boito) had been discussing the advantages and goals of adaptive reuse only from the stand point of finding sufficient revenue to conserve and maintain authentic fabric (Jokilehto, 1988; Plevoets & Van Cleempoel, 2012a). Adaptive reuse is acknowledged to help achieving goals of conserving the authentic fabric, to the extent that much literature mentioned that the exclusive goal of reuse should be conserving heritage values (Douglas, 2006).

Up until the moment, adaptive reuse is one of many successful approaches that aim to conserve heritage buildings. Governments and interested groups helped shaping the international laws and charters that discussed heritage conservation by reuse (Australia ICOMOS Incorporated, 2000). Famous charters for discussing issues of building adaptation for reuse are Venice charter, Washington Charter on conservation of historic towns and urban areas (1987), ENAME Charter for the Interpretation and Presentation of Cultural Heritage Sites (2007), International Symposium on Conservation and Restoration of Islamic Architectural Heritage (1980). Laws and international charters discuss principles of adaptive reuse, some of which are worldwide accepted, and some are dedicated for specific nations, such as NARA Document on Authenticity (1994) which discussed intangible heritage in Japan.

However, these charters laid down principles of intervention with authentic fabric. Generally accepted principles are the ones which promote minimum intervention, reversibility of actions, sustainable adaptation and reusing of waste materials, while discourage façadism (Matero, 2006), and character falsification (Venice Charter, 1964). Other principles are still debatable such as loss and compensation (Matero, 2006), additions and innovative architectural annexes (Torres, 2009). According to (Rodwell, 2007), minimum intervention is a principle that is shared by conservation and sustainability. Other rules and regulations -that this thesis cannot behold- are laid down by governments to conserve their local heritage are also relevant to complex factors of new functions and suiting the building for new uses (e.g. Buildings Department of Hong Kong, 2012).

2.4.2. INTRODUCING ADAPTIVE REUSE PRACTICE AS PART OF COMMUNITY DEVELOPMENT PROCESSES

The limited scope of reusing for finding sufficient revenue did not last for long, as in the early 1960s, a wide scope of interests has been investigated internationally while adapting old buildings for reuse (Douglas, 2006; Bond, 2011), more specifically when The Venice Charter inspired other regional charters that were more oriented towards local problems. Afterwards, as a global trend, many international charters have discussed heritage conservation and concluded that the most effective conservation policies are inseparable from urban development (Ashworth, 1984). With the doubling of world population in the recent decades, and the enormous increase of environmental threats to our heritage buildings, the concern about their survival, conservation and reintegration in our society, and how to pass them on to future generations is more acute than ever (Jokilehto, 1988).

At this point, it became obvious that conservation of significant buildings is more efficient than conserving individual buildings when perceived within the whole area development and integrated within the planning strategies (Ashworth, 1984). In practice, this has meant that the architectural and historic merit of threatened buildings is not the main concern, instead, they are perceived as potentially useful for sound economic, social and ecological reasons, and as an opportunity for urban regeneration. That instead of looking for new public "Romantic" uses like museums and art galleries, commercial, workspaces for small firms, housing units, or even a mix of uses are favoured (Plevoets & Van Cleempoel, 2011a).

Among architects in the last decade, there has been an opening and development in the perception of cultural property itself not being limited to "ancient monuments" and to "works of art" only, but encompassing urban and rural areas with historic or social significance. The discussion of heritage adaptive reuse has consequently been enlarged to *"integrated conservation"*, *"genius loci"* and to the role of conservation in the general planning of society (Plevoets & Van Cleempoel, 2011a). This does not exclude single heritage buildings though, rather on the contrary, it is more likely to say that saving old buildings is no longer enough. The aim of adapting heritage for reuse is not accurate and reverential restoration but a freer and more creative attitude of transformation, an architectural rather than a sentimental or historicist approach, to re-introduce life into the old fabric (Powell, 1999), or as Cantacuzino (1989) puts it: *"perceiving heritage*

adaptation has transformed ... from the building as art object to the building as the product of a whole socio-economic system". Therefore, in any city with overlapping and multi-layered historical quarters, a strategic plan for adapting heritage buildings ought to perceive this land use transformations as a holistic opportunity to ameliorate the performance of their surrounding community (Ashworth, 1984; Rodwell, 2007; Bullen & Love, 2010; Kalner, 2004; Elkerdany, Innovation and conservation: Case studies in intervening with valuable buildings, 2002). A sustainable proposal for re-use should be assessed for passing the value of heritage buildings on to the following generations, enrich the local culture and raise the economic level of the community (Yildirim, 2012).

2.4.3. INTRODUCING ARCHITECTURAL ASSESSMENT FOR ADAPTIVE REUSED HERITAGE BUILDINGS

The doctrine for analyzing the structure of architectural heritage has been formulated in a recent ICOMOS Charter entitled Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage (ICOMOS, 2003). It states that systematic monitoring is essential to the continuous process of observing the conditions of heritage sites with periodic reporting on their state of conservation (Lamei, 2005), given that conservation work, in itself, is not the ultimate goal of valuing historically important structures. *"Restoration of the structure in Architecture Heritage is not an end in itself but a means to an end, which is the building as a whole"* (ICOMOS, 2003, p. 1). Evaluation after usage can make it clear how the building is actually used and appreciated (Voordt, 1999). Evaluating any designed output in an organized research improves and extends present general design knowledge, the *'body of knowledge'* of the design profession. As such development of knowledge is a cyclic process (Voordt, 1999).

In their book, Letellier, Schmid, & LeBlanc (2007) divide any conservation project (adaptation, restoration, anastylosis ...etc) to six repeatable phases shown as satellites (**Figure 2.1**). Their diagram shows the phases and required outputs of the conservation process. The last phase in every cycle is "*Operation*" which generates ongoing operational, monitoring, and maintenance activities after the site is opened to the public or for its intended use. Management of heritage sites establishes a monitoring program for critical components for maintenance or re-treatment purposes, where a site or property manager is assigned to that responsibility for its continued use and safeguard. When a new need, problem, or opportunity arises, the cycle should begin anew (Letellier, Schmid, &

LeBlanc, 2007). Thus, in order to identify problems, the reused heritage buildings shall undergo critical assessments based on specific criteria, to ensure the long-term sustainability of these cultural resources.

Figure 2.1 Diagram of the six phases of heritage conservation processes.

Adapted from: Letellier, Schmid, and LeBlanc (2007), p. 20.

Despite old structures formulated a critical point for investigation, questions were raised academically and practically on how any type of the man-made environment would affect the human behaviour and socio-economic interactions. Architects and engineers had become more interested into this scope of research. As an assessment methodology for newly built structures, *Post Occupancy Evaluation* (P.O.E.) was first introduced in the late 60s in response to significant problems experienced in building performance, and had developed quickly since then as a result of the growth of environment and behaviour research-pursued by social scientists, designers, and planners who were interested in understanding the experience of building users (Preiser, Rabinowitz, & White, 1988). It is any and all activities that originate out of an interest in learning how a building performs once it is built, including if and how well it has met expectations (Konara & Sandanayake, 2010, p. 220). According to Preiser, Rabinowitz, and White (1988) in Konara and Sandanayake (2010), p. 220, P.O.E. is the process of evaluating buildings in a systematic and rigorous manner after they have been built and occupied for some time. Researchers

further introduced P.O.E. as a more specific process of systematic data collection, analysis, and comparison with explicitly stated performance criteria pertaining to occupied built environments. P.O.E. serves as a way of providing subjective and objective feedback that can inform planning and practice throughout the building's life cycle from the initial design to occupation (Duvall, 2002).

The P.O.E. process model developed by Preiser and his co-workers in 1988 based on the collective and cumulative experience of number of researchers in the field of P.O.E., has been adopted and used worldwide (Konara & Sandanayake, 2010). P.O.E.s can result in a variety of benefits and uses as recommendations can be brought back to stakeholders, and remodelling can be done to correct problems and lessons learned can influence design criteria for future projects, as well as provide information to the building industry about buildings in use. This is especially relevant to the public sector, which manage and implement projects for its own use on a repetitive basis.

It is noticeable, however, that most P.O.E.s focus on building performance evaluation in terms of: user's perceptions, preferences and satisfaction (Voordt, 1999). The followed methods and techniques of analysis are based upon a number of criteria which can be measured by specific indicators. General criteria include space configuration, energy performance and sustainability parameters, health, safety and security. Specific criteria for educational buildings for example are success ratios, urban accessibility and proximity for students, etc. P.O.E. health criteria in case of healthcare facilities are more sophisticated and complex. The results of performing such assessment for each building typology can make it clear how any building is actually used and appreciated.

Although P.O.E. was not originally initiated for the purpose of assessing conservation or adaptation projects, evaluation after occupancy of any building typology can make it clear how any building is actually used and appreciated (Voordt, 1999; Preiser & Schramm, 1997). According to Douglas (2006) and Aksah (2011), P.O.E. can be applied, with modification where necessary, to heritage conservation and community development practices. Criteria for measuring the performance of buildings in P.O.E. methodologies are considered relative, beneficial and effective in case of evaluating adaptively reused heritage buildings. It is never underestimated to prepare a framework assessing major adaptation schemes, as a P.O.E. on the reused heritage building. Some recent studies in assessing refurbishments of heritage buildings had followed the P.O.E. methodologies

(Aksah, 2011). P.O.E. are typically performed within four to twenty-four months following occupancy of a new or renovated facility, however, Preiser and Schramm (1997) state that P.O.E. can be conducted at any time in the life of a building; which means that it is doable in cases of heritage buildings (Aksah, 2011).

2.5. OVERLAP OF ASSESSMENT APPROACHES

This part presents different assessment approaches existing in literature, those which discuss complex relationships between reused heritage and today's needs expressed in their adaptive reuse. In the projects of adapting heritage for reuse, many professionals from both the public and private sectors work together to ensure that all project goals are met. Because of their specific roles, expertise, and backgrounds, these stakeholders naturally approach the adaptive reuse pillars differently, with different ideas, priorities, strategies, and methods. Each group of stakeholders has their own conceptions and set of values that dominate the process of evaluation. Not surprisingly, each of these general stakeholder groups approaches the adaptive reuse development process from a different point of view—they expect different results from the process, have varying ideas about appropriate design and treatment of heritage buildings, possess a range of understanding of real estate and development economics, and have different values and priorities (Bond, 2011).

Therefore, these stakeholder groups frequently find themselves approaching the adaptive reuse process with dissimilar, and often discordant, agendas. Often this results in negative stereotyping and judgment of the other stakeholders, making these conflicts personal. It is not surprising then, that effective collaboration among the stakeholders can be both difficult and frustrating, because everyone has particular beliefs (and for some, very strongly held) about how an adaptive reuse project should proceed. While finding consensus can certainly be difficult, if carefully and thoughtfully handled, these differences in approach can and should be harnessed to produce a more dynamic final product. There seems no good reason why adaptive reuse should not be able to achieve all that it is capable of, while satisfying every one of its stakeholders' needs.

There are some conflicts between cultural preservation and economic development in reuse selection, especially between the people working in separate worlds with regard to reuse(Wang & Zeng, 2010; Yildirim, 2012). On one side are the professionals in local and national governments whose responsibility is to see that the standards are heeded in the

interest of protecting the historical fabric in question. As architects or architectural historians do not lend themselves to absolutes, their judgments vary case by case. On the other side are the owners and investors, for whom, the new function is money in the reuse process. At times, in the haste to turn a profit, their actions may appear insensitive to the integrity and authenticity of heritage buildings. In other words, the governments, architectural historians, users, architects and owners have different concerns. Therefore, in adaptive reuse, decision-making is a difficult task that involves multiple and complex factors.

A successful adaptation balances the goals (pillars) of the reuse depending on prioritizing multiple values related to the building, real estate and the building's context (Bond, 2011). When a particular stakeholder group practice extensive measurements, problems in the adaptation arises (Jonas, 2006). Most, if not all adaptive reuse of heritage project had been undergone in Cairo in an unbalanced status; especially when political decisions, or extensive engineering installations, or miss-configuration of built assets in community development processes are overwhelmed. It is evident that in Cairo's historic city, adapting heritage buildings for reuse has favoured some approaches that were not appropriate for some valuable buildings (El-Habashi & Nada, 2011; Gharib, 2011).

Although a balance is required among these different points of view according to local context, this thesis does not aim to investigate how to attain comprehensive balance between multiple approaches for adapting heritage for reuse in Cairo; instead, it aims to provide an inception about their overlap in approaches.

It is helpful to understand some ground-occurring actions about heritage buildings and adaptive reuse as seen today. The following are four general facts about valuable heritage buildings in the historic centre of Cairo, as presented by the architects and academics Gharib (2011), the conservationists, and the government official in the Ministry of State for Antiquities Affairs and a contractor working in conservation industry. These facts will help a better understanding of external forces, the context, and circumstances within which heritage buildings are assessed for reuse in Cairo:

- In Cairo's historical city quarter, there are more than 600 listed historic buildings, not to mention architecturally and historically valuable unlisted heritage buildings; there are far more heritage buildings than can ever be turned into museums, the

need to find a present-day function to justify the continuous existence of valuable buildings under threat is urgent;

- Not even the wealthiest of governments or international organizations have funds available to conserve all buildings worthy of conservation;
- In Cairo's deteriorating context, every heritage adaptation project- even if having a new function unrelated to the community- should, by one mean or another, address the cause of developing the socio-economic aspects of the neighbourhood implicitly, and thus assessed for that end as well. That is why adaptive reuse policies usually have a broader framework for considering "supporting local community" pillar in literature and in practice.

To simplify varying approaches of assessing adaptively reused projects in Cairo, they have been grouped between the three main pillars of assessment according to goals of reuse, each with a different vested interest and point of views of adaptive reuse. These interest groups are based on three different, but yet overlapping fields of research; *Heritage Conservation, Architectural and Engineering*, and *socio-economic and urban researches*. The first usually discusses adaptively reused heritage/listed/historic structures, and the second is worldwide famous for discussing the use of built structures as part of post occupancy evaluation P.O.E. or building performance evaluation (B.P.E.), while the third discusses socio-urban aspects of heritage districts. According to مهدى (2002), these different approaches of assessing heritage reuse projects does not mean that they contradict each other, or should be handed in separate; on the contrary, they overlap in theory and in practice. But they are organized here to represent a theoretical classification that facilitates any adaptation process to be assessed in a clear, achievable, and practical manner.

2.5.1. CONSERVATION AND PRESERVATION

Although methods and outcomes are certainly not universally agreed upon, historic conservation professionals generally encourage restoration and rehabilitation of historic buildings. This approach is usually represented by both governmental and non-governmental conservation specialists working as regulators and supervisors of conservation policies and Charters, restorers, heritage related bodies, as well as consultants and purveyors of conservation knowledge (Bond, 2011). The previous organizations plan, approve and execute projects of reuse. This group focuses on the minimum intervention done to the heritage structures, as well as the degree of conservation, restoration and

preservation works during adapting the building for reuse. Their main goal of finding a new use is to find sufficient support in order to conserve, maintain and present the world cultural heritage. Their adaptive reuse approach is characterized to be more towards tourism and monumentalising of buildings, and aims to introduce cultural messages in the most romantic way, presented in museums, galleries, educational and entertainment methods (Afify, 2002). Nonetheless, their search for a new function aims to ensure sustainable revenue for long-term maintenance. Despite that a considerable support can be raised out of the surrounding local community, most of their assessment tools are based on what is specified in international charters and restoration technicalities without considering local incentives.

According to Shehayeb and Sedky (2002), at the heart of interdisciplinary critical research on heritage has –lately in Cairo- endorsed the notion that cultural heritage is a social construction encompassing communities of interest, communities of culture or religion, communities of practice, communities of place and communities of resistance. Adaptive reuse as one approach of conservation, focus on the building fabric as well as on the integration of the new function in the local context, where local communities are inseparable part of these functional transformations and to certain extents, considered success indicators for the reuse project (Department of the Environment and Heritage, 2004). Therefore, assessing adaptive reuse would refer mainly, from the view point of heritage conservationists to both: first comes conserving the physicality of authentic buildings, secondly to have a role in the development of the surrounding local community (**Figure 2.3**).

2.5.2. ARCHITECTURAL AND TECHNICAL INTERVENTIONS

Architectural conservation describes the process through which the material, historical, and design integrity of mankind's built heritage are prolonged through carefully planned interventions. The individual engaged in this pursuit is known as an architectural conservator. Decisions of when and how to engage in an intervention, are critical to the ultimate conservation of the immovable object. Ultimately, the decision is value based: a combination of artistic, contextual, and informational values is normally considered. In some cases, a decision to not intervene may be the most appropriate choice. Architectural conservation deals with issues of prolonging the life and integrity of architectural character

and integrity, such as form and style, and/or its constituent materials, such as stone, brick, glass, metal, and wood. In this sense, the term refers to the "*professional use of a combination of science, art, craft, and technology as a preservation tool*" and is allied with its parent fields, of historic environment conservation and art conservation (**Figure 2.3**).

In a more aggregated scale, in addition to the design and art/science definition described above, architectural conservation also refers to issues of identification, policy, regulation, and advocacy associated with the entirety of the cultural and built environment. This broader scope recognizes that society has mechanisms to identify and value historic cultural resources, create laws to protect these resources, and develop policies and management plans for interpretation, protection, and education. Typically this process operates as a specialized aspect of a society's planning system, and its practitioners are termed historic environment conservation professionals (Afify, 2007)

According to this approach, not all structures require the level of aesthetic detail needed for historical rehabilitation. For many structures, practical considerations are the driving factor in adaptive reuse. Above all, the integrity of the building must be intact for the safety of the occupants and security of the interior (Jack Jacob Group, 2010). After building occupation, they assess the new functional requirements versus what achieved to house these functions (Aydin & Yaldiz, 2010). They investigate technological advancements (such as HVAC systems) and rapid developments in lifestyle due to their implications on the user satisfaction. Generally, Post Occupancy Evaluation (P.O.E.) is the most world-wide applied method to evaluate building performance; P.O.E. comprises the techniques that are used to evaluate whether a building meets the user's requirement, with little regard to preservation and restoration principles (Aksah, 2011).

Other aspects of the occupied buildings' performance are usually addressed by the assessment in P.O.E. frameworks. Most P.O.E.'s focus on user's perceptions, preferences and satisfaction (Voordt, 1999). Also Kathryn Klass, a facility management consultant who specializes in P.O.E., described post occupancy evaluations as "*systematic study of facilities from the perspective of the occupants*" in Duvall (2002), p. 414. So P.O.E. refers mainly to both: the building in use as well as to the users (Aksah, 2011; Voordt, 1999). If the main function of the building was to satisfy the needs of the local community and to provide a space for supporting their communal activities, in this case, P.O.E. considers assessing the third pillar of supporting local community implicitly.

2.5.3. SOCIO-ECONOMIC AND URBAN DEVELOPMENT

Interested groups include, but not limited to the Ministry of Planning, urban planners and consultants in both regulatory and facilitative roles, social and economic researchers, Cairo's Municipality and its divisions and non-governmental organizations (NGO's). This includes officers and engineers working at permitting offices, enforcing zoning and building codes, and ensuring that development follows neighbourhood, city-wide and regional comprehensive plans. Socio-economic and urban research disciplines are somehow diverse when dealing with utilizing old buildings for the upgrading of a community (**Figure 2.3**). The main categories of this group's interest lies within the domain of upgrading deteriorated and informal districts, because Most of Cairo's historical district lies within degraded quarter that thrives for urban development. Therefore, groups interested in socio-urban upgrading perceive heritage assets as opportunities for creative interventions in order to be re-used for the direct benefit of the surrounding local community, and maybe on a larger aggregated scale that covers neighbouring informal districts such as *ad-Darb al-Aḥmar*.

They set community needs to be priorities for determining new uses for heritage buildings. The methods of public participation and community planning must be an important part of the conservation activity if the local public is to understand and appreciate the cultural importance of the city in which people live and work (Fowler, 1995). Censuses and on-ground studies help socio-urban developers prioritise goals of building adaptation projects; therefore they are fully aware and seek to satisfy needs of local NGOs and community leaders. Their approach aims also to increase the awareness of local community in relation to their valuable cultural heritage. It is of their interest to encourage accessibility to these building by locals and foreigners, where tourism push forward local economic development in the most practical way, in terms of generating job opportunities and business starters among local inhabitants (UN-HABITAT, 2005). When an asset provide spaces for multiple functions required by planners, such as health clinics or social and sports centres, or schools for multiple types of education, that is when it is considered successful adaptation project.

Summary

According to this literature survey, assessing heritage reuse is not based on singular goals, but on multiple factors that might vary for every case even in the same context. In deciding priorities and goals of re-using heritage assets, conflicts usually arise between professionals and the public. Government representatives, architects, architectural historians, developers and owners often have different ideas regarding the reuse of heritage. Owners are often primarily interested in the socio-economic values of the building; while developers and contractors do the work regardless of the integrity and authenticity of a heritage building. Conservationists care about the physical condition of the building and prefer minimum intervention to any of its elements. Architects aim to satisfy functional requirements even if this leads to increasing the level of intervention in authentic fabric. Social and urban sciences perceive heritage buildings as a good opportunity for ameliorating urban conditions. These different priorities may lead to problems and conflicts while deciding the main strategic goals of each heritage reuse project. In order to assess the appropriateness of the adaptation process for each case, among various proposals for re-use, multiple factors should be considered and assessed. Thus, the most successful built heritage adaptive reuse projects are the ones that balance the three pillars of: 1) conserving the building's cultural and historical significances, 2) satisfying the needs dictated by its new use, and 3) mind the local community's development simultaneously in different ratios according to project variables, and without extensively jeopardising any pillar (**Figure 2.2**).

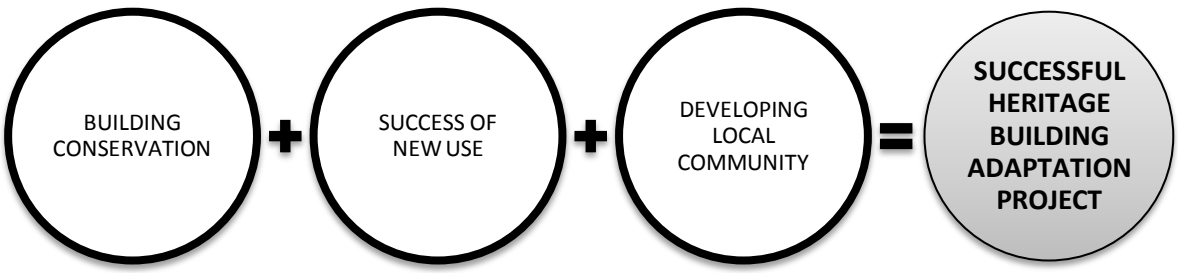


Figure 2.2 The additive value of the three pillars of assessment

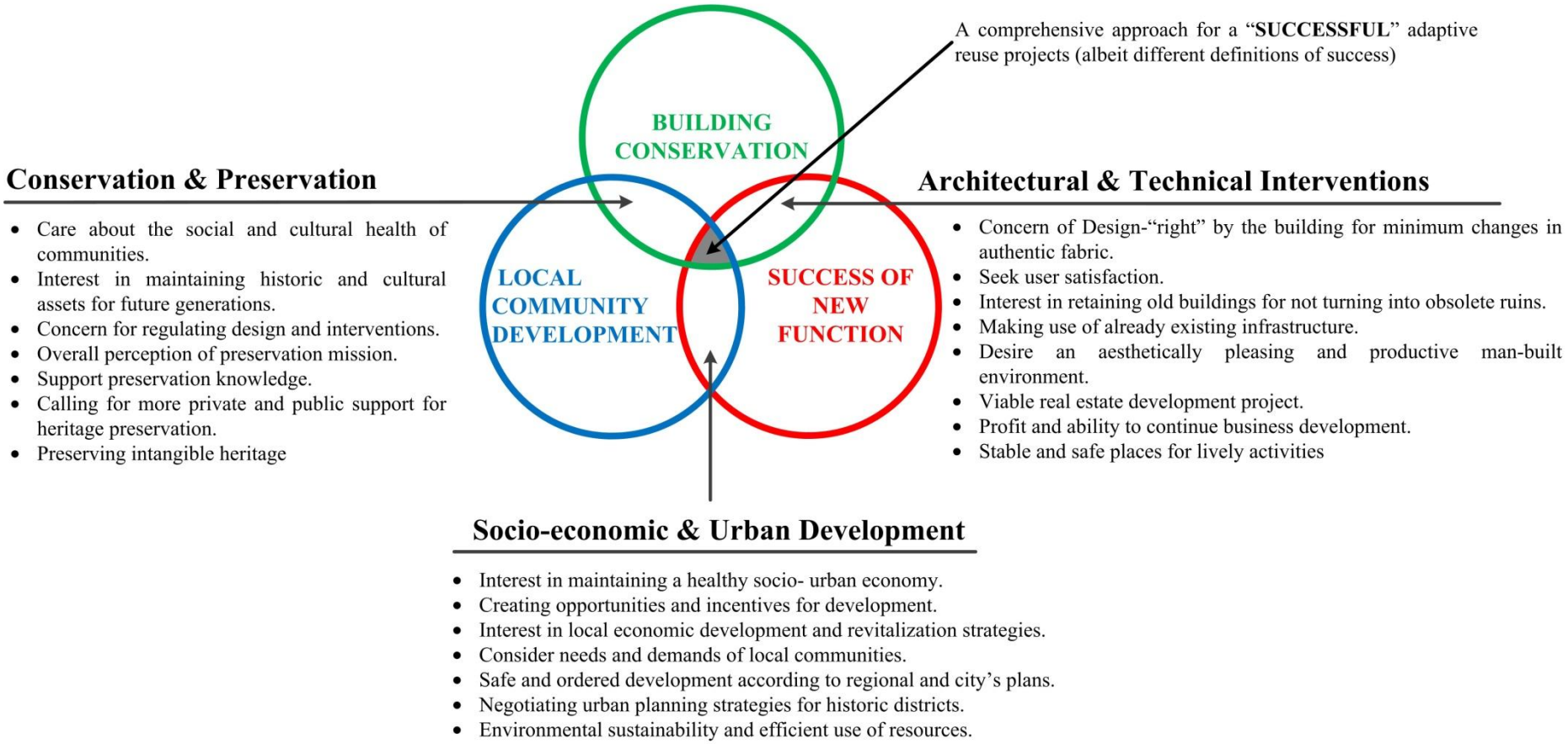


Figure 2.3 Paradigms in heritage adaptive reuse research.

A diagram presentation showing the overlap in adaptive reuse research. These are the main three approaches existing in literature for assessing adaptively reused heritage buildings.

CHAPTER THREE

A COMPREHENSIVE ASSESSMENT FRAMEWORK

3.1. MAIN PILLARS OF ASSESSMENT

As stated in chapter ONE, the framework presented here was generated inductively from an extensive analysis of the relevant literature in such diverse fields or areas of research such as restoration (Matero, 2006), funding (Serageldin, 1984), socio-urban research (Rodwell, 2007), environmental sustainability (Bullen & Love, 2010), tourism and economic development (Smith, 1988; Nasser, 2003), building engineering (Douglas, 2006), environmental psychology, and architectural transformations (Aydin & Yaldiz, 2010). Although the proposed framework was generated to focus on the particular context of Islamic architectural heritage in Cairo, the literature used includes research and experiences from other parts of the world. The proposed framework identifies first what the literature presents (in Chapter TWO) as the main goals or pillars of adaptive reuse projects in Historic Cairo: 1) Building conservation, 2) Success of new use, and 3) Local community development.

3.1.1. BUILDING CONSERVATION

Since the early 1930's, international charters primarily see adaptive reuse as a strategy for the conservation and maintenance of architectural heritage buildings, and that the new use shall respect their historic or artistic character (ICOMOS, 1931). They consider that the main aim of adaptive reuse is to conserve heritage buildings for future generations by generating sufficient economic resources for restoration and maintenance work (see for example: Antoniou et al., 1985; Cantacuzino, 1990; Australia ICOMOS Incorporated, 2000; Afify, 2002). Until the 1950's, the benefits of adaptive reuse have been discussed almost exclusively in relation to building conservation (Jokilehto, 1988; Plevoets & Van Cleempoel, 2012a). However, today, a growing literature emphasises other important goals for adaptive reuse: the success of the new function and the development of the local community.

3.1.2. SUCCESS OF NEW USE

The success of an adaptive reuse project depends on the success of the new use. The need to achieve a desired level of success for the new use is usually emphasized by architects who investigate the dynamic engagement of humans and their architectural heritage (Elzeyadi, 2001; Douglas, 2006). Architectural space programming can help determine appropriate new

functions that correspond to the heritage building's morphology (Langston, 2011; Campbell, 2011). Combining the satisfaction of needs related to people's activities with the opportunity to enjoy architectural heritage is one of the most important goals of reusing heritage buildings (Elzeyadi, 2001).

3.1.3. LOCAL COMMUNITY DEVELOPMENT

The change of functionally obsolete heritage buildings into contemporary functions in heritage districts has an important role in urban rehabilitation and upgrading because the resultant functional building is involved in the living context it lies within. In historic districts, there is a need for integrating economic, educational, health, and cultural activities that not only attract tourists, but act as a catalyst for the development of the community (Rodwell, 2007). This is particularly relevant in the case of Historic Cairo. Adapting heritage structures of Historic Cairo for reuse should be planned and integrated within the environmental upgrading projects that aim to improve the life of people living and working in the area (Bianca, 2004; Boussaa, 2010). In Cairo's deprived context, every heritage adaptation project - even if the new function is not directly related to the community - should, by one mean or another, address the cause of developing the socio-economic aspects of the neighbourhood and, thus, should be assessed for that end as well (Siravo, 2004; Afify, 2007).

Accordingly, in the case of Historic Cairo, the most successful built heritage adaptive reuse projects are the ones that appropriately balance these three goals or pillars according to the specifities of the project without ignoring or jeopardizing any of them. The following sections shows the proposed framework, and details for each of the assessment pillars a set of assessment criteria. The criteria under each pillar are derived from the multi-disciplinary body of literature analyzed.

3.2. THE PROPOSED FRAMEWORK

A comprehensive framework for the assessment of adaptively reused heritage building in Cairo is introduced in (**Table 3.1**). The Historic centre of Cairo contains at least 600 monuments, of which at least 100 are in use. Since a more aggregated level of dealing with those monuments is needed (Gharib, 2012), the proposed assessment framework deals with all

of these buildings regardless their original typology, current function, location, or users' classifications. This framework is designed to assess building adaptation strategically according to Cairo's pressing needs and considering its rich assets simultaneously.

In this thesis, the three pillars of assessment are considered main goals of every reuse project. This thesis does not aim to give weights or stress on one than the others. The elements of each assessment pillar are called 'Assessment criteria'. They are organized in the framework according to their relevance to their field of application and research. They are also not weighted or prioritized in the context of this thesis.

Table 3.1 The proposed framework for the comprehensive assessment of adaptively reused heritage buildings in Historic Cairo.

	PILLARS OF ADAPTIVE REUSE ASSESSMENT		
	Building Conservation	**Success of New Function**	**Local Community Development**
ASSESSMENT CRITERIA	▪ Conservation of authentic features ▪ Preservation of architectural style ▪ Explicitness of alterations ▪ Visual compatibility of extensions ▪ Safety and structural stability ▪ Maintenance	▪ Compatibility between building and new function ▪ Basic environmental qualities ▪ Accessibility ▪ Economic and intangible benefits ▪ Minimum adaptation costs	▪ Enhancement of socio-cultural values ▪ Safeguard of intangible heritage ▪ Heritage interpretation and raising awareness ▪ Increase of liveability of historic quarters ▪ Socio-economic benefits ▪ Improvement of contextual physical characteristics ▪ Sustaining natural and local environments

3.3. DESCRIPTIVE ANALYSIS OF THE ASSESSMENT CRITERIA

This part of the chapter explains the elements of assessment mentioned in the proposed framework. The objective of this part is to rationalize assessment criteria per pillar as available in literature, and explain it according to its specialized field of research. Each assessment criterion is discussed on both levels, strategically and practically. This dual approach of discussion is more comprehensive to best describe the importance of each criterion and provide a practical, and thus, successful solution from best practice. World-wide and local examples are presented as a method of showcasing previous experiences in the field. The criteria are not weighted, but randomly mentioned per each pillar. They are all considered of equal level of importance in this thesis. It is worth noting however, that these assessment criteria are relevant in the case of assessing the adaptive reuse of heritage buildings in Historic Cairo, and might need some alterations when being thought of in other contexts.

The following methods and techniques of analysis are based upon a number of criteria which can be measured by specific indicators. The methods and tools employed for assessment of the criteria can be either quantitative or qualitative or both. The following section answers the research question of: *what* criteria can be used to assess the adaptive reuse of heritage buildings in Historic Cairo, and *how* will it be measured/ assessed for success or failure.

3.3.1. DESCRIPTIVE ANALYSIS OF THE PROPOSED CRITERIA TO ASSESS BUILDING CONSERVATION

The following part presents these assessment criteria: conservation of authentic features, preservation of architectural style, explicitness of interventions, visual compatibility of extensions, safety and structural stability, and facility management and maintenance.

3.3.1.1. Conservation of authentic features

Conservation is one of the main goals of any heritage adaptive reuse project. An indispensable part of any heritage adaptation project is conservation work that best upkeep its value and allow utilization for modern purposes (Jokilehto, 1988). During the adaptation process, it is vital that as little as possible of valuable/ unique heritage features

of the building are damaged or lost (Athens Charter, 1931; Venice Charter, 1964). Authentic features are the valuable architectural elements that truly represent the craftsmanship at the time they were created. Once damaged or lost, authentic features can be difficult, if not impossible, to restore or recreate (Douglas, 2006; Matero, 2006). In the context of adaptive reuse, assessing the quality of conservation work has mainly two indicators: the first discusses the level of changes done to the authentic fabric during the adaptation project with minimum losses, and the other discusses the reversibility of modern implemented actions such as architectural works and electrical wiring.

a) Minimum Intervention/ Minimal loss of authentic fabric

Many old buildings contain material of cultural value or are unique in terms of their construction or architectural style. Once eliminated or dissolved, these authentic features can be difficult, if not impossible, to reinstate or rectify (Douglas, 2006). Although adaptive reuse is to leave the basic structure and fabric of the building intact, and change its use (Langston, 2011), this change of use is usually accompanied by spatio-physical adjustments in the structure to house the new requirements (اللحام، 1996؛ يونس، 2002). Usually interior and exterior renovations are also necessary during the adaptation processes (Shopsin, 1986). These spatio-physical adjustments to heritage buildings ought to have minimal impact (Australia ICOMOS Incorporated, 2000 article 21; El-Habashi & Nada, 2011), and are made to the building while leaving the basic structure and character of the building intact (Wilson, 2010; Langston, 2011), and without losing its original identity (Elkerdany, 2002) or its historical value and cultural significance (Eyüce A. , 2010). '*As much as is needed as little as required*' is a good rule to adopt (Douglas, 2006; Venice Charter, 1964, article 5). Even for the types of additions that might prove necessary for structural stability (consolidation) or for the practical reuse of a monument, the essential principle to follow is to limit new elements to a minimum. Matero (2006) adds that even necessary alterations for structural stability or for the practical use of the monument should be minimized and simplified in adherence to the structural outline. These spatio-physical adjustments to heritage buildings ought to have minimal impact after considering design alternatives (Yones, 2002; El-Habashi & Nada, 2011; اللحام, 1996; Australia ICOMOS Incorporated, 2000 article 21). Consistent approach of intervention is essential to make the adaptation project harmonious.

It is vital, therefore, that as little as possible of the heritage features of the building are damaged or lost as a result of a proposed adaptation. Each structure has to be evaluated individually to determine whether adaptation is appropriate and desirable and also the level of intervention made (Wilkinson, James, & Reed, 2009). For example, HVAC systems usually cause problems when they are installed in valuable structures because heritage structures were not originally designed to include metal tubes, electrical wirings and chillier units; and if there is any evidence of electrical supply before adaptive reuse process, they would be very primitive (اللحام، 1996). Modern technology enables engineers to intervene more delicately with valuable elements, and without detracting from the whole aesthetical cognition. The former school of Darb Shoughlan that was restored and reused by the Aga Khan Trust for Culture had made some use of unconventional HVAC systems. The roof of the building was not used as usual to put mechanical units; instead, they were stored in a lower room and supplied the building with conditioned air by using hidden shafts inside the walls.

Many researchers tried to quantify the physical values of authentic fabric. For example, El-Habashi and Nada (2011) suggest a system to evaluate Sabīl buildings of Cairo through the intrinsic specificities of that heritage building type, to use some set of parameters to classify them into three types: Sabīl of high, medium and low values. "The artistic and architectural value" was distinguished as an important attribute because it conforms with the Egyptian Antiquities Law of giving importance to such aspect. Every element in the Sabīl is graded so the total architectural value was calculated for each case. This research is important because it introduced a simple, yet practical methodology for grading historically significant architectural and ornamental features; those ought to be conserved during adaptive reuse of heritage buildings (**Figure 3.1**). Lost, ruined and disseminated authentic fabric during adaptation process are then summed together in order to quantify the lost value. The more lost elements, the less successful adaptive reuse project becomes.

Letellier, Schmid, and LeBlanc (2007) discussed how site documentation would be helpful for assessing conservation and preservation of each element. Recognizing and conserving each authentic element in any heritage building is essential during any adaptive reuse project. According to Letellier, Schmid, & LeBlanc (2007), recording is a necessary step in the initial phases of all investigative processes, providing conservation professionals with a two, three or four dimensional graphic record of the starting point for their work: clear and explicit information concerning the as-found nature and condition of

a site. Recording is also a critical accompaniment to all site interventions in providing an ongoing record of change. Documented comparison is made before, during and after intervention will be used as material in this assessment criterion. This process is called comparison condition mapping (**Figure 3.2**), it is the comparison of architectural elements, ornaments, original space organization and configurations, historic evidences and authentic fabric would be undergone between before and after reuse.

In case of losing valuable elements during adaptation works, according to Matero (2006), Jokilehto (1988) and أبو الفضل (1998) an approach for dealing with deteriorated and lost fabric should be followed: exact replication of one of preceding eras, harmony (usually related to colour, material and form), and contrast are of the main approaches. The Egyptian restoration approach usually prefers exact replication of authentic design, although other approaches are justified worldwide. However, it does not matter which of the above mentioned approaches in the assessment of restored heritage buildings for reuse is followed, as long as it is well justified in each case and consistent in the whole project.

As an excessive intervention in heritage buildings, the case of demolishing interior parts of the building and replacing them with new constructions while retaining its facade is called *'Façadism'*; that is, gutting the building and retaining its façade (Department of the Environment and Heritage, 2004). Façadism is one famous intervention method that deletes the original character of the building's interior morphology and leaves its facade intact and well preserved. Façade retention after all provides only a superficial solution to a building with architectural or historic qualities. Some architectural commentators, for example, are prone to criticising this option because it destroys the integrity of the building. Given that the façade is an integral part of the building's components, the criticism is valid. The new building behind the façade can be thus branded a fake (Douglas, 2006). Essentially, 'façadism' is one of the issues of debate between modernists and traditionalists in building conservation (Douglas, 2006). The former are those who take the view that buildings are primarily meant for people. They take a pragmatic or functional approach to the adaptation of buildings in that it can take any form so long as the property is being put to good use. Traditionalists, on the other hand, see buildings in cultural as well as functional terms. They do not favour wholesale conversion or renovation of old buildings just for the sake of it. Respect for the past and adaptation works that are modest and sensitive and do not undermine the building's architectural merit are more important to them than conversion at any price.

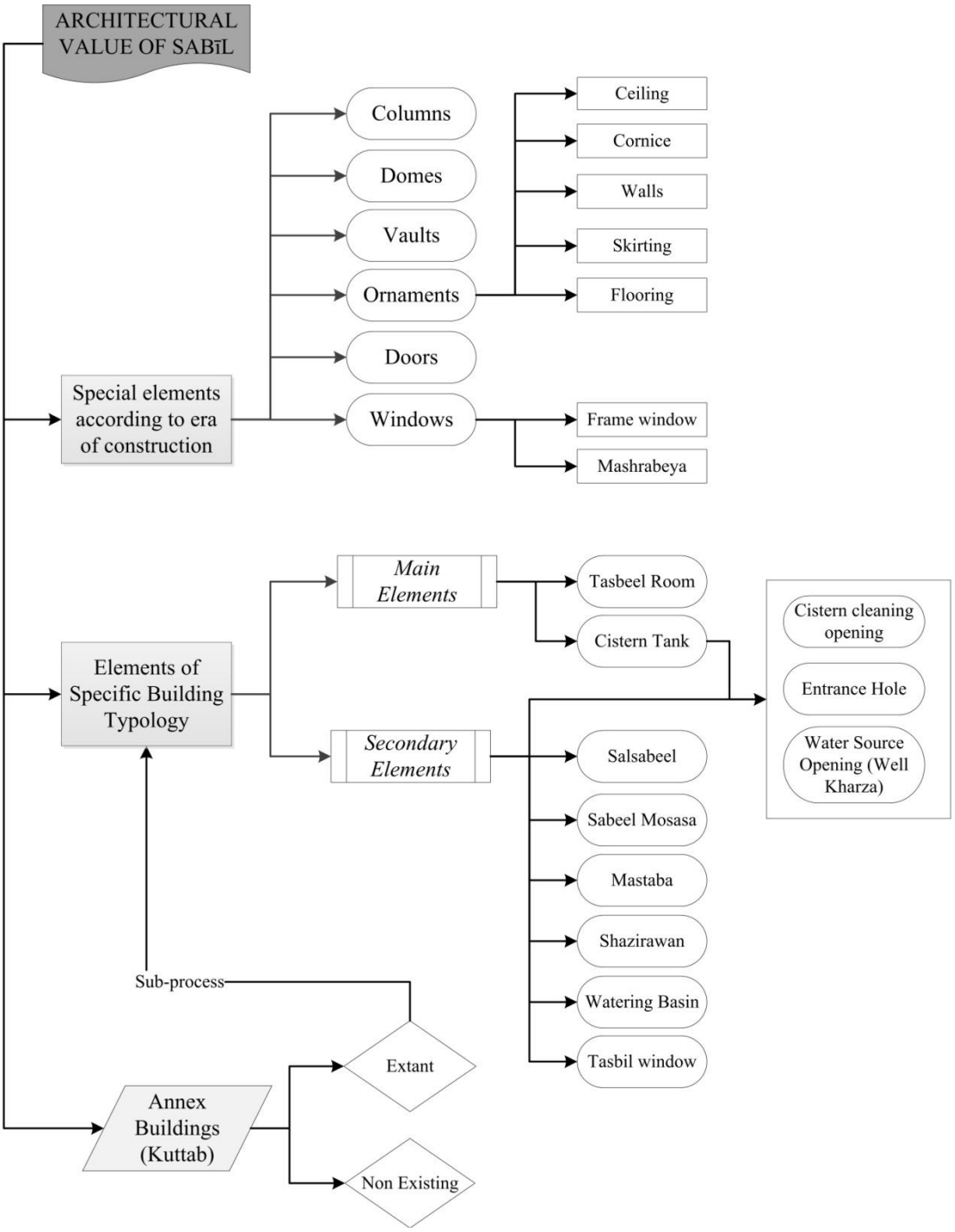


Figure 3.1 A diagram of a Sabīl building components.

This diagram illustrates a methodology to identify and easily assess the degree of change/ loss/ compensation/ damage of architectural elements of Sabīl buildings before and after reuse. Adapted from El-Habashi and Nada (2011).

Although part of the project of rehabilitation of The City Hall of Utrecht, the Netherlands is an example of façadism, it won two awards: Rietveld Award & Nederlandse Bouwprijs in the Netherlands. It is a rehabilitation project by Enric Miralles & Benedetta Tagliabue

architects (EMBT) inaugurated in 2000 (**Figure 3.3** and **Figure 3.4**). The architects conserved the 1820's "monument" facade and demolished the old interior. Preserving the facade enabled the architects to define the historical street and its entry to an adjacent new square (Miralles & Tagliabue, 2008). When the City decided to accept the demolition of the brick building they took a chance on urban life with humanistic qualities. The newly constructed interior is integrated with the streetscape from under one of the retained facades. Other meeting-spaces are housed in the upper stories of the building.

Façadism is not usual in Cairo's preservation experiences, might be because of its well known expensive costs (Douglas, 2006), or because the traditionalists in the Ministry of State for Antiquities Affairs perceive this approach to be intensive intervention. However, it should be examined if it is the only possible solution for *rescuing/ benefiting from* many historic façades that are aesthetically appreciated, and are free standing in historic quarters of Cairo (Elkerdany, 2002), such as building new constructions on the remaining gate portal of Wikālat Qawsūn (**Figure 3.5**). It can also be investigated as an option for preserving the façade of Wikālat as-Sultān Qayetbāy (**Figure 3.6**). What currently remains of the Wikālah –besides its rich and well preserved façade- is its gate portal and the first raw of interior spaces behind the main façade. Future plans for reuse may suggest the construction of an annex building just behind the remaining facade.

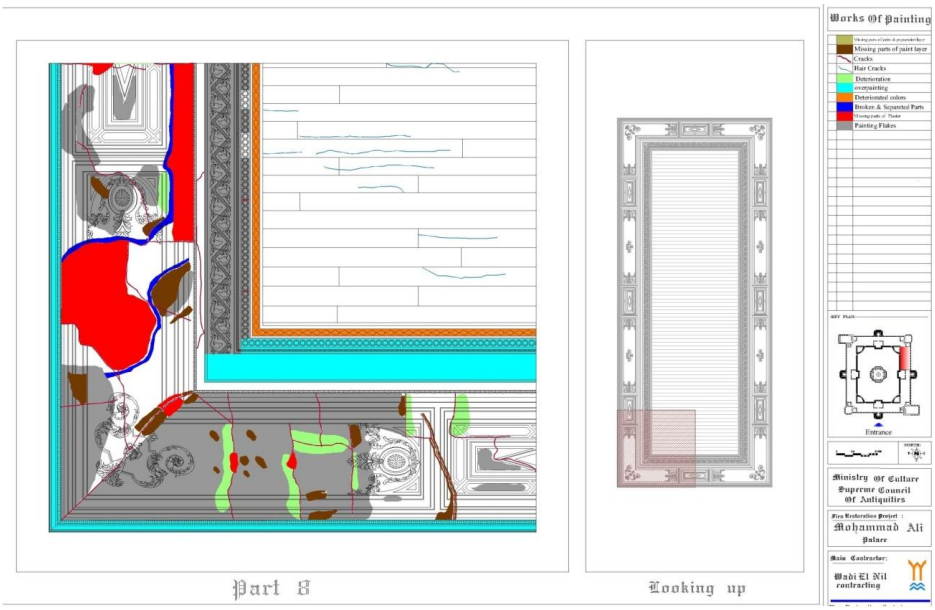


Figure 3.2 Condition mapping of the ceiling at Mohammad Aly's Palace.

A looking up drawings as prepared by conservation specialists of Wadi el Nil Contracting Company before intervention to detect deterioration symptoms (such as missing parts, cracks, colour fading) to be compared later on after conservation works in Shubra el-Kheymah. Image source: El-Rasheedy, M., S. (2012).

Figure 3.3 Northern façade retention of the City Hall of Utrecht.

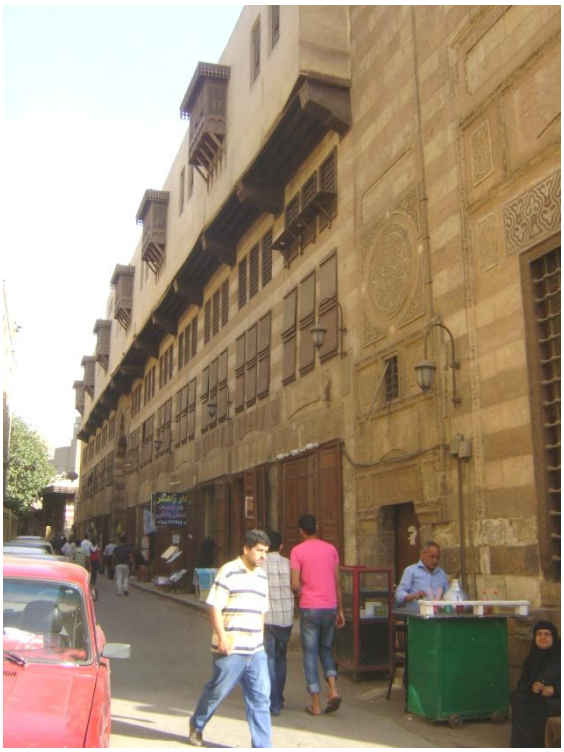
The city hall of Utrecht, the Netherlands is as an example of preservation by "façadism" by retaining an old building's facade and replacing the whole interior.

Figure 3.4 The public space in front of the City Hall of Utrecht.

Southern façade and the public space. Image source: Google maps Street view, August 2009.

Figure 3.5 The remaining entrance of Wikālat Qawsūn.

This stand-alone structure is a potential candidate for reuse by reintegrating the surviving facade in a new construction behind/above it.


a

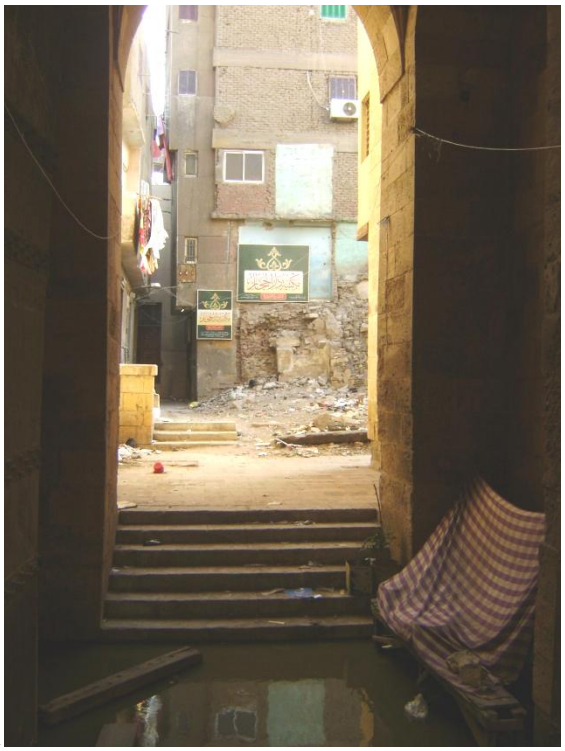

b

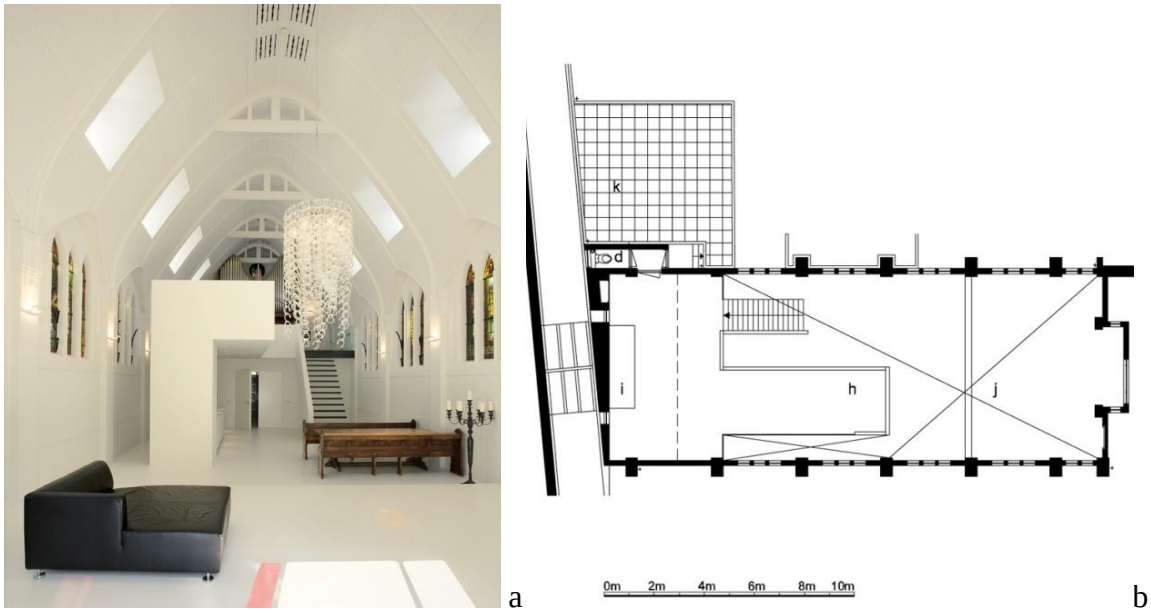
Figure 3.6 The standing façade and first raw of spaces of Wikālat as-Sultān Qayetbāy.

This stand-alone structure is a potential candidate for reuse by reintegrating the surviving façade and first raw of spaces with a new annex building behind it. Image (a) shows the façade containing shops and bazaars overlooking the street; image (b) shows vacant land and informal encroachments just on the other side of the entrance portal.

b) Reversibility of Actions

Reversibility of intervention actions is an important criterion to assess adaptation works done to heritage buildings to house contemporary use(s) (Douglas, 2006). Reversibility of intervention actions is based on the principle that nothing should be added to the building that later cannot be taken away. In other words, any alterations to a building should be capable of being removed and made good without too much collateral damage to the existing structure and fabric (Douglas, 2006). Architects and engineers should consider the potential for reversibility in the design of alterations if substantial change is proposed so that the possibility of returning a building to its original use may be kept open should the circumstances permit this at some later time (Pickard, 1996). This activity ought to be undone quickly and in an organized manner, to the extent that there may be an advantage in well-conceived and executed permanent alteration. Types of alterations and implementations are usually of architectural, structural, electro-mechanical, plumbing and fire protection nature. These actions are part of systems that are being replaced, upgraded, modernized, or installed during adaptation projects. The following examples illustrate different types of interventions and how did they succeed to reversible in heritage adaptation projects.

Reversible architectural alterations: The Church of Living (**Figure 3.7**) is a good example of reversibility of implemented adaptation designs of reversible architectural alterations by Zecc Architecten in Utrecht the Netherlands. The Old Catholic church is transformed into a residence. The character of the small church is maintained and where possible reinforced. The architects deliberately freed any new additions from the interior walls. No permanent fixations had been used to tie the added floor slab into the interior walls of the church. In the future if the church would return to its original function or to its original state, inner additions can be easily dismantled and put away to clear the space. International example is provided in this case because there are no local attempts.



a b

Figure 3.7 Church of Living.

This Church is reused as a private house in Utrecht, the Netherlands. Image (a) the interior of Church space after conversion into the living space. Image (b) is the 2nd Floor Plan of the house; it shows clearance spaces between floor slab and the inner walls of church. Images source: www.zecc.nl

Reversible interior fittings: Interior furniture is necessary elements that enable users to use and enjoy the experience in heritage buildings. Some of these elements are chairs, tables, light units, stage for performances. These fittings are usually of two types: fixed and non-fixed. Fixed furniture is not recommended due to many reasons such as it limits the flexibility of reuse, maximise intervention, hard to be reversible or undone. Non-fixed furniture are preferred in heritage reuse (Douglas, 2006), because it best preserves authentic fabric, provides flexible layout and ensures minimum effects on authentic elements. (**Figure 3.8**) shows a successful example of how modern furniture elements can be placed in heritage building with minimum harm.

Reversible electro-mechanical implementations: Electrical installations should not damage the building and there may be a need for specialist advice regarding where to locate cabling and the design of fittings so as to have minimum visual impact within interiors (**Figure 3.9**). It is always an important issue to consider conflicts between old and new technologies when adapting heritage for reuse.

Figure 3.8 Seating benches in Khanqāt as-Sultān Qānşuwah al-Ghūrī

The Khanqāt is converted to be a multi-purpose space for lectures, seminars and audio performances. The added furniture to accommodate audience is installed on platforms that only rest on the floor, while leaving enough space away from walls for preserving authentic fabric.

a b

Figure 3.9 Modern technical implementation in heritage buildings.

Image (a) Lighting equipment in Wikālat as-Sultān Qānşuwah al-Ghūrī is hung on newly added tent over the building in order to assure minimum fixation to the authentic fabric; to the right: Sound output device installed on tripod without using permanent fixations, in Bait es-Sennarī, es-Sayedah Zainab.

3.3.1.2. Preservation of architectural style

Heritage buildings are considered valuable for many reasons; one important reason is because of the architectural significance of ornaments and elements. These architectural features represent the era of the building's construction, using the technology, craftsmanship, building morphologies and styles available at that time (Plevoets & Van Cleempoel, 2012a). This combination of influences produces unique and valuable identity to the heritage buildings that are still surviving. However, during adaptation for reuse, many intervention actions could be done as part of the building's conservation process and to prepare it for its new use. These interventions should be assessed for not conflicting or falsifying the uniqueness of the heritage building. This criterion assesses any alterations, additions and extensions that have been done to heritage buildings -as part of their adaptation for reuse- in terms of respecting their authentic style, character, and identity. The main indicator is avoiding the conflict in architectural style between the additions and the heritage building.

The approach that considers inserting classic (historic) elements from another time frame is called in literature: *'Conflicting/ falsifying records of the past'*; and mostly agreed to be a negative action towards valuable structures. Mixing elements of different architectural identities misleads future generations about the origin of the building (Douglas, 2006). Imposing a fake style from different era onto a heritage building is considered a clear violation to the 9th article of Venice Charter which states that:

"...The process of restoration aims to preserve and reveal the aesthetic and historic value of the monument and is based on respect for original material and authentic documents..."

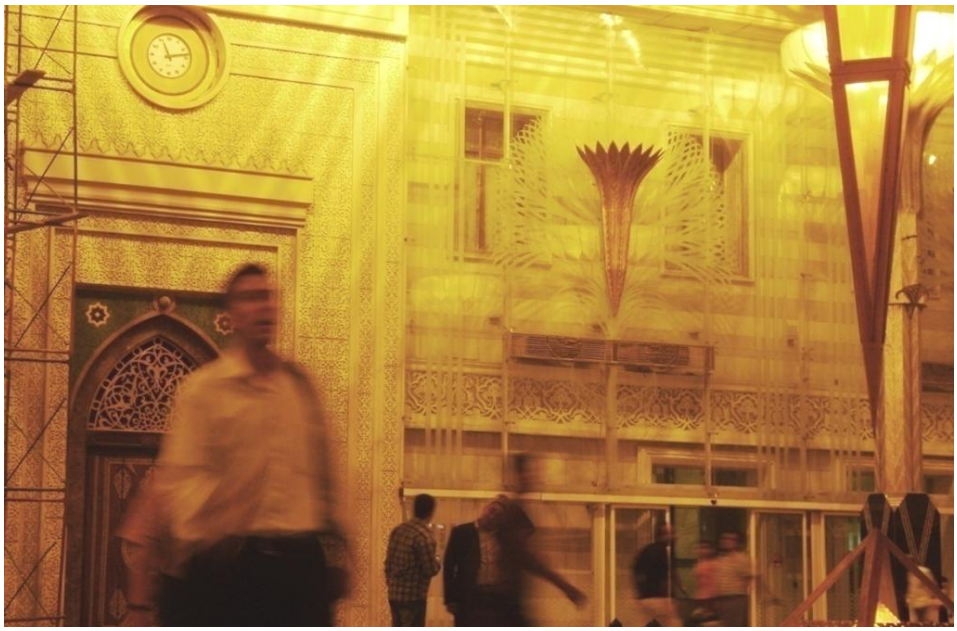
New elements should be harmoniously incorporated into the whole, but at the same time be distinguishable from the original parts in order that the addition do not falsify the record of the past (Elkerdany, 2002). If the architectural and interior additions cause conflicting interpretation of the site with architectural features of another historic era, then this is a serious defect in the adaptation project. In regard to compensations while conserving the buildings, the *Carta del Restauro Italiana* (1931) is quite specific; no removals or additions which falsify are advocated (Matero, 2006).

Cairo's train terminal is a heritage building that is not in the list of monuments/ antiqutues, but is enlisted in the heritage buildings list. It was built in 1892, and was

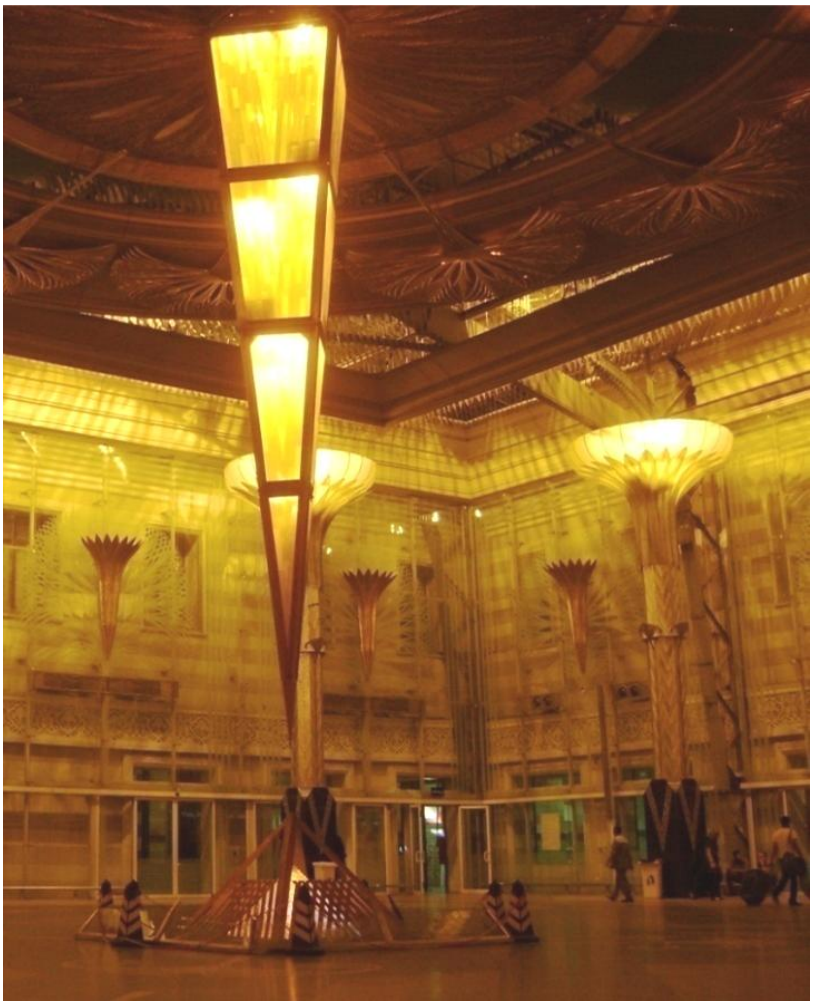
constructed using steel frames that support large spans. The building bore structural resemblances with its counterparts in any industrialized European capital. Its façade and interior hall however were decorated with eclectic neo-Andalusian motifs with rich blue mosaics adorning complex patterns. The main hall, with a symbolic gate at its apex and its iron truss structure supporting its roof, was a cultural and political stage for modern Egypt (Elshahed, 2011). The building is considered a landmark of current time and therefore, should have been treated in a whole different manner (Hawas in سامي, 2011). Venice Charter (1964), states clearly in article 1 that: "*The concept of a historic monument embraces not only the single architectural work but also the urban or rural setting in which is found the evidence of a particular civilization, a significant development or a historic event. This applies not only to great works of art but also to more modest works of the past which have acquired cultural significance with the passing of time*." Currently, this building has lost its authenticity and hence, its value (سامي, 2011).

In 2011, the building was fully upgraded and new functions were added. New uses had been introduced in the main building's terminal. The new uses are railway museum, commercial shops, book stores, restaurants and Cafe's. A mezzanine floor had been added in the grand hall and escalators were added leading to the new commercial functions. New electronic information panels, ticket desks were renovated and infrastructure was upgraded. The introduction of new functions and services, aside with enhancing and developing existing infrastructure is beneficial to the commuters.

However, by undergoing this renovation, the building -with all its history and memories- had been assaulted (Elshahed, 2011). The way the architect had planned and executed the renovation design contradicts with the basic principles of many international and local charters. The interior renovation works of the station had incorporated a mix between Islamic architectural styles with Pharaonic motives (**Figure 3.10**). The main hall is encased in unnecessary glass windows and the walls are decorated with floral pilaster forms that hover above head. The grand space is now air conditioned; Pharaonic columns and carvings were added decorated with golden paint. What used to be an open and airy station hall is now crowded with ten thick columns that support an unnecessary false ceiling. All these changes have completely deformed the genuine design of the station.



a



b

Figure 3.10 Cairo's Train Terminal Station after restoration in 2012.

Image (a) glass panels decorated with Pharaonic floral patterns cover the original neo-Islamic internal façades; image (b) columns were covered with Pharaonic lotus capitals in the main hall.

Many scholars and professionals of the field of conservation criticised this renovation and describe it as a crime (Elshahed, 2011). Adapting the station for new uses should have respected the authentic character and worked on presenting it to future generations instead of covering it and intentionally falsifying its identity. Poor legislations and laws for heritage conservation in Cairo prevented public voices against this renovation from the chance to stop the works (2011 ،سامي). Architectural extensive intervention is so evident in this project to the extent that no attention had been taken to conserve the building's authentic value. According to Botros in سامي (2011), the duality of the approach undertaken is the core problem of this project. The introduction of new facilities and functions does not mean to self-contradict existing architectural style. Since it is too late for rolling back the negative intervention, other valuable structures when being altered for new uses should be dealt with carefully to avoid repeating these problems.

3.3.1.3. Explicitness of interventions

During adaptation for reuse, designers might intervene with modern alterations and additions, or to exactly remodel what had been lost and make replications from the old architecture in the new extensions. Lost parts of the buildings might be its roof, floors, side façades, ornaments and decoration motives...etc; while extensions can be in various forms that will be discussed later. There exist three points of view regarding alterations and the design of new additions to heritage structures (Torres, 2009).

The first restoration school (such as in Egypt) adopts the point of view of blending new work with the original features of the heritage building in an attempt to achieve complete matching. This approach is to use the same style and materials as the original building, or, to build in the original style. At some point, experts determined that the best and easiest way to avoid the physical alteration of a heritage building was by making the existing building and the new addition look as one structure, or of a singular style. Before this practice is employed, the designer must understand the original style very well in order to obtain good results, otherwise it is likely to result in a "parody" of the original style instead of a reproduction. According to this perspective, designers tend to duplicate the architectural ornaments and finishes of the heritage building so as to be hardly distinguishable from the original heritage structure. This approach raises the question of misrepresentation (Torres, 2009).

A second approach calls for using a similar or slightly different style. This approach is known as abstraction (Torres, 2009); it looks for the essence of the original building that can be used in a new addition and details that can be translated into a new but related style. This approach should be used with the same or more in depth understanding of the original style as when using it literally, because to recreate the "essence" of the building and selecting the details to be refurbished could be very complicated and, although it could avoid misrepresentation, it could also affect the physical integrity of the heritage building by drastically changing its original character if not done properly.

The third point of view is adopted by most international charters (such as generally applied in Europe), in which they favour that any new work or major alteration to an existing heritage building are best made obvious rather than veiled (Venice Charter, 1964; Douglas, 2006; Torres, 2009). This approach is called "Contrasting". The replacement of missing parts of the building must be distinguishable from the original so that the restoration does not falsify the artistic or historic evidence (Matero, 2006). The contrasting approach avoids potential misrepresentation by making clear what is original and what is new, plus it adds to the heritage building an element that truly speaks for the present. According to Venice Charter (1964), new additions can be distinctive in terms of form, colour, texture and material.

> Article 9 of Venice Charter (1964) states clearly: *"any extra work that is needed for reuse and which did not originally exist must be distinct from the architectural composition and must bear a contemporary stamp"*.

The clear and strong statement of contemporary alterations saves the truth for future generations, allowing them to understand the additive layers of interventions that ultimately appear in their heritage (Torres, 2009). This is the approach is the most recent, and is recommended today by leading organizations and experts in the conservation field when an addition needs to be done (Torres, 2009). Since this point of view is adopted in international charters, it will be also followed in this assessment criterion.

As an example: (**Figure 3.11**) shows a distinctive contemporary addition of metal handrail and entree floor slab providing entrance to Bait ar-Razzāz, in ad-Darb al-Aḥmar. The project team had to facilitate entree to the adaptively reused building using this architrave. The usage of contemporary materials was purposefully chosen to clarify the difference between the authentic building itself and recent addition.

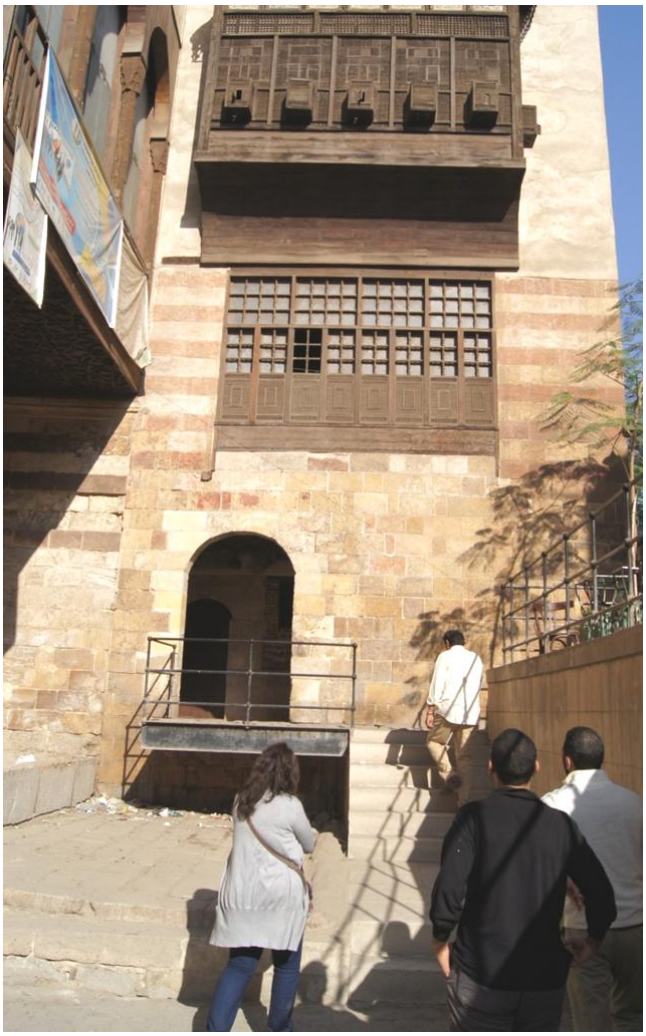


Figure 3.11 Modern steel handrail and entree floor slab implementations in Bait ar-Razzāz, in ad-Darb al-Aḥmar.

3.3.1.4. Visual compatibility of extensions

Adaptive reuse promotes finding a new function for older buildings, which sometimes necessitates making internal alterations or external extensions (أبو الفضل، 1998). Despite that choosing to expand a building by adding to it must be only in cases where the new function strives for more space/volume; contemporary extensions to adaptively reused heritage buildings could be used as an opportunity to enhance the architectural significance and character of the architectural heritage, as well as its context (Elkerdany, 2002; Douglas, 2006; Torres, 2009; Prihatmanti & Bahauddin, 2012).

> *"The use of contemporary architecture for additions to historic buildings is the best way to contribute to the historic fabric... By using a contemporary style, we add to the historic building elements that truly speak for the present" (Torres, 2009, p. 68).*

By assessing the relationship between old and new, researchers developed some design guidelines that better preserve and present the heritage building's form. Researches discussed the visibility of the new extensions, while others discussed the formal qualities of the extensions:

Visible versus non-visible extensions: Visible extensions can take the form of lateral and/or vertical annex to the building (either attached or detached), which means increasing the volume of the heritage building, thus changing its authentic morphology. Non-visible extensions mean adding floors underneath the heritage building in an underground level, or even by adding additional floors (such as mezzanine levels) if the building's interior space allows. Non-visible extensions increase the building's capacity to better house the new function without adding to the original volume of the building. If technically and economically feasible, non-visible extension would be more encouraged than visible ones (أبو الفضل، 1998).

Characteristics of the extensions: As a start, and according to Article 13 in (Venice Charter, 1964): *"Additions cannot be allowed except in so far as they do not detract from the interesting parts of the building, its traditional setting, the balance of its composition and its relation with its surroundings".* New parts of the building shall be designed in a simple manner which integrates harmoniously with the whole (Matero, 2006). أبو الفضل (1998), specified assessment criteria for assessing the aesthetic preference of alteration treatments, they are: *Harmony* in shape, colour & material; or *contrast*.

For more detailed design guidelines aimed to assess the level of cohesiveness between contemporary additions and the heritage building. Torres (2009) conducted a survey among professionals in the field, including both architects and conservationists, to help identify specific design elements and patterns that can lead to the success or failure of contemporary additions to heritage buildings. The main criteria to assess a successful and cohesive relationship between a heritage form and its contemporary addition are mainly:

- The control of the general volumes, mass and proportions, avoiding competition between the addition and the original building; the use of compatible materials, colours and texture.
- The new elements must be easily distinguishable from historic elements; that is to use modern materials, contemporary designs and/or proper interpretation methods.

- To place the new addition on a secondary location to avoid drastic changes in the urban view of the structure alone, are not enough to achieve cohesion between a heritage building and a contemporary addition.
- Surface articulations that include the arrangement, quantity, shape and scale of openings, linear and planar elements, enclosures, additive and subtractive forms, and their proportions, rhythm and arrangement, individually and as a group. The presence of surface articulation elements such as doors, windows and floor levels were a way to establish a more close relationship between the building and the spectator because they give a sense of scale.

According to the UNESCO (2008), even new buildings near heritage buildings should respond to many design constrains. In 2007, a request for technical report was sent to the UNESCO by the ministry of Culture, the Supreme Council of Antiquities (back then) and archaeologists to set rules for the construction of Cairo's new Financial Centre near the citadel (**Figure 3.12**) (El-Aref, 2007). Work on the building began in 2006 without the permission of the SCA's Permanent Committee for Islamic and Coptic Antiquities, which had twice refused to license development of the site. The original scheme constituted an encroachment on the citadel complex and violated Antiquities Law 117/1983 (El-Aref, 2007). The UNESCO prepared the report with very strict criteria that had lead to multiple design variations of the complex (**Figure 3.13**). In the issued report (UNESCO, 2008), they considered many rules that when followed, would reduce the visual impact of the new complex on the Citadel:

- The height of the Financial Centre near the Citadel to be no more than 31.55 m,
- The volume of the complex should be broken up into several parts which would better balance the urban form and volumes of the Citadel,
- The colour code should be composed of earthy colours to blend in the site,
- And the building's elevations should be redesigned in order to harmonise with the surroundings and minimise visual disturbance.

In Egypt however, adaptation projects usually reject proposals for expansions (Elkerdany, 2002), because most preservationists refuse to insert any type of modern expansions, even if the new function needs extra floor space and circumstances are appropriate (available annex land parcels, height regulations allowance, interior double height...etc). As an international example of contemporary extension to the Louvre Museum, أبو الفضل (1998)

mentioned that the glass and steel pyramid in the main courtyard (Cour Napoléon) is successfully harmonious with the rest of the Renaissance museum, despite being modern addition in the middle of a 13th century Palace. Designed by Ieoh Ming Pei in 1984, The Louvre's Glass Pyramid had faced a lot of opposition claiming it does not have any relation to the original Palace. Many people felt that the futuristic edifice looked quite out of place in front of the Louvre Museum with its classical architecture. Critics favoured it to be a dome, such as the many glass domes they are used to see around Paris, and they claimed that a glass dome would have been more compatible with the old building. Ieoh Ming Pei defended his design by saying that the pyramid is a pure geometrical form that fits perfectly in the rectangular courtyard of the Louvre (أبو الفضل, 1998) see (**Figure 3.14**).

Pei also found the pyramid shape best suited for stable transparency, and considered it compatible with the architecture of the Louvre, especially with the faceted planes of its roofs. Moreover, as a clever attempt to soothe public, Pei placed a full-sized cable model of the pyramid in the courtyard prior to its construction. During the four days of its exhibition, an estimated 60,000 people visited the site. Some critics eased their opposition after witnessing the proposed scale of the pyramid in its real-life scale and location (Wiseman, 2001). Although considered a modern structure, it constitutes a strong but yet pure visual element that enrich the whole historic context (Torres, 2009).

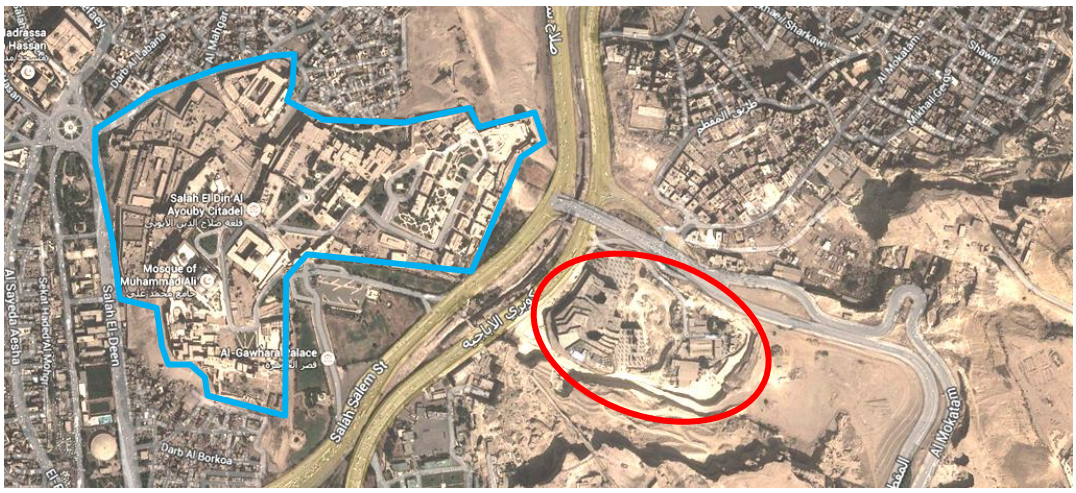


Figure 3.12 Location map of Cairo's Financial Centre in relation to the citadel.

The red boundary shows the location of the new project, and the blue boundary points to the Citadel's boarders and its proximity to the construction site. Image source: maps.google.com

Figure 3.13 Architectural renderings of Cairo's Financial Centre.

The design was developed multiple times in order to gain the approval of Cairo Governor Abdel-Azim Wazir to resume construction works. Images sources: (El-Aref, 2007), http://shakerconsultancygroup.com /images/officebuildings_cairofinacial_01.png, and http://i47.tinypic.com/s29nk7.png respectively.

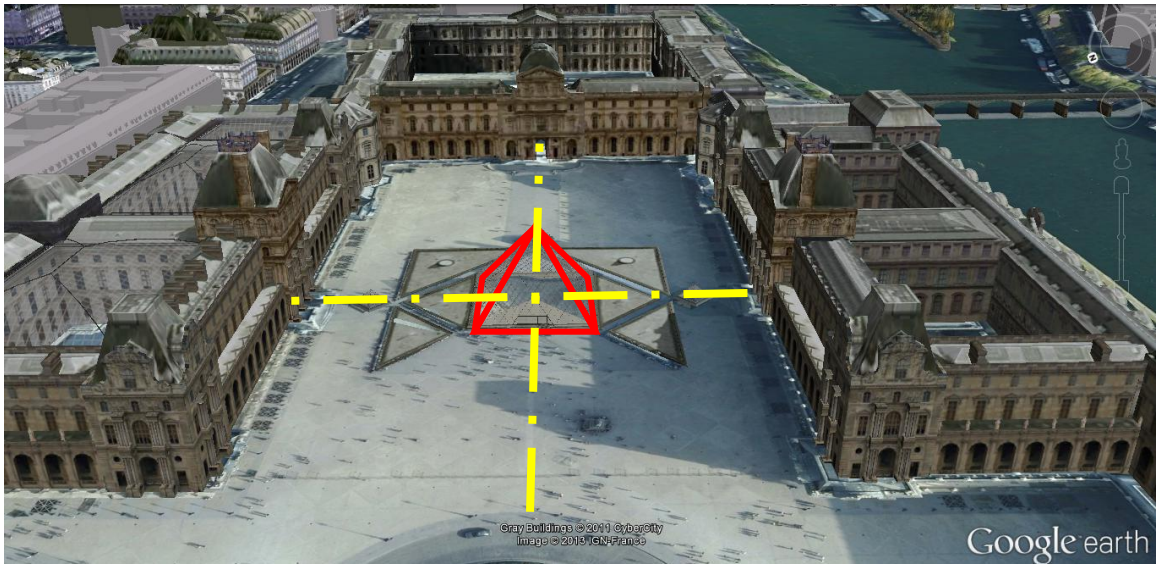


Figure 3.14 Aerial view of the Louvre's Pyramid.

The Pyramid is framed with a red square, and yellow dashed lines indicate its four-side axiality to the Louvre's main courtyard and towers. Image adapted after Google Earth.

3.3.1.5. Safety and structural stability

Structural and architectural alterations form parts of most heritage adaptation schemes (Bullen & Love, 2010), where changes of use often involve increases in imposed loadings (Douglas, 2006), and reuse of construction materials (Bullen & Love, 2010). Adaptation schemes in Cairo of less valuable structures often entail some modifications to the layout, configuration or morphology of buildings, and finding solutions to structural deterioration problems. The structure should receive a complete condition assessment by a design professional teamed with an experienced team (Clark, 2008). Professional consultants should test and revise the level of safety and health requirements to cover their minimum construction codes and regulations. According to Buildings Department of Hong Kong (2012), and from the perspective of heritage adaptation for reuse, the major building safety and health requirements which may affect the heritage building may be categorized as *structural considerations, fire safety provisions, and anti-theft measures*. In the following part, general guidelines are provided to describe this criterion.

a) Structural Considerations

- Structural Design for Alteration and Addition Works: The adaptive reuse of heritage buildings may involve the design of new structural works and/or the checking of structural adequacy and structural strengthening of existing buildings – whether varying in size, era, or method of construction. Thus, all new structural elements should be designed in accordance with the current building regulations and relevant codes of practice. In principle, the building regulations and codes of practice prevailing at the time of construction of the building may be used for assessing the structural adequacy of the existing portion of the building affected by the proposed adaptation works, provided that the design assumptions on which the building was originally based still apply (Buildings Department of Hong Kong, 2012). This, as well as many other changes of use necessitates strengthening the building (اللحام، 1996). Indeed, safety and stability are the criteria for any structural alterations; nonetheless, the aesthetic preference of such consolidations should be also examined. For example in al-Sam'a Khānah, reinforcing the structure had shown to achieve an improvement in the appearance of these exposed elements because they are covered with an appropriate cladding or finishing material (**Figure 3.15**).

- Structural Appraisal: Since the long-term durability of the valuable structure is essential for granting a safe reuse, it is necessary to appraise their current conditions and identify the extent of defects, deterioration and any damage (Douglas, 2006; Buildings Department of Hong Kong, 2012). Structural appraisal for heritage buildings should be carried out in a scientific and rational way, taking into consideration the deterioration in material properties over time and the validity of design parameters. For example, the gradual deterioration of buildings in Cairo might be caused by multiple factors, such as dust, rain, vehicle vibrations, ground water, and humidity. The high water table is the most serious of the deleterious forces that have increased drastically during the last sixty years in Cairo (Antoniou, Bianca, El-Hakim, Lewcock, & Welbank, 1985). It used to be accepted that the buildings in the Cairo were dry at ground level and often dry even in basement rooms. This is no longer the case. The increase of Cairo's population and the introduction of piped water supplies and water-borne sewerage is an important deterioration factor. Nonetheless, the always high water level of the Nile after constructing the High Dam in the 60's had also raised groundwater level. This excessive amount of water, which was often imperfectly drained, meant that water began to accumulate in the ground within the urban area of historic Cairo. Capillary attraction phenomena draw the dampness up to the height of the foundation walls or even above ground level. When the dampness in the wall reach natural air, any acids it carries might have a chance to form crystalline salts (**Figure 3.16**), which because of their expanding volume, could break up the materials of the wall, reducing the strength of the material and continuously spill off the surface, until the whole of the fabric is destroyed to the height which the ground water can reach. Restorers and preservationists have many ways to avoid this problem. As a solution adapted by the Aga Khan Trust for culture, the restoration team inserted ventilation canals underneath the foundations of School of Darb Shoghlan in ad-Darb al-Aḥmar (**Figure 3.17**). These ventilation tubes help in refreshing air beneath the building to minimize the effect of soil moisture.
- Design Imposed Loads: many heritage buildings were constructed with wooden floors resting on masonry or brick walls. These constructions were often based on traditional practice, craftsmanship and relevant prescriptive requirements that were prevalent at the time of construction. A complete set of approved plans and

structural calculations for this type of construction in many heritage buildings may not be available. When carrying out adaptation works, taking into account the possible material deterioration of these buildings, it would be prudent to carry out a structural assessment with site measurements of dimensions and tests for the material properties of structural elements respectively, to substantiate the structural capacity of these elements for adaptive reuse. In essence, direct comparison of the design imposed load of the proposed adaptive reuse against that of the existing use is not recommended for heritage building as the existing use may not tally with the original design imposed load. As an example, changes of use, particularly from residential to commercial, often involve increases in imposed loadings. The standard imposed floor loading for residential dwellings is at most half of loadings for offices (Douglas, 2006).

Figure 3.15 Added structural elements in al-Sam'a Khānah.

Steel beams were added to bare the load of the dance floor above it. These consolidations besides supporting the structure do not harm the aesthetics of the building.

Figure 3.16 Salt layer on walls of Hassan Pasha Taher's Mosque.

Although this mosque was recently restored in the early 2000s by the Supreme Council of Antiquities (Warner, 2005), a Salt layer has formed on stones at level of 1.5 m of walls of Hassan Pasha Taher's Mosque. Capillary phenomena are wide spread in Cairo's buildings due to the rise in ground water levels.

Figure 3.17 Ventilation openings for foundations of Darb Shoghlan school.

This openings lead to air tubes underneath the foundations in ad-Darb al-Aḥmar district that is characterized by its high-bed water level.

b) Fire Safety Provision

According to اللحام (1996), Douglas (2006) and many others, applying codes of "Fire safety" is an important assessment criterion of adaptively reused heritage buildings. The primary objectives of assessing the fire safety standards prescribed in the fire safety codes are to ensure that occupants are able to escape from the building safely, fire fighters can enter the building safely to fight the fire and for rescue, and to prevent the spread of fire within the building and to adjacent properties. Protection of the properties themselves and market shares against damage by fire is not the primary concern. As such, owners and designers may wish to enhance the fire safety provisions in their heritage buildings to protect such properties of high heritage value against damage by fire.

For assessing heritage adaptation projects, at least the areas affected by the proposed works shall comply with the current standards prescribed in the fire safety codes (Buildings Department of Hong Kong, 2012). On one hand, local fire safety codes provide technical standards to assess the passive fire protection measures including the provision of means of escape, means of access for fire fighting and rescue and fire resisting installations in a building (Yung & Chan, 2012). On the other hand, computer models can assess fire safety variables and are valid methods for research worldwide. Agent based modelling is commonly applied to virtually simulate human reactions to themselves and to the building in case of fire (Augustijn & Flacke, 2010). As an example, Augustijn & Flacke (2010) simulated evacuation behaviour for a reused Chinese supermarket in the Netherlands. The output of running such models in adaptively reused heritage buildings would enable evaluator personnel to quantify fire risk in terms of: escape period, proximity to fire exists, size capacity of fire exists, fire-safety officers in the building, priorities of saving authentic materials, obstacles and dangerous architectural features, signals for escape routes, vertical and horizontal escapes and responding to instructions. However, there is a gap in research about fire safety in functioning heritage buildings, where different variables and priorities might be re-organized such as protecting significant fabric.

Most of the adapted heritage buildings in Cairo contain basic means for fire fighting such as manual fire extinguishers and sand buckets. One successful reused building in terms of fire fighting contains advanced fire detection and resistance systems which is Sabīl-Kuttab of Isma'il Pasha (**Figure 3.18**). This building was reused as the Egyptian Textile Museum since 2009. It contains historic fabrics and textiles that belong to different Egyptian eras.

Despite being expensive, installing this fire detection and fighting systems had been a priority of building management because of the valuable collection it posses.

a


b

Figure 3.18 Fire fighting equipments in the Egyptian Textile Museum.

Images show fire resistance mechanisms in Sabīl-Kuttab of Isma'il Pasha. Image (a) Automatic door closure in case of fire; image (b) complex wiring of fire alarm systems installed on walls.

c) Anti-theft Measures

Valuable elements that belong to adaptively reused heritage buildings, in addition to probably valuable exhibited items, both represent priceless items that should be protected. According to Douglas (2006), the key issues of security and safety are, paramount in building adaptation schemes, whether occupied or empty. Security in is important for a variety of reasons: to minimize theft of building materials, components, plant and equipment; to reduce breaches of security so that unauthorized personnel are prevented from entering the refurbished building (or even during adaptation work); and to prevent non-essential personnel from entering the work-zone so that they do not endanger either themselves or others (Pentagon Renovation Programme, 2005). For larger schemes, this may require (a) permanent security guard(s) on the premises during the adaptation scheme.

Assessment of anti-theft measures of heritage adaptive reuse projects vary in accordance to many variables. Some of these variables are the nature of the new function (governmental building, private company, jewellery exhibition...etc), the building's size, location, and the nature of its context, in addition to its value. Security gates, personnel, alarms and many other tools can be used to protect the building and its contents from

vandalism and theft actions. However, separate security assessment of each case of a building is essential, because some results might sometimes seem contradicting. As an example given by Douglas (2006), out-of-hours working may be a standard requirement or feature of the adaptation contract. On one hand, this might bring problems of security and degree of supervision to ensure operatives are in attendance at the correct times. On the other hand, constant presence of people in the building sometimes might lead to reducing crime and theft rates in and around the inhabited building.

3.3.1.6. Facility management and maintenance

An effective management plan plays a key role in protecting and enhancing the historical environment and is important for the successful reuse of heritage structures (see for example (Jonas, 2006, Yildirim, 2012, and many others). A heritage management plan is a detailed document which a specialist prepares after consulting with the different stakeholders and aims to help looking after heritage assets (Jonas, 2006; Heritage Lottery Fund, 2008a). More specifically, maintenance and facility services are usually highlighted in literature for their importance in the process of managing any reused heritage asset (Jonas, 2006; Wilson, 2010; Prihatmanti & Bahauddin, 2012) because they (1) help looking after heritage sites, (2) upkeep its good condition, (3) sustain the building's quality and performance, (4) prevent decay, (5) manage resources and expenditures, and (6) avoid repeating of same problems (Douglas, 2006; Heritage Lottery Fund, 2008b). The development of integrated policies, strategies and procedures in the management plan that are focused on the protection and enhancement of the cultural significance of the site is an essential part of heritage adaptation process (Cantacuzino, 1990). Some local efforts had worked on developing a comprehensive some framework for maintenance of conserved buildings (**Figure 3.19**).

As an example in Bait es-Sennarī, maintenance personnel have to check a safety valve on daily basis. This valve is responsible for protecting the valuable structure from extra-raise of ground water level, the person in charge ensure clearing gutters and keeping drains clear. The evaluation of performing this check and its punctuality is essential to assess the level of maintenance the building receives. Another example shows inefficiency of housekeeping, storage and routine cleaning in as-Sultān Qānṣuwah al-Ghūrī's complex that lacks a proper storage spaces (**Figure 3.20**). Accumulated dust in old buildings' corners increase their deterioration rates (Shopsin, 1986).

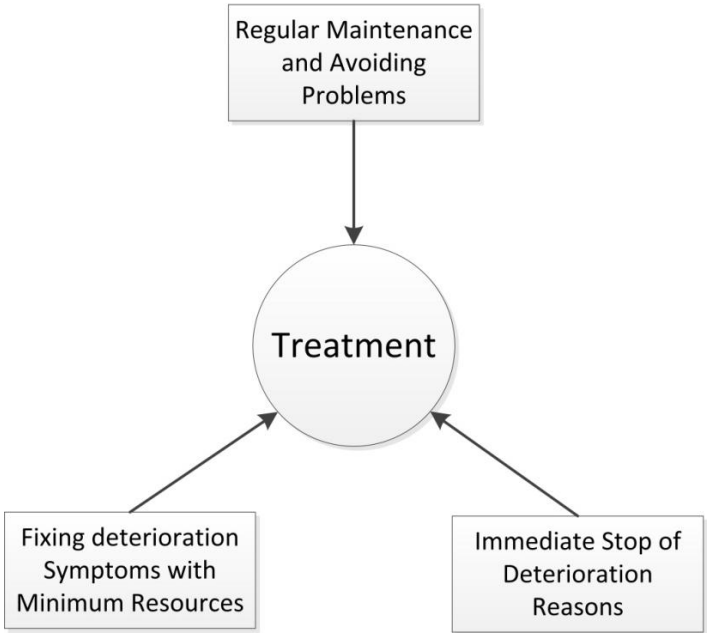


Figure 3.19 Conceptual framework for maintenance of heritage buildings in use.

Adapted after a lecture by Al-Morry, T. (2013).

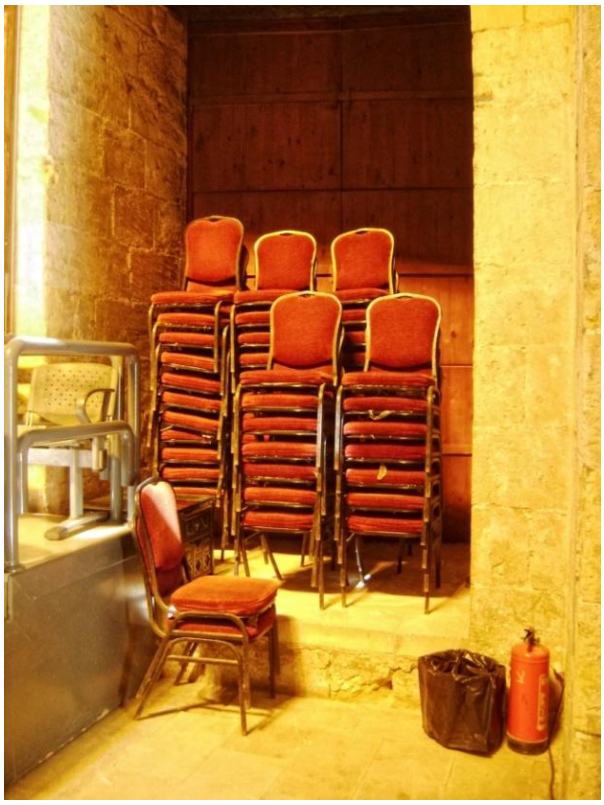


Figure 3.20 Chair storage in a doorway in as-Sultān al-Ghūrī's complex.

3.3.2. DESCRIPTIVE ANALYSIS OF THE PROPOSED CRITERIA TO ASSESS THE SUCCESS OF NEW FUNCTION

The following part presents these assessment criteria: compatibility between building and new function, basic environmental qualities, accessibility, economic and intangible benefits, and minimum adaptation costs.

3.3.2.1. Compatibility between the spatio-physical characteristics of the building and the new function

The key to a successful building is not just how it looks; in addition, the way it functions. And since adapting heritage for reuse is a well known approach to overcome functional obsolescence of old buildings' typologies, the debate on the binary relation between form and function of heritage buildings has always been on the agenda of architectural discourse. In the past few years, Langston et al. (2010), Buildings Department of Hong Kong (2012), Conejos and Langston (2010) and other researchers designed, developed, and tested a number of methodologies to help selecting optimal or appropriate new functions for heritage buildings. In general, these methodologies emphasize the importance of the good compatibility between the spatio-physical characteristics of the heritage buildings and the requirements of the new function (Hansen, Haugen, & Leaman, 2005; Shull, 2005; Volker & Prins, 2005; Aydin & Yaldiz, 2010; Eyüce & Eyüce, 2010; Yildirim, 2012).

Adaptation for reuse normally entails adding walls and floors or dividing openings in these elements to articulate the previously opened spaces. Thus in order to assess the compatibility/appropriateness of the new function, there is a need to provide a deep analysis of project requirements versus what could be achieved with minimum changes in already built structures. The literature presents two main approaches to assess the appropriateness of the new function and the architectural performance of adaptively reused heritage buildings: a) functional continuity versus discontinuity, and b) the absolute architectural performance of adaptively reused heritage building. The first examines the appropriateness of new function in relation to the old one, and the second is by examining the architectural spatial supply versus new functional program.

a) Functional Continuity versus Discontinuity

The first approach primarily examines the correspondence between the new function and the original function of the building. According to Douglas (2006), adaptive reuse projects follow one of four scenarios: adaptation to same use (refurbishment), mixed adaptation that is inspired by original use, fully functional conversion, or conversion into tourist attraction site for visitors. These four scenarios are discussed in the following section to compare them and to conclude from the literature, the most successful one in satisfying the new function.

Adaptation to same use (Refurbishment): it is continuing, modifying or reinstating a significant use, by just making some developments to the same old function it was built to perform, in order to meet contemporary needs (أبو الفضل, 1998; Afify, 2002). It sets the new function to be exactly similar to the original function of the heritage building, or at least is derived from the same building typological class. A surviving example is Wikālat Sulāymān Aghā as-Seleḥdar (**Figure 3.21**). It was originally a commercial caravanserai, and after restoration, it is currently used as small commercial shops for souvenirs and handmade products yet the upper floors were not reused. Another example of refurbishment in Cairo is the traditional public bath Ḥamam el-Malatyali (**Figure 3.22**). Its original function which is a public bath since 1780 AD was restored. Adaptation to the same use usually entails minor modifications to the internal layout. It may also consist of exploiting empty or unused space within the building, such as the roof space or basement area (Douglas, 2006).

Mixed adaptation: having a mix of old and new functions, or at least have a function that is related to the original one in some sense (Douglas, 2006). Sabīl and Kuttāb Qayetbāy (**Figure 3.23**) forms an example of that mixed functional adaptation projects. The Sabīl on the ground floor is no longer used, it forms an obsolete function in Cairo's contemporary context (El-Habashi & Nada, 2011). The rest of the building is currently functioning as an educational space. The first floor currently functions as a library and kindergarten for neighbourhood children whereas the original function contained a small school (Kuttāb) (Warner, 2005). While the upper floor (3rd floor) houses a library that holds a fine collection of history books. Two rooms in the building are used on secondary bases as offices for library managers, while a large hall on the 2nd floor is used as the Arabic film and Television school. The whole building is managed by the ministry of culture. Another

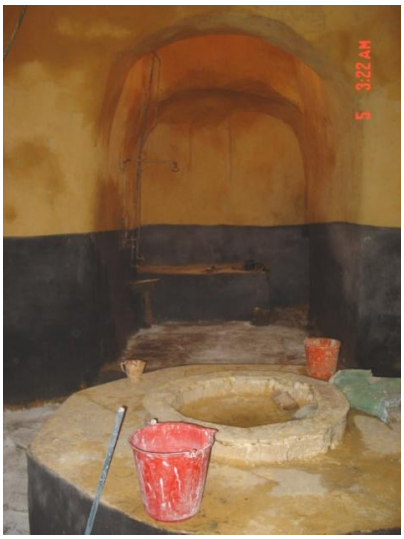
example of mixed adaptation is the Community College (ROC van Twente) in Hengelo, the Netherlands (**Figure 3.24**) that was a textile factory. Currently it is used for technical education related to textiles industries and other technologies in the region of Twente. The new function is considered related to the original one. The region of Twente had been always famous for textile industries; therefore, the new use shows that education of industrial activities is still persistent in the region. The integration of the heritage hall with the modern design of the expansion leads to an admirable and sublimating increase the significance of this complex (IAA Architecten, 2012).

Full functional conversion: is the change of function of a redundant building that differs from the original one it was built for (Shopsin, 1986; اللحام, 1998; أبو الفضل, 1996). When the original use is totally impracticable it is possible to consider alternative uses for old buildings. Walters & Brown (2004) emphasised that through a process of conversion and adaptive reuse, the same building form can accommodate several different functions during its lifetime. Alternatively, non-residential projects such as banks into cafés or offices into hotels are other popular forms of adaptive reuse in urban areas (**Figure 3.25**). Conversions to other uses are more awkward than same-use conversions. The new use may involve spatial and functional requirements that are quite different from the original. This often requires structural alterations to accommodate the change of use.

Figure 3.21 The front shops of Wikālat Sulāymān Aghā as-Seleḥdar.

This Wikālah was originally a commercial caravanserai, and is currently used as small commercial units for souvenirs and handmade products.

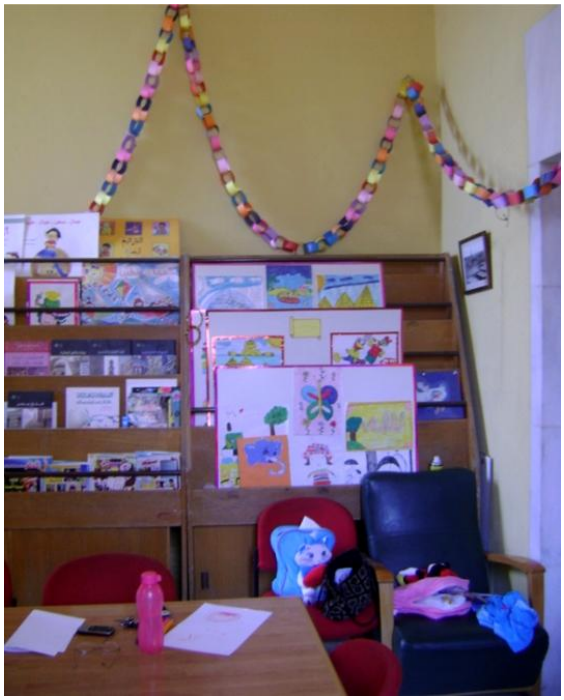

a



b

Figure 3.22 Ḥamam el-Malatyali is still functioning as a public bath.

Image (a): a washing basin; image (b): hot steam room.


a


b

Figure 3.23 Sabīl and Kuttāb Qayetbāy.

The building is being used for mixed educational purposes since 2002. Image (a) children library and summer school; image (b) specialized library of Islamic Civilizations.

Figure 3.24 Community College for technical education (ROC van Twente).

This college in Hengelo, the Netherlands was originally a textile factory. Upper image describe the original building (www.iaa-architecten.nl). Lower images show the contemporary college.

Figure 3.25 Bait es-Sennarī interior atrium.

Originally built as a residence; since 2010 it is used by Bibliotheca Alexandria as a cultural space that houses lectures, seminars, workshops, music, and art exhibitions. Its adaptive reuse is an example of full building conversion of function.

Tourist-attracting functions: This option is occasionally considered in literature to be conservation for the tourism industry (Smith, 1988). Tourism frequently provides new opportunities of retaining the exact original building's state, when original uses are no longer appropriate, and simultaneously when the heritage building is too valuable and well preserved to be used for any function other than be opened for public as a museum (El-Habashi & Nada, 2011). According to أبو خشبة (1997), opening heritage buildings for tourists imply minimum alteration and leaving most of the building intact and well "museumified". This approach needs careful considerations not to turn the whole historic quarters into museum zones (Afify, 2007). A policy of encouraging tourism should never end up damaging the social, cultural and economic structures and endangering its traditions and identity. Instead, part of the need to revitalize historic quarters is to conserve heritage buildings for tourists, but also to link these museums to lively urban life of local industries, education and services and/or cultural activities (Rodwell, 2007).

Many conservators perceive that the adaptive reuse projects are successful when the new use is basically different than its original use, where original use had faced one or more obsolescence factors. However; they face a lot of opposition when a building's original design is totally remodelled that it is no longer recognized with its previous characteristics. The new use must not be too different or inconsistent with the previous use as to radically affect the building's historical character or reputation (اللحام, 1996; Douglas, 2006).

As a conclusion, the continuation of use is considered an evidence of successful architectural and urban conservation (Rodwell, 2007, p. 207), and is the best adaptation strategy as long as it is economically and culturally feasible (Pickard, 1996; Douglas, 2006; مهنا, 2006؛ Hsu, 2007; Rodwell, 2007). The logic is that (1) refurbishment only entails minor modifications to the original layout and morphology of the building, (2) it permits the utilization of empty or under-used spaces and already installed infrastructure within the building, (3) it can help gain community approval and support for the adaptation project (Ouf, 1995), and (4) it will have a minor impact on the building's historical character, cultural significance or reputation. Accordingly, the best use will very often be the use for which the building was designed, and the continuation or reinstatement of that use should certainly be the first option when the future of a building is considered.

> *"Conserving use is the most appropriate and preferred form of conservation"* Australia ICOMOS Incorporated, (2000), Article 23.

Furthermore in the Islamic-Egyptian context according to مهدى, (2002) and UNESCO (1980, Article 5), reuse according to the origin endowment is a virtue in Islamic religion, because the will of the endower is respected.

However, there exist two points of weakness in the first assessment approach of functional continuity versus continuity:

The first is that not all original uses are viable or even necessarily appropriate for rehabilitation. This is because the nature of uses changes over time, along with the paradigm shifts in technology, transport and planning. So in some cases, the same typological class of function may now totally differ and requires different spatial configurations to serve its purpose (Symes, 1994), thus considered to be less compatible with the building than a totally different new function. For example, it is hard to think of old commercial buildings such as caravansaries and wikālat to be converted into a contemporary commercial mall with a hotel/motel on top, along with their entire acquired complex functional program and engineering implementations. Instead, it can be converted into mega book store, souvenir shops, jewellery and antique shops, motels, hostels or other much simpler kind of commercial or residential activities that does not require strong interventions.

The second point of weakness in the first assessment approach is that most heritage buildings in Cairo have been subject to changes and alterations since they were built, or even may have been subject to adaptation for reuse once or more during their life time. Consequently, it becomes hard to find untouched heritage buildings in the same status as they were built originally to best represent the original function. These alterations might form additive layers of heritage that should be preserved. So the pre-adaptation architectural morphology might not represent the original building typology. Thus, determining the success of the new use based on false identification of function might be misleading to the assessment procedures.

b) Architectural Space Performance

The level of compatibility of the new function with spatio-physical characteristics of the heritage building should show propriety of the form to new functional requirements as a sign for good architecture by ensuring functional efficiency (Hansen, Haugen, & Leaman, 2005; Shull, 2005; Volker & Prins, 2005; Aydin & Yaldiz, 2010; Eyüce & Eyüce, 2010;

Yildirim, 2012). Re-adaptation projects of heritage buildings are architecture work, that they should show contemporary suitability for use as an indicator of success. This calls for a more comprehensive way of measuring performance. Matching demand and supply is one of the key requirements in any conversion scheme. According to Aydin and Yaldiz (2010), space planning is about finding the most appropriate match between supply (the buildings and space available before adaptation), and demand (the needs of the occupiers and the functions they and the space use). An existing building that is scheduled for conversion has a set or limited amount of space to accommodate the new use. This is the supply side of the conversion equation. The demand side is determined by the needs of the client, design professionals, users, planning controls, and the community. In the middle lies the rational-adaptive approach, which accepts that quality is a difficult and uncertain aspect to measure but that the development of tools to think about the impact of the design could be beneficial (Volker & Prins, 2005).

Although most architectural oriented research on environmental qualities did not discuss adaptively reused heritage buildings or consider implicitly the importance of minimum intervention, Aydin and Yaldiz's methodology can be considered as a milestone when assessing the architectural space performance of new functions in adaptively reused heritage buildings in Cairo. In their research, Aydin and Yaldiz (2010) introduced a methodology to assess the impact of the design on reused historic building in Turkey. Their assessment is based on the idea of comparing what is desired to what is actually achieved, in order to be objective in evaluating new functional appropriateness to original layout. First, the required functional program desired by the organization responsible for reusing the building were studied and analyzed. Secondly, Aydin and Yaldiz (2010) compared the results of the first phase to current users' satisfaction as a method of verifying the primary results. They assessed the users' perception on the following variables: "*spacious, beautiful, peaceful, comfortable, convenient, tidiness, maintenance and luxury"* respectively. Other researchers, such as Elzeyadi (2001) categorized another level of environmental "latent qualities". This level focused on a number of physical and psycho-social qualities of reused spaces such as *personal space and crowding, personal control, connectivity, ergonomics and spaciousness, flexibility, aesthetics and indoor decor, way finding, privacy, territoriality, personalization, safety, and security.*

As an example, "*Flexibility*" is a spatial quality that enabling minor if not major shifts in space planning – to reconfigure the layout and make it more efficient. Since conversion

enables the owner or user to obtain maximum potential of the property, designed new use shall be assessed for space and furniture flexibility when assessing new use for heritage structures (Shull, 2005; Douglas, 2006). That is why rooms that are "loose fit" are more of an asset than rooms that fit "perfectly", where different circumstances can be accommodated, since uses rarely stay the same (Shull, 2005). Common shapes are the best way to plan spaces. Sometimes it is appropriate to compensate structural elements to provide large flexible spaces, however this should be rarely done. Minimum intervention criteria might stop plans for extensive alterations, even if it will allow space flexibility, because ultimately, new uses have to be well chosen to secure a building's survival (Pickard, 1996).

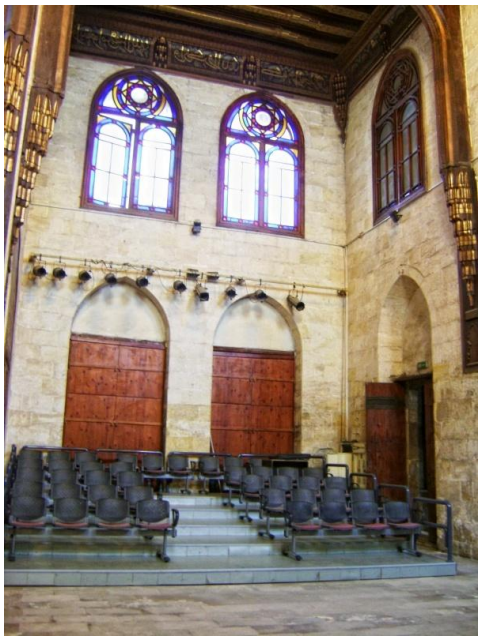
Īwān of Khanqāt as-Sultān Qānṣuwah al-Ghūrī sets a successful example of flexibility of inserting new function for reuse as auditorium, while having no need to alter any of the physical fabric or partitions (**Figure 3.26**). The new use as auditorium for cultural performances needed extensive amount of furniture for the audience to be added inside the Īwān of the Khanqāh. In addition, purpose electrical lighting is also required for the show. The added furniture was designed to be easily dismantled and stored away when the hall is not used for performances, while the electrical equipments can be harmlessly uninstalled. In this case, effective management system plays an important role in using resources wisely to attain maximum flexibility possible (Douglas, 2006).

Elzeyadi's (2011) and Aydin and Yaldiz's (2010) assessment methodology are based on evaluating the adaptively reused heritage building after being occupied and operating for a while. Their approach is based on Post Occupation Evaluation, which depends on real-life situation in which the needs of the new program could be assessed after occupation and operation for a while, and according to the initial desires of the owner and user (Yildirim, 2012). Despite all the research and application advancements, the Egyptian law of antiquities number 117 for the year 1983 does not provide any design guidelines for meeting best functional performance in reused buildings; it only specifies that any proposed utilization and alterations shall be authorized by a committee from the Ministry of State for Antiquities Affairs (article number 13.4). In spite of these gaps in local laws and regulations regarding re-organizing spaces of new uses into old structures, there exist few examples of successful new uses that preserve the authentic fabric intact. Two examples are discussed, one of high significance historically and architecturally, and the other is of much lesser value. Discussing contrasting, but yet successful examples aims to

stress that all levels of valuable structures can probably be reused successfully in terms of selecting the appropriate new function that best fits the building's layout and space configuration.

The first example is Sabīl-Kuttab ʻAbd er-Raḥman Katkhudah, which shows high value of architectural significance (**Figure 3.27**). It is currently used as a gallery and shop for the products of the Centre of Traditional Crafts in Fusṭāṭ. Minimum interventions were done to the authentic fabric of the building. The reuse plan just reused the spaces the way they existed without any alterations or re-partitioning. The new use required only three low tables to display the centre's products.

The former Darb Shoughlan School stands as the second successful example of fitting in the demand of the new function in a less valuable heritage structure (Bianca & Siravo, 2005). The original building was estimated to be built in the late 19th century, and only walls and few slabs remained with almost no ornaments or embellishments (**Figure 3.28**). The Aga Khan project made use of the former school's close proximity to the historic wall and Al Azhar Park, as well as its potential, given its location and size, to serve the community. The building's adaptive reuse project planned that the spaces be altered extensively as part of a multi-phased utilization program. First, a visitor centre and the Aga Khan Offices are introduced, then after finishing the Aga Khan projects in Cairo, a combined community facility would replace the offices (Siravo, 2004). An orientation and exhibition space and a rooftop area with views of the park and the Citadel will accommodate visitors, while recreational as well as family, educational and community services are housed in other parts of the building. This programme introduces much needed services in a context that sorely lacks public facilities. The conversion of the structure also includes provisions for the future reuse of the building as a guesthouse to generate revenue for the orientation of the planned community development agency.

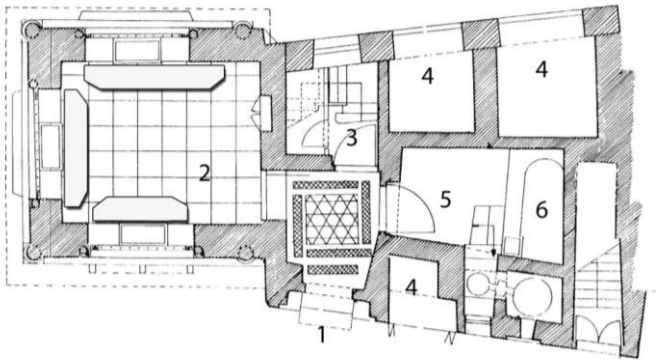

a


b

Figure 3.26 Khanqāt as-Sultān Qānşuwah al-Ghūrī.

Image (a) the hall when the chairs and lighting equipment are installed and ready for receiving the audience; image (b) the hall when no cultural event for long times the chairs is dismantled, the platform gets removed and the electrical light equipments are uninstalled.

1. Entrance
2. Tasabīl Room
3. Stairs to Kuttab
4. Shops
5. Opening well
6. Cistern tank



a


b

Figure 3.27 Sabīl-Kuttab ʻAbd er-Raḥman Katkhudah.

Image (a) Reuse plan indicating the reuse of the Tasbīl room as a gallery displaying on small counter units; plan adapted after: www.archnet.org. Image (b) The gallery of traditional handcrafted pottery displayed on low tables in Tasbīl room.

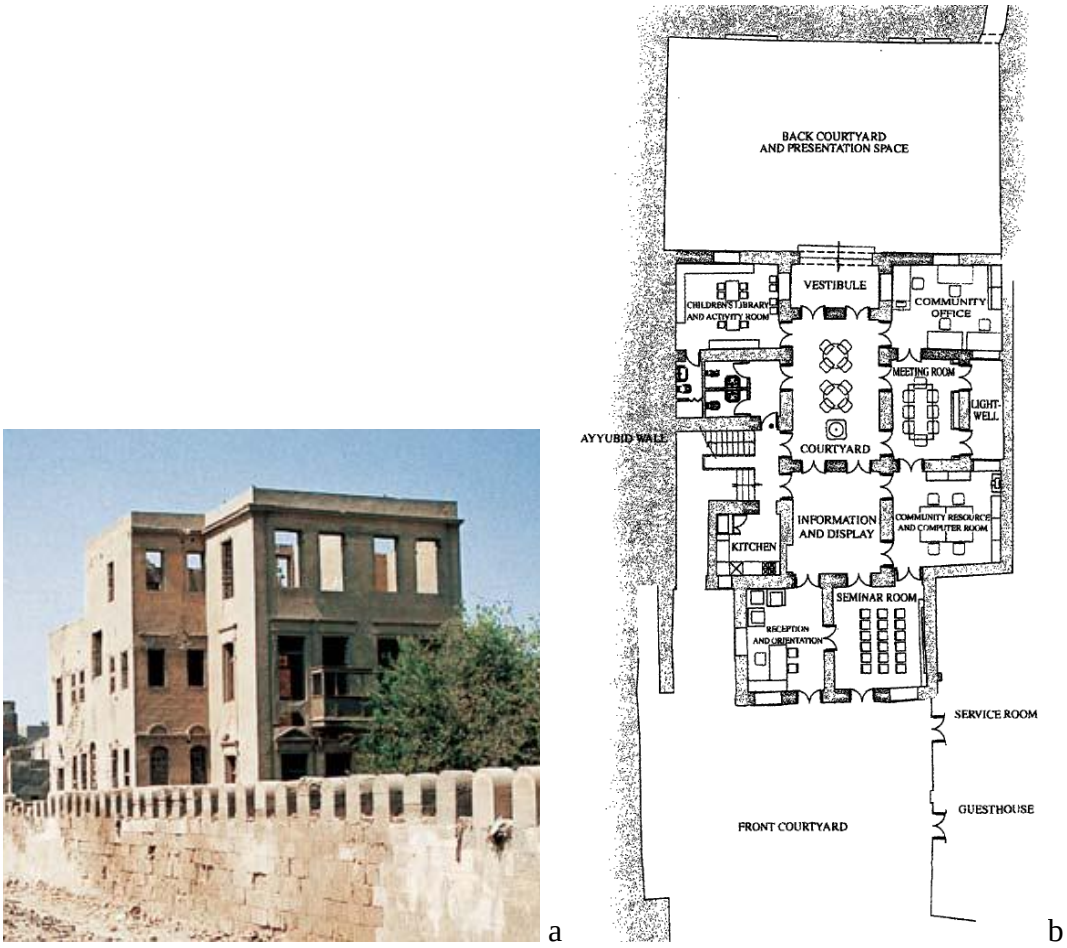


Figure 3.28 Darb Shoughlan Community Centre, ad-Darb al-Aḥmar.

Image (a) the former school before rehabilitation and adaptive reuse showed less historic and architectural value. Image (b) Ground Floor Plan after alterations. Images sources: Bianca and Siravo (2005) and Siravo (2004) respectively.

Space Syntax is considered a useful tool for measuring the performance of architectural program. Space syntax quantify and describe how easily navigable any space is, useful for the any building typologies where way finding is a significant issue. Space syntax has also been applied as part of P.O.E. to predict the correlation between spatial layouts and social effects such as *crime, traffic flow, sales per unit area*, *cultural communication and telecommunications* (Campbell, 2011), *movement* (Zimring, 2003). Campbell (2011) used space syntax to survey heritage architectural spaces, specifically South Asian caravanserais from the 16th through 18th centuries AD, such that the structural information gathered facilitates in-depth spatial analyses. Campbell followed historical evidence for change in physical arrangement of spaces according to the culture and lifestyle at these times. He combined the study of the original physical spatial arrangements with consideration of the new functional uses of spaces.

3.3.2.2. Basic environmental qualities

Attaining a satisfactory level of environmental qualities should be considered in adaptively reused heritage buildings (Elzeyadi, 2001). Basic environmental qualities represent everyday qualities that enable individuals and groups to perform their basic activities, behave, and act appropriately and predictably in the adapted heritage building regardless any specific function. Post occupation evaluation and environmental/behaviour research have developed several methods to assess the satisfaction of these qualities and set thresholds for each indicator's primary requirements (Douglas, 2006). Elzeyadi (2001), Volker and Prins (2005) and Hansen, Haugen, and Leaman (2005), introduced the following measurable attributes: *ambient comfort, lighting and views, and sensory comfort.*

As an example of ignoring problems of olfactory comfort, Bait es-Sennarī's users suffer from bad smells. The house was originally built as a residential dwelling; currently it is used by Bibliotheca Alexandria as a cultural space that houses lectures, seminars, workshops and courses. Bait es-Sennarī lies beside a factory and storage for herring and dried salt fish of a famous store. In most of its spaces, users smell the distinctive smell of salted fish, to the extent that curators and lecturers usually notify the representatives of Bibliotheca Alexandria of that issue. Although the street is almost clean and air refreshers are installed in most building's rooms, adapting the building for reuse should have dealt with this problem more efficiently.

3.3.2.3. Accessibility

One of the primary relationships between heritage reuse and its sustainable conservation is to consider equitable access to heritage resources by the local community and visitors (Nasser, 2003). Adaptively reused heritage buildings shall be accessible to welcome different groups of users and produce an equitable and a barrier-free environment. These conditions are mentioned in literature to be of the primary goals of heritage reuse. New function of adaptively reused heritage buildings determines the type of anticipated users and the commuters' travel distances to reach the building, and involves ease of circulation inside it as well. Literature discussed site accessibility assessment in two concepts: 1) site accessibility on architectural scale, and 2) in an urban scale. The site accessibility on architectural level shall guarantee full site inclusion and being physically accessible for all;

while urban level of accessibility shall guarantee the ease of different groups of users to arrive to the building from the surrounding city neighbourhoods.

a) Site Accessibility on Architectural Scale

Adapting heritage for reuse should involve sufficient work to prepare the old structure to welcome users, and to produce a barrier-free informative environment (UNESCO, 2007). Site accessibility is mentioned in literature in both meanings, physical easiness for people accessibility, and open accessibility for information and resources related to cultural heritage. Both accessibility meanings shall consider special accessibility measures for disabled and elders.

The right of basic accessibility for all users have been carefully laid down in the ICOMOS charter for the interpretation and presentation of cultural heritage sites (UNESCO, 2007), the report prepared by the (Heritage Lottery Fund, 2012), and the Burra charter (Australia ICOMOS Incorporated, 2000). Principles describing the right of basic accessibility for all users have been carefully laid down in the ICOMOS charter for the interpretation and presentation of cultural heritage sites (UNESCO, 2007), the report prepared by the (Heritage Lottery Fund, 2012), and the Burra Charter (Australia ICOMOS Incorporated, 2000). *Ease of way finding, full site enclosure, clearance of circulation routes, clear signs and labelling and barrier free spaces* are some of the criteria discussed in detail by (Buildings Department of Hong Kong, 2012; Douglas, 2006) describing measurements to make reused heritage building easily accessible for all users.

One of the indicators is *full site inclusion,* which means accessibility to all spaces and elements of a building. It is an indicator for assessing the degree to which adaptive reuse project facilitates building conservation. Heritage adaptation schemes usually consider utilizing the primary spaces such as the Majlis halls, courtyards, and large rooms with rich architectural details. Secondary spaces such as dim small rooms, basements, roof pantries and many others are usually marginalised in the adaptation design. Re-programming the new function according to available spaces should consider involving all spaces into the program efficiently. Utilizing marginal spaces is beneficial in two aspects. The first, when users enter marginalized spaces more frequently, this increase the probability to spot defects or deterioration symptoms of the authentic fabric. Regular cleaning staff and space managers can also observe such symptoms easily, and take protective measures. The second benefit of using all spaces is to ensure that the building is not underused. Part of the

task of selecting new function for heritage buildings is to make use of every potential available in the asset to achieve the desired economic or socio-economic goals. The following example sets how to best use every space as part of the rehabilitation of al-Ashrafīyah Mosque and school in Ta'ez, Yemen (**Figure 3.29**). During conservation works, the responsible team found out about closed basement. The basement of the mosque contained mausoleums of historically important kings that ruled this region; while some other rooms were vacant. The conservation team is re-designing a tourist trail path that goes around the ground floor to go downstairs and visit mausoleums and a small museum about the history of the local inhabitants.

In the heart of Historic Cairo, and proximate to Bait as-Seḥīmy, lies Wikālat Bāzar'ah. Although it is 300 years old, it preserves its upper floors intact (Aalund, 1980; Warner, 2005). It is a typical Wikālah building, ground and first floors were used to store and sell merchandise, while the second, third and fourth floors were used as residences for the travelling merchants and their families. It was restored by the Supreme council of Antiquities in 2001 to house cultural activities and concerts, while the first floor was used as offices for employees of the Supreme council of antiquities. The courtyard was used as an auditorium for music and cultural performances, while the two lower floors where used as workshops for education of traditional crafts available in historic Cairo. Upper residential units were vacant and not utilized. However, since 2005 the building has been only functioning as office building for the Ministry of State for Antiquities Affairs. The offices were placed in the ground and first floors only, while the upper floors are kept vacant because it is difficult to use them as office spaces. **Figure 3.30** shows a proposal by Aalund (1980) and عزمي (1984) to use the upper floors as hotel. These proposals might be premature in that specific case, but ignites a discussion of how to best utilize vacant spaces in Wikālat Bāzar'ah. The outmost priority is not to keep this valuable fabric unused (Aalund, 1980; أبو خشبة , 1997; مهدى, 2002).

According to Douglas (2006), a common feature of many town centres is the widespread disuse or under-use of upper-floor space above ground level properties in some inner city streets. This problem can manifest itself in inner urban areas even where the demand for retail and office space is high. Empty spaces are considered a waste of resources, and unvalued potential. Vacant and not used spaces in heritage adaptive reuse plan are considered a threat to the sustainability of this building.

In addition, in central Cairo, real estate values are too high to letting some spaces to be ignored and closed. In the case of Wikālat Bāzar‘ah, this had lead eventually to decreasing the annual revenues of the adaptive reuse project, and thus, threatening its sustainable maintenance. Enrolling heritage buildings partially under legitimate real estate market is beneficial in terms of maximizing economic income, while stressing laws of conservation that limit intervention and assure regular supervision of preservationists (Buildings Department of Hong Kong, 2012).

Accessibility for disabled is the second indicator of site accessibility on architectural scale. While the right for accessibility for disabled people need special requirements, reused heritage building and landscapes in Egypt were originally constructed with no support for such cases or according to current codes (El-Halafawy & Soliman, 2002). When the term ‘*disabled people*’ is considered, one may immediately think of wheelchair users and other people with mobility problems which result in them not being able to use stairs or steep slopes, but there are a number of other impairments and conditions which impact on a person’s ability to carry out day-to-day activities. Impairments include: mobility problems, visual impairments, hearing impairments, speech impairments, and often hidden impairments such as dyslexia, mental health problems, learning disabilities/difficulties, and conditions such as diabetes and epilepsy. It is the impact of these impairments and conditions upon individual, users, visitors, volunteers or participants that should be considered in heritage-related projects (Heritage Lottery Fund, 2012). Accessibility measurements for people with special needs, elders, and the infirm form an important aspect of assessing the reuse projects (El-Halafawy & Soliman, 2002; Douglas, 2006). People with disabilities should be able to use heritage buildings efficiently without obstacles. Accessibility modifications should be in scale with the heritage property, visually compatible, and whenever possible, reversible (El-Halafawy & Soliman, 2002; Douglas, 2006).

Figure 3.29 Basement Floor Plan of al-Ashrafīyah Mosque and school.

Tourist path indicated in Red dots shows the visitor's path through mausoleums and galleries (coloured in beige), and managerial offices (shaded in purple) and have separate entrance form the East side. The mosque is in Ta'ez, Yemen. Image source: Lecture by El-Habashy, A. (2012).

Figure 3.30 Plan of the Southern wing of the residential units in Wikālat Bāzar'ah.

Plans adapted after Aalund (1980).

b) Users' Accessibility in Urban Context

The type of newly provided services or functions in neighbourhoods should be discussed in terms of accessibility to the targeted realm of users, or the spatial proximities between groups of users and the facilities on the basis of pedestrian rather than automobile (Talen, 2003; Al-hagla, 2010). To stay close to source is underscored by the concept of proximity, whether it is of place of work to place of residents, of education to leisure, or importantly for architectural conservation, of traditional building materials and craft skills to the localities in which they are employed in contemporary fabric (Scadden & Mitchell, 2001). Reduction in the need for travel and transport for everyday purposes, and the unnecessary use of non-renewable energy sources in the process, is a key beneficial consequence (Rodwell, 2007). The nature of new functions of reused heritage determines the range of users, and thus gives some clues of their average travel distance and transport networks they use to reach their destination in the middle of historic Cairo. Thus, the selection of the new function should be assessed in relation to the location of the building. According to Talen (2003), the assessment of new functions should consider factors of accessibility measurement variations: *origins, destinations, modes of travel, travel route characteristics* and *distance calculation*.

Tourist-attracting functions: Generally, culture-related functions such as traditional galleries and festivals usually attract artists and tourists from outside the centre of Cairo (أبو خشبة، 1997). Also for residential and commercial reuse, easily accessible location is a vital requirement; because this will ultimately influence the level of demand for (and hence the value of) an adapted commercial property (Douglas, 2006).

Wikālat Ūdah Bāshā/ Dhūlfiqār is already planned to be restored and reused as hotel for tourists. (**Figure 3.31**) shows the location of Wikālat Ūdah Bāshā/ Dhūlfiqār to be far from main road networks and public transport routs; relatively in the middle of historic fabric between an-Nasr Gate and al-Azhar Street. An added obstacle for reuse as hotel is that Al-Gamaliyah street is currently under maintenance, so it would not support regular transport of hotel amenities and supplies.

Local community's accessibility: New functions managed by NGOs and urban development programs mostly attract surrounding local community, and some interested groups and organizations from outside the historic district (Abdelhalim, 1985). Adaptive reuse of heritage for community related activities such as health clinics, schools,

kindergartens and community service centres are preferred to be located in the middle of where the target group lives. According to Wati (2009), one of major reasons behind social problems of traditional communities in developing countries is the lack of adequate accessibility they have to local services and job opportunities. Accessibility of local community to local services and facilities is much easier when the new function is proximate to their territory. At ad-Darb al-Aḥmar's health clinic in Khayer Bak Complex, supported by AKDN addressed behavioural issues that support social lives for young women, which offers information on sexual and reproductive health, family planning and child rearing, and managing household finances (AGA KHAN Foundation, 2011). Targeting local young women as main users of adaptively reused building makes it a central call for designers to choose a building of which its entrance is just a few steps away from the main street of Bab al-Wazeer (**Figure 3.32**). Providing entrance directly from vital street ensured further security measures for vulnerable groups of users.

Accessibility for workers, craftsmen and employees: Adaptive reuse of heritage buildings as offices and small enterprises is evident in many cases worldwide, mostly because historic centres add a value to any firm that aims to be attached to local identity. These business's daily employees depend on transportation networks, on regular and quick basis, to reach their place of work (Grube, et al., 1987). Assessment of location and accessibility to these types of new functions ought to be analyzed carefully, in relation to public means of transport, appropriateness of leading routes for large numbers of access. For example, (**Figure 3.33**) shows the location of Wikālat Bāzar'ah in central Cairo's urban fabric. Currently, Wikālat Bāzar'ah is used as offices for employees of the Ministry of State for Antiquities Affairs. Daily employees have to walk in damaged and tight streets every morning and afternoon to reach to or away from the building. They walk to reach either el-Azhar street or to Bab en-Nasr to reach their parked vehicles, or take the bus.

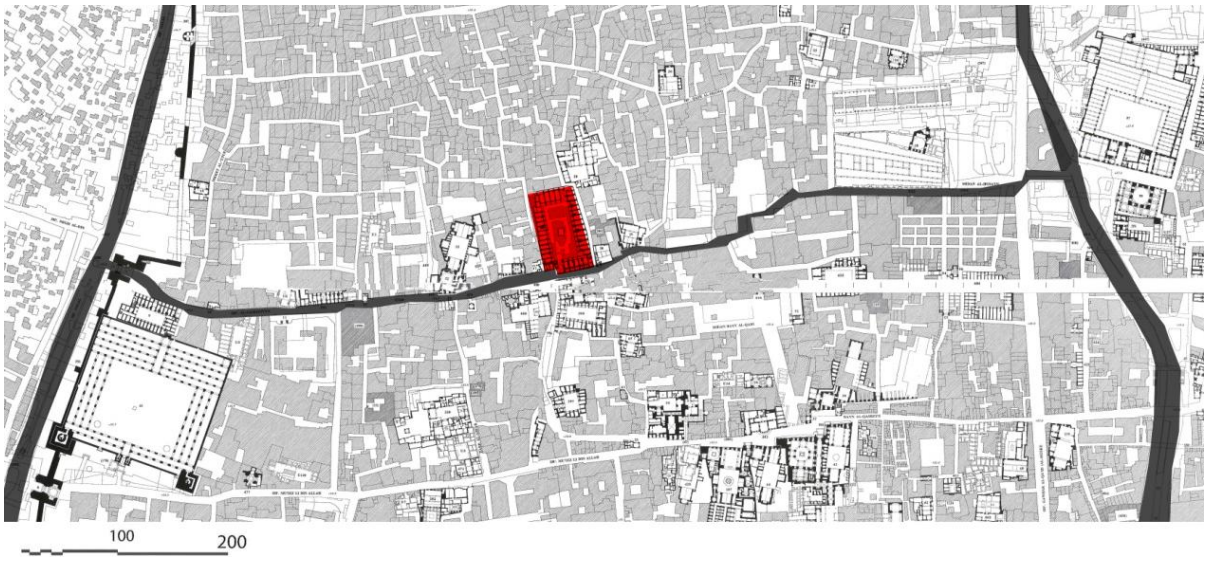


Figure 3.31 Wikālat Ūdah Bāshā/ Dhūlfiqār on en-Nasr Street.

The location of Wikālat Ūdah Bāshā/ Dhūlfiqār (in red) in relation to el-Azhar street (to the right) and to Galal Street (to the left). Map adapted after Warner (2005).

Figure 3.32 Rendering of Khayer Bak Complex.

The arrow on the low left side shows the entrance of Khayer Bak Complex's clinic directly overlooking Bab al-Wazeer Street, ad-Darb al-Aḥmar. Image source: Bianca and Siravo (2005).

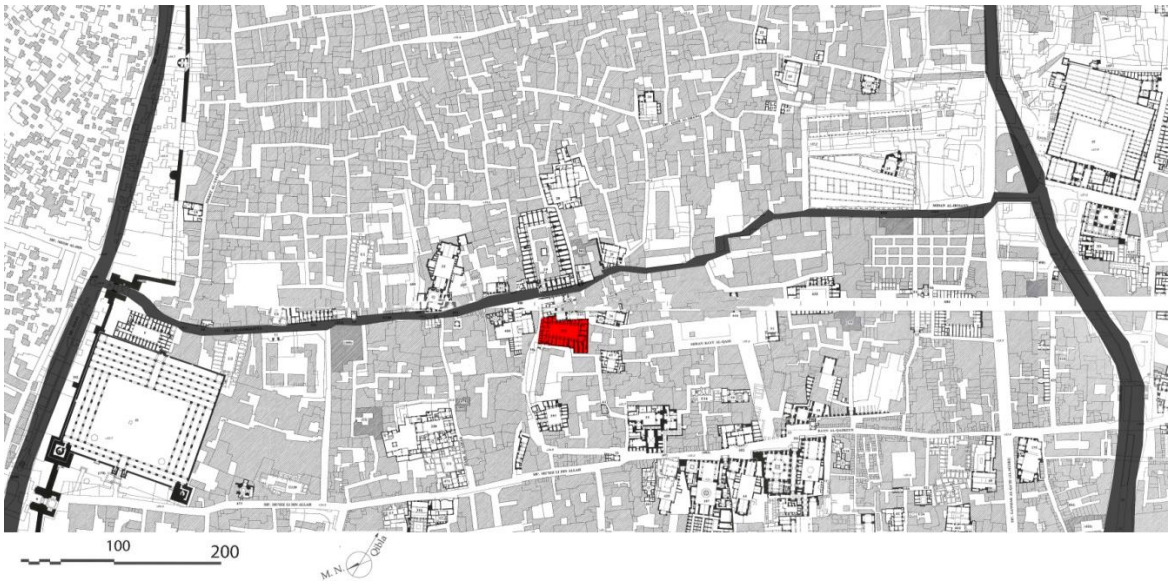


Figure 3.33 Map showing the location of Wikālat Bāzar‘ah.

Wikālat Bāzar‘ah is shown (in red) in relation to el-Azhar street (to the right) and to Galal Street (to the left). Map adapted after Warner (2005).

3.3.2.4. Economic and intangible benefits

This criterion can be either of the following: return on investments, cost recovery, increase of work efficiency, high productivity rates, increase of numbers of tourists and visitors...etc according to each project. Most literature agree that the key to the success of a heritage-based regeneration project is finding the right use or mix of uses in order to make it economically viable, while achieving economic efficiency on the long run (Plevoets & Van Cleempoel, 2011a). On a basic level, the return on investments simply means recovering all organizational costs, including the direct costs of projects and their associated overheads (Heritage Lottery Fund, 2008c). Full cost recovery is a way of strengthening the heritage sector and in particular heritage organizations delivering adaptive reuse projects. All organisations need to recover their costs in order to exist.

In Cairo’s case, most of the adaptively reused heritage buildings are managed and run by governmental bodies that are funded by the central government. Reused buildings consume huge investments to function, starting with regular maintenance to pay rolls of employees. The total revenues of any activity the building houses do not pay even a fraction of the

expenses being spent. Depending on the funds of the national government makes most adaptation project not economically sustainable[6].

But it is misleading to consider economic revenues to be the only indicator of success of the new functions of reuse. Economic efficiency is achieved when the tangible and intangible benefits of the project outweigh its costs (Elzeyadi, 2001). According to Hansen, Haugen, & Leaman (2005), efficiency is a major factor for making a building usable. Tangible benefits are sound economic and business achievements, and can be assessed, while the intangible values are difficult to assess and measure. It is normal that intangible benefits vary, but are dependable on the new function of adaptive reuse project as well as on the goals of that new function. For instance for heritage reuse as office building, the level of productivity of the building's employees indicate levels of business achievements; this can be used to monitor the rate of success with the factor of time (Elzeyadi, 2001).

According to أبو خشبة (1997) and Kreag (2001), in some case of reusing high valuable buildings as tourist destination, the increase in number of tourists that visit the site can be considered an indicator of success, even if the total revenue of the tickets' fees are not enough for just covering running costs. That also occurs when the increase of citizens' awareness of their cultural heritage is the main goal of reuse. In most cases when revenue generating is a marginal goal of reuse projects, the main contributor is the government and mostly is publicly financed (Serageldin, 1984). While in other cases, full cost recovery is targeted at those grant-aided organizations that have no other means to recover their costs and encompasses mainly voluntary and volunteer-led organizations.

3.3.2.5. Minimum adaptation costs

Adapting heritage for reuse shall balance the selection of the most appropriate use for conserving cultural values with the adaptation costs required to adjust the building's morphology for this desired function (Douglas, 2006). On one hand, the usual items of expenditure in addition to estimated additional costs associated with any adaptation project can be estimated (Serageldin, 1984). Total cost of an adaptation project depends on many factors such as the size, quality, complexity, technology and location of the work. Project

[6] Economic sustainability in the context of the above statement means that the revenue of each reuse project shall be enough to cover its adaptation, as well as, its running costs with little dependence on national/ central funds.

managers might tend to increase the adaptation budget for two main reasons: in order to allow future users to achieve the desired level of business performance and also in order to expect return on investment. For example, the costs of implementing HVAC systems vary according to the quality of the system, on one hand to work efficiently, and on the other to have a minimal impact on the building fabric. Choosing an expensive system that satisfies the basic quality of the HVAC system might be more important than saving resources. However, in this assessment criterion it is important to isolate these variables to get more accurate assessment measures. Therefore it is generally assumable that the more total adaptation costs, the less successful adaptive reuse project become (Douglas, 2006).

On the other hand, good practice to reach minimum costs of building conservation is also good practice of energy saving in economical terms (Heritage Lottery Fund, 2009; Rodwell, 2007; Bullen & Love, 2010). The amount of recycled materials saving energy, water and material charges during construction and operation of reused heritage buildings should be assessed for avoiding extra costs (Shull, 2005; Douglas, 2006; Heritage Lottery Fund, 2009). A building is successfully reused when it takes advantage of the buildings' existing attributes (Bullen & Love, 2010); these can include the initial shape, structure, or materiality (Heritage Lottery Fund, 2009).

There exist other types of costs in dealing with old structures. Hidden costs and contingencies are one of the most awkward aspects of adaptation schemes, regardless of their size (Douglas, 2006). Hidden costs are the likelihood of extra costs arising during the contract. In particular, conversions tend to involve primarily internal works, because there is a higher risk of discovering unforeseen or hidden defects as the work proceeds. Problems such as deleterious materials, dry rot, dampness and defective services are often not apparent until the adaptation works are well under way. Early prediction is much better; however this might not be always the case (Serageldin, 1984).

3.3.3. DESCRIPTIVE ANALYSIS OF THE PROPOSED CRITERIA TO ASSESS THE LOCAL COMMUNITY DEVELOPMENT

The following part presents these assessment criteria: enhancement of socio-cultural values, safeguard of intangible heritage, increase of liveability of historic quarters, heritage interpretation and raising awareness, socio-economic benefits, improvement of contextual physical characteristics, and sustaining natural and local environments.

3.3.3.1. Enhancement of socio-cultural values

> *"Preservationists often talk about the 'value' of historic properties: the social value, cultural value, aesthetic value, urban context value, architectural value, historical value and sense of place. In fact, one of the strongest arguments for preservation ought to be that a historic building has multiple layers of 'value' to its community".* Rypkema in (Jonas, 2006, p. 6)

Symbolic attributes such as religious values, historical and other cultural specific beliefs have largely been ignored in adaptive reuse projects (Elzeyadi, 2001). According to Plevoets & Van Cleempoel (2011a), modern conservation is rooted in community traditions, so assessment of positive contributions towards a healthy community's values should be the basis for each heritage reuse project. Older buildings have the ability to provide character to an area and create a 'sense of place'; acting as a link to the past. A successful adaptation of a redundant property can offer hope to a community devastated by the loss of traditional elements (Douglas, 2006). During the time period when the building was originally in use, it served a specific purpose in the neighbourhood or the whole city to which people, in one way or another, were connected. It is for these reasons that building conservation as a part of reuse project is becoming increasingly important.

Multiple socio-cultural meanings appeared in literature, but lead for the same meaning (Van Kamp, Leidelmeijer, Marsman, & de Hollander, 2003). Attributes of adapting heritage buildings for reuse for the benefit of social values came in terms such as: *socio-urban harmony; social cohesion* (Siravo, 2004; Yung & Chan, 2012), *inclusiveness* (Yung & Chan, 2012)*; integrity and sincerity* (Elzeyadi, 2001)*; memory* (Shull, 2005; Arkoun, 1990), *social sustainability* (Yung & Chan, 2012; Boussaa, 2010), *identity* (Melis, 2010),

sense of ownership and pride (Elzeyadi, 2001; Al-hagla, 2010) and *improvement in confidence* (Jonas, 2006). The outmost first condition to achieve all of the above is congruence with beliefs (Elzeyadi, 2001). The next part will discuss the congruence with believes. The other values will be grouped up in two main streams: sense of pride (which can be also called: pride and status/promotion of local distinctiveness/ sense of belonging/identity), and social cohesion.

a) Congruence with Beliefs and Community Values

It is the degree to which occupants' religion, beliefs, and world views can fit the setting and be supported and practiced with suitable ease and freedom. Reusing heritage buildings should follow basic integrity principles, so that the new functions do not falsify original themes and values of heritage structures. Forcing contemporary use that completely differs from the original use might be better solution than imposing a fake imitation of the old use, because contemporary use can be easily identified, while non appropriate uses that are not really related to the building's history can make the visitors confused.

For example, imposing one religious ritual that is not related to the core values of the heritage building confuses the users as well as local communities, and thus, is not preferred. The complex of as-Sultān al-Ashraf Qānṣuwah al-Ghūrī lies in a very strategic location in the conjunction of Al-Azhar Street with al-Moezz Street. The complex was restored several times and was reused till 2008 as an inspectorate by the Supreme Council of Antiquities. The eastern wing consists of the Sabīl and Kuttab building; another entrance leads to the main courtyard, tomb chamber and a separate prayer space. The latter are currently used as spaces for cultural and educational purposes and managed by the Cultural development fund. Seminars and lectures are organized in these spaces; also various concerts and musical assemblies currently take part in the main three spaces of the building: the courtyard, the burial chamber and the prayer hall (**Figure 3.34**). In addition, Coptic hymns are played by a local Egyptian Band in that complex (**Figure 3.35**).

The reuse of religious monuments should respect the teaching and principles of the religion. According to Islamic religious teachings, it is not acceptable to raise a voice in Islamic mausoleum, not to shout, sing or cry out loud (العسقلاني، 1986). Thus, when prayer halls and mausoleums are reused as concert halls for musical festivals, the adaptive reuse become questionable/ controversial as it confuses visitors. In communities with religious beliefs it is preferable to use civic buildings -such as Wikālāt- for this sort of functions.

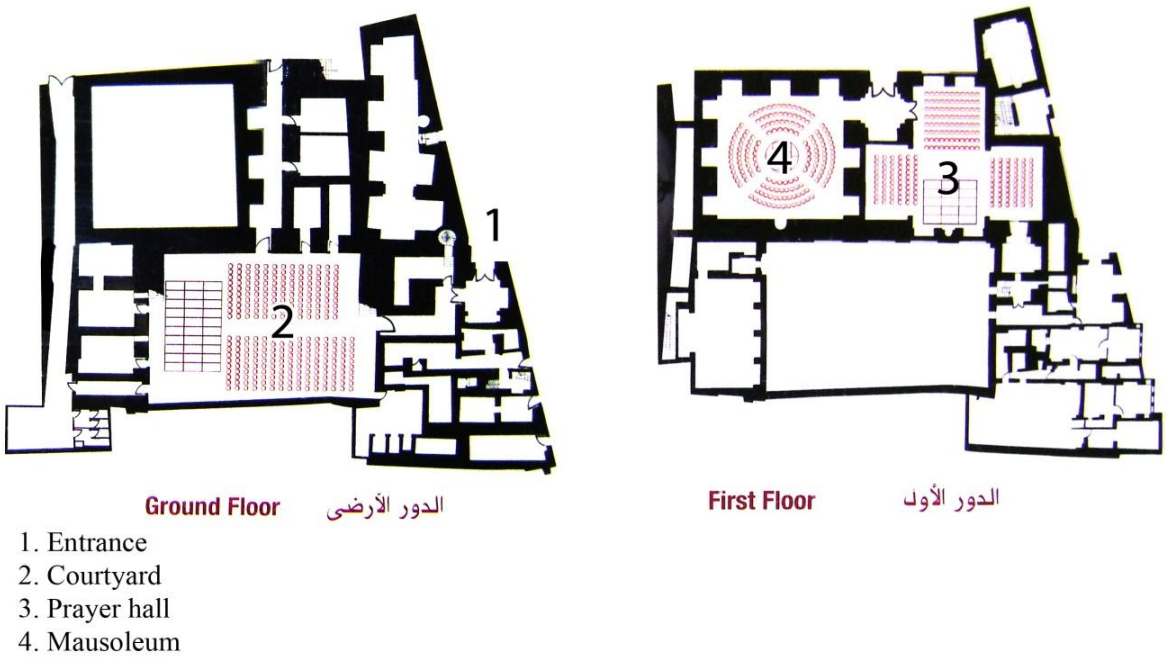


Figure 3.34 Plans of The complex of al-Ghūrī.

Floor plans show the spaces of the complex and Qibla wall. Plans were photographed from a pannel on site.

Figure 3.35 Musical concert in the complex of al-Ghūrī.

Sama'a for Sufi band sitting below, Coptic Hymns band on the left, Indonesian band to the right, and the Church ensemble in the middle in a joined concert in Mausoleum's courtyard of as-Sultān al-Ashraf Qānşuwah al-Ghūrī. Image Source: Cultural Development Fund.

In historic contexts in developed countries, the community has a level of concern that profoundly affects the nature of any intervention and may inhibit or prohibit reuse entirely. New uses must be coherent and fulfil the needs of the population. For any adaptation project to coincide with community values, the community should be part in all its stages: from planning to post occupancy. The methods of public participation and community planning are widely acknowledged tools of the conservation, rehabilitation activities if the local public is to understand and appreciate the cultural importance of the city in which they live and work (Lamei, 2005; Fowler, 1995). Local communities are always willing to maintain heritage buildings because of their functional utility and its intangible value (Van Huyck, 1990; Ouf, 1995) and collaborate for the sustainability of their historic environment (Cantacuzino, 1990). Efficient levels of participatory actions should be evident in strategies for adaptively reused heritage projects as a guarantee for success of urban revitalization efforts (Gharib, 2011; Yildirim, 2012; Al-Ibrashy, 2012).

Obtaining the local citizens' views on preferred new uses is possible through regular visits conducted by social welfare organisations. In addition, the appropriate project time period for public engagement is very important. In order to allow for project time constraints, make sure representatives from major stakeholder groups are included in any public engagement exercise. A working partnership can be beneficial, especially between the local community and the government (Jonas, 2006). Non-profit organisations can also play a role in the participation process. This is vitally important in both public and private uses as it can bring back collective memories about the people and stories connected to the place. It also enhances the social inclusiveness of the project.

b) Pride and Status/Promotion of local distinctiveness/ Sense of belonging/Identity

It is the extent to which the environment supports the identification of ranks and hierarchy as well as the provision of symbols of self-achievements and ability to "show-off' to other occupants and visitors. Place attachment refers to the social cohesion, community identity, or other feelings of affiliation that social groups (whether very small and local, or national in scale) derive from the specific heritage and environment characteristics of their "home" territory (The Getty Conservation Institute, 2002). The availability of cultural heritage and the awareness of local identity enhances the sense of pride (Al-hagla, 2010; The Philips Think Tank on Livable Cities, 2011; Yung & Chan, 2012); when citizens identify their city and feel a sense of belonging and pride, they try to get attached to it and express it in their

contemporary customs and architecture (Aziz & Shehata, 2012). In addition, the improvement of the sense of pride is mentioned by many researches to have a positive impact upon the built environment, where people tend to upgrade their surrounding district when they feel attached to it (Antoniou, Bianca, El-Hakim, Lewcock, & Welbank, 1985). As cultural landmark, reused heritage building must generate a sense of pride, and the message it conveys must be comprehensible to be understood.

Even negative memories associated with some heritage building (such as wars), cannot be separated from this socio-cultural context (Arkoun, 1990). Arkoun stressed that the reuse of buildings that symbolise negative memories depend on the integration of past by the collective contemporary consciousness. The adaptive reuse of heritage buildings or whole urban areas depends on the integration of the past by the collective contemporary consciousness, even if the past resembled a dark side of the story. Arkoun (1990) and Rodwell (2007) gave an example of how adaptive reuse policies can aim to save the destroyed city of Dubrovnik in Croatia and to reconnect its inhabitants with their traditional city on multiple social levels. Dubrovnik is a medieval walled city that contained numerous monuments and numerous old valuable buildings, and has been listed in the World Heritage List since 1979. In recent decades Dubrovnik has witnessed a succession of disasters and triumphs in the protection and conservation of its cultural heritage. Due to a strong earthquake in 1979 and war bombing in the early 1990s during the Croatian War of Independence (**Figure 3.36**), the city had suffered severe damage to many of its key buildings (Institute for the Restoration of Dubrovnik, 2011). Inhabitants left for suburbs; as a consequence, the city had a severe economic recession, in addition to recession in tourism industry.

Knowing the potential role that local communities feel the pride of their city and are willing to support the government for the rehabilitation of the old city of Dubrovnik, the municipality targeted non-touristic activities to stabilize the economy of the city as a whole by avoiding excessive concentration of activities in the historic core and encouraging the development of higher education, introducing cultural activities (**Figure 3.37**) and strengthening social functions (Rodwell, 2007). The city's architectural heritage has been supported by the set of heterogeneous activities that were initiated in the city (Institute for the Restoration of Dubrovnik, 2011). This cultural heritage and the relationships to other potentials are seen as central to the healthy community life in the city today.

a b

Figure 3.36 Dubrovnik's main historic street during and after the war.

Image (a) source: www.flickr.com; image (b) source: Google maps street-view (2011).

Figure 3.37 Music concert in a historic building in Dubrovnik.

Image source: www.dubrovnik-festival.hr/

The meaning or latent function of a place can be measured by assessing the perceived values of the place for different user groups, and complementing that to the values perceived by professionals in the field, and by the national decision makers (Shehayeb & Sedky, 2002). To assess the sense of place, belonging, and sense of pride, The Philips Think Tank on Livable Cities (2011) prepared multiple question surveys to investigate whether citizens feel a sense of belonging and pride in the city or not. Detailed questions examine particular symbols or markers (built heritage as well as socio-cultural practices) which give the city a unique identity to its local inhabitants. Questions that were asked aimed to know what factor of uniqueness does have stronger impact on the general population's sense of pride, cultural heritage or other types of assets (such as natural environment, native languages...etc).

As a successful example of how would reuse project enhance the pride of local community, a currently UNESCO funded project aims to conserve and revitalize the mosque and school of al-Ashrafīyah in Ta'ez, Yemen. The basement level is composed of small rooms that were closed and not used. The team plans to utilize part of the basement level to be a museum for local artifacts and valuable belongings (**Figure 3.29**). The conservation team invited the inhabitants of the city to place their valuable belongings that they inherited from their grandfathers (some of which dated back hundreds of years). These artifacts were swords, historic copies of Holly Quran, treasure boxes, etc. Each item is planned to be placed in the museum and labelled with a name-tag of its owner and his/her family names. These contributions from local citizens make them feel that this building contain their valuables, hence increase their sense of pride, attachment and belonging to this mosque.

c) Community Cohesion

Community cohesion refers to the quantity and quality of social interactions between community members. It is represented in the togetherness and relationships exhibited extensively by community members (Gehl, 1980). Community cohesion, in turn, promotes social bonding and group integrity which promotes attachment to the place, pride, status and increases sense of belonging. "Affective social bonds are promoted through interactions; members develop psychological feelings of membership and belonging" (Stokols & Altman, 1987; Glynn, 1981). Social interactions depend on stimulation and a response that in turn becomes the stimulation for another response, forming continuous

loops of human interactions. Thus, city liveability is an important contributor to social cohesion of local communities.

Special social indicators can aim to investigate the impacts of heritage projects on social cohesion upon determined time intervals related to project phases. Urban revitalization strategies should also help to build bridges and trust between communities by appreciating everyone's heritage and reducing barriers to the enjoyment and benefits that the historic environment can bring (English Heritage, 2008). Reuse activities should involve multiple groups and try to find place for conversations to limit social gaps. Surveys that assess how the majority of people accept or reject minority, marginalized, ethnic, secluded, and multi-cultural groups can give a clue of the success or failure of the reuse project to attract all community members together and increase their social bonds.

3.3.3.2. Safeguarding intangible heritage

The "intangible cultural heritage" means the practices, representations, expressions, knowledge, skills, craftsmanship – as well as the instruments, objects, artifacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage (UNESCO, 2003). The "intangible cultural heritage" is manifested inter alia in the following domains: oral traditions and expressions, including language as a vehicle of the intangible cultural heritage; performing arts; social practices, rituals and festive events; knowledge and practices concerning nature and the universe; and traditional craftsmanship. The revival of intangible activities can only be secured through planning policies and coordinated urban management (Rodwell, 2007). However rehabilitation for adaptation of historically valuable structures can aim to encourage intangible activities. For instance, construction contracts and bids with small enterprises for accomplishing conservation works must be considered. According to Cantacuzino (1990), rehabilitation is labour intensive where it creates employment for local construction industries. High-value elements and ornaments in the site when assigned to local workshops can revive their work and give it a new space to flourish. However, literature and international charters lack defining appropriate indicators to assess the degree of safeguarding intangible heritage in heritage adaptation projects.

According to Bianca & Siravo (2005), the Aga Khan Trust for Culture planned for the rehabilitation of nineteenth-century mansion on Abou Ḫureiba Street, in ad-Darb al-Aḥmar district into a vocational training centre. The rehabilitation of the building was planned to

foresee on-the-job training for builders and craftsmen to upkeep traditional methods of construction and traditional handicrafts. Vocational training was planned to include existing training for carpenters and stone masons, which aimed at improving product quality and marketability. Most of the vocational training was intended to be centred on the rehabilitation of an historic mansion in Abou Ḥureiba Street, for trainings related to current physical restoration and rehabilitation activities (**Figure 3.38**). Most conservation projects should act as an in situ training for local builders to practice old methods of construction and ensure its continuity (The Getty Conservation Institute, 2002).

Figure 3.38 Craftsmanship of the preservation works done to wood panels.

Craft shops specialized for special treatments of wood are targeted as part of restoration strategies to maintain intangible craftsmanship of Egyptian products. Images source: Bianca and Siravo (2005).

3.3.3.3. Increase in the liveability of historic quarters

Many authors defined city's liveability: Veenhoven (1996) identifies a liveable city as humane, and habitable. Liveability is a quality that is not an attribute inherent in the environment but is behaviour-related function of the interaction between environmental characteristics and personal characteristics (Van Kamp, Leidelmeijer, Marsman, & de Hollander, 2003). A liveable space is the space that responds to human needs for interaction and existence of cultural and environmental resources. On a micro-scale, liveability is the individual tie to the district well-being and social networks (Van Kamp, Leidelmeijer, Marsman, & de Hollander, 2003). Thus, it is acknowledged that "liveability"

is considered to be the resultant of the interaction between physical and social domains, in such a relation where it depends on the quality of the built environment that encourages social interactions of a neighbourhood as perceived by people who inhabit the space. Liveability is largely affected by conditions in spaces of the public realm, places where people naturally interact with each other and their community, including streets, parks, transportation terminals, central heritage districts, and other public facilities (Arend van Dam in Schepel, 2005, p.4).

> *"The best way to restore vitality and liveability to a community is to build on its strengths such as heritage assets"* (The National Trust for Historic Preservation, 2002)

Adaptive reuse of cultural heritage is one of the important factors that increase the overall liveability of heritage/old districts (Wilson, 2010; Department of the Environment and Heritage, 2004; Yung & Chan, 2012; The National Trust for Historic Preservation, 2002), stimulates opportunities for sustainable social relationships (2008 ،الدليل), revitalizes urban cores (Ebbe, 2009; Atash, 1993). Heritage conservation has proved to increase city liveability by preserving streets and neighbourhoods built at a human scale, public areas that support positive community interaction and green spaces that offer recreational activities (Ebbe, 2009). By conserving their heritage, cities can create a unique sense of place and singular urban landscapes, developing strong branding and conditions to attract investors. This is especially true for investors in tourism, which is one of the largest industries in the world today and has a track record of creating significant levels of employment for unskilled and semi-skilled workers (Ebbe, 2009).

Old-city cores should remain as places for living and working (Atash, 1993). Old structures that are composed of a stock of housing units and commercial establishments could be restored to meet the growing social and economic needs of its poor or lower-class inhabitants. It is important that the authentic character of the old core be preserved and the creative and adaptive re-use of its old structures be encouraged to fit new needs and to keep the core alive.

Generally, because the old core has to continue to be viable in socio-economic terms for its inhabitants, local government policies should aim to maintain and upgrade its two key components: the centre and the residential quarters. First, the centre (the bazaar and the mosque with its related cultural and religious activities) should maintain its historical roles

and functions - providing employment opportunities and offering a greater variety of goods and services as well as socio-cultural amenities to the residents of the old core. Specifically, local government policies should strengthen and diversify the economic base of the old core by proposing new uses, activities, and employment opportunities or by encouraging certain carefully selected and revitalized activities in the field of trade and craftsmanship. This would require developing effective systems of cooperation between the public and private sectors and ensuring the availability of credit facilities, loans, grants and other financial incentives for private business that participate in the redevelopment process.

Second, the old core should continue to be a place for living as well as working. This would mean maintaining in use (on the basis of upgrading) houses and other buildings in residential quarters that are basically more functional, comfortable, and appropriate to the way of life of the city's inhabitants than those designed according to principles and guidelines imported from the West. Also, attention should be given to the improvements in the infrastructure and physical environment of residential quarters. These improvements require that local governments allocate an adequate share of total urban expenditures for municipal improvements and public services to the old core and its residential quarters (Atash, 1993).

Although according to Cantacuzino (1989), community liveability in heritage districts directly benefits people who live in, work in or visit the area, Whyte (1980) and Van Kamp, Leidelmeijer, Marsman, & de Hollander (2003) argue that environmental and social conditions that lead to liveability are affected by multiple factors which are hard to gauge. However, many literature mentioned that liveability can be evaluated using various indicators (Van Kamp, Leidelmeijer, Marsman, & de Hollander, 2003; Dale & Newman, 2009; Ebbe, 2009). The list below indicates general community liveability objectives. This list can be modified and prioritized based on community surveys and public involvement techniques because people tend to prioritize these factors according to their different perceptions and underlying circumstances.

- *Economically sound objectives:*
  increasing property values,
  marketing tourism and business activities,

and increasing the buildings' affordability, which allows people of all income classes to be part of a community.

- *Environmentally sound objectives:*

  convenient accessibility to mixed uses and transportation choices which increase people's opportunities for housing, employment, shopping, recreation, and exercises,

  improving public health and safety,

  attractive streetscapes, softscape and other public features,

  quiet, fresh air and cleanliness,

  quality of independent mobility for children (Schepel, 2005), elders and people with special needs,

- *Socially sound objectives:*

  increase the quality of social interactions (including residents, employees and visitors), such as friendliness and consideration, community cohesion, respect, equity, fairness, tolerance, organising patterns of activities, genuine / informal community interaction, preserving & facilitating social networks and positive personal interactions between people,

  allowing a mix of social classes which reduces stress and uncertainty of residents,

  uniqueness of cultural identity manifested in heritage structures,

  increase of daily commuters and passerby's,

  walk-ability that is a primary way that people travel, interact and experience their community,

  and increasing pride, sense of belonging, and inclusiveness.

3.3.3.4. Heritage interpretation and raising awareness

According to UNESCO (2007, p. 3), *Interpretation* refers to the full range of potential activities intended to heighten public awareness and enhance understanding of cultural heritage site. These can include print and electronic publications, public lectures, on-site and directly related off-site installations, educational programs, audio information (**Figure 3.39**), community activities, and ongoing research, training, and evaluation of the interpretation process itself. It is important to encourage inclusiveness in the interpretation of cultural heritage sites, by facilitating the involvement of stakeholders and associated communities in the development and implementation of interpretive programmes.

Presentation donates the carefully planned communication of interpretive content through the arrangement of interpretive information, physical access, and interpretive infrastructure at a cultural heritage site. It can be conveyed through a variety of technical means, including, yet not requiring, such elements as informational panels, museum-type displays, formalized walking tours, lectures and guided tours, and multimedia applications and websites (UNESCO, 2007, p. 3).

Interpretation and presentation should serve a wide range of conservation, educational and cultural objectives. Since heritage is what the community wishes to protect and pass on to future generations, dissemination of heritage records should be as wide as possible, and the location of the records should be made public (Letellier, Schmid, & LeBlanc, 2007). The success of an interpretive programme should not be evaluated solely on the basis of visitor attendance figures or revenue; but also for serving a wide range of conservation, educational and cultural objectives by facilitating the involvement of stakeholders and associated communities in the development and implementation of interpretive programmes (UNESCO, 2007). For example in Florence, Italy a historic excavation site was underneath a restaurant. When the time period allowed for the excavation team to study and document the site had ended, the restaurant covered the excavation chambers with safe glass flooring and kept it as a presentation for cultural heritage for visitors (**Figure 3.40**). This example is unique because it showed a rare case of turning a problem of site delays into a benefit for its presentation. Other good examples are set the conservation team responsible for the restoration and conservation of heritage structures in Bahrain and Yemen. In Bahrain, the site was originally a market for manufacturing and selling juice of dates. The new use was set to be a cafe to attract local youth and tourists. However, part of the historic process of producing dates juice had been presented to the visitors (**Figure 3.41**) as part of their experience of the place.

In a second showcase, the conservation team that is responsible of the restoration and conservation of the mosque and school of al-Ashrafīyah in Ta'ez, Yemen. It is a historically and locally significant mosque that is still used today. The prayer hall still has rare and rich ornaments of Yemen. The design proposal introduces a tourist trail path in addition to the original prayer function of the mosque (**Figure 3.42**). The conservation team is facing a lot of challenges to convince local community to agree to their proposal, in order to efficiently present the valuable heritage to tourists. According to the conservation

plan, tourists will be able to enter the prayer hall of the mosque to witness its significance without disrupting religious prayers.

The local example of adapting Sabīl - Kuttab of Isma'il Pasha for reuse showed defects in the presentation of this monument's significance. This building stands as a famous example for adapting heritage building for reuse. Originally a water dispensary built in 1828 by Muhammad 'Ali, it was restored in 2002-2004 by the Supreme Council of Antiquities back then. It is reused as a museum for Egyptian textiles and fabrics in 2008. The selection of this particular function appears to be appropriate to the architectural characteristics of the building, and to the historic context of el Moe'zz Street. However, the problem lies in the way the gallery is organized and presented. Items in display cover historical walls and ornaments in the interior hall of the building (**Figure 3.43**). In addition, there is no efficient presentation material for the historic significance of building that illustrates its history, except for a small board above ticket office.

Raising of Public and Local Awareness

According to the operational guideline for the implementation of the world heritage convention (2008) (Intergovernmental Committee for the Protection of the World Cultural and Natural, 2008; Wang & Zeng, 2010; Al-hagla, 2010) and many others, increasing public awareness heritage values is one of the major aims of conservation and heritage development projects. That is promoting heritage sites to raise the visitors' awareness of their historical and cultural value. The conservation and restoration of heritage buildings and sites increase awareness about the city great assets, and encourage the utilisation of ancient architectural elements in contemporary architecture to be responsive to cultural heritage. Awareness of cultural heritage would help conserve and achieve a balanced environment which reflects both past originality and actual modernity (Almughany, El-Wazir, Al-Qeeq, & Dawood, 2009; Plevoets & Van Cleempoel, 2012a).

On one hand, local inhabitants, along with activities in historic areas stimulate raising questions about stories behind these buildings, and thus create a sense of place and increase the users' awareness of their ancestors' identity (Al-hagla, 2010). Raising public awareness for cultural heritage may include the development of web resources by providing means of remote engagement with the cultural heritage. These may range from simple image-rich web sites to sophisticated three-dimensional virtual reality visualizations, including sound and lighting effects (Almughany, El-Wazir, Al-Qeeq, &

Dawood, 2009). Assessing the educational impact (the opinions of business owners, residents, and visitors) about their heritage can be an important assessment methodology of increasing local awareness (Al-hagla, 2010). On the other hand, the development of related cultural tourism activities raises local people awareness of the importance of local cultural assets for economic-sound activities. Tourism can act as a catalyst for raising awareness of not only the local community, but also policy makers, officials, developers, professionals and the general public (Smith, 1988; Al-hagla, 2010).

A simple, but yet rich example in the old City of Cordoba, Spain explains how reusing historic buildings can be part of re-discovering the city's rich history. In 1981, the city mayor at that time "Julio Anguita" invited many high profile persons from diverse backgrounds and different cultures to participate in his vision to revitalize Cordoba and to re-define its historical importance in the shadow of globalization. The participants worked with the mayor in his major project of reusing an old defence tower as a museum for cultural diversity in Cordoba. Later on, two of the invited persons, Salma Tija el-Farouki a Palestinian woman and her husband Roger Garaudy the French philosopher had settled in a historic house they restored by themselves in Cordoba. The mayor legitimized laws into actions to let Salma and Roger open up their own 12th century house La Casa Andalusi (**Figure 3.44**) to the public in 1999, exhibiting Islamic civilization in Andalusia. The house exhibits items, books, calligraphy, pictures and documents about the importance of the Islamic civilization in Andalusia in general, and in Cordoba in particular. This adaptation project presents a flexible cooperation between politicians having visionary schemes on one side and private funds motivated by the need to increase awareness of Islamic civilization in Andalusia on the other side.

Figure 3.39 Audio devices are used to present information to visitors.

The image shows iPod devices that are offered upon entree to the Jewish Museum, Berlin, Germany for visitors as an easy audio guide to the information the museum displays.

Figure 3.40 Historic excavations in Toscanella Osteria restaurant in Florence, Italy

Image (a) in the middle of the restaurant exists transparent safe glass floor strip; image (b) the excavation basement level covered with the safe glass. Images source: www.toscanellaosteria.com

Figure 3.41 Es-Seyadi shops, in Kaysareyah commercial zone.

Image (a) the cafe clients have access to see excavations of the remains of the dates juice factories shown in front of the Cafe's entrance; image (b) the excavation site surrounded with a handrail to present it safely to cafe visitors. Bahrain. Images source: lecture by El-Habashy, A. (2012).

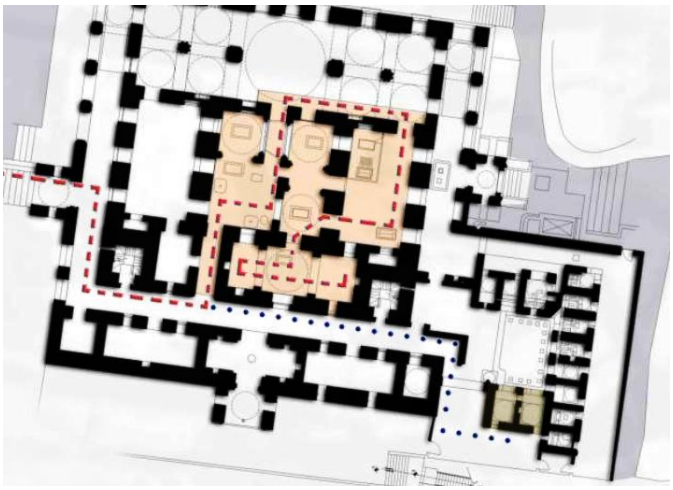


Figure 3.42 Al-Ashrafīyah Mosque and school in Ta'ez, Yemen.

Ground Floor Plan indicating the tourist trail path inside the building in red, passing by the well-preserved hall of prayer among other spaces. Images source: Lecture by El-Habashy, A. (2012).


a


b

Figure 3.43 Interior images of Sabīl-Kuttab of Isma'il Pasha.

The building has been reused as a museum for Egyptian textiles and fabrics. Image (a) Museum display panel covering parts of an authentic column in the Sabīl; image (b) Dark curtains hiding the historic copper windows from the interior side of Sabīl room.

Figure 3.44 La Casa Andalusi in Cordoba, Spain.

The ground floor is open to visitors who want to explore Islamic civilization in Andalusia, while the upper floor is inhabited by Salma el-Farouki.

3.3.3.5. Socio- economic benefits

The successful adaptation (whether refurbishment or adaptive reuse) of a redundant property can offer hope to a community devastated by the loss of traditional economic activity (Douglas, 2006). According to Cantacuzino (1990) and Chan & Lee (2008), rehabilitation is labour intensive where it creates employment, stimulate economic growth, and create a wide range of income-earning opportunities (Ebbe, 2009). These direct revenues are reflected back in maintaining properties, sustaining local intangible heritage, revival of craftsmanship. Then they are called indirect benefits. It is of course not easy to measure the social benefits of adaptation, however, direct economic benefits of adaptation projects to local communities can be measured following these attributes:

- Attracting and retaining local workforce (Jonas, 2006)
- Number of employees from the local community (Jonas, 2006)
- Number of integrated informal economic activity in adaptive reuse projects.
- Number of new businesses created (Jonas, 2006)
- Incentives and financial encouragements in the form of grants, loans, access to credit subsidies and tax relief (Cantacuzino, 1990).
- Provided accommodation for various social groups (Chan & Lee, 2008).
- Revenue of Tourism industry (Smith, 1988): The character of the historic Cairo is the real asset of the community and can reappear again on most of the local levels if the rehabilitation plan directs its action towards the previously stated patterns. Provisions for tourism and its facilities can be naturally introduced in the local level along the following patterns: individually- owned and institutionally-aided enterprises, street cafes and restaurants, local markets, small inns, public bathes, local festivals and others (The Arab Bureau for Design & Technical Consultations, 1984).

As a successful example, Patrick Green in Jonas (2006) explained that at the adaptively reused train station of Manchester into Museum of Science and Industry: for every £1 spent by visitors at the museum, £12 is spent elsewhere in the local economy. With 300,000 visitors spending £1.5m in 2000, the contribution to the prosperity of the region was £18m. To the previous, other contributions can be added such as the goods and services purchased by the museum from local businesses, the employment of 120 people and the investment in new exhibitions and building work.

Aga Khan Trust for Culture set an example in rehabilitating ad-Darb al-Aḥmar's residential buildings with micro-loans system (Bianca & Siravo, 2005). Since the year 2000 till 2009, The Aga Khan Trust for Culture and its partner funding agencies, with a direct financial participation of the area's residents, have developed a series of projects on the eastern edge of ad-Darb al-Aḥmar that combine social and economic initiatives with physical improvements. According to Bianca & Siravo (2005), these works include micro-credit for business development and housing rehabilitation, and employment-generation. Grants, loans and a combination of the two were made available for rehabilitating housing in ad-Darb al-Aḥmar, thus serving both lower income households and households with extremely low levels of income.

a) Market Interest

The rehabilitation of old city quarters helps upgrading the aesthetic and physical qualities of neighbourhood in general, leading to increasing competitiveness (Ebbe, 2009), then directly to the raise of economic value of the property itself, as well as proximate properties. Change of rental and price values of buildings usually increase the rate of urban renewal of heritage districts (Engelhardt, 2009; Jonas, 2006), because, investors recognize opportunities of major investments, and because landlords seek to maximise economic revenues. Sustaining sufficient revenues is important to ensure the long-term maintenance and preservation of the historic fabric. Accordingly, the increase of economic value of reused heritage building and its surrounding properties is an indicator of the success of adaptive reuse projects (Elsorady, 2012; Heritage Lottery Fund, 2008c; Langston, et al., 2010) to ameliorate economic devastations of local communities (UN-HABITAT, 2005). However, the rate of increase in property values of different new uses is different according to new use (Jonas, 2006).

- Residential property values: There is evidence to suggest that heritage buildings can command higher prices in residential use than new build (Jonas, 2006). Attractive or prestigious heritage buildings can have a less efficient use of space but can achieve similar values to new build. This means that with thoughtful refurbishment and a pragmatic approach to conversion, heritage buildings can command rental and capital values that make development successful.
- Commercial property values: As competition in the contemporary market is strong, according to Plevoets & Van Cleempoel (2011b), locating one's store in a

heritage building has even become a tool for differentiation for two reasons. Besides its proximity to Central Business District (CBD), retailers look for means to differentiate themselves from competitors. As consumers nowadays are looking for emotionally engaging experiences that are authentic and original, being located in a heritage building is such a possible differentiation strategy. This means that commercial property values are directly related to heritage qualities. This is evidence in Cairo, some of commercial property values raise rapidly; bazaar and traditional food/ souvenirs/ crafts shops. Tourists related functions seek existence to locations proximate to accessible loci, and simultaneously in rich authentic fabric. Shop rents in historic town centre can be just as high or even more than of modern retail areas, although the size of units and their overall quality might not be sufficient (Jonas, 2006).

- Office buildings' values: Heritage buildings used as offices satisfy the demand from some occupiers for a 'front door' and the image of smart tradition that many old buildings convey. Generally in Europe, small and medium sized firms are keen to reuse old properties in Centrum as offices for their own, in order to reflect their originality and identity for their clients. This is known to be very expensive reuse for them to pay off.

One way to assess adaptive reuse projects of heritage buildings that lies in city centres is to assess the level of economic impact it exercised upon its value, and surrounding property values. According to Heritage Lottery Fund (2008c), it is possible to carry out economic research depending on data sets stretching over many years-as the return is not always immediate (Elsorady, 2012)- in order to compare the increase in market value with progress of heritage related projects. Direct value or rental price of adapted buildings is more straightforward to measure than that confers to neighbouring properties (Heritage Lottery Fund, 2008d). Value that confers to neighbouring properties, or the wider economic and social value created in an area through inward investment, is more difficult to quantify and yet is clearly one of the most easily observed impacts of successful regeneration involving heritage buildings. Oversupply or drop in demand is a major influence for this measurement especially when adapted heritage buildings are enrolled in real-estate.

Although prices of modern apartments and houses do usually rise by being in a neighbourhood of heritage buildings, in the Egyptian context this might not be the case.

This is because of two reasons. First, property values are directly proportional to the quality of the environment of the neighbourhood. Heritage buildings of Cairo lie within deteriorated context that lacks proper services and infrastructure. Limited and low-impact developments in the historic centre of Cairo make minor improvements made by adaptive reuse of heritage buildings seem of a little affect to the overall environmental status of Cairo's historic city. The second reason is because heritage buildings are not integrated to any extend as real-estate market of supply and demand. They are untouchable buildings that their use cannot take any form of economic value to buy, thus freezing assets in historic fabric (Gharib, 2011).

> *"The desire to preserve must ultimately be a rational economic and commercial choice: problems will arise where buildings are preserved only as a consequence of legal and land use planning controls".* Tiesdell, Oc and Heath in (Jonas, 2006, p. 6)

Despite that raising the quality of the built environment is preferred; its accompanied dramatic increases in land price and rent should be avoided to mitigate the effect of gentrification (Al-hagla, 2010; Yung & Chan, 2012). *Gentrification* is a dynamic that emerges in poor urban areas when residential shifts, urban planning, and other phenomena affect the composition of a neighbourhood. Urban gentrification often involves population migration as poor residents of a neighbourhood are displaced. Often old buildings are converted to residences and shops, and new businesses, which can afford increased commercial rent, expand in rehabilitated structures, further increasing the appeal to higher income migrants and decreasing the accessibility to the poor.

> *"Planners' and the nations' tendency to focus mainly on what pays off preservation costs may lead to gentrification; resulting in a "kitschy," instead of the authentic, or "real," ambiance that we still feel in the alleys of Old Cairo despite of their apparent physical deterioration"* Shehayeb & Sedky, (2002).

Attractive or prestigious heritage buildings can have a less efficient use of space but can achieve similar values to new build. This means that with thoughtful refurbishment and a pragmatic approach to conversion, heritage buildings can command rental and capital values that make development worthwhile (Jonas, 2006). While control policies must accompany urban upgrading projects to limit gentrification effects as possible.

b) Service Provision

Provision of public services is one of the primary Millennium Development Goals (UNCDF, 2010) as part of turning citizens into productive members of society. The term public service refers to any of the common, everyday services provided by federal, state, and local governments (Savas, 1978). Examples of these services are education, police and fire protection, emergency medical care, social services, postal service, transportation, road construction, street paving, street cleaning, dust removal, traffic control, street lighting, water supply, wastewater collection and treatment, solid-waste collection and disposal, recreation services, libraries, and parks (Chan & Lee, 2008). There is a lack of strategic prioritizing of adaptive reuse goals; where providing for basic services such as education, healthcare and solid waste collection is more important than providing cultural, touristic, or recreational activities (Kamal, 2002; UN-HABITAT, 2005). Adaptive reuse of underused heritage on a city planning level can provide a solution to the lack of spaces dedicated for public services in deprived historic districts (Al-Ibrashy, 2012). Spaces and facilities can be provided in heritage buildings with minimum intervention done to authentic fabric, in order to bridge the current gap in service provision. Therefore, adapted heritage projects need to be assessed for supplying basic services based on a comparison between what is achieved in heritage reuse projects, and what the urban planning regulations and demographic characteristics recognise to be of high demand for communities living by heritage (The Arab Bureau for Design & Technical Consultations, 1984).

Generally in Egypt, there is a lack of public service provision according to demographic distribution (Siravo, 2004; Gharib, 2012). Since adapting heritage for reuse for new functions should consider the needs and demands of local communities, adapted heritage projects in Historic centre of Cairo need to be assessed for supplying basic services for the surrounding local community. The project lead by the Aga Khan Trust for Culture in ad-Darb al-Aḥmar had been planned to use spaces in restored heritage buildings to, partly, provide health and education services (Bianca & Siravo, 2005; Bianca, 2004). In ad-Darb al-Aḥmar health clinic, supported by Aga Khan Development Network, comprehensive healthcare services were made available in Khayer Bak Complex, for a nominal charge to women of reproductive age and children up to age 5. The clinic was well known for its accessibility to the community, excellent patient services and quality health care (AGA KHAN Foundation, 2011) till 2009. However, as mentioned in Chapter 1, the building is currently used as a Children's school of music arts.

3.3.3.6. Improvement of contextual physical characteristics

The historical-cultural environment has increasingly been recognised as an important contributor to enhance urban environment (Shimomura & Matsumoto, 2010), improves the quality of life (Yung & Chan, 2012), develops a prosperous, comfortable, civilized and clean city with a pleasant environment (Xie & Costa, 1993). Adaptive reuse of single heritage buildings acts as a catalyst for whole-wide area upgrading, since it regenerates capital by private/public investments to enhance elements of physical environment (Yung & Chan, 2012), where individual heritage buildings can only play part of the role. Areas with heritage buildings, which individually may not be of particular architectural or historic merit, provide sufficient sort of environment that can form the basis of sustained urban regeneration. In other words, regeneration of the whole public realm is greater than the sum of the parts, where according to Van Kamp, Leidelmeijer, Marsman, and de Hollander (2003), the resultant of the quality of composing parts of a given region but yet more than the sum of parts, it is the perception of a location as a whole. The composing parts (nature, open space, infrastructure, built environment, physical environment amenities and natural resources) each have their own characteristics and partial quality. Nonetheless, attractiveness, enhancing townscapes and lifting the overall quality of the built environment have been also regarded as a key goal for urban policies of heritage regeneration and adaptive reuse projects (Serageldin, 1984; Shimomura & Matsumoto, 2010; Jonas, 2006).

The physical urban environment is composed of various elements including not only public realms for which the public sector is mostly responsible, but also private properties were private owners play an essential roles in enhancing (Shimomura & Matsumoto, 2010). The physical deterioration should be halted by relieving the overcrowding in residential quarters, maintaining/ improving the overloaded physical infrastructure (such as sewerage system, drainage, refuse disposal, public transportation, road system) and enhancing the built environment by providing pedestrian amenities such as urban parks and street lighting. These improvements shall upgrade the living conditions and standards in the old core (Atash, 1993). Even when vacant and in poor condition, listed buildings, and all other forms of built heritage, remain ‘assets’ with the ability to truly enrich our experience of our environment through their physical qualities and/or their historic or community associations (Jonas, 2006).

Van Kamp, Leidelmeijer, Marsman, and de Hollander (2003) argue that concepts as living quality, living environment, quality of place, residential perception and satisfaction, the evaluation of the residential and living environment, quality of life and sustainability do overlap, and are often used as synonyms—but every so often are contrasted. Others argue that uniformity in concepts is not per se necessary: environmental quality is a container concept; different theories relate to different aspects of environmental quality, the concept is multi-dimensional. Still other authors claim that it is not really possible to assess these multi-dimensional concepts. Thus it is not possible to give an exhaustive review of all approaches, definitions and models within this thesis, and instead the choices of indicators for the above mentioned concepts are collected from two main researches in that field, the first by Van Kamp, Leidelmeijer, Marsman, and de Hollander (2003) describes basic conceptual definitions of physical environmental indicators that assess quality of life, while the second described by Jonas (2006) and others is a list of goals that should be targeted in regeneration projects.

In their paper, Van Kamp, Leidelmeijer, Marsman, and de Hollander (2003) mentioned many valid definitions of Environmental quality. Generally, an environment of high quality conveys a sense of well-being and satisfaction to its population through variations of physical characteristics (Porteous, 1971). They added that environmental quality can be defined as an essential part of the broader concept of 'quality of life', the basic qualities such as health and safety in combination with aspects such as cosiness and attractiveness. Liveable community spaces hold some characteristics that provide and promote opportunities for casual social interactions, by compiling a comprehensive understanding about what space qualities and activities that could improve community cohesion. Human experiences depend not solely on the physical environment, but mainly on the patterns of events which they experience there. The framework introduced by Van Kamp, Leidelmeijer, Marsman, and de Hollander (2003) set the domains of environmental quality of life in any built environment to be: *sources of annoyance, urban design, housing, sanitation and pollution*.

In a more heritage related analysis, Jonas (2006) and others refer a successful environment to provide:

- Narrow streets rather than wide roads leading to less traffic and/or reduced traffic speeds, and encouraging pedestrian mobility,

- A mix of uses and a variety of building styles,
- Less informal structures and slums (The Philips Think Tank on Livable Cities, 2011),
- Public spaces that are animated by people,
- Well-maintained buildings and streetscapes of a scale and massing that people can relate to,
- Mostly illuminated at night and partly shadowed at day,
- Parking spaces for cars and bikes next to dwellings to encourage more use of this 'green' mode of transport (Douglas, 2006),
- Beautiful and interesting architectural design features or detailing,
- Elements that increase sense of safety and attractiveness,
- Better access to and around the buildings (Douglas, 2006),
- Recreational facilities (Douglas, 2006),
- A variety of spaces building types sizes and uses,
- Distinctive local character,
- Clear associations with the past,
- Richness and warmth of design,
- and Physical manifestation of a city's reinvention.

As a local example in Egypt, the intimate and densely built-up residential fabric in al-Aslam neighbourhood had been undergone many interventions to improve the open space, rehabilitation of housing and commercial spaces, upgrade infrastructure and many other goals. The improvements done to the square aimed at creating an attractive and well-maintained public space in the heart of ad-Darb al-Aḥmar (Bianca & Siravo, 2005). Specifically, intervention aimed to:

- Restore the Aslam Mosque, a highly valued community facility and prominent local landmark. Restoration of the mosque aimed to have an immediate impact on the quality of the surrounding urban environment (**Figure 3.45**).
- Rehabilitate the houses around Aslam Square, enhancing the view of the square from al-Azhar Park and enticing visitors to venture down the park's western slope to enter and explore the old city. This was achieved on two phases, the first depended mostly on Aga Khan's funds to present a prototype, the second

depended mostly on private funds after the local inhabitants witnessed upgrading and enhancement of the surrounding buildings.

- Upgrade the public space within the square itself—infrastructure and paving—and create new seating areas and a pedestrian area in front of the mosque; in addition to inserting vegetation and softscape (**Figure 3.46**).
- Promote tourists' guided tours from monuments of ad-Darb al-Aḥmar into the park.

Despite that the efforts done in Aslam's project was not assessed or evaluated to measure its impact on the overall environmental upgrading of the neighbourhood, previous efforts for assessment procedure could have been undertaken to measure the impact of this upgrading program. In his presentation, Angel (1999) suggested that the assessment of enhancing the built environment can be in the form of before-and-after comparisons (**Figure 3.47**) of physical elements. These physical characteristics –as mentioned above by Van Kamp, Leidelmeijer, Marsman, and de Hollander (2003) and Jonas (2006) - can then be compared to the overall goals of the project. Angel adds that in the measurement system that contain both cause and effect, indicators can assess more precise decisions of rehabilitations and their direct influence on the environmental upgrading results.

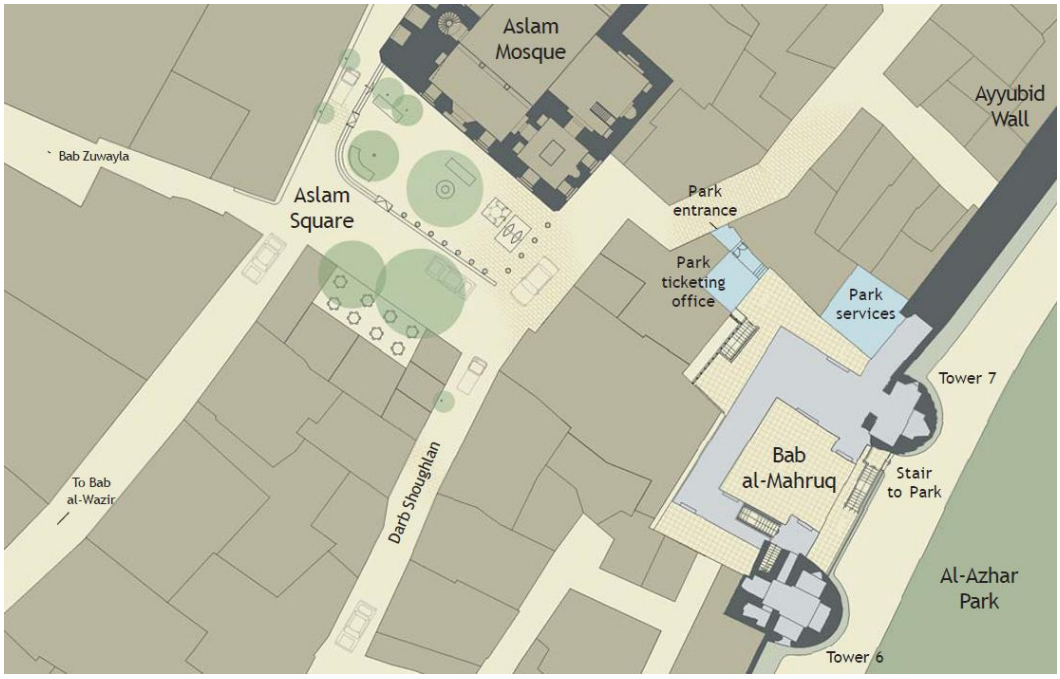


Figure 3.45 Aslam Square Plan.

A plan showing the proposal for Aslam Square and the Mahruq Gate in ad-Darb al-Aḥmar. Image source Bianca and Siravo (2005).

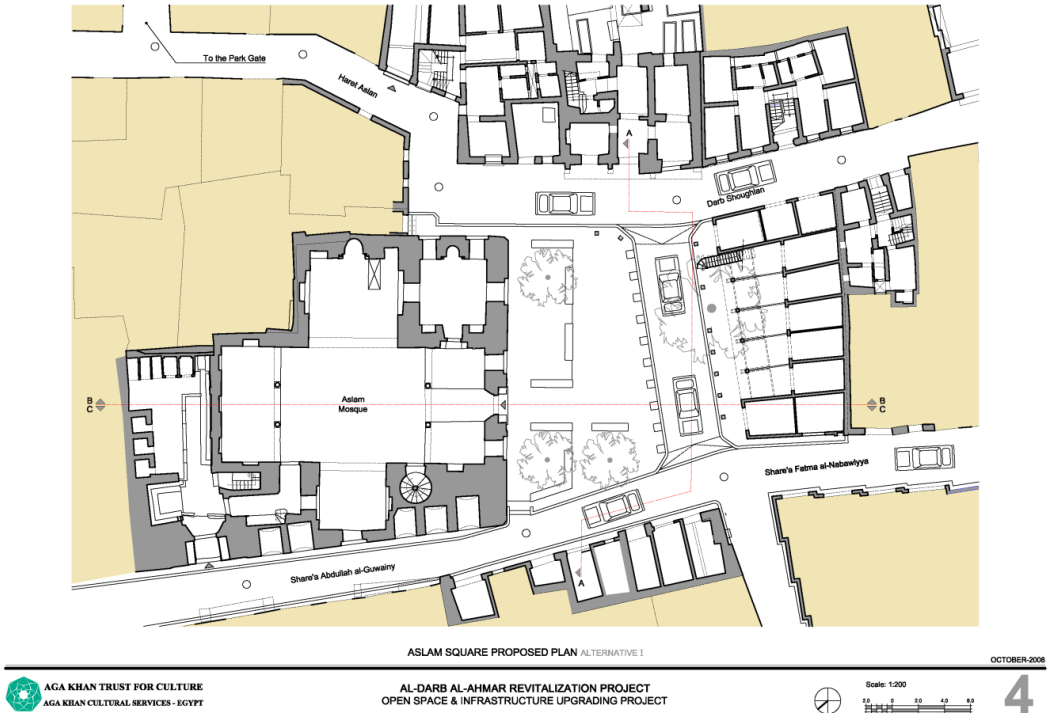


Figure 3.46 Aslam Square Softscape Plan.

Detailed Design Plan showing design features (vegetation, poles, paving, open spaces, well defined streets...etc) as part of the process to enhance the physical built environment in Aslam square and surrounding fabric. Image source: archnet.org.

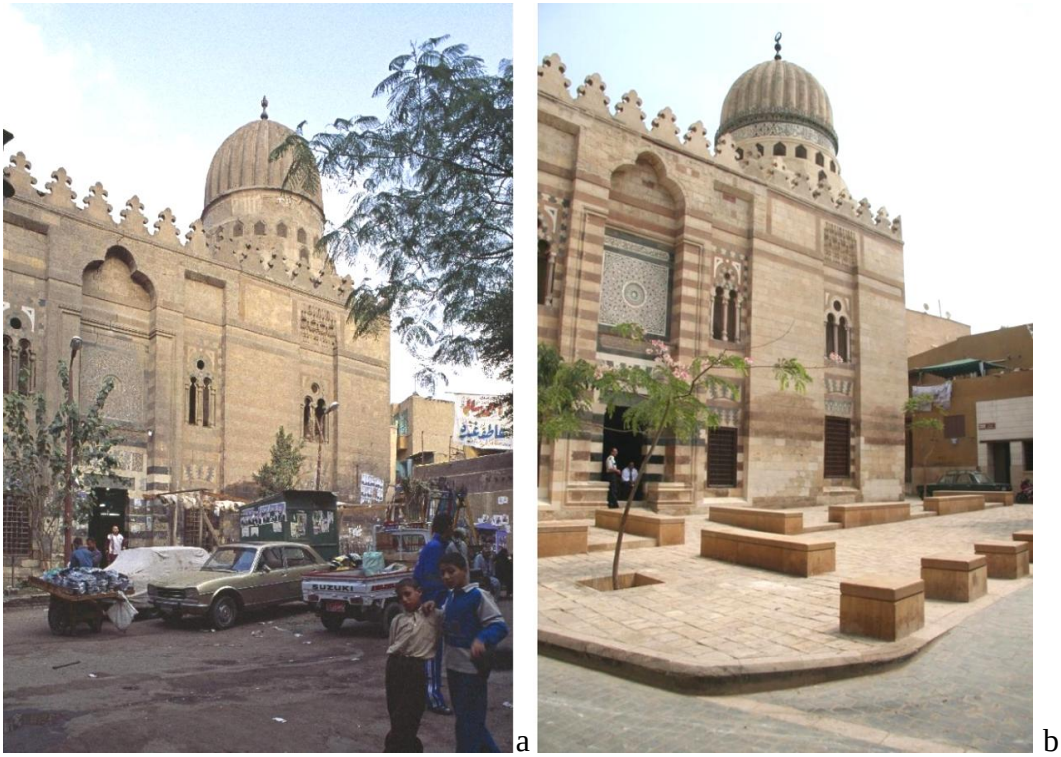


Figure 3.47 Aslam Mosque before and after rehabilitation

Comparison between the condition before in 2000 (a) and after rehabilitation works in 2009 (b) of the street facade of Aslam Mosque and its adjoining square. Images source: archnet.org.

3.3.3.7. Sustaining natural and local environments

Sustainability pressing issues and the increase in demand and charges for energy and water are important aspects to assess adaptive reuse of old buildings (Douglas, 2006). Good practices of minimum intervention in historic environment conservation is also good practice in energy conservation, and that conserving heritage buildings is useful for both their cultural value and because it makes environmental sense (Heritage Lottery Fund, 2009; Rodwell, 2007; Bullen & Love, 2010). To follow the track of the ancestors who conserved natural resources is important when dealing with their buildings as part of the global thinking today (Plevoets & Van Cleempoel, 2012a). In his book, Douglas (2006) identified two primary actions that are applicable in the process of assessing adaptively reused heritage buildings for being environmentally sustainable.

a) Implemented Energy Efficiency Actions

In an adapted building this can be best achieved by reducing energy consumption and minimizing heat losses. Lighting, for example, accounts for the majority of energy consumption in commercial buildings (Douglas, 2006). Adaptation schemes for this building typology should therefore attempt to maximize natural day lighting when possible and provide energy efficient lighting where necessary. Global warming is likely to raise the demand for active cooling systems in buildings. Air conditioning in a building increases its energy consumption. In many cases it is more expensive to cool a building than it is to heat it. More reliance therefore will need to be placed on passive cooling measures to combat this problem. Draught proofing and insulation measures to the external fabric can help minimize heat gains.

b) Used Environment- friendly Products and Materials

A building is successfully reused when it takes advantage of the buildings' existing attributes (Bullen & Love, 2010). This can include the initial shape, structure, or materiality. The production, use and disposal of building materials have a major environmental impact. In 1995 for example, 10% of UK CO_2 emissions were related to the manufacture and transport of building materials (Heritage Lottery Fund, 2009). Assessing the amount of recycled materials is one important criterion for avoiding extra-waste and in sustaining the environment; nonetheless, ample quantity and ease of acquisition are important attributes to material selection (Shull, 2005). The handling and processing of

materials used in building adaptation projects can be achieved in various ways. However, the Heritage Lottery Fund (2009) and Douglas (2006) specified seven guide items for adaptive reuse projects. Generally, the more items achieved out of this specifications, the more the building is considered part of a sustainable intervention to the world.

- Recycling waste material from reuse
- Using traditional building materials
- Use materials available locally
- Nature-based materials
- Incorporate materials with high recycled content
- Use materials that are low in embodied energy
- Adopted site waste management plan

Conclusion of Chapter three

This chapter has presented a framework for the comprehensive and systematic assessment of the adaptive reuse of heritage buildings in Historic Cairo. For each of the three pillars of adaptive reuse, the framework details relevant assessment criteria. These criteria were derived through an analysis of the global and local literature from such diverse fields as restoration, funding, socio-urban research, environmental sustainability, tourism and economic development, building engineering, environmental psychology, and architectural transformations. The following chapter discusses the strengths and limitations of the framework as well as implications for future research and adaptive reuse practice.

CHAPTER FOUR

GENERAL CONCLUSIONS

This thesis has presented what is argued to be a much needed comprehensive assessment framework for adaptively reused heritage projects in Historic Cairo. It is presented as an initial step for the development of tools that could permit such assessment. In the conclusion of this thesis, the following sections successively discuss the strength of the proposed framework, its limitations, as well as implications for future research and practice.

4.1. STRENGTHS OF THE PROPOSED FRAMEWORK

As discussed by Rapoport (1985, p. 256), frameworks are somewhat "arbitrary" in the sense that, for a particular subject or phenomenon, many frameworks could be formulated and that alternative frameworks may prove useful for different purposes. Yet, they are not completely arbitrary. Theoretical frameworks need to fit and unify existing evidence. Superior or more useful frameworks will fit evidence better than others. In this section, the strengths of the framework presented in this thesis are discussed in relation to its synthesizing, integrative and organizing value.

First, the proposed framework fits, summarizes, and synthesizes a large amount of literature relevant to the study and assessment of the adaptive reuse of the architectural heritage in Historic Cairo. Second, the proposed framework integrates the different disciplinary orientations within this literature. Indeed, it integrates paradigms from such diverse disciplines or fields of study as restoration, heritage management, funding, socio-urban upgrading, environmental sustainability, tourism and economic development, building engineering, environmental psychology, and architectural transformations.

Finally, the proposed framework organizes this vast multi-disciplinary literature to facilitate the development of tools for the comprehensive and systematic assessment of the adaptive reuse of the architectural heritage of Historic Cairo. To date, evaluations of adaptive reuse projects have relied on atheoretical and isolated case studies. This has not permitted or helped the development of tools for the comprehensive and systematic assessment of projects. On the other hand, the proposed framework organises the literature by identifying the three main goals or pillars of heritage reuse: 1) building conservation, 2) success of new use, and 3) local community development. For each of these pillars, it also identifies the criteria of evaluation. It is believed that through this organisation of the literature, the proposed framework is an important and useful initial step for the

development of tools that will permit the needed comprehensive and systematic assessment of adaptive reuse projects of the architectural heritage in Historic Cairo.

4.2. LIMITATIONS OF THE PROPOSED FRAMEWORK

The proposed framework has a theoretical limitation, which is that it does not address the issue of the relative priority (weighting) of the different assessment criteria. In theory and practice, it is believed that the appropriate weighting of these criteria will vary from one project to another, and can develop through time. Decisions of adaptive reuse of any heritage building may vary according to case-by-case or collective conditions, such as the type of its value (valueness), and its structural condition.

4.3. RESEARCH IMPLICATIONS

The proposed framework is considered to be an important step toward the comprehensive and systematic evaluation of adaptive reuse projects. The following section discusses future implications of this research for future research, and for practice and policy making.

Usually, each heritage building or group of buildings has its own circumstances that might push the adaptation scheme towards satisfying certain project goal(s) more than the others. This means that some criteria in the proposed framework might be of more importance than others. As a direct development of the framework to be applied in the assessment of heritage adaptive reuse, future research can work on prioritizing/ weighting the assessment criteria according to some attributes that are related to heritage buildings. The attributes might be location, significant social values, size, age, aesthetics, degree of preservation/deterioration, location, structural stability, typology, and the urban, economic and social aspects of the immediate surrounding area. Priorities of the assessment criteria can be reo-organized according to multiple classification systems/levels of these attributes. Preparing surveys, matrixes, and lists of heritage buildings that handles all relevant attributes make it easier to plan and implement adaptation proposals successfully.

The second research implication could be to develop the proposed assessment framework of adaptive reuse projects for the purpose of application on a more aggregated level of urban planning. The comprehensive assessment of a city-wide network of adaptive reuse projects may lead to double the benefits and potentials of reuse projects more than just assessing single projects individually. The strategy of whole area revitalization by reusing

heritage buildings can influence neighbouring districts. Multiple historic areas in one rich city such as Cairo could be integrated on urban and managerial levels to act more efficiently in attracting investments and urban development projects; and thus, cause a dramatic change of how Cairo is perceived globally as a cultural capital.

As a third research implication, the proposed framework offers a step that needs to be developed into practical assessment tools. It would be beneficial to discuss in details the quantitative and/or qualitative indicators of evaluation. Each specific field of research of conservationists, architects and socio-urbanists can technically develop, apply, test the assessment criteria, further increase their indicators' precision and adjust the assessment thresholds. Ever evolving technological advancements and paradigm shifts might also affect the assessment framework to change, either by adding other indicators, removing and overemphasising others. Even some of the proposed criteria that are either based on local or international codes are subject to modifications, enhancements and development. For example, future research related to adapted buildings for reuse might consider applying space syntax as a valid scientific tool for evaluating architectural performance of heritage buildings' typologies.

It is important to emphasize that although the proposed framework was formulated for the specific context of Historic Cairo, with few adjustments, it may be generalized/ applied to other contexts. Only detailed indicators per each assessment criterion might be fine-tuned, and thresholds to be changed before application in different contexts. For example, urban renewal projects historic Dutch city-centres consider turning underused Churches into another uses as a proper solution when they form financial burden on the municipality. While in the case of Cairo's Mosques and Churches, religious, legal and socio-cultural factors discourage any changes of their function while no other option but functional continuation is recommended. Thus, coinciding with local socio-cultural values might be an indicator that changes according to the context of the study.

And as a final research implication, future research can develop/ adjust the assessment framework for the purpose of evaluating the adaptive reuse of modern architecture of the 19^{th} and 20^{th} centuries. Many of these buildings that were built in the modern era are now vacant and suffer neglect and threats of demolishment.

Although much research is still needed to develop actual assessment tools from the framework presented here, as is, the proposed framework can be of practical value in

adaptive reuse practice. It identifies the main pillars of heritage adaptive reuse to be: 1) building conservation, 2) success of new use, and 3) local community development. And for each of the goals it identifies the main criteria to consider for achieving them. Thus, the framework can be used as a checklist and a reference document for both: planning new adaptive reuse projects and evaluating already completed ones. It is believed that this framework could be of great help in heritage-led upgrading projects of the architectural heritage of Historic Cairo, where deprived and marginalized communities live and work.

In the proposed framework, the assessment criteria are discussed independently. While in practice and in real-life situations, intervening in heritage buildings might result in multiple reactions. Future researches for the purpose of applying this framework need to find relations between multiple assessment criteria. For example, the conservation of architectural value of the whole heritage site may increase the level of local recognition and the liveability of historic districts. The sudden increase of economic benefits can lead to gentrification, and this might threaten community cohesion. More research is needed to analyze relationships between the assessment criteria of the adaptive reuse of heritage buildings based on case study research.

There is a design related issue that is highlighted in this thesis: conservative approaches for intervention in historic fabric calls for restoration of a replica of what have been lost, or to imitate the architectural elements of style that the building belongs to when adding an annex or extension. These conservative approaches are criticized explicitly in global literature. Contemporary additions to heritage buildings should respect the uniqueness of the cultural heritage by not repeating them. There are many successful international examples which used contemporary design interventions in historic fabric. As an implication for practice, these examples should be analysed to extract clear guidelines and regulations that would enable conserving Cairo's authentic fabric, while acknowledging the right to construct contemporary architecture simultaneously.

Finally, it is worth noting that the greatest benefits from assessing adaptively reused heritage buildings come when the information made available to as wide an audience as possible, beyond the institution whose building is evaluated, to the whole heritage-interested groups and organizations, local community and governmental systems. Information from applying and documenting such assessment framework can provide not only insights into solving problems, but also provide useful benchmark data with which

other projects can be compared, and more informed policies can be produced. This shared learning resource would provide the opportunity for improving the main aims of conserving heritage buildings, developing local community and achieving a sustainable use of valuable buildings. All institutions should have access to knowledge base, be active in revitalization activities and learn from previous attempts.

REFERENCES

Aalund, F. (1980). The Wekalat Bazar'a: The rehabilitation of a commercial structure in the Old City. In M. Meinecke (Ed.), *Islamic Cairo: Architectural conservation and urban development of the historic centre*. (pp. 35-41). Cairo: Flexiprint Ltd, Worthing, UK.

Abdelhalim, A. I. (1985). Transformations in Architecture and Urbanism: Public Projects and Private Initiatives. In A. Evin (Ed.), *The Expanding Metropolis: Coping with the Urban Growth of Cairo* (pp. 43-46). Cairo: Concept Media Pte Ltd Singapore, for Aga Khan Award for Architecture.

Afify, A. N. (2002). New approaches for rehabilitation and conservation of urban heritage. *First international conference of the UIA-WPAHR-V on Architecture & Heritage as a Paradigm for Knowledge and Development: Lessons of the Past, New Inventions and Future Challenges.* Alexandria.

Afify, A. N. (2007). The Rehabilitation and Conservation policies for Historical Areas; Issues for Egypt and Mediterranean cities. *First Euro-Mediterranean Regional Conference, Traditional Mediterranean Architecture; Present and Future.* Barcelona. Retrieved February 11, 2013, from www.cpas-egypt.com/pdf/Ayman_Afify/5th%20Paper.pdf

AGA KHAN Foundation. (2011). *A Continuum of Development.* Aga Khan Foundation. Geneva: Rosseels Printing Company.

Aga Khan Program for Islamic Architecture (1985). Cairo: 1800-2000 Planning for the Capital City in the Context of Egypt's History and Development. In A. Evin (Ed.), *The Expanding Metropolis: Coping with the Urban Growth of Cairo* (pp. 91-120). Cairo: Concept Media/The Aga Khan Award for Architecture.

Aksah, H. (2011). *Post Occupancy Evaluation on Refurbished Historical Government Buildings in Metropolitan City of Kuala Lampur.* UiTM, Architecture, Planning & Surveying. Kuala Lampur: UiTM.

Al-hagla, K. (2010). Sustainable urban development in historical areas using the tourist trail approach: A case study of the Cultural Heritage and Urban Development (CHUD) project in Saida, Lebanon. *The International journal of urban policy and planning (CITIES), 27*(4), 234-248.

Al-Ibrashy, M. (2012). *Whose Monument? Participatory Design Project on the Relationship of AL-KHALIFA ST. Monuments and Their Surroundings.* Retrieved February 13th, 2013, from Athar Lina: www.atharlina.com/en

Al-Minabbawy, M. (1995). Restoration Work in Cairo: Past, Present, and Future. In J. L. Bacharach (Ed.), *The Restoration and Conservation of Islamic Monuments in Egypt* (pp. 17-21). Cairo, Egypt: The American University in Cairo Press.

Almughany, N., El-Wazir, M., Al-Qeeq, F., & Dawood, H. (2009, March). A Sustainable Approach for Urban Integration of HAMMĀM SAMĀRAH in the Historic City of Gaza. *Archnet-IJAR, International Journal of Architectural Research, 3*(1), 171-185.

Angel, S. (1999). Upgrading Indicators: measuring the performance of national urban upgrading programs. *Presentation prepared for the Scaling-Up Urban Upgrading in Latin American Workshop.* Washington, D.C.: World Bank. Retrieved January 12, 2013, from web.mit.edu/..../upgrading-indicators.html

Antoniou, J. (2004). Cairo's Urban Growth and Its Impact on the Historic City. In S. Bianca, & P. Jodidio (Eds.), *Cairo: Revitalising a Historic Metropolis* (pp. 31-41). Turin: Umberto Allemandi & C. for Aga Khan Trust for Culture.

Antoniou, J., Bianca, S., El-Hakim, S., Lewcock, R., & Welbank, M. (1985). *The Conservation of the old City of Cairo.* UNESCO. Paris: UNESCO.

Arkoun, M. (1990). The Meaning of Cultural Conservation in Muslim Societies. In A. H. Imamuddin, & K. R. Longeteig (Ed.), *Architectural & Urban Conservation in the Islamic World. 1*, pp. 25-33. Geneva: The Aga Khan Trust for Culture.

Ashworth, G. J. (1984). The management of change: Conservation policy in Groningen, The Netherlands. *The international journal of urban policy and planning (CITIES), 1*(6), 605-616.

Atash, F. (1993). Fragmentation of the urban fabric: The experience of Middle Eastern and North African cities. *CITIES, 10*(4), 313-325.

Athens Charter (1931). The Athens Charter for the Restoration of Historic Monuments. *Articles adopted at the First International Congress of Architects and Technicians of Historic Monuments.* Athens: UNESCO.

Augustijn, E. W., & Flacke, J. B. (2010). Investigating the effect of different pre-evacuation behavior and exit choice strategies using agent-based modeling. *Procedia Engineering, 3*, 23-35.

Australia ICOMOS Incorporated. (2000). *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance 1999 with associated Guidelines and Code on the Ethics of Co-existence.* International Council of Monuments and Sites. Burwood: Australia ICOMOS Incorporated.

Aydin, D., & Yaldiz, E. (2010). Assessment of building performance in a re-use adaptation case. *Journal of the Faculty of Architecture in Middle East Technical University, 27*(1), 1-22.

Aziz, M., & Shehata, W. (2012). Revival of Past-Present- Future: Sustainability in Islamic Architecture: Past-Present- Future. In A. Mandour, & Y. E. Putrie, *Contemporary architecture of Islamic societies: Between globalization and traditions.* Jakarta: UIN-Maliki Press.

Barnes, C. (2010). *Preserving Industrial Heritage: A Methodology for the Reuse of Industrial Buildings and Campuses.* the University of Cincinnati, Division of Research and Advanced Studies. Cincinnati: the University of Cincinnati.

Ben-Hamouche, M. (2012). Contemporary Architecture of Islamic Societies: Islamization of Contemporary Architecture; Shifting the Paradigm of Islamic Architecture. In M. A. Mandour, & Y. E. Putrie, *Contemporary architecture of Islamic societies: Between globalization and traditions* (pp. 1-40). Jakarta, Indonesia: UIN-Maliki Press.

Benzagouta, S. D. (2008). The reuse of a hammām as a public services centre: HAMMĀM suq el ghezal ; towards a sustainable future. *Archnet-IJAR, International Journal of Architectural Research, 2*(3), 69-79.

Bianca, S. (2004). A new path to urban rehabilitation in Cairo. In S. Bianca, & P. Jodido, *Cairo: Revitalising a Historic Metropolis* (pp. 69-83). Turin: Umberto Allemandi & C. for Aga Khan Trust for Culture.

Bianca, S., & Siravo, F. (2005). *Historic Cities Support Programme. Cairo: Urban Regeneration in The Darb Al-Ahmar District. A Framework for Investment.* Geneva: The Aga Khan Trust for Culture.

Bond, C. (2011). *Adaptive Reuse: Explaining Collaborations within a Complex Process.* University of Oregon, Department of Historic Preservation and the Department of Planning, Public Policy, and Management. University of Oregon.

Boussaa, D. (2010). Urban Conservation and Sustainability; Cases from Historic Cities in the Gulf and North Africa. *Conference On Technology & Sustainability in the Built Environment* (pp. 305-326). Riyadh: King Saud University - College of Architecture and Planning.

Broto, C. (2002). *Reborn Buildings.* Barcelona, Spain: Links International.

Buildings Department of Hong Kong. (2012). *Practice Guidebook on Compliance with Building Safety and Health Requirements under the Buildings Ordinance for Adaptive Re-use of and Alteration and Addition Works to Heritage Buildings.* Heritage Department. Hong Kong: Buildings Department of Hong Kong.

Bullen, P., & Love, P. (2010). The rhetoric of adaptive reuse or reality of demolition: Views from the field. *The international journal of urban policy and planning (CITIES), 27*(4), 215-224.

Campbell, J. L. (2011). *Architecture and Identity: The Occupation, Use, and Reuse of Mughal Caravanserais.* University of Toronto, Department of Anthropology. University of Toronto: University of Toronto.

Cantacuzino, S. (1989). *Re/Architecture: Old Buildings/ New Uses.* Spain: Thames and Hudson, Artes Graficas Toledo S.A.

Cantacuzino, S. (1990). A Policy for Architectural Conservation. In A. H. Imamuddin, & K. R. Longeteig (Ed.), *Architectural & Urban Conservation in the Islamic World. 1*, pp. 12-24. Geneva: The Aga Khan Trust for Culture.

Chan, E. H., & Lee, G. K. (2008). Contribution of Urban Design to Economic Sustainability of Urban Renewal Projects in Hong Kong. *Sustainable Development, 16*(6), 353-364.

Choi, E. (2010). *Adaptive reuse of religious buildings in the U.S: determinants of project outcomes and the role of tax credits.* Doctor Of Philosophy Dissertation, Cleveland State University, the Department of Urban Studies and the College of Graduate Studies, Cincinnati.

Clark, D. (2008, April 1). *Adapting an Older Building for a New Use.* Retrieved March 11th, 2013, from Buildings: www.buildings.com/article-details/articleid/5837/title/adapting an older building for a new use.aspx

Conejos, S., & Langston, C. (2010). *Designing for future building adaptive reuse using adaptSTAR.* Retrieved March 5th, 2012, from Bond University:works.bepress.com/sheila_conejos/1

Conejos, S., Langston, C., & Smith, J. (2012). AdaptSTAR model: A climate-friendly strategy to promote built environment sustainability. *Habitat international*, 13.

Dale, A., & Newman, L. L. (2009, August). Sustainable development for some: green urban development and affordability. *Local Environment: The International Journal of Justice and Sustainability, 14*(7), 669-681.

Department of the Environment and Heritage. (2004). *Adaptive Reuse: Preserving our past, building our future.* Commonwealth of Australia. Sydney: Pirion.

Department of the Environment (2014). *A Strategy for Australia's Heritage*. Retrieved from: http://www.environment.gov.au/system/files/resources/426e089a-b460-4e21-b613-4b86eabd3127/files/heritage-strategy-apr14_1.pdf

Dina, A. & Maignan, C. (2012). Revitalization through Arts and Culture: New Developments for 5 European Industrial Complexes. Central Europe Programme. Central Europe: Project Second Chance.

Douglas, J. (2006). *Building Adaptation* (2nd ed.). Edinburgh, Oxford & Burlington, Oxford & MA, Great Britain & USA: Butterworth-Heinemann is an imprint of Elsevier.

Duvall, C. (2002). Specialty Practices. In C. Coleman (Ed.), *Interior Design: Handbook of Professional Practice* (pp. 366-433). USA: McGraw-Hill Companies, Inc.

Ebbe, K. (2009, February). Infrastructure and Heritage Conservation: Opportunities for Urban Revitilization and Economic Development. (C. H. Group, Ed.) *The World Bank-Urban Development Unit*. Retrieved from: go.worldbank.org/8I5UVZPU60

el Habashi, A. (2008). Monuments or Functioning Buildings: Legal protection over five case-study historic HAMMĀMS in the Mediterranean. *Archnet-IJAR, International Journal of Architectural Research, 2*(3), 42-55.

El-Aref, N. (2007, September 20-26). Cut down to size. *Al-Ahram Weekly, 863*. Retrieved from http://weekly.ahram.org.eg/2007/863/eg3.htm

El-Habashi, A. (2001). *Comments on the Comité Bulletins*. Retrieved October 4th, 2012, from Islamic Art Network: www.islamic-art.org/comitte/comite.asp

El-Habashi, A., & Nada, H. A.-E. (2011). Monuments or Heritage Buildings: The Historic water dispensaries (Sabils) of Cairo. *Safeguard of Architectural, Visual, Environmental Heritage*. Capri, Napoli: Commissione Nazionale Italiana per l'UNESCO.

El-Halafawy, A. M., & Soliman, M. H. (2002). Accessability for People with Special Needs to Historic Properties: Proposed Evaluation Checklist for Historic Egyptian Public Libraries. *First international conference of the UIA-WPAHR-V on Architecture & Heritage as a Paradigm for Knowledge and Development: Lessons of the Past, New Inventions and Future Challenges*, (p. 18). Alexandria.

Elkerdany, D. (2002). Innovation and conservation: Case studies in intervening with valuable buildings. *First international conference of the UIA-WPAHR-V on Architecture & Heritage as a Paradigm for Knowledge and Development: Lessons of the Past, New Inventions and Future Challenges.* Alexandria.

Elkerdany, D. (2008). Hammam Folklore Dymanics in CAIRO: Lessons from Operation to Regeneration. *International Journal of Architecture-Archnet, 2*(3), 29-41.

Elshahed, M. (2011, May 2). *Saving Cairo Station.* Retrieved April 14, 2013, from Egypt Independent: http://www.egyptindependent.com/opinion/saving-cairo-station

Elsorady, D. A. (2012, December). Heritage conservation in Rosetta (Rashid): A tool for community improvement and development. *Cities, 29*(6), 379-388.

Elzeyadi, I. M. (2001). *Ten Palaces Tell Their Stories: Environmental Quality Assessment of Offices Inside Adaptively Re-used Historical Palaces in Cairo, Egypt.* Ph.D Dissertation, The University of Wisconsin-Milwaukee, Architecture, Wisconsin.

Enam, K., & Rashid, K. (1990). Planning Tools for Architectural Conservation. In A. H. Imamuddin, & K. R. Longeteig (Ed.), *Architectural & Urban Conservation in the Islamic World. 1*, pp. 69-72. Geneva: The Aga Khan Trust for Culture.

Engelhardt, R. A. (2009). *Hoi An Protocols for Best Conservation Practice in Asia: Professional Guidelines for Assuring and Preserving the Authenticity of Heritage Sites in the Context of the Cultures of Asia.* Bangkok, Thailand: UNESCO Bangkok.

English Heritage. (2008). *Putting the Historic Environment to Work: A Strategy for the West Midlands 2010-2015.* English Heritage.

Eyüce, A. (2010). Adaptive reuse of industrial buildings at Bahçeşehir University (BU). In M. Al-Asad, *Workplaces: The Transformation of Places of Production* (pp. 167-184). Geneva, Switzerland: The Aga Khan Award for Architecture, 2010.

Eyüce, Ö., & Eyüce, A. (2010). Design education for adaptive reuse. *International Journal of Architectural Research (Archnet-IJAR), 4*(2-3), 419-428.

Fournier, D. F., & Zimnicki, K. (2004). *Integrating Sustainable Design Principles into the Adaptive Reuse of Historical Properties.* Construction Engineering Research Laboratory, Champaign.

Fowler, D. (1995). Conservation Priorities in Cairo Today. In J. L. Bacharach (Ed.), *The Restoration and Conservation of Islamic Monuments in Egypt* (pp. 12-16). Cairo, Egypt: The American University in Cairo Press.

Gehl, J. (1980). *Life Between Buildings: Using Public Space* (6th ed.). Washington D.C.: Island Press.

Gharib, R. (2011). Revitalizing Historic Cairo: Three decades of policy failure. *International Journal of Architectural Research (Archnet-IJAR), 5*(3), 40-57.

Gharib, R. (2012). Politics Succeeding the Egyptian Revolution: Which will Revitalize Historic Cairo? *3rd International Conference on Heritage and Sustainable Development.* Porto, Portugal: Green Lines Institute for Sustainable Development.

Glynn, T. J. (1981). Psychological sense of community: Measurement and application. *Human Relations, 34*(9), 789-818.

Google. (2012). [360^{o} Panoramic image of Dubrovinik, Croatia, 2011]. *Google Maps Street View.* Retrieved from: maps.google.com

Groat, L., & Wang, D. (2002). *Architectural Research Methods.* New York: John Wiley and Sons Ltd.

Grube, E. J., Dickie, J., Grabar, O., Sims, E., Lewcock, R., Jones, D., & Petherbridge, G. T. (1987). *Architecture of the Islamic World: Its history and social meaning.* (G. Michell, Ed.) London, UK: Thames and Hudson Ltd.

Hampikian, N. (2004). A Decisive Moment for the Survival of Historic Cairo. In S. Bianca, & P. Jodidio, *Cairo: Revitalising a Historic Metropolis* (pp. 209-219). Turin: Umberto Allemandi & C. for Aga Khan Trust for Culture.

Hansen, G. K., Haugen, T., & Leaman, A. (2005). A usability success story? the case of nord Trondelag University College. In S. Emmitt, & M. Prins (Ed.), *Designing value: new directions in architectural management* (pp. 357-365). Lyngby: International Council For Research And Innovation In Building And Construction.

Harriman, L. (2006, October). *Practical aspects of measuring moisture in buildings.* Retrieved March 15, 2013, from Masongrant: http://www.masongrant.com/pdf_2008/Field_Moisture_Measurement.pdf

Heritage Lottery Fund. (2008a). *Conservation Management Planning.* Retrieved February 12, 2013, from: www.hlf.org.uk/aboutus/Pages/allourpublications.aspx

Heritage Lottery Fund. (2008b). *Management and maintenance planning.* Retrieved February 12, 2013, from: www.hlf.org.uk/aboutus/Pages/allourpublications.aspx

Heritage Lottery Fund. (2008c). *Understanding full cost recovery.* Retrieved February 12, 2013, from: www.hlf.org.uk/aboutus/Pages/allourpublications.aspx

Heritage Lottery Fund. (2008d). *Evaluating your HLF project.* Retrieved from www.hlf.org.uk/aboutus/Pages/allourpublications.aspx

Heritage Lottery Fund. (2009). *Planning greener heritage projects.* Retrieved February 12, 2013, from: www.hlf.org.uk/aboutus/Pages/allourpublications.aspx

Heritage Lottery Fund. (2012). *Making your project accessible for disabled people: Good-practice guidance.* Retrieved February 12, 2013, from: www.hlf.org.uk/aboutus/Pages/ allourpublications.aspx

Hillenbrand, R. (2000). *Islamic Architecture: Form, function and meaning.* Cairo, Egypt: The American University in Cairo.

Horgen, T., Joroff, M. L., Porter, W. L., & Schon, D. A. (1998). *Excellence By Design: Transforming Workplace and Work Practice.* New York, USA: Wiley.

Hsu, J.-H. (2007). *The highest and best use assessment of an adaptive reuse development: A former Agere systems campus redevelopment plan.* M.Sc. thesis, Massachusetts Institute for Technology, Department of Architecture, Massachusetts.

Hutton, T. (2004). The New Economy of the inner city. *The international journal of urban policy and planning (CITIES), 21*(2), 89-108.

IAA Architecten. (2012). *ROC van Twente, Hengelo*. Retrieved March 12, 2013, from: www.iaa-architecten.nl/projecten/renovatie/%5Eindex.html/Hengelo%20-%20ROC%20van%20Twente.html

ICOMOS. (2003). *ICOMOS Charter- Principles for the analysis, conservation and structural restoration of architectural heritage.* ICOMOS. Victoria Falls, Zimbabwe: ICOMOS.

Institute For The Restoration Of Dubronvik. (2011). *Cinema,Coffee House,Exhibition Hall.* Retrieved December 29, 2012, from: http://www.zod.hr/eng/novost.php?id=30

Institute for the Restoration of Dubrovnik. (2011). *War Damages of the Cultural Heritage*. Retrieved December 29, 2012, from: http://www.zod.hr/eng/novost.php?id=50

Intergovernmental Committee for the Protection of the World Cultural and Natural. (2008). *Operational guidelines for the implementation of the world heritage convention.* UNESCO, World Heritage Center.

Issa, S. M. (2002). Historic form: The corenerstone to sustainable development. *First international conference of the UIA-WPAHR-V on Architecture & Heritage as a Paradigm for Knowledge and Development: Lessons of the Past, New Inventions and Future Challenges.* Alexandria.

Jack Jacob Group. (2010). *Adaptive reuse*. Retrieved March 11, 2013, from: www.jackjacobgroup.com

Jokilehto, J. (1988). Conservation Principles and Their Theoritical Background. *Durability of Building Materials, 5*(3-4), 267-277.

Jonas, D. (2006). *Heritage Works: The reuse of historic buildings in regeneration. A toolkit of good practice.* Retrieved October 17, 2012, from: www.english-heritage.org.uk/.../heritageworks.pdf

Kalner, S. (2004). Adaptive Re-use. In R. S. Sennott (Ed.), *Encyclopedia of 20th-century architecture* (Vol. 1, pp. 22-25). New York: Fitzroy Dearborn.

Kamal, A. M. (2002). Economic prespective of historic preservation: A missing dimension. *First international conference of the UIA-WPAHR-V on Architecture & Heritage as a Paradigm for Knowledge and Development: Lessons of the Past, New Inventions and Future Challenges.* Alexandria.

Konara, k. M., & Sandanayake, Y. G. (2010). Building Post Occupancy Evaluation Framework. *The 5th International Research Conference on Management and Finance (IRCMF)* (pp. 218 – 228). Sri Lanka: University of Colombo, Sri Lanka Foundation Institute. Retrieved January 12, 2013, from: 192.248.17.88/mgt/images/stories/research/ircmf/2010/HRM/23.pdf

Kreag, G. (2001). *The Impacts of Tourism.* University of Minnesota. Minnesota: USA: Minnesota Sea Grant.

Lamei, S. (2005). Insights into Current Conservation Practices. *Museum International, 57*(1-2), 136-141.

Langston, C. (2011). On Archetypes and Building Adaptive Reuse. *the 17th Annual Pacific Rim Real Estate Society (PRRES) conference.* Gold Coast, Australia.

Langston, C., Liu, C., Beynon, D., de Jong, U., Langston, Y. L., Merlino, D., . . . Williams, P. (2010). *Strategic assessment of building adaptive reuse opportunities.* Retrieved October 31, 2012, from Bond University: http://epublications.bond.edu.au/sustainable_development/141

Larkham, P. J. (1996). *Conservation and the city.* London & New York: Routledge.

Lawson, B. (2005). *How designers think: The design process demystified* (Fourth ed.). Oxford & Burlington, Oxford & MA, UK & USA: Architectural Press is an imprint of Elsevier.

Leemhuis, F. (1980). A further note on the Wakalat Bazar'a. In M. Meinecke (Ed.), *Islamic Cairo: Architectural conservation and urban development of the historic centre* (p. 73). Cairo: Flexiprint Ltd., Worthing, UK.

Letellier, R., Schmid, W., & LeBlanc, F. (2007). *Recording, Documentation, and Information Management for the Conservation of Heritage Places.* Los Angeles, CA, USA: The Getty Conservation Institute.

Lewcock, R. (1978). Three Problems in Conservation: Egypt, Oman and Yemen. In R. Holod (Ed.), *Conservation as Cultural Survival. 2*, pp. 66-80. Istanbul: The Aga Khan Trust For Culture.

Lewcock, R. (1985). Conservation in Islamic Cairo. In A. Evin (Ed.), *The Expanding Metropolis: Coping with the urban growth of Cairo* (pp. 49-53). Cairo: Published by Concept Media Pte Ltd Singapore, for the Aga Khan Award for Architecture.

Matero, F. (2006, March). Loss, Compensation and Authenticity in Architectural Conservation. *Journal of Architectural Conservation, 12*(1), 72-90.

Meir, I. A., Garb, Y., Jiao, D., & Cicelsky, A. (2009). Post-Occupancy Evaluation: An Inevitable Step Toward Sustainability. *Advances in building energy research, 3*(1), 189–219.

Melis, K. L. (2010). *Preservation of Identity: Memory and Adaptive Reuse.* University of Cincinnati, Department of Architecture of the College Design Art Architecture and Planning. Cincinnati: University of Cincinnati.

Miralles, E., & Tagliabue, B. (2008). *Enric Miralles & Benedetta Tagliabue Projects*. Retrieved December 15, 2012, from: www.mirallestagliabue.com/

Morton, W. B. (2001). The Bayt al-Razzaz Palace: an opportunity for a new direction in urban conservation in medieval Cairo. *International Millennium Congress-Archi2000.* Paris: UNESCO.

Mostafa, L. (1984). Comments on "The Meaning of History in Cairo" by Oleg Grabar. *The Expanding Metropolis: Coping with the Urban Growth of Cairo* (p. 23). Singapore: Published by Concept Media Pte Ltd for the Aga Khan Award for Architecture.

Mourato, S., & Mazzanti, M. (2002). *Economic Valuation of Cultural Heritage: Evidence and Prospects, , in the report: Assessing the Values of Cultural Heritage.* The Getty . Los Angeles, CA: The J. Paul Getty Trust.

Nasser, N. (2003). Planning for Urban Heritage Places: Reconciling Conservation, Tourism, and Sustainable Development. *Journal of Planning Literature, 17*(4), 467-479.

Ouf, A. S. (1995). Priorities in Selecting Restoration Sites: An urban-conscious approach. In J. L. Bacharach (Ed.), *The Restoration and Conservation of Islamic Monuments in Egypt* (pp. 91-98). Cairo, Egypt: The American University in Cairo Press.

Parliament of the United Kingdom. (2010). *Equality Act 2010.* Retrieved February 16, 2013, from Legistlation in UK: http://www.legislation.gov.uk/ukpga/2010/15

Pentagon Renovation Programme. (2005). *The History of the Pentagon and Pentagon Renovation Program.* Retrieved February 15, 2013, from: old.911digitalarchive.org/crr/documents/5084.pdf

Pickard, R. D. (1996). *Conservation in the Built Environment.* Edinburgh, Essex, England: Addison Wesly Longman Limited.

Plevoets, B., & Van Cleempoel, K. (2011a). Adaptive reuse as a strategy towards conservation of cultural heritage: a literature review. In C. Brebbia, & L. Binda (Ed.), *Structural Studies, Repairs and Maintenance of Heritage Architecture XII.* Chianciano Terme, Italy: WITpress.

Plevoets, B., & Van Cleempoel, K. (2011b). Adaptive reuse within the retail design discipline: exploring the concept of authenticity. *First International Congress on Architectural Design, Teaching and Research* (pp. 1-10). Bari, Italy: the Institute for the Promotion of Innovation through Science and Technology.

Plevoets, B., & Van Cleempoel, K. (2012a). Adaptive Reuse as A Strategy Towards Conservation of Cultural Heritage: A Survey of 19th and 20th Century Theories. *Reinventing Architecture and Interiors: the past, the present and the future*, (pp. 1-6). Ravensbourne.

Plevoets, B., Petermans, A., & Van Cleempoel, K. (2012b). (Re)using historic buildings as a retail differentiation strategy. *the Heritage.* Porto.

Porteous, J. D. (1971). Design With People: The Quality of the Urban Environment. *Environment and Behavior, 3*(2), 155-178.

Powell, K. (1999). *Architecture Reborn.* New York, NY, USA: Rizzoli, International Publications, INC and St. Martin's Press.

Preiser, W. F., & Schramm, U. (1997). Building performance evaluation. In D. Watson, M. J. Crosbie, & J. H. Callender (Eds.), *Time-Saver Standards for Architectural Design Data: The Reference of Architectural Fundamentals* (seventh ed., pp. 231-238). USA: McGraw-Hill.

Preiser, W. F., Rabinowitz, H. Z., & White, E. T. (1988). *Post Occupancy Evaluation.* New York, USA: Van Nostrand Reinhold.

Price, N. S., Talley, M. K., & Vaccaro, A. M. (1996). *Historical and philosophical issues in the conservation of cultural heritage*. (A. Trone, Trans.) Canada: Getty Conservation Institute.

Prihatmanti, R., & Bahauddin, A. (2012). *Impacts of adaptive reuse in the UNESCO listed heritage buildings, George Town, Penang*. Penang: School of Housing, Building and Planning, Universiti Sains Malaysia.

Rapoport, A. (1985). Thinking about home environments: A conceptual framework. In I. Altman, & C. M. Werner (Eds.), *Home environments.* New York: Plenum Press.

Rapoport, A. (2000). Science, explanatory theory, and environment-behavior studies. In S. Wapner (Ed.), *Theoretical perspectives in environment-behavior research: Underlying assumptions, research problems, and methodologies.* New York: Kluwer AcademiclPlenum Publishers.

Rapoport, A. (2001). Theory, culture and housing. *Housing, Theory and Society, 17*(4), 145-165.

Rodwell, D. (2007). *Conservation and sustainability in Historic cities.* Oxford, UK: Blackwell publishing.

Russell, P., & Moffatt, S. (2001). Assessing Buildings for Adaptability. *Energy-Related Environmental Impact of Buildings, Annex 31*, pp. 1-13.

Savas, E. S. (1978). On equity in providing public services. *Journal of Management science, 24*(8), 800-808.

Scadden, R. A., & Mitchell, S. J. (2001). *Facility decommissioning and adaptive reuse*. Roy F. Weston, Inc. Austin, Texas: NDIA 27th Environmental Symposium and Exhibition.

Schepel, S. (2005). *Woonerf Revisited: Delft as an example*. Retrieved February 1, 2013, from: www.woonerfgoed.nl/int/Childstreet_files/StevenSchepel.pdf

Serageldin, I. (1984). Financing the Adaptive reuse of culturally significant areas. In Y. R. Isar (Ed.), *The challenge to our cultural heritage* (pp. 67-95). Washington: Smithsonian Institution Press.

Shehayeb, D., & Sedky, A. (2002). Heritage protection... against what? A model to explain adverse change in historic districts. *First international conference of the UIA-WPAHR-V on Architecture & Heritage as a Paradigm for Knowledge and Development: Lessons of the Past, New Inventions and Future Challenges.* Alexandria.

Shimomura, T., & Matsumoto, T. (2010). *Policies to Enhance the Physical Urban Environment for Competitiveness: A New Partnership between Public and Private Sectors.* OECD Regional Development Working Papers, No. 2010/01. OECD Publishing.

Shopsin, W. C. (1986). *Restoring Old Buildings for Contemporary Uses: An American sourcebook for Architects & Preservationists.* New York: Whitney Library of Design, an imprint of Watson-Gutpill Publications.

Shull, M. W. (2005). *Fringe Benefits: Reclaiming Forgotten Marginal Space.* Master of architecture thesis, University of Cincinnati, Division of Research and Advanced Studies, Cincinnati.

Siravo, F. (2004). Urban Rehabilitation and Community Development in al-Darb al-Ahmar. In S. Bianca, & P. Jodidio, *Cairo: Revitalising a Historic Metropolis* (pp. 177-193). Turin: Umberto Allemandi & C. for Aga Khan Trust for Culture.

Smith, R. (1988). The role of tourism in urban conservation. *The international journal of urban policy and planning (CITIES), 5*(3), 245-259.

Stokols, D., & Altman, I. (Eds.). (1987). *Handbook of Environmental Psychology* (Vol. 1 & 2). New York, USA: John Wiley and Sons.

Su, X. (2010). Urban conservation in Lijiang, China: Power structure and funding systems. *Cities, 27*(3), 164–171.

Symes, M. (1994). Typlogical thinking in architectural practice. In K. A. Franck, & L. H. Schneekloth (Eds.), *Ordering Space: Types in Architecture and Design.* New York, NY, USA: Van Nostrand Reinhold.

Talen, E. (2003). Neighborhoods as service providers: a methodology for evaluating pedestrian access. *Environment and Planning, 30*(2), 181-200.

The Arab Bureau for Design & Technical Consultations. (1984). The Rehabilitation and Up-grading of Historic Cairo. *The Expanding Metropolis: Coping with the Urban Growth of Cairo* (pp. 54-63). Singapore: Concept Media Pte Ltd for the Aga Khan Award for Architecture.

The Getty Conservation Institute. (2002). *Assessing the Values of Cultural Heritage.* The Getty Conservation Institute. Los Angeles, CA: The J. Paul Getty Trust.

The International Institute for Geo-Information Science and Earth Observation [ITC]. (2010). *GI Science and Earth Observation: A process based approach.* Enschede, Twente, the Netherlands: ITC.

The National Trust for Historic Preservation. (2002). *Rebuilding Community: A Best Practices Toolkit for Historic Preservation and Redevelopment.* Washington, DC, USA: National Trust. Retrieved from www.preservationnation.org/issues/housing/Rebuilding_Community.pdf

The Philips Think Tank on Livable Cities. (2011). *Self-assessment framework on livable cities*. Retrieved January 15, 2013, from The Philips Centre for Health and Well-being: www.philips-thecenter.org/

Torres, Z. N. (2009). *Historic Buildings and Contemporary Additions: The Elements of a Cohesive Design Relationship.* University of Maryland, the Faculty of the Historic Preservation Program, School of Architecture, Planning and Preservation. College Park: University of Maryland.

UNCDF. (2010). *Global Forum on Local Development Report: Pursuing the MDGs through Local Government.* UNCDF, UNDP. Kampala: UNCDF. Retrieved from: uncdf.org/gfld/docs/thematic-annex.pdf

UNESCO. (1972). Convention Concerning the Protection of the World Cultural and Natural Heritage. *General Conference. 17*, pp. 1-17. Paris: Patrimonio Mundial.

UNESCO. (1972). The Third General Assembly of the International Council on Monuments and Sites. *Resolutions of the Symposium on the introduction of contemporary architecture into ancient groups of buildings.* Budapest: ICOMOS.

UNESCO. (1979). Historic Cairo. Retrieved March 5, 2012, from://whc.unesco.org/en/list/89/

UNESCO. (1980). *International Symposium on Conservation and Restoration of Islamic Cultural Heritage*. Lahore, Pakistan: UNESCO.

UNESCO. (1983). International Syposium on Conservation and Restoration of Islamic Architectural Heritage. *Report And Recommendations of International Syposium on Conservation and Restoration of Islamic Architectural Heritage* (p. 26). Paris: UNESCO.

UNESCO. (2001). Conserving and restoring the Harawi and Al-Sinnari Houses in Cairo. *Museum International, 53*(2), pp. 22-35.

UNESCO. (2003). Convention for the Safeguarding of the Intangible Cultural Heritage. *Safeguarding of the Intangible Cultural Heritage.* Paris: UNESCO.

UNESCO. (2007). ENAME. *The ICOMOS Charter for the Interpretation and Presentation of Cultural Heritage Sites*. ICOMOS.

UNESCO. (2008). *Committee Decisions Report about Historic Cairo, Egypt*. Retrieved from: http://whc.unesco.org/en/decisions/1665

UN-HABITAT. (2005). *Promoting Local Economic Development through Strategic Planning.* United Nations Human Settlements Programme. Nairobi: United Nations Human Settlements Programme.

Van Huyck, A. P. (1990). The Economics of Conservation. In A. H. Imamiddin, & K. R. Longeteig (Ed.), *Architectural & Urban Conservation in the Islamic World. 1*, pp. 47-54. Geneva: The Aga Khan Trust for Culture.

Van Kamp, I., Leidelmeijer, K., Marsman, G., & de Hollander, A. (2003). Urban environmental quality and human well-being: Towards a conceptual framework and demarcation of concepts; a literature study. *Landscape and Urban Planning, 65*(1-2), 5–18.

Veenhoven, R. (1996, January). Happy Life-Expectancy: A Comprehensive Measure of Quality-of-Life in Nations. *Social Indicators Research, 39*(1), 1–58.

Venice Charter (1964). International charter for the conservation and restoration of monuments and sites. *2nd International Congress of Architects and Technicians of Historic Monuments* (pp. 1-4). Venice: International Council On Monuments and Sites (ICOMOS).

Viollet-le-Duc, E.,E. (1854). *Dictionnaire raisonné de l'architecture française du XIe au XVIe siècle*. Paris, France: B. Bance. From: http://fr.wikisource.org/wiki/Dictionnaire_raisonn%C3%A9_de_l%E2%80%99architecture_fran%C3%A7aise_du_XIe_au_XVIe_si%C3%A8cle

Volker, L., & Prins, M. (2005). Exploring the Possibilities of Correlating Management with value in Architectural Design. In S. Emmitt, & M. Prins (Ed.), *Designing value: new directions in architectural management* (pp. 47-60). Lyngby: International council for research and innovation in building and construction.

Voordt, D. J. (1999). *Objectives and methods of POE. Lecture at FAU, Sao Paulo, Brasil.* Retrieved January 11, 2013, from TU Delft: www.bk.tudelft.nl/..../1999-Voordt_POE_Brazil1999.pdf

Walters, D., & Brown, L. L. (2004). *Design first: Design-based planning for communities.* Oxford, UK: Architectural Press.

Wang, H.-J., & Zeng, Z.-T. (2010). A multi-objective decision-making process for reuse selection of historic buildings. *Expert Systems with Applications, 37*(2), 1241–1249.

Warner, N. (2005). *The Monuments Of Historic Cairo: A Map and Descriptive Catalogue.* Cairo, Egypt: American University in Cairo Press.

Wati, K. (2009). *Transport Related Social Exclusion in Ahmedabad.* the International Insititute for Geo-information Science and Earth Observation, Urban Planning and Management. Enschede, The Netherlands: Twente University.

Wikipedia. (2013, May 08). *Louvre Pyramid.* Retrieved May 13, 2013, from Wikipedia, the free encyclopedia: en.wikipedia.org/wiki/Louvre_Pyramid

Wilkinson, S. J., James, K., & Reed, R. (2009). Delivering sustainability through the adaptive reuse of commercial buildings: the Melbourne CBD challenge. *Pacific Rim Real Estate Society*, (pp. 1-19). Sydney.

Williams, C. (2001). Islamic Cairo: A Past Imperiled. *The Massachusetts Review, 42*(4), pp. 591-608.

Wilson, C. A. (2010). *Adaptive Reuse of Industrial Buildings in Toronto, Ontario: Evaluating Criteria for Determining Building Selection.* Queen's University, the School of Urban and Regional Planning. Ontario: Unpublished.

Wiseman, C. (2001). *I.M. Pei: A Profile in American Architecture.* New York: H.N. Abrams.

Xie, Y., & Costa, F. J. (1993, May). Urban planning in socialist China: Theory and practice. *CITIES, 10*(2), 103-114.

Yeoh, B., & Huang, S. (1996). The conservation-redevelopment dilemma in Singapore. *The International journal of urban policy and planning (CITIES), 13*(6), 411-422.

Yildirim, M. (2012). Assessment of the decision-making process for re-use of a historical asset: The example of Diyarbakir Hasan Pasha Khan, Turkey. *Journal of Cultural Heritage, 13*(4), 379–388.

Yung, E. H., & Chan, E. H. (2012). Implementation challenges to the adaptive reuse of heritage buildings: Towards the goals of sustainable, low carbon cities. *Habitat International, 36*(3), 352–361.

Zawya. (2014). The UAE outshines European Cities with its urban development. Retrieved March 16th, 2014, from Zawya: www. zawya.com/ story / The_ UAE _outshines_ European_ Cities_ with_ its_ urban_ development -ZA WY A20140312094300/

Zimring, C. (2003). Postoccupancy Evaluation: Issues and Implementation. In R. B. Bechtel, & A. Churchman (Eds.), *Handbook of Environmental Psychology* (pp. 306-319). New York: John Wiley & Sons.

المراجع العربية

ابراهيم , عبد الباقي. (ديسمبر, 1983). توظيف المباني و المناطق الأثرية. (عبد الباقي ابراهيم، المحرر) *عالم البناء، 40*، الصفحات 34-41.

إبراهيم , شيماء حسن زكي. (2012). الحفاظ و إعادة توظيف القصور التاريخية فى مصر كمدخل لتحقيق جودة الحياه. *المؤتمر الدولى الثانى: جودة الحياه: رؤية نحو مستقبل أفضل* (الصفحات 179-193). القاهرة: الجامعة الحديثة للتكنولوجيا و المعلومات.

إبراهيم , محمد عبد الباقي. (2000). *تقييم دور الأجهزة المعنية التى تتعامل مع التراث العمرانى للقاهرة الإسلامية*. تاريخ الاسترداد 12 مارس, 2013، من مركز الدراسات التخطيطية والمعمارية: http://www.cpas-egypt.com/Articles/Dr_M_Baki/Dr_M_Baki_Research/Mor210015.pdf

أبو الفضل , هبة الله فاروق. (1998). *إعادة توظيف المبانى القديمة*. جامعة الإسكندرية، قسم العمارة بكلية الفنون الجميلة. الإسكندرية: جامعة الإسكندرية.

أبو خشبة , محمد لؤي. (1997). *استخدام المبانى الأثرية في مجال السياحة*. جامعة عين شمس، قسم عمارة, بكلية الهندسة. القاهرة: جامعة عين شمس.

البدري , نجوى محمد منير السيد. (2004). *تحويل المبانى التاريخية إلى متاحف*. جامعة حلوان، قسم العمارة بكلية الفنون الجميلة. القاهرة: جامعة حلوان.

الجزري , أبي العز إسماعيل بن الرزاز. (1200). *الجامع بين العلم و العمل: النافع في صناعة الحيل*. تركيا: فؤاد سزكين , إكهارد نويباور , و مازن عماوي.

الدليل , دعاء وفيق عمر. (2008). التنمية المستدامة كمدخل للحفاظ على طابع المناطق ذات القيمة التاريخية بمدينة القاهرة. *الفنون الجميلة في مصر, 100 عام من الإبداع*. القاهرة: كلية الفنون الجميلة, جامعة حلوان.

العسقلاني , أحمد علي بن حجر. (1986). *فتح الباري شرح صحيح البخاري*. دارالريان للتراث.

الغيطانى , جمال. (1997). *ملامح القاهرة فى ألف سنة*. القاهرة: نهضة مصر للطباعة و النشر و التوزيع.

اللحام , نسرين محمد رفيق محمد. (1996). *الحفاظ على المباني التراثية و توظيفها. رسالة ماجستير*, جامعة عين شمس، قسم العمارة, كلية الهندسة. القاهرة: جامعة عين شمس.

المورد. (1977). *قاموس إنكليزي-عربي*. بيروت، لبنان: دار العلم للملايين.

بناه. (10 يناير, 2011). *أفضل ما فى العمارة المصرية ...(ترميم وكالة بازرعة)*. تاريخ الاسترداد 10 مارس, 2012، من بناه: http://www.bonah.org/news.php?extend.743

سامي , علي. (26 أكتوبر, 2011). *محطة مصر بعد التجديد ... مأساة ثقافة أم مأساة نظام*. تاريخ الاسترداد 16 إبريل, 2013، من بناه: http://www.bonah.org/news-extend-article-1104.html

عزمي , حسام عزمي عبد الحميد. (1984). *وكالة الغوري كحالة تاريخية للحفاظ على التراث المعماري المصري*. رسالة ماجستير , كلية الفنون الجميلة, جامعة حلوان، قسم العمارة.

علي , طه. (7 أغسطس, 2010). تجار وسكان وكالة «أوده باشا» يغادرونها لترتدي حلة جديدة. عمرها 337 عاما وتعد معلما أثريا بالقاهرة. *الشرق الأوسط, جريدة العرب الدولية، 11584*.

فريق ميثاق التنمية و العمران. (2012). *ميثاق التنمية و العمران فى مصر*. القاهرة: جمعية ميدان لتطوير و إدارة الفراغات العمرانية.

مجمع اللغة العربية. (1999). *المعجم الوجيز*. القاهرة، جمهورية مصر العربية: الهيئة العامة لشئون المطابع الأميرية.

محافظ القاهرة. (2009). *قرار محافظ القاهرة رقم 3717 لسنة 2009 بشأن الإشتراطات البنائية المؤقتة لمحافظة القاهرة تطبيقا لقانون البناء رقم 119 لسنة 2008 ولائحته التنفيذية*. القاهرة: محافظة القاهرة.

مركز الدراسات التخطيطية و المعمارية , و مركز إحياء تراث العمارة الإسلامية. (1990). *أسس التصميم المعمارى و التخطيط الحضرى فى العصور الإسلامية المختلفة بالعاصمة القاهرة*. القاهرة، مصر: منظمة العواصم و المدن الإسلامية.

فريق مشروع الإحياء العمراني للقاهرة التاريخية (2012). تقرير أعمال عن الفترة من يوليو 2010 إلى يونيو 2012. اليونسكو

مصطفى , صالح لمعي. (2004). تطوير المناطق التاريخية و التنمية العمرانية المستدامة. *المؤتمر و المعرض الدولى الأول: الحفاظ المعمارى بين النظرية و التطبيق* (الصفحات 19–33). دبي: بلدية دبي.

مكتب محافظ القاهرة. (2009). *قرار محافظ القاهرة رقم 3717 لسنة 2009 بشأن الإشتراطات البنائية المؤقتة لمحافظة القاهرة تطبيقا لقانون البناء رقم 119 لسنة 2008 ولائحته التنفيذية*. محافظة القاهرة، محافظة القاهرة. القاهرة: محافظة القاهرة.

مهدى , حسام محمود. (2002). فلسفة الحفاظ و الترميم المعماري للآثار الإسلامية بمدينة القاهرة. *دراسات في آثار الوطن العربي* (الصفحات 703–719). القاهرة: جمعية الأثريين العرب بالتعاون مع المجلس العربي للدراسات العليا و البحث العلمي.

مهنا , وسام أبو الحجاج عبد الحكيم. (2006). *صيانة و إعادة استخدام الفراغات العمرانية التراثية*. جامعة طنطا، قسم الهندسة المعمارية. طنطا: جامعة طنطا.

يونس , زين العابدين حسن. (2002). *الحفاظ على المباني ذات القيمة و إعادة توظيفها: منهج للإرتقاء بالبيئة العمرانية و الحفاظ على الطابع العمراني و المعماري*. رسالة ماجستير، قسم الهندسة المعمارية, هندسة المطرية, جامعة حلوان.

المستخلص

تكييف المباني التراثية لإعادة استخدامها هي استراتيجية فعالة للتعامل مع التراث . و يوصى بها كإستراتيجية للحفاظ على التراث المعماري في القاهرة. ورغم أن العديد من المباني التراثية بالقاهرة التاريخية يجري إعادة استخدامها بالفعل ، فإن العديد من مشاريع إعادة الاستخدام لم تنجح فى تحقيق كافة الأهداف المرجوة . هذه الأطروحة تناقش أن هناك حاجة إلى تطوير نهج شامل و منظم لتقييم مشاريع إعادة الإستخدام في القاهرة التاريخية , و أن هناك حاجة لتطوير الأدوات التي تسمح بإجراء هذا التقييم الشامل و المنظم . و كخطوة أساسية بإتجاه تطوير هذه الأدوات , هذه الأطروحة تقترح نهج شامل مستنبط من الأبحاث السابقة من مختلف مجالات كالحفاظ و الترميم , تقييم ما بعد الإستخدام , علم النفس البيئي , التصميم الحضري و الإرتقاء العمراني للمناطق المتدهورة. تعتبر هذه الأطروحة أن ركائز التقييم الثلاثة هى الأهداف الرئيسية من إعادة استخدام التراث و هم: 1) الحفاظ على المبنى ، 2) نجاح الوظيفة الجديدة ، و 3) تنمية المجتمع المحلي . ثم في كل ركيزة للتقييم، تستمد معايير متعددة من الأبحاث السابقة وفقا لمجال التطبيق. في الإستنتاج , هذه الأطروحة تناقش سبل تطبيق هذا النهج لمقترح في مشاريع التكييف لإعادة الإستخدام و أيضا دوره في توجيه و دفع الأبحاث المستقبلية لتطوير أدوات القياس المقترحة.

الأكاديمية العربية للعلوم و التكنولوجيا و النقل البحرى

كلية الهندسة و التكنولوجيا

قسم الهندسة المعمارية و التصميم البيئي

إطار شامل لتقييم إعادة إستخدام المباني التراثية في القاهرة التاريخية

إعداد

وليد طارق على شحاته

جمهورية مصر العربية

رسالة مقدمة للأكاديمية العربية للعلوم و التكنولوجيا و النقل البحري لإستكمال متطلبات نيل درجة

الماجستير

في

الهندسة المعمارية و التصميم البيئي

إشراف

لبنى شريف	**ياسر مصطفى**	**أشرف بطرس**
أستاذ العمارة	**مدرس بقسم العمارة**	**دكتوراه بالعمارة**
بالأكاديمية العربية	**بالأكاديمية العربية**	**إستشاري تخطيط عمراني**

سنة التخرج

2014