

An Innovative Methodology for Achieving Compatibility between Heritage and Contemporary in Architecture (Case Study: Omani Architecture)

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Abstract:

Abstract: This paper presents an innovative methodology for achieving correlation between heritage and contemporaneity in architecture within analytical study of Omani buildings examples to explain the role of heritage in fulfilling the society needs of architectural design. It examines 3 main aspects: first aspect: Heritage - The study explains the different types of heritage as well as the importance of heritage for society, with an explanation of the various factors that have effect on the formation of architectural and urban heritage, such as cultural, social, economic, legislative, educational, and technological factors.

The 2nd aspect: Elements of Heritage – Here, the study classified the different needs of society from architecture and planning to four main needs: social, climatic, visual, and planning needs. These different needs require a set of architectural and planning solutions and treatments at the level of the general formation of the building, as well as at the planning level, these solutions and treatments have produced heritage elements that are being used down for generations.

The 3rd different trends of correlation between heritage and contemporaneity in architecture. Four key dimensions of society needs are identified and applied to the cases: planning; climatic; social; and visual requirements. The analytical study reveals that climatic and social requirements play most important role in contribution to moulding the role of heritage in architectural design. Understanding such role and properties of heritage is essential for achieving urbanized and architectural correlation between what is inherited (architectural heritage) and what is imported (contemporary architecture) so that, the architectural and urbanized product reflects the uniqueness and derives its elements from Omani architectural heritage, while not lagging behind the civilized ride represented in contemporary.

Keywords:

Heritage; Elements of Heritage; Contemporary Architecture; Omani Architecture; Identity of Society

المخلص:

قدم هذه الورقة منهجية علمية مبتكرة بغرض تحقيق الترابط بين التراث المعماري والمعاصرة في العمارة بصورة عامة وذلك من خلال اجراء دراسة تحليلية لأمتثلة من المباني العامة في العمارة العمانية بغرض بيان دور التراث في تلبية احتياجات المجتمع من التصميم المعماري. وتتناول الدراسة ثلاثة أبعاد رئيسية وهي: البعد الأول: التراث، حيث القت الدراسة الضوء على انواع التراث وكذلك أهمية التراث بالنسبة للمجتمع مع توضيح للعوامل المختلفة التي تؤثر على تشكيل التراث المعماري والعمراني كالعوامل الثقافية، الاجتماعية، الاقتصادية، التشريعية، التعليمية، التكنولوجية. البعد الثاني: عناصر التراث المختلفة وفي هذا الجانب قامت الدراسة بتصنيف احتياجات المجتمع المختلفة من العمارة والتخطيط

الى اربع احتياجات رئيسية وهى: اجتماعية، مناخية، بصرية، وتخطيطية، هذه الاحتياجات المختلفة فرضت مجموعة من الحلول والمعالجات المعمارية والتخطيطية على مستوى التشكيل العام للمبنى بصورة عامة، وكذلك على المستوى التخطيطي، هذه الحلول والمعالجات افرزت عناصر تراثية تتوارثها الاجيال. ثم انتقلت الدراسة الى بيان الاتجاهات المختلفة لتحقيق الترابط بين التراث والمعاصرة فى العمارة من خلال البعد الثالث للدراسة. ثم قدمت الدراسة الآلية المقترحة لاتخاذ القرار التصميمي بغرض تحقيق التوافق بين العمارة المعاصرة والتراث المعماري والعمراني. وفى الدراسة التحليلية تم قياس اثر استخدام العناصر التراثية فى مجموعة من المباني العامة المتنوعة الوظائف من العمارة العمانية من خلال بيان اثر العناصر التراثية المستخدمة فى تحقيق المتطلبات المختلفة. ولقد اظهرت الدراسة التحليلية أن المتطلبات المناخية والاجتماعية تلعب الدور الأكثر أهمية فى المساهمة فى تشكيل دور التراث فى التصميم المعماري. إن فهم هذا الدور وخصائص التراث أمر ضرورى لتحقيق التحضر والارتباط المعماري بين ما هو موروث (التراث المعماري) وما هو مستورد (العمارة المعاصرة) بحيث يعكس المنتج المعماري والعمراني التفرد ويستمد عناصره من التراث المعماري العمانى، بينما لا تتخلف عن الركوب المتحضر المتمثل فى المعاصرة

الكلمات الرئيسية

التراث، عناصر التراث، العمارة العمانية

1. Introduction

Architecture and urbanism are the mirror that reflects the civilizational development of any society through different eras. They reflect the nature of change of society, as a result of social interaction between its various elements. This interaction is generated as a result of the different cultures flocking to society. There are local and inherited culture, and there is an incoming culture that carries many modern changes. Architecture reflects this contrast and interaction between both cultures, and this interaction is reflected at the level of architectural design where the general architectural formation of the building, as well as at the level of residential communities, or what is known as the urban fabric.

Here, both the planner and the designer face the problem of combining both cultures, as they are two components of society, and neither of them can be ignored. Hence the research problem, which is how to achieve the architectural and urban linkage between what is inherited (architectural heritage) and what is incoming (contemporary architecture) so that the architectural product is an expression of originality and its elements are derived from the vocabularies of Omani heritage architecture, and at the same time it does not lag behind the civilized technological rode represented in contemporary. The research paper discusses this problem from several different aspects stems from the research problem, which are: the architectural and urban heritage; heritage elements; and the trends of correlation between heritage and contemporary in Omani architecture as a case study.

2. Material and methods

2.1 First Aspect: Heritage

Civilizational heritage generally means: the aggregated of the civilizational and cultural achievements that the generations inherit from the parents. It is an honest record and a mirror reflecting the culture of society and its varied features throughout the different ages. As for the architectural and urban heritage, it is the group of architectural buildings, structures and

architectural formation that have proven their suitability with the conditions of the society and its climatic, social, cultural and civilizational nature and demonstrated its originality and value in facing the constant change in the characteristics of society and its renewed ideologies. This heritage is characterized by steadfastness, continuity, and acceptance of society [1010].

2.1.1 Types of Heritage

Heritage is divided into two main parts:

- (1) *Natural Heritage*, which refers to the natural plant and geological formations, and also includes habitats of rare plants, and places that have a scientific and aesthetic value.
- (2) *Cultural Heritage*: refers to the material and moral product of different civilizations through ages and eras of time. It is also called human heritage. This type of heritage includes architectural and historical buildings of aesthetic and archaeological value. The architectural and urban product is considered as one of the forms of cultural heritage that is produced by the life of society, and includes within it a group of architectural buildings and formations that have continued through different ages, and have proven their originality and value in facing the modern architecture with all that it carries within it again at the intellectual and technical level.

2/1/2 the importance of heritage to society

In general, Arab and Islamic societies suffer from two main types of problems: the loss of identity and cultural division on one hand, and the emergence of modern styles and needs on the other hand, which cannot be achieved through heritage only. Heritage in its two aspects: physical aspect which is represented in creative formations and distinctive architectural vocabularies, and moral aspect which is represented in interaction with the surrounding environment, among the features of the place and translation of the group's way of interacting with the surrounding environment, is considered as a need for Arab and Islamic societies to bridge the urban identity gap and the cultural division between heritage and contemporary. Hence the importance of heritage lies in the affirmation of the identity of society and a tool for achieving civilization continuity [17].

(1) Heritage as a tool to affirm the identity of society

The contemporary architectural product must represent a reflection of local culture, heritage values and social relations, and the constructed environment shall express the culture and heritage of the community and society, so that the lessons and experiences of the past are used as inputs, even if partial, in providing some solutions to the problems of the contemporary constructed environment. On the other hand, the contemporary architectural product must express the cultural variation of each region in order to affirm the identity of the community and achieve its human aspirations through a new vision that is culturally authentic with a traditional reference, and at the same time includes achieving all the contemporary progressive elements that society seeks. Therefore, a methodology that combines contemporary progressive elements and at the same time is culturally authentic must be achieved through the architectural product expressing the heritage and culture of the place, and making use of its lessons and particulars in meeting the architectural product of contemporary needs while preserving societal identity. (Figure 1).

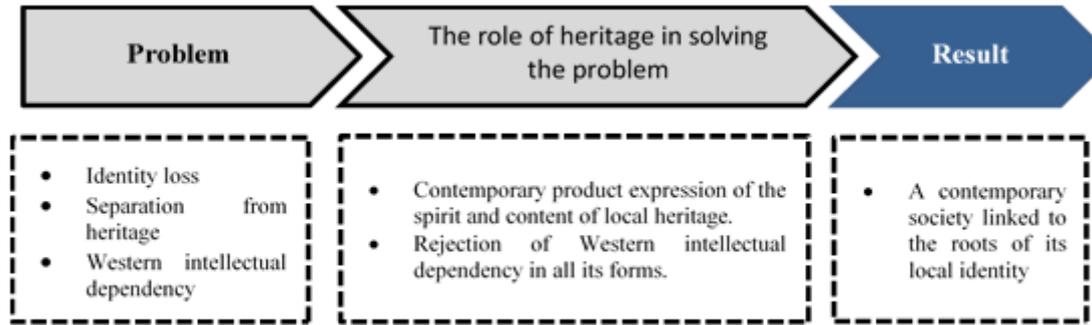


Figure 1. Heritage as a Tool to Emphasize the Identity of Society

Heritage as a tool for achieving the civilizational continuity of society

Civilizational continuity means looking beyond the mere simulation of traditional and distinctive ancient forms and configurations of society, when searching for new formative expressions in contemporary architectural and urban design. It also means building the future heritage of society without being satisfied with transferring the existing ancient heritage as it is. This future environment is achieved through achieving the proper link between contemporary and the existing society's heritage, and this does not mean complete consistency with the characteristics of the past, as these characteristics are not sufficient to meet contemporary civilizational needs. The new building environment must also reflect the continuity of development of the previous ones, and it is worth noting that the heritage buildings are not considered as an obstacle to the movement of development, progress and the continuity of civilization, as they give the contemporary city a distinct personality, and lead to a homogeneous integrated environment. In other words, it is necessary to incorporate principles and foundations derived from the past, and to include them in a new contemporary architectural lexicon without reusing old forms and elements as they are. (Figure 2) and (Table 1)



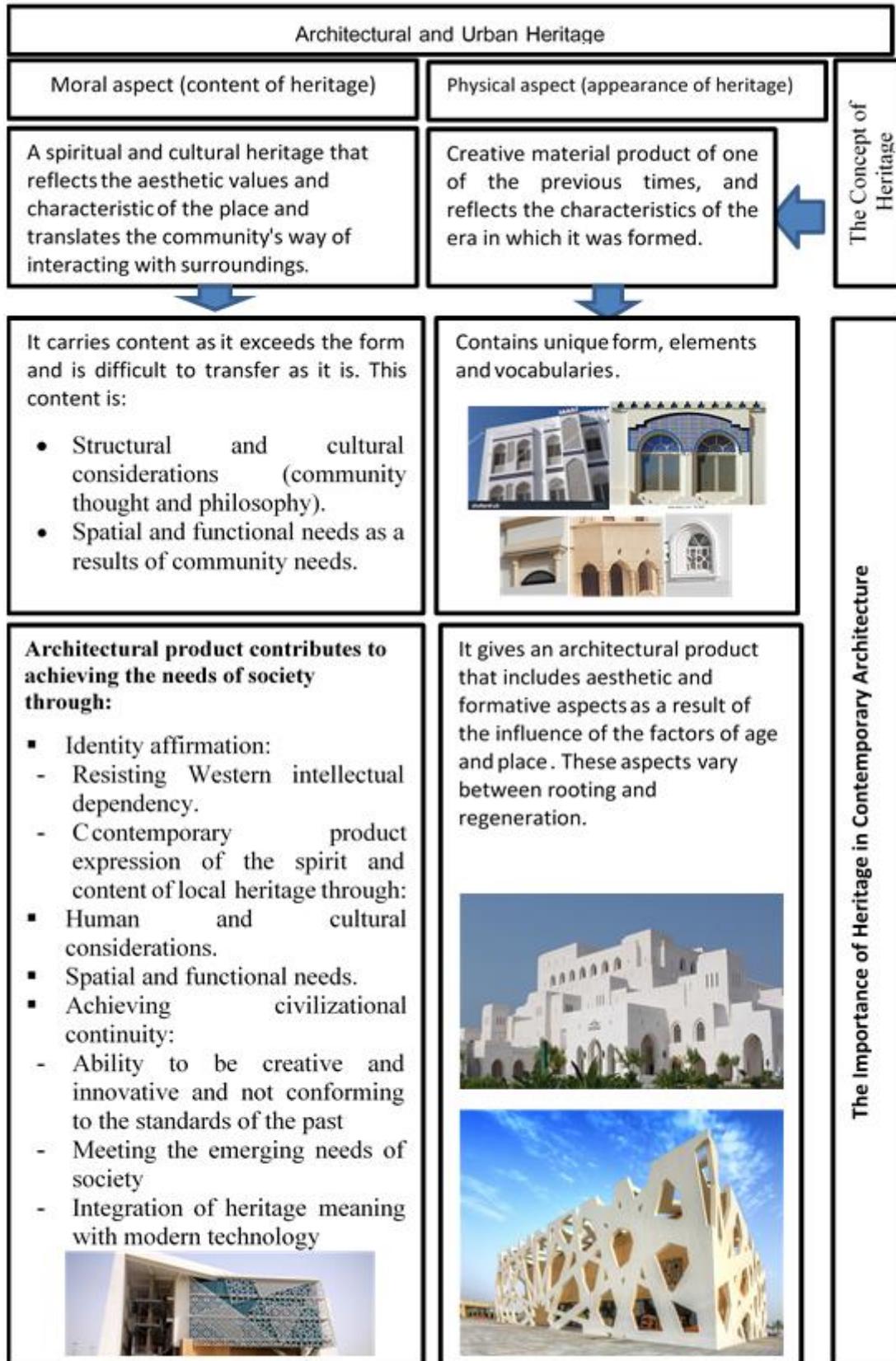


Table 1. Heritage in Contemporary Omani Architecture

2/1/3 Factors affecting the formation of architectural and urban heritage

Factors affecting architectural heritage can be divided into cultural, social, economic, political, and educational factors. (Figure 3)



Using glass facades, which do not meet the climate requirements in Saudi Arabia



Repeated residential units with identity in the outer shell in the Sultanate of Oman



Using new building styles in Muscat city

Figure 3. Factors Affecting the Formation of Architectural and Urban Heritage

(1) Cultural Factors: The culture of society has been linked to the principles and belief of Islam. This link has been reflected in architecture in a large way at the general form of the building from the outside, as well as at the level of interior architectural design. With the incoming of different western cultures, many changes and habits are acquired in society, which were clearly reflected in contemporary architecture, given that these cultures are not related to the principles

of Islamic architecture, and are not compatible with the spatial environment, and therefore architecture has become an extension of the Western character despite the difference in environmental and urban characteristics and community image. One of the most important of these reflections is the proliferation of glass facades in the buildings despite their lack of suitability to the climatic conditions and social requirements of the members of society, as well as the spread of wide streets dedicated to cars that led to the disappearance of the human scale that was characteristic of the traditional city [17]

As a result of cultural changes, a state of imbalance occurred between the cultural heritage and the incoming culture, and Western architecture became a symbol of civilization and progress, which led to neglecting the values and cultural heritage of the society in varying levels, so new and modern architectural forms, planning, and formative elements for the society were used, which led to the fact that emergence of architecture does not significantly reflect the characteristics of the city.

(2) Social Factors: It includes changes in customs, traditions, social mobility, and social classes forming society, which leads to a continuous change in the needs of society, and thus a change in the spatial requirements to contain the new social requirements, which leads to a change in design thinking in response to this social change.

In addition to that, demographic changes that are represented in increasing the population, changing the average number of family members and the social desire for independence from the mother family etc., which leads to the emergence of a large number of repeated residential units in which the architectural identity has been taken into account in the outer shell only by using some heritage architectural elements.

(3) Economic Factors: The effect of the economic factor on the weak compatibility in visions and ideas between the designers is evident, especially in large projects in which the focus is on the principle of economic profitability in the first place, and this affects the method of architectural treatment, where many aspects that in turn affect identity and architectural heritage are neglected. On the contrary, we find in some projects, the designer intends to the technological dazzling with all its items, which leads to a complete visual separation between the building and the surrounding environment with a distinctive cultural identity of the community.

(4) Legislative Factors: They are the laws and legislations that the state enacts to regulate the urban and architectural process, and we note that most of these laws are concerned with the formative process only in terms of heights and responses, and do not address the environmental, spatial and visual treatments of the architectural product, which leads to a product that does not have the characteristics of the local environment.

(5) Educational Factors: The educational process has a clear impact on the architectural image of society in general. Sending educational missions, introducing curricula and teachers from western culture greatly affects the crystallization of local architectural thought, and it is noticeable that the crisis of identity and architectural heritage did not arise until after adopting

western education curricula and ignoring the culture of place and full separation from the past, and disrespecting the characteristics of the built environment.

(6) Technological Factors: The development of building methods and techniques, and the emergence of new building materials with enormous structural properties, radically affected common engineering concepts and theories, which led to a change in many design values and considerations in local architectural thought. In addition to the revolution in information technology and the resulting expansion of the horizons of architectural creativity in obtaining architectural formations that could not be obtained before. These formations contradict the characteristics of local community.

2/2 The second Aspect: Heritage elements

The heritage elements are generated as a result of the conditions and characteristics of the environment in which the heritage is generated, hence the heritage elements are considered as a set of treatments that meet the requirements of society in the field of architecture and planning, and at the same time they have become one of the most important features of the distinctive identity of society, and these treatments are: treatments for social requirements; climatic requirements; visual requirements; and planning requirements. The following figures (Figure 4 and 5) illustrate these treatments

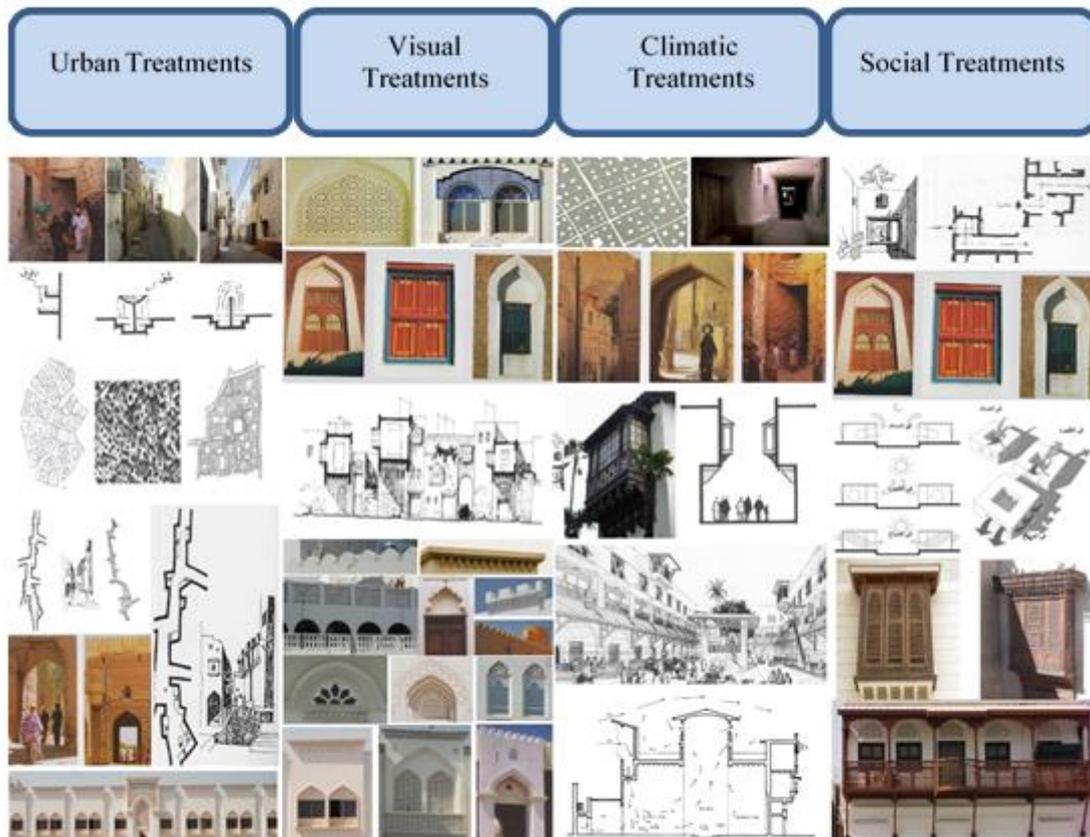


Figure 4. Heritage Items as Treatments for Society Requirements

2/2/1 Social treatments:

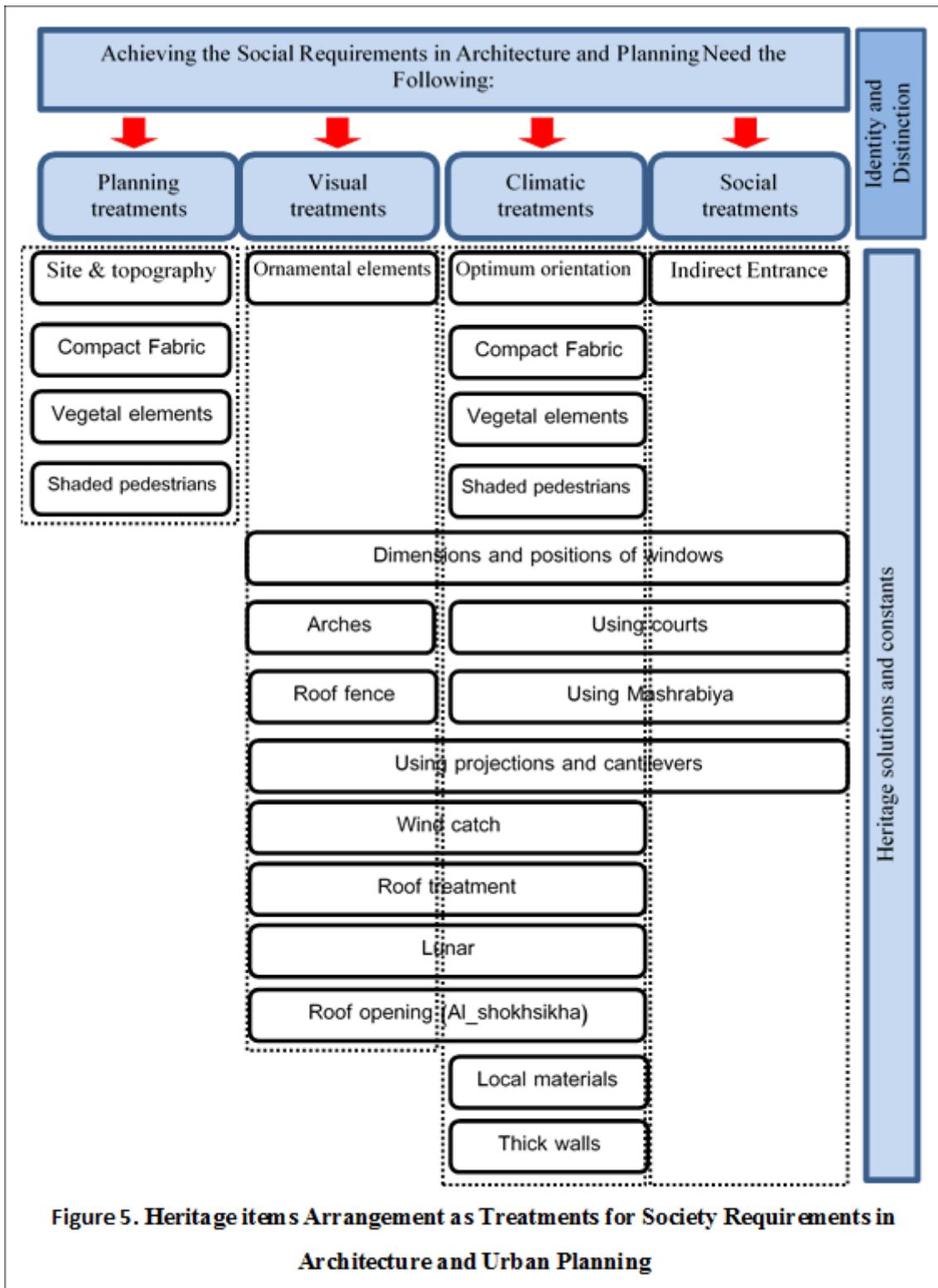
Include the group of treatments that preserve the customs and traditions of society, which are closely related to the true Islamic religion, and what generations pass on through the ages, which has become the law written in the chest, and among the most important:

- Indirect entrance: one of the most important treatments used to achieve privacy, as it blocks the internal spaces of the house, which leads to achieving comfort, safety and privacy.
- Shapes and dimensions of windows: in general, small flat surface of external openings leads to reducing the sunlight penetrating into the buildings, and it also has another social requirement which is achieving privacy for the owners of the home.
- Inward orientation: the interior windows of the building are opened on the open courtyard space, in order to reduce the surface area exposed to solar radiation, and it also creates a better social atmosphere by moving all social activities into the residence, thus achieving privacy [6].
- The use of the Mashrabiya: Mashrabiya is a wooden mesh sieve holes in a circular section separated by specific and organized distances in an accurate and extremely complex decorative geometry. The Mashrabiya has five functions: adjusting the passage of light; adjusting the air flow; lowering the air current temperature; increasing the air humidity; and providing privacy. Usually it is made of wood and sometimes gypsum.

2/2/2 Climatic treatments:

Include a group of treatments that work on achieving the requirements of thermal comfort inside the different building spaces [17]

- Building orientation: In order to get the best natural lighting and ventilation.
- Use of local building materials: Building materials play an effective role in reducing thermal radiation inside buildings. Clay bricks and stone have demonstrated a high thermal insulation capacity for interior spaces.
- Use of thick walls: Gives a sense of the building strength. Increasing the thickness of the walls reduces the thermal transfer between the interior and exterior [6].
- Use of wind catchers: It is a ventilator over the building and has an opening opposite to the direction of the prevailing winds to capture the air passing over the building, which is usually cooler and push it into the building. It also helps reduce the dust and winds that are usually carried by winds blowing in hot regions. The one-way catcher has been developed to be replaced by what is known as the Badger, which is a catcher that opens in four directions to capture air from any direction that it comes from [89].
- Use of the interior courtyards: the courtyard is that closed or semi-closed space formed by continuous or semi-continuous walls from its four sides in the case of the quadrilateral or more in the case of the polygonal shape. Other building elements open to the inner courtyard that is open to the outside air from above. In one house, there may be more than one courtyard that connect with each other through corridors or through some rooms. The interior courtyards work to achieve good ventilation throughout the day, especially when these courtyards contain green areas and water elements, as they work to reduce the high temperature inside the buildings in general, as well as beautify the internal architectural environment [11].



- **Roof treatments:** These treatments include double roofs and planting roof in order to reduce the impact of solar radiation on the roof of the building, thus softening the internal temperature. Also using roofs in the form of a half cylinder or vaulted roofs in the form of a hemisphere as in this case, the roof is always shaded except at noon and the domed or arched roofs increase the speed of air passing over their curved surfaces, which increases the effectiveness of the cooling winds to reduce the temperature of these roofs [6].
- **Use of projections and Cantilevers:** The use of cantilevers and projections works on achieving the appropriate amount of shadows on the external facades, thus reducing the impact of direct radiation on the outer walls of the building. Such as the use of the projected frames in the openings and windows, which are slightly wider than the width of the window and it is protruded about 0.25 meter in order to prevent solar radiation from entering into the architectural spaces [11].
- **Lunar:** It is an opening in the wall covered with colored glass and gypsum. It can be considered as a fixed window, and it is mainly used to provide lighting for some spaces without passing hot air.

2/2/3 Visual treatments:

Include treatments of the outer skin of the building, which would give the external heritage character to the general formation of the building. Among the most important of these treatments are:

- **Positive and negative in the facades:** Such as the use of the wooden flaps in the facades, which are projections of wood mounted on the cantilevers, for the purpose of protection from rain in the winter, and protection from sunlight in the summer.
- **Use of decorative elements:** such as Muqarnas and drawings of different colors, which work on excitement and mental and cognitive interaction with heritage.
- **Use of different types of Arches,** which are usually linked to the heritage of society.
- **Use of roof fence in various shapes and building materials** to give a different and gradual skyline.
- **Achieving the principles of the architectural formation (unity - proportion - scale - rhythm).**

2/2/4 Planning treatments

- **Choosing the appropriate location and respecting the topography of the earth.**
- **The use of compact fabric (integrated):** Means to follow the integrated solution in the rapprochement of the city's buildings with each other, in terms of agglomeration and agglutination in adjacent rows, so the plots are divided so that spaces are left between the divisions with small widths used as pedestrian paths, these paths work to increase the shade surfaces on the external facades, which is caused by the difference in heights and projections in the outer walls, which works on thermal stability and maintaining stagnation of cold air under the streets, taking into account to be vertical on the prevailing wind direction [8].
- **Using vegetal elements to overcome climatic conditions.**
- **The use of pedestrian paths and shaded voids:** The desert environment affects the external voids so they are not wide, given that strong sunlight prevents these voids from being

used, and shading is done by different building heights, or the use of vegetal elements and wooden pergolas, as these solutions have an effective role in reducing the fall of solar radiation on the outer walls of the building.

2/3 The third aspect: Trends in the interrelationship between Heritage and Contemporary in Omani architecture:

2/3/1 Concept of contemporary in architecture:

Architecture reflects the continuous human interaction with the passage of time, and therefore contemporary architecture expresses the renewable interaction of the methodology of architectural thought with the growth of life, and combined with the daily and civilized activity of human, and the degree to which he reached of knowledge and science in all fields, and if architecture separates from contemporary, it loses its dynamism and meaning. Architectural work must be based on a set of constants that enable it to face the requirements and variables of the age in which it exists for a significant period.

Hence, contemporary architecture represents an extension and continuation of the historical civilizational heritage, but in new contemporary style, it is acquired from the character of the age, and at the same time has roots extending to the distant past.

2/3/2 The importance of contemporary in architecture:

The correlation of architecture with contemporary means keeping abreast of the various factors, conditions and events at the present time, which is an important goal for all human societies, as the life of any society is closely related to its achievements and work, and the renewal of society by its connection with contemporary enhances its ability to continue to give, because contemporary in the past is one of the most important reasons for the existence of heritage in the present. Contemporary has two basic aspects: one is cultural and intellectual as a civilizational framework for the formation of society and its growth, and the other is an architectural application that helps to develop architecture to serve human by taking advantage of all the data of the age within the limits of the cultural social heritage framework of society, in the sense of accurate reading of the heritage with the contemporary vision in order to create acceptable architectural formations at the contemporary time and with contemporary technology [18].

2/3/3 The relationship between architectural heritage and contemporary architecture

This relationship usually arises in case of constructing new buildings within the boundaries of heritage areas, or next to monumental buildings of historical value and distinctive architectural character, and here the new building is in one of the following relationships with the surrounding environment:

2/3/3/1 The clear revival relationship: In this case, the new architectural product is a repetition of what is existing on the design level, or the general formation of the building, as well as structural components such as structural systems and building materials. This relationship is considered a repetition of the conditions and characteristics of a particular age and their transfer as they are in a completely contrary age in most characteristics.

2/3/3/2 The complete contrast relationship: In this relationship, the architectural product is completely contrary in all characteristics of the architectural environment in which it exists, such as utilizing new structural systems and building materials, or at the level of architectural design thought using contemporary architectural trends.

2/3/3/3 The harmonious and interconnected interaction relationship: the heritage districts are distinguished by a distinctive urban and architectural characteristic, which is known as the physical component of the characteristic, this heritage characteristic achieves a distinct and continuous visual personality for them through different ages. In this relationship, the compatibility between the elements used with the existing elements is achieved and it is an attempt to find harmony between the building and the architectural environment and the general characteristic surrounding the building, such as the use of some building materials and structural systems while creating the spirit of the general characteristic of the district at the planning and designing level [1].

2/3/4 Trends of the interconnection between heritage and contemporary architecture

The importance of the correlation between heritage and contemporary is due to the importance of both of them and the necessity of its expression and presence in society in a way that connects them and without prejudice to each of them. This interconnection is linked to two basic factors: a cultural factor that represents the general framework of society which should not deviate from it, and the other factor is a physical architectural factor translating basic principles inspired by the architectural heritage related to the culture, characteristics and originality of societies in the form of architectural forms

Through the follow-up of contemporary architectural forms and examples, and the architectural approaches and trends to contemporary thought, and in an attempt to inspire the extent of the mechanism of interconnection and integration between heritage and contemporary, these trends can be classified into two basic trends:

2/3/4/1 Contrast and separation from heritage: In this trend, the contrast between contemporary and heritage is in all formative elements. The contrast may be completely in the case of building contrast in all formative elements such as rhythm, scale, porosity, and proportions. The contrast may be partially when the difference is only in one of these elements. The architect approaches contrast with the heritage in order to attract attention to the contemporary building, and it may be a temporary view that the eyes will turn away from, due to that the architectural product is strange from what is familiar and contiguous.

(1) Complete Contrast: This trend is used in architectural design when there is a need to design a building of a national nature or a landmark sign. For example, the ancient Egyptian pyramids are completely different in terms of architectural formation from the buildings of Pharaonic architecture, despite their being in the same time period. From here we notice that the difference in the architectural formation of a building in the environment around it gives a visual impression and a heritage value within the existing surrounding, and its impact decreases whenever it is similar and congruent with the surrounding. Therefore, we find that many architects intend to create a difference in the general formation of the building from its surrounding environment to give it uniqueness and draw attention to it. On the contrary, we find that the American architect Richard Rogers believes that the contrast between buildings of

different ages leads to integration, because each of these buildings provides a different expression about its age.

(2) Partial Contrast: In this trend, the architect attempts to express his design thought when dealing with heritage. At the same time, the building is visually similar to the surrounding where he may use the same architectural forms or finishing materials so that the building from the outside appears to be close to the surrounding architectural environment.

2/3/4/2 Correlation with Heritage: Correlation with heritage is in four levels, depending on the skill and professionalism of the architect in achieving this correlation, namely: clear revival of heritage, selection and collection, revival and abstraction, and complete abstraction of heritage.

(1) Clear revival of Heritage: This trend is considered a process of copying a specific heritage architectural product as it is in circumstances, environment and function completely different from the heritage building, and it is only at the formal level without attention to the social or cultural aspects that this architectural formation aims to. The architect, in this trend, tries to duplicate in the same proportions, with difference in some details and dimensions due to site conditions, laws and regulations governing the construction process and available technologies. The truth of the matter is that this process of copying seeks to create an architectural style from the past, and thus leads to the preservation of what was existing in the past at the expense of what may be in the future, as it completely ignores the present architectural character, and detains the mind (Figure 6)



Figure 6. . Clear Revival in Omani Architecture (Sohar Market - National Museum)

(2) Selection and Collection: At the present time, this trend is widespread in most Arab countries, in which the architect considers heritage as a dictionary that contains many architectural vocabularies and solutions, some of which can be selected and used in contemporary architecture as an attempt to link with the past. It is worth noting that many of this vocabulary have a cultural and social significance that the architect is aware of when using them in contemporary architecture, and not just formations with only geometrical relations (Figure 7)

(3) Revival and Abstraction: This trend relies on the general abstraction of architectural formation with a revival of the heritage vocabulary used, in which the architect uses heritage vocabulary but in a contemporary form and style of his personal innovation, which reflects the extent of his understanding of the selected elements and forms, and the social, cultural and environmental related to them. In this trend, the architect uses several methods to achieve correlation with heritage through several formative processes: Unity and Similarity; Reflection; Analogy; Camouflage; and Integration (Figure 8).



Figure 8. Revival and Abstraction of Heritage Vocabulary in a Modern Way in Omani Architecture (Mosque and Science Center - Muscat)

(4) Complete Abstraction of Heritage: It is a concept that is based on defining the cultural significances of heritage formation, and thus the architect creates new formations and configurations that are expressed in contemporary way and circumstances. This concept is not based on the sensory abstraction of the original vocabulary, but is based on the moral abstraction that preserves the cultural significance, and thus the architectural forms represent contemporary with all its material significances, but its meanings contain the heritage culture of this formation. From the foregoing, it becomes clear the necessity of the link and integration between the architectural and contemporary heritage. This link is achieved through the inspiration of the basic principles and architectural solutions that have achieved for the society, in long periods of time, its various social, climatic and formative requirements, and the use of what is adapted with the conditions, characteristics of society and contemporary architecture, so that the contemporary architecture fulfills all the different requirements of society, and at the same time, expresses human interaction with the characteristics of the modern age (Figure 9).



Figure 9. Complete Abstraction in Omani Architecture (Opera and Bank Muscat)

(Figures 10 and 11), present the proposed mechanism for design decision-making in order to achieve correlation between contemporary architecture and architectural and urban heritage.

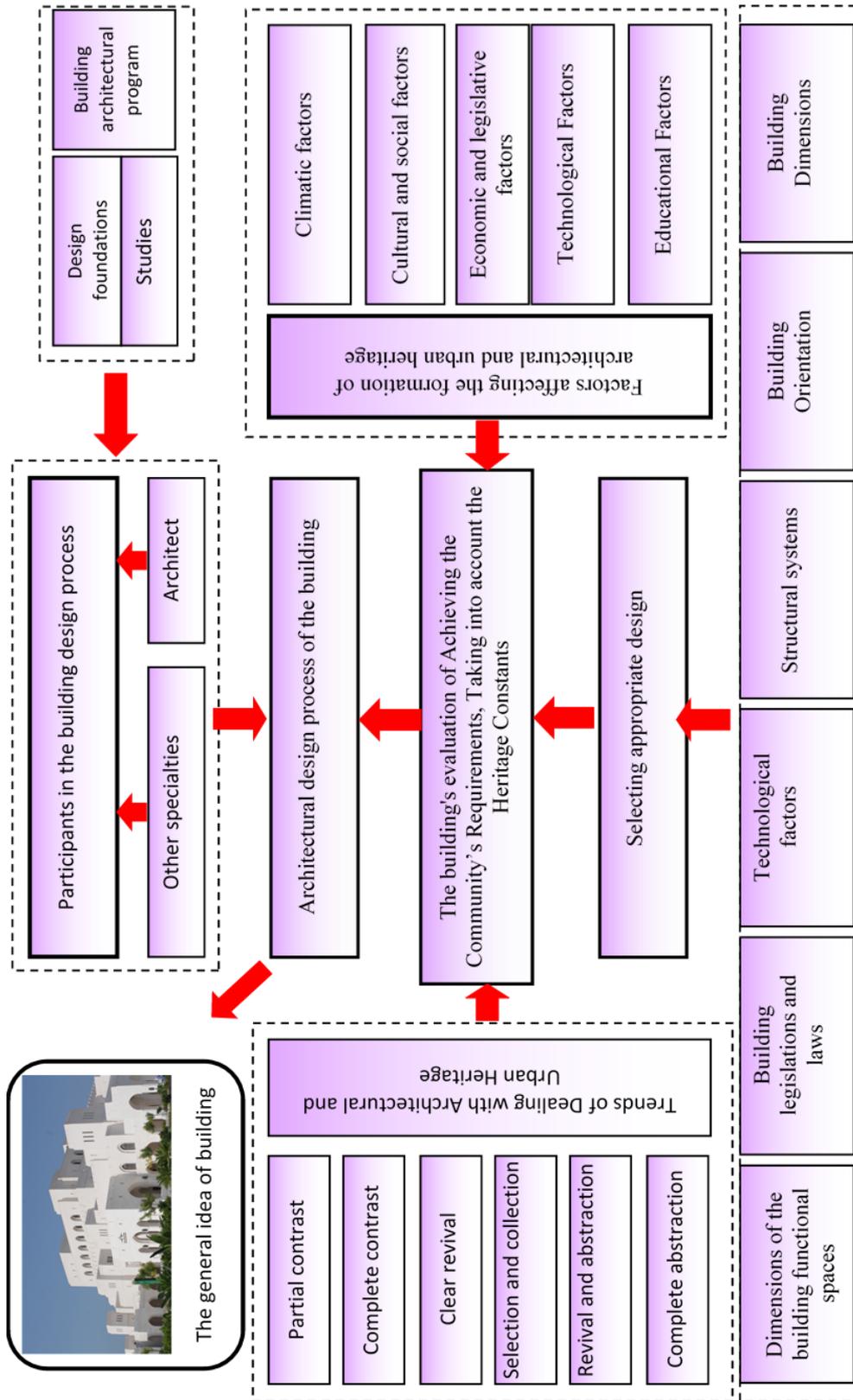


Figure 10. The Proposed Mechanism for Design Decision-Making for Achieving Correlation between Contemporary and Heritage

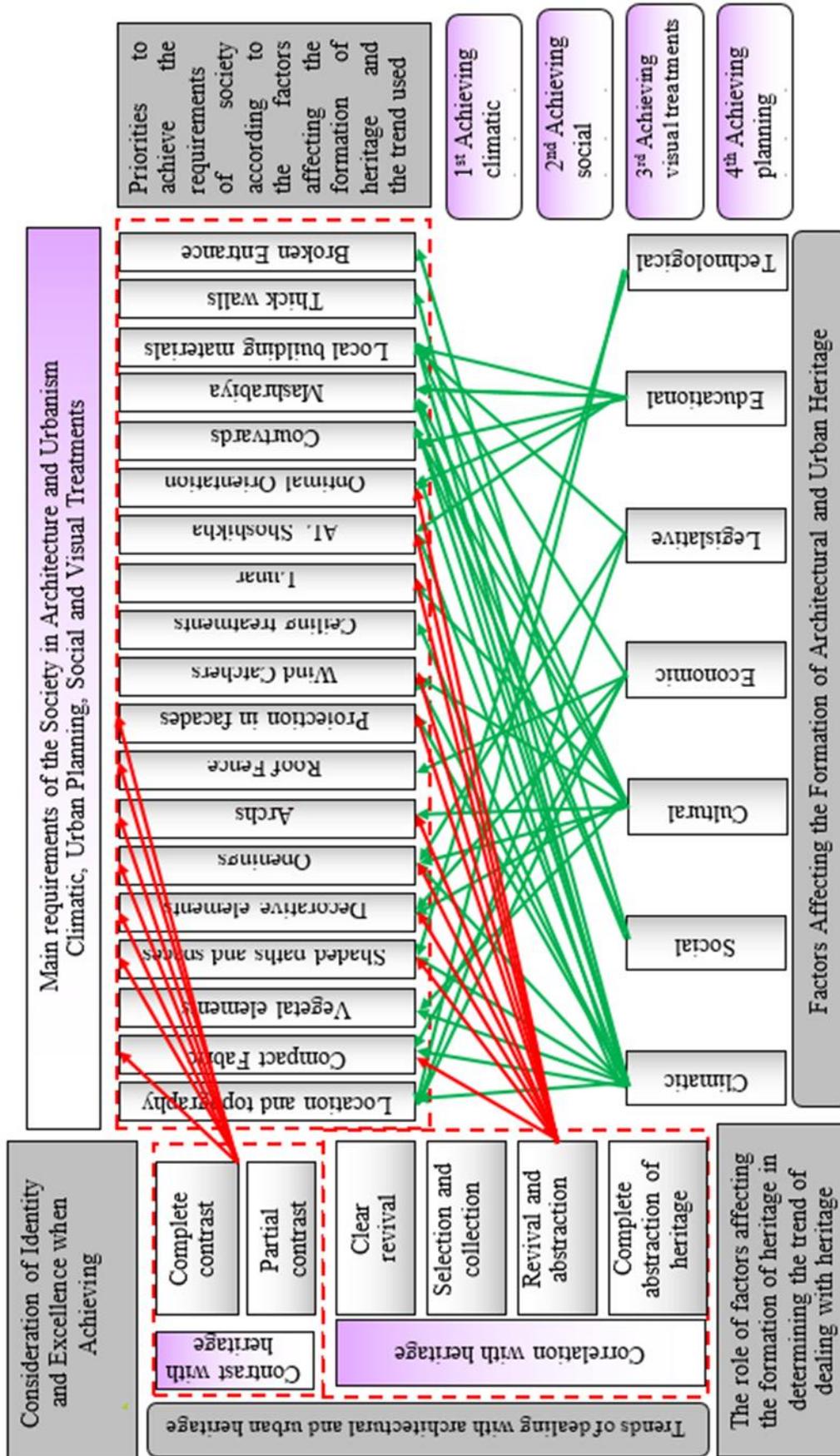


Figure 11. The Proposed Methodology for Design Decision-Making for Achieving Correlation between Contemporary and Heritage

2/3/5 Heritage and contemporary in Omani architecture

Omani architecture is considered one of the most important sources that are still closely related to the architectural heritage in the Arab Gulf region, and was not completely drifted into contemporary architecture, but rather tried to merge the heritage elements that the Sultanate is famous for with some contemporary vocabularies in one crucible so that the architectural product combines with originality and contemporary. The last four decades are considered the main former for local Omani architecture as the local materials and colors are clear in all types of buildings, as well as the lack of exaggeration in the height of buildings, which usually reaches three floors as a maximum, with the use of engraved decorations, as well as distinctive openings, and also the use of some architectural vocabularies in the walls, openings, roof fences and ceilings, of which the architecture in Sultanate of Oman is distinctive. It is worth noting that the Sultanate pays huge efforts under the leadership of Sultan Qaboos bin Said in preserving this distinctive architectural heritage through laws, organizations and governmental authorities that would preserve this heritage. To confirm this, the researcher is conducting an analytical study for selected examples of contemporary Omani architecture to emphasize the extent of their relation to architectural and urban heritage. The study chose the examples for the measurement process, which were taken into account in choosing to include different types of functions and types of owners as shown in (Tables 2: 8).

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Building Form and Name</p>	 <p style="text-align: center;">Ministry of Oil and Gas - Muscat</p>	 <p style="text-align: center;">Sultan Qaboos University - Muscat</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Building Form and Name</p>	 <p style="text-align: center;">Bank Muscat Main Branch</p>	 <p style="text-align: center;">Sustainable Residential Complex in Muscat</p>

Building Form and Name		
	Al Bustan Palace Hotel - Muscat	Royal Opera House in Muscat

Table 3. Case Study Examples of Omani Architecture

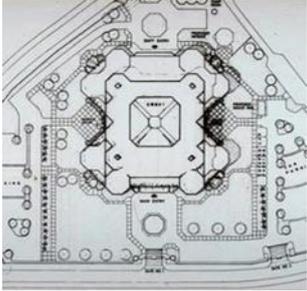
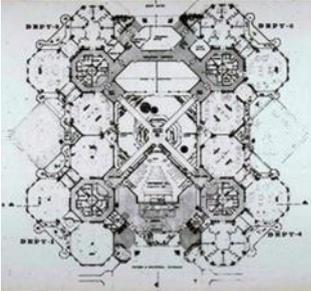
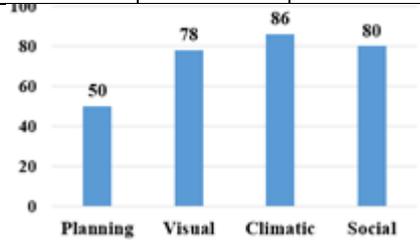
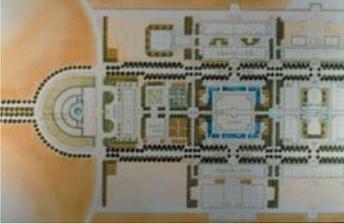
Project: Oman Ministry of Oil and Gas 1981							
							
Building layout, Ground Floor and Entrance							
The role of heritage in achieving requirements							
Planning 4		Visual 9		Climatic 14		Social 5	
50%	2	78%	7	86%	12	80%	4
				<p>The main role of using heritage elements and vocabularies in the design of this building was to fulfill the climatic and social requirements</p>			

Table 3. The Analysis of Oman Ministry of Oil and Gas

Project: Sultan Qaboos University 1988					
					
					
Building layout and Details					
The role of heritage in achieving requirements					

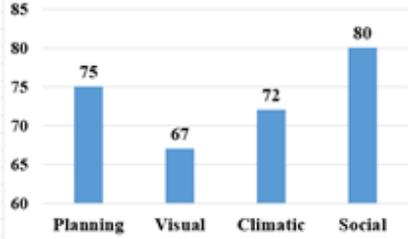
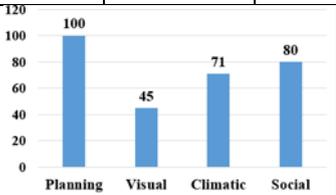
Planning 4		Visual 9		Climatic 14		Social 5	
75%	3	67%	6	75%	3	67%	6
				<p>The main role of using heritage elements and vocabularies in the design of this building was to fulfill the climatic and planning requirements</p>			

Table 4. The Analysis of Sultan Qaboos University

Project: Bank Muscat							
							
Building Form, Entrance and Detail							
The role of heritage in achieving requirements							
Planning 4		Visual 9		Climatic 14		Social 5	
100%	4	45%	4	100%	4	45%	4
				<p>The main role of using heritage elements and vocabularies in the design of this building was to fulfill the planning and social requirements.</p>			
Project: Sustainable Residential Complex in Muscat 2012							
							
							
Complex layout, Formt and Details							
The role of heritage in achieving requirements							
Planning 4		Visual 9		Climatic 14		Social 5	
75%	3	78%	7	75%	3	78%	7

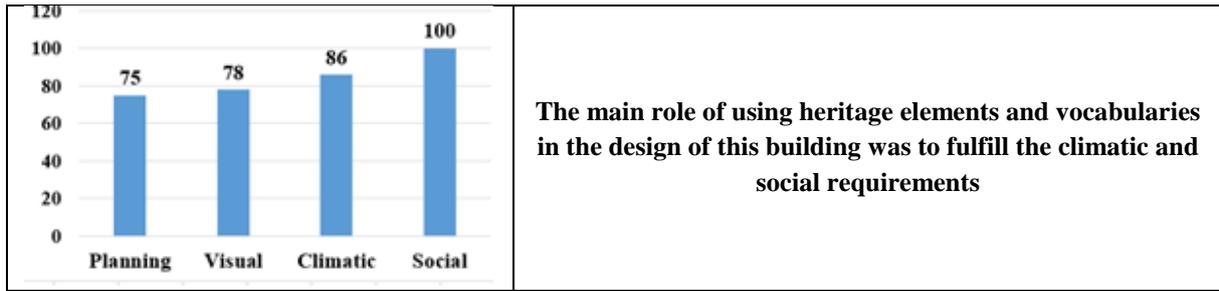


Table 5. The Analysis of Bank Muscat

Table 6. The Analysis of Sustainable Residential Complex in Muscat

Project: Al Bustan Palace Hotel																	
<p>Building Form, Entrance and Details</p>																	
The role of heritage in achieving requirements																	
Planning 4		Visual 9		Climatic 14		Social 5											
75%	3	78%	7	75%	3	78%	7										
<table border="1"> <thead> <tr> <th>Category</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Planning</td> <td>75</td> </tr> <tr> <td>Visual</td> <td>78</td> </tr> <tr> <td>Climatic</td> <td>79</td> </tr> <tr> <td>Social</td> <td>80</td> </tr> </tbody> </table>				Category	Value	Planning	75	Visual	78	Climatic	79	Social	80	<p>The main role of using heritage elements and vocabularies in the design of this building was to fulfill the climatic and social requirements.</p>			
Category	Value																
Planning	75																
Visual	78																
Climatic	79																
Social	80																
Project: Opera Complex in Muscat 2011																	
<p>Building Form, Entrance and Details</p>																	
The role of heritage in achieving requirements																	
Planning 4		Visual 9		Climatic 14		Social 5											

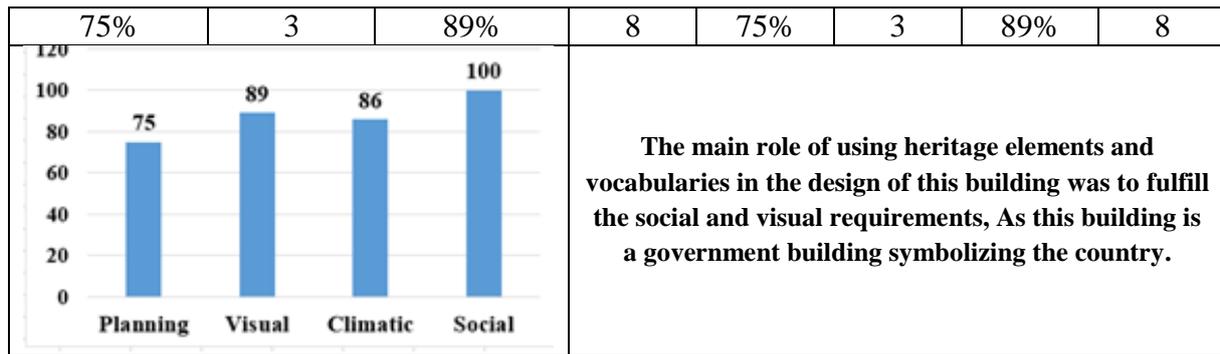


Table 7. The Analysis of Al Bustan Palace Hotel

Table 8. The Analysis of Opera Complex in Muscat 2011

3. Results and Discussion

(1) The urban and architectural heritage means that it is a group of architectural buildings, constructions and forms that have proved their suitability with the conditions of the society and its climatic, social, cultural and civilizational nature, and have proven their originality and value in facing the continuous change in the characteristics of society and its renewed ideologies. This heritage is characterized by steadfastness, continuity, and acceptance of society. It is also a tool for affirming the identity of society, as well as evidence of its cultural continuity.

(2) The necessity of looking at the architectural and urban heritage in a more comprehensive way to include the distinctive values and characteristics of the heritage such as environmental, social, economic, aesthetic and emotional values, and not only limited to the formative aspects of heritage architecture of elements and vocabularies.

(3) The formation of architectural heritage is influenced by many factors: cultural; social; economic; legislative; educational; and technological factors. The architectural heritage is also associated with a group of elements and vocabularies that are used to fulfill the different requirements of society: social, climatic, visual, and planning.

(4) There are different trends to deal with the architectural and urban heritage. These trends depend on the cultural outcome of the designer, and they vary from complete contrast with heritage, to trying to harmonize in different degrees (clear revival, selection and collection, revival and abstraction, complete abstraction) to link between originality and contemporary.

(5) There are some distinctive architectural examples that were able to utilize the architectural heritage, but in a contemporary style that reflects the degree of deep study of the characteristics and values of heritage. This led to an architectural product expressing the identity of society, and carries with it historical and heritage roots, that is, it combines time (contemporary) and place (heritage) in one. One of the most important of these attempts is the Royal Opera Complex and the Sustainable Residential Complex in Muscat. The percentage of the heritage impact on the buildings chosen in the analytical study as shown in (Figure 12)

(6) The necessity of a serious attention with the heritage to reformulate it according to what are the necessities of the modern age require, and it is not considered as a mere repetition of the architectural formations and solutions that are not compatible or dynamic.

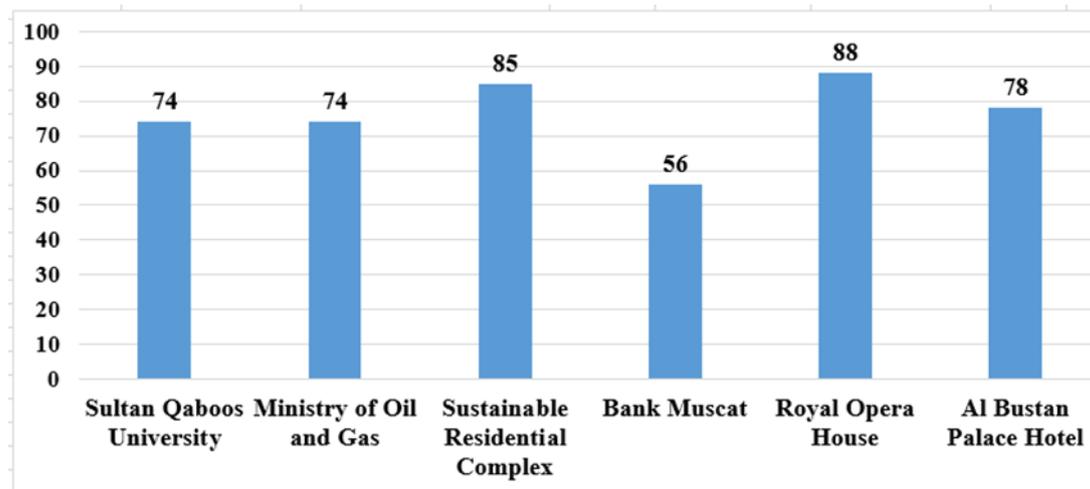


Figure 12. The percentage of the heritage impact on the buildings of analytical study

(7) The necessity of achieving complementarity between heritage and contemporary. Heritage is the way to reflect the culture of society and its uniqueness. As for contemporary, it is the tool that expresses the dynamics and development of society, as the today's contemporary is the heritage of tomorrow. If the matter is confined to the architectural and urban heritage only, societies will remain in their static form.

(8) Using the proposed methodology of the study for achieving correlation heritage in contemporary architecture. The selection of the heritage elements, vocabularies and the way of correlation should depend on specific functions of elements so that can achieve the needed requirements of society.

4. Conclusions

The correlation between heritage and contemporaneity in architecture became essential, so that reflects the roots of place in which the architecture has been formed. This correlation can be determined by using the elements and vocabularies of heritage, completely or partially, according to nature, type and function of building. The correlation process is done through methodology based on the priority of achieving the different requirements of society such as: planning, social, climatic, and visual.

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