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MODERN INTERPRETATIONS OF TRADITIONAL ARCHITECTURAL DETAIL

WSPÓŁCZESNE INTERPRETACJE TRADYCYJNEGO DETALU ARCHITEKTONICZNEGO

Abstract

The presented paper aims to discuss diverse aspects in which the concepts of modernity and tradition are confronted during the design of architecture, using the example of contemporary adaptations of traditional detailing. The methods used are multiple case study, carried out on selected designs from diverse cultural regions, as well as comparative analysis. The study results allow to conclude that there are three essential features that successful adaptations of this type share in common. Firstly, it is the respect towards the differentiated cultural context of the selected works. The second aspect relies on rethinking the functionality assigned to the concerned detail typology, which gives its authenticity. Finally, the third feature is the use of contemporary trends with regard to the aesthetics.

Keywords: modernity, tradition, design, architectural detail

Streszczenie

Prezentowany tekst ma na celu omówienie różnych aspektów, w jakich dochodzi do konfrontacji pojęć nowoczesności i tradycji w projektowaniu architektonicznym na przykładzie tworzenia współczesnego detalu w oparciu o tradycyjne wzorce. Zastosowane metody to studium przypadku, przeprowadzone dla wybranych projektów z różnych regionów kulturowych, oraz analiza komparatywna. Wyniki badania pozwalają wyciągnąć wniosek, że udane adaptacje tego typu łączą w sobie trzy zasadnicze cechy. Po pierwsze, jest to respekt względem zróżnicowanego kontekstu kulturowego wybranych projektów. Drugi istotny aspekt polega na przemyśleniu funkcji przypisanej danej typologii detalu, która stanowi o jego autentyczności. Trzecia cecha odpowiada użyciu współczesnych trendów w zakresie estetyki.

Słowa kluczowe: nowoczesność, tradycja, projektowanie, detal architektoniczny

1. INTRODUCTION

In the field of architecture, modernity and tradition are often confronted during the design of the building's facade. Many contemporary architects tend to seek for local cultural inspirations at this stage of their work, which they subsequently reinterpret in a creative and often utterly modern way. While making reference to the local building tradition is intended as a means to legitimise the new project in its particular location, its transformation usually brings it to a new dimension by application of the state-of-art building technologies and innovative materials. Intended to give modern expression to the local culture, contemporary interpretations of the tra-

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ditional architectural detail are an undeniable resource to discuss the cultural aspects of facade design. The presented paper will analyse selected examples of how traditional architectural detailing was transformed by contemporary architects into a modern and, in some cases, innovative facade system. Particular attention will be brought to the design methods and tools that were used by the architects in order to make a comprehensible reference to the location's cultural background as well as to the functional aspects that were assigned to the facade in the regard of the project's location and its geographic features, including insolation and climate. The architectural works which were selected for the purpose of the study are situated in different regions of the world, including several buildings realised lately in the Persian Gulf which constitute representative and recent examples of the raised matter.

2. STATE OF KNOWLEDGE

2.1. GENERAL DISCUSSION ON THE ORNAMENT

The culture-related role of architectural detailing has been discussed from different points of view and to a varying extent. Taking into consideration the major interest this paper places in the confrontation of modernity and tradition, the preliminary related literature is Adolf Loos's manifest on the ornament, maintaining the puristic view that a modern society would rather restrain from using any ornaments, both in architecture and in personal culture.² According to Loos, a tendency to adorn anything, from buildings to human bodies, with fake elements or motifs that are not functional but limited to decorative purpose only, is typical of primitive societies, while a modern and educated person would rather find his reflection in the simplicity. This restrictive point of view over architectural ornamentation has recently been discussed on the background of the contemporary culture by Wojciech Bonenberg, who questions the validity of Loos's puristic ideas in the context of the contemporary knowledge in the fields of cultural anthropology and environmental psychology.³ Focused on the differences in the attitude towards the ornament that occur between the recipients and the creators of architecture, the discussion relates to the spatial perception by individuals, in which ornamentation plays an important role as it refers to the collective unconscious, that underlies any system of communication. The ambiguity of the ornament is therefore related to its semantic layer, as it represents and communicates the aesthetic values common for the given society or a group of individuals, the total lack of ornament being also a sign of the aesthetic values that were typical of the modernists.

2.2. ARCHITECTURAL ORNAMENT AFTER THE MODERNISM

The return to the use of architectural detail after the modernism has been significantly marked by two opposed attitudes, which can basically be referred to the reconstructive and deconstructive design philosophy.⁴ As the deconstructive way of thinking about architectural

² Loos A., *Ornament and Crime*, 1908 [in:] Loos A., *Ornament and Crime: Selected essays*, Ariadne Press, Riverside 1997.

³ Bonenberg W., *Ornament dziś: zbrodnia czy chluba?*, Czasopismo Techniczne. Architektura, 2012, no. 5-A/1, pp. 56–65.

⁴ Jencks Ch., *Language of Postmodern Architecture*, 6th Revised edition, Rizzoli, New York 1991.

detail involves its free transformation in terms of scale, proportions, function and location, it intentionally plays with a substantial modification of its semantic content. Such principles of using ornament in postmodern architecture, applied among others by Michael Graves or Robert Venturi, were often based on literal citations from the history of architecture, transformed in a creative and playful way. The reconstructive way of approaching the notion of the ornament, on the other hand, involves its complete redefinition. Among other postmodern architects, Mario Botta and Louis I. Kahn have invested their efforts in working out the new principles regarding the design of architectural detailing, with a particular attention being put on its adjustment to the values recognised by the modern society.

Since the post-modernism has opened a multifaceted discussion on the use of architectural detail, its diverse aspects, including aesthetic, functional, social and others, are in the centre of interest of many designers and researchers. While the designers would rather focus on the practical aspect of the knowledge gained in the result of case studies, from which they can potentially draw some principles of composition that can be applied in their designs, most researchers will focus on a specialised, narrow aspect of architectural detailing.

2.3. GLOBAL IDEAS OF MODERN DETAILING

The abundance of literature on the ornament can be most conveniently classified according to the time-space it refers to. The regionality of works related to the notion of the ornament in architecture does nonetheless extend to diverse scales. Firstly, in the global scale, the internationalisation of research topics and results finds its reflection in the concept of the universal parametric and computer-based ornament, which can be algorithmically derived from various formal inspirations and therefore can be characterised by a wide reach of application. This approach to the architectural detail can be exemplified by the works of Russell Loveridge and Kai Strehlke, who present different forms of computed-based details, interpreting either historical motifs or abstract patterns.⁵

2.4. CULTURAL REGIONALITY OF THE ORNAMENT

After the global approach to the computer-aided fabrication of architectural detailing, there is a great number of works and publications that follow the string of the cultural influence which finds its expression in the aesthetic values shared by the relevant society. The works of this type can remain limited to small communities, but do they often refer to geographically large regions that find, or once found themselves within the reach of an influential culture. These studies can be differentiated according to the referenced culture being low- or high-context. According to the definition proposed by Edward T. Hall, all messages exchanged within a low-context culture have a direct meaning and do not contain additional meanings hidden “between the lines”, while those exchanged within a high-context culture contain underlying informations which are not vocalised.⁶ This refers to diverse aspects of the culture, including architecture.

In the first case, the ornamentation will rather refer to the notion of the architectural style that expresses aesthetic preferences of a given society in a given period of time. With the time

⁵ Strehlke K., Loveridge R., *The Redefinition of Ornament. Using Programming and CNC Manufacturing* [in:] B. Martens, A. Brown (eds.), *CAAD Futures 2005: Learning from the past – a foundation for the future*, IRIS-ISIS Publications, Vienna 2005.

⁶ Hall E.T., *Beyond Culture*, Anchor Books, Doubleday, New York 1976.

passing, these preferences might change and, consequently, the semantic content of ornamentation might discontinue, being nonetheless a testimony of the past. For this reason, the research in that field concentrates mainly on the architectural detail that was characteristic for a precise epoch and a limited region. For example, some studies analyse the adaptation of European building traditions on the American ground, distinguishing varied styles with relation to their unique ornamentation features. An example of such work can be found in the catalogues of American buildings elaborated by William H. Pierson Jr., in which the author presents colonial versions of different continental styles in architecture.⁷

When it comes to the high-context cultures, the detail in architecture tends to have a persistent symbolic dimension, also in non-sacral buildings. The semantic layer related to architectural detailing and decorative motifs is continued and represents hidden meanings to the society. Taken away from their original location such ornaments will not be understood in the same way, as the cultural context has changed. Islamic art and architecture are relevant examples of the semantic load deposited in motifs and particular forms. A complete work on that subject has been written by Titus Burckhardt who has precisely analysed the symbolical meaning of different forms of ornamentation in the cultural context of Islam, describing the connection of diverse geometrical shapes and composition patterns with culturally important concepts relating to the spiritual life of the society.⁸

2.5. CONTEMPORARY ADAPTATIONS OF TRADITIONAL FACADE DETAILING

A selection of publications on the ornament are focused on the contemporary designs that use traditional elements of architecture or decorative motifs as inspiration to create original facade detailing. However, the cultural legitimisation of their use as ornamental detail in another region proves to be of great importance. The factor of cultural regionalism and its importance for the correct perception of the referred tradition are discussed by Akçay and Alotman in their work on the misconceptions of using *mashrabiya* by modern copies.⁹ Besides the issues related to the “transplantation” of the concerned architectural element to another ground, the authors indicate the problem of it being reduced to the role of a decorative motif, while its original use had an important functional aspect, which was its passive cooling effect. The displacement of cited detail to another context and, moreover, the transformation of its functionality from pragmatic to purely decorative, brings as a result its semantic eradication.

Taking into consideration the large amount of multithreaded literature on the ornament, it seems appropriate to select and analyse a narrow aspect of the subject. This paper will

⁷ For example: Pierson W. H. Jr., *American Buildings and their Architects*, Volume I, *The Colonial and Neoclassical Styles*, Oxford University Press, NY Oxford, first published 1970, edition 1986. Pierson W. H. Jr., *American Buildings and their Architects*, Vol. II, *Technology and the Picturesque, The Corporate and the Early Gothic Styles*, Oxford University Press, NY Oxford, first published 1978, edition 1986.

⁸ Burckhardt T., *L'art de l'Islam. Langage et signification*, La Bibliothèque de l'Islam, Collections éditées par Pierre Bernard, Éditions Sindbad, Paris 1985.

⁹ Akçay A.Ö., Alotman H., *A Theoretical Framework for the Evaluation from the Traditional Mashrabiya to Modern Mashrabiya*, *Journal of History Culture and Art Research*, 2017, no. 6 (3), pp. 107–121.

therefore discuss selected examples of modern adaptations of traditional architectural details, seeking to draw some universal conclusions on how historical inspirations can be used in this regard nowadays.

3. METHODOLOGICAL APPROACH

As the basic method, the multiple case study has been used, forming the foundation of a comparative analysis.¹⁰ The use of the case study method in the field of architecture is discussed by Richard Foqué, who raises several issues related to its subjectivity, selectiveness and tendency to perform simplifications.¹¹ At the same time, the author points to the particular utility of this method in the field of architecture due to the creation of a direct link between scientific research and its application in the daily practice of an architect, as well as to the educational values that result from it. The pragmatic knowledge that results from multiple case study does not allow to draw generalised conclusions that can be presented in the form of an indisputable truth or a universal rule, but it nonetheless permits to observe certain mechanisms that refer, in this case, to the modern redefinition of historical architectural detailing. The basic tools that are used in the implementation of this method are descriptions and graphic analysis, which are the standard selection for the works in the fields of architecture and planning. Moreover, the comparative analysis will be used in order to resume the results collected from the presented case studies.

The buildings selected for the study are contemporary designs in which architectural detail is based on the adaptation, or redefinition, of traditional building techniques or decorative motifs, which are typical of the location area. Moreover, selected works are situated in different cultural regions. Taking into consideration the division between low-context and high-context cultures, the examples derived from these two opposed culture families will be analysed separately.

4. CASE STUDY 1: REDEFINING THE BUILDING TRADITION OF NEW ENGLAND

The first case study refers to the low-context culture and includes a few designs elaborated by the architect Louis I. Kahn and situated primarily in the region of New England. Consistent with the modern approach to the design, Kahn's research of new architectural detail started with the selection of building materials. There were several criteria he took under consideration in order to decide what materials would be used for a given project. First of all, the architect was particularly interested in expressing the cultural heritage of the area where he was based, which justifies the frequent use of brick. However, the fact of having individual preferences did not prevent Kahn from searching for local references. He draws a lot of inspiration from the character of the place, namely from the local models of architecture, including popular styles and materials. As far as possible, Kahn takes into

¹⁰ Niezabitowska E. D., *Metody i techniki badawcze w architekturze*, Wydawnictwo Politechniki Śląskiej, Gliwice 2014.

¹¹ Foqué R., *Building Knowledge in Architecture*, University Press Antwerp, Antwerp 2010.

account the on-site availability of preferred materials as well as of qualified labor. Although the choice of materials was made separately for each project, some can be distinguished as preferred by the architect. Above all, it is brick. Inherent to the character of New England, brick was in the focus of Kahn's interest from the beginning of his career. He tends to favour this material not only for the designs located in the Northeast of the US, but also in other places if the local context allows. He also preferred to use brick in Bangladesh and India, where the manufacture of this material as well as the tradition of masonry belong to the local culture.¹²

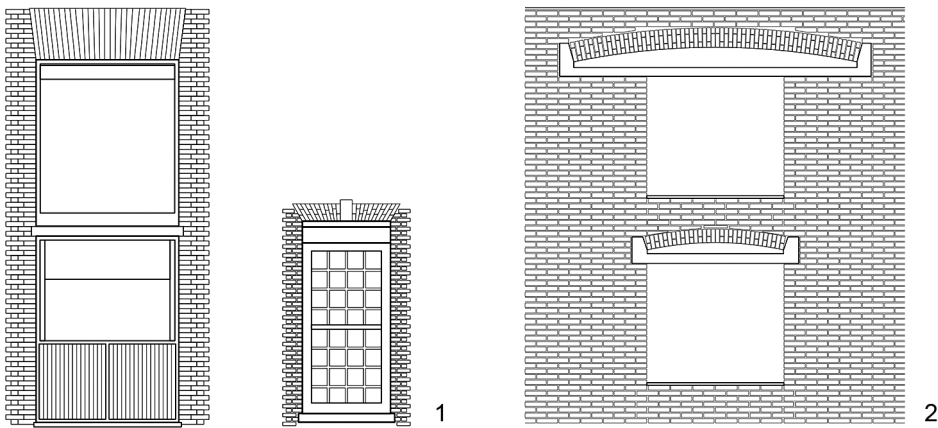
In the works of Kahn, the selection of brick is often accompanied by the use of concrete. The marriage of these two materials corresponds to the architectural models of Philadelphia and its region, where the traditional masonry was enriched by the use of stone details, for example window frames. And, more recently, the architecture of factories of the region has imposed the industrial aesthetics to the masonry buildings, which was familiar to Kahn by growing up in a working class neighbourhood in Philadelphia. Inspired by the historic architecture of New England, Kahn introduced a modern adaptation of the local traditional building method. One of its first implementations were Kahn's projects of the Mill Creek residential quarter and the Richards-Goddard laboratories. In the latter example, all the supporting elements are prefabricated in concrete, while the role of brick is limited to the filling or cladding. The differentiation of functions that are attributed to certain materials refers to the notion of the constructive order, which was particularly important to the architect. Interested in innovations, Kahn aimed at creating such a construction system that could be easily understood by the observers. In the case of the laboratories in Philadelphia, the bearing structure of the main units is composed of prefabricated concrete elements which are all exposed in the facades.

The use of brick and concrete can also involve other constructive systems. In the library in Exeter and in the First Unitarian Church in Rochester, for example, Kahn returns to more traditional building methods. Influenced by the local character, that is by the Georgian architecture of the campus for the library (Ill. 1) and by the residential periphery for the church, he decided to use traditional masonry for the facades. Contrary to the exterior layer, the interior structure of both buildings is realised in poured concrete. The differentiation of materials corresponds to the varied use of spaces and is envisaged to give an architectural expression of the hierarchical relationship between the building's centre and its periphery. While the concrete remains reserved for the interior structure containing *the form*,¹³ or the building's sense, that is the central void and the books for the library or the sanctuary for the church, the periphery is built of brick. Subordinated in the terms of hierarchy, the periphery plays, however, the leading role when it comes to relating the design with its environment because the choice of brick corresponds to the local characteristics. It can be easily imagined that the architect would select any other finishing material if the contextual frame was different.

¹² Pieczara M., *L'échelle du territoire dans l'architecture de Louis I. Kahn*, PhD dissertation under the supervision of prof. Patrick Mestelan, Polytechnique Fédérale de Lausanne EPFL, n° 5178, Lausanne (2012), p. 531.

¹³ This expression stands for the sense of the building and is borrowed from one of Kahn's basic writings: Kahn L. I., *Form and Design*, 1960 [in:] Twombly R. (ed.), *Louis Kahn. Essential texts*, W.W. Norton & Company, New York 2003, p. 63.

The assortment of brick and concrete gained a whole new dimension in Kahn's projects located on the Indian subcontinent. Rather than by the architect's personal preferences, the selection of brick can be explained by the available labor. Being part of the region's cultural heritage, the masonry offers more suitable quality of realisation, which was very important for Kahn. On the other hand, the labor of concrete was less common in the region and its quality was much worse. Nevertheless, this is on the Indian subcontinent where the selection of brick and concrete has brought a new concept in Kahn's theory of design. The *composite order*, as the architect has named his concept, attributes the bearing role to both materials and is characterised by assembling a drop arc made of brick with a concrete tie rod (Ill. 2). Manifesting the architect's idea of the composite order, this new complex element is exposed in the facades of the Indian Institute of Management in Ahmadabad, for example.



- Ill. 1. Wall detailing around windows in the Phillips Exeter Academy Library (left) and a historical Georgian building (right) in Exeter, New Hampshire. Drawing previously published [11]. (redrawn by PM)
- Ill. 2. The *composite order* according to Louis I. Kahn, shown on the example of the Indian Institute of Management in Ahmadabad. (redrawn by PM)

Derived from the traditional building techniques used in the region of New England in the form of their modern adaptation, the idea of the constructive order gave the beginning to Louis I. Kahn's personal definition of the ornament, according to which the ornament begins at the joint of structural elements. "The way things are made, the way they are put together, the way one thing comes to the other, is the place where ornament begins. It is the glory of the joint which is the beginning of ornament."¹⁴ When he speaks of "the glory of the joint", the architect shows his special concern about the legibility of the structure. Perceiving the capacity of the joints to express the way a building was assembled, Kahn sees the ornament as an essential means of transmitting the correct understanding of the architectural work.¹⁵ In this sense, any elements that are used to clearly separate the bearing structure from the filling

¹⁴ Louis I. Kahn, *Talk at the Conclusion of the Otterlo Congress*, 1959 [in:] *ibidem*, p. 60.

¹⁵ Pieczara M., *op. cit.*, p. 90–91.

as well as from the facing, like for example narrow window slits, can be defined as the ornaments. And so are the visible concrete beams or discharge arcs within brick wall, which constitute modern interpretation of traditional brick and stone building technique.

5. CASE STUDY 2 : REINVENTING TRADITIONAL WINDOW DETAILS IN THE REGION OF THE PERSIAN GULF

The second group of case studies are selected contemporary buildings situated in the region of the Persian Gulf, which belongs to the category of high-context cultures. One of the region's most recognisable architectural features is mashrabiya, a prominent and decorated window that overlooks the street or the courtyard in traditional Arab houses. As Akçay and Alotman explain, the term of mashrabiya was once used to describe a space enclosed with wooden lattice openings where jars of drinking water were put to cool.¹⁶ Later, the name started to be used to describe “the lattice screen which is made of wooden balusters with a circular section as a perfect condition to provide smoother airflow which contributes to the evaporation factor. This screen was completely hand-made and the design of the balusters was varied in different artistic ways.”¹⁷

Nowadays, traditional design of mashrabiya is seen as a resource of symbolical ornamentation motifs, with a powerful semantic load that underlies its composition.¹⁸ It is considered as “spiritual, decorative, and functional architectural element that merges the form and function of the Islamic window screen with a conventional jalousie, taking on the materiality of local culture.”¹⁹ The reinterpretations of mashrabiya in modern designs bring its recognition as “hybrid architectural element revealing the shifting cultural, historical and political dimensions in light of cultural globalisation, foregrounding thereby the notion of identity as a process of constant flux and cultural exchange.”²⁰ Many contemporary architects treat this heritage form of Islamic building detail as a potential source of inspiration, especially for the design of the double facade in hot climates. The most important aspects that distinguish successful designs in this regard are the correct adaptation of the concerned inspiration to the location's cultural context as well as the right combination of its functional and decorative purpose. When it comes to the functionality of double facade systems that were clearly inspired by mashrabiya, their basic utility is sun filtering and reducing the heating effect it has on the building's inside.

The first building selected for case study are Al Bahar Towers, situated in Abu Dhabi and designed by Aedas Architects. In this project the modern reinterpretation of traditional mashrabiya lattice screens has been achieved with the use of state-of-the-art building techniques and giving as the result an advanced interactive sun-shading skin system. The outer layer of the building's skin is formed from triangular panels which are arranged in a hexag-

¹⁶ Akçay A.Ö., Alotman H., *op. cit.*, p.108 cited after: Fathy H., *Natural Energies and Vernacular Architecture, Mashrabiya*, The University of Chicago Press, Chicago, USA 1986, pp. 46–49.

¹⁷ *Ibidem*.

¹⁸ Burckhardt T., *op. cit.*

¹⁹ Azra Akšamiija, Karina Silvester, Claudine Pachnicke, *Mashrabiya*, 2013, project description: <https://architecture.mit.edu/art-culture-and-technology/project/mashrabiya> (access: 12.06.2019).

²⁰ *Ibidem*.

onal module (Ill. 3). The panels are equipped with a mechanical system that is responsive to the intensity of solar radiation, allowing the triangular elements to fold up and down, which corresponds to different levels of solar protection. In its maximal range, the outer skin system forms a solid solar barrier. As stated in the project's description²¹, this innovative double facade system, visibly inspired by Islamic vernacular architecture, has an important influence on the building energy efficiency, as it allows to reduce heat gain and glare by half.²² When it comes to the design method that was used by the architects in order to transform the traditional Islamic decorative motifs into the structural design of the double facade, the parametrical approach has been used, leading to the development of a repetitive hexagonal modules which form the structural basis of the building's skin. The movable triangular panels that are attached to it can form diverse star-shaped arrangements, which change dynamically in response to the insolation factor.

Modern and innovative interpretations of the traditional mashrabiya became an important point of interest also for the French architect Jean Nouvel, who uses this vernacular inspiration in three different forms. The first of them can be referred to as traditional, integrated approach, in which mashrabiya is used in accordance with its original form of a window screen. The second use can be called hybrid,²³ as it forms an integrated outer layer of the building, remaining nonetheless strictly linked to its original function of shading the windows. Its usual form is a double facade. In its third form, the modern interpretations of mashrabiya lead to the creation of a totally separated structure, independent from the rest of the building. The three different approaches to reinventing the traditional form of mashrabiya will be analysed below on selected examples, which are the designs of one architect.

The first and a more conservative approach to reinventing the mashrabiya in a contemporary modern style can be exemplified by the window screens installed within the building of the Arab World Institute in Paris (Ill. 4). The representative character of the institute legitimise the use of Islamic vernacular motifs in the European context, which is essential for the correct comprehension of the referred values. The composition of the screens is based on graphical analysis of the traditional Islamic geometric patterns, pointing to the visual effect of interlacing lines that form an arabesque, framed within rectangular panels. The innovation factor of the design refers to the used material, which is metal, as well as to the specially invented responsive system of photographic apertures which open and close depending on the sun exposure. Each of 240 panels is composed of a great number of elements which are made of aeronautical aluminium alloy, steel and bronze. The composition the elementary panel is symmetric, with a large central aperture and multiple smaller surrounding ones. The layout of the elementary panels on the overall facade is modular, which refers to the contemporary language of architecture.

The hybrid approach employs the concept of mashrabiya as an exterior shading screen which is used together with a high performance curtain wall system as the interior layer of

²¹ Project description by Danny Hudson: <https://www.designboom.com/architecture/aedas-al-bahar-towers/> (access: 14.06.2019).

²² *Ibidem*, also cited in: Ayçam I., Beyhan F., *Performative Architecture: A Holistic Approach for Sustainability* [in:] S. Fırat, J. Kinuthia, A. Abu-Tair (eds.), *Proceedings of 3rd International Sustainable Buildings Symposium (ISBS) 2017*, Vol. 1, Springer International Publishing, 2017, p. 288.

²³ The term of the hybrid double facade appears in: Boake T., *Mashrabiya reinvented: Double façades, Persian Gulf style: Beyond their Limits* [in:] P. J. da Sousa Cruz (ed.), *Structures and Architecture*, Taylor & Francis Group, London 2016, pp. 583–591.

the building skin. In this system, a second layer of glazing is not used on the outside, while the layers of the double facade are usually divided by an air gap, which increases the cooling ventilation and also gives access for maintenance. The outer layer of the double facade can be either fixed or responsive. An example of the responsive hybrid double facade can be found in the above described design of Al Bahar Towers, while the fixed model was selected by Jean Nouvel for the design of Doha Tower, a high rise building situated in Qatar's capital. In this particular design, the building skin is not limited to the natural light control function, but it plays the structural role. This important decision corresponds to the architect's search for "the circular-plan tower with a peripheral structural system that allows for open, better-lit spaces with more control over interior lighting and abundant views onto the landscape, as opposed to the traditional, orthogonal, central-cored, curtain wall scheme for high rise buildings."²⁴ The building's outer skin is made of butterfly shaped modular elements, made of aluminium and produced in four scales (Ill. 5). The elements of the largest size constitute the basic skin layer, on which those of three other scales are subsequently mounted, depending on the desired level of shading. The east and west sides of the building are shaded in 60%, the south side in 40%, and the north side in 25%.²⁵

Finally, the third way in which Jean Nouvel has approached the idea of reinventing traditional Islamic mashrabiya was to create a separated structure from it. In one of his recent designs, the Louvre Museum in Abu Dhabi, he applied this inspiration to a vision of a large scale dome, 180 meters in diameter, which covers the building. Same as the geometric patterns of mashrabiya, the dome is also a powerful symbol of traditional Islamic architecture. Derived from the building tradition of the region, these two important inspirations are joint in the modern design of the museum. As the architect says in his own words: "it wishes to create a welcoming world serenely combining light and shadow, reflection and calm. It wishes to belong to a country, to its history, to its geography without becoming a flat translation, the pleonasm that results in boredom and convention."²⁶ When it comes to the geometrical pattern of the dome structure, it is centralised, yet based on a roughly perforated texture typical of crude woven materials (Ill. 6). During daytime, the dome provides the "shade punctuated by bursts of sun"²⁷ over the surfaces of the museum, which are raised above water and divided into house-like rectangular shapes, recalling the layout of an archaic village. According to the architect, the design resembles "a built archipelago in the sea..., protected by a parasol creating a rain of light."²⁸

6. CONCLUSIONS

The general assumption that can be made on the basis of the analysed material is that there are three important factors which have the crucial impact on the adequate comprehension of modern architectural detail that seeks to be a continuation of the local building tradition. The first is its cultural consistency with the location, the second is its functionality and the third is the design's compatibility with the modern aesthetics.

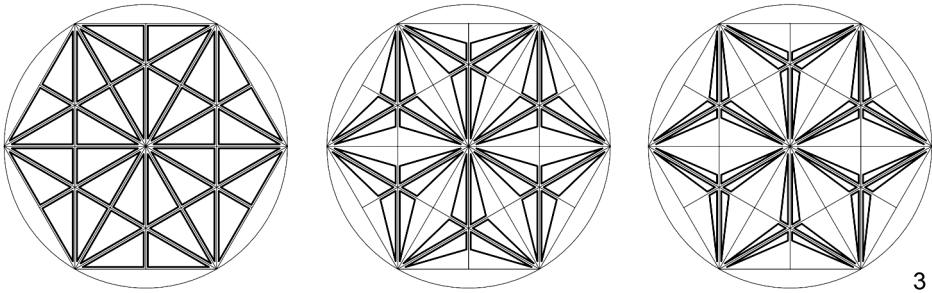
²⁴ Project description by Olivier Boissière: <http://www.jeannouvel.com/en/projects/doha-9-high-rise-office-tower/> (access: 14.06.2019).

²⁵ *Ibidem*.

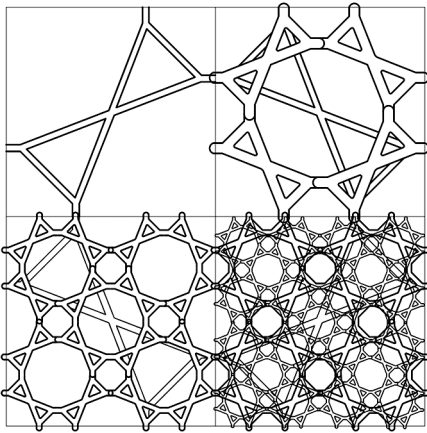
²⁶ Jean Nouvel: <http://www.jeannouvel.com/en/projects/doha-9-high-rise-office-tower/> (access: 14.06.2019).

²⁷ *Ibidem*.

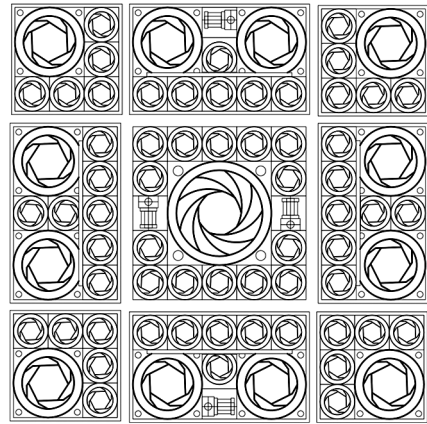
²⁸ *Ibidem*.



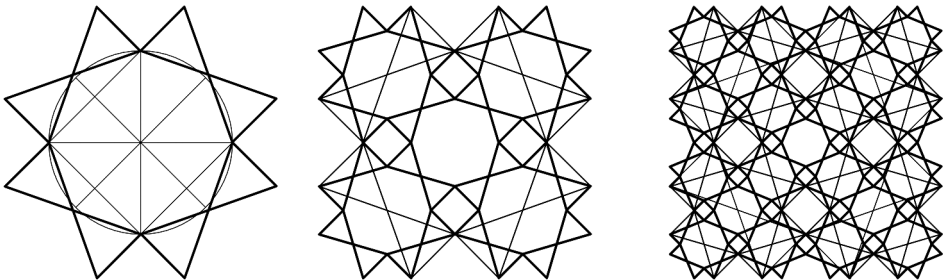
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- III. 3. Facade module from Al Bahar Towers in Abu Dhabi, designed by Aedas Architects. (redrawn by PM)
- III. 4. A window screen panel from the Arab World Institute in Paris, designed by Jean Nouvel. (redrawn by PM)
- III. 5. The geometrical pattern used as the structural foundation of the double facade in Doha Tower, designed by Jean Nouvel. (redrawn by PM)
- III. 6. Geometrical evolution of the roof structure used in the Louvre Museum in Abu Dhabi, a recent project by Jean Nouvel. (redrawn by PM)

Concerning the first requirement of cultural adequacy, it is important that the designers are conscious of the semantic layer which underlies the traditional ornamentation motifs they have selected to reinterpret in their projects. This knowledge can be gained by the study of local building tradition and its inherent detailing standards. The issues to concentrate on are the possible symbolical meanings of different architectural elements as well as of the geometrical principles related to the development of traditional patterns and motifs. It ought to be remembered that every culture can deliver inspiration for developing aesthetic and useful ornamentation and that some differences in the approach to the ornament will occur depending on a given culture being low- or high-context one. In high-context cultures the ornamental motifs and architectural elements might be underlaid with important meanings and they often refer to essential values recognised by the society. Their use can evoke emotions. On the other hand, low-context cultures tend to reduce the meaning attached to the ornamentation and therefore limit its role to the aesthetics.

The second factor that distinguishes successful interpretations of traditional building details is their properly selected functionality. As it could be observed from the analysed examples, despite their location in diverse cultural regions, the reuse of traditional elements or details in contemporary buildings involves providing them with a pragmatic function, which is usually consistent with their traditional purpose. In the referred works by Louis I. Kahn, essentially situated in the region of New England, the functional aspect of the ornament was related to the role that concerned elements played as structure members. The importance of this aspect finds its prolongation in the discussed concept of the constructive order as well as in Kahn's own definition of the ornament. Remote from New England, the region of the Persian Gulf has shaped the building tradition largely in the effect of its latitude and through the characteristics of its climate. The building tradition of the region finds its expression also in contemporary designs conceived by different international architects who show their respect for it. The functionality which is assigned to the interpreted elements and forms drawn from the traditional architecture is generally adequate with their original purpose, as it could be seen from the examples of traditional mashrabiya and the modern shading structures that took inspiration from it. It can be therefore summarised that the functionality proves to be one of the most essential features that allow authentication of any contemporary adaptation of the traditional architectural detailing.

Finally, the third factor which applies to the contemporary interpretations of traditional detail relies on the adoption of the modern aesthetics. As a design principle, this factor finds its expression in the use of the latest achievements in the domains of construction and materials science. These include, for example, innovative facade systems, which can be responsive to diverse external conditions. Among many relevant composition principles, which can sometimes contradict one another, some of the latest trends include the rejection of symmetry or the search for the antigravity effect.

On first sight, the occurrence of the above-described aspects in the design of architectural detail may seem dependant on the architect's intuition. However, as it can be assumed from the analysed examples, rethinking them constitutes an integrated element of the methodological approach to the design, also allowing to distinguish project's successive stages. As a result of its application, diverse contemporary adaptations of the traditional architectural detail, whether they be complex double facades systems or simple decorative motifs, can blend successfully into their contextual frame.

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