

# The Use of the Multi-Framing Mechanism in the Facades of Islamic Architecture

Assist. Prof. Dr. Ahmed Abdulwahid Dhannoon Taha

Department of Architecture Engineering, College of Engineering, University of Mosul  
e-mail: ahmadabdulwahid@uomosul.edu.iq

Dr. Oday Qusay Abdulqader Alchalabi

Department of Architecture Engineering, College of Engineering, University of Mosul  
e-mail: odaychalabi@uomosul.edu.iq



## Abstract

The multiple-framing in Islamic architecture included in the building a hidden order, which needs deep investigations and studies that depend on quantitative measurement methods. Framing process related to geometric and relational properties, in addition to the formal relationships. Moreover, the frequencies, proportions, shapes, and directions are essential variables. The finishing materials have a role in the Framing process. The research problem is (the lack of clarity of the multi-framing mechanism in the facades of Islamic architecture). Therefore, the research question is (What is the mechanism for designing interior or exterior facades that includes the feature of multiple-framing within the buildings of contemporary Islamic architecture). The study aims to determine the design characteristics, design elements, and relationships of the multiple framing processes. The

methodology used a qualitative approach using the visual observation technique by special observation sheet designed to observe the characteristics of each sample based on the secondary data. The study included morphological analysis and visual analysis based on VGA analysis. The results showed that the multi-framing process is in three levels (whole - part - detail). Scale and proportion are the most used principles as the formal analysis results showed.

## 1. Introduction

The facades in Islamic architecture included a distinctive feature, which the multiple-framing is one of these hidden features (Hattstein et al., 2015). This feature is used in various functional types of Islamic architecture buildings, whether in interior or external facades. The current paper deal with the multi-framing mechanism, which is trying to discover the elements, rules, and causes of using it in the facade.

Most of the literature related to the façade analysis has deeply discussed the lines of the facades organization structure, segmentation, shapes, and relationship in the various architectural

styles. In Islamic Architecture studies, the lack of analyzing the facades element in overall and part level lead to hiding the generating rule of the style, which is considered unique and elegant.

Therefore, the research problem is: (The lack of clarity of the multi-framing mechanism in the facades of Islamic architecture).

The research question is: (What is the mechanism for designing interior or exterior facades that includes the feature of multiple-framing within the buildings of contemporary Islamic architecture).

In order to answer the research questions, the study objective is: (To determine the design characteristics, design elements, and relationships of the multiple framing processes).

The theoretical framework of the current study created depends on reviewing the previous studies related to the general topic of the study.

## 2. Theoretical framework

The multi-framing is defined by literature by various meanings. The segmentation of the facades is the main process of analysing the façade shape, which included two levels in general. The first level represents the overall façade wall. The overall façade wall included structural lines, shape, and elements. However, the level of the detail is the parts that create the overall level (figure 1).

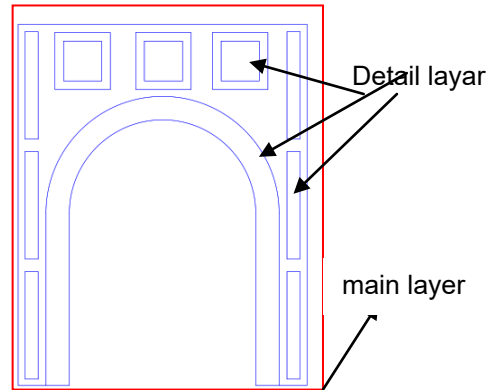


Figure 1. The types of layers (source: the researchers)

The richness of the façade reflected by the including of multi-layers of the multi-framing, which measured by visual analysis of the facades. Moreover, the uniqueness of the facades is created by the defences in the order and type of the element, shape, and structural line, which reflect the segmentation of the façade.

Vozniak and Butyrin (2019) highlighted the process of classifying the façade depending on the details of the façade (architectural elements). The value of the historical façade is related to the verity of the elements in term of quantity and unity. However, the richness can be reached by the value of complexity of the elements of the facades. Details of facades are the most important components of the style, which determining the structure lines.

Acceding to Vozniak and Butyrin (2019), the facades can be analysed in to seven main category ( Horizontal Segmentation, vertical Segmentation, wall Surface, Top Element of wall, Windows, Doors, Balconies and there Elements ) (Vozniak & Butyrin, 2019).

Gunce, Erturk, and Erturk (2019)

described a visual analysis method of the form. The façade shape is the important elements that represent the style and the richness of the architecture style, which is considered part of the architectural form. However, the researchers analyse the architecture form as 'whole' including the space, mass, and façade. The analysis process used the variables of organisational structure, which contained (Nodal organization, Clustered organization, Linear organization "One-way" & "Two-way", arranged organization, Gridiron organization, Combined organizations (Gunce et al., 2019).

Alaane (2014) analyse the traditional houses in Mosul, which are considered a style of Islamic Architecture, depending on the principles of generating the interior facades form. The architectural elements, shapes, lines, and framing are the main identifiers of the façade form (Alaane, 2014). Sabah (2006) explained the structural line of the alleys, which is created by the element of the façade. The relationship between the architectural elements of the façade reflects the characteristics of the architecture style. The researcher mentioned that framing used in detail around the opening elements in the façade such as, windows, doors, and arcs (Sabah, 2006). The multi-framing is the container of the ornament and pattern in Islamic architecture, which framed the doors, windows, arcs, and any architectural elements. Thanoon and Kasim (2013) identified the location of the inscriptions within the frame. the locations are Dome (inside and outside), Minaret, exterior façade, entrance, interior façade of the courtyard, interior walls, interior elements). Moreover,

frame shapes are the most frequent shape used in Islamic architecture in framing the architectural elements in Islamic architecture in interior and exterior design (Abdullahi & Embi, 2013; Thanoon & Kasim, 2013).

In summary, the variables of analysing the mechanism of the multi-framing in Islamic architecture are divided into two layers (details and main layers). While the quantity of layers is used to reflect the value of the style. Moreover, Location of framing, type of framing, the context of the framing, and segmentation are the main identifiers of the multi-framing mechanism.

### **3. Methodology**

The methodology applied the qualitative approach depending on the visual observation technique following the observation sheet that designed based on the variables abstracted from previous studies to observe the characteristics of each case study. The study included morphological analysis and visual analysis based on VGA analysis to represent the layers of framing. The visual analysis used the segmentation method of the façade to the layers of the framing that included in the multi-framing mechanism.

This method widely used in the analysis of the façade form such as the study of (Esmaili, Fatemeh; Charehjoo, Farzin; Hoorijani, 2020) and (Serna et al., 2012) (Figure 2).

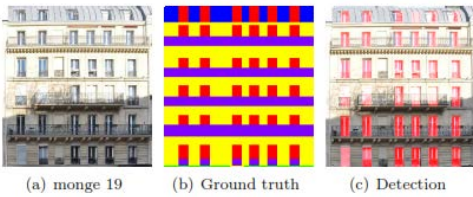


Figure 2. Example of an annotated image from. (Serna et al., 2012, p4)

The sampling of the cases is based on an intentional strategy towards cases that show richness in their multiple frameworks within the interface. However, the criterion of the samples selected depends on the historical age and architectural value of the building. All samples of Islamic architecture have different types of functions. The study analysed the internal and external interfaces. Formal analysis is related to the causes and function of the multi-framework of the interface.

#### 4. Result and discussion

The visual analysis results show the depth of the façade formation, which totally works as hidden order (Figure 3). Most of the cases have multi-framing layers that can reflect the richness of the façade (Figure 4).

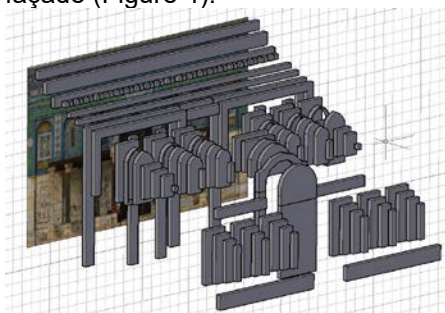


Figure 3. The hidden order of framing (source: the researchers)

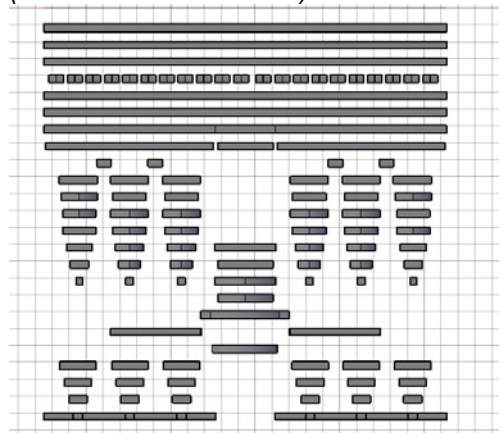


Figure 4. Top view of the framing layers show the depth of the façade form.(Source: the researchers)

The result shows that there are various types of frames that generated the multi-framing façade. There are vertical, horizontal, and path types, which can have included cartography about 10% from overall framing (figure 5), ornament about 70% (figure 6), and painting materials about 20%. The frame identifies the type of materials and ornaments, which frames act as a divider to generate the segmentation of the façade. The types of frames divided the façade into various segments, which create the verity and unity that related to the principles of the Islamic Architectural



style.

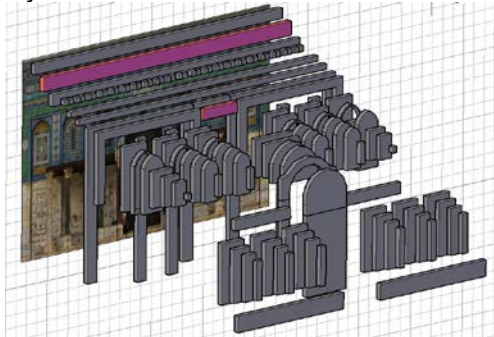


Figure 5. the location of cartography frame (Source: the researchers)

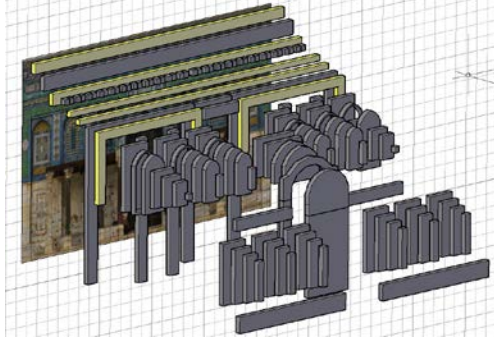


Figure 6. the framing of the ornaments that located in various layers.(Source: the researchers)

The framing type follows the function of the element in the facades, which framing can identify the elements such as doors, windows, and openings (figure 7). Moreover, the framing enhances the human scale, which converts the monumental scale of the façade to scale that can be recognized by the recipients.

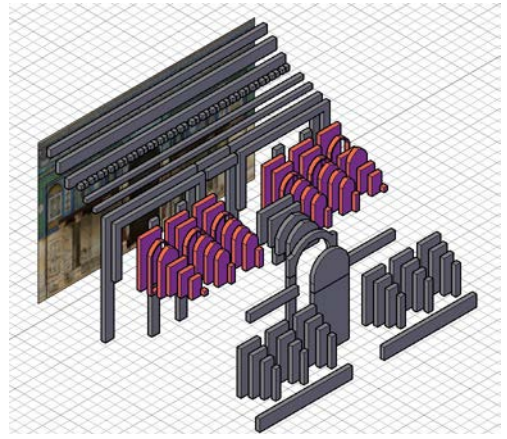


Figure 7. Framing follow the window and opening elements (source: the researchers)

From the visual analysis, the results show that framing included a minimum of 3 layers. The first layer is the main layer, which is considered the platform of the framing. The second layer is the frame shape. While, the upper layer is the detail layer that includes finishing materials, such as ornament or painting (figure 8).

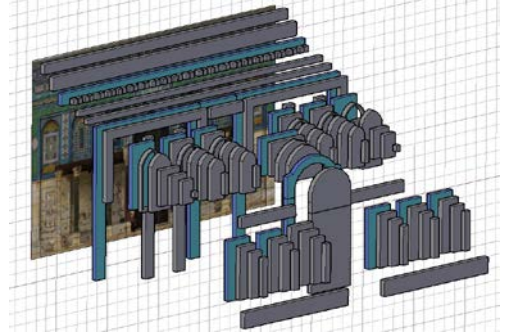


Figure 8. blue color represent the first layer of the frame (platform) (Source: the researchers)

In summary, the mechanism of multi-framing acts as a hidden principle in the facades of Islamic buildings. The richness of the façade is reflected by the deepness of the framing formation.

## 5. Conclusion

The study identified causes of Multi-Framing in the façade of the building in the Islamic Architecture Style. The multi-framing is used to follow the structure of the element; which framing is arranged in special order following the line of the element structure. Moreover, the Multi-Framing follow the function of the façade element such as using the Framing around the window and opening element, which is attached to the shape of these facades elements. Arc, rectangular, square, and any other shape. A multi-framing unit is used as a container for cartography, ornamentation, and patterns, which are constructed by various materials depending on the overall façade and the architecture style. The use of segmented multi-Framing in the Islamic architectural style has a role in reducing the effect of the monumental scale and converting it to a human scale.

In addition to the functional role of the multi-framing, the multi-framing is used as decoration and articulation of the facades to reduce the effects of the negative impact of some principles such as proportion, repetition, and hierarchy. Moreover, the multi-framing is considered a converter for the direction of the organizational lines of the façade.

## 6. Acknowledgment

The researchers acknowledged the Scientific committee in the Architectural Engineering Department, College of Engineering, University of Mosul for registering this paper under the scientific research plan (2020-2021) no. 9/16/6539

in 12/10/2021.

## 7. References

- Abdullahi, Y., & Embi, M. R. Bin. (2013). Evolution of Islamic geometric patterns. *Frontiers of Architectural Research*, 2(2), 243–251. <https://doi.org/10.1016/j.foar.2013.03.002>
- Alaane, T. I. (2014). The Attributes of Architectural Form of Traditional House Internal Facades of Mosul's Traditional House as a Case-study. *AL-Rafdain Engineering Journal (AREJ)*, 22(2), 16–28. <https://doi.org/10.33899/rengj.2014.87312>
- Esmaili, Fatemeh; Charehjo, Farzin; Hoorijani, N. (2020). Analyzing and Evaluating Facades with a Special Approach to Visual Aesthetics Using the Grid Method (Case Study: Enqelab Street in Sanandaj). *Bagh-e Nazar*, 17(82), 65–78. <https://doi.org/10.22034/bagh.2019.165147.3934>
- Gunce, K., Erturk, Z., & Erturk, S. (2019). *Visual Interpretation of Architectural Form*. 385–392.
- Sabah, O. A. (2006). *Compositional Structure of Traditional Lanes in Mosul City*. University of Mosul.
- Serna, A., Hernández, J., & Marcotegui, B. (2012). Adaptive parameter tuning for morphological segmentation of building facade images. *European Signal Processing Conference, August*, 2268–2272.
- Thanoon, A. Abdel W., & Kasim, H. M. H. (2013). Design Characteristics of the Written Inscriptions in Islamic Architecture. *Al-Rafdain*

*Engineering*, 21(6), 54–70.  
[https://rengj.mosuljournals.com/article\\_82151\\_0d51872bed2752c21584305e1967d426.pdf](https://rengj.mosuljournals.com/article_82151_0d51872bed2752c21584305e1967d426.pdf)

Vozniak, E., & Butyrin, A. (2019).  
Classification of historical buildings  
façade's details on the basis of  
order theory. *E3S Web of  
Conferences*, 91.  
<https://doi.org/10.1051/e3sconf/20199105016>