ON DRAFTING A NEW ARCHITECTURAL SYNTAX: CASE STUDY OF THE GREAT MOSQUE OF ALGIERS

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Abstract

The project to build the Great Mosque of Algiers is underway. This will be the largest mosque in the world, after the mosques at Mecca and Medina. Trying to reflect the Algiers' context, this project refers in his architectural design to Almoravid (11th century) influences, through an abstract way of interpretation. The aim of this paper is to explain this mode of interpretation by using a new approach. This approach combines both syntactic and semantic categories of the architectural object. It consists on the architectural syntax which tries the combination of space syntax and figurative abstract process. It is through a comparative study between the former mosque of Algiers: Djama' al-A'dam (AH 490/ AD 1096–1097) and the future great mosque of Algiers that will explain this abstract way of interpretation, which seems more expressive than figurative.

Keywords: mosques; Algiers; Almoravid; architectural syntax

Introduction

The El-Djezaïr medina lies at the heart of the historical centre of the city of Algiers. It was founded in the tenth century by Bologhine ben Ziri ben Menad [1][2]. At the time, the port of Algiers played a significant commercial role and attracted fleets from as far away as Ifriqiya and Al-Andalus. The link that it formed between the two shores of the Mediterranean helped to maintain trade and cultural exchanges, and propagated artistic and architectural influences [3].

After the military success of the Almoravids in Spain (AD 1054/ 1147), and the capitulation of Valencia and Zaragoza, Sultan Youssouf Ben Tashfin left his son an empire that included the Maghreb, Muslim Spain and other islands [4]. Ifriqiyan and Eastern influences disappeared at the expense of landmarks in the newly-conquered territories. Al-Andalus became the main source of architectural inspiration, notably through the Great Mosque of Córdoba and the Palace of the Alhambra [5]. After the fall of Granada, Algiers became home to Andalusians, Moriscos and Tagarins who had been expelled from Spain [6].

In AD 1519 the city was put under the protection of the Ottoman Sultan Selim I who made it the first vassal of the Ottoman Empire in North Africa [7]. To this day, the buildings and traditional constructions that compose Ottoman architecture can still be seen. Such buildings were not independent of Maghrebian constructions; rather they were juxtaposed and superimposed on them.

This paper makes no attempt to provide an historical account of events. Rather it is a comparative study of mosque architecture, where there is a noticeable trend towards an increasingly abstract architectural language.

We present two case studies: the Djama' al-A'dam (AD 1096) and the Great Mosque of Algiers (2008), which is still under construction. Their comparison contributes to a better understanding of the historical issues and more profound architectural knowledge.

Method

The method applied to the analysis of the two mosques is based on an introspective approach [8] and more precisely, on the architectural syntax [9]. We mean by architectural syntax the integration both of syntactic and semantic criteria [10]. This method allows not only the clarification of spatial operation and spatial arrangements but also their visual features manifested through their envelopes (facades) and their fifth facade.

Throughout this paper, we will identify the architectural criteria, by using the following three points:

- Manifestation and architectural expression processes: This consists of the study of building facades. It uses abstract representation processes and the identification of the distinctive visual features of the object in question [11][12][13][14]. This point (the process of figuration of the facades) consists on an immaterial grid applied to the facade to mark the distinction between bottom/figure of this latter [15].
- Composition and morphological articulation processes: This consists of the identification of geometric manipulations and syntactic operations at the planimetric level [16][17][18]. This point helps in the comprehension of the spatial syntax through the identification of elementary/basic sketch first, then the applied operations [19].
- The materials and substances used in the composition and architectural design [20][21][22]. This point is based on the principle of inventory. It ensues from rationalist and explanative approaches [23].

A comparative summary leads us to the understanding of the architectural characteristics in the two case studies.

The Beginnings of Islamic Architecture in Algiers

According to Ricard [24], the first mosques constructed in Algeria can be dated to the ninth century, following the vassals established by the Cario Fatimids and the founding of the Aghlabid dynasty in Tunis. In the capital Algiers, the mosques in the El-Djezaïr medina are characterized by multiple architectural influences. El-Bekri [25] argues that they date from the medieval Muslim period, specifically the foundation of El-Djezaïr by the Zirids in the tenth century. However, the mosques, public buildings (*hammam*, *madrasah*, the *Dar As-Sikka*, the *Bayt al-Mal*, the *Bulukbashi* and the *Tarsana*), and private houses in the medina are not limited to Fatimid and Aghlabid architectural influences. On the contrary, stylistic traces can be seen resulting from the historical overlap of North African, Muslim Spain and Ottoman architecture.

Political instability in Zaragoza and Granada, then the influx of Andalusians following the fall of Grenada in AD 1492 resulted in the penetration of Nasrid [26] expertise. These influences were superimposed onto the vernacular construction practices of local Berber tribes [27].

Following on from the Almoravids, in the eleventh century, the Almohads designed monuments in both Andalusia and North Africa. Their influence confirmed Hispano-Maghrebian stylistic elements: artisanal construction methods, pointed horseshoe arches, concentric and lobed arches, tracery, domes resting on squinches, stalactites, etc., which comprised the main elements of the architectural style. While it first appeared in the extreme Maghreb, it spread throughout the North African Barbary states, including areas occupied by the Moroccan Merinids, the Zayyanids that ruled Tlemcen and the Hafsids in Tunis (between the thirteenth and fourteenth centuries). It was at this time that the influence reached its apogee. With their modest size and more varied uses, these buildings reflect the harmonious proportions, consummate interior decoration and refined tastes that are the superlative demonstration of the true Moorish style [28][29].

The style persisted in northern Africa in the fifteenth and seventeenth centuries. However, beginning in the sixteenth century, the situation changed when the arrival of the Ottomans created greater heterogeneity. New formulas were introduced that brought architectural and stylistic additions, including: cruciform mosques, the use of vaults and domes as covers, and octagonal forms. Other elements included neo-Byzantine features such as: semi-circular arches, Italian capitals, and floral and geometric arabesque stylizations [30].
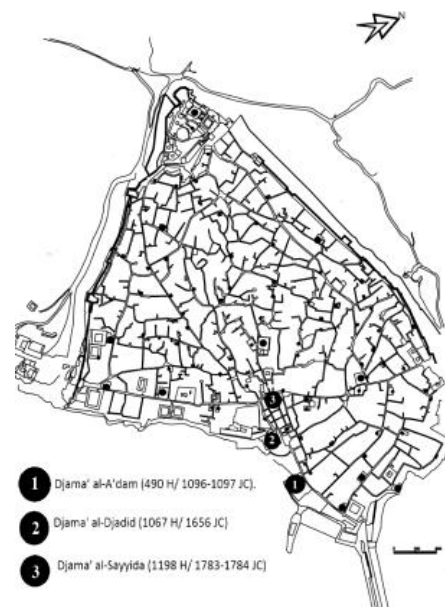

Figure 1. Plan of the historical medina of Algiers and its three major mosques (Source: Missoum, 2003)

During the same Ottoman period, the El-Djezaïr medina was divided between Maliki and Hanafi Muslims. Therefore, it did not have one, but

three major mosques [31][32], which rather than being enclosed by markets (as was the case in Cairo, Fez and Tunis) were side-by-side, as in Aleppo and Damascus [33] (figure 1).

Djama' al-A'dam, the Former Great Mosque of Algiers

In a monograph that coincided with the restoration of the mosque in 1997, Chergui confirmed an Almoravid reinterpretation of Djama' al-A'dam, which was built on pre-Islamic remains in AH 490/ AD 1096–1097. Although the mosque has undergone significant changes in the course of its history, it appears to have retained the basic structures of the Almoravid period. One such change concerns the minaret, which is offset from the mosque, and is the work of Sultan 'Abd al-Wadid Abu Tashfin in AH 723/ AD 1323 (figures 2 and 3). Another is the irregular transversal gallery located south-east of the courtyard that led Cresti [34] to hypothesise that it was a later addition. Finally, a third change occurred during the French colonial intervention, during which time a portico was added to the north-west facade. Despite various bombings and earthquakes, and the subsequent repairs and reconstruction, Djama' al-A'dam has preserved its original shape (figure 3).

The mosque occupied a strategic position and its structures formed part of a defensive system that was fortified during the Ottoman period. It is laid out in the form of an almost perfect square. Its facades extended for almost 40m, while the juxtaposition of an Ottoman courtroom added another 18m along the *Rue de la marine* (figure 2).

Behind the colonial portico, access to the mosque is provided by three similar doors. The doors are framed by a marble, semi-circular arch that is decorated with mouldings and topped with a projecting cornice. All of the spandrels feature a simple crescent. Narrow and elongated (0.60m x 1.75m) windows offer a view onto the street. A brick cornice runs along the length of all of the building's facades.

The prayer hall is striking in its simplicity. Its whitewashed columns and pointed and poly-lobed arches attract the attention. This rectangular room (45.40m x 23.75m) has eleven naves that are between 2.85m and 3.60m wide, and run perpendicular to the *qibla* wall and five bays. The hall is enclosed by a timber gable covered with red tiles. The extension created by three of the naves that are located at the far end of the hall leads to wide *riwaqs* (figure 3). An eight-sided gored dome with an octagonal cap (a feature that was widespread during the Ottoman period) is found at

the junction of the central nave and the final span. The mosque's minaret has a square (6m x 6m) base and is 27.50m high. It is surmounted by a lantern topped by an octagonal dome [35]. The minaret is aligned with the north-west facade, where a portico and an arcade created by fifteen poly-lobed horseshoe arches have been added. The arcade's columns are grouped into sets of two or four with square bases.

The courtroom that was added to the mosque is home to the Supreme Court (*Madjlis al-'Ilm*). It consists of a courtroom (*Madjlis*), a courtyard, a tribunal, a room for *wakils* (a representative appointed by a party to the case) and another unidentified room.

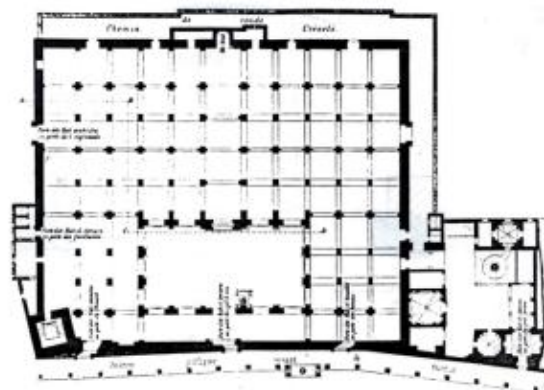**Figure 2. View of Djama' al-A'dam mosque and its facade on the street '*rue de la marine*'.(Source: Authors, 2014)**

Figure 3. Plan of Djama' al-A'dam mosque (Source: Chergui, 1998)

The Future Great Mosque of Algiers

The future Great Mosque of Algiers is currently being constructed on a 275, 000m² plot of land close to the sea in a central position on the Bay of

Algiers; the project forms part of the redevelopment of the Bay of Algiers and the banks of the Oued El-Harrach [36]. It will be the third-largest mosque in the world. A consortium of KSP Jürgen Engel Architekten and Krebs Und Keifer won the international competition to design the mosque complex in 2008 [37].

The project, which has yet to be completed, consists of a set of buildings on a raised platform arranged in a discontinuous alignment. The vast courtyard will be surrounded by various buildings forming a U-shape (figures 4 and 5). It will provide access to the 270m-high minaret, which will be the tallest in the world. The minaret will be divided into various functional areas that will be accessed via panoramic lifts. At the foot of the minaret there will be a spacious entrance with a reception area that extends into the adjacent building.

The main entrance to the prayer hall will take the form of a portico composed of twelve 23m-high monumental columns (traditional calla pillars) that open upwards to the sky in a flower shape. The prayer hall itself will be laid out in a 150m square, surmounted by a dome that is 50m in diameter, giving the hall a total height of 70m. This demispherical dome has been designed with a freestanding geometric metal framework, filled with geometric motifs. The centre of the prayer hall will be filled with a forest of 36 Calla Pillars that will reach a height of 45m [38].

The mosque complex (in the north wing) is separated from the other buildings (in the south wing) by a huge plaza lined with more Calla Pillars. In addition to the underground car park positioned below the plaza, the complex's other buildings will include a cinema and shopping centre. The Islamic Art and History museum, a large multimedia library, a convention centre, a school for Quran studies, and student and staff accommodation are also planned for the south wing. The top of the minaret will be equipped with a viewing platform for visitors.

Figure 4. View of The future Great Mosque of Algiers
(Source: www.kuk.de)

The mosque's facades will take two forms: *riwaqs* will be dominated by narrow, tall bays, while the opacity of the prayer hall facade is emphasized by slightly oblique foils. Mashrabiya screens and geometric decoration will adorn the surfaces of other buildings in the complex and the minaret (figure 4).

Figure 5. Plan of The future Great Mosque of Algiers
(Source: www.kuk.de)

A Comparison of the Architectural Syntax

In this section, the study of the architectural syntax proposed concerns the two case studies (Djama' al-A'dam and the future Great Mosque of Algiers). It is achieved by the use of the three headings given above, namely: i) the abstract representation of facades; ii) the fundamental elements of syntactic operations at the planimetric level [39], and iii) the materials or substances used in the architectural object.

Djama' al-A'dam

We begin with the abstract representation processes that are applied to the two main facades (north-west and south-east) of the Djama' al-A'dam. In addition to the opacity of the *qiblah* wall, they are seen in a pattern of total control (figure 6), and in the position and proportions of ornamental elements that are applied to all the facade surface (figures 6 and 7) [40]. These ornamental elements are defined by almost complete closure, horizontality and symmetry; they are seen in the dome of the central nave of the north-western facade (figure 6a), and also in the full opening and repetition of arches and columns seen in the south-east facade (figure 7a). This highlights a striking syntactic contradiction that is explained by the colonial intervention. Furthermore, the perception of height (provided by the arcades) slightly exceeds that of depth (provided by the building's envelope) (see figure 8).

Figure 6. The north-western facade of Djama' al-A'dam (Source: Chergui, 1998).

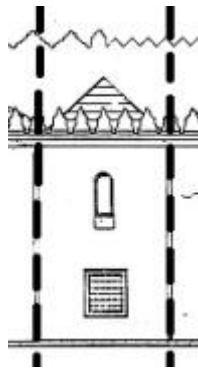**Figure 8. View of the added gallery during the colonial period. (Source: authors).**

Secondly, the syntactic operations seen in the plan of Djama' al-A'dam, (leaving aside any later additions) obey a simple and basic formula, which takes the form of a fundamental syntax of derivation [41]. This means that the generic form (the square) has not seen any changes to its shape. On the contrary, not only has it maintained its initial shape, it has integrated a spatial division leading to the addition of a prayer hall, courtyard and riwaqs (figure 9).

Figure 6a. Repetitive arches of the north-western facade of Djama' al-A'dam (Source: authors).

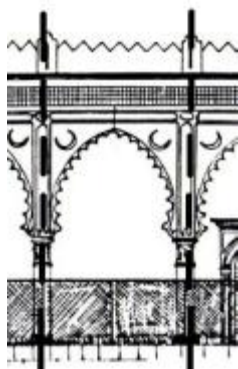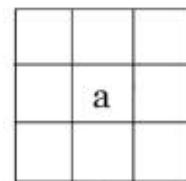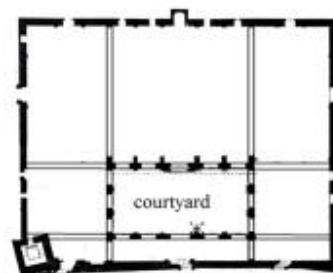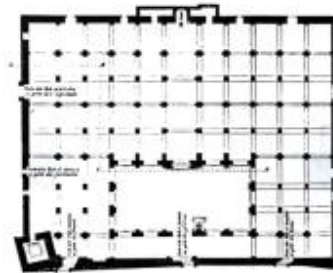**Figure 7. The south-east facade of Djama' al-A'dam (Source: Chergui, 1998).**

Figure 7a. Repetitive arches of the south-east facade of Djama' al-A'dam. (Source: authors).

Figure 9. Spatial sketches of the space syntax of Djama' al-A'dam. (Source: Authors)

Thirdly, the materials used in the mosque architecture refer to the stylistic attributes of Islamic architecture, specifically elements used during the Almoravid period. These include: pointed and polylobed pointed arches; various column arrangements (square section, cruciform or supporting); entrances with marble mouldings and Thuluth calligraphy; wooden doors carved with geometric motifs; facades crowned with red tiles; the use of several types of columns (octagonal, twisted, smooth, Corinthian capitals with round, octagonal or square bases); decorative panels, and both geometric and floral ceramic tiles (figures 10 and 11).

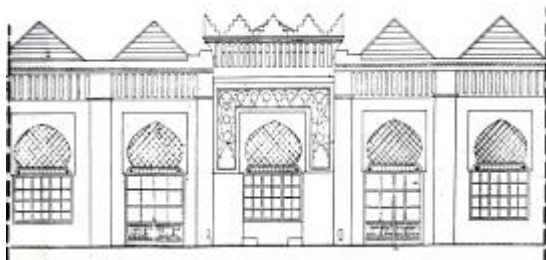**Figure 10. Decorative elements of the north-western facade of Djama' al-A'dam (Source: authors).**

Figure 11. Facade giving on the courtyard of Djama' al-A'dam. (Source: Chergui, 1998)

The Future Great Mosque of Algiers

In the second case study, the future Great Mosque of Algiers, abstract representation processes reveal the superposition of codified architectural facades. While the facade of the main entrance is opaque and unitary, the rear facade attains a height that far exceeds (through its size, width and lightness) its depth. This linguistic superposition is seen in the foils and sculptures that are applied to the main facade, then by the exterior wall that is completely covered in carvings, located at the end of the rear facade (figure 12). In turn, the lateral facades follow a full and empty rhythm, with repetitive proportional modules and vertical monumental openings that refer to modern architectural principles (see figure 13). As for the fifth facade, the roof of the prayer hall has a
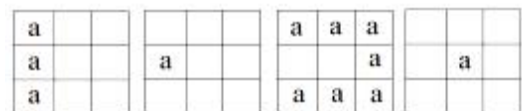
rhythmic geometric line that is applied to domes, the hall's columns, small windows and *riwaqs*.

Figure 12. General view of the future great mosque of Algiers. (Source: www.kuk.de)

Figure 13. Section of lateral facades. (Source: www.kuk.de)

Figure 14. Spatial sketches of the space syntax of the future great mosque of Algiers. (Source: Authors)

Next, we look at the syntactic operations derived from the Great Mosque's plan, which result from a dissociation between its spatial elements (figure 14). Specifically, this is seen in the spatial separation between the prayer hall, the main courtyard, riwaqs and finally the minaret. Although the overall syntactic pattern is consistent with a derivation operation based on simple juxtaposition [42], it also reveals, at a lower level, a fundamental pattern of addition, at the scale of each entity. The consistency and harmony of the whole materialises in geometric lines that are applied to the overall complex, and which unite its cover, envelope and the treatment at ground level.

Finally, the materials used in the mosque architecture reveal the re-use of the stylistic attributes that are typical of Islamic architecture. This re-use integrates high-tech solutions that result from a symbolic desire and technical and monumental requirements. They include: the geometric line as a compositional and decorative element, the dome, the Mashrabiya screens, marble columns, sculpted surfaces and tracery (figures 15 and 16).

Figure 15. View of lateral interior facades. (Source: www.kuk.de)

Figure 16. View of the dome. (Source: www.kuk.de)

Discussion

The comparison of the architectural characteristics of the two case studies shows certain similarities, which are re-used in the future Great Mosque of Algiers. The reinterpretation is novel, and goes beyond direct and 'object-to-object'-type references [43][44].
Based on the quoted methodological approach, which is developed on the basis of the architectural syntax, we identify the following characteristics:

- Both exterior (opening on street) and interior facades (opening on interior courtyard) benefit from stylistic attributes: arcs, columns and ceramics in the case study of Djama' al-A'dam.

And Mashrabiya screens and columns in the case study of the future mosque of Algiers. Added to the treatment of all the surface of the facades, the two mosques obey to a certain rhythm and modularity in their composition. These characteristics (treatment, rhythm and modularity) generate confusion between bottom/figure, which is identified by the abstract figurative process.

- The two case studies (Djama' al-A'dam and the future mosque of Algiers) have ornamental elements that cover the entire surface of the building's envelope, with the use of architectural elements and stylistic attributes drawn from Islamic art.

- In the two case studies, (Djama' al-A'dam and the future mosque of Algiers) there is respect of the typology of the prayer hall, which takes the form of a square topped with a dome, and includes a forest of columns, *riwaqs* and a minaret. At Djama' al-A'dam the pattern of the space syntax is one of addition, while for the future Great Mosque it will be one of simple juxtaposition. This latter ensues from the decomposition and separation of main composition elements in the traditional mosque (prayer room, courtyard, forest of columns, galleries, minaret and annexed spaces). This separation has allowed the integration of new functions and spaces, as well as their hierarchy and linearity. This characteristic corresponds perfectly to the monumentality and the scale of the mosque.

- The minarets of the two mosques, which, despite their difference in size follow the same typology (i.e. the square section form that is widespread in North Africa and Muslim North Africa). The monumentality and height of the minaret of the future mosque of Algiers allow the integration of several spaces (panoramic restaurant, museum and sky lobbies).

- The used materials (substances) are inventive and creative in the case of the future mosque of Algiers. This creativeness is seen through the column shape, the double envelope dome, the minaret decoration and the Mashrabiya. reinterpretation and the materials used (marble, glass and metal).

Conclusion

This study offered a brief glimpse into the history of the early architectural influences on the mosques of the old medina in Algiers. Of these, Djama' al-A'dam is the most important, built by the Amloravids in the eleventh century.

Djama' al-A'dam is the first tangible reference for mosque design in the Algerian context. Its influence is apparent in the design of the future Great Mosque of Algiers, which will be the world's third largest mosque.

Despite great differences in the scale and scope of the two case studies, there are certain similarities that exist and emerge following a study of their architectural syntax. These similarities concern the typology of the prayer hall and the minaret, the unity of the positioning of ornamental elements seen on facades, and the use of arcades and colonnades.

The reference to the first mosque of Algiers is not direct and didn't apply 'object-to-object' type reference. In contrary, it (the reference) corresponds to an abstract way of interpretation, which stimulates creativeness and inventiveness in forms, dimensions, functions and used materials.

The comparison of the two case studies makes it possible to discern an architectural syntax that is more expressive than figurative, which does not concern the architectural object as such, but that seeks novelty and inventiveness together with an excellent command of the technological and construction challenges.

The expressive way of this architectural syntax is deduced from the application of our approach. In this way (expressive way), first: the treatment of facades corresponds to both modern design and Arab-Muslim stylistic attributes. Second: the comparative study of the space syntax shows the development from simple sketch of derivation to the juxtaposition of four interpretative sketches of derivation. This interpretation corresponds to the dissociation of the main spaces and to changes in the position of the principal space (named (a)), which results from reorganisation of the derived spaces. Moreover, the used materials correspond to the contemporary needs and exigencies.

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