The Proportional Relations Systems of Islamic Architecture

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Abstract- The problem of the current research has been represented by the lack of studies on the foundations of forming the proportional relations in the Islamic architecture. The objective of the study was defined in an attempt to reveal the concepts and the items of the system of proportional relations in the Islamic architecture. The proportion in architecture either derived from the mathematical matrix or other disciplines are always concerned on the spatial system through measurement and form's relations. The obtained conclusions show the authenticity of the system of proportional relations in the Islamic architecture which was based on two factors, the aesthetic sense related to the symbolic aesthetic systems and the acquired knowledge related to the mathematical geometrical systems of Muslims. Hence, the Islamic architecture compositions are correlated even though the functional types and the architectural styles of its architectural models are differentiated by a unified view of the constructs underlying the proportional relations system.

Index Terms- proportional relations, the aesthetic sense, the acquired knowledge, architectural styles.

I. Introduction

Proportional relations system is considered to be among the basic rules of form or the internal system of the form, as it indicates the nature of the tangible relations that is resulted from the correlation of the parts and the wholes of the form components. It is based on items that are regarded as the fundamental characteristics or rules of the form where the basic attributes of the architectural typify[1] are embodied.

Plato has considered the proportional relation as being a symphonic construct contingent to a dynamic symmetry and associated with a rhythm in time and space. This view was originated from the Pythagoras notion on musical harmony. The Greek have given the name Analogia to proportionality i.e. symmetry. Vitruvius has expressed proportionality within the concept of Symmetry, yet it implied the meaning of proportionality. Symmetry, in this place, lies in the reciprocal relationship among different elements, i.e. the parts, then between these parts and the whole (Ghyka: introduction).

Gedal has defined the science of amount or what is referred to as, at present, the Science of Proportion as being the body of knowledge that concerns about studying the spatial system through measurement and form's relations. Before considering it as a Pure Theoretical science, the science of amount represented the body of applied knowledge which had proven being more useful in the architectural design for many ancient civilizations like those of Mesopotamia, Egypt and India. Geometric principles have become familiar for Islamic schools in the middle ages through the book of Euclid, translated by Alhajjaj Bin Yousif Bin Matar in 790 A.D. (Gedal: 20).

II. The Noble Proportions

The Muslims believed that Allah, the Almighty has no partner and no counterpart, Allah is One in reality and all other livings are two at a time composed and created. He is the one in reality and responsible for the composition and creation of all living things. All creations are perfected and the proportion are more than the image beyond composition. In everyday items also to cussed on symmetry and proportion for example a house, the symmetrical design of each elements of the compositions also show the proportion. Generally speaking, everything made of something of a contradictory nature, conflicting forces or different shapes, the most perfect of which is the one whose parts' composition and organs' structure are at the best proportion. The noble proportions as determined by Ikhwan Alsafa are as follows: the equivalent, the equivalent and the half, the equivalent and the third, the equivalent and the quarter and the equivalent and the eighth Table: 1 (Ikhwan Alsafa: 222-255).

Table 1: Noble Proportions at Ikhwan Alsafa.

The Proportion Increase	The Proportion Decrease
1:1	1:1
1:1.5	1:0.66
1:1.33	1:0.75
1:1.25	1:0.80
1:1.125	1:0.90

Alarmwe restricts the proportions of numbers to each other and infers their dimensions while using the proportions from the proportions and the ranks of their amounts in terms of consistency, inconsistency as well as the names given to them. He states that there is a proportion between every two numbers by the way of quantity and this proportion is confined to twelve

[1] The typify concept is meant to identify a set of architectural works that have the same architectural characteristics, such that are perceived to belong to the same group (Mitchell: 83:95).

segments if the greatest is proportioned to the smallest, which is either equation proportion, the equivalent and the part proportion or the equivalent and the parts or the double, the double and the part, the double and the parts or the equivalent, the equivalent and the part, the equivalent and the parts or the doubles, the doubles and the part or the doubles and the parts Table: 2 (Alrijab: 37).

Table 2: Noble Proportions at Alarmwe.

The Proportion Increase	The Proportion Decrease
1:1	1:1
1:2	1:0.5
1:1.5	1:0.66
1:1.33	1:0.75
1:1.25	1:0.80

(Alrijab: 37).

Alarmwe confirms that the most noble proportions is the double, then the three to the two which are the first ranks of the equivalent and the part which I have known as being the whole and half of the whole. Next, the equivalent and the third proportion, then the quarter and what follows on the order according to this scale. What could be found of dimensions on the equivalent proportion is concurrent and what is found on the equivalent and the part proportion or the double, the double and the part or the third equivalents, the third equivalents and the part or the doubles, the doubles and the part are considered as concurrent dimensions Table: 3 & 4 (Alrijab: 51:54).

Table 3: Noble Proportions of Dimensions that are Consistent at Alarmwe.

The Proportion Increase	The Proportion Decrease	The Proportion
1:1	1:1	1:1
1:1.33	1:0.75	3:4
1:1.66	1:0.6	2:3
1:2	1:0.5	1:2
1:2.3	1:0.42	4:9
1:2.6	1:0.37	3:8
1:3	1:0.33	1:3

(Alrijab: 51).

Table 4: Noble Proportions of Dimensions that are Consistent at Alarmwe.

The Proportion Increase	The Proportion Decrease
1:1	1:1
1:2	1:0.5
1:1.5	1:0.66
1:1.66	1:0.60
1:1.6	1:0.625
1:1.62	1:0.615
1:1.615	1:0.619

(Alrijab: 54).

Alarmwe suggests that the first proportion that should be considered is the two to one proportion which is the double. This dimension is the most noble concurrent, consistent and intermingled dimensions if the soul wasn't in a state of mental confusion that necessitates a perception pause in delivering someone's saying that the two is the double of the one which is similar to the state of mental confusion when it is said that this number is the equivalent of five sixth, its similar to the number (611). The soul is before a mental confusion followed by spiritual pain to the lack for perception speed for perfection which has no actual occurrence in that situation. Further, the soul is also-through the sense of hearing- might be in a sense of imperfection in that situation, such that finds it not good to be heard for the above mentioned reason although the cause in that isn't reasoned Table: 5 (Alrijab: 37).

Table 5 : Mattresses and Percentage of Number at Alarmwe.

The Proportion
1:1
4:3
5:3
6:3
7:3
8:3
9:3
10:3
11:3
12:3
13:3
14:3

(Alrijab: 38).

III. Types of Proportional Relations in Architecture

Ching maintains that proportions are three types (Ching: 285:286) as follow:

3.1. Arithmetic proportion like (3:2:1) , (1,2,3) c/c= c-b/b-a
3.2. Geometric proportion like (4:2:1) , (1,2,4) c/b= c-b/b-a
3.3. Harmonic proportion like (6:3:2) , (2,3,6) c/a= c-b/a-b

IV. Systems of Proportional Relations in Architecture

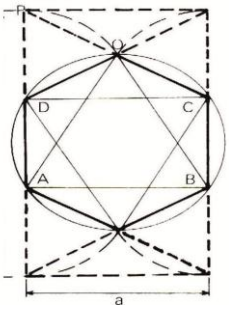
The studies that dealt with proportionality in architecture presented a number of systems that control proportional relations in architecture (Langhein: 3) as follows:

4.1. Triangulation

Triangulation system is obtained by drawing two circles with a constant curve where each circle intersects the center of the other one. Through this simple process, Langhein & Al-Said confirm that the building, like the Islamic architecture, during the middle centuries has three important results as follows: a right angle, an equilateral triangle and a (3:1) ratio. If one continues drawing curve-shaped circles, he would only need to reiterate that five times to form a hexagon, which can be made square like

the triangle and the regular square to completely pave a surface Figure: 1 (Langhein: 7).

Figure 1: Systems of Proportional Relations in Architecture: Triangulation.



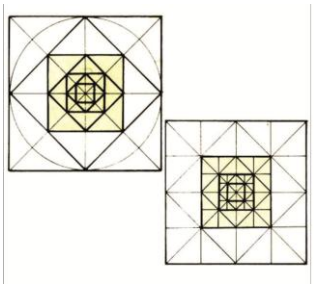
(El-Said:51).

4.2. Quadratue

Langhein suggests that quadratue might be the most commonly used and flexible proportional systems as it allows multi groups of integers in the horizontal and vertical lines. Diagonal organizing lines could be also made in quadratue system. Quadratue proportions usually give an impression of calmness, welfare and full satisfaction of life.

Quadrartue proportions have prevailed in the ruins of the Romans, in the civilizations of the middle ages up to the Gothic age as well as in the Indian, the Buddhist and the Islamic civilizations Figure: 2 (Langhein: 6:8).

Figure 2: Systems of Proportional Relations in Architecture: Quadratue.

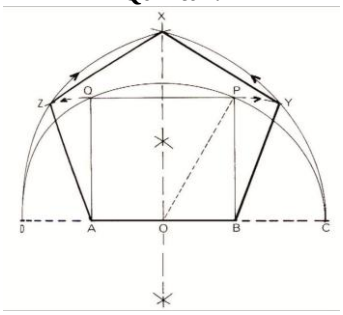


(El-Said: 9).

4.3. Quinture

The dimension of the quinture or the pentagon system is based on the quinqueliteral and the pentagonal shape which is the proportion of the Golden Mean and ambiguity. This shape used to be the greatest secrets of Pythagoreans which he used to call Luca Pacioli the Divine Proportion. There are mathematical and physical riddles, secrets of cultural traditions surrounding the quinture, the quinqueliteral, the pentagonal and the pentagonal star Figure: 3 (Langhein: 8).

Figure 3: Systems of Proportional Relations in Architecture: Quintur.



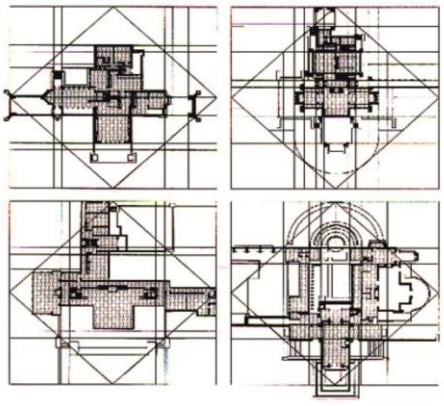
(El-Said: 83).

V. The Main Organizing Lines - Lineaments

Achieving the notions of typify and unity is done through the processes of designing. Perhaps, the most important among these processes is working out the main lines or as Alberti called them "Lineamenta". This includes the creation of a matrix of lines with a space of three dimensions aiming at emptying the total shape of the building and the relations of the constituting elements with each other, such that the linaments identify walls' thickness and locations or the like, the size of the constructional holes-the space between the elements bearing the weight. Thus, they draw up the required number, the dimensions and the relations among each other and away from others, i.e. drawing up the proportional relations (Crowe: 170).

Lineaments are rarely connected parts, and reading them isn't a solution for the puzzle since we are all set with an unconscious ability to distinguish and identify them. The most common lineaments which are related to the main constructs-the whole- of the building are the main diagonal connecting points and the constructional diameters, besides the main lengths of the construct where the eye connects any elements that are placed along those lines by the whole Figure: 4 (Langhein: 7).

Figure 4: The Main Organizing Lines - Lineaments.



(Crowe: 171).

5.1. The System of Dimensions: The Standard Module

The digital system, upon which the proportional relations system is based, rests on the concept of standard module or the "Datum Dimension" as Vitruvius called it however, Abdulrahman, in his study entitled: "Design Module and

Proportions in Architecture", prefers to use the term "Design Module". Though evident differences are noticed in this term, all the studies agree that the standard module, upon which the majority of proportional relations are based, is a dimension whereby different parts of the building-or any other work of art- are reiterated. In other words, it is a module of constant dimensions which itself or its multiples reiterate whether by an increase or a decrease as a foundation for any construct in order to -eventually- achieve the total consistency of the emerging group whether it was functional or aesthetic (Tansey: 11) (Abdulrahman: 75).

5.2. The System of Relations: The Reciprocal Relation

The system of relations, upon which the system of proportional relations is based, rest on the concept of the reciprocal relation between the whole and the part. P.H. Scholfeild confirms that the domination over most of the systems used in establishing the architectural proportionality, is the attempt to create an evident system through the system of relations between the part and the whole which depends on the principles of frequency, symmetry, balance, gradation for similar forms and shapes compatible with generating the orders of mathematical proportional relations among the linear dimensions of the design (Steadman: 222).

El-Said suggests that the process of using the basic geometrical forms is achieved by certain proportional relations, confirming that they aim at forming varied types based on unified proportional foundations, as those proportional relations are founded on a system of relations between the part and the whole through the principles of frequency, symmetry, balance, and gradation (El-Said: 115:127).

VI. Hypotheses Formation

6.1. Hypotheses Related to the System of Dimensions

6.1.1. Proportional relations in the Islamic architecture are based on the system of favorite dimensions which is founded on the system of the noble proportions systems.

6.1.2. Proportional relations unify through the system of favorite dimensions among the part, the parts and the whole levels throughout different shapes and measurements of the Islamic Architectural composition, regardless the classifications of functional type and architectural style of the construct.

6.2. Hypotheses Related to the System of Relations

6.2.1. Proportional relations in Islamic architecture rest on the system of favorite relations which is based on frequency, symmetry, balance, and gradation.

6.2.2. Proportional relations are combined through the system of favorite relations among the part, the parts and the whole levels of various forms and measurements of the architectural Islamic composition, regardless the classifications of the functional type and the architectural style of the construct.

VII. Applied Study

The major items upon which the system of proportional relations rests have been identified in order to be measured and specified. They are represented by the system of dimensions and favorite relations achieved at the part, the parts and the whole levels. These items occupy a special position for the fundamental role they play in the construct of proportional relations and the possibility of recognizing the nature of those relations through them. Besides, these items represent the formal aspect of the architectural construct, such that could be measured on the Islamic architectural models (Al Ali: 125).

17 Islamic architectural samples were chosen for study and analysis, taking into consideration their different ages and regions to prove that a certain system for proportional relations had been used in such architect as a part of the Islamic culture (Al Ali: 121:125).

The final selection of the samples was done within the following: Table: 6, Figures: 6,7&8.

7.1. The chosen architectural models represented the three levels the part, the parts and the whole to study the proportional relations. So, there has been integration in the relation among the levels, regardless of the measurement incorporated in the reflection of proportional relations of the part into the whole and vice versa.

7.2. The chosen architectural models are not subjected to certain conditional determinants of time and place since the formal stylistic diversity in various places and times is combined by a unified formal type.

7.3. Focus is going to be on the public Islamic buildings such as mosques, schools and shrines which are considered as being typical ones arose in the Islamic culture or for the special nature they acquired during the Islamic period that didn't appear in later periods. Ancient none-Islamic buildings like the Roman's and the Christian's, for instance, weren't used to meet Islamic functions, unless certain modifications are made on churches and other religious temples to be converted into mosques like the mosques of Damascus and Jerusalem. Yet, that modification was rare and the image of the building after modification was completely different from the original Romanian or the Hinlistic structure (Schacht & Bosworth: 375).

7.4. The architectural models were chosen from the golden periods of the Islamic architecture not in its early or late periods, because earlier periods were characterized by focusing on establishing the Islamic thought in the society more than building the architectural aspects. Thus, most of the buildings were simple and reduced to their primary basic elements as in the construction of the prophetic mosque. As to the late historical periods, local effects related to symbolic origins of the ancient local culture of pre-Islamic periods are evident.

7.5. The chosen architectural models are not subjected to physical qualitative, non-quantitative determinants or what is referred to as the type of construct, such as the horizontal projection of the whole the mass including the courtyard: square, rectangle, circle, octagon…, types of spatial compilation: central,

longitudinal, radial…, the types of an axis-symmetric, two axis-symmetric outlines…, the existence or non-existence of the courtyard…, as the type of construct is the parameter of form-function relation that resulted in types characterized by flexibility in the Islamic architecture and imparted unity and divvy without losing its suitability for the purposes behind its foundation[2].

The considerations behind choosing the architectural models have turned to be in harmony with studying and analyzing as much as possible of the remaining Islamic architectural models taking into account their different ages and regions to prove that a certain system for proportional relations was used in the Islamic architecture as being a part of the Islamic culture.

VIII. Results Discussion

8.1. Discussing the Results of the Geometrical Analysis of the Architectural Models Geometrically

8.1.1. Discussing the Results of Analyzing the System of Dimensions of the Lineaments

The results attained through analyzing the system of dimensions of the main lines organizing the architectural models geometrically Table: 7 show that, although the projects of the architectural constructs vary in shapes, volumes and the level of their study; they are combined through the system of dimensions of the main lines organizing them. It is also found that this system isn't confined to a certain proportional system or a certain proportion, as we noted that the same model has several proportional systems just as the other architectural models have, in the chosen architectural models in general. Those systems were organized into seventeen grades relative to the increase and the decrease shown in Table: 7 and whose compatibility could be noted with what has been presented about ratio and proportionality amongst Muslims and which shows that the most important proportion for them is equality, then the other proportions that follow. By increasing the maximum variations, which are: multiple, the equal plus a part, the equal plus parts, multiple, multiple plus a part, multiple plus parts…. Or by decreasing the minimum variations, which are: the half, the third, the quarter, the fifth, the sixth, the seventh…. These proportions turned to express the nature of the proportional relation whether in a successive -connected- or non-successive –disconnected- proportionality by one increasing or decreasing relation. Therefore; the proportional relation derived from the equality relation -the equal- would be either a -halving, tripling… relation or a multiplication, equalization.. relation, the most of which starts out -at the construct of Islamic architecture- from the relation of the diameter with its chords and perimeter and the relation of the square side with its diameter Figure: 5.

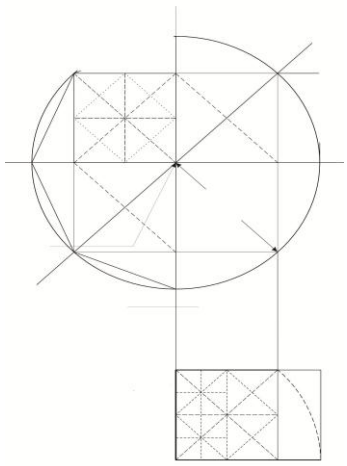
[2]Islamic buildings are characterized by flexibility in terms of the traditionalism of their architecture and the change of their functions and forms. If we moved from Samarqand to Andalusia, we'll find that an idea found in one building could be found in other places and finds its way to it. Yet, it isn't meant to assimilate the function only, but to be in harmony with the idea of place as well, where the extremely flexible basic type exists, such that the same form is wide enough for different functions (Almaliki:148).

Table 7: The Proportion Increase and Decrease for the Relations System of Lineaments of the Architectural Models.

The Proportion Increase	The Proportion Decrease
1:1	1:1
1:1.25	1:0.9
1:1.4	1:0.87
1:2	1:0.83
1:1.25	1:0.8
1:1.33	1:0.75
1:1.5	1:0.66
1:1.66	1:0.6
1:2	1:0.5
1:2.3	1:0.42
1:2.6	1:0.37
1:3	1:0.33
1:3.3	1:0.3
1:3.6	1:0.27
1:4	1:0.25
1:4.3	1:0.23
1:4.6	1:0.21

(Source: The Researcher).

Figure 5: Formative Basis of Proportional Relationships in Islamic Architecture.



(Source: The Researcher).

8.1.2. Discussing the Analysis of the Relations System of Lineaments

The results attained from analyzing the relations system of the lineaments for building the architectural models geometrically Table: 7 shows that, although the projects of the architectural constructs vary in shapes, volumes and the levels of study, the system of relations of the main lines gives them a formal unity.

Obviously, that system includes common characteristics regarding its basic attributes constituting the architectural construct order Repetition, Symmetry, Balance, and Gradation in terms of their type and nature for various architectural models, the most of which starts out -at the construct of Islamic

architecture- from the relation of the diameter with its chords and perimeter and the relation of the square side with its diameter. We find that the formal structure of the Islamic architectural construct includes the following:

1. Frequency of certain formal modules in a straight linear sequence where the frequency of these formal modules is inclusive, so it is the same for all the parts of the construct.
2. Constant symmetry for constant symmetrical formal modules. Symmetry might be dynamic based on the type of the rotational symmetry by separating the circular shape of the dominant foundation. Or the construct might be of a two-axis-symmetry or one-axis symmetry for all the parts of the construct.
3. Constant balance for formal modules leads to achieving centralization. The balance might be dynamic as a result of the relation between the constant-shaped square and the dynamic shape of the circle. Still, both cases include the type of formal balance for all the parts of the construct.
4. Gradation from what is considered secondary to what is considered principal towards the center; the construct is based on formal proliferated modules aligned in gradation towards the center which is regarded as the general foundation for all the parts of the construct.

8.2. Discussing the Results of the Geometrical Analysis of the Architectural Models Statistically by Applying Minitab 11, Stimulant 3.08

8.2.1. Discussing the Unilateral Analysis of Variables

Through the results attained on the statistical description of the unilateral analysis of variables, the following is evident:
Islamic architectural constructs have approximate proportionalities made clear by the large convergence of the arithmetic means of those proportions which are within the noble proportions that unify at all levels and for all the architectural models that have been classified in accordance with functional types, architectural styles, geographical locations as well as through the major lines aligning the architectural models which indicates the fact of form invariability in the Islamic architectural constructs along with function variance at the levels boundaries of the whole, the most significant parts and even at the level of the part. The unity of the proportional relations system that leads the designing process in Islamic architecture is a general attribute for all the architectural models with all its functional types, architectural styles and levels. The variance in volumes and different dimensional variables of those models neither affect the determination of the proportional relation system used, nor making it different.

8.2.2. Discussing the Results of Analyzing the Close Relation among Variables

A unilateral analysis of variables paves the way for the statistical study that examines analyzing and studying the close relation among variables. Correlation coefficient was deduced through finding out the correlation matrix that clarifies the relations of all variables –the lineaments- among each other as follows:

1. The correlation matrix of the architectural models, in order to be classified over their geographical locations, is in direct relation with each other. The correlation ranges between middle and close correlation in general and sometimes are strongly correlated.
2. The correlation matrix of the architectural models classified per functional types shows that all the types are in direct relation with each other and show an extremely close correlation among mosques, schools and shrines, whereas schools and shrines were in a middle value correlation.
3. The correlation matrix of the architectural models classified per architectural styles shows that all the styles are in direct relation with each other and each style is correlated with the remaining ones ranges between middle and very close in certain cases and extremely strong in general.
4. The aforementioned shows that the Islamic architecture constructs are correlated with each other through their geometrical building and mainly through proportional relations among them.

8.2.3. Discussing the Results of Analyzing the Nature of the Relation among Variables

Obviously, the lineaments system of the Islamic architecture constructs that is related to the length, the width and the radius of the construct, represents the most important variables at the part, the parts and the whole levels where they show their closest relations with other variables through equations, such that indicating inclusiveness and integration of the designing process and confirming, as well, that the designing process begins from the whole followed by a gradation of the part towards the whole and vice versa. Altogether, the equations attained had considerably participated in the process of anticipating the lost parts of any artistic or architectural constructs in case there is no sign indicating its form when an attempt is made to recognizing and documenting them.

8.2.4. Discussing the Results of Analyzing Variables Frequency

The aforementioned as a whole is oriented in the statistical study that examines the analysis of proportions frequency of the variables where the proportions of the proportional relations - the lineaments - for all variables. The results attained show the following:

1. A considerable convergence was found in the most frequent proportions of the chosen architectural models at all levels. Proportions are represented as follows: (1:0.2, 1:0.3, 1:0.4, 1:0.5, 1:0.6, 1:0.7, 1:0.8, 1:1).
2. Matching was found in the most frequent proportions for the chosen architectural models classified per functional types at all levels. Proportions are represented as follows: (1:0.5, 1:0.6, 1:0.7, 1:0.8, 1:1).
3. A considerable convergence was found in the most frequent proportions of the chosen architectural models classified per architectural styles at all levels. Proportions are represented as follows: (1:0.5, 1:0.6, 1:0.7, 1:0.8, 1:1, 1:0.2, 1:0.3).
4. A considerable convergence was found in the most frequent proportions of the chosen architectural models classified per geographical locations at all levels.

Proportions are represented as follows: (1:0.6, 1:0.7, 1:0.8, 1:1, 1:0.2, 1:0.3, 1:0.5).

5. Matching was found in the most frequent proportions for the lineaments related to the radius of the construct, the width and the length. Proportions are represented as follows: (1:0.5, 1:0.6, 1:0.7), (1:0.7, 1:0.5, 1:0.6), as for those related to the height, they were as follows: (1:0.3, 1:0.4, 1:0.5). The frequency of the most frequent proportions of the lineaments related to the constructs height and width has corresponded with the remaining variables and height. Proportions are represented as follows: (1:0.5, 1:1) for the remaining variables. The following proportions are related to the height (1:0.2, 1:0.3, 1:1).

It is obvious from the aforementioned issues, although the architectural models and their functional types, architectural styles and geographical locations are variant; they are unified through the system of proportional relations, i.e. through using certain and specified proportional systems. The unification of variant types and styles is asserted by reiterating the same proportions and how it is reflected on the part, the parts, the whole levels of the constructs of architectural models, particularly those related to the lineaments related to the length, width and radius of the constructs which are considered as the most important variables upon which the lineaments are based and where most frequent proportions are related and matched with the proportions by which they are aligned at different levels. This might confirm the existence of the conceptual foundation that directs those proportional relations by adopting and reiterating those proportions only, represented by the noble proportions in particular.

IX. Conclusions

The conclusions show that there is a mutual relation among the levels of the architectural work the part, the parts and the whole in different forms and measurements of Islamic architecture constructs, such as making the system of proportional relations unified and characterized by inclusiveness and integration through the following:

9.1. Proportional relations in Islamic architecture lean on the system of favorite dimensions which is characterized by the unity of its system variables proportions that imparted unity on the architectural constructs through the alignment of variables that determine the dimensions system in certain proportions extremely convergent in all the architectural models represented by the noble proportions.

9.2. The proportional relations in the Islamic architecture that depends on the favorite relations is based on the following:

9.2.1. Repetition: Characterized by following a standard module reiterated by the multiplications and the parts of the standard module of the same construct. A capacity for expansion is available by multiplying the volumes which, in turn, results in the continuity of construct structure as a whole by multiplying itself with a different measurement -inclusive repetition- in a straight linear shape, such that constituting a net of reiterated modules that are -combined with the same reproducing module without being combined in size and measurement- around a given center of the construct, such that distinguishing the Islamic constructs with the potentiality of addition or reduction.

9.2.2. Symmetry: Characterized by adopting regular pure geometrical shapes for the entire construct around a point -a central position- or around axis with constructional relations per constant system of dimensions.

9.2.3. Balance: Characterized by adopting the formal and imparts the visual balance to the construct amongst the dynamic shapes like the circle and the stable ones like the square per constant system of dimensions.

9.2.4. Gradation: Characterized by adopting the progression idea from what is considered secondary towards what is regarded a principal whether as a result of orienting towards what is being principal for its strategic subscription or for its extraordinary measurement through the gradation of relations among the part, the parts and the whole, such as confirming the elaborate integration in those relations in Islamic architecture constructs.

All of it introduces a cultural species for the Islamic architecture that is characterized by a unified system for the dimensions that include the noble proportions, a unified system for the relations which has the characteristic of constructional flexibility through frequency, high centralization plus preserving balance and evident symmetry.

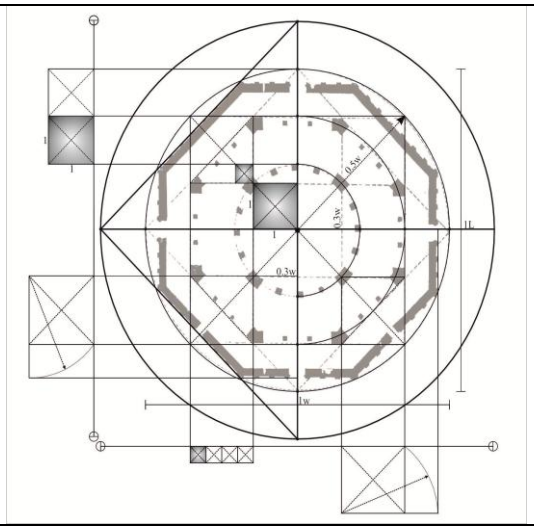
After all, it is obvious that the analytical and the applicable findings of the study support the validity of the research hypotheses which have been checked out by finding out the evidence - conclusions - and whose validity have been verified through scientific and practical interpretation of the research problem.

Table 6: Islamic Architectural Models Elected According to Geographical Location, Functional Type, and Style.

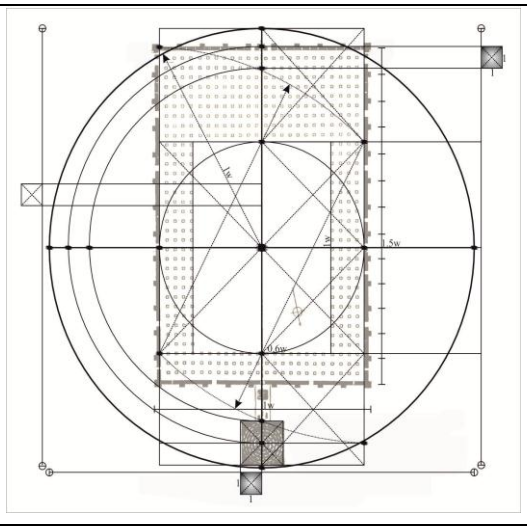
Functional Type	Architectural Model	Geographical Location	Year of Achievement	Style
Mosques	Dome Of The Rock Mosque	Jerusalem	685/86-692	Umayyad
	Al-Mutawakkil Mosque	Samarra	848/49-852	Abbsid
	Ibn-Tulun Mosque	Cairo	876/77-879	Abbsid
	Great Mosque	Qayrawan	838-1016/62	Abbsid
	Al-Hakim Mosque	Cairo	990/91-1002/13	Fatimids
	Baybars Mosque	Cairo	1267-1269	Ayyubids
	Bibi Khanum Mosque	Samarkand	1399-1404	Persia
	Ulu Cami Mosque	Bursa	1396/1400	Ottoman
	Uc Serefeli Cami Mosque	Edirne	1438/47	Ottoman
	I-Shah Mosque	Mashhad	1638	Safavid
Schools	Al-Mustansiriya School	Baghdad	1233	Abbsid
	Sultan Hassan School	Cairo	1356-1359	Manluks
	Muradiye School	Bursa	1414	Ottoman
Shrines	Qubbat Al-Salaybiyah Shrine	Samarra	826	Abbsid
	Mashhad Sharif Shrine	Cairo	934	Fatimids
	Nur Al-Din Shrine	Damascus	1172	Ayyubids
	Yesil Turbe Shrine	Bursa	1413-1424	Ottoman

(Source: The Researcher).

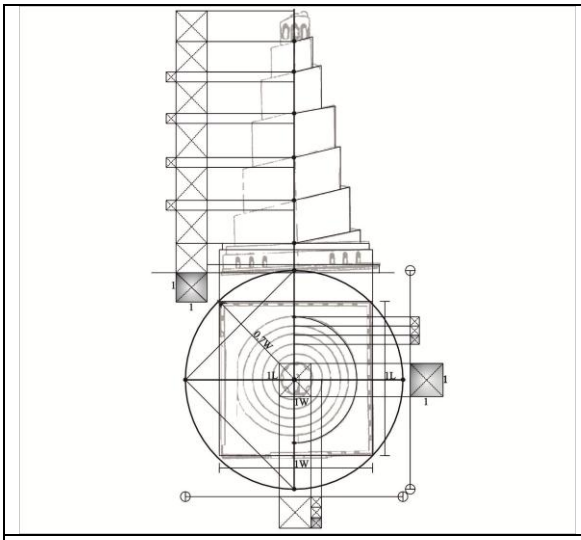
Figure 6: The Geometrical Analysis of the Architectural Models Geometrically.



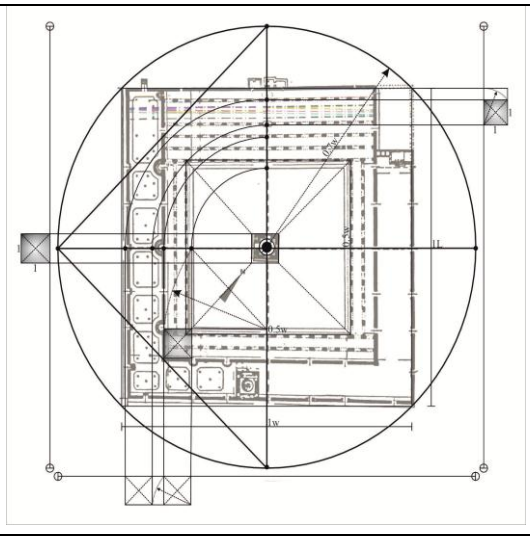
1. Dome Of The Rock Mosque



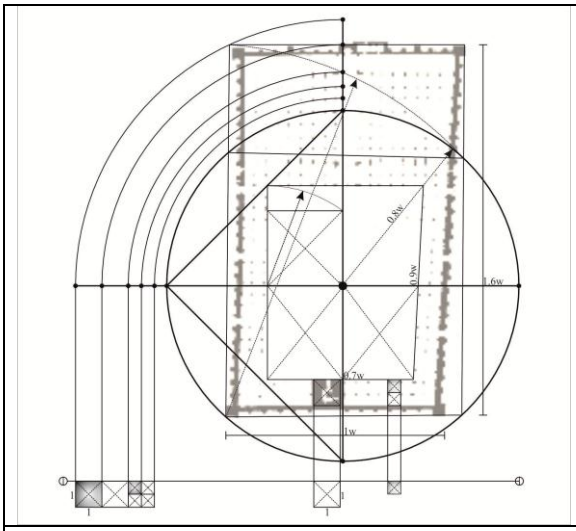
2. Al-Mutawakkil Mosque



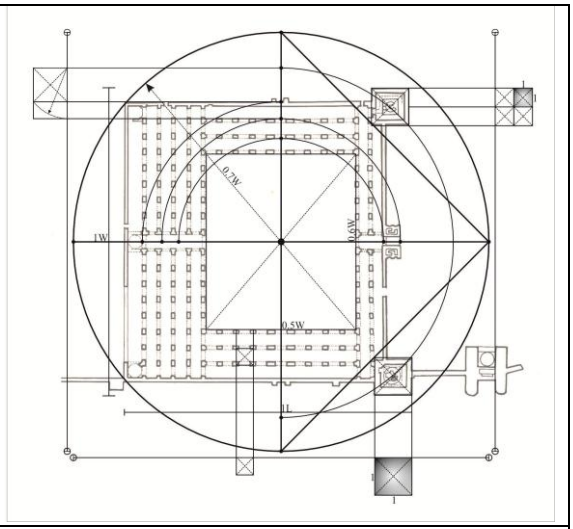
Al-Mutawakkil Mosque



3. Ibn-Tulun Mosque



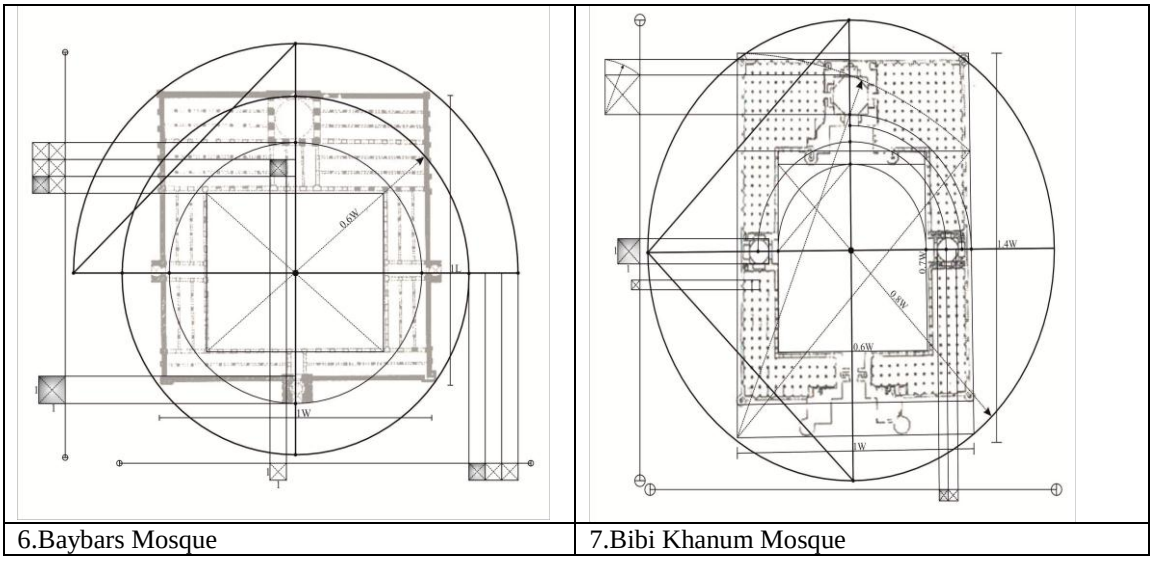
4. Great Mosque



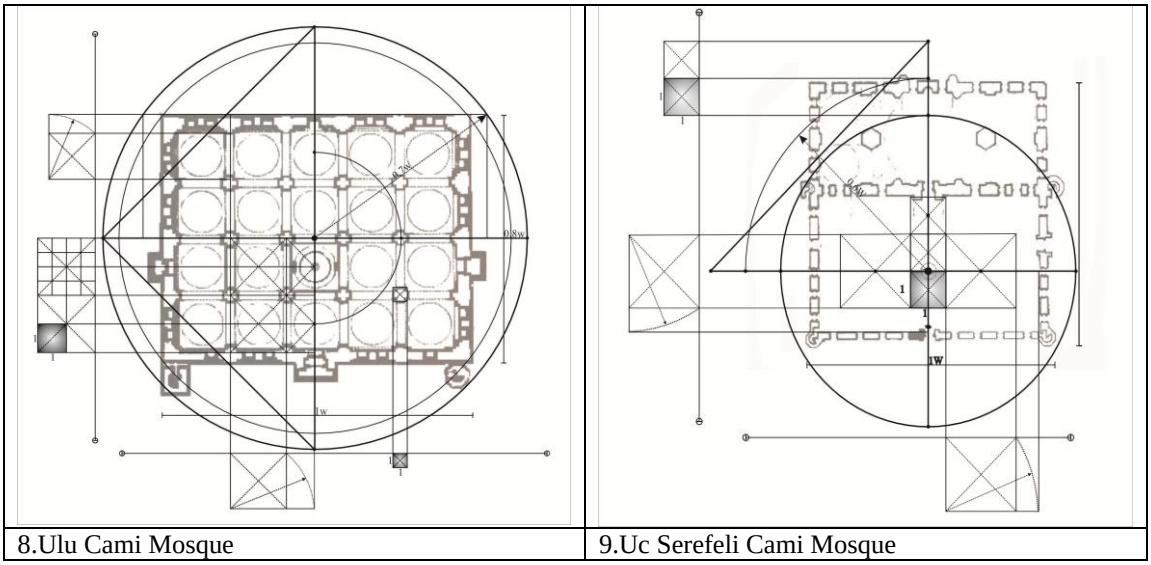
5. Al-Hakim Mosque

(Source: The Researcher).

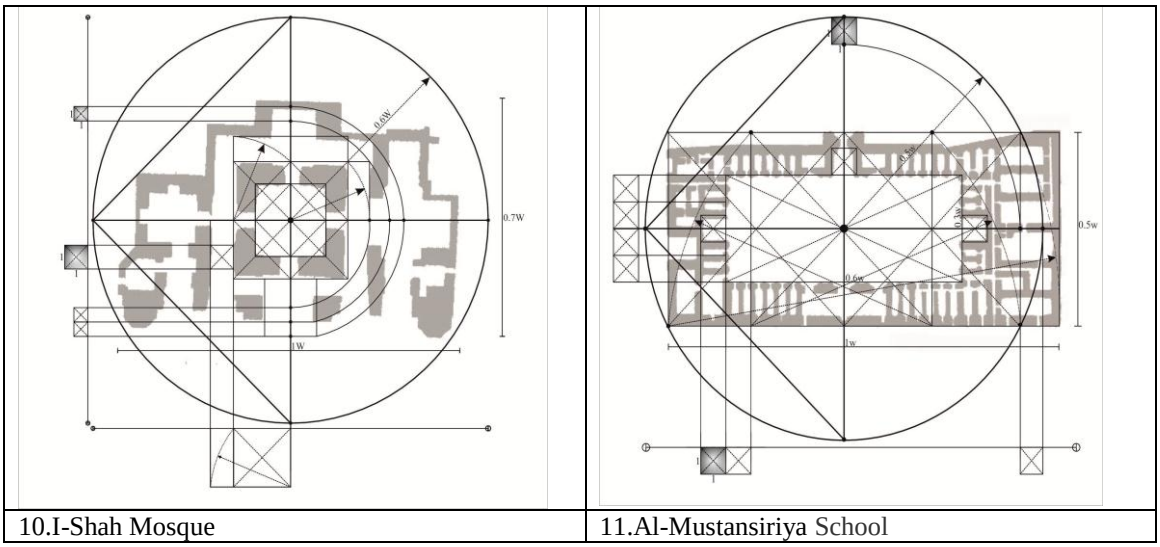
Figure 7: The Geometrical Analysis of the Architectural Models Geometrically.



6.Baybars Mosque | 7.Bibi Khanum Mosque



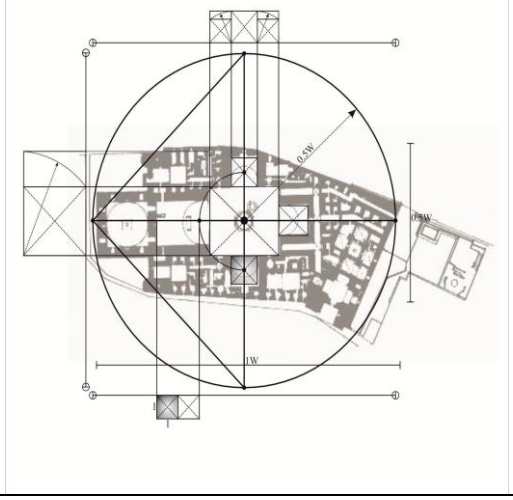
8.Ulu Cami Mosque | 9.Uc Serefeli Cami Mosque



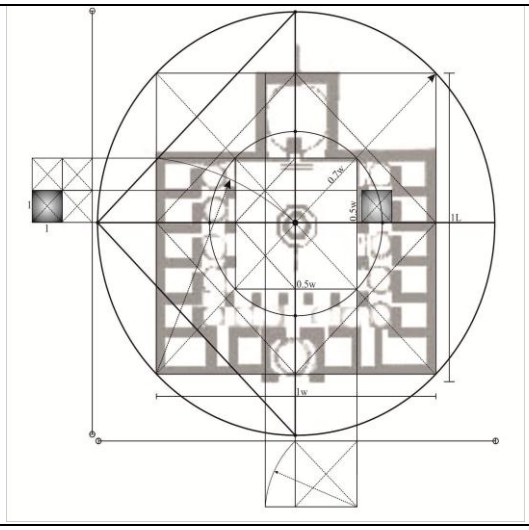
10.I-Shah Mosque | 11.Al-Mustansiriya School

(Source: The Researcher).

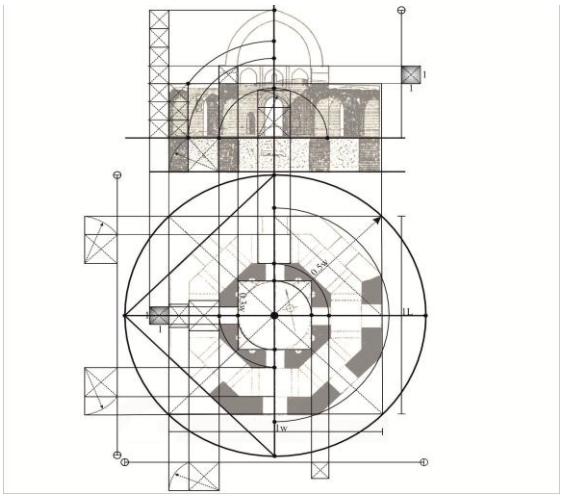
Figure 8: The Geometrical Analysis of the Architectural Models Geometrically.



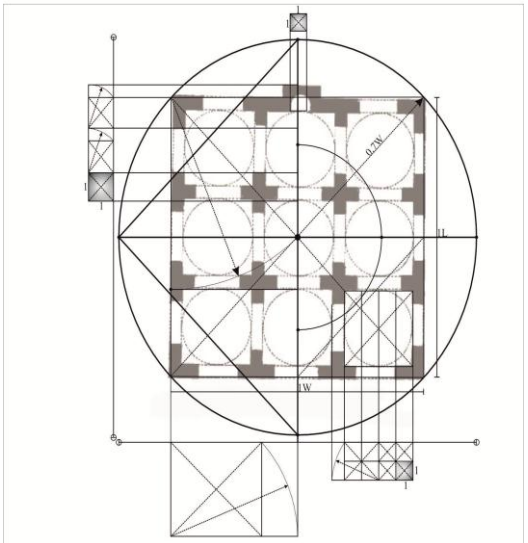
12.Sultan Hassan School



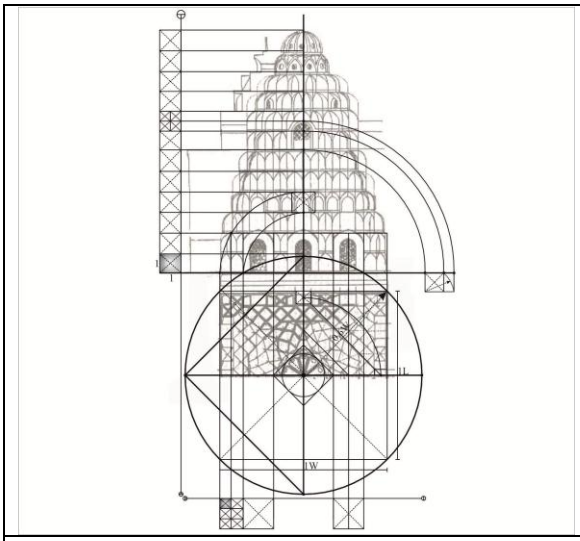
13.Muradiye School



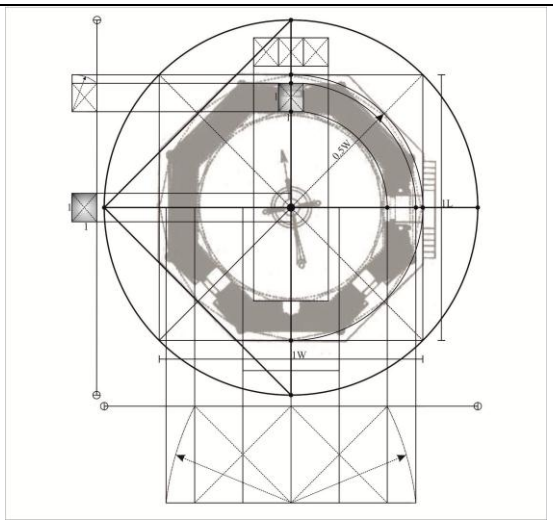
14.Qubbat Al-Salaybiyah Shrine



15.Mashhad Sharif Shrine



16.Nur Al-Din Shrine



17.Yesil Turbe Shrine

(Source: The Researcher).

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