THE SOCIAL LOGIC OF THE MOSQUE:  
a study in building typology

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Abstract
In order to use the idea of building type comprehensively as a method in the design process (Colquhoun, 1967) the socio-spatial knowledge of the architectural artefact has to be retrieved (Hillier and Hanson, 1984; Markus, 1993). Each building type is a unique socio-spatial configuration that requires different methods to unpack its relationships. This paper aims at analysing the socio-spatial organisation of the congregation mosque, the chosen type for this study, to contribute to the knowledge of its building type. Based on space syntax concept of ‘interface’, the study’s objective is to define the ‘genotypes’ of this particular building type. The analysis answers the following questions: What is the nature of the interface, which the mosque’s socio-spatial organisation reveals? Moreover, what is the impact of cultural diversity on the similarity or difference of the genotypical patterns? To investigate the nature of the interface and the building genotypes, the study explores 12 case studies of various formal typologies of mosques (Frishman, 1994; Ardalan, 1980) selected from cities representing the Islamic world’s cultural diversity and historical continuity. The methods used in the analysis unpack the socio-spatial relationships by breaking the building into its lines of movement, convex spaces, boundaries and points of visibility. The results show a tendency towards a greater similarity among the diverse cases in exhibiting a relatively unified pattern of visual and structural spatial integration.

Introduction
It is widely regarded that it is possible to use building type as a tool to generate a conceptual design. The question then is what constitutes a comprehensive understanding of building typology? Moreover, how does this understanding come about? Moneo defined type in his article On Typology (1978), by linking the question of typology with the nature of architectural work itself. He stated that type:

‘can most simply be defined as a concept which describes a group of objects characterized by the same formal structure. It is neither a spatial diagram nor the average of a serial list. It is fundamentally based on the possibility of grouping objects by certain inherent structural similarities’ (Moneo 1978, p. 23).
What seems to generate various classifications is the disagreement on what constitute the ‘structural similarities’. Of these variations, formal and functional classifications (Pevsner, 1976) are the most dominant in architectural conventions. Rossi (1982), Krier (1979) and Argan (1963) proved this classifying approach to be limited. They, however, consider typology as an analytical tool for the creative process for architecture and urban form.

In recent arguments to expand the knowledge of typology, Markus (1993) raises the multi-dimensional domain of the social relations that underlies our experience described by labels of type. He suggests a ‘typology based on relations, not only of people but between them and knowledge and things.’ (Markus, 1993)

The discussion today of what constitutes the knowledge of the mosque and what makes it what it is for the society, is divided between two extremes. On one side, we have the formal approach taken by Serageldin and Steele (1996), the typology based on cultural formal diversity by Frishman (1994) and the spiritual formalism by Ardalan (1980, 1983). On the other, we have those who call for a return to the Quran and to the Prophet’s tradition for a comprehensive understanding of the mosque as an institution (Rasdi 1995). Both formal and religious interpretative approaches seem to be weakened by their separation and singularity. This paper, however, seeks to bridge these two sides and offer a complementary approach to the knowledge of the mosque type.

The sample for this study consists of 12 historical congregation mosques selected from diverse geographical regions of the Muslim world. These cases represent a particular prominence characterised by historical continuity and cultural diversity. The study assumes that these diverse ‘living traditions’ demonstrate little deviation from their original intent, and that this continuity is in itself an evidence of the society’s continual investment in space. The cases also represent the formal and regional building typology as classified by Frishman (1994) and Ardalan (1980; 1983). The mosques are referred to in the analysis by their abbreviations as follows: Damascus DAM, Sanaa SAN, Cairo CAI, Tunis TUN, Fez FEZ, Djenne DJN, Istanbul IST, Isfahan ISF, Bukhara BUK, Shahjahanabad (Old Delhi) SHJ, Xian XIN and Malacca MAL. (Figure 1)

Based on space syntax concept of ‘interface’, the study's objective is to define the spatial syntactic properties of this particular building type based largely on the method shown in Hillier et al (1987) and Hanson (1998). It attempts to answer the following questions: what is the nature of the interface, which the mosque’s socio-spatial organisation reveals? And what is the impact of cultural diversity on the similarity or difference of the genotypical patterns?

The paper is divided into two parts. The first part is concerned with introducing the congregation mosque as a building type representing an institution of the Muslim society. The second part analyses the building spatially within its boundaries setting.

**Concepts Concerning the Mosque Type**

The congregation mosque, or masjid al-jami in Arabic, is an important institution for the Muslim community. It is not only a place of worship, but also a communal place. This double purpose space found its genesis in the Prophet’s house constructed in Madinah. The construction with its courtyard became the prototype of the mosque in which submission and remembrance of God were realised and a new knowledge was transmitted to an emergent society. The mosque continues to hold the same double purpose in many parts of the world.
Elements of the Structure

Architectural elements

The architecture of the mosque is composed of several elements developed over time and became the symbol of the religious building. There is, however, no sacred significance to any of these elements. The mosque, in Arabic masjid which means a place of prostration, is not defined by any architectural elements but by its orientation to the Kabah in Makkah, hygienic conditions, a kind of partition to contain the imam's or prayer leader's space and enough space for the worshippers to stand in rows and prostrate on a flat surface.

Architectural elements such as gates, courtyards, water fountains, mihrab (niche), minbar (pulpit) and the minaret are all nonessential elements in the constitution of the concept of the mosque. The minaret, as an example, is not part of the worshippers' ritual sequence but rather part of the symbolic call of prayer, which was used for reaching out to a larger catchments area.

Categories of space

To analyse the mosque, it is necessary to break it into spatial categories, which are found in almost all of the mosques selected for this analysis. The presence of the same space categories (Figure 2) in such a diversity of cases in this sample is an evidence of their significance in the social organisation of this institution.

Figure 1: Images of the 12 mosques from representative cultural regions of the Muslim world
The spaces concerned with the rituals or lying on the ritual route need to be identified. Based on a general architectural analysis, seven spatial categories emerged as essential in this building type. The exterior of the building is considered as a spatial category. This spatial type is referred to in the analysis as ‘E’. The following is a description of the spatial categories considered for this analysis.

The first of these spatial categories is the gate. Usually, there are several gates for one mosque, opening onto the neighboring streets. This allows for maximum accessibility. The sample includes various

Figure 2:
Plans of the 12 mosques with space categories indications
cases, ranging from 3 gates to 36 gates, including street and interior gates. It is possible to try to divide the gate category into two types: the street gates that connect the building to the outside world and the deep gates, which link the courtyard to the prayer area. These two gate types within the category seem to be present in most cases of this sample. This spatial type is referred to in the analysis as ‘G’.

The second category is the transition space. Two types appear in the sample: the transitional foyer, leading to either the court or the prayer area, and the transitional arcade around the courtyard. The arcade type usually forms a ring around the courtyard, but not in all the cases. It is a space that can be used for prayer but is not essentially built for this purpose. This is referred to in the analysis as ‘T’.

The third category is the courtyard, which is found in almost all cases. Apart from its architectural function, it acts as a provisional spatial extension for the prayer area during the overflow at times of Friday prayers and congregations. Other elements may appear in the courtyard, like water fountains, trees and pavilions. This is referred to in the analysis as ‘C’.

The fourth category of spaces classifies the facilities provided in the mosque for ablution and hygienic purposes, such as water fountains and lavatories. In many courtyards, a water fountain appears. It is used for ablution and for cooling of the courtyard. Not all the mosques have it nor do they necessarily have lavatories attached to the mosque. The ritual’s intention of performing ablution at home prior to coming to the mosque, might contribute to their absence in the mosque. In some cases, the lavatories or public baths are in close proximity to the mosque and are integrated in the urban context of the neighbourhood. It is therefore a matter of availability to have them attached to the mosque. This facility’s presence and absence, as well as its integration into the overall movement sequence, is part of this spatial pattern’s analysis. This is referred to in the analysis as ‘W’.

The fifth category is the prayer area with rows and central bay. This is the main space of the mosque where the ritual performance takes place. Based on the ritual’s intention, the presence in the prayer area during the ritual dictates a prior personal and ritual purification. The primary purpose, respected by all, for being in this space is the remembrance of God either in a communal act or individually. The first row of the prayer area confers greater merit than other rows. This category is referred to in the analysis as ‘P’.

The sixth category refers to a group of objects found always in the proximity of one another forming the imam’s praying space. This space includes the mihrab, from which the imam leads the prayer facing the Qibla; and the minbar, from which the imam gives the sermon prior to Friday’s noon prayer. Architecturally, the prayer area seems to suggest another dimension of place, based on the centrality of the mihrab on the Qibla wall, which indicates the direction to the Kabah, and the associated imam space including the minbar. This place is sometimes celebrated by a dome directly above and by expressing this centrality throughout the entire bay of the prayer area. This is coupled with the ritual’s intention, which confers greater merit when praying right behind the imam in the first row. This spatial category is referred to in the analysis as ‘M’.

The seventh category of spaces classifies the various uses found in the sample under the labelled functions. Examples of these functions include minarets, libraries, treasuries, kitchens, storage spaces, bedrooms and other functions. None of these spaces contributes directly to the ritual performance. Their presence, however, may
suggest a degree of which the mosque contributes to social practices other than the rituals. This category is referred to in the analysis as ‘F’.

The congregation mosque is the ultimate mosque type as it is an embodiment of all possible spatial and social relations. There are other mosque types such as the neighbourhood smaller size mosque, the larger prayer space for Eid celebration and other temporary or permanent smaller prayer spaces for smaller groups of people found at public or domestic places.

**Islamic laws and rules**

The mosque is an embodiment of spatial and temporal Islamic laws that came directly from the Quran and the Sunna of the Prophet of Islam. Spatially, the primary laws are the mosque’s orientation to the Kabah and the arrangement of the worshippers in parallel rows behind the imam facing the Qibla wall. Temporally, the ritual five performances are carried out in specific times of the day following the sun movement. These changeless spatial and temporal laws are unvaried throughout the Islamic world regardless of the cultural and traditional variations.

The rules or codes of practice, however, are subject to various interpretations of the Islamic schools of thought and the consensus of the Muslim scholars. Such rules may have evolved into various traditions influenced by the regional cultures. The core traditions, however, remain that of the Quran and Sunna.

**Rituals and social activities**

The mosque spatial patterns are based on the ritual’s temporal and spatial activities. The five-time prayers are spread throughout the day from sunrise to sundown and into the evening. Despite their number of occurrences, the prayer does not take long to perform. Unlike other prayers, Friday’s noon prayer is preceded by a sermon. During the rituals performance, the space is characterised by a strong diachronic property structured in time by the ritual’s rules. When the ritual ends the temporal and spatial properties become synchronic. The entire mosque space transforms into a generator of social activities through random encounter (Aazam, 2005). Examples of such activities may include a communal reading of the Quran, social meetings, learning and listening to lectures and other rituals and traditional events such as initial marriage ceremony and breaking the fast in Ramadan.

This account of sacred-profane intervals has a profound effect upon the idea of the social role of the mosque in addition to its religious role. It is important to note that both the sacred rituals and the profane social activities take place within the same spaces. It is for this reason that the spatial categories defined above are not fixed to one ritual use but open to other social uses differentiated by time. The permeability sequential pattern from the mosque exterior to its interior spaces, in all the cases presented here, can take the following order but not exclusive to it: exterior (E), gates (G), transition (T), courtyard (C), water (W), prayer area (P), imam area (M) and other functions (F).

**Nature of the ‘Interface’**

The concept of ‘interface’ between inhabitants and visitors refers to the spatial analysis work of Hillier and Hanson (1984), Hillier (1996) and Hanson (1998). The nature of the ‘interface’ as it happens within the boundaries of the mosque, however, requires further exploration as it is not a direct application of the inhabitants/visitors relationships.

There are few possible inhabitants in the mosque, the imam and the caretakers or custodians of the mosque. It is also possible to consider particular types of visitors as ‘inhabitants’. These visitors may become
‘inhabitants’ by staying all night during particular worshipping days, or by changing their behaviour due to a familiarity of the space, or by becoming volunteers for helping with social activities sponsored by the mosque. These types of inhabitants have no control over visitors’ movement in the mosque. It can be said then that the mosque is an institution characterised by the absence of people’s control for God’s authority to have the sole presence. All visitors and would-be inhabitants become inner-directed by the codes of conduct established by the Islamic traditions rather than by a particular group of people.

It follows that in the absence of people’s power and control, people’s submission to the One God is the essence of the ‘inhabitation’ of the mosque. It can be said that the mosque is a ‘House of God’, as often described in the Quran, and its prime ‘Inhabitant’ is God’s eminent presence.

**Analysis**

The cases selected for the space syntax analysis cover the following formal building types: a) the hypostyle with dome accent and courtyard type, represented by the mosques of Damascus, Sanaa, Cairo, Tunis, Fez and Djenne; b) the central dome type, represented by the Fatih Mosque of Istanbul; c) the hypostyle with domical vaulting and an extensive courtyard type, represented by the mosques of Isfahan, Bukhara and Shahjahanabad; and d) the detached pavilion within a walled garden enclosure type, represented by the mosques of Xian and Malacca.

This selection is balanced between the mosques of Arabic origin DAM, SAN, CAI, TUN, FEZ, and to some extend DJN which is African; and the mosques of various cultures, such as Turkish IST, Persian ISF, Central Asian BUK and Indian SHJ, representing regions surrounding the Arab world and reflect a distinct character of the cultures that came to a close contact with the Arab. Mosques, a step further away from the Arabic influence into East and South Asia, are represented by the Chinese XIN and the Malay MAL. The investigation uses JASS (Bergsten, 2003), Depthmap (Turner, 2000) and Mindwalk (Figueiredo, 2002) software for the spatial analysis.

**Lines of Movement and Lines of Worshipping**

Two types of lines are present in the mosque, the line of movement and the line formed by the individuals for the performance of the prayer. Since worshippers have to stand behind the imam facing the Kabah, they from a line parallel to the Qibla wall and form rows. This basic requirement shapes the mosque open space into an extended Qibla wall and relatively shorter sides. Structural requirements turn the open space into a field of columns. Movement is expected at any angle between columns. This setting, theoretically, creates as close to a perfect grid as a building can be. The axial analysis of the 12 cases shows where movement is expected along an almost perfect grid (Figure 3). Axial lines pass between the columns in ways perpendicular and parallel to the Qibla wall. To have an initial basic resolution, possible diagonal lines of movement are not included in this study.

The analysis reveals that, although the grid is near-perfect in most the cases, there are some strong differentiation in the integration values. This indicates other effects on the axial lines, such as the direct connectivity to axial lines passing through the courtyard, transition spaces and gates. The integrated lines of the system seem to be, in some cases, as integrated in the prayer spaces as they are in the courtyard and transition spaces. This shows that, where differentiation in the integration values occur, the worshipping spaces, which are
expected for seclusion and occupation, can be for high movement. The prayer spaces alternate between occupation and movement regulated by time of formal rituals and their intervals. Individuals who chose to perform the rituals at the interval times may have to negotiate their individual worshipping space of occupation to avoid lines of movement. In the sample, SHJ, unlike the rest of the cases, shows no integrating lines passing through its prayer spaces while lines passing through the courtyard are highly integrated.

Spaces of Co-presence and Spaces of Divine Presence

The final destination for the visitor of the mosque is a personal space on the floor of the mosque, seated barefooted on a carpet. This humble occupation of a personal space is always negotiated with others’ occupational spaces. It is during the formal ritual performance
that this individual space is bonded with the others creating the communal spatial structure of the ritual. During the intervals, the spaces of occupations return back to their individual usage creating a mix of purposes ranging from movement to occupation.

When breaking up the convex spaces of the mosque, the spatial analysis needs to address the nature of interface between the visitor and the divine presence and between the visitor and other visitors. In the convex analysis of the 12 cases (Figure 4), the principal guidance for breaking up the spaces is to take the prayer space rows parallel to the Qibla wall as the governing space. Spaces between columns and two rows are also considered in the break up as they form spaces of occupation for things like copies of the Quran.

The analysis shows that not all the prayer spaces are in seclusion as expected in a religious building. The cases vary in exhibiting the degree of convex integration in the system. The first prayer row along with imam area are less integrated in most cases, yet in some cases this row seems to have a higher integration as in IST and ISF.

It follows that when the prayer spaces are not structured by the formal ritual performance, social activities are expected in spaces of higher integration at the middle section of the mosque and near the courtyard. Individual worshippers, performing during intervals, need to negotiate more for their personal space of occupation in the higher integrated spaces than they need in the less integrated spaces.

Figure 4:
Convex analysis of the 12 mosques shows the break up of the spaces based on the convex space of the prayer space rows parallel to that of the Qibla wall
Visual Points and Prostration Points

The main characteristic of the mosque’s space is its high visibility. Visitors expect to have a high visual command upon entering the mosque in order to find their way to their chosen personal space of prostration. Obstacles like other worshippers, racks or small partitions may cut the lines of movement on the ground, but high visual integration at any point is an indication of the command given to the individuals to find an empty space for occupation.

The visibility graph analysis (Figure 5) shows high integration in the courtyard in most of the cases. When the prayer spaces are examined, less visual integration is found in some of the cases but the majority have the tendency towards more visual integration. Cases like DJN, IST, ISF, BUK, SHJ and to some extent SAN, show pockets of less visual integration suggesting potential places for seclusion. In contrast,
FEZ, CAI, TUN, DAM, XIN and MAL seem to exhibit high visibility throughout the prayer spaces.

**Spatial Boundaries Analysis**

To analyse the spatial boundaries of the mosque's continuous interior, some interpretation of social intent in space is required. The spaces, other than the peripheral functions, cannot be labelled for any particular use since various rituals and social activities occupy them. Therefore, the spatial boundaries have been interpreted from the dominant rituals use as well as the architectural form of the spaces, which suggest labels like prayer row, imam area, transition, courtyard and water fountain. These labels are the same as the space categories identified above.

**Figure 6:**
The Justified graph analysis using JASS shows the plans of the 12 cases and the J-Graphs of the space categories taken from the exterior space.
Upon examining the justified graphs of the 12 cases (Figure 6), they appear similar in shape with a noticeable number of gates G for each building and a high depth for the imam M spaces. The extreme high and low number of prayer spaces P in some cases is also noticeable. Another look at the basic graph data (Table 1) reveals a mean depth of 8 with a standard deviation of 2, suggesting a general agreement in the sample on the depth level. The space-link ratio also shows a mean of 1.42 with a standard deviation of 0.12 suggesting relatively similar degree of ‘ringness’ across the sample.

It appears that there is a great tendency among the cases to agree on the courtyard C as the most integrated space in the sample, with a mean of 1.94 and a standard deviation of 0.99; and M as the least integrated, with a mean of 0.76 and a standard deviation of 0.16 (Table 2a). Such findings are consistent with the mosque purpose as a worshipping place. On one hand, M is at the least integrated space and therefore less possible movement is expected, which is a property appropriate for its seclusion. On the other hand, C is at the most integrated space, which is appropriate for being spatially the hub of the system and therefore of a particular significance for social activities.

When comparing the integration values of the sample spaces with the exterior accounted for (Table 2a) with the integration values without the exterior (Table 2b), the results show a considerable decrease of the mean for G and T, a relative difference for C, and less difference for P and M. This suggests the dependence of G, T and C on the exterior for their high integration while less dependence is found for P and M.

<table>
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<tr>
<th>Cases</th>
<th>No. of Cells</th>
<th>Depth</th>
<th>No. of Links</th>
<th>Space-Link Ratio*</th>
<th>No. of Rings</th>
<th>Spaces</th>
<th>(T) &amp; (G) Transition</th>
<th>t:s Ratio**</th>
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<td>6</td>
<td>62</td>
<td>1.37</td>
<td>10</td>
<td>32</td>
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<tr>
<td>2 SAN</td>
<td>56</td>
<td>6</td>
<td>78</td>
<td>1.41</td>
<td>4</td>
<td>44</td>
<td>12</td>
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<td>140</td>
<td>1.41</td>
<td>7</td>
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<td>31</td>
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<td>62</td>
<td>1.50</td>
<td>6</td>
<td>14</td>
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</tr>
<tr>
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<td>5</td>
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<td>33</td>
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<td>65</td>
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<td>91</td>
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<td>6</td>
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| Min | 32 | 5 | 46 | 1.19 | 3 | 13 | 11 | 0.17 |
| Mean | 68 | 8 | 94 | 1.42 | 7 | 43 | 25 | 0.79 |
| Max | 131 | 11 | 163 | 1.66 | 10 | 96 | 55 | 2.00 |

SD: 33 2 42 0.12 3 27 13 0.57

*Space-link ratio is the number of links plus one, divided by the number of spaces. The complex with a value above 1 shows the degree of ‘ringness’.

**Transition to spaces ratio

Table 1: Basic justified graph data for the 12 cases of the sample

Table 2a: Integration of spatial categories (With Exterior)

<table>
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<th>Cases</th>
<th>E</th>
<th>G</th>
<th>T</th>
<th>C</th>
<th>W</th>
<th>P</th>
<th>M</th>
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<td>0.97</td>
<td>1.03</td>
<td>0.76</td>
<td>0.57</td>
<td>0.42</td>
<td>0.73</td>
</tr>
<tr>
<td>Mean</td>
<td>1.29</td>
<td>1.27</td>
<td>1.35</td>
<td>1.94</td>
<td>1.16</td>
<td>1.11</td>
<td>0.76</td>
<td>0.97</td>
</tr>
<tr>
<td>Max</td>
<td>1.86</td>
<td>1.46</td>
<td>1.87</td>
<td>3.94</td>
<td>1.94</td>
<td>1.68</td>
<td>1.04</td>
<td>1.51</td>
</tr>
<tr>
<td>SD</td>
<td>0.35</td>
<td>0.18</td>
<td>0.24</td>
<td>0.99</td>
<td>0.42</td>
<td>0.28</td>
<td>0.16</td>
<td>0.24</td>
</tr>
</tbody>
</table>

(E) Exterior, (G) Gate, (T) Transition, (C) Courtyard, (W) Water, (P) Prayer Area, (M) Imam Area, (F) Function

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A particular consistency of the rank order of integration values starts to appear in the sample once rearranged according to the spatial categories (Table 3). The similar genotypical patterns of the mosque’s spaces, ignoring E, W and F, are expressed in the following strings: C>T>G>P>M in DAM, IST, ISF, SHJ, TUN, and XIN; C>G>T>P>M in FEZ and CAI. Individual genotypical patterns can be found in the following strings: C>P>T>G>M in SAN, C>T>P>G>M in BUK, T>G>C>P>M in DJN, and T>G>P>M in MAL.

The sample in the graphs (Figure 7a), shows where the integration difference is high between maximum and minimum values of the case as in BUK and SHJ and to some extent SAN. It is clear from (Figure 7b) that this high difference is due to the high integration values for C.

**Syntactic Space Types and The Spatial Categories**

Space types of a, b, c, d as classified by Hillier (1996, p. 319) are examined in the sample. Their relationships with and spatial categories G, T, C, W, P, M and F is analysed. The overall characteristics of this relationship in the sample reflect the prevalent nature of the mosque socio-spatial organisation. The degree of the presence of these space types is indicative of the nature of the mosque prevalent in the sample. On one hand, space type ‘a’ is mainly for occupation since only one link can be found to it; and ‘d’ space generates movement and choice since it is connected to several rings. While ‘a’ is a controlled space, ‘d’ is less controlling. On the other hand, ‘b’ is a space that negotiates between occupation and movement and it is a controlling space since trips have to pass through it; and ‘c’ is a space that has two links but it is also on a ring with some control.

Consider type Pd spaces count, 116 spaces, as one of the highest after Fa, 136 spaces, and Gb, 100 spaces (Figure 8a and 8b). Such results are indicative of the emphasis of the sample on ‘d’ spaces, as
the least controlling of space types; and the fact that F spaces are ‘a’ type space, appropriate for occupation of people and things.

Figure 7:
- a. Max, min and mean integration values for the sample; 
- b. Graph shows the integration of the spatial categories for each case

Figure 8:
- a. Space types numbers in each spatial; 
- b. Space types numbers in each case
Spatial category G is overwhelmingly high, 100 spaces. One would expect that 12 cases would result in a rather smaller number than this. The majority of G spaces are of ‘b’ type. Unexpectedly, however, there are 36 G spaces of ‘c’ type, which mainly connect rings within the boundaries of the mosque. Here, the connection is mostly between the prayer hall and the outside space, through either a courtyard or an open space defined by the mosque's boundaries such as a platform with stairs, as in TUN and SHJ, or a fence, as in XIN and MAL.

Prayer spaces P are not easily classified into ‘c’ or ‘d’ type spaces. The analysis is needed to uncover the relationship between the prayer rows. At the first instance, the entire mosque with its planted columns in an open space seems to suggest an entire spatial relationship based on ‘c’ and ‘d’ type spaces. There are, however, multiple possibilities of moving around the columns in several rings. The analysis also shows P spaces linked serially in a ‘b’ type spaces.

Prayer space P is an interesting case, which tells us about the essence of the mosque. Consider the following results: Pa 3 spaces, Pb 87 spaces, Pc 64 spaces and Pd with the highest number of 116 spaces. It is expected that in such a religious building Pa and Pb would have the highest number since spaces for occupation and control are characteristics of such religious purpose, yet the results show otherwise. This can be interpreted in such a way as to say that with regard to P, people had invested more in a less controlled and for movement spaces then they did in occupational and controlled space types. This tendency confirms the people's intention in creating worshipping spaces that encourage movement, encounter and co-presence which render the spaces ready for, not just what is expected of it in terms of reproduction of the ritual practices, but also in terms of the production of the social practices.

The closer to the Mihrab, where the imam occupies space M, the more secluded the praying space P is. The case here is not unified in the sample. The sample reveals that some of the first rows are connected to outside gates and therefore rendered shallow as far as the exterior is concerned. It also makes that first row loses its depth and segregation.

All 20 cases of M found in the sample are in fact type ‘a’ space. This is an obvious case of adherence to the law. The imam has to have the mihrab enclosed in such a way as to form an occupational space of an ‘a’ type.

**Tacit Knowledge Made Explicit**

To discuss what constitutes the knowledge of the mosque type, it is proposed in this paper that tacit ‘structural similarities’ are to be found and made explicit for a more coherent understanding is to be formed. Although, such tacit knowledge in the architectural practice has been largely based on intuition and experience, evidence-based knowledge will only support and complement our view of both the type and the institution.

To point out the possible explicit knowledge of such an approach, one can propose from the findings that particular spatial properties are characteristics of the mosque type. Take for example the lines of movement and convex spaces in the sample. They have shown a general agreement to express high integrated lines and spaces in specific parts of the mosque’s prayer area. This may suggest two types of prayer space, which have not been made explicit before, the secluded with less movement and the busy with more movement.
Conclusion

The paper concludes that these diverse spatial forms reveal: a) a tendency towards similar spatial syntactic properties that ignore the buildings' formal classification, and b) similarities in the nature of the less controlling 'interface' conforming to the Islamic traditions. This tendency indicates a high agreement with the mosque concept as a unified institutional form based on the Islamic principles and intentions in spite of the culturally diverse forms, rules and codes of conduct of Muslim societies.

Further investigations in the mosque's relationship with the city's structure and the nature of its local interface and global integration will contribute to this study. The overall contribution will add to the general knowledge of this particular building type, which can be practically utilised as a rational base for design.

References


Hanson, J., 1998, Decoding Homes and Houses, Cambridge University Press, Cambridge


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i. List of mosques: The Great Mosque of Damascus, Syria, 8th c.; the Great Mosque in Sanaa, Yemen, 7th - 17th c.; Al-Azhar Mosque of Cairo, Egypt, 9th c.; the Great Mosque of Djenne, Mali, 13th c. - 1907; Fatih Mosque of Istanbul, Turkey, 15th c.; the Jami mosque of Isfahan, Iran, 8th - 11th c.; the Kalyan Mosque of Bukhara, Uzbekistan, 16th c.; the Friday Mosque of Shahjahanabad, India, 17th c.; the Great Mosque of Xian, China, 14th c.; and Masjid Kampung Kling, Malacca, Malaysia, 18th c.
