Contemporary Arab Architecture:
Space, Form, and Function

Dr. Waleed Al Sayyed 1
1. Director - Lonaard and Dar Mimar Research and Design Group, London - UK.

Sent for evaluation on (07 November 2011), and was approved on (12 January 2012)

Abstract
This paper focuses on contemporary Arab architecture from three main angles: First it explores the extent to which previous research and studies dealt rigorously with the symbolism of physical form(s) in Islamic architecture. Second it turns to the problematic issue of form versus function in design that is the centre of debate and criticism as far as contemporary Arab architects' attempts are concerned. Third, and more precisely, it looks closely at the theoretical framework of two contemporary Arab architects, Hassan Fathy and Rasem Badran.

The scope of the research is limited to the available literature review available in the record first on the so called 'Islamic' Architecture, which this paper argues it is a pre-requisite to understand contemporary Arab Architecture for its vital influence on architects. The methodology of this paper is to review, analyze, and discuss various arguments to establish certain standing points for further research. The aim of the preview is to focus on the vernacular, space, form versus function for further research to understand the way contemporary architects may approach design issues.

1. Introduction
Two main conclusions can be derived from the paper (Tradition versus Modernity: From Cultural Discourse to Architectural Crisis (Al Sayyed, 2011). First, studies on the controversial ‘Islamic architecture’ often depicted a monumental architecture while ignoring the vernacular side that relates to the majority, hence mistaking the special for the general. Second, the use of such a broad term has provoked a series of questions that put the forms often used under so much scrutiny, eventually leading to a major review to main concepts as far as tradition and modernity or Islamic architecture are concerned. This provoked many questions such as: what determines whether or not this form is 'Islamic'? Or: What makes it legitimate to use this 'Islamic' form in contemporary architects' designs, even when the urban, regional, or trans-regional context is believed to be different?

The questions, notably, bring to the front stage two main themes that will form the centre of this paper and the opens up the door for further investigation; the form versus function and the vernacular architecture. The first is a problematic issue that haunted theoreticians in architecture in general for ages; an issue that either throws architects to this stylistic approach or that if they favour the form over the function, or makes them obsessed with the function as the generator of building form. However, both approaches were subjected to sufficient debate and criticism, and it was not until recently that theories began to point to a third factor in this dual, which is often defined as an
unbalanced, relation between the two. This line of thought was argued by Grabar, Hillier and others as we will see next.

The second is the vernacular side of Arab architecture, which will be argued in a forthcoming paper within the context of seeking an appropriate approach to understand the logic of forms used in relation to functions and cultural meanings embedded in them. For this, the scope of the argument in this paper will be as follows: first, we will review arguments and studies on Arab architecture within the context of form versus function, then we will elaborate on the issue from a wider view to bring in context recent thought and theories in this regard by Hillier and others. Second, we will reflect on design issues and the process of generating design for its pivotal role to understand form, function within a wider context. Third, the paper will focus on the thought of two prominent Arab architects for their contributions in theory and in design; Hassan Fathy and Rasem Badran. This review will prove to be useful to understand current thought in contemporary Arab architecture.

2. Studies on (form–function) in Islamic Architecture

Within Arab/Islamic architecture, two categories can be noticed: The first to do with form and the architectural style (The mashrabiyya, malqaf, dome, or arch), and the other to do with space organisation in the building (the courtyard, Qa'a, the indirect entrance, or the iwan). It is quite striking to note that most studies in the record have focused on the formal level leaving the other deeper one needing rigorous investigation. Grabar writes: 'The second approach would be syntactic and would consist in studying and explaining whole ensembles. To my knowledge, no one has attempted to do this in Islamic architecture' (Grabar, 1983-a: 31). So what current studies on Islamic architecture are all about and what can we learn from such available studies?

It is notable that efforts to study Islamic architecture were governed by the western conception provided by western scholars, hence arriving at universal commonalities, as Kuban have argued, to try to meet a pre-designed definition. Most of such studies, due to their focus on such a monumental architecture, which in most cases contradicted the term 'Islamic', were subjected to a mounting criticism for failing to address core issues of Islam. In fact, such studies betrayed the failure of these buildings to meet the terms of the pre-designed concept of Islamic architecture. These are evident in Amra Palace in the Jordanian desert; a palace replete with nude paintings, or in the palaces of Granada that contain statues prohibited by Islam1.

However, some efforts were made by scholars to focus on vernacular architecture within Islamic context, as they tried to provide symbolic and hidden themes within the architecture that represents Islam. Apart from the studies by Hakim (1986), and Al Hathlool (1981, 1994) that subjected the physical built environment to theories and values derived from Islam or Sharia'a, there are many other studies of similar interest, yet with different approaches. For example, Francois Montequin in his article 'The Essence of Urban Existence in the World of Islam', in 1983 aims to contribute to the understanding of the environments of the traditional Islamic city by analysing its fundamental physical and spiritual characteristics, and by exposing the major religious and social aspects which motivated those distinguishing urbanistic traits. He claims an urban homogeneity and a morphological uniqueness of the classical Islamic city that should be an example for future planning of contemporary city. Janet Abu-Lughud in her 'Preserving the Living Heritage of Islamic Cities', in 1978 and 'Contemporary Relevance of Islamic Urban Principles', in 1983 questions what is or is not 'Islamic' about certain Islamic cities, in her attempt to define an approach for what should be taken or left in designing a contemporary 'Islamic city' based on the principles that governed the traditional one. On another dimension, Omur Bkirer based his study of 'Geometric Aspects of Brickbonds and Brick Revetments in Islamic Architecture' on the famous 'Sense of Unity' in 1973 by Ardalan-Bakhtiar, and Critchlow's 'Order in Space' in 1969, and 'Islamic Patterns' in 1976, to derive common geometric proportions by analysing brick work in Islamic architecture.
Based on the same two books, Paul Oliver in his 'Binarism in an Islamic City', takes Isfahan as an example to investigate what is called 'the hidden dimension' in the Islamic city, based on geometry and proportions. Most famous of all are the two Critchlow's studies, which mark his long investigation into pattern in Islamic architecture, his concern of order in space, and analysis of three dimensional geometry realized in architecture to illustrate the appropriateness of its determining geometry to its spiritual function (Critchlow, 1976, 1988). Critchlow's 'Islamic Patterns' is a detailed analysis of the underlying grids and their development in tiled walls, ceramic panels, etc., these 'patterns of integrity', he calls, feature a hidden internal geometry. However, his approach is cosmological, based on evidence throughout Islamic history such as 'the letters of the Brotherhood of Purity'.

The other 'The Sense of Unity: The Sufi Tradition in Persian Architecture', is the most remarkable in this regard. Ardalan and Bakhtiar extend the principles of sacred architecture from the mosque to other architectural units and finally to town-planning and city planning. Their approach and interpretation stems from that 'Insofar as the cosmos is defined, the city is defined, and so man is defined, and the significance of city's conceptual achievement lies in its ability to provide that essential sense of an ordered place in the universe' (Ardalan, 1973: 79). The authors argue that the growth of a city takes place through time, yet they determine that 'Islamic principles expressing unity through the organization of space have assumed three systems of order-making: natural, geometric and harmonic' (Ibid.). Where the first is developed by nomad and villager, geometric order relates to a system of man's most ancient cities as a unity within a unity. And harmonic order creates multiplicity within unity, geometric shapes linked in natural patterns within the framework of a superconscious geometry. Yet the culmination in the sequence of order, according to the authors, is harmonic, which reaches unity through the maximum use of architectonic vocabulary. The authors argue that cities in their evolution over time, by taking Isfahan as an example, present complexities resulting from the diversified nature of their buildings, uses and occupiers. They evolved from concepts which maintained the city walls that defined the cities, positive shapes in space and their correspondence to cosmic laws. They maintained the concept of a centre as a single point in space that moves in time and creates the line, or the linear element of the bazaar (Ibid.: 89).

Such various approaches that tackle the 'vernacular' side rather than the monumentality of Islamic architecture have brought to the front stage one important issue; that is, Islamic architecture in its vernacular, as well as monumental side, is replete with signs, symbols and forms that are iconographic or carry certain functions. This in turn makes it pivotal in order to understand and analyse the interpretations by contemporary architects to focus on the issue of form versus function. The fundamental question in this regard is: What makes an Islamic building Islamic? Is it the form, the function, the use, the purpose of erection, the hidden values embedded in its spatial pattern, or its urban context? More importantly it questions the legitimacy of using such heritage as precedents in contemporary Arab architecture by architects. Unfortunately, little has been offered in the record to contribute to a better understanding of this issue. This can be attributed to two main factors: first, the fact that, methods to conduct a search for an answer have been 'conventional' in the sense they oscillate within the theoretical realm with no attempt to understand spatial patterns rigorously. Second, most studies were obsessed with a 'sacred' past to the extent that certain elements are deemed as sort of sacred 'icons' and hence prevented such studies from digging deep to understand their relation to the whole spatial structure within socio-cultural context(s). However, the only theoretical attempt we find is Grabar's who has even little to offer in this regard.

Two opinions seem to exist, a general one adopted by many thinkers which strongly relates forms to cultural association. The other one adopted by Grabar states that form on its own cannot be directly taken to do so. Grabar strongly argues that seeking an answer within the form, or even the function, does not seem to provide a convincing or logical interpretation. As opposed to the first
common opinion, Grabar asks: what distinguishes a minaret in Cairo from towers of San Geminiano in Italy or Big Ben in London? What makes the former 'Islamic architecture', and the latter non-Islamic? (Grabar, 1983: 9) Furthermore, in attempting to dissolve this fundamental question, Grabar argues that 'Islamic architecture' is either iconophoric or iconographic (Grabar, 1983: 9); in other words, it is either carrying a meaningful message or representing a message. Therefore, the forms can be interpreted in the light of two factors: the symbolic value they hold and their cultural association. For example, the minaret is 'Islamic' in the sense that it was created within the Islamic culture, and functions for Islamic purposes. Yet, different examples cannot be detected as simple as that, where they, according to Grabar, indicate the existence of order of meaning, which is neither inherent to forms, nor to functions, nor even to the vocabulary used for forms or functions, but rather to the relationship between all three (Grabar, 1983: 10). From this, we begin to see why certain prototypes, such as courtyards, iwans, domes, etc., cannot be simply taken to be ascribed to 'Islamic architecture' for their shape or form, or function, but rather due to certain meanings carried within the internal structure of their spatial organization, which conveys cultural as well as form-function association.

Other studies on form versus function within an analytical context are found in John Hancock's theoretical framework which attempts to provide a methodology to understand such a relation. In this regard, a set of questions that have been the concern of theoreticians in contemporary Arab architecture shed some more light on the issue; particularly in the field of comparative analysis and evaluation. His methodical framework was adopted by MIT students in the late 1980s who attempted to evaluate works of contemporary Arab architects such as Hassan Fathy and Rasem Badran. John Hancock in his article 'Between History and Tradition: Notes towards a theory of precedent' proposes a framework marked by a set of questions to understand the extent to which the past can be referred to and how form can be integrated with function to understand the relation between the two. His focus, mainly and most importantly in the evaluation process, is on the rationale behind the process of employing historical precedents, from which he raises three concerns: First is, how is one to select historical precedents out of otherwise unlimited alternatives? Second, how is one to obtain the necessary and appropriate knowledge about the selected historical precedents? And third, to what extent does one have to use, transform, and utilise the selected precedents to come to terms with the new design circumstances?

The significance of form-function paradigm in contemporary Arab architecture lies in the following two facts: First the fact that it is the key stone in understanding the logic behind such contemporary employment of historic precedents. Second, it is similarly a key issue in understanding the 'hidden' ties that structures the spatial pattern, or using Hillier terms, spatial configurations and their socio-cultural association. This second point will be discussed as the key methodical approach in further research. On the first point, contemporary architects are criticised by critics such as Alan Colquhoun or Khaled Asfour for lacking such an understanding of the relation between form and function in the sense that they refer to traditional architecture in a passionate way. Asfour argues that the process by which reference to traditional architecture in the Arab world nowadays can be best described as 'cut and paste' process. He argues that the process of borrowing architectural ideas, foreign or historical, is a global phenomenon. Yet, according to him, borrowing in the Arab world is usually problematic as it involves little inquisitive consciousness, and so much image cloning. In other words, it is not the outcome of a screening mechanism that results from debates, theories and criticism but a passionate move without thinking too much of the consequence (Asfour, 1998: 60). Moreover Alan Colquhoun writes: 'The recent tendencies toward stylistic reference seem to be motivated by a need to reintroduce the notion of figure into architecture and to see architectural configurations as already containing a set of cultural meanings' (Colquhoun, 1985: 191)
It is also notable, on the general level of theory of contemporary Arab architecture, that most of the known current architectural or design criticism is centered around relating the work to this theory or that. In other words, the evaluation of the 'product' of architects' designs in best cases is not based on certain measures to understand the themes inherited in the forms themselves on the one hand or to relate form to function. Instead, we find that such attempts to evaluate the design endeavours to relate form to a certain stylistic type of architecture; for example: modern, post modern, tradition, etc., and then to interpret architects' intentions and concepts inherited in the design by referring to historical precedents. Such a 'conventional' method of evaluation is common among most theoreticians and architecture critics. Yet, it can be refuted for being incapable of relating form to function, especially in cases with no precedents. 3

However, recent rigorous studies in the field of architecture criticism and evaluation of works can be found based on certain methodologies that adhere to a theory or rather a so called 'rational model' developed by Imre Lakatos (Lakatos, 1978), and adopted by students at MIT. Such a theory attempts to deconstruct the 'design thinking' into a set of design decisions and reasoning hence focusing on the rational part of the design process telling the researcher the inviolable 'hard core' which contains the common or basic theories and conceptions and a fixed set of rejections called the 'negative heuristic' that works to tell the researcher where not to look. Stanford Anderson has illustrated this theory in his article 'Architectural Design as a system of research programs' 4. So far this methodology of analysis to relate form to space and function prevailed in schools like MIT and adopted by students on contemporary Arab architecture in difference to its precedents and references. However, despite the rigorous analysis by students to look closely at the works of contemporary Arab architects, such as the research done by Mohammed Khaled and Yaser Sakr at MIT which we will review in due course, their analysis, and to a large extent, the application of this theory offers little or nothing in some cases about how to understand and quantify the quality of spaces in the case studies, and foremost to understand the designs in a comprehensive space, form and function relations. The challenge in contemporary Arab architecture, as far as tradition versus modernity is concerned, seems to be of this type, this research generally, is concerned to focus on this issue to better understand how we can relate form to function and to establish a better rigorous method to evaluate qualities of space. Hence, this paper is concerned to focus on from function relations in general.

Moreover, in other cases, evaluation can be conducted to understand the form of the building and then try to 'fill' the function within its structure and derive concepts and themes intended by its architect. Such a method of understanding function as a 'fill' within the form comprises problems in understanding the relation between the two, as Hillier puts it: 'in architecture [some may think] that an architectural space is a geometrical shape, and function is what occurs in that shape' (Hillier, 1992). He therefore warns that, if the relation between form and function is set up this way, it is hard to see why there should be any relation between the two (Ibid.). Therefore, the use of elements borrowed from the past in a contemporary design cannot be understood or explained by theoreticians, neither can be even justified by architects from this point of view.

For example, the abundant use of the courtyard in contemporary designs, as a reference to traditional architecture, cannot be understood unless the evaluation is made to relate form to its function between past and present to account for the validity of this use, if we have to accept the claim that this reference to the past goes beyond the form. Yet, again we face a very simple question: How is it possible to understand this relation between form and function and how central is it in architects' conceptual work in design?

Following this we will discuss further the form-function paradigm with a brief preview of ideas related to design as a 'process' and socio-cultural factors that influence the 'product'. Second we will highlight theories and intentions in design of two architects Fathy and Badran. Intentions, according
to Hillier, are 'a favourite theme in architectural discourse, [as] not only they are said to be the starting points for design, but also that which distinguishes architecture as an art from architecture as science' (Hillier and Leaman, 1975, 5). Looking closely at architects intentions will also benefit forthcoming research when we evaluate spatial patterns and configurational data.

2.1 The form-function paradigm

The form-function relation in architecture is a core issue addressed by many modern theories in architecture. However, this form-function relation is not the interest of architects or theorists only, but also on a practical level is to a large extent the interest of the users or people who live the consequences of failure of theories that do not meet the basics of good architecture that achieves commodity, firmness and delight. Yet, according to Hillier, this pair exhibits a problematic nature that is difficult to be talked about in the level of precision due to its association with architecture as art to a large extent unlike other sides of architecture like construction, lighting, or acoustics (Hillier, 1991: 10). Hillier points out that 'it is not even clear how we should talk about it. The form-function relation, unlike construction, does not seem to belong to architecture as science, since there seem to be no clear facts, let alone explicit and testable theories' (Ibid.).

So what were modern theories all about in addressing this relation between form and function in buildings? And how can we address this issue since it is part of design as a 'process' to produce good architecture that is the focus of analysis as well? And how is architecture defined in terms of form or function?

Two of the most influential architects in modern architecture, Le Corbusier and Mies van der Rohe provide two different definitions. The former defines it in terms of forms, whereas the latter rejects form as the aim in architecture. Le Corbusier defined architecture as 'a masterly, correct and magnificent play of masses brought together in light. Our eyes are made to see forms in light: light and shade reveal these forms; cubes, cones, spheres, cylinders or pyramids are the great primary forms which light reveals to advantage; the image of these is distinct and tangible within us and without ambiguity. It is for that reason that these are beautiful forms, the most beautiful forms' (Le Corbusier, 1927, 29). On the other hand, Mies van der Rohe defines architecture as: 'the will of the epoch translated into space; living, changing, new. We refuse to recognise problems of form, but only problems of building. Form is not the aim of our work, but only the result. Form, by itself, does not exist. Form as an aim is formalism, and that we reject' (Johnson, 1947: 183). Other writers contributed with more definition and ideas, for example Christian Norberg-Schulz in his 'Intentions in Architecture' questions the idea of assigning certain forms to particular functions, he argues that this assignment in architectural history as well as in the theory of architecture is central; that is it is not intended when we study history that it should lead to copying certain forms from the past (Norberg-Schulz, 1977: 22). Instead, he argues that information given by history should illustrate the relations between problems and solution, and thus furnish an empirical basis for further work (Ibid.: 24). Others like Charles Jencks relate forms to meanings rather than functions, he says 'the minute a new form is invented it will require, inevitably, a meaning' (Jencks, 1969, 11). Oswald Mathias Unger views the process of design in architecture as a continuous transformation of forms. However, he tends to liberate architecture as a continuous process of correlations from the reduction to purely functional thought by adopting what he calls 'the morphological transformation' as an instrument of design (Unger, 1982: 14). By this he states his inclination to believe that form is an expression of spiritual content, and therefore calls to a move away from functionalism for its own sake (Ibid.).

However, others claimed a much stronger relation between form and function. Paul Rudolph in his writings claims a strong influence on the form of buildings by six factors. These include the environmental context, function, climatic and topographic factors, material, what he calls 'peculiar psychological demands of the space', and the 'spirit of the times' (Rudolph, 1957:149). Unlike others, Reyner Banham's in his 'Theory and
Design in the first Machine Age’ finds architectural new international style based on machine-like and technology to be problematic. He suggests that most of architects adopting this method were imitating the forms and the design methods of current machine technology. Therefore, the new forms were justified not on their own terms, but by reference to and by analogy to mechanical imagery held up as an exemplar of universal form-giving validity (Banham, 1960: 328).

2.1.1 Discussion: Form-function paradigm

Much dispute and controversy can be observed among those and others over the relation between form and function. For most theories in architecture emerged as a result of understanding such a relation. However, despite these attempts to account for the form or function the problematic issue of finding a relation between the two or to provide a methodical approach remains unsolved.

It is, however, notable that such attempts have accounted for two main issues: The first is to define architecture and the extent to which form is central or not in its product. The second is to test the legitimacy of borrowing forms from either past precedents of contemporary time, or from historical examples, and that copying forms is associated with meanings, especially when borrowing from history. Yet again, this preview does not seem to provide an answer to the question we raised earlier of finding the method by which we understand the relation between the two. In this regard, Hillier questioned this relation between form and function, and argues that form-function relation, as a simple fact about building and urban design, passes through a variable he calls 'configuration' (Hillier, 1992). Therefore, he argues that this relation has to do with the way design is generated, and that it shows the inherent difficulty of 'bottom-up' approaches to design, yet it still has a value which lies in the attempt to understand the logic of existing configurations rather than a direct design tool (which we will address next), for the reason, Hillier argues, that elements of design gain their identity by virtue of being embedded in configuration, as they do not have a pre-given nature prior to configuration (Ibid.). According to Hillier, it is within the spatial patterning, definable formally as sets of configurational numbers assigned to graphs of spatial representations that lies the fundamental link between form and function in architecture and urban design (Ibid.). Hillier, therefore negates the idea that architectural space is a geometrical shape 'filled' then with function. Instead, he argues that while human beings are 'functioning' they do have spatial shapes to their doings already, and these spatial shapes tend to exploit the formal properties that are already inherent in space (Ibid.). Hillier therefore suggests that certain shapes of space such as the axial line, convex space, or convex isovist are associated directly with how people use and experience space. Therefore, Hillier argues that such basic relationships between the form of space and its use suggests that the proper way to formulate the relation is to say that the formal properties of spaces are given as potentials, and that we exploit them as individuals and collocivities in using them, which, Hillier suggests, is what makes the relationship between space and function analysable (Ibid.). Yet, the form-function relation, according to Hillier, exhibits a conceptual difficulty in architecture because the morphology of forms contains what he calls 'negative redundancy' in relation to function (Hillier and Leaman, 1975: 9). That is, Hillier explains, functions in architecture, like those in language, exhibit a dual nature. They serve man-nature and man-man purposes (Ibid.). The former, according to Hillier, is the modification of the building to environmental conditions, whereas the latter is the interaction between activity and space at its lower level, or is space as a social language constructed through the properties of morphology at its higher level (Ibid.). Hillier therefore suggests that in design higher order of morphologies should work algorithmically rather than on a one-on one basis; that is, it suggests an abstract nature which is constructed by means of 'codes' (Ibid.). The 'code', as defined by Hillier, is 'the means by which the unfolding of a morphology in space-time passes through the head' (Hillier and Leaman, 1975: 7). Therefore, Hillier argues, by studying the structurally stable states of the unfolding and its history in relation to the societies that produced
them, we are in all likelihood studying the means of our awareness of space; that is the cultural intelligibility of the morphology of artificial space' (Ibid.). It seems, as design is a mental creative work, it is pivotal to shed some light on the process by which architects generate their designs, the nature of architectural creative work, and the influences or variables that affect the outcome.

3. The design process and variables that influence the outcome

The problem of understanding the mechanism by which design process takes place has been discussed by many scholars and thinkers. The enquiry has begun on the level of the entity of architecture itself in order to understand how it can be created and what distinguishes it from other acts of design and building. In this regard we find definitions by which architecture is seen as science and art (Chappell, 1992, Hillier, 1996). Chappell, for example, states that 'architects are qualified to design and administer the erection of buildings, and must possess both theoretical and practical knowledge. Their work is a science as well as an art, for they must produce a structure as well as create form, and must combine aesthetic effect with practical considerations' (Chappell, 1992: 4). Hillier, on the other hand provides an interesting definition to architecture as 'a technique and an art with social consequences which are intrinsic rather than extrinsic.

They lie in the nature of the object itself, as well as in its associations and symbolic meanings' (Hillier, 1991: 10). Apart from his definition of architecture, Chappell raises important issue that has to do with the essence of architecture; that is the form-function relation, which is further expressed in the design process. He claims an important integration between the two that should be maintained in the design. He writes: 'They [architects] must visualise the interior as well as the exterior of the building and must ensure that the accommodation is properly related to the requirements of the owners and occupiers, and that the form and construction are appropriate to the function of the building and its setting' (Chappell, 1992: 4). Moreover, Hillier's approach to understand architecture and how it can be distinguished from building or vernacular is of interest. Hillier addressed this issue in 'Space is the machine', where he questions the essence of architecture and the way it can be differentiated from building. He argues that architecture adds something to buildings, 'to go beyond the process by which the culturally sanctioned non-discursivities are embedded in the spatial and physical forms of buildings' (Hillier, 1996: 45). Therefore, Hillier states that architecture begins 'when the configurational aspects of form and space, through which buildings became cultural and social objects, are treated not as unconscious rules to be followed, but are raised to the level of conscious...' (Hillier, 1996: 45-46), in other words, when it is raised from its non-discursive level to the level of discursiveness.

However, the process itself in architecture, Hillier argues, is a configurational thinking; that is the designer not only thinks of objects during the process, but also he thinks of relations between parts to the whole. Hillier here is referring in particular to 'the idea of configuration' where architecture can be seen as a process of relating the parts to the whole. However, it is not always the case, in actual design, that the architect can comprehend architecture this way, as there emerge two notions in this regard: one, in which design process is approached from part to the whole, the second is from the whole and then reflected on the parts. Such notions were expressed by many writers and those who accounted for theory and history of architecture. For example, Robert Venturi, in his famous Complexity and Contradiction in Architecture states that architecture has a special obligation towards the whole and that 'its truth must be in its totality or its implications of totality' (Venturi, 1966: 16). Therefore, he argues that it must exhibit the difficult unity of inclusion rather than the easy unity of exclusion (Ibid.). Similarly Alberti, indicated this wholeness about architecture as he stated 'it is the property and business of the design to appoint to the edifice and all its parts their proper places, determinate number, just proportion and beautiful order; so that the whole form of the structure be proportionable’ (Alberti, 1755).
However, others emphasized the importance of the part in relation to the whole. For example, Kneivitt defines good design where 'an object is [considered to be] well designed [when] the relationship of the part to the part and of the part to the whole appear to be inevitable' (Kneivitt, 1986: 493). Errol Harris in his *Roots of Scientific Method* argues that the principle determining the whole is 'logically prior to every part and it is the whole that the explanation (intelligibility) of the part must be sought. One cannot therefore begin from the parts that are structureless and hope to find the principle of construction by accumulating large numbers of them' (Harris, 1970: 331). However, Schulz argues that architecture is explicitly a synthetic activity which has to adapt itself to the form of life as a whole, yet this adaptation does not request that every work should be related to the total whole. The individual work concretizes secondary wholes, but because it belongs to an architectural system, it participates in a complete concretization (Norberg-Schulz, 1977: 188).

On the other hand, Hillier addressed this issue in his writings (Hillier, 1998: 39-40). He states that this configurational relation that accompanies the design process can be seen in two ways: One is a bottom-up process, and the other is a top-down process (Ibid.). The former means that architects de-construct the components of the building into organic parts that they attempt to assemble according to functional zones, then to arrange these to achieve the best solution that meets the requirements. The latter is shaped, by contrast with the former, when a building is constructed in the mind of the designer as a preconceived image or set of functional zones.

Given these factors that influence the design process, which tends to be conducted within high complexity, we ask: are these the only factors that affect the design? The answer is no, as there exists many other factors that affect the designer architect (Fig. 1). One is the client, his influence on the design, and his cultural background. This may include his demands to be met in the design, the extent to which he can influence the architect or influenced by the architect, and his social class which may imply certain education and knowledge background. According to Chappell, the client is of prime importance in the process of design, as the architect must attempt to interpret the client's needs. Therefore, the work of the architect may be subjected to meet the financial capabilities of the client (Chappell, 1992: 4). The old adage states that a good building requires a good client as well as a good architect (Ibid.). Second is the architect and his theoretical as well as cultural background. This includes his education, the trend or style he adopts, and most importantly the stage of his career. As, according to Jencks, 'architects tend to jump from one approach to another, or in some cases to stay loyal to one approach due to some reasons: 'as the architect may jump back and forth because he and his audience get bored, or may be because a [change may signify a shift in culture and the development of an architect]' (Jencks, 1997: 9). Third is the cultural context, that includes environmental constants or variable factors; the constants can be in the form of geo-climatic ones surrounding the design.

Hence, the creativity of the design lies in the ability of the architect to manage these factors with the best solution. The variables may take the form of implicit environments, whether social, economic, or other, or they can be a result of cross cultural interaction. The outcome of the design is a result of the interaction between the three factors. Yet, the differences between one architect's designs and another depend also on the relations between these three main factors. Therefore,
differences in this tri-relation could be ascribed mainly to the architect's theory and conceptual thinking at a certain time in his career in addition to other factors mentioned.

Following this general review of different ideas and arguments on form-function relations, the available approaches to relate vernacular architecture within Islamic context to symbolic meanings, as well as ideas on the design process, let us turn again to the context of Arab architecture, or more precisely to look closely at the works and thought of two contemporary Arab architects; Hassan Fathy and Rasem Badran, in relation to these issues.

4. Hassan Fathy

"Architecture is still one of the most traditional arts. A work of architecture is meant to be used, its form is largely determined by precedent, and it is set before the public where they must look at every day. The architect should respect the work of his predecessors and the public sensibility by not using his architecture as a medium of personal advertisement. Indeed, no architect can avoid using the work of earlier architects; however hard he strains after originality, by far the larger part of his work will be in some tradition or other. Then why should he despise tradition into an artificial and uncomfortable synthesis, why should he be so rude to earlier architects as to distort and misapply their ideas, as when an architectural element, evolved over many years to a perfect size, shape and function, is used upside-down or enlarged beyond recognition till it no longer even works properly, simply to gratify his own selfish appetite for fame" (Fathy, 1973: 25).

Hassan Fathy, considered by many critics to be one of the leading Arab architects, was born in 1900 in Alexandria to a middle class family. During the course of more than fifty years until his death in 1989 Fathy established a school of thought characterised by a strong adherence to vernacular architecture and symbolizes a tendency to implement traditional elements in contemporary forms.

The most distinguished theoretical work of Fathy is his 'Architecture for the Poor' published earlier by the University of Chicago under the title 'Qurna: A tale to two villages' in 1965. In this book Fathy summarised his thoughts and experience on Arab Islamic architecture, the vernacular as well as his struggle throughout his long career to establish ideas to the rural Egyptian communities he was building for. To avoid a narrative descriptive review to his long career we are particularly interested to focus on three main issues and to answer the following questions: What are the key points and ideas in Hassan Fathy's thought? What does the vernacular mean in his theory? And what is the morphology of Hassan Fathy's architecture; its spatial components, as well as form-function relations?

4.1 On contemporary Arab architecture and 'Islamic architecture'

The story of Fathy's fascination with the countryside began at an early age from tales told by his parents that inspired him to dedicate himself to rural life. His application to the school of agriculture was declined so he sought to fulfill his ambition by studying architecture (Fathy, 1969:7-9). Early in his career, Fathy developed an awareness of an international invading architectural style and planning theories. From this standing point, Fathy's thought evolved marking an unprecedented school of thought in the region.
Hence, the following main points we investigate stem from this framework.

Fathy believes that contemporary Arab architecture suffers from a state of alienation. He argues that ‘Islamic architecture’ has ceased entirely in Islamic countries since the mid-18th century (Faraoui, 1980: 77). To him, ‘Islamic architecture is a traditional and regional art, where every country has its own art’ (Faraoui, 1980: 77). The problem of architecture in the Arab world, according to him, is multi-sided, where architecture is an important element in culture, and culture is the outcome of the interaction between the intelligence of man and his environment and the satisfaction of his spiritual and physical needs (Faraoui, 1980: 78). Therefore, Fathy argues that certain changes have taken place in the process of building and producing architecture itself: First, is the change from introversion to extraversion in house design, where the former is purely Islamic and traditional in concept, whereas the latter is western. Hence the modern Arab architect, according to him, is facing a challenge while designing in a contemporary western-like urban fabric in Arab countries (Faraoui, 1980: 77).

Another aspect of the problem, he argues, lies in the system of producing architecture itself between the past and present. He believes that ‘the architectural system in the past included the Sufi, the master mason, and the apprentice, whereas nowadays, the system of building includes the architect, the craftsman, the university student, and the contractor’ (Ibid.). Therefore, he believes that the problem lies in the domain where all parts of this building process nowadays have no knowledge or genuine interaction with building material and traditional skills. In other words, the outcome of the design is dictated by the T-square and available modern building material. Therefore, all parties in modern building process are keen on architecture as a means of living rather than as a cultural output (Faraoui, 1980: 78). He also views a problem in the education and the training of the architects. He argues that ‘in the architectural schools they make no study of the history of domestic buildings, and learn architectural periods by the accidents of style, the obvious features like the pylon and the stalactite. Thus the graduate architect believes this to be all there is in style, and imagines a building can change its style as a man changes clothes’ (Fathy, 1973: 84). In his quest for a solution, Fathy turned to rural Egypt to understand the prevailing traditional process of building among peasants in Aswan. This was partly caused by the shortage of wood used in modern building process for scaffolding to build the roof. This resulted upon a long period to produce a set of spatial elements that are attributed to Fathy. First let us review his thought on space, and the relation between form and function.

4.2 On space & form-function in Arab architecture

Fathy argues that ‘Islamic architecture is one of space and not walls, and that it ‘begins with the interior and goes to the exterior’ (Blumenfeld, 1974: 54). Moreover, Fathy shows a great deal of awareness of the relation between the spatial composition of the structure in relation to the function assigned to it, and hence the essential integral relation between form and function in the design of a building. He writes: ‘The function of the space is primary. The outer form must express the forces on the inside,..., space has its own logic’ (Blumenfeld, 1974: 54). However, Fathy believes, the modern has been superimposed across the board onto the regional (Faraoui, 1980: 77). Therefore, in describing the architectural character in Egypt, he argues that ‘in modern Egypt there is no indigenous style’, and ‘the houses of poor and rich alike are without character’ (Fathy, 1969: 31).

When describing the existing planning of Egyptian villages, Fathy believes they are differently planned from European ones, as the latter are open to the fields and the view, and the former are inward looking (Blumenfeld, 1974: 54). Fathy ascribes this to the hostile nature of the countryside, and for the sake of security (Ibid.). According to Steele, the Kallini House, is the first to give features of what will become familiar signatures of Fathy's style (Steele, 1997: 38). Such features, which include domes, vaults, and the meticulous wood works, are the visual expressions of typical space prototypes such as the Qa’a, and
other spaces that form the composition of what may be called Fathy style (Ibid.). This house is also the first trial design of the combination between mud brick with what Fathy calls ‘a thesis of space’, in which, according to Steele, Fathy intends to create a new system of building based on the traditional one (Steele, 1997: 38). This style of building developed by Fathy represents the sequence of building domes and vaults using mud brick load on the bearing walls. The organisation of spaces in the plan structure is very much dictated by a strict module due to the limit of the span needed for the roofing of spaces. This 3.1 meter module, is the maximum that can be used without the roof falling as Fathy discovered in the trial and error in his project in Bahtim (Fathy, 1973).

(Fig. 2), Spatial elements in Fathy’s architecture in which (see graphs clockwise), Fathy builds thick bearing walls, then the vaults, and finally the dome, relying in each phase on distributing the load (After Steele, 1997).

4.3 On tradition and the vernacular

In his writings Fathy defines ‘tradition’ as all inherited experience and the legacy acquired over generations’ (Fathy, 1991: 29), though he differentiates between tradition in the urban environment and that in rural Egypt. The latter is the main concern in his writings and particularly in his ‘Architecture for the Poor’. Fathy uses tradition as a conceptual means to revive social themes, whereas he utilizes the vernacular to address environmental issues related to building process itself, though according to him it can be social as well as a self-help and cooperation process of building, building materials, and the evolution of certain climatic elements in the building such as the courtyard, the Qa’a, the Malqaf. Fathy wrote about the role of ‘tradition’ in society, and considered it to be equivalent to ‘habit’ to an individual; he tends to make such a social analogy. He draws the connection between man’s decision making and his habits, as many conscious decisions are merely the operation of a habit, and decision making is a self-expression that distinguishes between individuals. To him the habit releases man from the need to make less interesting decisions so that he can concentrate on the artistically important ones (Fathy, 1969: 26). Fathy points out that everyday habits form individuality and make the establishment of tradition possible. He tends to make an analogy between tradition and individual habits. To him tradition need not be old-fashioned or date from long ago, but might have begun quite recently. To establish tradition is to overcome a problem, then when the same solution has been adopted by another, and then another then the tradition is established. By solving the problems that encounter a nation, then the tradition has solved its problem and when it ceases to develop, then the cycle is completed. Once the tradition is established and accepted, it is the individual artist’s duty is to keep it going, using his own invention and insight to give it that additional momentum that will save it from coming to a standstill, until it has reached the end of its cycle and completed its full development (Fathy, 1969: 37).

According to Fathy, this is where tradition has a creative role to play, for it is only by tradition, by respecting and building on the work of earlier generations, that each new generation may make some positive progress towards the solution of the problem. When tradition has solved its problem and ceased developing, we may say that a cycle has been completed (Fathy, 1991: 30). However, in architecture as in other human activities and in natural processes, there are cycles just beginning, others that have been completed, and others at all stages of development in between that exist simultaneously in the same society. There are two traditions that go back to the beginning of human society, yet which are still and which will exist as long as society does; bread-making for example, and brick making (Ibid.).
On the one hand, he stresses the importance of the viability of tradition, and points out that there are traditions which, although they have appeared only recently and are in an early phase of their cycle, were in fact born dead, albeit some may argue they are still born. To him modernity does not necessarily mean liveliness, and change is not always for the better (Fathy, 1991: 41). On the other hand, he claims situations that call for innovation, where ‘innovation must be a completely thought-out response to a change in circumstances, and not indulged in for its own sake’ (Fathy, 1969: 37). He gives an example that an airport control tower be built in some peasant idiom, and industrial structures like nuclear power-stations may force a new tradition upon the designer (Fathy, 1991: 12). Once a particular tradition is established, the individual artist’s duty is to keep this tradition going, with his own invention and insight to give it that additional momentum that will save it from coming to a standstill, until it reaches the end of its cycle and completes its full development (Ibid.).

On modernity as opposed to tradition, Fathy argues that the word means ‘living at the same time with’, which implies reference to time without the will to accept or refute (Fathy, 1971: 21), though he argues that such a term is being used by architects and art-related critics to hold certain artistic values. As it is said that modern European architecture is related to modern times so is Arabic-Islamic architecture of past ages ascribed to retrogression. Therefore, Fathy sees there has been misuse and confusion between the chronological meaning of time in ‘modernity’ and the metaphoric meaning of the term. Therefore, to reconcile the chronological meaning and the definition of the ‘architect’ for the term ‘modernity’, we can say that an architectural work related to its time or ‘contemporary’ should be part of daily life, and should be in harmony with the level of human achievement in all aspects of scientific and human knowledge, as well as the natural sciences that cannot be separated from architecture and planning (Fathy, 1971: 22). Fathy believes that the physical and dynamic validity of the traditional design of the house with its cooling climatic system is still valid today, whereas what we might call ‘modern’ could be of no use or validity for our present (Fathy, 1971: 22, Abdel-Baqi, 1987: 122-123).

On the issue of the vernacular, Curtis summarises some of Fathy's views on vernacular as he writes: Fathy felt that the wide windows, concrete construction and free standing boxes in modern architecture made no sense in extreme heat, and in societies with long-standing courtyard traditions embodying well tried devices for excluding the sun and for dealing with privacy. Fathy's position was articulated through a 'Pharaonic' ideal: a notion of returning to the basis of Egyptian culture in the mud vernacular of the southern part of the country. His hope was to regenerate architecture from the ground up, by encouraging the peasant to build for himself, with forms and techniques that were cheap and had stood the test of time (Curtis, 1982: 381). He also considers traditional architecture to be closer to the natural environment than the ‘international style’ which invaded the Arab world, as the former respects ‘the necessities of the natural environment’, its social circumstances, and its physical aspects, resulting in an authentic architecture (Abdel-Baqi, 1987: 11).

Fathy addressed the vernacular issues in his ‘Natural Energy and Vernacular Architecture’. This book shows an extensive research into the thermodynamics of certain forms and elements (wind catcher or Malqaf, Mashrabiyya, Qa’a, courtyard). He attempted to demonstrate the complexity of thermodynamic systems that can be found in simple buildings, to serve as a basic unit to improve thermal efficiency while maintaining a building’s value within local culture and to reduce its impact on the environment (Jencks, 1997: 144).

To Fathy, one of the central aspects in vernacular architecture is the climate, as the main factor for generating the elements such as the malqaf, and other elements, he writes ‘over many centuries, people everywhere appear to have learned to interact with their climate. Climate shapes the rhythm of their lives as well as their habits and clothes, thus they build houses that are more or less
satisfactory at providing them with the microclimate that they need’ (Fathy, 1986: 7). Therefore, Fathy argues the need for a ‘natural architecture’ which embodies a true reflection of social needs. He argues that man imitates natural shapes, whether human or animal, in his own way of expressing his feelings in the work of art he produces.

In architecture the model is not the natural environment itself, although it dictates principles that respect the surrounding environment and its natural forces, allowing the creativity to produce forms (Fathy, 1971: 9). In this regard, he integrates man, nature and architecture, and believes that they could and should coexist in harmonious balance, where architecture as a communal art should reflect personal habits and traditions. He also believes that technology should be subservient to social values, and appropriate to popular needs (Steele, 1997: 11).

Fathy believes architecture to be one of the most traditional arts based on precedents, thus he embarked on the study of ancient Egyptian architecture to derive proportions to be used in architectural applications. He also embarked on studying the vernacular in the southern part of Egypt where Nubian peasants built their houses using natural resources (Ed., 1988-a: 26). The motive for studying the vernacular was the need to search for an alternative of wood due to its shortage during the Second World War, in order to build domed and vaulted roofs (Fathy, 1991: 15).

He writes in ‘Architecture for the Poor’ about his search, that he was advised to visit villages in Aswan (Ibid.: 7-14). In the village of Aswan he was looking for those who knew the method of this indigenous building process, when he came across a mason who used old techniques of building by utilizing natural resources and techniques (Fathy, 1991: 14). Therefore, he urges architects to look soberly in the tradition where they can contribute to their society. Fathy feels that many architects believe that the peasant community has nothing worth consideration, thus he defines two kinds of architecture, the first is what he calls folk architecture, and the other is the architect’s architecture (Fathy, 1991: 36). In fact, Fathy felt that the relation between the architect, the builder, and the client or the inhabitant should be reestablished. Therefore, he believed that by this re-establishment, a great advantage of using traditional building methods could be achieved. This means relieving the architect of the work he had unnecessarily taken over from the craftsman (Fathy, 1973: 39). In fact, we find that Fathy focused in his theoretical work on the role of the architect in relation to the building process. For example, Fathy points out that the responsibility of the architect is to revive the peasant’s faith in his own culture: that is, ‘when the architect uses forms in his designs, then the peasants at once begin to look at their own products with pride, thus the village craftsman is stimulated to use and develop the traditional local forms, simply because he sees them respected by a real architect’ (Fathy, 1991: 31).

On the other hand, he focused on the mason and the craftsman to enable them to revive the traditional methods of building according to new designs. He therefore, attempted to establish a standard unit, which is the room, where the mason can be trusted to supply it with quality and size to compete with modern prefabricated technology, and hence to validate his role in newly emerged building types of different sizes (Fathy, 1973: 39-45). On a third level, he addressed the client as the beneficiary of this building process. Accordingly, he considers the building process to be subject to change and improvement to fit the client needs. In his work to relocate the Gournis at Qurna village, he writes: ‘right up to the last moment I should be learning, modifying, and improving my designs and making them fit more perfectly the families that would live in them’ (Fathy, 1973: 42). Fathy defines the beauty of a building as the true reflection of society’s everyday needs, materials, and its environment. He also believes that after many generations of the active relationship between society and architecture, buildings will take on the many dimensioned shape of society, with the habits and routines of its inhabitants (Fathy, 1991: 35, Ed., 1988-c: 25). Also by finding out the customs and rituals and to map the hierarchy of the community, Fathy points out that it could be through detecting history by talking to
elderly people, and by making observations to the daily life (Fathy, 1991: 36).

4.4 Discussion: architectural forms and social meanings in Fathy’s thinking

From this review we can sum up some points in Fathy’s thinking about architecture as an output and a building process. Firstly, it reflects awareness of an era when Arab architecture can be seen in relation to its context. This was expressed by him on many different levels: The first, as a defensive return to old techniques and building process, seeking a solution in the past. The second is to revive concepts and meanings in forms and shapes borrowed from the past. And the third is his attempt at re-adjusting the relation between the trinity: the craftsman, the architect, and the user. Secondly, Fathy’s approach to architecture seems to rely on history as a viable source. However, such an approach may seem legitimate, yet controversial as one may argue that being confined to certain shapes and forms, hence forcing the revival of certain social traditions by adopting these elements, may not seem legitimate, even in the name of modernity. This argument may give rise to the notion that Fathy invokes tradition to sustain his ‘style’ of architecture, which adopts certain forms, and then to invoke another time the vernacular to ‘justify’ the usage of these forms and their relevance to climatic issues. In fact, if we put Fathy’s return to ‘tradition’ under scrutiny, we can clearly see that it took the shape of an individual return rather than a collective effort as a school of thought until late in his life. Moreover, if his architecture is to be claimed to be Vernacular, or as a school of thought to be adherent genuinely in principle to tradition, one may ask: why did it not find acceptance among the users of Qurna on the one hand, and among the decision-makers at the time on the other? Moreover, a series of questions can be provoked in this regard, where some might ask: Given that Fathy’s theory seem to be adherent to the vernacular and the tradition, and most importantly to address the needs of society, and the poor in particular, how can we then see later works of Hassan Fathy limited to the high class of society? In fact, unlike vernacular architecture, Fathy’s style of architecture did not take a community form, in the sense that it evolved and spread as a natural group output, but rather it can be seen as an individual attempt at creating a ‘trendy’ new approach amidst messed up socio-cultural milieu. Therefore, even Fathy’s students like Abdel Wahid Al-Wakil who adopted his thoughts were not seen as continuation to his school of thought, but rather as seekers of fame through a stylistic architectural trend that evolved in a certain era. Thirdly, regardless of the output and the application of his theory upon society, many aspects of his thinking seem to reflect an awareness of the challenge between a past model and a current situation. In fact, we find Fathy realistic in certain times where he admits that ‘defining the problem goes ninety percent of the way towards the solution, but we are not properly defining our problems. We are talking about economy, about crowding of people and this and that, but we don’t seem to go any further. We are blaming the client, but they are not to be blamed because, to put it bluntly, we are all in a mess’ (Faraoui, 1980: 78). However, despite the strong relation he was trying to establish between architectural forms and society’s cycle of needs and rituals, one may ask: how could Fathy integrate his architecture into the social context and the community he designs for? In other words, is it simply possible to ‘redesign’ society by means of architectural forms and spatial patterns, and hence to revive traditional values?

Throughout Fathy’s career, some main principles can be identified from his theoretical works and expressed in his architectural designs, such as his belief in the primacy of human values in architecture, the importance of a universal rather than a limited approach, the use of appropriate technology, the need for socially-oriented, cooperative construction techniques, the essential role of tradition, and the re-establishment of a national cultural identity through the act of building (Steele, 1997: 16). Moreover, we can notice in Fathy’s thinking, according to Steele, some basics that integrate architecture and society: First, is the ‘privacy’ and seclusion which were integral parts of the reflection of tradition, social lifestyle, and being part of the Islamic world. Moreover, it was most important in residential
architecture where both the domains of family and guests are defined (Steele, 1997: 12). The second theme, is where Fathy regarded as ‘his thesis of space’, where he created a series of typological elements by studying Arab architecture in general and in Cairo in particular. He noted that the courtyard served as a temperature regulator as well as a filter of the dust from the polluted air in the city. In addition, he noted the Qa’a; the main reception room, flanked by two iwans. These elements were to become his main elements of design later. Steele writes ‘As adapted by Fathy, the Qa’a took on a new significance as a formal residential reception area, as he carefully began to scale down the high central tower of the Mamluk and Ottoman houses to allow it to fit contemporary domestic needs’ (Steele, 1997: 13). The third theme expresses the integration between man and nature, or the God-made environment. In his call for vernacular architecture, Fathy stresses the need for harmony between architectural work and the environment (Serageldin, 1985: 28).

Another bond appears in tradition as an integration between architecture and society, as he stresses the role of tradition with its link to society needs. Fathy argues that it is a natural reflection to social needs and requirements. He invokes an example from a village in India where, some villages were provided with running water though such innovation was not too popular. The young girls preferred to continue to go to the river to fill their heavy jars and to carry them upon their heads. This was the only way to go out and to be seen by the village’s young men. They knew that a long stay at home using tap water would surely mean not getting married (Maluenda, 1989: 35, Ed., 1994 33: 35). Fathy argues further that in order to eliminate an established tradition or rather replace it, we must ‘see how the rigid and outdated customs served a lot of unexpected and practical purposes (Maluenda, 1989: 35). Furthermore, he adds that no matter how trivial some traditions may seem, ‘it is necessary to provide other means that must be able to facilitate social compromises and communication, when a meaningful aspect of tradition is eliminated, that it becomes necessary to replace it with another one that satisfies the same social function’ (Fathy, 1991: 32). Following this review to Fathy’s ideas, let us look closely at the concepts of Rasem Badran with regard to these issues.

5. Rasem Badran

“You can see the methodology in the design progress of the Justice Palace Mosque that won the Agha Khan Prize. My intention was to create a building within the urban fabric that would provide spaces for social interaction and maintain an environment that is physically and socially indigenous. My second goal was to understand relevant values inherited from the past and the architectural precedents of place that reinforce these values. I wanted to take an innovative approach that would evoke the local culture without literally copying past forms. Human invention has always been a significant aspect of Islamic culture and, as far as I am concerned, invention within the framework of valid precedents is the essence of being contemporary” Rasem Badran (Steele, 1996: 52-53).

Rasem Badran is considered by many critics of contemporary Arab architecture to be a prominent architect for his active contributions across the Arab world. Bilal Hammad argues that ‘Badran] is one of the best of the new generation of architects in the Arab world. He has tried to make use of the traditional architecture of the area, perhaps the most significant aspect about his work is that he is the first architect to create a current of arguments and discussions about architecture, to throw people
into pro-Badran and anti-Badran camps' (Kultermann, 1991: 13).

Born in Jerusalem in 1945, Badran then went to a primary school in Ramallah and later in West Germany where he enrolled to study architecture and graduated in 1970. Upon his graduation he worked in Germany for two years, then returned to Jordan in 1973, where he established his practice in Amman. In an interview with Abu Hamdan, Badran states that he has adopted tradition in his designs since his return to Jordan in mid seventies (Abu Hamdan, 1987: 53). In addition to his practice, he is an active participant in many symposiums held at MIT and Harvard, as well as numerous lectures, seminars, and conferences across the Arab world, Europe and the States. To avoid a narrative biography, we are rather concerned next to throw light on three main theoretical issues about his works; his thought in terms of tradition and the vernacular, the form-function in his designs, and his general views on Arab and Islamic architecture which could be the broad determining parameters of his theoretical as well as professional frameworks.

5.1 Badran’s views on tradition and 'Islamic' architecture

Badran’s career witnessed over three decades a shift from a modern style to a traditional one, as during the days of his education in the late 1960s in West Germany he shifted his style radically from a modern western architecture to an architecture that, according to him, derives its roots from the heritage of the region (Abu Hamdan, 1987: 50). However, the roots of this inclination towards traditional architecture are thought to have strong influences during the days of his study as his graduation project was about the traditional urban development and the reconstruction of the old city of Kuwait (Fig. 3). In addition, the fact that his father Jamal Badran is a well-known artist in the field of Islamic ornament is said to have had an early influence upon him.

Examples of his early inclinations towards modern architecture can be seen in his project of the theatre of the future (Figure 2.3) in addition to some other works during this period that shows the influence of technology upon his designs (Fig. 3). The turning point was his visit to West Bank cities, Abu Hamdan writes: ‘it is believed that his visit to Jerusalem and Naples was the turning point of his architectural style, shaping his inclination to study and implement traditional concepts and forms in his designs' (Abu Hamdan, 1987: 50).

Fig. 3 Theatre of the future, reconstruction of Kuwait, and Housing in Germany. (After Abu Hamdan, 1987).

Perhaps Jordan and Amman -in which he based his practice- have little to offer as far as Islamic architecture is concerned compared to its neighbouring Arab cities like Cairo, Baghdad, Damascus or Jerusalem. Instead, Jordanian cities accommodated a mix of other roots that can be traced back to the earliest settlements in the region that, according to Hadidi, witnessed civilisations such as Canaanites, Egyptians, and Babylonians (Hadidi, 1985: 54). Perhaps one of the prevailing styles that can be ascribed to 'Islamic architecture' dates to the Ottoman period from the 16th century to 1916, which left few imprints upon mosque architecture in the old city of Amman. Hadidi notes that the movement of the Circassian community who took refuge in Jordan in the second half of the 19th century has left major imprints on the architectural scene in Jordan in terms of style and building methods (Hadidi, 1985: 54). In addition to that background Jordan has gone through dramatic changes in its architecture following the ‘invasion’ of modern theories of architecture and ‘international style’, as well as the rapid multiplication and spread of information via...
media. Such changes can be seen mostly in the city of Amman, and other cities, where a mixture of buildings ranging from small-scale houses to high-rise buildings of various functions and large housing projects of different architectural styles can be seen. Consequently, according to critics, a large part of the traditional architecture is lost and no real character can be identified nor does the built environment express the long cultural history of society (Kultermann, 1991, Abu Hamdan, 1987). Perhaps such a context had little to offer to Badran in his quest for conceptual thinking that can be said to be derived from tradition. Instead, and from personal experience (working with him), Badran looked beyond the geographical borders of Amman or Jordan. Hence, the spreading geography of the Arab world formed his inspiration for concepts, particularly cities with rich 'Islamic' heritage like Cairo, Baghdad, Aleppo, Naples, Tunis, Sana'a, Fez, Meknes and others. Kultermann notes that 'traditional Arab architecture was to be at the core of Badran's new concept inspite his studies and competition success in West Germany' (Kultermann, 1991: 13).

However, despite this seemingly direct shift from a modern hi-tech style to a traditional one, the look of Badran's projects over the three past decades reveal a continuous quest for a new outlook, material, forms and conceptual framework to accommodate the various requirements for his clients across the Arab world. The following chronological review reveals this clearly ranging from small villas, which formed the start of his career, to large multi-functional projects. Firstly, from mid sixties to early seventies he was exposed to the industrial and technological advances which reflected the level of modernity at the time. This effect is clear in his works during that period, such as the theatre of the future project in 1968, the graduation project dealing with the reconstruction of the old city of Kuwait, and the low cost housing competition in 1972 with other German architects utilising prefabricated material. Secondly, during the seventies, and upon his return to Amman, his works were mainly private villas. His approach, he argues, was rather aesthetic embracing factors such as climate and local materials without going into social and cultural factors (Abu Hamdan, 1987: 53). During that period, his designs reflected his rather obsession with forms, solids and voids and the use of traditional elements such as the courtyard. In this stage he practised locally and designed mainly houses. The houses designed during this period are: Khuri, Madi, Handal, and Hatahit (Fig 4).

Badran argues that his outlook defined the direction that he adopted in his work in not importing any European style despite being educated in Europe, neither a school of thought (Abu Hamdan, 1987: 52). However, Badran argues that he dealt with the design process as an extension of what he had started in Europe in respecting the environment with its socio-cultural, economic, and political forces, to find a basis for a comprehensive intellectual dialogue, by analysing the problems and diagnosing their causes, and by seeking solutions that stem from that environment itself. He goes on to explain that a vocabulary is then devised which translates into built form the changing aspects and the continuities of civilisation (Ibid.). Thirdly, during the eighties Badran has shown an inclination to deal with large scale urban projects. He participated in many national and international competitions which gave rise to his fame regionally and internationally. Such competitions include Al Al-Beit, the Grand Mosque of Baghdad (Fig. 5), and Kasr Al-Hokm in Riyadh. This stage of Badran's career could be considered as a turning point that shaped his theoretical ideas. Moreover, during this period Badran had the chance to be exposed to academic centres in the United States. He was nominated to participate in seminars, lectures and symposiums. Most importantly, critics noted, Badran in this stage started to focus his design strategy towards re-interpreting certain elements of traditional architecture in a contemporary forms by utilising new building materials, then decoding such elements and recomposing them (Kultermann, 1991: 14, Abu Hamdan, 1987, Al-Sayyed, 2001-a, 2001-b). Fourthly, during the nineties stage, Badran collaborated regionally with other leading architects, such as Dr. Abdel Halim Ibrahim Abdel-Halim, Dr. Mohammed Makiya, and other reputed international firms. This team work influenced his later works and shown maturity and innovation as far as themes are concerned. It also
reflected the use of new building materials and forms.

**Figure 4** Badran's earliest domestic designs. (Above) Madi and Handal villas in Amman.

**Fig. 5:** Model of Baghdad State Mosque competition by Badran. (After Abu Hamdan, 1987).

Badran argues that his career over thirty years reveals his tendency to utilize fragments of concepts derived from the local environment within broad cultural framework (Badran, 1988: 149). To Badran, cultural-bound architecture is an outcome of an 'attempt to address the question of how contemporary design practice can make use of the cultural heritage of a society and still meet the requirements of contemporary life' (Ibid.). Thus, Badran argues that the traditional architecture or what he calls the 'cultural heritage' is considered the authentic manifestation of the culture. This heritage is to be used as a reference and a source for architectural ideas and vocabularies (Ibid.). However, Badran's definition of such broad term as 'cultural heritage' which might stand for the entire Islamic culture needs further explanation as it is too vague to provide a well articulated position. It can stand for a national cultural identity, defined by political boundaries for countries, or to refer to certain climatic and geographical regions or trans-regions which could transcend or to be contained within political boundaries, like Bild Al-Sham, Wadi Al-Nil, the Gulf region and so forth.

However, Badran's selection of such 'cultural heritage' varies from one project to another. In Qasr Al-Hokm in Riyadh, for example, he chose local vernacular traditional architecture of Najd region as the main source for design references. His definition of 'cultural heritage', Khaled argues, seems to be bound to a local context of the design, particularly the Najd region (Khaled, 1989:21). However, Badran has concentrated on a more specific local region within the context of broad general one bounded by political boundaries, for example Badran argues that 'in this project [Qasr al-hokm] the design process was directed towards getting acquainted with the Saudi environment in general and Najd in particular' (Badran, 1987: 75). Badran reinforces the local contextual architecture as opposed to other 'rival' architectural positions, he writes 'The outcome stands in confrontation with foreign imported theories and ways of life that brought the Arab into isolation within his own surroundings' (Badran, 1987: 82). Badran also became more interested in Arab village architecture, yet a sense of nostalgia to certain spaces and forms is what he refers to. This is very clear from an extract of an interview with him by a journalist from Amman, who writes: To Badran, the Arab village is the core theme of Amman. He tried to incorporate the village concept into his later houses. The old Arab village atmosphere is clearly apparent in the irregular outer contours of his designs: the multiple levels, the narrow twisting pathways to the entrances, the internal patios, the
garden ingrowths, and above all the closed-outer/airy-inner concept' (Mai, 1979).

It is evident from this and other statement as well as my personal experience working with him, that Badran tends, on a conceptual level, to utilise urban broad concepts in such small limited architectural schemes. In other words, he tends to superimpose organic elements often found in Arab cities upon small projects, particularly the house. In a nutshell, Badran utilises in his conceptual designs elements of the Arab city such as the mosque, the market, the main Qasabah - street- or the idea of a neighbourhood as precedents in his buildings and often makes an analogy between the morphology of urban large scale projects and the morphology of buildings such as the house. Such a strategy of design adopted by Badran provokes this question: To which extent can this nostalgia to elements of Arab city be legitimate in the sense that functions are not actually compromised in favour of forms? This leads us to the issue of form versus function in Badran's thought.

5.2 The form versus function in Badran's conceptual thought

Part of the answer, it seems, can be investigated within Badran's theoretical framework while the other part can be concluded by looking closely at his works. We will try next to investigate the theoretical part of the answer by throwing light upon the relation between form and function and how it is thought of in Badran's designs, and most importantly to understand the extent to which space has, or has not, a key role in his conceptual thinking.

Available research and studies that focused upon Badran's work and his conceptual thinking, were conducted by scholars and critics, like James Steele throughout his articles on Badran and his most recent book The Architecture of Rasem Badran, Asfour or scholars at MIT such as Mohammed Khaled or Yaser Saqr. These studies reveal a tendency to find a 'claimed' link between Badran's 'style' of architecture and Arabic Islamic or traditional architecture as precedent(s) to his designs. Such a tendency is greatly influenced by Badran's continuing references to such a vast architectural heritage within the Arab Muslim world of architecture. This in turn has laid a 'trap' for such studies to get involved in no more that pursuing such claims on an elementary level of architectural style or vocabulary, offsetting a more deep rigorous investigation on the level of the overall spatial composition. In other words, none of these studies examined space as a key issue of investigation in such a way as to examine the spatial qualities of his designs in difference to their claimed historical precedents. Instead, to my knowledge and as available data betray, all these studies concluded by giving Badran sufficient credit for his ability to interpret, and to a certain degree, transform elements of traditional architecture into contemporary forms. This is evident in Steel's most recent book on Badran published in 2005. In chapter three of the book under the title 'Houses and Housing', Steele reviews no more than a chronology to his remarkable house and housing designs with comments on the geometry of the houses. Steele argues that Badran's two houses of Khouri and Madi present what he defines as 'shifted grid-like module' by utilizing a diagonal sequence of entrance spaces betraying, Steele argues, Badran's cultural layering of traditional thinking and his western education (Steele, 2005: 49). To a great disappointment, this is the most that the chapter offers as far as deep analytical thinking is concerned to understand beyond the physical geometrical composition in Badran's designs. For this, the following review of studies and research from the record offer very little towards a coherent convincing answer, leaving a heavy task upon the empirical research. However, it is the aim in this section to preview critics' ideas and Badran's statements to better understand the relation between form and function within his conceptual thinking.

Within the context of defining certain forms as precedents for contemporary design, writers are found divided on the issue and the extent to which Badran's approach is rationally balanced between the use of precedents within their contextual meaning and literal obsession with images. For example, Steele argues that Badran in his approach makes a strong link between forms and their
cultural attachments to look at historical examples and attempts to understand the socio-cultural forces behind topology by using his extraordinary artistic ability to study these principles graphically, and to assimilate them in a kind of visual and tactile osmosis that transmutes a particular historical context into a living part of his architecture (Steele, 1991: 43). On the other hand, critics of Badran's approach to design such as Asfour refer to Badran's approach as a mixture of historical examples at the level of principles, and the use of them at a level of imagery. He argues that Badran 'treats extrapolated principles and visual icons equally, though the criterion with which he validates components from either approach is rational thought' (Asfour, 1990: 72-74).

Many of Badran's designs are evidence of such an approach in which Badran draws on aspects or vocabulary from the local environment to reflect a rather visually-pleasing harmony between forms, natural colours, and material. The design of Qatar Museum in 1997, or Waadi Abu Jamil housing in Beirut in 2002 and many others are clear examples. The jury committee credited Badran's winning-design of Qatar Museum for being 'based on research into the local built environment': 'while using contemporary architectural language. The committee based the decision to award him the prize upon the fact that: 'Badran succeeded in creating an urban image which reflects the city's history. The fragmentation of volumes and multiple accesses from the existing city's fabric has produced an interesting humane environment....' (Editors, 1998: 28). Again, such criteria for criticism and the understanding of Badran's thinking through his designs seems to reflect no more than personal judgment or rather 'visual' comparison with precedents from the traditional city or the local environment.

However, contrary to these rather sophisticated analyses by critics, Badran's approach to designs betrays a more simplistic, and to a certain degree, humble if not superficial approach. Ironically, Badran himself defines this superficial approach to design that lacks any real mentioning of deep rigorous method of placing space or spatial qualities inherited from the past in his contemporary compositions. Whether it is the case that he subconsciously depicts similar spatial compositions as in traditional precedents or it is a matter of coincidence while portraying visual images from the past, this should be verified and analysed. But the theoretical review of Badran's thinking does not seem to provide a strong clue to such a tendency or a strong theoretical background.

To sustain the above rather bold conclusion about Badran's simple or visually- oriented approach, which will eventually throw him into the 'form'- oriented camp which sacrifices function, we will review next some evidence for this. Badran, when referring to the influential factors upon his designs, argues that 'during the 1970s, his approach was centered on physical environment factors (i.e. constant elements such as climate, material and the physical nature of the site) (Abu Hamdan, 1987: 67). Within this context, Badran's approach to design, as various studies have shown, depends greatly upon utilising elements to do with the environment or vocabulary that prevailed in traditional architecture, while offsetting anything to do with spatial qualities that an architect can utilise in his designs intentionally.

It is common indeed among traditionalists to adhere to such a reference to historical precedents in contemporary designs to invoke the past as a strong legitimate living evidence of their use of forms or vocabulary, but that often can hardly be separated from the risk of undermining 'function'. This reference may, in some cases, be used to express regionality rather than local architecture only, hence giving rise to such broad terms as 'Islamic architecture' with the dangers that such a usage entails if utilised accidentally or even consciously. This is eventually a return back to square one and the debate and controversy such a term causes. Badran sometimes shows this tendency to use rather broad regional elements and refers to Islamic architecture, but in other cases doesn't. However, this is a common trap for an architect who wishes to design for Islamic societies. For example, Badran adhered to this strategy in some competitions like the competition of the headquarters of Arab capital cities in Jeddah.
in which I was involved during early 1990s while working with Badran. In this competition, Badran refers to a vast number of vocabulary across the Arab world to reflect these elements in a rather medium complex of buildings. That often wins him the benefit of adhering to Islamic architecture as a style and wins him competitions, but does not contribute much to a rather rigorous theoretical framework that distances him from such problematic broad terms as Islamic architecture being taken accidentally. In some other cases, Badran prefers to stay local, while his opponents in competitions go regional. Mohammed Khaled in his thesis at MIT 'The use of precedents in Contemporary Arab Architecture: The case of Rasem Badran and Henning Larsen' in 1989 looks critically at Badran's works in difference to Henning Larsen's Ministry of Foreign affairs in Riyadh and examines both architects' employment of historic precedents in their contemporary designs. In this study Khaled argues that while Badran adhered to utilising local Iraqi architecture in his design of the Grand Palace in Baghdad, and to the local Najdi architecture for the design of Qasr Al-Hokm in Riyadh, Henning Larsen, contrary to Badran, referred to the vast 'Islamic tradition' in Isfahan-Iran, Aleppo, Istanbul, India and Spain reflecting Mugol monuments, vernacular architecture, fortresses, bazaars, urban complexes and general references (Khaled, 1989). In other cases, Badran's laborious research into local architecture to extract guidelines for his conceptual design on the level of precedents leads him to the over-use of certain formal elements. For example, when Yaser Sakr, in his Masters thesis at MIT in 1987 'The Mosque Between Tradition and Modernity: A study of Recent Designs of Mosque architecture in the Muslim world', examined Badran's attempts in the Grand mosque of Baghdad in comparison to Venturie's entry for the competition held in 1982, he concluded that Badran evokes local Iraqi historical precedents as much as the Ziggurat in constructing the form of the grand mosque ending with employing an overwhelming huge cubic units in his design (Sakr, 1987: 33).

Evidence of Badran's simplistic approach is notable in his definitions of his design strategy, Badran writes: 'when we began our work we had little knowledge of the architectural heritage of Iraq. Our familiarity with it was more or less limited to the structures such as Mesopotamian Ziggurat and Abbasid monuments, the client was helpful in introducing us to examples of the Iraqi Islamic heritage' (Badran, 1988: 152). Moreover, he defines his approach to design and refers to spatial qualities reflected upon his designs, he writes 'To define the space, we studied examples of traditional mosques to discover the various ways they were devised to accommodate a large number of worshippers, though traditional forms were often used, they were modified to meet contemporary requirements and to convey fresh meanings' (Badran, 1988: 153).

It is often the case that despite such a simplistic approach, this still helped Badran to supersede other contestants who showed little sensitivity in dealing with the local or even broad concepts like 'Islamic architecture'. In other words, Badran's attempt to reconcile between borrowing traditional forms from the local environment and adapting them to meet the needs of the new multi-cultural centre in the centre of Baghdad has given him great credit and reputation, in difference to other contestants who were heavily criticized. Oleg Grabar in 'From Past into the future: On two Designs for State Mosque’ in 1984 and Sakr in his thesis greatly criticised Venturie's borrowing for the huge dome that he placed, in an unprecedented and bizarre way, upon the courtyard of the mosque marking a rather obsession with an icon, let alone the misuse of the ornaments in a 'cut and paste' way in the prayer hall indicating superficial references to elements of traditional architecture (Grabar, 1984: 150, Sakr, 1987, Chadirji, 1984: 50).

On another level, Badran's constant shift from an early western style he started in Germany to a traditional one, betrays his inclination to formalistic architecture. Steele argues that what he calls 'an anti-grid' phenomenon, in which Badran's avoidance of using rigid grid system, is an indication of Badran's West (Germany)- East (Arabic architecture) shift (Steel, 2005: 49). However, that does not provide strong supporting
evidence for a comprehensive design strategy that derives its core concepts from the spatial composition of the precedents. For this, Badran's domestic architecture, in the early seventies, reflected either a western image using pitched roofs and imported architectural vocabulary derived from classical or modern international architecture, which neither reflected the existing traditional architecture of Amman city, nor the inherited traditional architecture of other surrounding cities such as Salt traditional city. This is contrary to some claims by some critics like Abu Hamdan that Badran attempted at introducing a new concept of domestic architecture in which he strove to reflect society needs in contemporary images derived from Jordanian built environment (Abu Hamdan, 1987: 64). Moreover, some of Badran's statements in this context offer little to understand a coherent strategy. Instead, they betray a rather constant quest for an approach that seeks legitimacy from traditional values while appreciating a modern touch with occasional reference to space or society. For example, Badran argues that Islamic morality played a big role in the past by separating the home environment and its owner's social status from the street environment, which belongs to all social classes. Moral codes also emphasised the importance of the interior space of the house which should satisfy the owner's physical and psychological needs (Abu Hamdan, 1987: 61-67).

On domestic architecture in particular, Badran's approach was formulated when he was commissioned to design for a few friends. In these houses, Abu Hamdan suggests, Badran tried to achieve an integrated unity between the open and closed masses (Abu Hamdan, 1987: 61). According to Abu Hamdan, historical and analytical research which Badran had conducted prior to his designs has had an influence on the development of design in relation to social habits and traditions. Badran claims that the simplicity of treatment of this internal/external relationship was apparent in the Khorma residence and brought out the characteristics of the inner court, its uses and its connection with the street. The Izz Eddin residence, Badran claims, redefines this space and provided the desired privacy (Abu Hamdan, 1987: 65). The Khorma house involves the effect of the outside surface on social behaviour and the creation of a human environment that is sympathetic to the class distinction that exists in society (Abu Hamdan, 1987: 65). Therefore, Badran argues that it is easy to compare the work of the 1970s with that of the 1980s. The Qattan Residence (1983-1985) for example, Badran claims, illustrates the development of interior space in a way that is a continuation of the enclosed volume of the Madi Residence (1974-1975), which itself is a development of the Khuri Residence (Abu Hamdan, 1987: 61-67). The Hatahit Residence, however, built in 1979-1982, reaffirms the importance of the relationship between the inner space and the external environment, a concept which started with the Handal residence built in 1975 and then was pursued with the Marto residence in 1982 (Abu Hamdan, 1987: 64).

It is quite often the case to come across statements and arguments by critics that are not supported by evidence. Kultermann, for example comments on Badran's approach to design houses, and that Badran managed to reflect an Islamic way of life, but one finds it hard to accept the statement based upon form or style. Kultermann writes: 'of greatest significance for the development of contemporary Jordanian architecture are the two houses [Madi and Handal, my emphasis] Badran built in the period 1974-1981; both are symbols for a mature Arab architecture of our time' (Kultermann, 1991: 13). Moreover, Kultermann continues: 'We also find Badran's approach to domestic architecture in large scale projects such as the housing estate of Abu Guwileh and Queen Alia housing project, best described as: 'a new concept of contemporary Arab housing which is in harmony with the old Islamic tradition, and where a cluster of houses are combined into a comprehensive unit interconnecting building and street and open and enclosed spaces' (Kultermann, 1991: 14). Kultermann adds: 'In this project Badran expressed the neighbourhood as the nucleus of the city articulated in a new and independent form. Kultermann describes Badran's general approach to housing design: The architectural and urbanistic importance of Badran's approach cannot be
overestimated as it touches on the very essence of the Islamic way of life' (Ibid.).

This review produced an initial idea on the way Badran generates his conceptual thinking, which is derived from a vast range of vocabulary inherited from the traditional heritage. However, what Badran's strategy seems to lack on a fundamental level, is a plausible evidence that it is deeply associated with precedents on a spatio-functional level. However, further research is needed to look closely at his works in more depth.

6. Conclusion: Sign posting work for further research

Following this review of the views and arguments on form versus function and the close study to both architects' theoretical framework, it is essential to assert certain points in way of sign posting for directions for further research. First of all, this theoretical introduction of ideas, concepts, and strategies of design by Fathy and Badran is a first step towards further addressing the research questions in this subject, to test the extent to which claims made by contemporary architects have legitimate roots from the past. However, the question specifically investigates the deeper level of spatial organisation and the way functions are integrated in the forms used in difference to a traditional precedent often claimed by such traditional architects to be the conceptual mentor for their works and designs.

Against this, the following investigation should turn to understand the extent to which current available research has the succeeded in understanding the vernacular in search for a methodology to better interpret its deep rooted principles that meet contemporary needs. Most important is it to seek a methodical approach and a theoretical framework to extract hidden meanings and architects’ intentions embedded in physical forms and structure.

As much as the previous review has accounted for the subject of form versus function we will aim in the a forthcoming research to bring to the front stage a no less important subject to the core of this subject and the problematic issues in 'Islamic architecture' within the realm of space; that is its vernacular more popular non-monumental side. In addition, the studies in the record will be reviewed to explore the extent to which they could investigate and extract spatial themes inherited in forms. Moreover, the theoretical review of both architects is the backbone for the theoretical investigation in further research where aim to further compare both architects' thought with similar international writings on the vernacular.

References


Montequin, F., (1983)’The Essence of Urban Existence in the World of Islam’, Selected papers from the symposium held at King Faisal
University, Dammam on ‘Islamic Architecture and Urbanism’, edited by Aydin Germen.


Notes


3 The problem can be seen clearly when a building types with no counterpart in traditional architecture, like multi-storey, multi-functional buildings, banks, hospitals, airports, and factories, etc. These building form a challenge to contemporary architects and traditional architecture if the analysis is conducted on the level of forms.

4 For more on Lakato's theory and its adaptation as architecture research programme see Anderson's article published in Design Studies, volume 3 July 1984 pp 146-150.