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**Sustainable Architecture in  
Rapidly developing Gulf Cities:  
A Search for Identity**

**Mohamed El Amrousi  
Assistant Professor  
Abu Dhabi University  
United Arab Emirates**

**Sadeka Shakour  
Assistant Professor  
Abu Dhabi University  
United Arab Emirates**

Athens Institute for Education and Research  
8 Valaoritou Street, Kolonaki, 10671 Athens, Greece  
Tel: + 30 210 3634210 Fax: + 30 210 3634209  
Email: [info@atiner.gr](mailto:info@atiner.gr) URL: [www.atiner.gr](http://www.atiner.gr)  
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President  
Athens Institute for Education and Research

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## **Sustainable Architecture in Rapidly developing Gulf Cities: A Search for Identity**

**Mohamed El Amrousi**  
**Assistant Professor**  
**Abu Dhabi University**  
**United Arab Emirates**

**Sadeka Shakour**  
**Assistant Professor**  
**Abu Dhabi University**  
**United Arab Emirates**

### **Abstract**

Rapid urbanization in Gulf cities has resulted in reducing the link between built environments and urban identities. However, in the last decade increased awareness towards sustainability, culture and identity have become drivers to rethink urban strategies. Public pressure has fostered policies on environmental and sustainable guidelines to re-shape architecture and urban fabrics. These experiences are evident in rapidly evolving modern Arab cities such as Abu Dhabi and Doha. Forms and fragments of Arab/Islamic architectural vocabularies are re-interpreted on contemporary buildings. For example perforated screens as enveloping skins have become more visible as actors in redefining building identity. Traditionally carved screens have been used to cover openings to control entry of light and glare in buildings around the Islamic world, and their designs have become iconic references to collective identities. Innovative styles and trends in architecture are set by renowned international architects emerge in modern Gulf cities as envisioned traditional forms in contemporary contexts. They also represent forms of Arab architecture and attempts of exploration for the study of new forms and selected segments tradition. This paper addresses the designs of emerging architecture in Doha and Abu Dhabi and their interpretation of identity through building skins that build on a broader spectrum of Islamic forms.

**Key words:** Gulf Heritage, Doha, Abu Dhabi, Contemporary Arab Architecture.

**Corresponding Author:**

## Introduction

Emerging Gulf state cities such as Doha and Abu Dhabi have begun, and continue to realize, an ambitious program of construction developments of iconic nature that aim to serve a larger economic agenda by increasing demand for investments in the real-estate sector, and a secondary agenda that serves the creation of a distinct Arab/Islamic identity. Through the construction of neo-heritage projects such as Msheireb in Doha, the new Central Market and Masdar in Abu Dhabi this image is juxtaposed against a previous 'modernist' image represented by unified high-rise blocks formulated by Abu Dhabi's grid pattern. The melancholic urban image of the 1970s and 80s shaped by generic prefabricated concrete structures, is being replaced by glass towers veiled with 'neo-Islamic' screens. The image of the city as particular image of Arab Muslim modernity, a modern multi-ethnic Arab City that is different from other global cities, a strategic aspect of the place branding process to market the city as a desirable destination. There is no doubt that today the Arab world, and especially Gulf State cities are becoming urban, at diverse rates and with comparable characteristics. Accordingly, the capital city becomes the national center of finance and is perhaps more connected to world outside that to its peripheries, other cities and rural areas become a liability. (Malkawi, 2008)

Doha's West Bay area, and Abu Dhabi's Reem Islands along with other shorefront developments represent a different image a re-emergence of architectural form as a driver of the real-estate sector after the 2008 economic crises. Projects such as the Masdar, the new Central Market, the Desert Louvre, the Guggenheim in Abu Dhabi, and Msheireb, the Museum of Islamic Art in Doha all designed by star architects brand the new image of emerging Arab cities on the world map to become similar poles of economic attraction for investors similar to Singapore and Malaysia. Here the image of Gulf State cities is constructed intentionally to announce a new era of prosperity, dreamscapes of hope engendered by global visibility. Oxford Business Group's latest report on Abu Dhabi notes that public construction projects, in particular, 'have been, and are likely to remain a key driver of the economy as a whole' (Oxford Business Group 2013: 199). As King outlines, emerging buildings represent the notion of global competition, and mark a new universalism that is derived from much more than their sign-value, residing in large part in their physicality and craft preserved in the rare expertise of the trained craftsmen assembled to re-manifest them. There seems to be an obvious determination to experiment with a sense of newness, in an attempt to brand a modern through the production of built heritage, and consolidating place identity in a post-modern, multi-ethnic and multi-cultural global society. (Gospodini, 2004)

Mega projects in Doha and Abu Dhabi aim to revive cultural values and create new designs through designs that address cultural identity and reinterpret traditions to create modern Arab/Islamic identities. *Mashrabiyya* perforated screens have been used in the past to obscure vision of the private sections of

vernacular urban enclaves. In addition they created a cooling mechanism through the creation of an air draft in connection with wind-catchers and courtyards. The vacuum of historical built fabric provoked buildings of global forms to emerge with little original reference to formal Islamic Architecture. (Damluji, 2006) Today modern screen has moved beyond the confinements of traditional use, only to assume a new role as iconic veils that drape modern skyscrapers to sustain local identity within rapidly developing cities. Glass facades founding on Mies van der Rohe's modernist theology are now being reinvented through 'Islamic' screens to manifest a State vision of the importance of preserving/sustaining local culture in a rapidly homogenizing world. The grammar of ornament of contemporary screens made of metal, wood or GRC is re-introduced to the Gulf community by star architects via their mega projects that exhibit an array of patterns from a broad spectrum of Islamic heritage that ranges from India to Moorish Hispanic Spain. Thereby modern screens on high-rise towers in Abu Dhabi and Doha not only construct a new urban identity but also partake a new role to manifest cultural/sensitivity and awareness to the surrounding hot arid environment. A new challenge is presented to architects in the Gulf region, that being the monstrous scale of new projects and merger of corporations such as Aldar and Sorouh real-estate in order to meet the challenges of rapid urban development in the Gulf. In a similar but directly connected the mega *mashrabiyya* screen is emerging as part of the mechanism, and in the process local heritage is overshadowed in favor of contemporary interpretations of the image of the modern city.

### **The Modern Arab City-Challenges of Rapid Modernization**

There is increasing concern about form and the construction of identity in emerging Gulf state cities, facades new buildings clad with contemporary screens serve two purposes. They reduce the effect of architectural modernism because they have linages to Muslim pasts one and promote the image of the city as one concerned with sustainability not just oil rich rapid urban developments. The range of variation in patterns from which screens were constructed historically and their effects on Islamic architecture achieved through the variation of light screens has been extraordinary, the tombs of I'timad ad-Dawla 1628 and Saleem Chisti 1580 in Mughal India, the Ali Qapu Palace in Isfahan in the 17th century, Beit el-Sehemi in Cairo and Alhambra in Spain all manifest an array of *mashrabiyya* screens with different materials, shapes and scales. (Dalu, 1978) These historic antecedents represent a rich vocabulary for contemporary architects to chose, interpret and produce new patterns. In the Gulf screens carved from stucco existed on a limited scale in traditional buildings in Al-Ain city and Dalma Island, in the form of adobe architecture penetrated with blind round headed arches decorated with stucco grills in different geometrical designs. (King, 2006). Their gradual integration in modern architecture can be seen in the design of the Cultural Foundation completed in 1981, designed by TAC of Cambridge Massachusetts and the

Sheikh Seif building were designers attempted to create an Arab/Islamic identity based on projecting parts of the façade and applying GRC panels and screens. (Figure 1) The difference in generations of buildings, materials and design methodology is evident in the juxtaposition of the Sheikh Saif bin Muhammad bin Butti building and contemporary icons emerging in Abu Dhabi.

**Figure 1.** *Sheikh Seif Building Abu Dhabi*



In the past decade the use of screens on high-rise buildings in Abu Dhabi as seen in Al-Bahar Towers (Figure 2) designed by Aedas Architects exemplifies the *mashrabiyya* screen in its new era. A representation of experimentation with triangular and hexeract orthographic projections and the use of mechanical systems and sensors shifts the static screen to another era. One that is of powerful visual impact on its surrounding environment because of its scale and new context initiated by Jean Nouvel's *mashrabiyya* screen of the *Institut du Monde Arabe* (1988), a mechanical veil that covers the whole façade opening and closing according to sensors tracking the sun path. Al-Bahar Towers' screens operate as a curtain wall, sitting two meters outside the buildings' exterior on an independent frame. Each triangle is coated with fiberglass and programmed to respond to the movement of the sun as a way to reduce solar gain and glare. To be highlighted here is to what extent is such a system sustainable and does the screen façade appear either too big or too small for its buildings. Initially, the *mashrabiyya* was designed to enable control of internal environments, and to maximize potential for natural ventilation, however, the *mashrabiyya* did not constitute the whole of the building, solid walls, small windows, terraces and wooden pergolas were all part of a design composition which architects worked hard to balance.

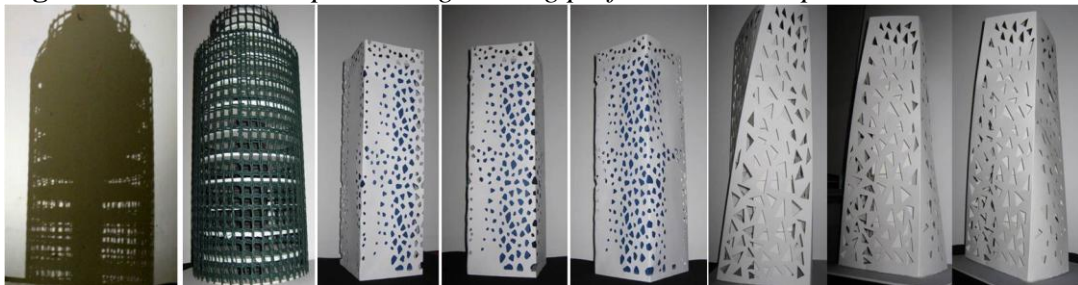


**Figure 2.** *Al-Bahar Towers Abu Dhabi*

In the past careful attention was paid to the location and size of windows in order to regulate the circulation of air through buildings and the entry of sun. This is evident in the placement of openings in the walls bordering courtyards, in allowing for cross ventilation and in the use of high-level windows to let the hot air out. (El Demery) Architectural theories developed a wide range of scholarly attention ranging from Le Corbusier's Assembly Building in Chandigarh in India which manifests a *Brise Soleil* as fixed shading system that is unreflective of the interior spaces and detached from the body of the building, in contrast to Hasan Fathy's nostalgic attempt to create a national style based on adobe vaults, domes and arches in new Gournia Village which was equally criticized for its lack of socio-cultural adherence societal changes at the time. Nonetheless, both represented honest attempts to resolve the problem of the modernist glass buildings and their suitability or lack thereof to the surrounding environment. Today, the balance of solid and void, and theoretical debates associated with it, is being replaced by a quilt of gridded based on the assumption that the most basic unit of design is a point, a plane or a line that can be integrated most easily into modern buildings as a fragment, a whole or a collage. (Schumacher, 2010) Emerging 'sustainable' practices in the Gulf involves challenging previous design cultures and germinating radical ideas. (Gurel, 2010) Iconic projects such as Al-Bahar Towers are modern representations of the city's urban developmental direction, rather than projects that stem from a purely sustainable agenda based on environmental considerations. Recent avant-garde architecture has multiple roles as seen in the Petronas towers whose design consciously draws on modern Islamic motives in order to construct a new image of Malaysian nation state as a modern/sound economic entity. (King, 2004) Following along those lines the double skin façade is getting more and more attention as it provides many possibilities for creating cultural icons and partially adhering to the conditions of Gulf state cities. Students studying architecture are strongly affected by their surrounding building environments, and emerging projects that avail on the internet shape many of their designs. In a theory of architecture class a group of 16 students were required to create skyscrapers both digitally and through simple physical models as part of hands on education project. The students were grouped in two's each group creating a design and providing supporting

evidence for their choice. Most projects produced a contemporary form and clad it with a form of screen testing the shades and shadows it produced. (Figure 3) The experiment generated a lot of discussion in class and highlighted that student architects no longer address a high-rise building as a sequence of floors which have diverse designs constituted of windows, balconies and solid walls, rather the building is addressed as a singular vertical unit covered with perforated skin. To the contemporary architect trying to transform a style from an international indiscrete form to an iconic one, borrowed typologies offer a solution that can be integrated most easily into modern buildings as a fragment in a collage. (Schumacher, 2010) Facades of newly constructed heritage are punctuated in colorful and geometric decorations within the traditional reinterpretation in the architecture around the square. The use of screens as vertical veils in different patterns replace applied ornament and transform the whole building into one big ornament. This is coupled with the introduction of new forms that are to construct a new heritage, and signify wealth, in the Arab city announcing its emergence as a global competitor. Here the reflections of star architects and emerging mega projects was evident, the trend of using screens on a massive scale to construct an Arab identity and adhere to environmental design was dominant.

**Figure 3.** *Student conceptual designs using perforated screen patterns*



### **Abu Dhabi Central Market-The Souq**

Abu Dhabi's new Central Market by Norman Foster can be viewed as a regional trend to experiment with traditional forms with an Arab Islamic lineage within new mediums such as GRC gridded screens. (Figure 4) The 1.3 billion dirham project that covers an area of 60,000sqm is yet another project that follows the same tradition of constructing heritage. The extensive use of perforated screens in the Abu Dhabi Central Market allows filtered daylight from above to illuminate the trafficked space which expands at the ground floor by the loping internal walls. Like a patchwork quilt of gridded modules of varying height, the scheme is a highly articulated composition that bridges and unifies light and shade thereby creating strong contrasts of planes and textures (Dalu, 1978) The *Souq's* screens included designs organized according to the rules of regular geometry, and the relatively ambiguous term arabesque. Their patterns were organized according to rectilinear grids, in which

derivatives play a prominent role. (Al-Asad, 1994) The historic covered *Souq/Bazaar* developed a variety of forms, one of which is the Khan or Caravanserai, as a space of accommodation, interaction and exchange along ancient trade routes. The mega project has replaced the old market space with its cheap goods, and socio-cultural aspects with offerings of traditional crafts and spices within a space that caters to a certain social group that overplayed an Indo/Pakistani space of consumption and exchange. (ElSheshtawy, 2008)

**Figure 4.** *Abu Dhabi Central Market Screens*



The new market illustrates through its enormity the vision of Abu Dhabi to represent itself as that capital of luxurious state and maintain its links to an Arab Islamic heritage. The massive exhibition of screens is manifested on the exterior and interior of the Abu Dhabi Market and offers a sense of enclosure through the creation of dark interiors. The labyrinth narrow walkways and uniformity of ornaments subtly applied construct the identity of the *Souq*, and traverse beyond façade architecture. Here lived space is reconstructed as a means of establishing and consolidating place identity in a post-modern, multi-ethnic and multi-cultural society. Today a new social class enjoys the Shakespeare Café, a variety of restaurants within a dominant Arab Khan like mystical space created through abstract screens and colored glass panels that simulate traditional shading devices-*mashrabiyya* and stucco windows that existed in Khans and Caravansaries. The combination of the spatial reproduction and re-enactment of narratives, seeks to create an image of national identity and socio-cultural cohesion that serves to repackage the image of many cities in the Gulf that aim to emerge on the world map. Heritage construction here did not necessarily adhere to the actual site. Therefore design elements such as the textured assemblage of intertwining pathways and abstract vernacular boxes highlight the multi-ethnic community in Gulf cities regardless of the confinements of localization.

### **Masdar City**

Designed by Foster + Partners the giant initiative was to cover six million square meters. Masdar a 22 billion Dirham project was an attempt to create a sustainable city that relies on the creation of a large photovoltaic power plant



using the sun to create energy, and perforated screens to construct an identity for the project. Jean-Marc Castera's Islamic designs applied the perforated screens in Masdar city highlight the idea of creating an Arab identity through a morphogenetic process that uses digitization in the creation of patterns fitted in predictable/symmetrical and unpredictable/asymmetrical ways to offer new patterns through interlacing projections best seen on the GRC screens of residences in Masdar city. Masdar's screens unlike interlocking tiles on a floor when used on perforated screen offers a 3D pattern that interplays with shade and shadow producing according the time of day a diversity of morphed and unpredictable patterns. Here a connection is made between the geometries of ceramic tiles, perforated screens can be revived and an argument can be constructed that Islamic art during the Moorish Hispanic era—Qasr Alhambra in the western Islamic World and the Safavid/Mughal decorative agendas went beyond the two dimensional flatness as claimed by many to a three dimensional realm. Jean Marc Castera describes his patterns in Masdar as an interplay of pentatonic patterns (five-fold) fashionable in central Asian; Persian, early Ottoman tile-work. (Figure 4)

**Figure 4.** *Masdar City: metal, wood and GRC Screens*



Currently through fragmentation and computerized amalgamation the geometries of tile work can be integrated to create new patterns for perforated screens, founding on a wide spectrum of patterns, and motifs. In the case of the perforated screen of Masdar they highlight a new era of contemporary architecture that is moving beyond the tradition, linking neo Islamic architecture, still in its formative stages to Arab/Islamic lineages beyond the constraints of regionalism. Since the project displays features of sustainable architecture such as perforated façades made of glass-reinforced concrete colored with local sand and detailed with patterns commonly found in traditional architecture in throughout the Arab World. Central to Masdar Institute's courtyard is a contemporary re-interpretation of the traditional wind tower, known as the *barjeel*, which is designed to bring cooling breezes down to ground level. The wind tower is located in the central courtyard, rising 45m above the podium, this modern interpretation of tradition has been transformed into an iconic landmark, despite the water sprinklers installed at the top of the modern *barjeel* it does not function as a wind tower. The future of Masdar as a complete/sustainably remains ambiguous, however it does serve its education

purpose to promote awareness to a broader public with respect to the need to preserve existing energy resources. (Taylor, 2009)

### **Downtown Doha-Msheireb**

The Msheireb project in Doha promoted by Sheikha Moza Bint Naser, follows in the footsteps of Masdar city yet on a much larger scale. The project replaces rundown shops and houses constructed in the 1970's with a more upscale, and cohesive fabric. An attempt to revive the downtown area after local families abandoned it in favor of suburban living. The project aims to familiarize its community with a great spectrum of sustainable concepts, including sustainable behavior and living, environmentally, culturally and socially responsible design, adaptive reuse and revitalization of old buildings in relation to an urban context. (Gurel, 2010) In Msheireb a modern version of the perforated screen—*mashrabiyya* applied to new forms, and highlight the importance of tradition through the use of modern materials and simplified patterns and forms. Msheireb's scale is exceptionally large in comparison to similar projects in the region, it reconstructs the heritage of a 31 acre area, based on a set of objectives that promote a more sustainable way of living within a compact city framework, and the recreation of a new Qatari downtown are that projects a specific image of wealth and tradition. Through the creation of a public transport system, integrated social interaction between Qataris and expatriate workers is to be encouraged. (Law & Underwood, 2012)

As Anthony King outlines, such buildings represent the notion of global competition, and marking a new universalism that is achieved through forms of displacement, selective inclusions, exclusions and classifications. (King, 2004) Given the duality of newly constructed heritage here the Qatari State reassures its community that Arab space and heritage remains unaffected by global socio-cultural changes. The new image of Doha is constructed through the mix of narrow shaded pathways that create a memory of a bygone era when the bazaar acted as a space of interaction, these pathways are connected to larger public spaces that allow the visitor to experience social space through high end cafes and restaurants. Modern courtyard houses are constructed to further accentuate the importance of heritage and modernity and blocks 3–5-storey create visually cohesive urban complexes, that have comfortable interiors clad with Islamic ornaments namely perforated screen known as *Jalis* or *mashrabiyyas* depending on their origin and materials used. (Law & Underwood, 2012) Msheireb addresses major trends of global concern, sustainable development, inter-generational equity, basic principles of sustainability, unsustainable activities, how to measure sustainability, concepts such as the ecological footprint and life-cycle analysis (LCA), as well as socio-cultural concerns and the reuse and redevelopment of a building in its connection to the environment. (Gurel, 2010)

In the process of the construction of the new quarter in the city center spaces are ‘transported’ and replaced by places, Msheireb is part of the construction process of mega projects to enforce the image of Qatar as an emerging political player in the Arab World especially after the Arab Spring where traditional cities such as Cairo, Damascus and Beirut can no longer act as centers of attraction especially for investment. Through this perception of a modern Arab city that adheres to a larger perception of cultural renewal, socio-cultural integration, and support of a sustainable environment a new Qatari image socio-cultural space is branded. Traditional patterns are understood as a set of motifs and relationships among them. In formal sense, this understanding corresponds to view a star pattern in terms of vocabulary of star motifs in the artifact, along with transformations rules between them. A variety of patterns are integrated in the design of the high-end structures of Msheireb. Islamic patterns, represented by molded stucco, interlocking marble, and perforated screen represent modern interpretations for providing traditional appearance to the hotel like buildings, traditional latticed screens with patterns are used as a fundamental resource to archive decorative effects and high-light a sense of identity and awareness of the importance of a form of cultural preservation. (Gulati and Katyal, 2010).

## **Conclusion**

Architectural icons and the creation of an Arab/Islamic identity have become of importance especially as modern cities compete with Asian cities such as Singapore and Malaysia on the global map. Urban spaces and new architectural icons are shaped through the adoption of Islamic forms, and fragments that clad or façade contemporary architectural forms branded by star architects. In the process of the construction of a modern city image iconic projects with mega screens represent attempts to create an Arab identity, open spaces are replaced by more high-end places. In the process there is a replacement of traditional forms with new interpretations as manifested by the Al-Bahar Towers and the Abu Dhabi central market which legitimize architectural practices of veiling contemporary forms with diversely patterned screens as they continue to realize an ambitious programs of building developments that aim to serve a larger agenda by increasing demand for investment related to cultural icons. Interests in promoting sustainable designs allowed for separation of the building and from its skin/facades in order to create iconic forms that market a new image of Gulf state cities. Facades of these mega projects have taken on an iconic status that merge between an interpretation of culture and tradition, and the demand for high-rise architecture. Contemporary screens cover the complete building creating a dramatic effect that reflects a coherent policy to support new designs that seek integrated understanding of modernity and tradition. There seems to be an obvious determination to experiment with a sense of newness, in an attempt to create a modern gateway city. In the process a blurring of stylistic boundaries

would perhaps be a better concept to capture the current transformation of Gulf state cities, through re-contextualization and re-interpretations of Islamic heritages.

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