From Sand to Silicon
One Decade: Three Paradigms
From Iconic Developments to Sustainable Bubbles: Gulf Cities Transformed

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Abstract
Gulf cities' development, in the last decade, can be seen as a sequence of three paradigms. I'll argue that Dubai, as a model of urban development, for contemporary Gulf cities is based primarily on Images and icons rather than sustainable concepts, process and strategies. A process which will be called "Dubaization or Dubaification" of Gulf and Arab cities.
The Second Paradigm,; knowledfication, is a manifestation of a shift towards knowledge economy as a more logical development strategy while approaching post oil world. I will shed some light on a new paradigm where Gulf cities are moving from doing more real-estate icons to use knowledge economy as a base for urban development and I will examine the different trials to establish knowledge cities in the Gulf.
The third paradigm, Sustainablization, marked its presence in this short history of Gulf urbanity with the declaration of building the first green, C2O free, renewable energy based city to be designed by Sir Norman Foster. Abu Dhabi broke ground on Masdar City, the world's first zero-carbon, zero-waste, car-free city.
Gulf capital cities need to consider a more holistic approach for its sustainable strategic development which is based on the principals of knowledge and creative economy. This approach as suggested in the paper is based on both global interpretation and local understating of the developmental process and challenges in Gulf cities today. Authentic sustainable development and a process of "glocalization" might be more appropriate approaches to Gulf cities development to replace the current skin deep and marketing oriented process of "Dubaization, knowledfication, and Sustainablization".

1. INTRODUCTION

Gulf cities' development can be seen as a sequence of three paradigms. The First paradigm had emerged from a desire to go beyond Modernization process which experienced by Gulf capitals following the first oil boom in the seventies of the last century. A move towards creating Iconic Development, a process which was considered as an answer to a compelling desire for globalizing Gulf Capital cities. The main model for this paradigm is Dubai which in the last decade, and at a remarkable pace, has developed into a global crossroads, and is now thriving on a new type of post-global condition. This phenomenon can be best described as "The process of *Dubaization*". Yet, crucial questions emerged; what are the consequences of such a competition on the future of Gulf cities? What kind of social life that will emerge out of this development. Is this a process of constructing, reconstructing or deconstructing identities and territorial outlook of our cities? And finally, is there any future for sustainability in developmental strategies of Gulf cities. In this paper, I'll argue that Dubai, as a model of urban development, for contemporary Gulf cities is based primarily on Images and icons rather than comprehensive sustainable concepts, process and strategies. Major conflicts are resulting from this process which include failing to consider sustainability in development planning, limited interpretation of globalization and degradation of locality.

The Second Paradigm The Second Paradigm,; *knowledfication*, is a manifestation of a shift towards knowledge economy as a more logical development strategy while approaching post oil world. I will shed some light on a new paradigm where Gulf cities are moving from doing more real-estate icons to use knowledge economy as a base for urban development and I will examine the different trials to establish knowledge cities in the Gulf. Knowledge and creative economies are structured around the value of people and the challenge is how to create the ideal environment which would encourage knowledge transfer, production and nurturing creativity. Inviting prominent world architects to insert cultural entities within the deep fabric of those cities is asserting the presence of a new perspective. Those stars or signature architects are designing a series of unique art museums, top ranked universities and cultural centers. I will try to elaborate on the consequences of the presence of signature architects and examine if it will help in initiating a new wave of architectural and urban creativity. This direction is highlighted by a historical session for the French Parliament when a decision was approved for franchising the Louvre Museum and uses its brand for a new branch in Abu Dhabi.

The third paradigm, *Sustainablization,* marked its presence in this short history of Gulf urbanity with the declaration of building the first green, C2O

free, renewable energy based city to be designed by Sir Norman Foster. Abu Dhabi, official capital of UAE, broke ground on Masdar City, the world's first zero-carbon, zero-waste, car-free city. As I will explain in the paper, the premises of building Masdar city are suggesting a great success and an excellent opportunity to create a model to be followed locally and regionally. Yet, I will provide a counter argument based on evidences which will show that sustainability is being used as a marketing tool for real-estate projects and not necessarily a comprehensive way of life.

The main aim of this paper is to explore and analysis the main transformations happening in the Gulf Capital cities during the last decade. Unlike the rest of world cities, the recent development, changes and transformations are suggesting an unprecedented rhythm of change. With outstanding flow of oil revenues, Gulf cities are literally competing to use the new assets in flourishing the cities images and to occupy a place on the world stage.

2. THE FIRST PARADIGM: DUBAIFICATION/DUBAIZATION PHENOMENOA

2.1 The Emergence of Dubai as a Global City

Dubai is emerging as one of the fastest growing cities in the Middle East. It is also considered as an emerging global contributor due to its hybridism and cosmopolitan nature and also as a main host for a diversity of global major events. Developed from determination and imagination in the inhospitable desert, the urban mirage continues to spread out with dynamism, both vertically and horizontally. The contemporary urban scene of Dubai is characterized by the infusion of new privately-owned: shopping malls, gated housing communities, theme parks, and headquarters of multinational establishments and corporations. Any global observer can see clearly that in its strive to become a global center, Dubai has embarked on a series of high profile projects meant to signify its arrival at the world stage as a first rate "Global" or "World" city. The Arab and Islamic backgrounds and origins of the city dramatize this sense of arrival and create considerable curiosity regarding the new comer from the myth of the Orient.

> "Dubai has an unrivalled proposition to visitors-everything from year-round sunshine to state-of-the-art facilities, and world class spas and restaurants- and its distinctive horizon is a further asset that sets it apart from other cities around the world."

Ian Scott, director of UK and Ireland Dubai Department of Tourism and Commerce Marketing quoted in Gulf News (30 Aug, 2008).

2.2 Major Transformations in Modern Dubai

Sampler (2003) offered interesting interpretation of main transformations which are taking place in the gulf and illustrating why a shift towards these new emerging small, yet influential cities are highly required. The learned lessons from Dubai's ability in achieving rapid growth were comprehensively analyzed precisely when it comes to investing in *infrastructure* and *infostructure* as well. Sampler's book is a continuation on the same path which Thomas Freidman, prominent and well-traveled *New York Times* foreign-affairs columnist, had started. Freidman (2000) who declared in his famous book "*The Lexus and the Olive Tree*", that few of us understand what exactly globalization means. Friedman, , cleverly use events and stories that illustrate his central theme: that globalization-the Lexus-is the central organizing principle of the post-cold war world, even though many individuals and nations resist by holding onto what has traditionally mattered to them-the olive tree. Another major dimension in the process of transformation is the change from providing the infrastructure to the establishment of the *infostructure*. And finally, it is obvious that Dubai's fast moving market raises product risk result in almost the diminishing of prototype or test models and the dominance of the capital in the accelerating process of construction. A process where developers and investors can't afford to pause and question the consequences of their course of actions.

Meanwhile, Major transformations are taking place in the architecture and urban fabric of the city. New Dubai cityscape is emerged through the implication of a set of developmental models that emphasizing the global nature and aspirations of the city Fig (1). Creations of Icons in Dubai "Iconic Development" seems to be the governing strategy for all its current and upcoming projects. Hence, projects and buildings are becoming urban brands waited to exported outside of Dubai and then consumed or more likely imitated by other Arab and Gulf cities in an intentional strive to join the global paradigm.

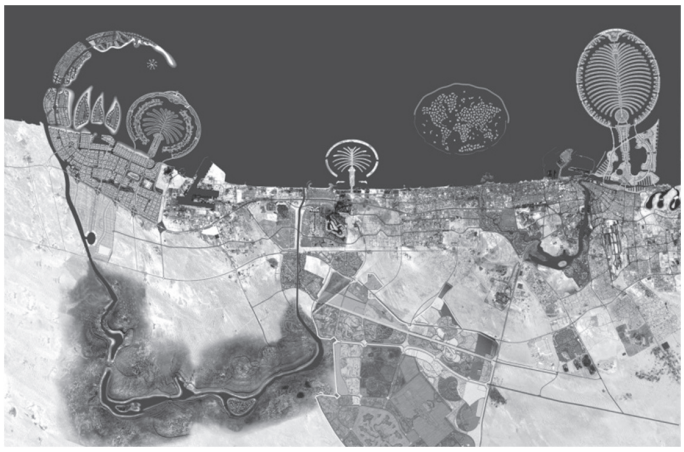

Fig (1) Iconic developments projects have constructed a new urban brand for Gulf and Arab cities in the Middle East.

This First paradigm had emerged from a desire to go beyond Modernization and to create Iconic Development. A process which was considered as an answer to a compelling desire for globalizing Gulf cities. The main model for this paradigm is Dubai which In the last decade, and at a remarkable pace, has developed into a global crossroads, and is now thriving on a new type of post-global condition. Most of Arab world cities are competing to imitate Dubai in its unprecedented effort to build the tallest, the biggest and the largest ever built architectural and urban statements. This phenomenon can be best described as The process of *Dubaization* or *Dubaification* of Gulf capitals and cities.

3. ICONIC DEVELOPMENT & REAL-ESTAT FANTACIEIS

Dubai has one of the world's most impressive, ever-evolving skylines, a horizon which stands evidence to how far the Emirate has come in establishing itself on the world stage. From its humble beginnings, Dubai has transformed itself into a landmark destination with a host of iconic buildings to match. From revolving towers and the world's tallest building to signature projects by everyone from Brad Pitt to Donald Trump and celebrated architects Rem Koolhaas and Zaha Hadid, Dubai is fast becoming an iconic destination, leading the field with its architectural prowess.

Accordingly, and not surprisingly, it is an easy task to interpret why Dubai has the largest Man-Made islands in the world, the 7 stars Burj Al-Arab hotel, The Tallest building on earth; Burj Dubai and the most elegant one kilometer ever built. Yet Two sets of questions are emerging. The first set is related to Dubai as a city: its identity and future. The second set is related to the impact of Dubai on contemporary Gulf cities. Main questions and issues need to be confronted; the social consequences of vertical development, sense of belonging, the meaning of neighborhoods, and interpretation and implementation of sustainability are crucial parts of this debate.

Fig (2 & 3): Iconic development in Dubai; Palm Island and city's skyline formed by skyscrapers. (www.nakheel.com)

The second set of emerging crucial questions as described earlier is related to Gulf and Arab cities; what are the consequences of such a competition on the future of Arab cities? What kind of social life that will emerge out of this development. Is this a process of constructing, reconstructing or deconstructing

identities and territorial outlook of our cities? And finally, is there any future for sustainability in developmental strategies of Arab and Middle Eastern cities. In this paper, I'll argue that Dubai, as a model of urban development, for contemporary Arab cities is based primarily on Images and icons rather than sustainable concepts, process and approaches/strategies. The result is manifested in a sever struggle in most of today's Arab cities to imitate the Icons of Dubai. Major conflicts are resulting from this process which include failing to consider sustainability in development planning, limited interpretation of globalization and degradation of locality.

For some, Dubai has lost its "soul". It is focusing on the creation of modern architectural icons to define its new identity as an emerging global city (Sadik, 2004). Global architectural fashions and popular tastes are among the driving forces shaping the urban fabric of the city. As a result, the newly created built and natural environments are being filled with imported illusions. Environments, which are often composed of artificially constructed urban forms and imagery detached from local physical as well as cultural contexts. Alternatively, what is it that we can learn from Dubai's experiment at city making is one of the core questions to be addressed. The urgency of dedicating intellectual efforts to answer such a question is so relevant to understanding the tangible impact of Dubai on other Arab cities Fig (4 & 5) or the *Dubaization* process.

Fig (4 & 5): The urban impact of Dubai on Gulf cities development; Durrat Al-Bahrain and Qatar's Pearle. (www.duratalbahrain.com & www.qatarpearl.com

Lefaivre & Tzonis (2003) , in their latest book; Architecture and Identity in a Globalized World, reconsider critical regionalism and demonstrate the global viability of one of the most visible trends in contemporary architecture. In Critical Regionalism, an important reexamination of critical regionalism, two prominent architectural critics argue for a truce between the seemingly antithetical philosophies of critical regionalism and globalization. The authors trace the genesis of critical regionalism. King (2004) extends the argument by showing how different phases of globalization are transforming the built environment. He introduced three main contemporary concepts: global culture, post-colonialism and modernity. He argues for a more historical, interdisciplinary understanding of globalization- one that places material space and the built

environment at the center and calls for innovative concepts to address new contemporary conditions.

Dubai's model or phenomena is extended even beyond the Arab world territories. A recent declaration by Pakistan presidential candidate; Asif Zardari explained how he wants to bring development on the lines of Dubai to the capital Karachi.

"*I want to develop Karachi like Dubai and bring prosperity and an economic boom to the country,"* (Gulf News: Saturday, August 30, 2008)

That was part of his speech where he was trying to invite Pakistani people to claim their support and vote for him. Zardari, who is impressed with massive development in Dubai, also lived there and his children are still living in one of Dubai's exclusive gated communities; Emirates Hill.

4. THE SECOND PARADIGM: *KNOWLEDGIFICATION*.

In this section, I will explain the second important paradigm which took place in contemporary Gulf Urbanity. The shift is marked by the global change from industrial economy to knowledge economy. In this paper, I will shed some light on a new paradigm where Arab cities and especially Gulf cities are moving towards. It is basically a shift from doing more real-estate icons to getting prominent world architects to insert culture within the deep fabric of those cities. I will try to elaborate on the consequences of the presence of signature architects and examine if it will help in initiating a new wave of architectural and urban creativity. This shift is also coupled with a substantial trend towards knowledge economy as a more logical relevant in the coming post oil world. More importantly, how Gulf cities are reallocating its resources and revisiting its planning visions to accommodate the requirements of Knowledge cities will be extensively analyzed. Some interesting regional case studies will be used to substantiate the analysis.

Castells (1996 & 1998) has argued that a new type of society is rising in our contemporary cities due to the consequences of the information revolution. From a sociological point of view, Sassen (2000) has argued that cities in the information age should be re-perceived as nodes of an immense network of cultural, commercial and political transactions. Giving these points of view, it is obvious that the classical planning process and design guidelines of contemporary cities need a substantial revision. In a world which is best described as a global village with less and less boundaries, Knowledge and its physical representation in the built environment creates a major challenge and invite us to vision and predict the main aspects of the cities of a new millennium.

In a collection of essays, Sassen (2002) and a distinguished group of contributors expand on the author's earlier work in a number of important ways, focusing on two key issues. First, they look at how information flows have bound global cities together in networks, creating a global city web whose constituent cities become "global" through the networks they participate in. Second, they investigate emerging global cities in the developing world-Sao Paulo, Shanghai, Hong Kong, Mexico City, Beirut, the Dubai-Iran corridor, and Buenos Aires. They show how these globalizing zones are not only replicating many features of the top tier of global cities, but are also generating new socio-economic patterns as well.

In global cities, urban and regional planning has displayed a recent interest in designing policies to attract international investment and encourage economic growth in Knowledge Cities (KCs). These policies also focused on creating social amenities and communities to attract knowledge workers (Martin 2001; Chen and Choi 2004). The key factors in attracting knowledge workers to KCs are mainly social relationships and quality of life of these cities (Mathur 1999; Leamer and Storper 2001; Robinson 2002; Santagata 2002).

4.1 Knowledge Economy and Cities

Knowledge Cities are cities that possess an economy driven by high value-added exports created through research, technology, and brainpower. In other words, these are cities in which both the private and the public sectors value knowledge, nurture knowledge, spend money on supporting knowledge dissemination and discovery (i.e. learning and innovation) and harness knowledge to create products and services that add value and create wealth. Currently there are 65 urban development programs worldwide formally designated as knowledge cities (Carrillo, 2005; Pol, 2005). Knowledge-based cities fall under a new area of academic research entitled Knowledge-Based Development, which brings together research in urban development and urban studies and planning with knowledge management and intellectual capital.

The aim of developing a knowledge based economy is to create value-driven relationships and value-added products and services. And one of the ways to do this is encourage innovations and entrepreneurship. The key to innovation lies in creative thinking and the generation of value creating opportunities. The people, who have the know-how and foresight to interpret, analyze and share information-to turn it into knowledge-are those who really make the difference. These people are called knowledge workers and form the backbone of the new economy- or what should really be called the "knowledge economy".

The creation of a knowledge economy of which entrepreneurship is a key component, is hugely important to the economic growth of the Middle East. But it is vital that knowledge is transferred to and shared by locals rather than residing only with expatriated who are likely to take the knowledge outside the country as Sam Hamden (2006), organizer of the first World Summit on Innovation and Entrepreneurship, pose the question of "*What happens if the knowledge is not transferred to nationals?"*. While Dubai, the most important Gulf city, has some of the core ingredients required for a knowledge economy-strong government support and a well developed physical infrastructure, the emirate has yet to put in place the legal infrastructure to protect intellectual property.

There are also issues related to social structure and cultural values. For the knowledge economy to flourish, especially small-to-medium sized enterprises and micro enterprises, you need a middle class. The importance of this class for flourishing local economy is not always appreciated and encouraged in the Arab world. Creating opportunities for local level business to interact with international corporations is hugely needed. If innovation is to flourish, and the knowledge economy thrives, people and organizations must also be prepared to take more risk. Risk Taking is not encouraged in the Middle East and this needs to be addressed. Transparency, risk taking encouragement, access to financing, good governance, and educated workforce are all critical to the development of the Arab world's knowledge economy.

KCs are seen as fundamental to the economic growth and development of the 21st century cities. KC is a new perspective of development which is based on knowledge, innovation and creativity. Leif Edvinsson (Dvir, 2004) defines KC as "a city that purposefully designed to encourage the nurturing of knowledge". KC is not just a regular city. It is a growing space of exchange and optimism in which each and everyone can devote himself to personal and collective projects and aspirations in a climate of dynamism, harmony, and creativity. What is unique about this definition is the focus on KC as a holistic environment for comprehensive development. Hence, it calls for different process of articulating the city structure and subsequently raises issues and concepts like transparency, democracy and sustainability. It is also suggesting new paradigm in city planning. Based on knowledge-based development, Carillo (2005) shows how knowledge can be and is placed at the center of city planning and economic development to enable knowledge flows and innovation to provide a sustainable environment for high value-added products and services.

When knowledge is perhaps the most important factor in the future of city's

economy, there is a growing interest in the concept of the "knowledge city". Hence, what are the qualities of future cities becomes a crucial question. An acceptable definition of knowledge city might be it is not just a regular city. It is a growing space of exchange and optimism in which each and everyone can devote himself to personal and collective projects and aspirations in a climate of dynamism, harmony, and creativity. Accordingly, Knowledge Cities are constructing a new paradigm in how we vision, perceive and plan cities in the 21st century.

Table (1): KIKM & ENTOVATION Int. Formation Principles of a Knowledge City.

Formation Principles of A Knowledge City	
Knowledge Purpose	Knowledge Symmetry
Knowledge commerce	New growth Medium
Abundant Economy	Knowledge-to-Democracy
Knowledge Fusion	Boundary-less Intellectual Capital
Knowledge Governance	Knowledge Enabling Grid

4.2 What is a Knowledge city?

Knowledge city is a new perspective of development which is based on knowledge, innovation and creativity. Leif Edvinsson (Dvir, 2004) defines Knowledge City as "a city that purposefully designed to encourage the nurturing of knowledge". Knowledge city is not just a city. It is a growing space of exchange and optimism in which each and everyone can devote himself to personal and collective projects and aspirations in a climate of dynamism, harmony, and creativity. What is unique about this definition is the focus on Knowledge city as a holistic environment for comprehensive development. Hence, it calls for different process of articulating the city structure and subsequently raises issues and concepts like transparency, democracy and sustainability.

5. Knowledge Cities/Zones: Regional Attempts

In a post-global, post-oil paradigm, most of the Middle Eastern cities are thriving into diversified economic industries. Knowledge economy was perceived by both leaders and intellectuals as a valid vehicle for bridging into the new paradigm. Gulf cities countries within the middle East are working seriously in this direction. Huge investments which used in the last five years to finance iconic real estate developments are now shifted towards planning and financing knowledge based economic centres. Additionally, an unprecedented concerns regarding the production and dissemination of information and knowledge are rising within all of those cities.

In this section, using comparative analysis approach, I'll try to evaluate

the status of constructing Knowledge Cities (KCs) in the Middle East. Using primarily the case of Gulf Cities and Cairo, I will illustrate a major shift in development strategies which presumably will secure those cities a place on the global stage and will introduce it to Knowledge economy paradigm. I will also examine the status of the projects which were promoted, and initiated within the context of selected cities to establish its new identity as Knowledge cities locally, regionally, and internationally. Projects like Dubai's Knowledge Village, Qatar's Science and Technology Oasis, Bahrain's Technology Park among others will be analyzed in order to reach a more comprehensive understanding of Knowledge Cities conceptual adoption within the context of the Middle East generally and the Gulf cities precisely.

The Middle Eastern cities are not only exceptions, but would require major social transformations. These transformations would be regarded as preconditions towards the creation of knowledge cities. Furthermore, based upon what has been put forward in the introduction above, the rest of the chapter would be devoted to spelling out the required preconditions or prerequisites as a result from evaluating the existing projects. Considering so, sustainability and citizenship would be regarded as the most important strategies in the development of a knowledge-city project in the Middle East.

In an attempt to actualize the high-performance knowledge city, different initiatives took place in some of the Middle Eastern cities. Egypt, UEA, and Qatar are pioneers among other Arab countries in trying to inject knowledge entities in the structure of their major cities. Cairo and Dubai are witnessing a major development in this direction which result in a variety of projects where knowledge is a substantial component of their identity.

nevertheless, on the contrary of the comprehensive strategic planning of European and American knowledge cities and the successful implementation of knowledge cities formation principles, Arab cities are building technologically advanced yet, isolated projects. This is considered as an attempt towards claiming a new identity for its contemporary cities as knowledge cities. An examination of projects like Egypt' Smart Village and Media City or Dubai's Internet City and newly lunched project Knowledge Village Fig (6), will be helpful in evaluating the knowledge status of contemporary Arab Cities. Experiences and lessons learned from developed world knowledge Cities initiatives must be used as a criteria for such an evaluation.

While in the case of Dubai and Cairo, the existence of knowledge-based isolated projects is not really helping in creating a knowledge city or even transforming parts of the city into a knowledge node. As was explained earlier, opposite to

the international applications of knowledge city's principles, the Dubai and Cairo models were more centralized and divorced from the real community. Both the Media city (DMC) and The knowledge Village (KV) projects in Dubai fail to construct a knowledge pole (Alraouf, 2005). The first one is becoming the headquarters of foreign media agencies and the second one is transformed into rental places for universities branches, collages or training centers. Sam Hamden, organizer of the first World Summit on Innovation and Entrepreneurship criticizing Dubai's model of knowledge-based economy by stating that *"The industry clusters are more like business parks and are not innovation clusters"*.

Fig (6) Dubai's recently opened Knowledge Village.

Fig (7&8): Aerial views of Dubai Internet City showing its urban, landscape and architectural setting.

5.1 Knowledge Centers by Signature Architects

In a historical session for the French Parliament on 9/10/2007 a decision was approved to give the green light for franchising the Louvre Museum and use its brand for a new branch in Abu Dhabi. Despite a petition signed by around 5500 of France's top artists, critics and intellectuals, the parliament approved the project on the ground that it is a vehicle towards promoting French culture globally. Under the 30-year agreement, Abu Dhabi will pay 400 million euro (525 million dollars) for the Louvre brand name and for loans of hundreds of artworks for periods of between six months to two years. I will try to shed some light on a new paradigm where Arab cities and especially Gulf cities are moving towards. It is basically a shift from doing one more Palm project to getting Zaha Hadid to do whatever she feels like doing in this interesting part of the world!

Four of the world's most prominent/renowned architects – Frank Gehry, Zaha Hadid, Tadao Ando and Jean Nouvel – have presented schematic designs for

iconic museums and performance arts centre which will position Abu Dhabi, the UAE capital's Saadiyat Island as a world-class cultural destination. All the four architects are international award-winners with three; Hadid, Gehry & Ando, being holders of the coveted Pritzker Prize – the highest honor within the architectural discipline.

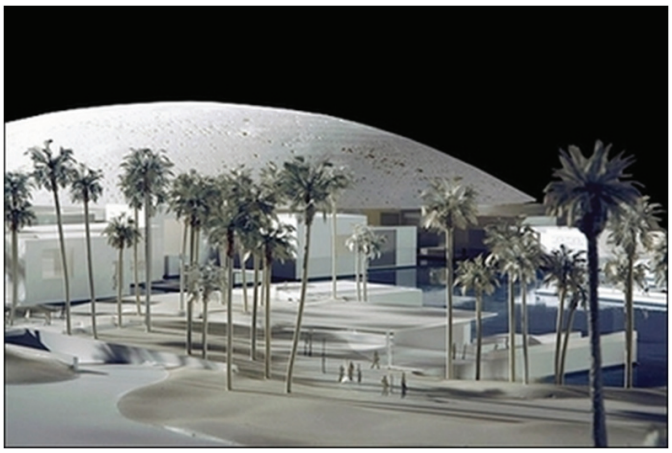

Fig (9): The new Abu Dhabi Louvre designed By French signature architect Jean Nouvel. (www. Saadiyatisland.com)

Saadiyat Island's cultural district – one of six distinct districts master planned for the signature destination – will also feature a Biennale Park and 19 international pavilions which will be criss-crossed by a 1.5 kilometre long navigable canal. The 19 pavilions, which will host a range of art and cultural events and activities, will be designed by some of today's leading architects. These include UAE's Khalid Alnajjar, Russia's Yuri Avvakumov, USA's Greg Lynn, UK's David Adjaye, China's Pei-Zhu and Korea's Seung H-Sang.

6. THE THIRD PARADIGM: SUSTAINABLIZATION.

"Treat the earth well. It was not given to you by your parents. It was loaned to you by your children" Kenyan Proverb.

The third paradigm or the third wave of change is centered around the concept of sustainability and the green revolution. Sustainable development and green design are becoming so fashionable. Marketing campaigns of real-estate mega companies are using interesting slogans to emphasize the sustainable nature of their new projects. Foreign consultants were brought to the Gulf cities to compete in building green skyscrapers. Cities like Dubai, Abu Dhabi, Manama and Doha are declaring new initiatives and incentives for sustainable projects and developments.

Abu Dhabi, marked its presence in this short history of Gulf urbanity with the declaration of building the first green, C2O free, renewable energy based city to be designed by Sir Norman Foster. Abu Dhabi broke ground on Masdar City,

the world's first zero-carbon, zero-waste, car-free city. The announcement was made on Feb. 9th., 2008. The global milestone event was marked by the laying of a virtual cornerstone by His Highness General Sheikh Mohammed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, and a visually stunning production depicting life in the city. Named Masdar City, which means "the source," the 1,483-acre project will include commercial and manufacturing space dedicated to developing eco-friendly products, housing, a university, and the headquarters for Future Energy Company, which is spearheading the initiative.

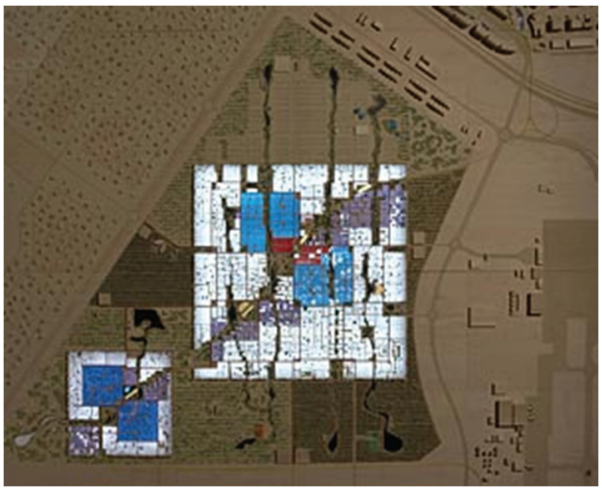

Fig (10) Masdar will be developed in phases centered on two plazas, including a 130-acre main square. (www.masdar.com)

"*We are creating a city where residents and commuters will live the highest quality of life with the lowest environmental footprint,....Masdar City will become the world's hub for future energy. By taking sustainable development and living to a new level, it will lead the world in understanding how all future cities should be built*."

Masdar CEO Dr. Sultan Al Jaber

Although the desert might seem an unlikely location for such a large sustainable undertaking, Masdar will tread lightly on the landscape by harnessing solar power and relying on construction features that resist high temperatures, including extra shading and slab cooling. Its design is rooted in the Arabic tradition of walled cities—but Masdar's stone-and-mud walls will be covered in photovoltaic panels capable of generating 130 megawatts. Along the site's northern edge, the walls will be more permeable to let in breezes. Electricity will also come from photovoltaic cells integrated into rooftops and a 20-megawatt wind farm. The city will get its water from a solar-powered desalination plant. Since Masdar will be car-free, shaded paths will make walking more bearable in the region's extreme climate. Land surrounding the

city, which is 20 miles outside the center of Abu Dhabi, will contain wind and photovoltaic farms, as well as research fields and plantations that will supply crops for the city's biofuel factories. These fields will also help reduce waste by acting as carbon sinks to offset gases produced in the factories—and they will be irrigated with gray water drawn from the city's water treatment plant. Masdar will be developed in phases centered on two plazas. The first stage includes construction of a 60-megawatt photovoltaic power plant that will supply electricity for constructing the rest of the city. This will be followed by a 130-acre main square. Foster finished the initial phase of master planning this spring. Designers estimate that it will take 10 years to build out the entire city, with structures ultimately occupying nearly half of the site. When complete, Masdar will be home to 45,000 people and attract an additional 60,500 daily commuters, who will arrive in part via a new rail line. Masdar's university is set to open by 2009, with 30 percent of the student population housed on site. Its students will be encouraged to participate in the development of the city while working on graduate degrees in sustainability.

Fig (12) Masdar city main spaces. (www.masdar.com)

"*The environmental ambitions of the Masdar Initiative – zero carbon and waste free – are a world first. They have provided us with a challenging design brief that promises to question conventional urban wisdom at a fundamental level. Masdar promises to set new benchmarks for the sustainable city of the future.*"

Sir Norman Foster, Masdar Planner

A need for examining The credibility of the sustainable movement in the Gulf and the rest of the Arab world. As Andrew C. Revkin (2008), has argued that surprisingly The latest effort comes not in some green hub like Portland, Oregon, but in the Persian Gulf, fueled as much by oil wealth — and the need to find post-petroleum business models — as environmental eagerness. In his

article, he questioned if Masdar as a car-free, solar city in gulf could set a new standard for green design. Attempts at such green communities have had mixed results. Arcosanti, the ecotopian town in the Arizona desert, was started three decades ago. Still a work in progress, it is now being encroached on by Phoenix's suburban expansion. Revkin also supported his suspicion using the example of China. With help from American partners, China has embarked on building instant rural communities and cities designed to limit environmental impacts, but recent reports have disclosed many problems.

Stanley Reed (2007) elaborated more by inviting his reader to answer an interesting question: Guess Who's Building a Green City? He goes on to say that in a delicious irony, Abu Dhabi is pouring oil billions into a zero-emissions metropolis in the desert. Still, environmental campaigners appear enthusiastic about Masdar City, which is part of a planned $15 billion investment in new energy technologies by Abu Dhabi. At an international energy conference in that city last month, Jean-Paul Jeanrenaud, director of the One Planet Living initiative of the environmental group WWF International (known in North America as the World Wildlife Fund), said independent monitoring would help ensure that the project lived up to its billing.

6.1 Towards a More Holistic Sustainable Cities

"*Probably within the next 5-10 years they will go through a period where they have overbuilt and they don't know what to do with it*"

Prominent Architect Ken Yeang commenting on the future of Gulf Cities.

Author of Green Skyscrapers.

Gulf Cities' grand and fancy designs should look to the future. It is the ultimate sustainability challenge. Dubai , for instance, home to nearly one-third of the UAE's 4.1 m population, has carbon dioxide emissions per person second only to those of the US. For the Emirates as a whole, per capita energy use is more than double the world's average. Fish stocks along its coast have plummeted by more than 80%, according to the environmental agency, and marine shorelines have been devastated by resort development.

Masdar city project and similar cases with different scale in the Gulf cities are suggesting a rosy picture and great future. City planners and decision makers shouldn't be overwhelmed by the state of the art marketing campaigns to promote this limited understanding of sustainability. Sustainability in the making of cities and architecture is a very comprehensive and holistic concept. It is a multifaceted vision which asserts affordability, social sustainability respect and

foster the cultural diversity. It is also a process by which we can create car-free cities but more importantly children friendly cities and women friendly cities.

7.CONCLUSIONS

This paper is nontraditional in the sense that it attempts not so much to provide conclusions or "findings", as to raise questions and issues-with the aim of stimulating dialogue about new frameworks for understanding, studying and analyzing the development of Gulf cities in the last decade.

- Knowledge cities should be perceived as the opportunity for new sustainable growth and prosperity in the global knowledge-based economy. Therefore, the emerging knowledge cities in the Middle East should be seen within a regional and global knowledge network. The ultimate goal is to increase the innovation and creative capacity of cities based on a new set of knowledge patterns.
- The making of a KC is a long and complicated process, but for sure it is the path to follow for achieving sustainable urban development. Examples of KC best practices can be guidance for cities that are willing to pursue knowledge-based development. However, it should not be forgotten that each city is unique and characterised by different cultural, economic and political conditions. Therefore, KC strategies need to be customised to the unique urban circumstances, competencies, opportunities and challenges.
- A Knowledge City is a place where the outcomes and by-products of information technology are widely available to all. The physical configuration of the city would educate the people and even by just living in the city they would absorb the manifestations of culture. Facades, landscapes, city elements, and etc. are designed and arranged in such a way to remind residents of the cultural presence. Moreover, well-equipped cultural centres evenly distributed throughout the city would be available to all without exception.
- For the establishment of contemporary Knowledge Cities in the Middle east, two integrated conditions are required. The process of creating Middle Eastern knowledge cities should be shifted from focusing on creating isolated and separated knowledge centers to a process by which a knowledge network is established and shared by different sectors of the community. Additionally, a comprehensive examination of the history of Islamic and Middle Eastern Cities is urgently needed to provide contemporary planners, urban designers and architects with tools and patterns which

were used successfully to disseminate knowledge in traditional built environments. Research is also a prerequisite of a Knowledge City. It requires infrastructure of research, an issue which has not been developed in the Middle East. Hence, an inclusive initiative to prepare the grounds for a major transformation must be translated into strategy.

- The establishment of world class cultural facilities will help in an urgently needed change in Gulf people's social patters of using spaces. Gulf cities need substantial change to move its communities from shopping malls which are becoming more and more the internal boulevards, squares and gardens of contemporary Gulf Cities. Paradoxically, museums and cultural centers will create a new arena to experience a different level of spatial experiences and public life engagements.
- Architecture can do much more with much less. We need to teach our selves and the next generation to build better but less, and with less; recycle; better yet, reuse; design for the long now, remembering that sustainability and environmental justice are intergenerational as well as international.
- Architecture as a domain and creative reflection of local culture can be used as a vehicle to maintain local culture and interact with the global hunger for knowing "The Other". The main condition for these architecture/cultural products to be exposed to the other is that it should be coming from deep and original local vision, which makes the ultimate balance between past, present and future.
- Observing the drastic transformations shaping the new Dubai cityscape and its impact on other Arab cities through the process of Dubaization may help conclude that a more environmentally oriented and sustainable approach to architecture and urban design should be considered for future successful development in contemporary Arab and Middle Eastern cities.

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من الرمل السيليكا الى السيليكون –ثلاثة تحولات في جيل واحد من التطوير بالرموز البصرية الى الفقاعات المستدامة : تحول مدن الخليج

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ملخص:

يمكـن تمثيـل تطور مدن الخليـج في العشرية السابقة من خلال تسلسل ثلاث تحولات جذريـة .سأطرح فكرة ان دبي كنموذج للتطـور العمراني لمدن الخليج المعاصرة تعتمـد اساسا على الانطباعات والرموز البصرية وليس على مبادئ مستدامة او على منهجية واستراتيجيات .

ويمكن تسمية عملية التحول هذه : (دبوبة) او (دبيوبة) المدن الخليجيه والعربية.

اما عملية التحول الثانية : (معرفة) فهي تبلور عمليه انتقال الى الاقتصاد المبني على المعرفة وهو استراتيجية تطور منطقية اكثر من الاولى وذلك لمواجهة عصر مابعد البترول.

وسألقـي الضوء على عملية تحول جديدة حيث تتجـه مدن الخليج للتحول من تحقيق المزيد من الرموز للتطوير العمراني الى استخدام الاقتصاد المعرفي كأساس للتنوير الحضري وسوف اناقش المحاولات العديدة لانشاء مدن المعرفة في الخليج.

اثبتـت عملية التحول الثالثة (الاستدامة) وجودها في هذا التاريخ القصير لتمدن الخليج عند اعلان بناء اول مدينة خضراء خاليـه من ثـاني اكسيد الكربون معتمدة على الطاقه المتجددة من تصميم السـير نورمان فوستر بذلك حققت ابوظبي سبق عالمي بأنشاء مدينة (المصدر) كأول مدينه في العالم (خالية الكربون) خالية الاهدار حرة من السيارات. ينبغي لمدن عواصم الخليج تبني سياسة اكثر شمولية لاستراتيجية التطوير المستدام معتمدة على مبادئ المعرفة والاقتصاد الخلاق .

ومثـل هـذا المدخل المقترح مـن هذا البحث مبني علـى تكامل المفهوم العالمي والحلـي لعمليه التطوير المبتكـر الغير مستنسخ وتطبيـق العولمـة هي سياسـات اكثر ملائمة لمدن الخليج ويجب ان تحـل محل الاتجاه الحالي المرتكز علـى القشور وسياسات التسويق في عمليات الدبيوبة والمعرفة والاستدامة.