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In this issue:

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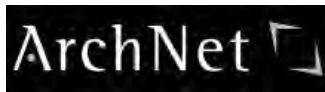
Editor

**Ashraf M. Salama**

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The Old City of Shibam, Yemen (Source: Aga Khan Award for Architecture)

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# International Journal of Architectural Research

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## EMERGING CITIES ON THE ARABIAN PENINSULA: URBAN SPACE IN THE KNOWLEDGE ECONOMY CONTEXT

Alain Thierstein and Elisabeth Schein

### Abstract

*Networks of the growing knowledge economy significantly influence spatial development on different scales. This paper proposes a framework for analyzing the impact of global knowledge economy networks on the rapidly developing urban space of emerging cities on the Arabian Peninsula, and vice versa. Two aspects of the described research are innovative: First, a global relational geography-perspective builds the basis for approaching the analysis of urban space development in emerging cities on the Arabian Peninsula. Second, the empirical methodology of the research project is a newly defined method triangulation, setting an example for systematic analysis of local urban development in a global context. The method triangulation combines three different research angles: A knowledge economy firm perspective, an on-site observation perspective and a planner perspective. The method triangulation defines the procedure for the research application in selected case study cities on the Arabian Peninsula. Initial results from applying the research methodology in the city of Dubai give a first indication, that emerging cities on the Arabian Peninsula play a significant role in the global and regional knowledge economy networks. Locally developed urban spaces reflect and influence the significance of cities in the global knowledge economy context. Especially the global visibility of urban spaces on a city district scale, which specifically address the needs of knowledge*

*economy players, contributes significantly to the attractiveness of emerging cities on the Arabian Peninsula.*

### Keywords:

Knowledge economy; urban space; case study cities; method triangulation; Arabian Peninsula.

### Introduction:

#### Coherence between Global Knowledge Economy Networks and Local Urban Space

Since the late 20th century cities on the Arabian Peninsula have emerged as fast growing knowledge economy locations. Unique for this region is the phenomenon of extremely young and fast urban development. Turning presumably valueless desert sand into highly attractive real estate, emerging cities on the Arabian Peninsula have gained global importance in terms of connectivity with other prominent cities in global knowledge economy networks in a very short timeframe.

The "World City network" ranking (Taylor, 2004)

special thanks to professors providing local technical support and advising on the Arabian Peninsula:  
Ashraf Salama, Ali Alrouf, Yasser Elsheshtawy

outlines the best connected cities within the global network of advanced producer service firms. The Top 200 list contains seven emerging cities from the Arabian Peninsula with a young history of rapid ascension. Sorted from the highest to the lowest rank the cities are Dubai (UAE), Manama (Bahrain), Jeddah (Saudi Arabia), Riyadh (Saudi Arabia), Abu Dhabi (UAE), Kuwait (Kuwait) and Doha (Qatar).

Since these cities developed in parallel to the growing importance of the knowledge economy, case example cities on the Arabian Peninsula seem to be the ideal place to answer our central research question: How does the global significance of emerging cities in the context of a growing knowledge economy affect the development of local urban spaces and vice versa? To answer this central research question this paper proposes a framework consisting of four parts that can be exemplified as follows:

The first part discusses theoretical approaches associated to relational geography and urban development in an economic context and gives definitions for frequently used terms of this paper. The theoretical and conceptual considerations are leading to the three main hypotheses of the research project.

The second part outlines the newly developed method triangulation, proposing a feasible empirical approach for a systematic analysis of local urban development in a global context. Furthermore, the process for selecting case-study cities to apply the method triangulation is outlined.

The third part presents preliminary results of the application of the research methodology in the

city of Dubai by discussing the initially suggested hypotheses.

Finally the fourth part concludes by synthesizing the major first findings of the research project and by giving an outlook of the further proceedings.

### Related Theoretical Approaches and Definitions

In this research project we bring together two different scientific fields: Relational geography and physical urban development. Therefore this chapter aims to provide an overview of the two areas: First, we explain the used theoretical approach of relational geography and define the term knowledge economy. Second, we give a background on the topic of urban development in an economic context and define the term urban space. The outlined conceptual frame will finally guide us to the key hypotheses of the research project.

#### Theory of Relational Geography and Definition of Knowledge Economy

Relational geography is a relatively new scientific discipline, analyzing the importance of locations within the global city network in the context of the growing knowledge economy. One of the most influential works for nowadays studies on relational geography is Manuel Castells' publications about the space of flows. Manuel Castells argues, that "our societies are constructed around flows: flows of capital, flows of information, flows of technology, flows of organizational interactions, flows of images, sounds and symbols..." (Castells, 1996: 412). He developed a new perception of spatial and urban development by identifying the space

of flows as the underlying concept of spatial development rather than the space of places, represented by world cities and other territorial spaces: "The global city is not a place, but a process [...]" (Castells, 1999: 39). The space of flows enables real-time interaction without physical proximity. While this is a necessary condition for globalizing markets, it is not sufficient, since face-to-face interaction is still "critical, to establish and maintain personal relationships of trust and cooperation" (Hall, Pain, 2006:10). Thus in order to properly understand the multi-scalar simultaneous development of large-scale urban structures, one has to consider a dual analytical approach. The relational worlds of non-physical functional inter-locking networks of knowledge-intensive firms is to be conceptualized as 'spaces of flows', while the physical side of localized urban nodes of these same inter-locking networks are to be considered as 'spaces of places'.

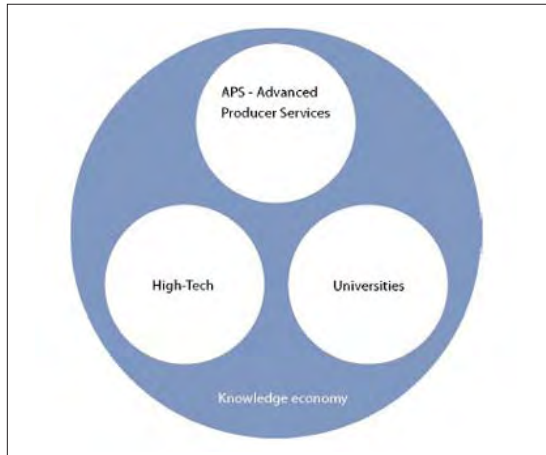


Figure 1: Structure of the Knowledge Economy. (Source: Thierstein et al., 2006).

Within the space of flows the growing knowledge economy has been identified as a major development driver (Raspe, van Oort 2006; Thierstein et. al., 2006). Knowledge economy as defined by Thierstein is an interdependent system of APS firms, High-Tech industries and knowledge creating institutions such as universities and research establishments (figure 1). Combining science based knowledge and operating experience is characteristic for innovation and thus for the knowledge economy.

The exchange of knowledge to a large extent requires geographical, social and cultural proximity, which at the core is based on personalized face-to-face interactions (Saxenian 1991; Oinas 2000; Torre, Rallet 2005). In this context we have to differentiate between two categories of knowledge: Codified knowledge and tacit knowledge (Polanyi, 1964). While codified knowledge can be easily standardized and replicated, the transfer of tacit knowledge requires contacts in person. Therefore "[...] tacit knowledge is localized in particular places and contexts" (Malecki, 2000:110). The described "local nature of knowledge" (Malecki, 2000) forms the basis for several studies on location strategies of knowledge economy firms, which aim to identify non physical global firm knowledge flows and networks.

Peter Taylor developed an empirical research method, to quantitatively identify inter-locking firm networks and measure the non physical connectivity of cities by analyzing intra-firm company networks (Taylor, 2004). He used the networks of Advanced Producer Service (APS) firms, one pillar of the knowledge economy, to come up with a ranking of world cities regarding their connectivity degree.

An analysis of the location behavior of knowledge-intensive economy (KIE) firms is also part of the research project described in this paper. The focus of the analysis in this case lies on the following two pillars of the knowledge economy: Advanced Producer Services (APS) firms and High-Tech firms. In the paper we will refer to these two sectors with the term knowledge-intensive economies (KIE). Universities and academic research institutions are omitted in this context since these institutions do not in general display a very dynamic multi-branch, multi-location behavior like the otherwise private firms in the APS and High-Tech sectors. We have defined KIE on basis of the international NACE classification (Nomenclature générale des activités économiques). Table 1 shows the lines of businesses, which have been included in the empirical research.

Another highly influential researcher in the area of relational geography is Saskia Sassen. She showed, that knowledge-intensive head offices of APS firms are mainly located in core metropolitan regions, which act as nodal points within an international network of cities. In 2001 she identified New York, London and Tokyo as the "global cities", which are prioritized locations for a large share of APS firms (Sassen, 2001).

However, the geo-strategic role of regions as well as cities changes over time. Wallerstein presented an analysis of the emerging world system and the core mechanism of the European capitalist trade system (Wallerstein, 1974). Thus the world capitalist system is organized in three parts: (1) the core areas – European territorial entities or states for a long time have been the "core" of the world economy; (2) The peripheral areas, that have been exploited to

supply cheap labour and natural resources and were markets for surpluses of the core area; (3) the semi-peripheral areas that always acted – and do so today – mediate in the sense of transaction services between the former two areas. Wallerstein's analysis later evolved into functional network concepts like 'Global Commodity Chains', 'World City Networks' or 'Global Production Networks' (Coe et al. 2008).

Furthermore, history shows that cities can gain and loose their significance within the global city network. This is simply a question of time. As Peter Dickens outlines (Dickens, 1998), the world economy follows long waves of economical up- and downturns. Driven by radical innovations these economic cycles influence the functional hierarchy of cities. The growing importance of cities on the Arabian Peninsula from a relational geography point of view is evidence of Dickens theory.

Advanced Producer Services (APS)	High Tech
Accounting	Chemistry and Pharma Industry
Insurance	Mechanical Engineering
Banking and Financial Institutions	Computers
Law	Electrical Machinery
Logistics	Telecommunication
Design and Architecture	Medical and Optical Instruments
Management and IT Consulting	Vehicle Construction
Advertising and Media	

Table 1: Overview of Knowledge-Intensive Economy Sectors (Source: Authors).

### Urban Development in an Economic Context and the Definition of Urban Space

Economic change historically seen has had an impact on urban development and urban space. Europe, for example, has faced its highest emergence of new cities back in the 13th century, when technical inventions in the agricultural sector and a flourishing trade economy have stimulated growth (Gross et al., 2004).

Another example for the impact of economic change on urban development and planning is the industrialization age. Industrialization created the demand for a city wide spatial segregation of urban functions. Ebenezer Howard developed the garden city as a segregated place for living with low density (Howard, 1902). However, the functional division, as manifested in the Charter of Athens, as well as the low density degree in certain city spaces created disadvantages like an increased commuting traffic and the loss of city enlivenment around the clock. These factors later on lead to the postulation of traditional city spaces with a high degree of functional intermixture and density by Jane Jacobs (Jacobs, 1993).

But not only historic examples show, that economic change has an impact on urban development and urban space. Nowadays the growing knowledge economy strengthens the role of cities as nodal points of exchange for tacit knowledge within the global space of flows.

But how can cities fulfill the requirements of a globally connected location and what exactly are the requirements of the knowledge economy towards urban space? A closer look at emerging cities on the Arabian Peninsula is

expected to help in answering this question. These cities have been free of boundaries from the above described historic urban developments, as their history of ascension is still very young. Dubai for example developed in a very short timeframe from a small fishing village to a global city attracting international knowledge economy firms. While in 1950 it still was a small town with no more than 20.000 inhabitants, it is a global hub with more than 1,5 million inhabitants today (United Nations, 2004). Besides Dubai several other emerging cities on the Arabian Peninsula have developed to highly attractive locations for the knowledge economy in the last decades.

If we want to analyze the impact of the growing knowledge economy on urban spaces, we need to define the term urban space first. We can look at space from different perspectives. Complex scientific theories about space underline this. Henry Lefebvre outlines three different angles, to observe space: Space is lived, perceived and conceived (Lefebvre, 1991). On the one hand side we live in space, which means that space is the basis for our social interactions. But space is also a physical, materialized surrounding, which we perceive with our senses. Finally, space is conceived in the sense of how architect, politics, scientists and others theoretically think about the outline of space and act upon the physical space as designers and planners. These three perspectives of space need to be considered, if we want to analyze space in a comprehensive way. Therefore our methodological research approach will also reflect the described perspectives, which will be presented later on.

Talking about urban space from any of the above mentioned perspectives, we have to

consider three different dimensions of space (Boesch, 1989): First, the dimension of distance, which reflects the proximity and availability of urban functions as well as the density of buildings, people and inhabitants. Second, the dimension of functionality which consists of the existence of urban functions, the degree of functional diversity and the morphology. Morphology is defined as the sequence of open and close spaces, the sequence of public and private spaces and the building types (e.g., high rise, one-story solitaire building). Third, the dimension of process which considers the urban development over time and the agents involved in the urban development and planning process.

### **Bridging the Gap between Existing Research: The Three Central Hypotheses**

We have so far given some background on the two scientific areas of relational geography and physical urban development. In order to answer our central research question regarding the impact of emerging Arab cities' global significance on the development of local urban space in the context of a growing knowledge economy, we have to bring the two scientific approaches together. The relational geographical analysis of emerging cities will give us a global functional perspective on the emergence of cities on the Arabian Peninsula, while a physical urban development analysis will compensate that from a local view point. In this way we can test the following three central research hypotheses:

- **Hypothesis 1:** If cities with a high functional connectivity rank in global city networks have emerged on the Arabian Peninsula in recent years, then this is due to a rapid growth of

knowledge-intensive economies influenced by various favorable location-specific development forces.

- **Hypothesis 2:** If an emerging city on the Arabian Peninsula is attracting knowledge-intensive economies, then a specific urban space aiming to fulfill the demand of knowledge-intensive economies is created there.

- **Hypothesis 3:** If the urban space of emerging cities on the Arabian Peninsula is fulfilling the demand of knowledge-intensive economies, then these developments can teach western-European cities urban requirements of knowledge-intensive economies.

The third research hypothesis focuses on Western-Europe, since the authors of this paper are of Western-European origin. However, theoretically the third hypothesis can also be applied to any of the so-called developed regions other than Western-Europe.

### **Method Triangulation and Defining the Study Area**

The method triangulation developed and applied in the described research project proposes an applicable empirical approach for a systematic analysis of local urban space development in a global context. As outlined before, our methodological approach reflects the three perspectives of urban space described by Lefebvre (Lefebvre, 1991). The method triangulation therefore consists of three complementary research methods:

- Survey with knowledge-intensive economy firms (lived urban space)

- On site observation of urban structure and space (perceived urban space)
- Content analysis of planning process and material (conceived urban space)

The three research methods are conducted in the above described sequence. In the following we will describe the research methods in greater detail, outlining the expected results of the methods and their benefit of combination.

### Survey with Knowledge-Intensive Economy (KIE) Firms (Lived Urban Space)

Target of this method is to develop an understanding for the following three factors: 1. The importance of emerging cities with respect to its non-physical connectivity degree (globally and in relation to other locations on the Arabian Peninsula) based on KIE firm location descriptions, 2. The location criteria of emerging cities globally attracting KIE firms and the relevance of local facilities for KIE city location selection, 3. The requirements of KIE firms regarding urban space. An online survey is used for a broad, quantitative evaluation of these factors. Interviews with managers and board members of KIE firms qualitatively validate the results of the online survey.

Zawya as one of the most exhaustive company databases in the Middle Eastern region is used to source firms for the online survey participation. A link to the online survey is sent via e-mail to all firms, which fall into the NACE code classifications of KIE defined above. In this way we reach out to a large amount of firms with low effort. However, the response rate of sending out survey invitations via an anonymous e-mail is very low (around 1%). Therefore this broad range invitation is combined with personalized e-mail invitations to company managers sourced by online business networks

(such as the global business network Xing or smaller local business networks). Personalized invitations usually reach out to a smaller range of people, since the effort of sourcing potential survey participants one by one is rather high. However, the response rate of sending out personalized invitations is around 20%.

Interview partners for the qualitative validation of survey results are selected from the sample of survey respondents. The criterion for selection is to achieve a variety of KIE firm interviews from different lines of businesses, company sizes and globalization degrees.

The following benefits from this method are created for the on site observation, the second part of the method triangulation: The local facilities influencing the global KIE location selection as a result of the KIE survey can be compared with the existing local facilities in emerging cities. Furthermore, the dimensions of urban space required by KIE can be compared with the existing dimensions in specific KIE relevant districts within the cities. Finally, the distribution of KIE business buildings across emerging cities can be explored through the business building location indication of survey respondents. That information is useful to identify potential city districts with a high accumulation of KIE firms for the following observational research in specific KIE relevant urban spaces.

### Onsite Observation of Urban Structure and Space (Perceived Urban Space)

Target of this method is to get an understanding of the overarching urban structure of emerging cities on the Arabian Peninsula and to analyze in detail urban spaces in specific KIE relevant city districts. We can finally compare the resulting knowledge gained on the existing city

structure and spaces with the requirements of KIE regarding urban space.

The method combines a broad graphical urban structure analysis of the whole city space with a deep dive analysis of specific city spaces with a high relevance for KIE businesses.

The broad graphical urban structure analysis includes a graphical allocation of KIE business buildings across emerging cities. Furthermore, we outline the distribution of urban functions, the building and inhabitant density as well as the degree of functional diversity in city ground plans and sections.

The deep dive analysis in one specific urban space per analyzed emerging city allows a closer look at an urban space with a high relevance for KIE firms. This analysis is conducted via behavioral mapping in combination with photographic observation. The used place-centered behavioral mapping method describes "how people use a specific space" (Dohr, Guerin, 2008: 4). Via using this tool we can describe the density and type of people as well as the use of available urban functions in specific urban spaces in a defined time period. We conduct behavioral mapping sessions combined with photographic observation in a city space of approximately 300 square meters on two different days: On a working day and on a weekend day. During these two days we observe the selected urban space for a total time period of 10 minutes seven times a day: In the early morning between 5 am and 8 am, in the forenoon between 8 am and 11 am, at noon between 11 am and 2 pm, in the afternoon between 2 pm and 5 pm, in the early evening between 5 pm and 8 pm, in the late evening between 8 pm and 11 pm and at night between

11pm and 5 am. The criteria for selection of the respective city space and perspective for behavioral mapping in combination with photographic observation are the following:

- Observation area is a public, open space
- Selected perspective should capture an average flavor of the respective KIE relevant urban space (amount and type of people, infrastructure, building and green structure; degree of lightness and shadow; colors of surrounding buildings and nature)
- Special characteristics of specific urban spaces should be captured (e.g., walk-able urbanism idea in Dubai International Financial Center)

The results of the broad graphical urban structure analysis and the in depth behavioral mapping analysis of specific urban spaces describes the qualities of urban space in emerging cities. These qualities are finally compared with the requirements of KIE regarding urban space. The overlap of existing urban qualities and urban requirements from a KIE perspective defines the degree of KIE satisfaction with the local urban spaces.

The following benefits from the onsite observation method are created for the content analysis of planning process and material, the third part of the method triangulation: The KIE satisfaction degree with the local urban spaces can be compared with the relevance of urban planning objectives, to design KIE attractive city spaces. Furthermore, planning process and objectives in emerging cities on the Arabian Peninsula can be evaluated with respect to the qualities of the existing urban space in a knowledge economy context.

### Content Analysis of Planning Process and Material (Conceived Urban Space)

Target of this method is to understand the process and objective of planning urban space in emerging cities on the Arabian Peninsula and its compatibility with the requirements of KIE firms. We can achieve this by using two tools: A graphical urban structure analysis over time and interviews with planners from different institutions involved in physical urban planning.

The graphical urban structure analysis over time is used to analyze when KIE relevant urban spaces developed. In this way we can reflect the timeframe, in which emerging cities developed highly attractive urban spaces for KIE firms.

In order to understand the guiding principles and objectives in developing KIE attractive urban spaces as well as the organizational setup of city planning we conduct interviews with key persons in charge of urban planning. The favorability of planning objectives for KIE attractive urban spaces as well as regulatory conditions for ensuring the objectives of urban planning in the context of creating KIE attractive urban spaces are evaluated. In addition, the interviews are leveraged to create an organizational chart of the institutions and offices involved in urban planning within emerging cities, as the organizational structure is expected to have a large impact on the pace of urban development in emerging cities.

In a city, which fully answers the needs of the knowledge economy in terms of urban space, the results of the method triangulation would show that the observed qualities of urban space and urban space expectations of KIE firms are identical. Since emerging cities on the Arabian

Peninsula have developed into highly attractive KIE locations in a very short timeframe, these cities are expected to come close to an ideal KIE location – at least in certain dimensions. We finally transfer findings from emerging cities on the Arabian Peninsula to cities in so called developed regions such as Western Europe. Potential learning areas can be outlined along three dimensions:

- Spatial resources: General exposure to spatial resources in the context of dispersing knowledge-intensive economies
- Urban development: Consequences for urban development in the context of growing knowledge-intensive economies based on analyses of urban space in emerging cities
- Urban planning processes: Outline of means to enhance proper regional and urban development according to the requirements of knowledge-intensive economies through conscious planning and proper involvement of decision makers

After having investigated the method triangulation and its targets and benefits in detail, we will conclude this chapter by defining the study area of the research project.

### Defining the Future Study Area: Three Case-Study cities on the Arabian Peninsula

Three case-study cities on the Arabian Peninsula have been selected, to which the method triangulation will be applied. A comparison of results across all case-study cities will enable us to determine the validity of our initial hypotheses on a broader basis. The selected case-study cities are Dubai (UAE), Doha (Qatar) and Manama (Bahrain).

The following criteria have been used for selecting the set of case-study cities:

- Absolute and dynamic importance of cities within the global city network
- Favorable influence of location-specific development forces (geo-strategic position, politics / regulation, financial investments / economic growth, history and culture)
- Diversity of institutional context (nation state)
- Operational possibility of conducting research (taking into consideration the social restrictions in some nation states)

For the purpose of evaluating emerging cities on the Arabian Peninsula on basis of these criteria a pre-selection of cities has been made. We have pre-selected seven cities on basis of the Top 200 "World City network" ranking (Taylor, 2004) which outlines the best connected cities within the global network of advanced producer service firms. Figure 2 shows a map of the Arabian Peninsula highlighting the preselected

cities and the finally selected case study cities.

### Preliminary Research Results from Dubai

So far we applied the method triangulation to one out of the three selected case study cities: The city of Dubai. In this chapter we summarize the preliminary findings and research results. In parallel we discuss the initial research hypothesis.

### Dubai and its Status in the Global Network Economy

To elaborate on the status of Dubai in the global network economy an online survey with 98 knowledge intensive economy firms (78 APS and 20 High Tech firms) and 10 qualifying interviews were conducted. The following multi-layered results were gained in Dubai:

- The history of growth of KIE firms is young and rapid. On average the survey firm respondents

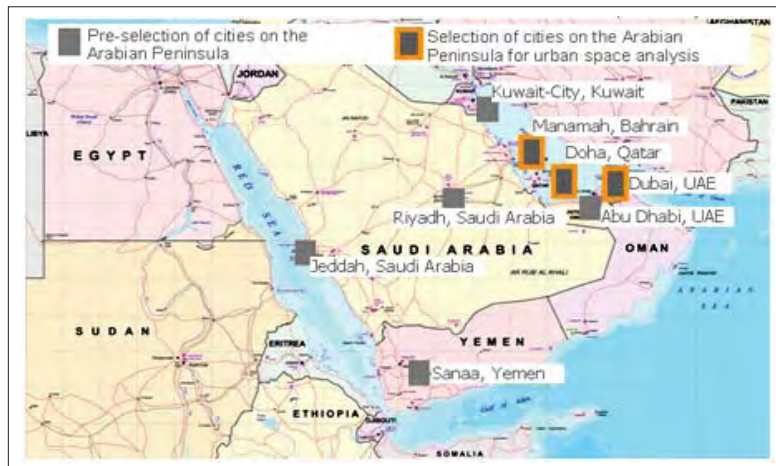


Figure 2: Map of Arabian Peninsula, highlighting the preselected and finally selected case-study cities. Source of map: <http://www.baghdadmuseum.org/maps/me2003.jpg> (downloaded at 24th of April 2008, adapted by the authors).

have established their company subsidiary in Dubai 8,6 years ago.

- The indication of survey respondents regarding other firm subsidiaries than the one in Dubai have lead to a measurement of the inter-firm network connectivity of Dubai to other cities on the Arabian Peninsula as well as to global locations on other continents. Around 75% of the 98 responding KIE firms have firm subsidiaries in locations other than the Arabian Peninsula while they established the best connection to Europe (figure 3).
- 50 out of 98 firms participating in the online survey have indicated one ore more additional firm subsidiaries on the Arabian Peninsula, showing the best connection to Abu Dhabi (UAE) followed by Doha (Qatar) and Riyadh (Saudi Arabia) (figure 4)
- City selection of Dubai as a firm location has been mainly driven by the following geo-strategic, political and economic criteria: Availability of important international airport hub, ease of market entry for foreign companies and people, low taxes/duties and high financial subsidies, favorable political and economical climate and stability.
- Infrastructural criteria (like seaport / airport hub availability) as well as the accessibility of supply and delivery markets were rated slightly more important by High Tech firms than by APS firms.
- The qualifying interviews with KIE firm managers gave a reasoning for the co-existence of several firm subsidiaries on the Arabian Peninsula in around 50% of all survey responses: Even though certain functions of the value chain (research, development, production) and cross-sectoral functions (operations, finance, IT, HR) are often

centralized in one firm location on the Arabian Peninsula, the market oriented functions of the value chain (customer service, distribution, marketing) require de-central firm locations responding to local market conditions.

The above mentioned survey results serve as a preliminary verification for our first hypothesis: The significance of Dubai within the global KIE city network is a result of rapid KIE growth in the latest years due to various location-specific development forces. Final and full appreciation of the results of course is possible only after having finished the entire empirical study.

### Requirements of KIE Firms Regarding Urban Space in Dubai and Actual Urban Space

The online survey with knowledge-intensive economies (KIE) has disclosed the distribution pattern of firm locations across the city of Dubai as well as the KIE firm requirements regarding urban space. The distribution of firm locations across Dubai (figure 5) shows that KIE firms are mainly accumulated around the following city districts: Dubai International Financial Center (DIFC), Knowledge Village, Internet City, Media City and Jebel Ali free zone. DIFC is the district with most KIE firm location indications. The basis for figure 5 were 64 out of 98 survey responses (50 APS and 14 High Tech firms) who provided information about their business building location in Dubai.

The described city districts are free zone areas. Free zone areas are specifically designed to attract firms of certain sectors to Dubai. Advantages of being located in such zones are exemption from taxation combined with a high facility, infrastructure and maintenance quality. The ease of market entry, which is one

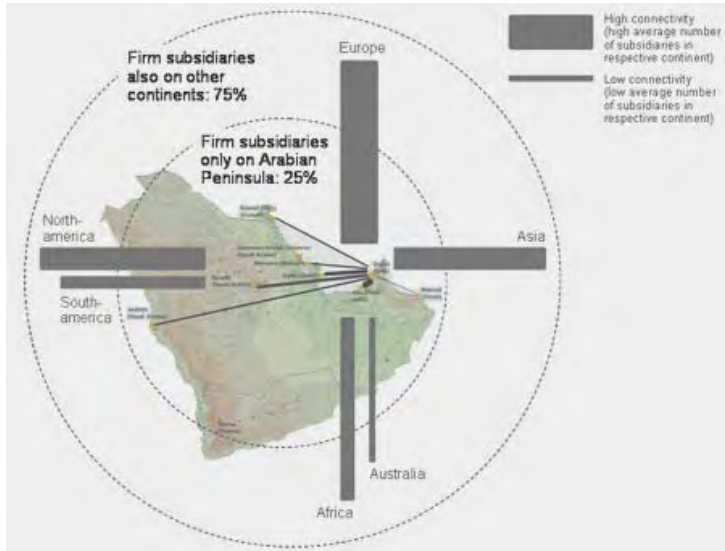


Figure 3: Global Non Physical KIE Firm Network Connectivity of Dubai. (Source: Authors).

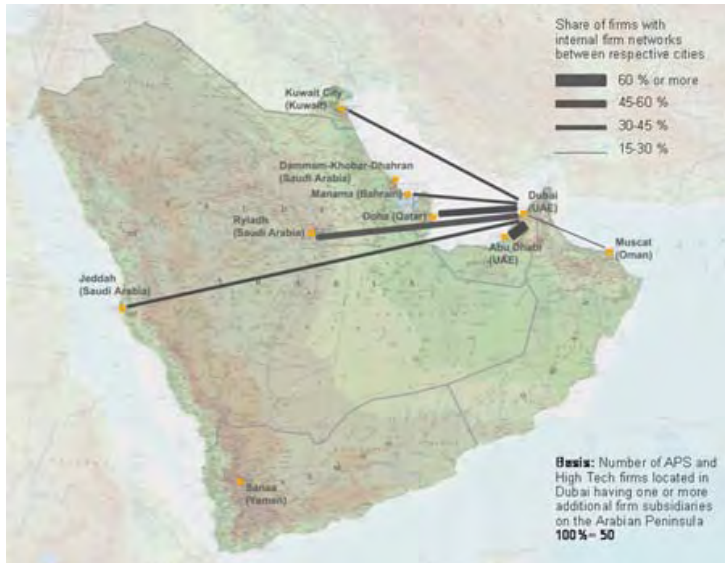


Figure 4: Non Physical KIE Firm Network Connectivity of Dubai to Other Arab Cities. (Source: Authors).

major criterion for selecting the city of Dubai as a company location, is increased tremendously through such city districts. City spaces like DIFC are internationally visible through adequate marketing. Not only the characteristics of the city as a whole are relevant for global KIE firm location selection: In particular the attractiveness of selected city spaces in a city like Dubai which specifically answer the needs of KIE firms influence global firm location selection.

Requirements of KIE in respect to urban space have been articulated in the online survey as well as in the interviews with KIE managers. The major findings are:

- In general time and quality of commuting is rated to be more important than distance. However, distance still matters for urban functions which are used on a daily basis during business life (e.g., restaurants, living locations, partner / subcontracting firms, important infrastructure facilities) rather than rarely used urban functions (e.g., exhibition center).
- A sound mix of urban functions in walking distance around the business location has a high relevance for KIE firms. The degree of urban density and the built morphology are less relevant for KIE, however highly relevant for customer-oriented sectors (e.g., banks). These sectors articulated the need for a high people- and experience-density as well as the preference for stand-alone buildings of branches.
- KIE managers have expressed a high satisfaction degree regarding the outline of urban spaces (density, functional diversity, morphology) on a city district scale. This can be underlined by the findings from behavioral

mapping and photographic observation in DIFC. As figure 6 outlines, the people density in the observed urban space in DIFC differs around the clock. However, the space has never been observed empty during the 10 minute observation time periods. This adds value to the experience of the public space, since it enlivens the space and creates a safety factor. The following various activities have been observed, which are stimulated by the offered broad range of urban functions in walking distance (restaurants, shopping facilities, green spaces, infrastructure): Walking, standing, phoning, sitting, eating / drinking, smoking, talking to other people, shopping. The offered functional diversity is creating an environment for multi-dimensional use of public space.

- A major urban disadvantage of Dubai has been recognized in the configuration of single city districts in the overarching city of Dubai. Former function separating zoning approaches (Dubai structure plan, 2003), the bundling of affordable housing at the outskirts of Dubai or in neighboring emirates and a lack of public infrastructure connections are reasons named for high traffic congestion in Dubai. This is influencing the quality of living and the attractiveness of Dubai for knowledge workers.
- The necessity of available urban functions for leisure and recreation is rated low from a pure business perspective. However, a lack of leisure and recreation facilities is articulated as one major reason for expatriate knowledge workers to limit their stay in Dubai to a certain timeframe. Shortage of skilled labor competence is the consequence tightened by a war for talent between the emerging cities on the Arabian Peninsula.

Our initial second hypothesis has been shown to be provable on a city district scale. However, looking at Dubai from an overarching perspective, the city currently lacks certain factors to be and remain attractive for knowledge workers on a long-term basis.

### Planned Urban Space in Dubai in the Context of a Growing Knowledge Economy

The objectives of "turning Dubai into a vibrant science and technology hub" and "attracting and retaining highly skilled employees" are outlined in the Dubai Strategic Plan 2015 (Dubai Strategic Plan 2015, 2007: 22). Satisfaction of KIE with urban space in Dubai can be seen as one enabler for reaching the above described objectives. Interviews with major organizations involved in urban planning in Dubai helped to elaborate on the satisfaction degree of KIE with urban space. Planners gave reasons

for the KIE perception of well designed city districts, which however are described as being disconnected on an overarching city level: Semi-governmentally owned organizations (Emaar, Dubai Holding, Nakheel) supported by several private firms have been responsible for the design of city zones in Dubai during the last decade. Cutting the city into zones partly with specific functions attached (Dubai structure plan, 2003) has helped to attract foreign investment for specially marketed city areas and has increased the pace of city development through parallel planning approaches. The missing link of city areas is seen as a disadvantageous consequence of that development.

The Urban Planning Committee and the supporting consulting company Urbis currently work on an urban master plan 2020 for Dubai.

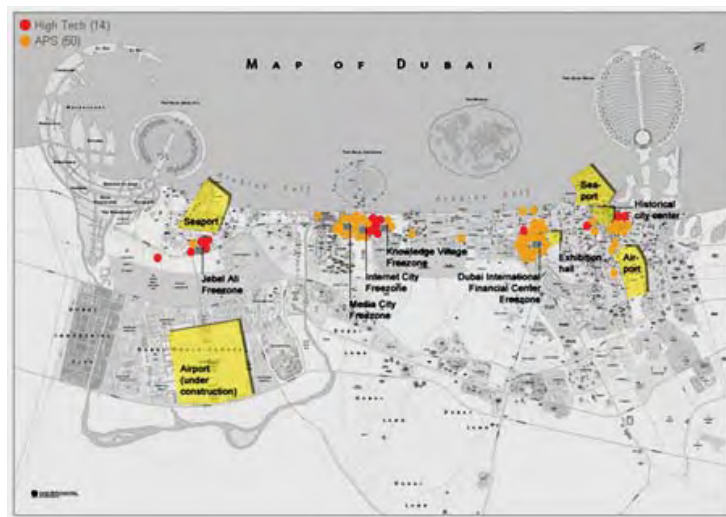


Figure 5: Map of Dubai indicating KIE business building locations. Source of map:

[http://www.maps-me.com/images/Map\\_of\\_Dubai\\_small.jpg](http://www.maps-me.com/images/Map_of_Dubai_small.jpg) (downloaded at 28th of April 2008, adapted by the authors).

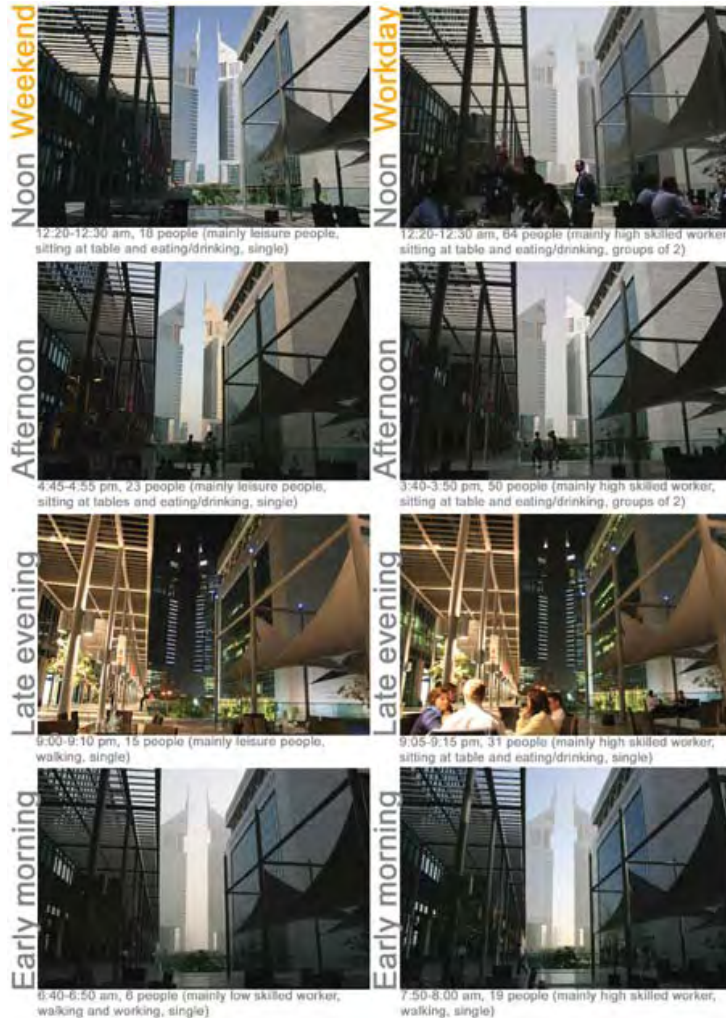


Figure 6: Behavioral Photography-Based Mapping and Observation in DIFC on 18th/19th and 21st/22nd of April 2008. (Source: Authors).

Addressing the requirements of KIE regarding urban space as outlined in the KIE survey results in this context should be seen as one success factor for strengthening the city of Dubai as an

attractive location for the knowledge economy. In addition, collaborative planning approaches of Dubai and neighboring functionally connected cities on the Arabian Peninsula

(figure 4) could enrich urban planning from a regional, normative perspective.

### Conclusion and Research Outlook

The application of the newly introduced method triangulation in the case of Dubai has shown that the used methodological approach is a highly useful tool to comprehensively examine local urban spaces in a global context. The combination of methods has proven to be a successful way to test hypotheses from different viewing angles. Only through the multi-layered perspectives taken into consideration the research can describe the complex character of urban space.

Dubai has gained global significance through the growth of knowledge-intensive economies. Globally visible, KIE attractive urban spaces on a city district scale contribute besides other factors to the global attractiveness of the city for KIE firms. These urban spaces fulfill the requirements of KIE firms in respect to their business building location. However, Dubai from an overarching city perspective has deficits in certain areas such as the disconnection of city districts leading to infrastructural problems as well as the unavailability and poor quality of leisure and recreational facilities. These areas pose a threat for the talent market in the knowledge economy sector of the city.

In the further proceedings of the ongoing research project we will apply the method triangulation to two other cities on the Arabian Peninsula: Doha (Qatar) and Manama (Bahrain). We will compare the results to the preliminary findings gained in Dubai. After we will have conducted our research in all three cities, we will evaluate our initial hypotheses. Finally we

will transfer our findings from the observed emerging cities on the Arabian Peninsula to western European cities.

The final outcome of this research project is seen to be valuable for a number of different organizations such as governmental and educational institutions dealing with urban planning and development in Arab and Western European locations, representatives from global knowledge-intensive economy firms as well as people with a personal interest in regional and urban planning and development in locations on the Arabian Peninsula.

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