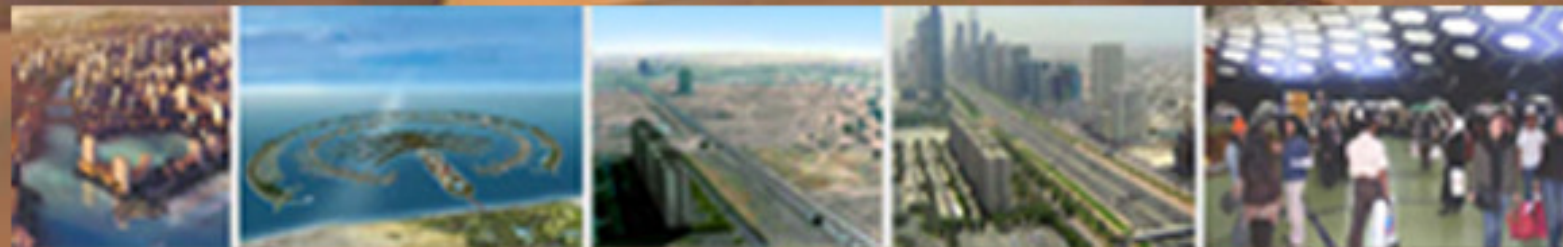# Built on Sand?



## Emerging cities on the Arabian Peninsula in the knowledge economy context

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TECHNISCHE UNIVERSITÄT MÜNCHEN

Lehrstuhl für Raumentwicklung

# Built on Sand?

# Emerging Cities on the Arabian Peninsula in the Knowledge Economy Context

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Vollständiger Abdruck der von der Fakultät für Architektur der Technischen Universität München zur Erlangung des akademischen Grades eines

Doktor - Ingenieurs

genehmigten Dissertation.

Vorsitzender:  Univ.-Prof. Dr. Gerhard Hausladen

Prüfer der Dissertation:  1. Univ.-Prof. Dr. Alain Thierstein

2. Prof. Ashraf M. Salama, Ph.D.
Queen´s University Belfast, United Kingdom

Die Dissertation wurde am 17.06.2009 bei der Technischen Universität München eingereicht und durch die Fakultät für Architektur am 21.07.2009 angenommen.

# Acknowledgment

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# 1   Introduction and key research question

***"We have always believed that tomorrow is a new day, that
yesterday's achievements are in the past and that history will
record what we achieve in the future."***

*Sheikh Mohammed bin Rashid al Maktoum, ruler of Dubai*

Figure 1: Images from cities on the Arabian Peninsula[1] – Source: Internet and own pictures

A few years ago there was nothing else but valueless desert sand. Today the
picture is a completely different one: Hundreds of high rises, huge man-made
islands and new financial centers are only some examples of the developments on
the Arabian Peninsula. Cities have emerged in a very short timeframe as globally
important knowledge economy locations. Rarely have we observed such a rapid
spatial transformation.

Literally, from one day to the other the Arabian Peninsula has obtained a geo-
strategic importance that is currently unique all around the world. Through the shift
of global economic forces, the Asian markets have recently gained a large
significance. As a consequence, cities on the Arabian Peninsula have developed
into central hubs right inbetween the developed Western nations and the rising
economies of Asia. Thus, the significance of cities on the Arabian Peninsula in the
global knowledge economy networks has grown rapidly, as did the urban spaces.
Arab cities have extended their city structures far beyond the historic centers of
settlement.

In today´s context of an international competition between geographic locations,
cities face completely new challenges. They need to find ways of how to sustain
and extend their position in the context of a globally operating knowledge

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[1] From left to right: King Abdullah City (Saudi Arabia), Palm Jumeirah Dubai (UAE), Sheik Zahed Road Dubai
in 1991 (UAE), Sheik Zahed road Dubai in 2005 (UAE), Abu Dhabi international airport (UAE)

economy. Knowledge-intensive economies have been identified as the key spatial development drivers (Hall, Pain, 2006: 4; Thierstein et al., 2006: 13; Lampugnani et al., 2007: 149). They strengthen the centers of global cities and functional urban areas as nodes within the space of flows (Castells, 1996; Sassen, 2001). In addition they are, to a large degree, dependent on connections between these nodes on different spatial scales. Through global and regional firm networks, knowledge-intensive economies take advantage of cooperation strategies between specialized locations and therefore increase their overall value creation.

But how exactly can cities survive in the global competition of geographic locations? How can they influence their significance in the global knowledge economy networks? The present research will offer answers by elaborating on the development of emerging cities on the Arabian Peninsula which have recently managed to attract a large amount of knowledge economy firms within a very short timeframe.

The explored key success factors for retaining and extending the competitiveness and attractiveness of a city in the global knowledge economy context can be summarized as follows: Economies of scale and scope with regards to the offered amount and complementarity of diverse utilizations in a location as well as the quality of urban space play a major role in this context. Cooperation strategies between locations are necessary pre-conditions to unfold the advantages of economies of scope on different spatial scales. Thus, the present research project argues that non-physical knowledge economy networks and physical, urban development are mutually interdependent.

In the course of the empirical work on this fascinating topic I have had the chance to spend nine months in different countries on the Arabian Peninsula. Around 200 survey data records, 50 interviews and field studies in the three selected Arab cities Dubai, Doha and Manama have created the required understanding of local developments in a global context. With this document I would like to share an evidence-based summary of the gained insights. Having a Western-European background, I will finally outline potential learnings from recent spatial developments on the Arabian Peninsula for Western-European cities.

People from the so-called developed nations tend to look at urban developments on the Arabian Peninsula with mixed feelings. Positive opinions, on the one hand, admire that cities could develop into globally important knowledge economy locations in such a rapid pace. Negative opinions, on the other hand, articulate that emerging cities on the Arabian Peninsula are "built on sand". In addition, the euphoria given the strengthened global position of emerging Arab cities has slowed down due to the current global economic crisis. However, especially during times of an increased global competitiveness and economic uncertain outlook it becomes important to understand the qualities of newly built and used urban spaces from a knowledge economy perspective. Thus, the present research piece tries to step out of a purely descriptive, observational position, towards a rather analytical, directive one. To achieve this objective the research document is structured along the following consecutive chapters:

Starting with an overarching introduction in chapter **one**, the **second** chapter discusses theoretical approaches associated to relational geography and urban development in an economic context and gives definitions for frequently used terms of this document. The theoretical and conceptual considerations lead to the main hypotheses of the research project.

The **third** chapter 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.

Chapters **four** and **five** present the research results gained through the application of the research methodology in the cities of Dubai (UAE), Doha (Qatar) and Manama (Bahrain), each of the chapters analyzing one main research hypothesis.

Chapter **six** illustrates potential lessons for Western European cities derived from investigations on the Arabian Peninsula.

Finally, the **seventh** chapter concludes by synthesizing the major findings of the research project and by giving an outlook of further proceedings.

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.

## 2   Related research and definitions

This research project is innovative in bridging the scientific fields of non-physical, relational geography and morphological, urban development (see figure 2).
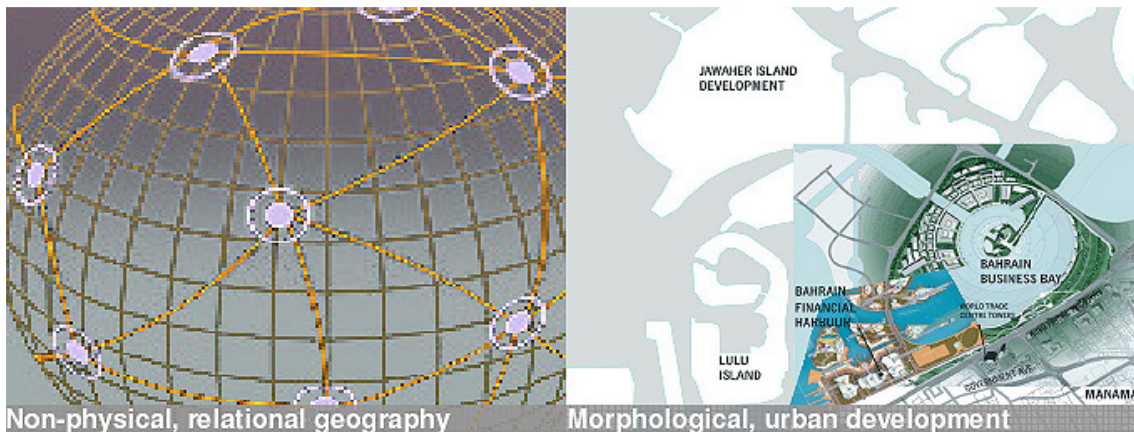


Figure 2: Two scientific fields bridged in the present research project – Source: Own Illustration

Therefore, this chapter aims to provide an overview of the two areas: First, it explains the used theoretical approach of relational geography and defines the term "knowledge economy". Second, it gives a background on the topic of urban development in an economic context and defines the term "urban space". The outlined conceptual frame will finally guide us to the key hypotheses of the research project.

### 2.1   Relational geography in the context of knowledge-intensive economies

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. Present studies on relational geography are influenced by Manuel Castells` publications about the space of flows.

#### 2.1.1   The "space of flows" hypothesis

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). Also, Vittorio Magnago Lampugnani et al. outline the remaining importance of personal meetings in the publication "Urban Density": *"[…] The prognoses, that the function of the city would become obsolete in the new era of ubiquitous telecommunication, have not proven true. On the contrary: Especially those people, who work a lot via their lap-tops and computers, do not want to remain isolated and intensely search for personal meetings."* (Lampugnani et al., 2007: 17)

In order to properly understand the multi-scalar simultaneous development of large-scale urban structures, one has to consider a dual analytical view of space. The 'space of flows' conceptualizes the relational worlds of non-physical, functional inter-locking networks of knowledge-intensive firms, while the physical side of localized urban nodes of these same inter-locking networks is to be considered as 'space of places'. With respect to the 'space of flows', the term "non-physical connectivity" is often used in the context of the present research project. It refers to the exchange of knowledge between two locations as a consequence of knowledge economy firm networks. On the contrary the "physical connectivity" between two locations refers to the transport of goods, people and other materialized matters. The results of the present research project will show the coherence of both, 'space of flows' and 'space of places'.

Castells` theory builds the basis for several studies on location strategies of knowledge economy firms, which aim to identify non physical, global knowledge flows and networks.

## 2.1.2 Knowledge-intensive economies as global driver of spatial development

The growing knowledge economy has been identified as a major development driver within the space of flows by different authors:

Peter Hall and Kathy Pain mention knowledge-intensive economies as development driver in their studies about the polycentric metropolis: *"Underlying the [..] spatial processes are two basic and parallel shifts, independent but closely and complexly related: the globalization of the world economy, and what can only be called (in an ugly but necessary word) its 'informationalization', the shift in advanced economies away from manufacturing and goods-handling and towards service production, particularly into advanced services that handle information"* (Hall, Pain, 2006: 4).

In the publication "Urban Density", Martin Hofer makes the service economies and the continuous tertiarization responsible for an *"obvious concentration tendency in metropolis and their agglomerations"* (Lampugnani et al., 2007: 149). Theoretically, telecommuting would be a potential option for these service economies. However, Hofer assumes that service firms prefer urban locations due to the ease of access to human capital and "soft" location factors like social contact opportunities.

Alain Thierstein et al. also describe the growing importance of knowledge economies in their publication "Spatial development on the quiet" (Thierstein et al., 2006: 13): *"The knowledge economy with the so called knowledge-intensive services is a central driver considered to be reliable for the development of the new gravitation fields of economic power"*. 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 3). 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). In addition, as Schamp outlines tacit knowledge in combination with personal experience is a necessary requirement to use codified knowledge in creative processes and innovation (Schamp, 2003: 181).
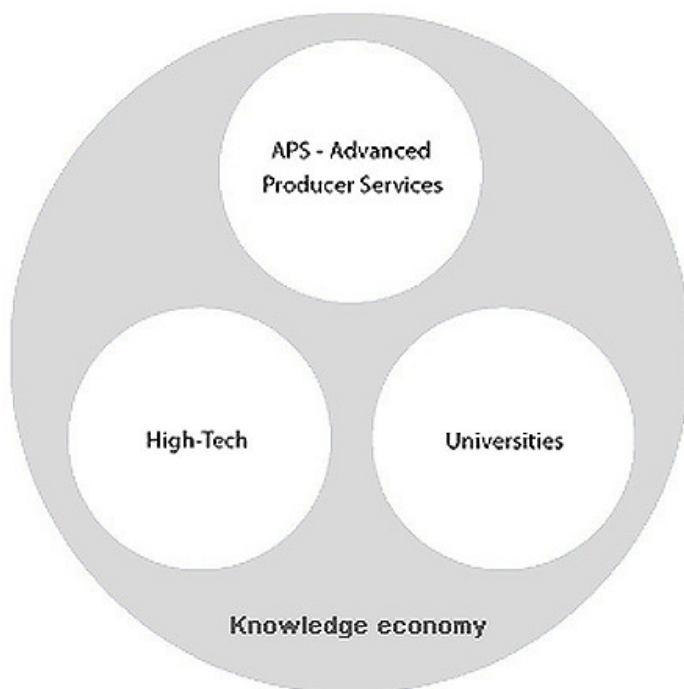


Figure 3: Structure of the knowledge economy. Source: Thierstein et al., 2006

The above described "local nature of knowledge" (Malecki, 2000) forms the basis for studies on location strategies of knowledge economy firms which are described in greater detail in the next chapter.

### 2.1.3 Concentration of knowledge-intensive economies in cities and urban nodes

Saskia Sassen shows, 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). Sassen argues, that the functional centrality of global cities plays an increasing role for Advanced Producer Service (APS) firms. These firms tend to choose city centers for their business location, which leads to a disconnect between central locations and broader hinterlands.

On the contrary side, Wallerstein presented an analysis of the emerging world system and the core mechanism of the European capitalist trade system (Wallerstein, 1974). From his perspective, the world capitalist system is organised 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).

Similarities to Wallersteins analysis of the emerging world system can be found in John Friedmann`s world city concept (Friedmann, 1986). Friedmann`s definition of a world city besides the central city includes as well the surrounding region. World city in his definition may even be a polycentric urban region, consisting of multiple cities and their hinterlands.

While Friedmann and other authors provide theoretical frameworks in the research field of relational geography, Peter Taylor has developed an empirical research method to quantitatively identify inter-locking firm networks of the knowledge economy. This methodology is capable to measure the non physical connectivity of cities by analyzing intra-firm company networks (Taylor, 2004). Taylor uses 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 firms is also part of this research project. 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 this project we will refer to these two sectors with the term knowledge-intensive economies. For the term knowledge-intensive economy firms we will use the short form "KIE". Universities and academic research institutions are omitted in this context, since these 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 and the respective NACE codes in brackets which have been included in the empirical research.

| Advanced Producer Services (APS) | High Tech |
|---|---|
| • Accounting (7412) | • Chemistry and pharmaceutical industry (2330, 2413, 2414, 2416, 2417, 2420, 2441, 2442, 2451, 2461, 2463, 2464, 2466, 2511, 2513, 2615) |
| • Insurance (6601, 6602, 6603) | • Mechanical engineering (2911, 2912, 2913, 2914, 2924, 2931, 2932, 2941, 2942, 2943, 2952, 2953, 2954, 2955, 2956, 2960) |
| • Banking and financial institutions (6511, 6512, 6521, 6522, 6523, 6711, 6712, 6713, 7011, 7012) | • Computer (3001, 3002) |
| • Management- and IT-consulting (7210, 7222, 7413, 7414, 7415) | • Electrical machinery (3110, 3120, 3140, 3150, 3161, 3162, 3210, 3320, 3330) |
| • Law (7411) | • Telecommunication (3220, 3230) |
| • Logistics (6030, 6110, 6220, 6230, 6340) | • Medical and optical instruments (3310, 3340) |
| • Design and architecture (7420, 7430) | • Vehicle construction (3410, 3430, 3511, 3520, 3530) |
| • Advertising and media (7440, 2211, 2212, 2213, 2214, 2215, 9211, 9220, 9240) | |

Table 1: Overview of knowledge-intensive economy sectors

### 2.1.4 Changing significance of cities as a result of long economic waves

The geo-strategic role of regions as well as cities changes over time. As history shows, cities can gain and lose 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 rapidly grown importance of cities on the Arabian Peninsula from a relational geography point of view gives evidence of Dickens theory.

## 2.2 Development of urban space in an economic context

Several urban design movements in the last decades have tried to find answers to changing social, demographic or economic conditions. Nowadays, the growing importance of knowledge-intensive economies in a progressively globalizing world generates new requirements for the development of urban space. How should these urban spaces look? Before we try to find answers in the later documentation of the empirical research, we first have to understand the historic context of urban development under specific economic conditions.

### 2.2.1 General impact of economic change on urban development

From a historic perspective, economic change has often had a significant impact on urban development. Europe, for example, faced its highest emergence of new cities back in the 13th century, when technical inventions in the agricultural sector and a flourishing trade economy 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 a low density of buildings and inhabitants (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 increased commuting traffic and the loss of city enlivenment around the clock. Thus, later on Jane Jacobs postulated traditional city spaces with a high degree of functional intermixture and density (Jacobs, 1961).

But not only historic examples show that economic change has an impact on urban development and urban space. Today, the growing importance of the knowledge economy strengthens the role of cities as nodal points of exchange for "tacit knowledge" (Polanyi, 1964). 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 these questions. Many cities on the Arabian Peninsula have been free of boundaries from the above described historic urban developments, as their history of ascension is still very young.

Dubai, for example, has developed in a very short timeframe from a small fishing village into a global city, attracting international knowledge economy firms. While in 1950 it was still a small town with no more than 20,000 inhabitants, it is a global hub with approximately 1.5 million inhabitants today (United Nations, 2004). In addition to Dubai, several other emerging cities on the Arabian Peninsula have developed into highly attractive locations for the knowledge economy in the last decades. Their city structures have evolved recently in parallel to their growing significance in the global space of flows. Thus, their urban spaces are objects of investigation in the present research project, since these are expected to reflect the requirements of the knowledge economy to a certain degree.

### 2.2.2 Existing research about recent urban development in the Arab world

A couple of Arab authors have presented their views about recent urban development in the Gulf during the past few decades. Referring to the rapid urban development of Arab cities in the latest years, the term "instant city" has been established (Bagaeen, 2007; Moustafa et al., 2008). The speed of urban development in the Middle East seems to be comparable to an instant soup, which you can readily mix in a couple of seconds. The historic origins of cities on the

Arabian Peninsula are vanishingly small compared to the city structures built during the latest decades. "Instant city" therefore also describes the fact that the cities seem to have suddenly appeared out of nowhere. Such a rapid, vast urban development has specific socio-cultural consequences, which are the research subject of several publications about Arab cities.

On the one hand, Arab cities with a young history of growth are described to search for identity, while presenting a broad architectural variety. In "Cairo's Plurality of Architectural Trends and the Continuous Search for Identity" Ashraf Salama talks about this phenomenon, exemplifying the city of Cairo (Salama, 2008). An additional trend to the loss of identity is the fragmentation of society. Based on the case-example of Dubai, Yasser Elsheshtawy critically describes the dualism of rich and poor impacting urban form (Elsheshtawy, 2004).

Another tendency frequently indicated in research is the increasing role of branding urban spaces, in order to give emerging Arab cities a global image. Iconic design like the palm-shaped islands in Dubai have created an impulse for the development of similar urban branding projects all around the Gulf (Elsheshtawy, 2004; Bagaeen, 2007; Adham, 2008; Helmy, 2008). Examples named are "The Pearl" in Qatar or "Amwaj Island" in Bahrain. Such so-called "megaprojects" (Elsheshtawy, 2004: 180) comprise large-scale urban developments with a specific branding focus established to create global recognition. Partly the developments have an economic focus or describe knowledge centers like "Smart Village" in Cairo or "Internet City" in Dubai (Alraouf, 2005; Elsheshtawy, 2006).

In addition to the socio-cultural perspective on urban development, another set of research deals with the ecological view on Gulf cities` development. Starting point for a larger investigation of the topic was the fact that the United Arabian Emirates have one of the "largest ecological footprints" worldwide (Müller, S.; Quednau, A., 2008). Wackernagel, the co-founder of the ecological footprint measure, explains that *ecological footprint analysis compares human demand on nature with the biosphere`s ability to regenerate resources and provide services"* (Wackernagel et al., 2002). To foster ecologically valuable urban development in Gulf cities,

Mustapha Ben-Hamouche demands *"compactness as a new paradigm in urban design and planning"* in the Arabian region (Ben-Hamouche, 2008).

### 2.2.3  Operational definition of key terms

In analyzing recently developed urban space of emerging cities on the Arabian Peninsula, the present research project follows the hypothesis that these urban spaces are designed according to up-to-date requirements of knowledge-intensive economies. However, if we want to analyze urban space in the context of a growing knowledge economy, we need to define "urban space" first. "Urban space" itself is a combination of two scientific terms: "space" and "urban".

Thus, in the following paragraphs both terms will be discussed in detail with the respective theoretical background. For the purpose of the present research project, the discussed theories are applicable to different kinds of geographic locations around the globe.

***What is "space"?***

People have thought about "space" since ancient times. Aristotle described his idea of a finite space with limits defined by fixed stars in the 4th century BC (White, 1992). Ever since, complex and manifold scientific theories about space have been established. Definitions of the term "space" can be classified along two major dimensions: Rather philosophical / anthropological definitions from social scientists and physical / geographical definitions from natural scientists.

Sociologist Henry Lefebvre outlines three different angles, to observe space. Space is lived, perceived and conceived (Lefebvre, 1991). In a similar manner, Gosztonyi in his publication "The Space" describes three perspectives on space (Gosztonyi, 1976). On the one hand 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 architects, politicians, scientists and others think theoretically about the outline of space and act upon the physical space as designers and planners.

Lefebvre and Gosztonyi besides others paved the way for a paradigm change from the original understanding of "space" as a container to "space" as a result of social relations and interactions.

Along with that goes the assumption, that asynchronous happenings can be stored in space superjacent. This is expressed by the historian Schlögel, when he talks about "reading time in space" (Schlögel, 2006). However, the idea of temporal overlap – going along with a heterogeneity and complexity – of space is not new, but is based on formerly established theories (Leibniz, 1715; Foucault, 1967; Latour, 2005).

If we look at the definition of the term "space" from a natural science perspective, the complexity of space in terms of its functional as well as its temporal overlap is implicitly articulated, as well. Boesch describes space as a three-layered system consisting of "distance", "functionality" and "process" (Boesch, 1989). Thus, the above described social science awareness of the space complexity due to the overlapping projection of differing times and the associated functional ambiguity finds an analogy in Boeschs terminology of "process" and "functionality". Boesch has abandoned the exclusive definition of space as a "container" with a measurable size which was the main attribute of space in the definition of Aristotle.

Nevertheless, Boesch still uses the layer "distance" as a basic defining element of space. In his "Theory of Central Places", Christaller in 1933 also refers to the role of distance in defining space. He outlines that distance-correlated transportation costs trigger centralization effects (Christaller, 1933).

Both, the social and the natural science definitions of space were acknowledged in the empirical approach of the present research project as the two major dimensions of space (see figure 4).
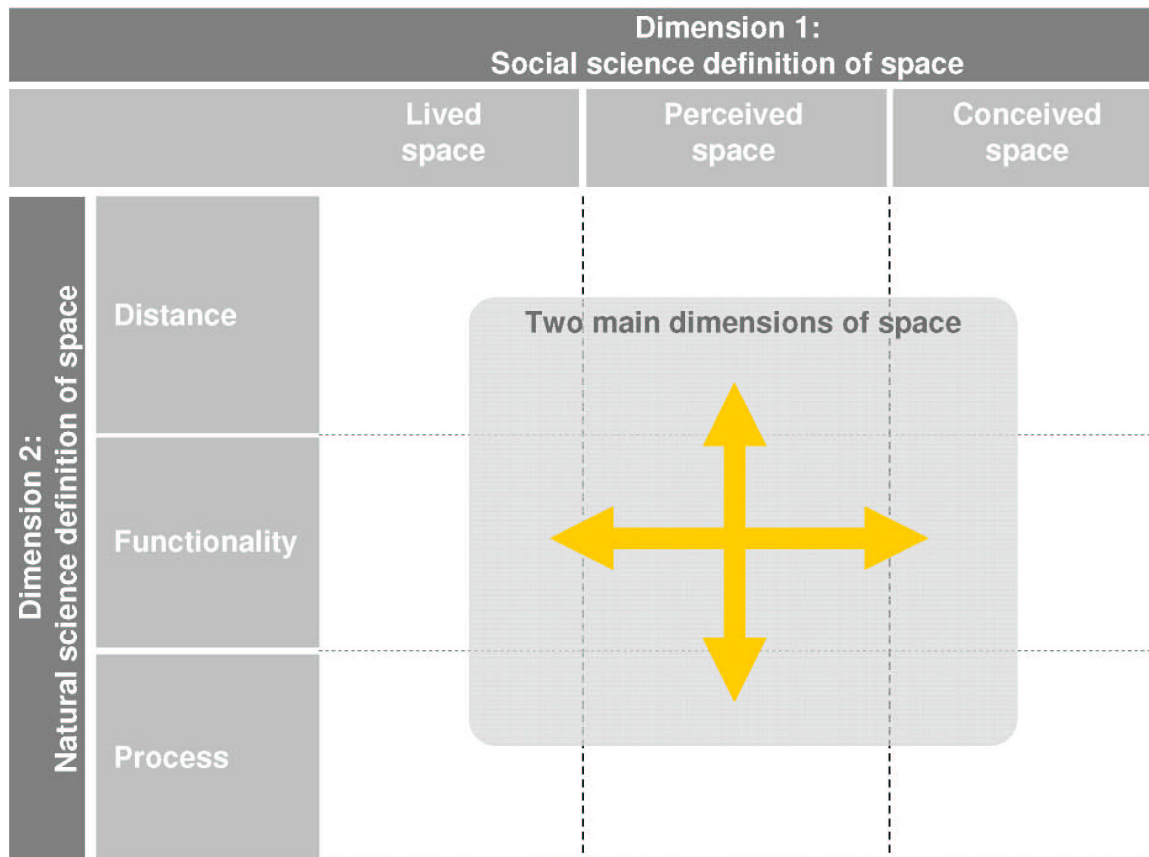
Figure 4: Dimensions of space used for present research project – Source: Own illustration

### When can "space" be called "urban"?

Fischer outlines in "Theories of Urbanism" four different, historically used types of definitions related to the term "urban" (Fischer, 2005: 52-53): *Demographic, institutional, cultural* and *behavioral* definitions. Parker offers a similar classification in his publication "Urban Theory and the Urban Experience" while he uses a slightly different wording for the main categories (Parker, 2004: 6).

*Demographic* definitions deal with the size and density of a population. Comparably, Parker talks about the *community* as a frequently described aspect of urban experience: The size of the population, its distribution and demography are measurable, defining elements related to the *community* used in "urban" theory. The demographic definition of the term "urban" has found various users from theoretical sociologists (Wirth, 1930) to urbanists (Jacobs, 1961).

*Institutional* definitions rather relate the term "urban" to communities with a specific set of institutions, e.g., commercial markets. Parker in this context more specifically talks about the urban feature of *consumption*: *Consumption* of goods and services and the nature of the exchange and the means by which such goods and services are produced are used as defining elements of the term "urban". Institutional definitions of "urban" can be mainly found in the early 20th century literature about the perception of city as a marketplace (Simmel, 1903; Weber, 1958).

*Cultural* definitions require that a community has certain cultural features in place. Parker like Fischer acknowledges this aspect of urban experience in different theoretical approaches, while he underlines that *culture* in this case can constitute systems of belief as well as the physically built environment. Lewis Mumford in "The Culture of Cities" provides the following cultural definition which is rather influenced by the European city image: *"The city, as one finds it in history, is the point of maximum concentration for the power and culture of a community."* (Mumford, 1938:3).

*Behavioral* definitions outline distinctive and typical behavioral styles among the people of a community as defining element of urban life. While Fischer with the term "behavioral definitions" in this case uses a rather neutral expression, Parker talks about *conflict* aspects of urban experience which refers not only to the physical violence, but also to the less visible struggles over resources between different interest groups. This rather negative, social impact of urban life has its origins in the determinist theory which argues that urbanism increases social and personality disorders (Simmel, 1903; Wirth, 1930). Contradictory to the opinion of Simmel and Wirth, the so-called compositional theory denies the described effects on the people of the city. Representatives of the compositional theory like Herbert Gans regard the differences between the behavior of urban and rural inhabitants as related to the composition of the differing population (Gans, 1968).

The most commonly used of the above mentioned types of definitions is the demographic one. *"On the basis of the three variables, number, density of settlement, and degree of heterogeneity, of the urban population, it appears possible to explain the characteristics of urban life and to account for the*

*differences between cities of various sizes and types"*, as Louis Wirth in one of the most quoted urban theory papers on "Urbanism as a Way of Life" pointed out (Wirth, 1930: 34). As Fischer outlines, the predominant use of the demographic definition has certain advantages (Fischer, 2005: 53), like the fact that the numerical criteria of population amount, density and heterogeneity are commonly comparable measures.

Even though the demographic definition of "urban" is also used as a basis for the present research project, *density* and *heterogeneity* as key defining elements are more broadly interpreted than outlined in the definition of Wirth. The rather broad interpretations of the terms *density* and *heterogeneity* will be explained in the following, backed up accordingly by theoretical literature. In addition, the term *public space* will be introduced, since public space has been recognized as another key feature of "urban" life (Borden, 2008; Carmona, 2008).

### *Density*

The importance of settlement density as one feature of urban life in the definition by Wirth is also underlined by Vittorio Magnago Lampugnani: *"Density stands at the origin of all human settlement. Courtyards, villages and larger settlements were founded, to protect themselves and to be able to better operate in a sheltered environment. However, primarily they were founded, to be able to better interact and communicate with each other thanks to the spatial proximity."* (Lampugnani, 2007: 13).

If we look at the term "settlement density", it basically contains two types of densities in one word: The **building density** which is the density of the tilled environment. Häussermann calles it the "structural density" (Häussermann, 2007: 22 ff.) and describes it as the ratio of tilled space to a specifically defined base area. The other type of density contained by "settlement density" is the so-called inhabitant density (Häussermann, 2007: 22 ff.) which spezifies the ratio of amount of inhabitants to a specifically defined base area. However, the demographic element of settlement density (Wirth, 1930: 34; Lampugnani, 2007: 13) only insufficiently describes the term "density". Thus the term "density" requires a

broader definition for the purpose of the present research project. Jane Jacobs offers an extension to the demographic definition of density as a necessary requirement for urban life. Thus, she postulates the requirement for a high **people density** which goes beyond the inhabitant density: *"There must be a sufficiently dense concentration of people, for whatever purposes they may be there. This includes dense concentration in the case of people who are there because of residence."* (Jacobs, 1961:151). Using people density instead of inhabitant density as defining element for "urban" life also has the pragmatic advantage, that applied analytical methodologies can easily count the amount of people while the differentiation between inhabitants or other sub-categories of people (like employees, tourists etc.) is rather difficult. In addition, Jane Jacobs claims a high density of urban functions: *"The district, and indeed as many of its internal parts as possible, must serve more than one primary function; preferably more than two. These must insure the presence of people who go outdoors on different schedules and are in the place for different purposes, but who are able to use many facilities in common."* (Jacobs, 1961: 150). Martin Hofer picks up this thought, when he articulates that *"positive density is **experience density**"* (Hofer, 2007: 149). Similar to Jacobs he illustrates that urban density must always accompany a certain mix of urban functions. He says, that *"to create positive density, the consumption of density potential necessarily has to be connected with qualitative requirements"* (Hofer, 2007: 151). Wolfrum talks likewise about the required "richness of occurrences" (Wolfrum, 2007). She also emphasizes the importance of experience density which goes far beyond the fairly numerically describable building density. In addition, Häussermann picks up the topic. However, instead of the term "experience density" he speaks about functional density: *"The post-modern economy demands temporal and spatial flexibility. This is much better brought in line with the requirements of everyday family life, if you live in a heterogeneously equipped environment with a high functional density. Therefore, heterogeneity and density undergo a new appreciation and contribute to the renaissance of cities."* (Häussermann, 2007: 28).

In general, urban theorizers of the 20th century mainly outline the positive connotation of high urban densities (Lampugnani, 2007; Hofer, 2007; Jacobs,

1961). Avoiding urban sprawl and a tilled landscape are only some of the named advantages of urban density.

The analysis of urban density in selected case study cities on the Arabian Peninsula was focused on the description of the above defined *building density, people density* and *experience density*.

### *Heterogeneity*

Heterogeneity as a defining element of "urban" beyond the aspect of a divers urban population (Wirth, 1930) covers also diversity in terms of building types and urban functions. It was the intention of the present research project, to capture heterogeneity from a holistic perspective. Based on theoretical background literature outlined below, the different types of urban heterogeneity will be defined: Heterogeneity of people, heterogeneity of building types and heterogeneity of urban functions.

*"The social interaction among such a variety of personality types in the urban milieu tends to break down the rigidity of caste lines",* as Wirth wrote in his explanations about **heterogeneity of people** (Wirth, 1930: 37). While Wirth has described the unification process of different social classes within cities, Saskia Sassen with the "dual-city" later on in a new global setting describes the opposite: Social polarization and disparities increasingly determine the nature of global cities which results in social instability and conflict. In either perception, the city remains to be an agglomeration of a heterogeneous set of people in terms of their social backgrounds. The difference between the city described by Wirth versus the city described Sassen lies in the degree of intermixture and interaction of heterogeneous social classes within the city structure. Recently, heterogeneity of people is not only seen from a social class perspective, but also from a local versus global geographical background perspective (Smith, 2005): *"Since human agency operates at multiple spatial scales, and is not restricted to "local" territorial or socio-cultural formations, the very concept of the "urban" thus requires re-conceptualization as a social space that is a pregnant meeting ground for the interplay of diverse localizing practices of regional, national, transnational, and*

*even global scale actors, as these wider networks of meaning, power, and social practice come into contact with more purely locally configured networks, practices, meanings, and identities."*

With respect to **heterogeneity of building types**, Jane Jacobs writes about the requirement of city districts which *"must mingle buildings that vary in age and condition"* (Jacobs, 1961: 150). This aspect, in a way, can foster the interaction of different social classes, since the buildings in this *case "vary in the economic yield they must produce"* (Jacobs, 1961: 151). Furthermore, the heterogeneity of building types can also reflect differing building typologies, like high rise buildings versus solitaire, stand-alone buildings. Along with that goes the idea of "contingent space" which describes the tolerance of architecture and space to allow a certain variability of its use (Wolfrum, 2008).

In general, buildings within cities are part of the interplay between "open spaces" and "closed spaces". Malone describes, that open spaces have weakly defined boundaries and are characterized by social mixing and diversity, whilst closed spaces have strongly defined boundaries and actively exclude objects, people and activities that do not conform (Malone, 2002). The sequencing of both, open and closed space, creates the heterogeneous, morphological pattern of a city.

**Heterogenity of urban functions** has been observable as a key element of city structures from early times on. Even medieval cities combined different functions on dense common ground, confined by protective barriers. During the industrialization period, people created the demand for spatial segregation of urban functions manifested in the Charter of Athens. Conscious of the disadvantages of a functional disjunction and the therewith combined "disappearance of the city" (Katznelson, 1992: 101), later generations have started to reconfirm the need for a mix of urban functions. Several authors even outline the demand for a parcel-accurate intermixture (Jacobs, 1961; Hofer, 2007). The remaining question is, whether the traditional form of functional intermixture, which Jacobs has propagated, is still applicable today. Economies of scale (Panzar et al., 1975) to a certain extent are weakly supportive for achieving the cozy atmosphere of conventional, functionally mixed urban areas. Also, the trend of consolidation in

several existing industries requires a reconsideration of the demands on urban
space with regards to the degree of functional diversity. Numbers from the Federal
Statistical Office (Federal Statistical Office Germany, 2004) as an example
illustrate consolidation trends of medium size companies (classified by their
amount of revenues) in Germany (see figure 5).

| Company´s yearly revenues from ... to ... EUR | Number of companies 2004 in Thousands | Change in number of companies | | Main driving sectors* |
| --- | --- | --- | --- | --- |
| | | 2003 - 04 in percent | 2000 - 04 in percent p.a. | |
| 17.500 - 50.000 | 849 | 5,4 | 2,4 | • Real estate and rental market sectors • Public and privat service sectors • Construction sector |
| 50.000 - 100.000 | 596 | 1,9 | 1,2 | |
| 100.000 - 250.000 | 660 | 0,1 | -0,1 | |
| 250.000 - 500.000 | 340 | -1,2 | -1,2 | • Construction sector • Trade and repair sectors • Production sector |
| 500.000 - 1 Mio. | 220 | -2,4 | -2,0 | |
| 1 Mio. - 2 Mio. | 134 | -2,4 | -1,7 | |
| 2 Mio. - 5 Mio. | 89 | -1,8 | -1,3 | |
| 5 Mio. - 10 Mio. | 33 | -0,9 | -1,5 | |
| 10 Mio. - 25 Mio. | 21 | 1,5 | -0,7 | |
| 25 Mio. - 50 Mio. | 8 | 1,4 | -0,1 | • Trade and repair sectors • Real estate and rental market sectors • Production sector |
| 50 Mio. - 100 Mio. | 4 | 5,0 | 2,0 | |
| 100 Mio. - 250 Mio. | 2 | 2,9 | 1,3 | |
| 250 Mio. and more | 2 | 5,0 | 3,1 | |
| Total | 2.957 | 1,4 | 0,4 | |

\* Top-3 sectors with highest total change

Figure 5: Consolidation trend of firms in Germany shown by change in firm numbers of certain
revenue sizes
Source: Federal Statistical Office Germany, own illustration

The pure extent of today`s building complexes and infrastructure often intervenes
with the postulate of Jacobs for a parcel-wide functional intermixture.

**Public spaces**

*"In order to actually be a city and not a large village, a city requires open spaces
and public spaces which enable the get-together of foreigners - spaces in which
one can play the game of the city."* (Wolfrum, 2007). Talking about "urban", the role
of public spaces as the actual place where heterogeneity reaches its maximum
extent cannot be denied. Iain Borden describes four kinds of differences
acknowledged by public space: 1. People shape their own public spaces in

different ways, 2. Public spaces differ in their physical and visual condition,
3. Public spaces can be used differently dependent on time, and 4. We can have different experiences in one and the same public space. (Borden, 2008: 157-158).

In the case of the present research project, selected public spaces have been observed for the purpose of describing the ongoing activities and interactions. Thus, an exhaustive definition of "public space" is required to establish a common understanding of the terminology. However, this is not an easy task, since the boundaries between public and private space are quite vague. In the publication "Public and private, power and space" Kilian even argues that a differentiation between public and private is not possible since all spaces contain restrictions, whether of access or activity, explicit or implicit. Thus, the spaces are expressions of power relationships containing both the public and the private (Kilian, 1996).

Other authors like Matthew Carmona et al. do not completely abandon the differentiation between public and private space. However, they acknowledge the fact that a grey area exists in between public and private space. Thus, Carmona et al. give a broad and a narrow definition of "public space" (Carmona et al., 2008). The narrow definition says:

*"Public space relates to all those parts of the built and natural environment where the public has free access. It encompasses: all the streets, squares and other rights of way, whether predominantly in residential, commercial or community/civic uses; the open spaces and parks; the "public/private" spaces where public access is unrestricted (at least during daylight hours). It includes the interfaces with key internal and external and private spaces to which the public normally has free access."*

While the narrow definition of "public space" only covers spaces which are freely and mostly unrestrictedly accessible, the broad definition in addition includes "public/private" spaces with partly restricted or controlled accessibility like private shopping centers, rail and bus stations and the interiors of key public and civic buildings like libraries, churches, or town halls. In addition the open countryside is explicitly mentioned as included in the definition.

For the purpose of the present research piece, the narrow definition has been applied since it was the intention of the author, to capture a preferably unrestricted overview of the urban community life. This is only possible in spaces where potentially all different types of the urban society have access.

All references to "public space" in the present research project refer to space in the sense of a freely and unrestrictedly accessible location rather than to spaces with freedom of expression and democratic rights. This needs to be articulated, since Hempel and Urban argue that *"in a place like Dubai, where democracy does not exist as political system, public space <in the traditional sense as a place of deliberation> does not exist"* (Hempel et al., 2008).

### *"Urban space" framework for empirical research*

An "urban space" framework can summarize the outlined theoretical discussions on the terminologies of "urban" and "space" (see figure 6). The framework can be used as a basis for the empirical part of the present research project.
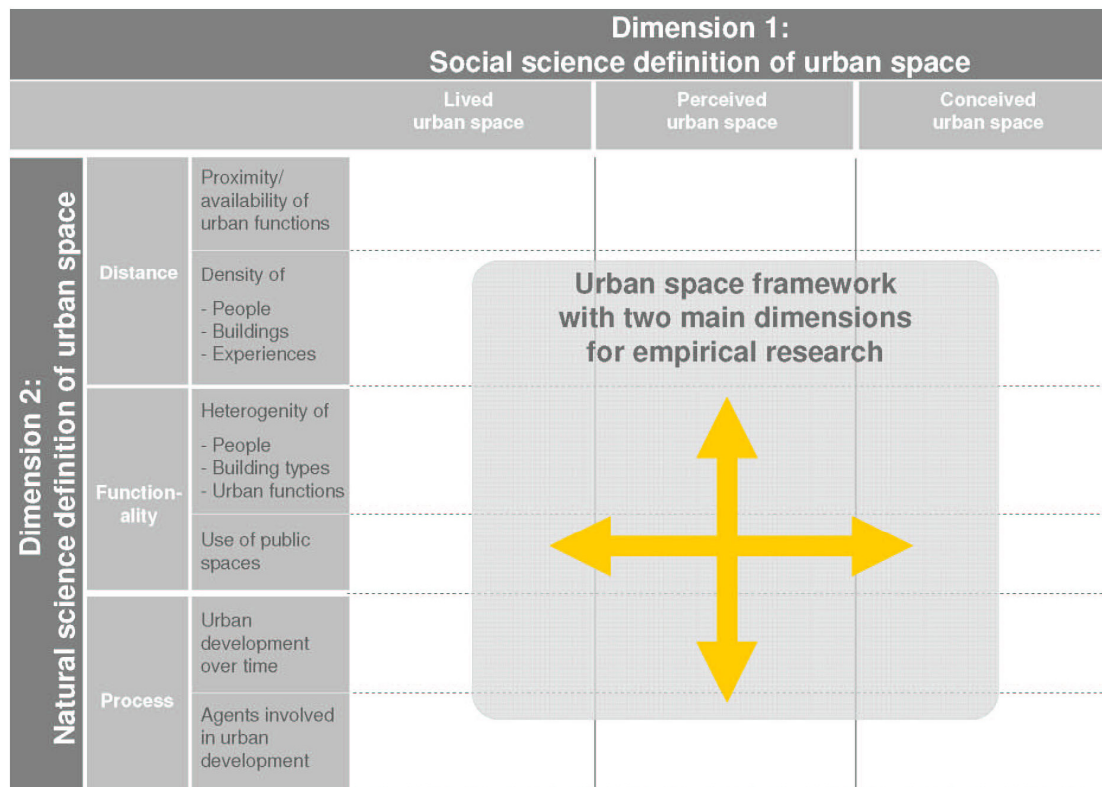


Figure 6: Urban space framework with two main dimensions for empirical research
Source: Own illustration

The framework picks up the formerly introduced dichotomy of the natural and the social science definition of space. Thus, the "urban space" framework has two dimensions: The first dimension contains the lived, perceived and conceived notion of "urban space". This dimension will be captured by appropriate research methodologies introduced in chapter 3. The second dimension contains the concrete objects of research along the "urban space" parameters of distance, functionality and process.

The parameter *distance* contains the proximity and availability of urban functions and the density of people, buildings and experiences. The parameter *functionality* beyond describes the heterogeneity of people, buildings and urban functions, as well as the use of public spaces. The parameter *process* finally considers the urban development over time and the agents involved in urban development. Urban space is dynamic in the sense that it changes over time. Cities on the Arabian Peninsula have shown rather high dynamics in terms of a rapidly changing urban space during the last decades. In-depth research about urban development over time, exemplified by certain cities on the Arabian Peninsula, are part of the present research. Furthermore, the outline of urban space heavily depends on the agents involved in the urban space design. Urban planers from public and private institutions play a major role. But also the end user of public urban spaces might participate in the urban planning process. The cooperation form of different agents involved in certain urban planning processes can influence the success or the failure of urban spaces. Therefore, the agents of urban planning process have been part of the investigations conducted in this research with respect to the fast urban development of cities on the Arabian Peninsula.

In the context of the present research project, the underlying assumption was that globally active knowledge economy companies have similar geno-typical requirements regarding urban space. This means that their needs in terms of distance, functionality and process of urban development are alike. Thus, even if urban spaces have a differing, pheno-typical, outer appearance (e.g., shape of open and closed space, construction style and materials), they can still all fulfill the needs of knowledge intensive economies due to similar geno-typical qualities.

Finally, the overview in table 2 summarizes in the following the operational definitions of the key terms for the purpose of the present research project which were introduced in the previous chapter.

| Term | Operational definition for present research | Exemplary, related theorists |
|------|---------------------------------------------|------------------------------|
| Space | Social science: Space as a storage of asynchronous happenings ("lived", "perceived" and "conceived" space)<br>Natural science: Space definition along the elements of "distance", "functionality" and "process" | Lefebvre (1991), Gosztonyi (1976), Foucault (1967), Boesch (1989) |
| Urban | Description for a dense, heterogeneous settlement of a large population in a specific location (demographic definition – institutional, cultural and behavioral definitions omitted here) | Wirth (1930), Fischer (2005) |
| Distance | Proximity / availability of urban functions and density of buildings, people, and experiences | Christaller (1933), Boesch (1989) |
| Density | Concentration of buildings, people, and experiences on a specific base area in a specific point in time | Wirth (1930), Jacobs (1961), Lampugnani (2007) |
| Functionality | Heterogeneity of people, building types, and urban functions and use of public space | Leibniz (1715), Foucault (1967), Latour (2005) |
| Heterogeneity | Variety of people, building types and urban functions on a specific base area in a specific point in time | Wirth (1930), Jacobs (1961) Smith (2005) |
| Public space | All parts of the built and natural environment where the public has free and unrestricted access (in the context of non-democratic national constitutions in Arabian nation states the traditional sense of public space as a democratic meeting place is consciously omitted here) | Kilian (1996), Borden (2008), Carmona et al. (2008) |
| Process | Urban development over time and agents involved in urban development | Boesch (1989), Schlögel (2006) |

Table 2: Operational definition of key terms for the present research project

### 2.2.4 Scale of urban space discussions

It is necessary to outline on which scale we talk about the previously described dimensions of space. Three different scale levels are to be introduced, which have been used in this research project:

1. Overarching city (Example: City of Dubai)

2. City district (Example: Dubai International Financial Center)

3. Neighborhood (Example: Plaza within Dubai International Financial Center)

It is not adequate to define these scale categories via certain measurement criteria (e.g., a neighborhood is 1 square kilometer in size). Different spaces of one and the same category can still have very different measures. Moreover, the categories are defined via spatial units perceived and articulated by the user, which is in our case the knowledge economy.

### 2.3 Open research questions: Bridging the gap of existing research

So far the document has given some background on the two scientific areas of non-physical, 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 knowledge economy context, we have to bring the two scientific approaches together and show their interdependence.

Scattered theoretical background literature on the intersection of both introduced scientific areas of non-physical, relational geography and physical, urban development is available.

Thus, Hall and Pfeiffer in their publication "Urban 21" reflect about the role of cities in the new "space of flows": *All different forms of urban population concentration possess a common characteristic: They are all embedded in a global network in which information and goods are exchanged across a certain distance […]. Mega cities show that the old economic principle of agglomerations is still valid even in the new world of cyberspace."* (Hall et al., 2000: 16)

Borja and Castells also describe the phenomenon of the formation of megacity developments in the course of a globalizing world in their publication "Local and Global – Management of Cities in the Information Age": *"The set of informationalization and globalization characteristics of our historical period, and the transformation of industrial and service productive structures that we have just outlined, lead to a deep-seated transformation of the urban spatial structure. However, the technological and economic processes that form the basis for this transformation intermesh with the history, culture and institutions of each country, region and city, giving rise to great diversity in spatial models. We nonetheless make bold to single out some of those processes as being typical of the new informational society. In particular, we believe that the formation of the so-called megacities, especially in newly industrialized countries, amounts to the most significant urban phenomenon for the twenty-first century"* (Borja et al., 1997: 27).

Furthermore, Borja and Castells outline migratory movements across country boarders as a consequence of globalization. This leads to the "multicultural city" (Borja et al., 1997: 68). The existence of ethnic minorities within the multicultural cities in the authors` opinion causes urban segregation. Saskia Sassen also incorporates the thought of social segregation in her work about the "dual city". However, she not only talks about ethnic minorities, but about a dualism in society formed by the *"growth of high- and low-wage jobs, along with the destruction of a much larger number of middle-range skilled jobs held by workers in production and commerce"* (Sassen, 2002: 321).

All mentioned publications mainly describe visible changes of cities and local spaces in a globalizing world. However, none of them gets to the point of empirically analyzing the urban space requirements of the knowledge economy as the main driver of spatial development. This topic is of high relevance since cities need to find ways to sustain and extend their competitiveness and attractiveness in the context of a globally operating knowledge economy (see also later chapter 6.1.2). Thus, the mentioned gaps of existing literature will be closed by the present empirical research. While the relational, geographical analysis of emerging cities will give us a global functional perspective on the emergence of cities on the Arabian Peninsula in the knowledge economy context, a physical urban

development analysis will compensate this from a local view point. In this way we can test the two central research hypotheses.

## 2.4 The central research hypotheses

To break down the central question of the present research project, the following two hypotheses form the basis for the empiricism presented later on:

*Hypothesis I:*

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 II:*

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.

The term "global city network" in the first hypothesis is based on Peter Taylor's previously described analysis of intra-firm APS networks for measuring the non-physical connectivity of cities or "functional urban areas". When talking about "favorable location-specific development forces" we are not only referring to advantageous oil and gas resources, but addressing geo-strategic, political, economic and social factors.

While testing the second hypothesis, the research project will describe the urban space requirements of KIE and their degree of fulfillment in certain Arabian cities. By drawing lessons from the findings, it is possible to outline certain areas of improvement.

It remains a task for future research to proof how far the findings from cities on the Arabian Peninsula are also applicable to other metropolis and cities around the world. Especially for so-called developed nations, findings from emerging cities like the ones on the Arabian Peninsula might unclose certain transferable expertise in the field of local urban space in a global knowledge economy context. Since the

author of this research document has a Western-European background, a preliminary additional hypothesis, which is open for testing in follow-up research projects, is of special interest:

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 important urban requirements of knowledge-intensive economies.

Chapter 6 will describe, in detail, how follow-up research based on findings from knowledge economy dedicated urban development on the Arabian Peninsula could be set up. A detailed work plan will be outlined.

# 3 Research methodology and study area

## 3.1 How to explore urban space as a local manifestation of global location capabilities

The described research project proposes an innovative empirical approach for a systematic analysis of local urban development in a global context. A comprehensive empirical data acquisition has preceded the conclusion of research results. The newly defined method triangulation described in the next chapter has helped to give consideration to the multilayered character of urban space. The methodological approach has been applied to a study area of three emerging cities on the Arabian Peninsula.

## 3.2 Method triangulation

As outlined before, our methodological approach reflects the three perspectives of urban space described by Lefebvre and Gosztonyi (Lefebvre, 1991; Gosztonyi, 1976). The method triangulation therefore consists of three complementary research methods (see figure 7).
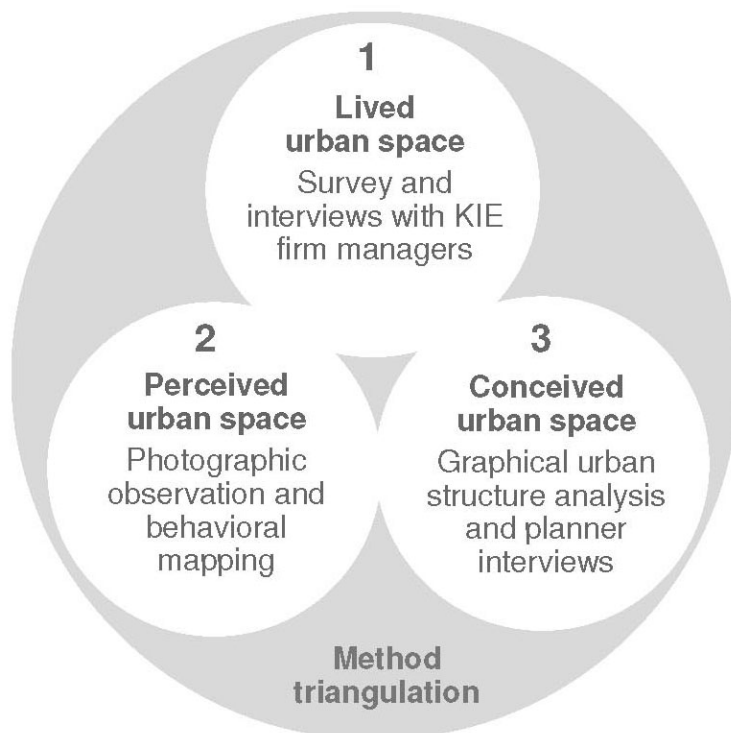


Figure 7 Illustration of method triangulation – Source: Own illustration

Built on Sand? - Emerging Cities on the Arabian Peninsula in the Knowledge Economy Context
Dipl.-Ing. Elisabeth Schein, Munich University of Technology

The three research methods have been applied in the above-mentioned sequence during a nine months stay on the Arabian Peninsula in 2008. In the following we will describe the research methods in greater detail, outlining the expected results of the methods and their benefit of combination.

### 3.2.1 Lived urban space: Online survey and interviews with knowledge-intensive economy firms

The objective 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 distribution pattern of KIE firms within the case study cities and the requirements of KIE firms regarding urban space.

An online survey is used for a broad, quantitative evaluation of these factors (for online survey outline see appendix 1). Interviews with managers and board members of KIE firms validate the results of the online survey qualitatively (for KIE interview guideline see appendix 2).

Zawya, as one of the most exhaustive company databases in the Middle Eastern region, was used to source firms for the online survey participation. A link to the online survey was sent via e-mail to all firms, which fall into the NACE code classifications of KIE defined above. In this way it was possible to reach out to a large amount of firms with relatively low effort. However, the response rate of sending out survey invitations via an anonymous e-mail has been very low (around 2%). Therefore, this broad range invitation has been 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 was around 35%. In total, 213 KIE firms from the Arabian Peninsula have participated in the scientific online survey, which allows us to draw quantitative results. As figure 8 shows, firms from

a broad variety of different knowledge economy branches have participated in the online survey in all case study cities.
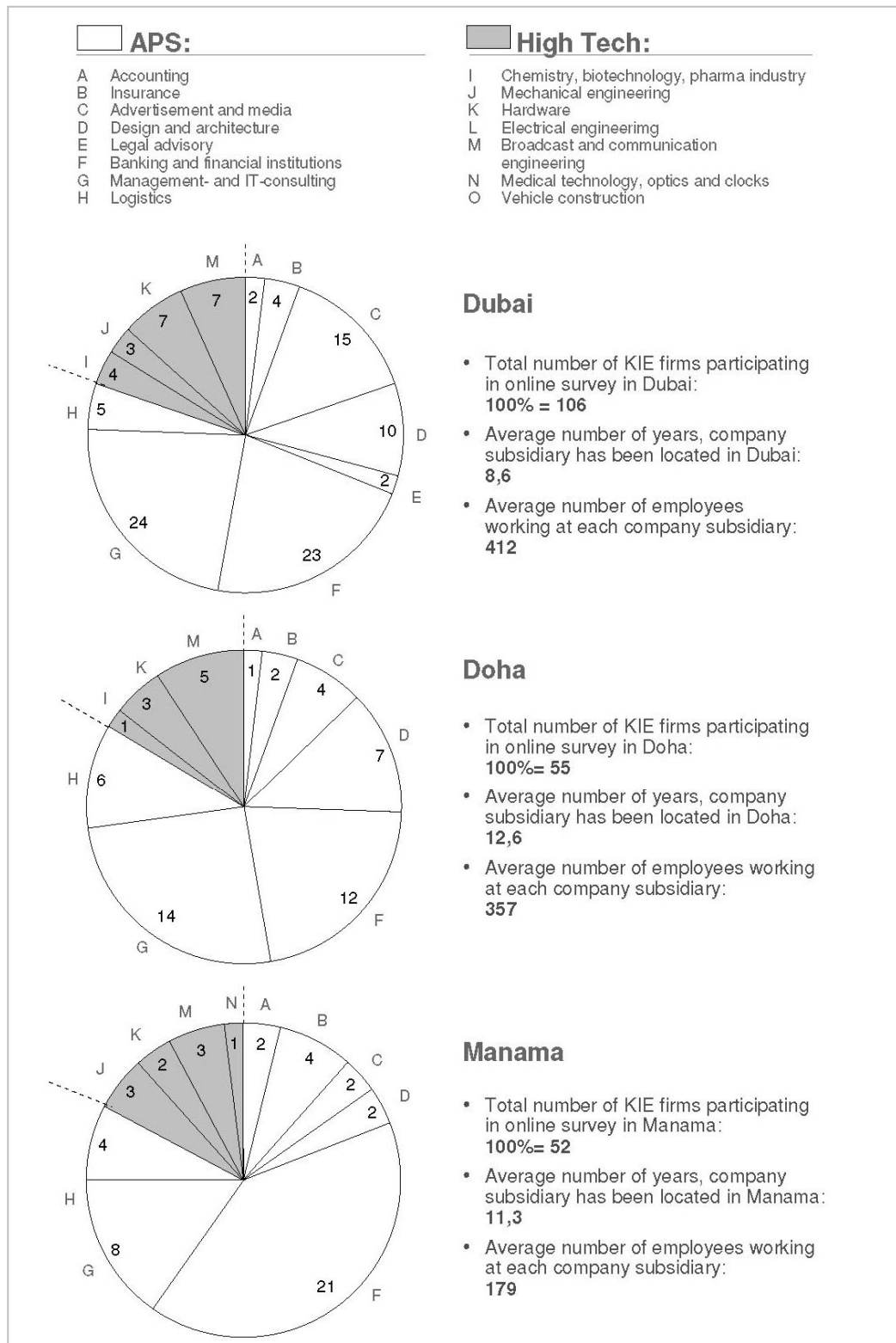


Figure 8: Split of knowledge economy firms by sector participating
Source: Online survey in each case-study city; own illustration

30 interview partners from KIE firm management were selected from the sample of survey respondents for the qualitative validation of survey results. The criteria for selection was based on the target to achieve a variety of KIE firm interviews from different lines of businesses (see figure 9), 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.
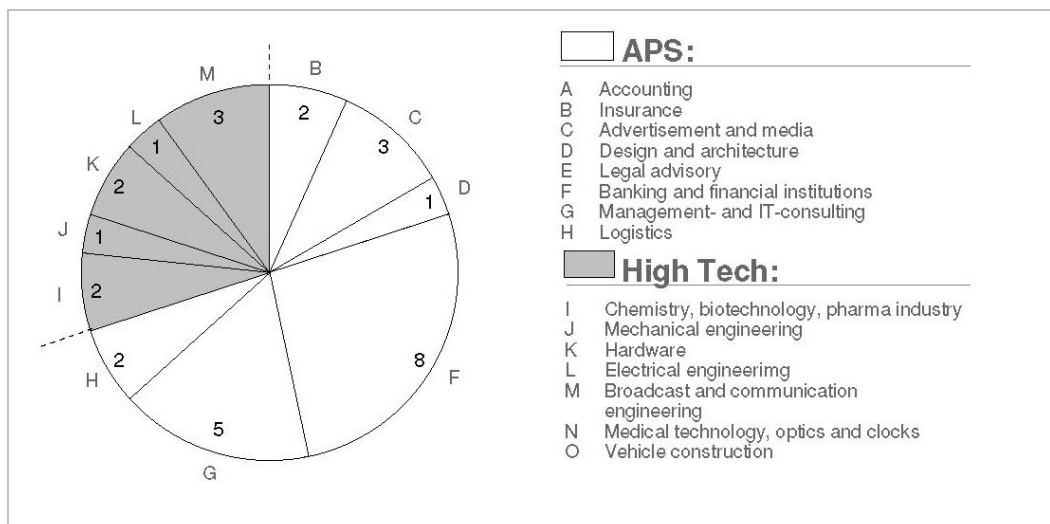


Figure 9: Split of 30 KIE firm interviewees by sector
Source: Own illustration

### 3.2.2  Perceived urban space: On-site observation of knowledge-intensive economy dense areas

The objective of this method is to analyze in detail urban spaces in specific KIE relevant city districts. Finally, it is possible to compare the resulting knowledge gained on the existing urban spaces with the requirements of KIE regarding urban space.

The method consists of a deep dive analysis in specific city spaces with a high relevance for KIE businesses. The analysis in one specific urban space per analysed emerging city allows a closer look at an urban space with a high relevance for KIE firms. This analysis is conducted via photographic observation in combination with behavioral mapping. The applied place-centered behavioral mapping method describes *"how people use a specific space"* (Dohr, Guerin, 2008: 4). By using this tool, it is possible to 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. Behavioral mapping sessions combined with photographic observation were conducted in specific city spaces on two different days: On a working day and on a weekend day. During these two days, the selected urban spaces were observed 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 used criteria for selection of the respective city space and perspective for behavioral mapping in combination with photographic observation are the following:

- The observed areas should be open spaces which are freely accessible for the public

- The selected public spaces should capture an average flavor of the respective city districts with respect to the available urban functions, the density of people, buildings and experiences and the heterogeneity of people, buildings and urban functions.

- Special characteristics of the respective city district should be observable in the selected public spaces (e.g., the walk-able urbanism idea in Dubai International Financial Center).

- The selected public spaces should be frequently used by KIE employees as points of exchange outside their closed business buildings.

- The observed spaces should cover an area of approximately 50 square meters in width in order to be able to compare the results in the end across all three case-study cities

The results of the in-depth observational analysis of specific urban spaces describe the qualities of urban space in emerging cities. Finally, these qualities are 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 on-site 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, namely to design KIE attractive city spaces. Furthermore, planning processes 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.

### 3.2.3  Planned urban space: Analysis of city development through historic city plans and city planning department interviews

The objective 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. It is possible to achieve this by using two tools: A graphical urban structure analysis over time, and interviews with planers from major public and private organizations involved in physical urban planning.

The graphical urban structure analysis over time is used to analyze, when KIE relevant urban spaces developed and how rapidly the overarching urban development happened. In this way it is possible to reflect the timeframe in which emerging cities developed to highly attractive urban spaces for KIE firms.

In order to understand the guiding principles and objectives for developing KIE attractive urban spaces as well as the organizational setup of city planning, interviews with 15 key people in charge of urban planning were conducted (for planner interview guideline see appendix 3). The favorability of planning objectives for KIE attractive urban spaces as well as visionary guidelines for ensuring the objectives of urban planning in the context of creating KIE attractive urban spaces were evaluated. In addition, the interviews were 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 such qualitative locations – at least in certain dimensions.

After having investigated the method triangulation and its targets and benefits in detail, the next chapter will define the study area of the research project.

## 3.3   Defining the Study area: Three case study cities on the Arabian Peninsula

Since the late 20th century, the emergence of cities with large growth potential in fast developing markets like the Arabian Peninsula has been prominent. Unique for the Arabian Peninsula is the phenomenon of extremely young and fast urban growth of cities, turning previously valueless desert sand into highly attractive real

estate and gaining global importance in terms of connectivity to other prominent cities in a very short period of time.

Seven emerging cities on the Arabian Peninsula were preselected and three case study cities were finally selected, to which the method triangulation has been applied: Dubai (UAE), Doha (Qatar) and Manama (Bahrain). Figure 10 outlines all pre-selected and finally selected cities on a map of the Arabian Peninsula.

A comparison of the research results across the three case-study cities enables us to determine the validity of the initial hypotheses on a broader basis.
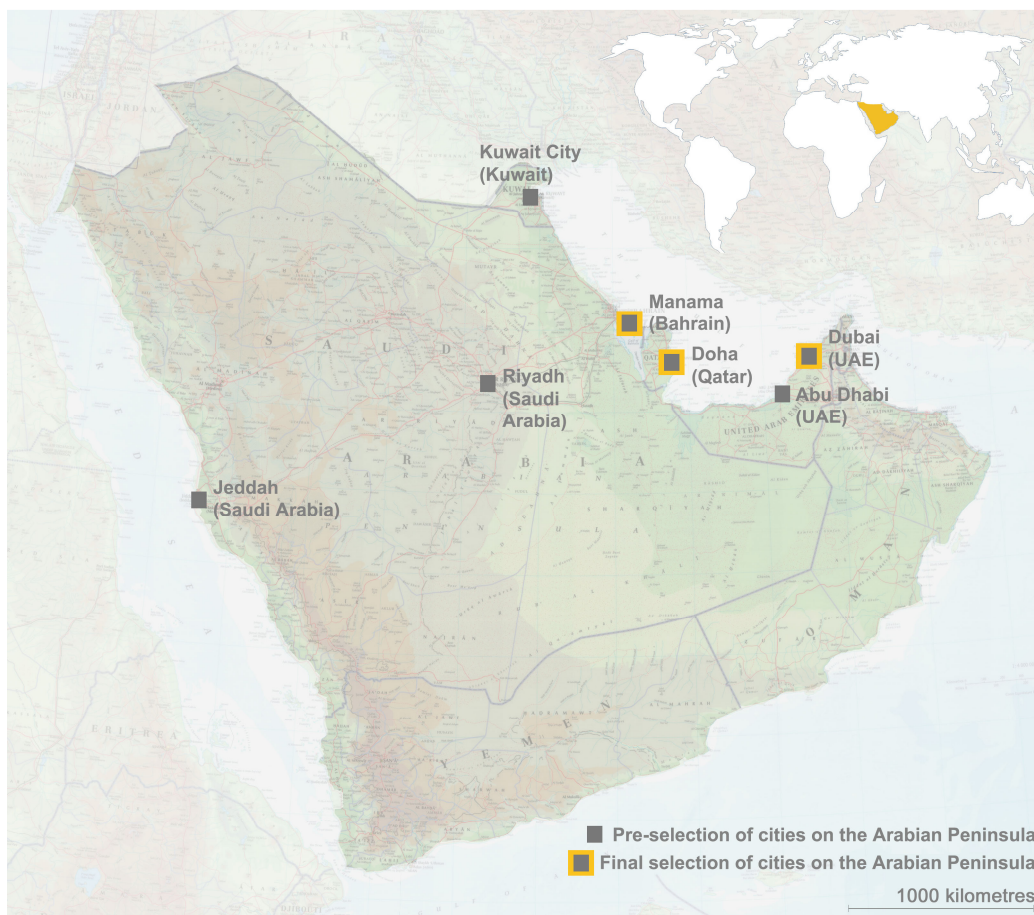


Figure 10: Map of Arabian Peninsula, highlighting preselected/finally selected case study cities. Source of map: Own development

The process of pre-selection and final selection of case-study cities is outlined in figure 11. The following chapters describe the selection process in detail.

| Process | Criteria for selection | Means/objectives of measurement |
|---|---|---|
| Pre-selection case study cities | **1** Static global city network connectivity | • **Global network connectivity of cities:** Dataset Peter Taylor 2000 (city-based, static) |
| Final selection case study cities | **2** Dynamic global city network connectivity | • **Trade flows:** ACI annual worldwide airport traffic report, Commercial freight by airport (loaded and unloaded)<br>• **People flows:** ACI annual worldwide airport traffic report, Passengers by airport (arrival, departure and transit)<br>• **Communication flows:** ACI annual worldwide airport traffic report, Mail by airport (loaded and unloaded) |
| | **3** Favorability of location-specific development forces | • Geostrategic position<br>• Politics, laws and regulation<br>• Financial investments and economic growth<br>• History and culture |
| | **4** Differing institutional context | • Nation state |
| | **5** Operational possibility of conducting research | • Social restrictions for female, non-islamic women in some nation states |

Figure 11: Process of pre-selection and final selection of case-study cities
Source: Own illustration

### 3.3.1 Preselection of cities on basis of "World City network" ranking

Seven Arab cities contained in the Top 200 "World City network" ranking from 2000 at Loughborough University were originally preselected as potential case study cities. As described before, the "World City Network" ranking outlines the cities with the highest score of global network connectivity (Taylor, 2004; Taylor, 2008). This factor describes the amount of connectivity from the analyzed city´s perspective to all other cities around the globe, which are part of the analysis. Taylor´s figures are based on the location networks of global APS firms, which represent one part of knowledge-intensive economies.

The seven preselected, emerging cities from the Arabian Peninsula with a young history of rapid ascension - scored by the amount of connectivity – are: Dubai (UAE), Manama (Bahrain), Jeddah (Saudi Arabia), Riyadh (Saudi Arabia), Abu Dhabi (UAE), Kuwait City (Kuwait) and Doha (Qatar). Within the last decades, all of these cities have experienced an extremely rapid urban growth. The recent rise of China, India and other Asian countries as strengthened global economic players

has placed cities on the Arabian Peninsula in an extremely interesting geo-strategic position. In between the traditional centers of economic power of Western developed nations and the rising economies in Asia, the Arabian cities are situated right in the middle. As the "World City Network" analysis shows, this fact obviously contributed massively to the increase in significance of all preselected, emerging cities on the Arabian Peninsula in the global knowledge-economy network context.

In the following chapters, the data of the "World City Network" analysis is reviewed from a today`s perspective. Furthermore, the development forces of the emergence of these cities on the Arabian Peninsula are explored. The selection of final case study cities with a high favorability in the respective dimensions is defined for deeper analysis of the urban space development in the context of knowledge-intensive economies.

### 3.3.2 Final selection of case study cities on basis of various criteria

The following criteria were used for finally selecting the set of case-study cities on basis of the pre-selection outlined in the previous chapter:

- Dynamic global city network connectivity
- Favorability of location-specific development forces
- Differing institutional context
- Operational possibility of conducting research

The selection criteria are outlined in greater detail below.

#### *Dynamic global city network connectivity*

In his publication "The informational age", Manuel Castells describes the broadening from a world economy to a global economy: *"The informational economy is global. The global economy is a historically new reality, which is different from a world economy. In Western countries a world economy – meaning an economy, in which capital accumulations occurs including the whole world – has existed at least since the 16th century, as Fernand Braudel and Immanuel*

*Wallerstein have taught us. A global economy is something different: It is an economy with the ability, to function as a unit in real time or elected time on a global level.[…] The necessary basis for it was the new infrastructure, which has been provided by the information- and communication technology. In addition the crucial support of deregulation and liberalization politics accrued, which was driven by governments and international institutions."* (Castells, 1996: 108). The global economy is the basis for the global space of flows. Flows of trade, people and communication between cities can be approximately be measured over time by evaluating data from international worldwide airport traffic reports.

*"Historically, the international trade was the main connecting element between the national economies. However in the current globalization process its relative importance is lower as the importance of the financial integration and as well of the "internationalization" of abroad direct investments and the production. But still the trade is a basic part of the new global economy."* (Castells, 1996: 67). As Manuel Castells outlines in his publication about the informational age, the international trade as one element of connectivity between the nodal points within the international flows has lost its importance in times of real-time interaction. However, the measurement of trade flows is still a valid method to show the degree of connectivity between locations within the worldwide hierarchy of cities. Based on airport trade flow data we can approximate the global connectivity of cities in terms of trade flow activity. Second, people flows can be measured by evaluating passengers movement by airports in the respective cities on the Arabian Peninsula. Communication flows are the third category of flows, which can be estimated from airport freight data. Figure 12 shows an overview of all pre-selected cities on the Arabian Peninsula and their ranking in terms of global connectivity within the "space of flows".

Low ranking "space of flows"
Medium ranking "space of flows"
Cities with highest overall ranking within "space of flows"
High ranking "space of flows"

| Criteria | Trade flows | | People flows | | Communication flows | | Overall ranking |
|---|---|---|---|---|---|---|---|
| Indicator | Commercial Freigth by airport* | | Passengers by airport** | | Mail by airport* | | |
| | Total amount (in thousand tons, 2006) | Growth rate (CAGR, 1996-2006)*** | Total amount (in mio., 2006) | Growth rate (CAGR, 1996-2006)*** | Total amount (in thousand tons, 2006) | Growth rate (CAGR, 1996-2006)*** | |
| 1 Dubai (UAE) | 1.453 | 13,6% | 28,8 | 12,3% | 50,6 | 15,6% | |
| 2 Manama (Bahrain) | 339 | 10,2% | 6,7 | 6,3% | 19,4 | 17,3% | |
| 3 Jeddah (Saudi Arabia) | 196 | 1,0% | 13,4 | 3,2% | 2,1 | -8,1% | |
| 4 Riyadh (Saudi Arabia) | 189 | 2,9% | 11,3 | 3,1% | 2,4 | -7,7% | |
| 5 Abu Dhabi (UAE) | 258 | 12,7% | 5,3 | 5,0% | 1,1 | 1,3% | |
| 6 Kuwait City (Kuwait) | 166 | 2,1% | 6,1 | 4,6% | 1,2 | 0,5% | |
| 7 Doha**** (Qatar) | - (N/a) | - (N/a) | - (N/a) | - (N/a) | - (N/a) | - (N/a) | -(N/a) |

  * Loaded and unloaded
 ** Arrival, departure and transit passengers
 *** Or earliest available growth rate period, if respective airports only provide figures after 1996
**** Not listed in airport traffic report

Figure 12: Ranking of pre-selected Arab cities along criteria of the global "space of flows"
Source: ACI annual worldwide airport traffic report, own illustration

From an overall perspective, taking into consideration trade, people and communication flows, Dubai shows the highest connectivity ranking. If we assume that the growth rates of all listed cities for trade flows stays the same as it was from 1996 to 2006, Dubai will overtake the leading Western-European Airport hubs London, Paris, Frankfurt and Amsterdam by 2011.

In terms of overall connectivity ranking, Dubai is followed by Manama and Abu Dhabi showing the second highest connectivity. The cities Riyadh, Kuwait City and Jeddah show a rather low connectivity rank. Data for Doha was not publically available.

### *Favorability of location-specific development forces*
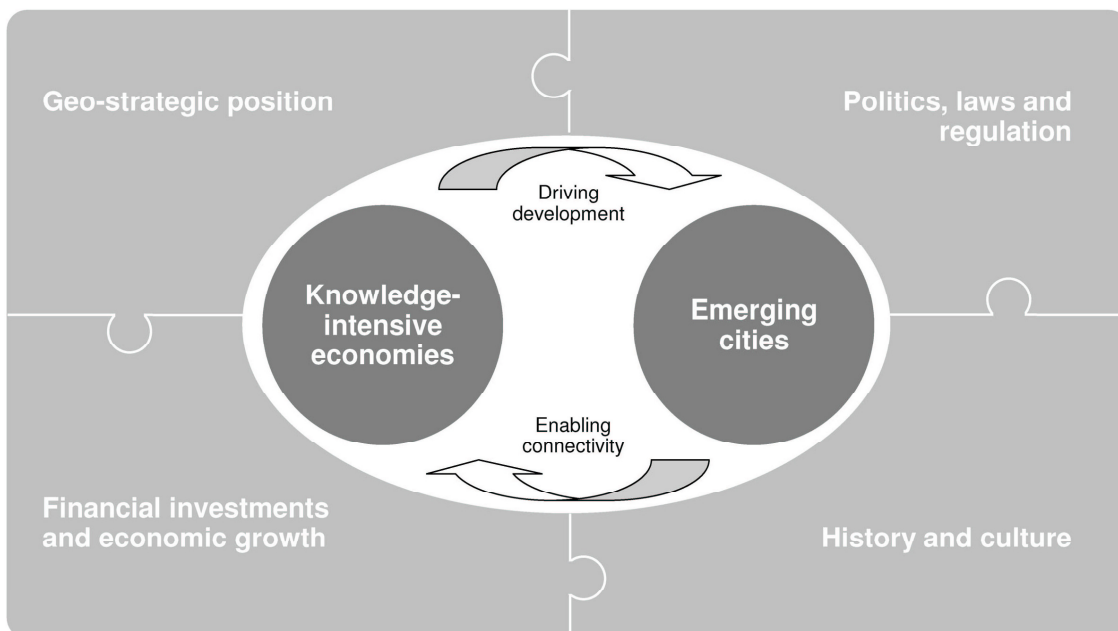


Figure 13: Framework of location-specific development forces ‒ Source: Own illustration

The functional connectivity of an emerging city in fast developing markets with other cities, driven by knowledge-intensive economies, determines the importance of the city within the global space of flows. The specific enablers, to attract, foster and retain knowledge-intensive economies are certainly manifold. Location-specific enablers can be structured along geo-strategic, political, economic and cultural development forces (see figure 13).

The general quality of these location-specific development forces has been examined from an external perspective and compared across the pre-selected Arab cities (see figure 14). Results show that also in terms of favorability of location-specific development forces Dubai lays ahead of its neighboring cities on the Arabian Peninsula. Dubai wins amongst other things through its geo-strategically located logistic hub function, its regulatory and social accessibility and its large economic growth. Manama, Abu Dhabi and Doha follow the leading city of Dubai. Jeddah, Riyadh and Kuwait City show a less favorable environment. A rather restricted regulatory system and society account for that.

Figure 14: Ranking of pre-selected cities along favorability of location-specific development forces
Source: UN country profiles, own illustration

***Differing institutional context***

The Arabian Peninsula consist of seven highly different nation states. A broad variety of political systems is in place (Dumont, 2007):

- United Arabian Emirates (UAE): Feudalism with pre-democratic institutions
- Qatar: Feudalism with pre-democratic institutions
- Bahrain: Constitutional monarchy
- Saudi Arabia: Absolute monarchy with pre-democratic institutions
- Kuwait: Feudalism with pre-democratic institutions
- Oman: Principality
- Yemen: Democracy (strongly influenced by royal clans)

To capture the variety of political and regulatory environments in the research analyses, the three case study cities are intentionally chosen from three different nation states on the Arabian Peninsula.

***Operational possibility of conducting research***

Taking into consideration the social restrictions in certain Arabian nation states, it is not possible to conduct research in Saudi Arabia as a woman of non-Muslim background. Therefore, the cities of Jeddah and Riyadh had to be excluded from the list of final case-study cities.

### 3.3.3   Conclusion for case-study selection

As described before, seven cities have been pre-selected for potential case-study selection: Dubai, Manama, Jeddah, Riyadh, Abu Dhabi, Kuwait City and Doha. Jeddah and Riyadh had to be excluded from the final case-study list due to operational matters in the Kingdom of Saudi Arabia. Abu Dhabi and Dubai as cities from the same nation state were compared in terms of connectivity degree. Dubai got into the final case-study selection round, since its connectivity degree is higher than the one of Abu Dhabi. The remaining four cities Kuwait City, Dubai, Manama and Doha have been compared along the selection criteria. Kuwait City has been excluded due to a lower global connectivity degree and less favorable location-specific development forces. All in all, these facts conclude in the final selection of the following case-study cities: Dubai (UAE), Manama (Bahrain) and Doha (Qatar).

### 3.4   Research process

Figure 15 outlines the process of the present research project with the respective time line attached. All in all, the present research project was conducted over the course of two years. The process covered three main steps: During the first step from June to Dezember 2007 the theory search took place and the research hypotheses as well as the methodological approach were defined. In the second step during the whole year of 2008 the empirical research was conducted in Dubai, Doha and Manama. The method triangulation was subsequently applied to all case-study cities. The final, third period from January to May 2009 covered the deduction of empirical research conclusions and potential learnings for Western-European cities. In addition, the research results were discussed and sharpened with experts from a scientific and an urban planning background in the course of a

topic-related, international workshop at the University of Bahrain in the beginning of May 2008.
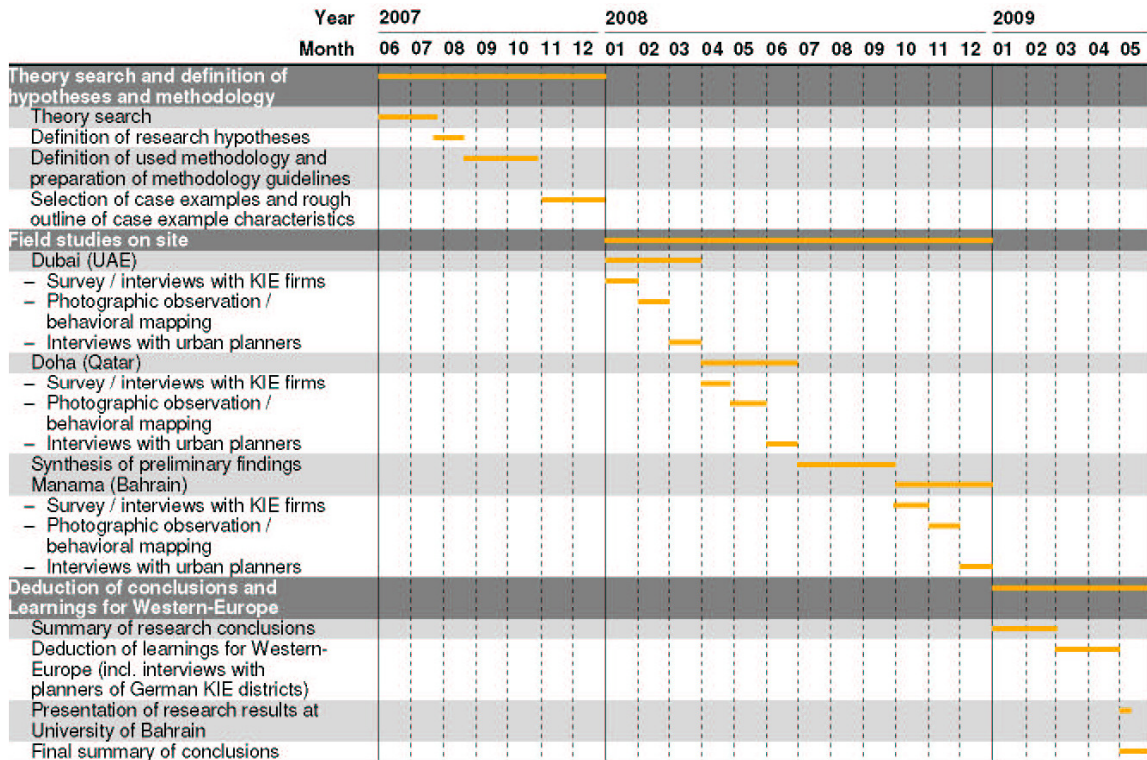


Figure 15: Research process – Source: Own illustration

# 4 Case study cities on the Arabian Peninsula in the global and regional knowledge economy network

This chapter presents a detailed research review of results obtained with respect to hypothesis one:

*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.*

This research hypothesis can be verified with the input from the empirical research results from the Arabian Peninsula. Knowledge-intensive economy firms have been identified as key spatial development drivers (Hall, Pain, 2006: 4; Lampugnani et al., 2007: 149; Thierstein et al., 2006: 13). On the one hand, they strengthen the centers of global cities and functional urban areas as nodes within the space of flows (Sassen, 2001), since the centers are capable agglomeration points for face-to-face contacts and the exchange of tacit knowledge. On the other hand, knowledge-intensive economies are to a large degree dependent on connections between these nodes on different spatial scales. Through their global and regional firm networks, KIE firms are able to take advantage of cooperation strategies between the different, specialized locations and therefore increase their value creation (see chapter 4.2.3). Thus, the connectivity of global and regional nodes via networks is a necessary requirement for KIE firms to increase their value creation, while this feature is rather irrelevant for traditional economies.

As a consequence, the measure of KIE firm network connectivities can well be used to determine the current significance of a city in global and regional city networks: A city with a high functional KIE connectivity to other locations is supposed to have a larger significance in world city networks, while a city with a low functional KIE connectivity to other locations is supposed to have a lower significance in world city networks. Today, cities as nodes within the networks of knowledge-intensive economies find themselves in a continuous struggle to retain or extend their significance in the global space of flows. Emerging cities on the

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Arabian Peninsula in this context provide unique case-study examples, since they have managed to gain a large significance within the "World City Network" very rapidly (Taylor, 2004; Taylor, 2008). The extremely advantageous, geo-strategic location of the Arabian Peninsula in the middle of the rising economic markets in Asia and the developed markets in Europe and North America has made it possible that the Gulf region rapidly has gained a new meaning which goes far beyond its traditional and historic global relevance.

Before we elaborate on the first hypothesis in detail, our case-study cities are introduced via short profiles. These profiles are supposed to create a general understanding of the respective geo-strategic, political, economic and historic context of each case-study city.

The case-study cities certainly show differences with regards to their context. It is important to know these differences in order to interpret empirical results correctly against the background of this information. Despite these differences, the general comparison of the case-study cities is legitimate, given the fact that the selection process of the cities ensured certain commonalities relevant for the research approach, like a high static and dynamic connectivity degree in the knowledge economy context in all cities.

## 4.1 Emerging cities on the Arabian Peninsula used as case study cities

### 4.1.1 Dubai (UAE)



Figure 16: Picture of Creek in Dubai – Source: Own photography (19.05.2008)

*Structural data profile of location*

Table 3 provides a rough structural data profile of the city of Dubai. Detailed background information on the geo-strategic position, politics, economics and history of Dubai follow in respective, separate paragraphs. GDP data refers not to the city but to the emirate of Dubai, since it is only available on an emirate-wide scale.

| | Structural data | Source |
|---|---|---|
| **Population** | 2007: 1,379,000 people<br>2006: 1,354,980 people<br>2005: 1,305,060 people<br>1995: 669,181 people<br>1985: 354,175 people<br>1975: 179,926 people | United Nations, 2007<br>UAE Ministry of Economy, 2009 |
| **Expatriates (in 2007)** | 75 percent | Bargaeen, 2007: 176 |
| **Real GDP (in 2004, UAE data)** | 32 billion USD | UAE Ministry of Economy, 2009 |
| **GDP split by sector** (in percent of total real GDP in 2004, UAE data) | Wholesale, Trade: 22%<br>Manufacturing Industries: 14%<br>Transport, Storage, Communication: 12%<br>Construction: 11%<br>Financial Corporation Sector: 10%<br>Real Estate / Business services: 10%<br>Government Services Sector: 7%<br>Mining, Quarrying: 6%<br>Others: 8% | UAE Ministry of Economy, 2009 |

Table 3: Structural data profile of Dubai

*Geo-strategic position*

The city of Dubai is located at the Persian Gulf in the north-eastern part of the United Arab Emirates, half way in between the Street of Hormuz and the capital city of the UAE Abu Dhabi (see figure 17). In terms of global connectivity degree in

the knowledge economy context the city of Dubai has the highest significance in the United Arab Emirates, as outlined by the "World City Network" ranking (Taylor, 2004; Taylor, 2008). With a total number of around 1.4 million inhabitants (United Nations, 2007), Dubai is also the largest city in the UAE.

The total real GDP of around 27 billion USD in 2003 (UAE Ministry of Economy, 2009) shows, that Dubai is only the second wealthiest city in the UAE following the city of Abu Dhabi: With a total real GDP of around 50 billion USD in 2003 (The Economist, 2004: 58), Abu Dhabi benefits from its large oil resources, while natural resources have nearly been entirely consumed in Dubai. The Petroleum and Mining share in Dubai today only comes up to six percent of the total GDP (UAE Ministry of Economy, 2009).
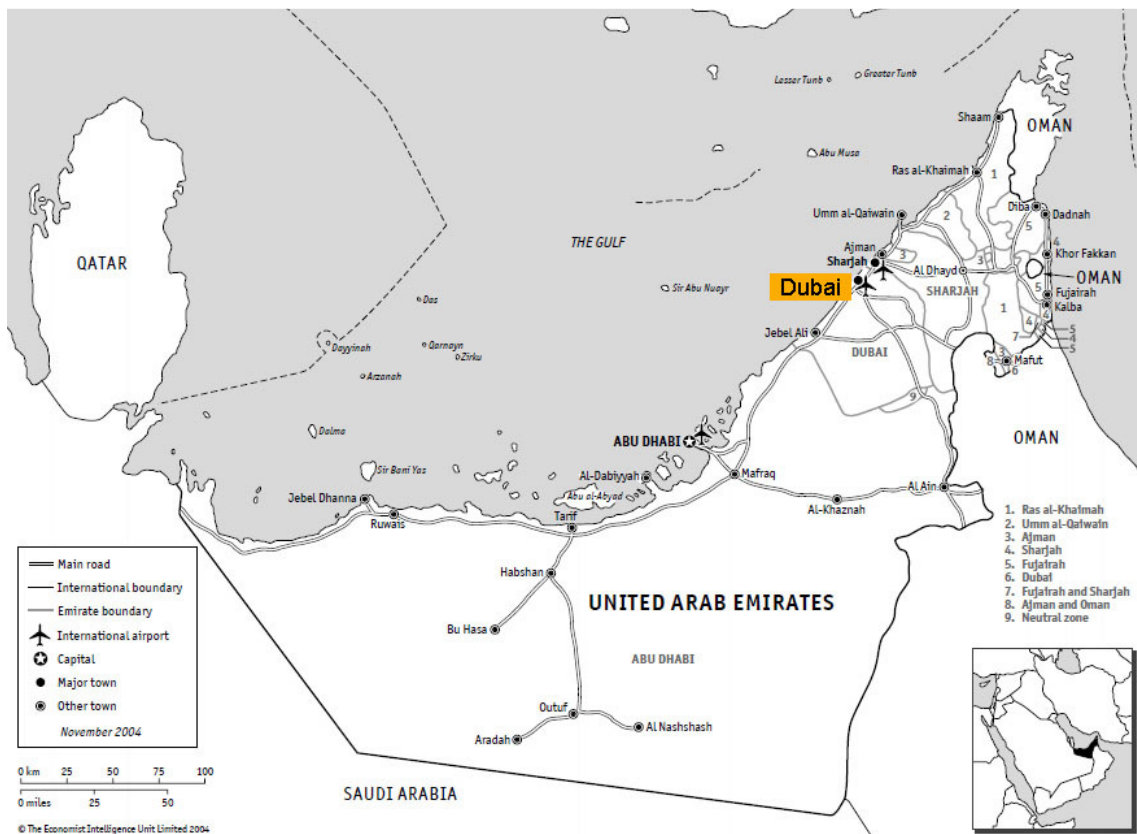


Figure 17: Map of United Arab Emirates and Dubai
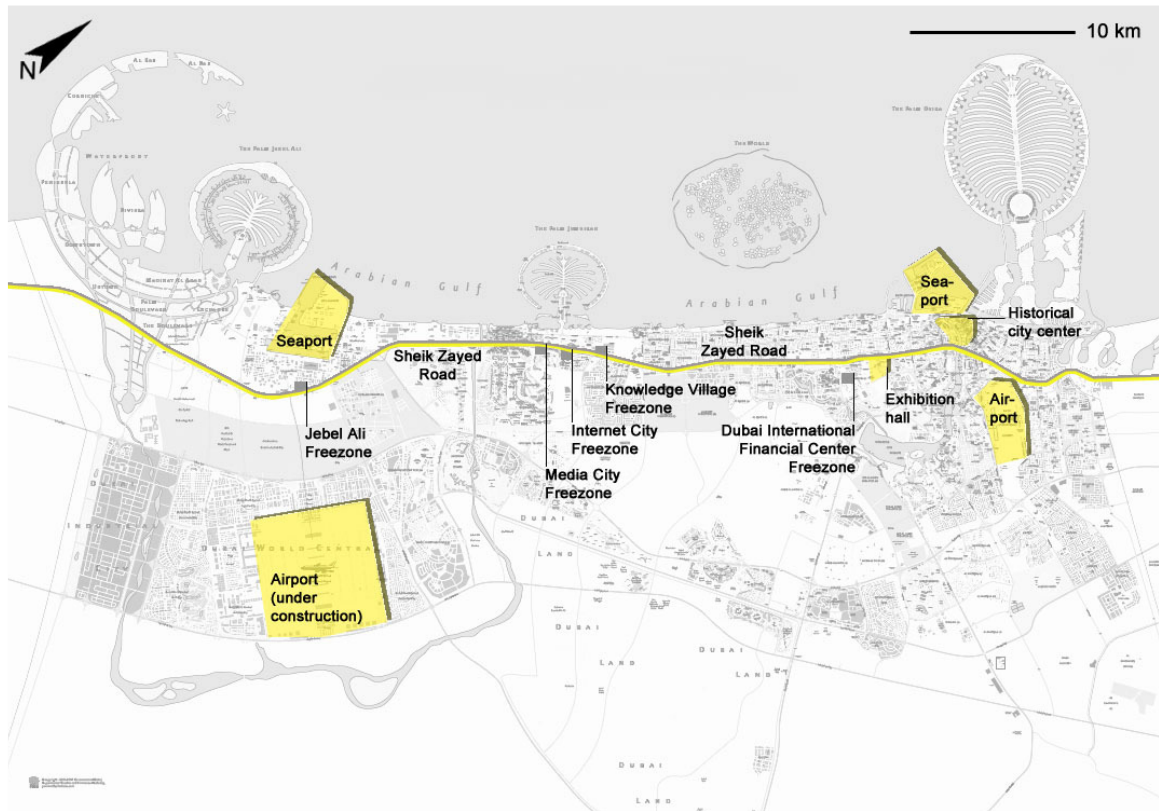Source: Country Profil 2004, United Arab Emirates (The Economist, 2004 – 1)

Figure 18: Map of Dubai highlighting specific urban functions and districts
Source: Own illustration

Dubai has developed an international gateway function over the course of the last years. Its unrivaled position as largest logistics hub all over the Arabian Peninsula is expected to even increase, once the newly planned airport "World Central International" will be finalized (first phase completed in 2010). With six runways it is going to be the largest airport all over the world. Furthermore, the two fully functional man-made harbors Jebel Ali and Port Rashid are the complementary shipping hub facilities. With a total size of 134 square kilometers, Jebel Ali is said to be the biggest man-made harbor all over the world (World Port Source, 2009).

The success of Dubai today is not purely driven by the mentioned logistics facilities. Dubai has developed a highly diversified set of industry sectors: Besides its long established trading and logistics hub function, it has strengthened its position in the sectors of financial institutions, real estate and construction, manufacturing industries and tourism.

### *Politics, laws and regulation*

Ruled by the Al Maktoum family, Dubai´s leadership is strongly formed by an anticipatory, visionary mindset: *"We are proud of our past and our present and we face the future with unflagging determination"*, as the ruler of Dubai Sheik Mohammed articulated recently (Sheik Mohammed, 2009).

A highly expatriate-friendly political system and regulation has brought many international people into the country. Citizens holding a UAE passport today only account for approximately 25 percent of the total population of Dubai (Bargaeen, 2007: 176). The other inhabitants come from many different countries around the world. Exemption from income taxation contributes to large immigration numbers in Dubai. Furthermore, regulation supports the immigration of international firms, while offering one hundred percent foreign ownership rights and zero percent corporate tax in selected city areas. The legal system is very liberal, compared to some of the more conservative nation states on the Arabian Peninsula, like Saudi Arabia.

### *Financial investments and economic growth*

Over the course of the last years the city of Dubai has recorded large financial investments, especially in infrastructure and real estate development projects. In the logistics area, investments have mainly flown into the new airport in Jebel Ali and the construction of a new metro monorail system for public transportation, which is planned to be finalized in a first phase in 2009. Large real estate developments include the three island-shaped land reclamation projects "Palm Deira", "Palm Jumeirah" and "Palm Jebel Ali", the "Dubailand" amusement park, the Dubai International Financial Center, the Dubai Waterfront and other projects. Yet, part of these real estate developments are still in the planning phase and some of the construction launches are postponed due to the recent economic downturn. The economic downturn has also had a significant impact on the economic growth rate of Dubai. While during the last years, the GDP has reached peak rates of a two-digit growth, the measured growth in the first quarter of 2009 has come down to two percent (UAE Interact, 2009).

Dubai has established into a diverse, multi-sector location (see table 3), which is no longer dependent on revenues from natural resources like oil and gas. The Economist Intelligence Unit in this context writes about Dubai: *"Although its oil production has fallen and is now small compared with neighboring Abu Dhabi, Dubai has replaced that source of wealth with a booming service-based economy that depends heavily on tourism, construction, telecommunications, media, and financial services. It is also developing an increasingly important manufacturing sector."* (The Economist, 2004 - 1: 5).

### *History and culture*

Dubai has become a city of international recognition within only a few decades. Originally it was founded as a small fishing village around 200 years ago, when the Bedouin family Al Maktoum left Abu Dhabi to settle down at the natural port of the Dubai Creek (see figure 16). While the urban outline of Dubai was formerly strongly oriented towards the central Dubai Creek, presently the city has widely extended and developed many additional urban districts. The new centers of urban growth are mainly located along Sheikh Zayed road (see figure 19), which is a multi-lain linear highway from south to north running in parallel to the approximately 70 kilometers long coastline of Dubai.



Figure 19: Picture of Sheikh Zayed road in Dubai – Source: Own photography (19.12.2007)

Dubai became a prosperous port in the first half of the 20th century. This success goes back to the year 1894, when Sheikh Maktoum bin Hasher al-Maktoum declared Dubai a tax-free port. In these former days, the natural Dubai Creek still was the only harbor in Dubai. The dredging of the Dubai Creek in the 1950s allowed large trading vessels to use the port. In 1966, the discovery of oil reserves changed the fortunes of Dubai rapidly. The construction of the additional man-made harbors Port Rashid and Jebel Ali followed in the 70s.

Nevertheless, the largest property boom and the most rapid urban growth not started before the late 20th century and intensified in 2002 in parallel to the announcement, that freehold ownership of certain properties in Dubai was available to international investors and companies. This was also the time, when Dubai has started to actively promote its partly symbolic and iconic urban and architectural developments on a global scale (Elsheshtawy, 2004: 180; Mandour, 2007: 330). The global branding today comprises countless projects like the:

- Three palm-shaped islands "Palm Deira", "Palm Jumeirah" and "Palm Jebel Ali"
- Group of islands "The World"
- "Burj al Arab", a sail-shaped Hotel tower
- "Burj Dubai", the largest tower all around the world with a height of 808 meters
- "Ski Dubai", a skiing dome built on former desert land

*"Dubai`s formula for development included several components"*, as Samer Bagaeen writes in the publication "Brand Dubai: The Instant City" (Bargaeen, 2007: 176-177). Bagaeen mentions factors like the expatriate-friendly environment, the visionary leadership, tax freeness and the infrastructure with regard to the international air- and seaport hub. He acknowledges the fact, that today´s status of Dubai is a consequence of several influencing elements.

## 4.1.2  Doha (Qatar)

### *Structural data profile of location*

Table 4 provides a rough structural data profile of the city of Doha. Detailed background information on the geo-strategic position, politics, economics and history of Doha follow in respective, separate paragraphs. GDP data refers to the country of Qatar, since it is only available on a nation-wide scale.

|  | Structural data | Source |
|---|---|---|
| **Population** | 2007: 384,000 people<br>2004: 339,847 people<br>1997: 264,009 people<br>1986: 217,294 people | United Nations, 2007;<br>Qatar Planning Council, 2006 |
| **Expatriates**<br>**(in 2003)** | 70 percent | The Economist, 2004 – 2: 16 |
| **Real GDP**<br>(in 2004, Qatar data) | 29 billion USD | GCC, 2009 |
| **GDP split by sector**<br>(in percent of total<br>real GDP in 2004,<br>Qatar data) | Mining, Quarrying: 62%<br>Government Services Sector: 10%<br>Manufacturing Industries: 6%<br>Wholesale, Trade: 5%<br>Construction: 5%<br>Financial Corporation Sector: 4 %<br>Others: 8% | Gulf Cooperation Council, 2008 |

Table 4: Structural data profile of Doha

### *Geo-strategic position*

The city of Doha is located at the Persian Gulf on the east side of the peninsula of Qatar around 100 kilometers away from the Saudi Arabian border (see figure 20). It is the capital of Qatar and the Qatari city with the best global connectivity, as outlined by the "World City Network" ranking (Taylor, 2004; Taylor, 2008).
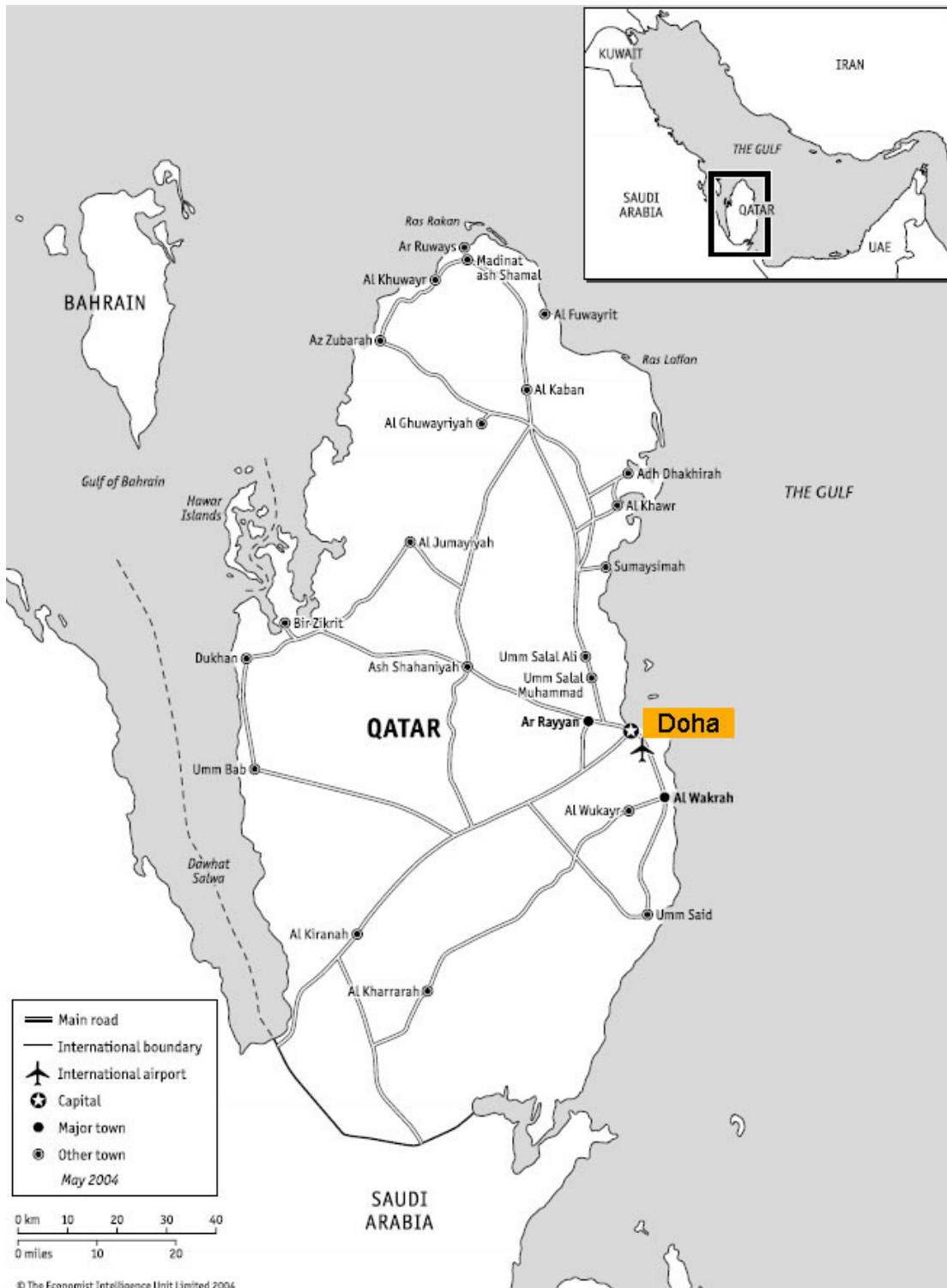
Figure 20: Map of Qatar and Doha
Source: Country Profil 2004, Qatar (The Economist, 2004 – 2)

Doha has a total number of around 400.000 inhabitants which is around 50 percent

of Qatar´s total population (United Nations, 2007). With a real GDP of

approximately 30 billion USD in 2004 (latest available data), the relatively small country of Qatar currently holds the record of being one of the wealthiest countries all around the world measured by GDP per capita (around 40,000 USD / person) due to its large revenues from oil and especially gas resources (Gulf Cooperation Council, 2009). With natural gas reserves reaching 5.8 percent of the world´s total, the country Qatar is one of the largest exporters of liquefied natural gas in the world (Walker et al., 2007).
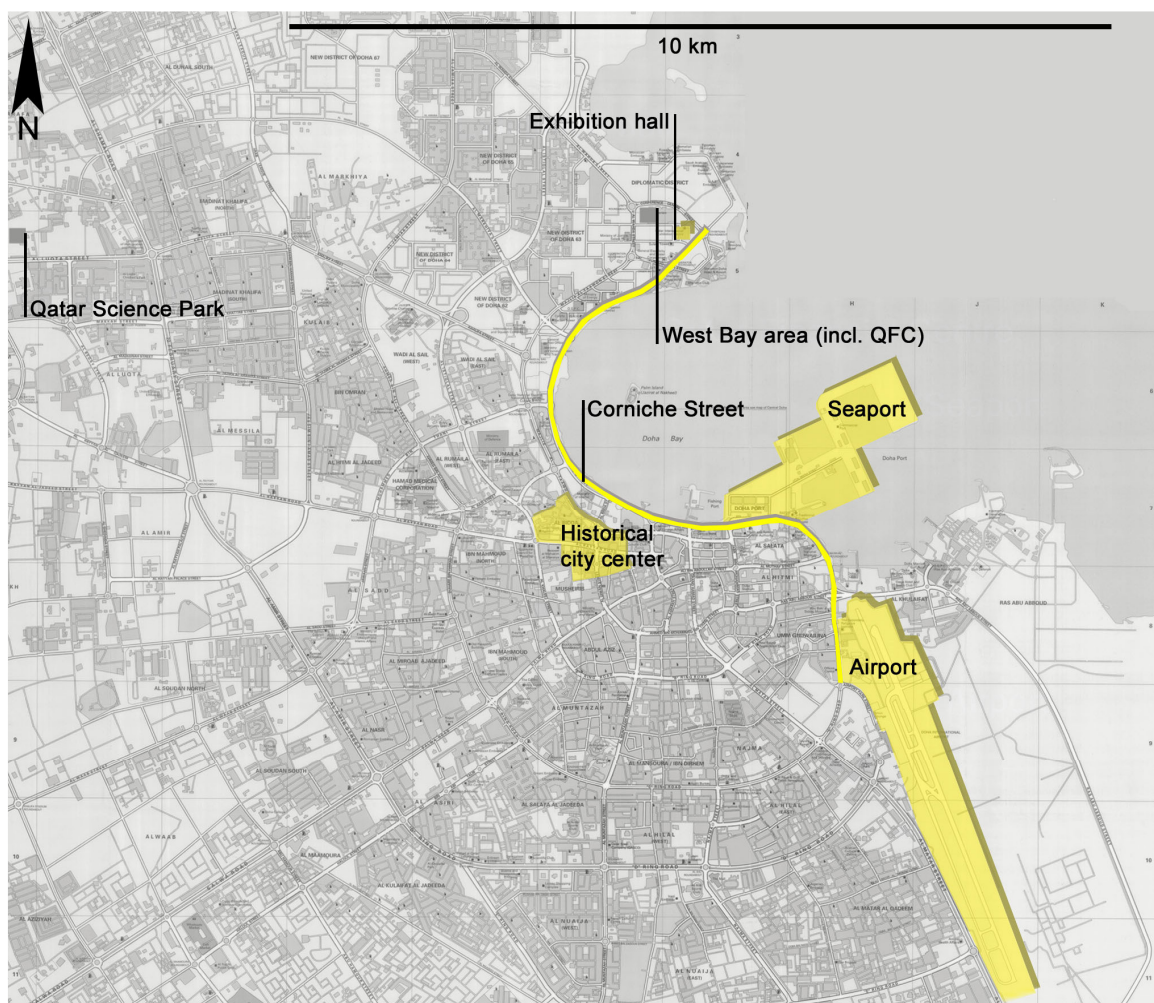


Figure 21: Map of Doha highlighting specific urban functions and districts
Source: Own illustration

Doha`s man-made deepwater port today serves as a regional container and transshipment point which handles cargo across the Gulf. Furthermore, Doha has an inner-city international airport with one runway which is currently running out of capacity given the recent rapid growth of Doha. An additional, new airport further outside the city with two runways (planned to be finalized by 2011) and a new, international seaport (planned to be finalized by 2014) are currently under construction. In addition, Qatar and Bahrain are planning to link their land borders with a 40-45 kilometer long "friendship bridge" (The Economist, 2004 – 2: 15).



Figure 22: Picture of the Corniche in Doha – Source: Own photography (20.12.2007)

### Politics, laws and regulation

Currently ruled by Sheikh Hamad bin Khalifa al-Thani, Qatar`s governance is similar to the one of an absolute monarchy with pre-democratic institutions. The ruling Al-Thani family strives for a diversification process of Qatar´s economy, to lower the current dependence on oil and gas income. Regulation since 2000 moderately supports the attraction of foreign companies by allowing them to hold more than 50% of the equity in all local projects, subject to the approval of the Ministry of Economy and Trade. In some sectors even a 100% stake is allowed. Furthermore, Doha like Dubai is a very expatriate friendly city. Inhabitants with a Qatari passport today only come up to approximately 30 percent of the total population of Doha (The Economist, 2004 – 2: 16).

In 2001 the city of Doha hosted the World Trade Organization Conference. Furthermore, Qatar has established strong international ties to the US military, since it was the location of the central command for the US-led forces engaged in the war against Irak in 2003. For Qatar, the still present military forces from the US offer a powerful guarantee of security for the country´s immensely valuable hydrocarbons assets.

Since 1995 Qatar´s press enjoys freedom of expression. Due to the liberal press censorship law compared to other nations on the Arabian Peninsula, Doha is home to the "Al Jazeera" TV channel which claims to be the only politically independent television station in the Middle East. Also, the rights of women have improved significantly over the course of the last years which is underlined by the fact, that Qatar had the first female cabinet minister in 2003 all across the Gulf Arab states. Nevertheless, until 1995, women were not allowed to drive and vote in the country of Qatar.


*Financial investments and economic growth*


Financial investments in Doha are heavily concentrated on the construction of several new large-scale real estate developments. The completely renewed West Bay area with the Qatar Financial Center, mixed-use developments like "Lusail city" and the land reclamation project "The Pearl" are only some of the currently built projects. In addition, the governmental institution "Qatar Foundation" has heavily invested in the construction of a new, large campus for education, called the "Education City" (Qatar Foundation, 2009), which hosts several international research institutions coming mainly from the USA (e.g., Northwestern University, Virginia Commonwealth University, Taxas A&M University). "Education City" is also designed to be a platform, which fosters relationships between research institutions and private companies. Furthermore, Doha invests in new infrastructure projects including a new seaport finalized by 2014 and a new airport, which is planned to start operations in 2011.

While in Dubai the global economic downturn has had a larger impact on recently launched real estate projects, in Doha the planning and the construction of large-scale real estate developments mainly moves on due to a relatively strong independence from international investments. Doha can ensure to finance many of the planned construction projects, since the government budget is consistently in surplus due to an extensive oil and gas income. For 2009, a GDP growth of 9% is forecasted in Qatar which is – given the current economic slowdown – far above the global average (Gulfbase, 2009).

With regards to the diversity degree of the economy, the oil and gas industry still dominates the GDP income of Doha. Besides the economic sectors related to natural resources, other important sources of revenues are construction, manufacturing, international banking, insurance and tourism (The Economist, 2004 – 2). In addition, Doha aims to benefit from its reputation as a global conference, exhibition and meeting place (Walker et al., 2007: 268).

### History and culture

Given today´s global reputation of Doha, the city has a surprisingly young history of growth. Doha originally was a small village called "Al Bidda", situated at a naturally sheltered bay. Fishermen who lived in low story mud huts formed the majority of Al Bidda´s population. After the discovery of oil and large natural gas resources in 1939, the city rapidly developed from a formerly poor Bedouin town to one of the richest places all around the world. It was only in 1971, when the Al Thani family could declare Qatar as an independent nation state with the capital city of Doha. Formerly the peninsula was still officially dominated by the Al Khalifa family from Bahrain, even though the way to independence was already paved since 1867/1868, when the Al Thani family under the protection of the UK government started to protest against Bahrain`s interference.

The Doha bay – today called the "Corniche" – is still at the heard of the city, while the daub buildings recently gave way to new multi-story buildings and high rises. In the meanwhile, Doha has developed in concentric semicircles around the Corniche. The Corniche has developed to a open, public space which especially

during weekends is used by all different kinds of people and their families as a barbecue and picnic spot. Furthermore, along the Corniche Doha offers museums like the "Photography Museum" and the "Museum of Islamic Art" which was recently designed by I. M. Pei. The "Museum of Islamic Art" hosts one of the largest collections of its kind in the world and it became a new landmark for the city (see figure 23). In recent years, Doha has also hosted several international top-level sporting events for tennis and golf and the Asian Games in 2006. The Asian Games is the third largest sporting event world-wide (after the Olympics and the Soccer World Cup). Doha has been the first Arabian city ever to host it.



Figure 23: Picture of "Museum of Islamic Art" in Doha – Source: Internet

### 4.1.3  Manama (Bahrain)

*Structural data profile of location*

Table 5 provides a rough structural data profile of the city of Manama. Detailed background information on the geo-strategic position, politics, economics and history of Manama follow in respective, separate paragraphs. GDP data refers to the country of Bahrain, since it is only available on a nation-wide scale.

|  | **Structural data** | **Source** |
|---|---|---|
| **Population** | 2007: 157,000 people<br>1960: 62,000 people | United Nations, 2007<br>Bahrain Country Study, 2009 |
| **Expatriates**<br>**(in 2004)** | 40 percent | The Economist, 2004 – 3: 15 |
| **Real GDP**<br>(in 2004,<br>Bahrain data) | 11 billion USD | Kingdom of Bahrain Ministry<br>of Finance, 2009 |
| **GDP split by sector**<br>(in percent of total real<br>GDP in 2004,<br>Bahrain data) | Financial Corporation Sector: 22%<br>Mining, Quarrying: 21%<br>Government Services Sector: 13%<br>Wholesale, Trade: 11%<br>Manufacturing Industries: 10%<br>Real Estate / Business services: 8%<br>Transport, Storage, Communication: 7%<br>Others: 8% | Gulf Cooperation Council,<br>2008 |

Table 5: Structural data profile of Doha

### Geo-strategic position

The city of Manama is located at the Persian Gulf on the north-east side of Bahrain´s main island (see figure 24). It is the capital of Bahrain and the Bahraini city with the best global connectivity, as outlined by the "World City Network" ranking (Taylor, 2004; Taylor, 2008). The by land area small country of Bahrain is connected to Saudi Arabia via the "King Fahd Causeway" bridge which is around 30 kilometers in length. An additional bridge connecting the countries Bahrain and Qatar is planned.

With a total population of approximately 200.000 inhabitants Manama is the largest city of the relatively small country Bahrain. The total population of Bahrain adds up to 750.000 people (United Nations, 2007). Via three bridges Manama is closely connected to the island Muharraq which hosts the international airport and "Khalifa Bin Salman Port" which is one of Bahrain`s two major seaport´s. The second important seaport is "Mina Salman Port" located south of Manama.

Originally Manama and Muharraq were separate settlements which grew together, when the first bridges linked them.



Figure 24: Map of Bahrain and Manama
Source: Country Profil 2004, Bahrain (The Economist, 2004 – 3)
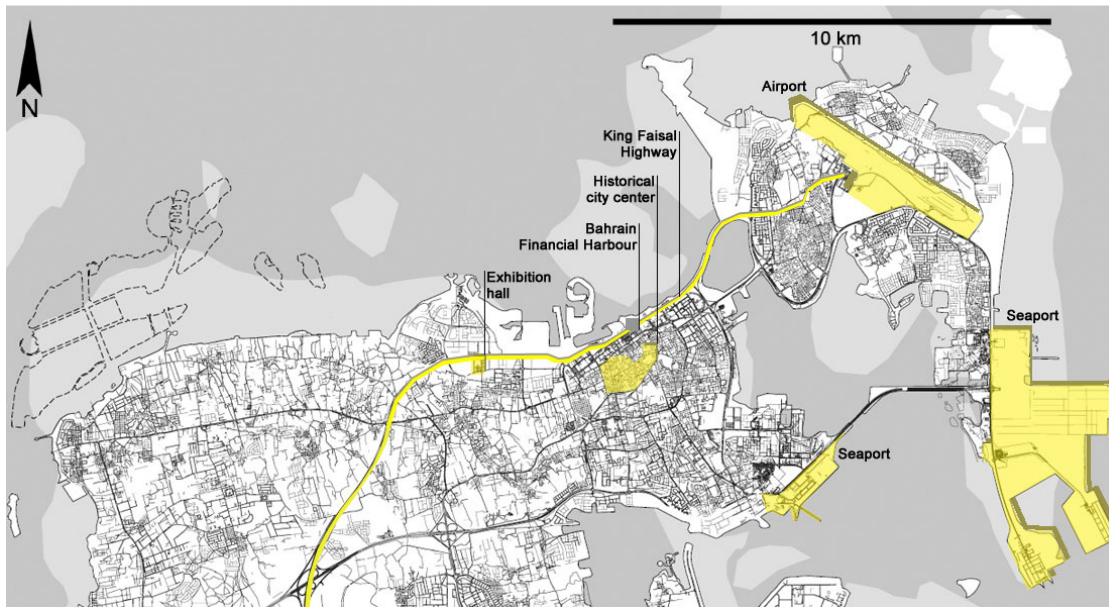
Figure 25: Map of Manama highlighting specific urban functions and districts
Source: Own illustration

The country of Bahrain today possesses only limited oil and gas reserves. Its large
mining and quarrying share of the total GDP is mainly a result of processing Saudi
Arabian oil reserves in local refineries. Furthermore, since the 70s Bahrain's
economy has been based on financial service sectors and trade. Only recently the
original preeminence of Bahrain in these sectors has been rivaled by other
emerging cities in the Gulf like Dubai.



Figure 26: Picture of the coastline in Manama – Source: Own photography (22.12.2007)

## *Politics, laws and regulation*

Ruled by the Al Khalifa family, Bahrain´s governance in 2002 changed from an absolute monarchy to a constitutional monarchy. Earlier than other cities in the Gulf region, the ruling family started to focus on supporting the diversification process by regulatory means to compensate for Manama´s small hydrocarbons reserves. Attracting foreign direct investments has been one of the main cornerstones of the government´s economic agenda. Today 100% foreign-owned firms are allowed to operate in Manama without a local partner under certain conditions. In specific areas of the city these firms also can buy their own property. Furthermore, the Bahraini commercial law system and regulation standards especially in the financial sector have gained a good international reputation. In addition, foreign investors easily can get visa access to the country.

Bahrain currently has an expatriate share of approximately 40 percent (The Economist, 2004 – 3: 15), while the majority of the expatriates are foreign workers from Asia. However, the recently declared "Bahrainisation" process supported by politics and regulation tries to lower the local unemployment rate by decreasing the number of foreign workers (The Economist, 2004 – 3: 22).

Compared to all other countries on the Arabian Peninsula, Bahrain is probably the most liberal one. In the Middle Eastern region Bahrain ranks as the freest economy by the US based Heritage Foundation, followed by Qatar, Kuwait and UAE (Heritage Foundation, 2009). The ranking is based on different indicators like trade freedom, investment freedom, property rights and labor freedom. Besides this general economic advantage, Bahrain has a relatively open atmosphere and attitude towards entertainment and alcohol compared to its neighboring states which attracts a lot of Arabian and Western visitors and investors at the same time. Also therefore, Bahrain developed a "filter" function between the conservative country of Saudi Arabia and the Western capitalist countries.

From a political and military perspective, Bahrain has established close ties with the US and the UK. The US has used Bahrain as a logistical hub since the second

Gulf war in 1991 and has stationed its Gulf naval force headquarter on the outskirts of Manama.

### Financial investments and economic growth

By attracting foreign investments Manama tries to finance the implementation of plans for large infrastructure and real estate projects. Infrastructure investments should mainly support the renewal of the road, water and power supply systems as well as the construction of the planned "friendship bridge" linking Bahrain and Qatar. The planned real estate projects are manifold and mainly located on large land reclamation plots like the projects "Bahrain Financial Harbour", "Bahrain Bay" and "Lulu Island", all situated north of Manama. Not all of the planned developments are finalized yet and – given the global economic downturn and Bahrain´s dependence on international investments – it is probable, that some of the planned developments are stopped and continued later on after the global economy has stabilized again.

While the GDP reached consistently positive growth rates of seven percent on average over the course of the last three years in Bahrain (CIA World Facebook, 2008), Merrill Lynch is forecasting a potential GDP decline for 2009 (Kuwait News Agency, 2009).

With regards to the diversity degree of the economy, Bahrain´s GDP is composed of a broad variety of sectors including financial institutions, manufacturing, trade and oil related businesses (see table 5). Oil related businesses mainly refer to the large oil refineries, processing oil coming mainly from Saudi Arabia through pipelines. From the 70s on, earlier than other countries in the Gulf Bahrain succeeded as a finance hub (especially regionally for Islamic finance).

### History and culture

The role of the sea in the history of Bahrain has been key starting a long time ago. Bahrain is associated with the ancient site Dilmun which was an important trading point between India and Mesopotamia. The largest field of burial mounds on the

world located in the north-western part of the main island of Bahrain still reminds us of these former times.

Today´s ruling family Al Khalifa took over the island of Bahrain in the mid 18th century under the protectorate of the British empire after a long and repetitive battle for dominance between Arabic tribes and the Portuguese. In the 19th century Bahrain became the British empire´s political headquarters in the Gulf. The country declared its independence formally in 1971.

Manama´s history goes back to the year 900 when the old center of Bahrain "Bilad al Qadim" was founded at today´s western outskirts of Manama. In the 15th century the city name of "Manama" appeared for the first time in literature.

Despite the comparably long urban history, large parts of today´s visible urban structure of Manama have developed from the 70s on, when Manama became the leading finance hub in the Gulf region.

Recently a new wave of large scale urban development projects has reached the city and partly these project have been built already. The settlement of the central part of Manama in the north-east of the main island of Bahrain has quite a high building density due to geographical limits of the city extension on the island. This continuously leads to the reclamation of new land on the shores of Manama.

Before oil was discovered in Bahrain in 1932, the main source of income for the population of Manama was related to pearl diving and trading. After the oil resources started to run dry, Manama became a place of divers economic branches and activities. Further outside the city the island also offers a large formula one race track (see figure 27). International motorsport events take place several times a year.

In terms of religion, Manama´s population is devided into Sunni Muslims and Shia Muslims. The Sunni Muslims are the minority of the population. However, the ruling family also belongs to the Sunni which sometime creates inner political tensions due to Shia insurgencies.

Figure 27: Picture of formula one race track in Bahrain – Source: Own photography (22.12.2007)

### 4.1.4  Concise, comparing overview of case-study city profiles

While the previous chapters have introduced each of the case-study cities in detail, the present chapter presents a summarized, concise overview of all case-study city profiles (see table 6). Thus, one can easily compare the structural data of the respective cities as well as information along the dimensions of geo-strategic position, politics / laws / regulation, financial investments / economic growth and history / culture.

|  | Dubai (UAE) | Doha (Qatar) | Manama (Bahrain) |
|---|---|---|---|
| **Structural data** |  |  |  |
| - Population (2007) | 1,379,000 people | 384,000 people | 157,000 people |
| - Expatriate share | 75 percent | 70 percent | 40 percent |
| - Real GDP (emirate/country view, 2004) | 32 billion USD | 29 billion USD | 11 billion USD |

| | Dubai (UAE) | Doha (Qatar) | Manama (Bahrain) |
|---|---|---|---|
| **Geo-strategic position** | Located in the North-East of UAE between Street of Hormuz and Abu Dhabi | Located on the East side of the peninsula Qatar around 100 km away from Saudi Arabia | Located on the North-East of Bahrain´s main island around 40 km away from Saudi Arabia |
| | Largest air- and Seaport hub at Persian Gulf | International Air- and Seaports at Persian Gulf | International Air- and Seaports at Persian Gulf |
| | Low amount of natural resources compared to other countries on the Arabian Peninsula | Large gas reserves (thus, world-wide one of the wealthiest countries measured by GDP/ capita) | Low amount of natural resources compared to other countries on the Arabian Peninsula |
| **Politics, laws and regulation** | Feudalism with pre-democratic institutions | Feudalism with pre-democratic institutions | Monarchy with pre-democratic constitution |
| | Highly foreign investment friendly (economic free-zone areas with 100% foreign ownership rights and zero % corporate tax) | Moderately foreign investment friendly (more than 50% foreign ownership rights are subject to approval by government, low corporate tax) | Highly foreign investment friendly (100% foreign ownership rights under certain conditions, 0 % corporate tax in most sectors, high quality of financial regulation standards) |
| **Financial investments and economic growth** | High infrastructure investments (e.g., World Central Airport, Metro system) | Moderate to high infrastructure investments (e.g., airport extension, bridge to Bahrain) | Moderate to high infrastructure investments (e.g., air- and seaport extension, bridge to Qatar) |
| | Large real estate developments (e.g., land reclamations, economic zones, "Dubailand") | Medium sized to large real estate developments (e.g., land reclamations, "Education city") | Medium sized to large real estate developments (e.g, land reclamations, "BFH") |
| | Two-digit GDP growth during last years | High one- to two-digit GDP growth during last years | High one-digit GDP growth during last years |
| | Highly diversified economy | Economy still focused on mining and quarrying | Well diversified economy |
| **History and culture** | Founded as a fishing village around 200 years ago | Founded as a fishing village around 180 years ago | Founded around the year 900 |
| | Linear urban growth along 70 km coastline until today | Concentric urban growth around corniche at Persian Gulf | Dense urban growth in the north-eastern part of the main island of Bahrain |
| | Prosperous trading and financial hub since 20$^{th}$ century | High wealth through income from large gas resources | Middle Eastern core financial hub since the 70s |

Table 6: Comparison of case-study city profiles

## 4.2 Relational significance of the three case-study cities in the knowledge economy context

While the profiles of Dubai, Doha and Manama have been introduced above, the following chapter will investigate today´s functional connectivity degree of all case-study cities in the knowledge economy context. As the "World City Network" analysis of Peter Taylor outlined in 2004, all case-study cities belong to the Top 200 globally best connected cities with regards to APS networks (Taylor, 2004).

The present research outlines the current "significance" of the three case-study cities within functional, non-physical networks of APS and High-Tech firms. Universities as the third pillar of the knowledge economy besides APS and High-Tech firms are omitted in the present research project, since these usually do not show a very dynamic multi-branch, multi-location behavior like the otherwise private firms in the APS and High-Tech sectors. The term "significance" in this case is related to the degree of connectivity. In the following, I would like to explain briefly, how the "significance" of a location is defined in this research project on basis of the available data from the empirical research: All together 213 KIE companies from Dubai, Doha and Manama have participated in an online survey conducted in the course of the empirical research on the Arabian Peninsula in 2008. Each company has outlined its distribution of subsidiaries – regionally in cities on the Arabian Peninsula and globally on the different continents. Based on the Taylor approach outlined in the "World City Network" (Taylor, 2004), the existence of subsidiaries in two specific locations causes the assumption of a higher flow of people, information, and capital, and therefore also of a higher connectivity between these two locations. If the sum of these connectivities across all companies seen from the viewpoint of one specific city is high, then the "significance" of the city in the functional KIE network context is high. If the sum of these connectivities across all companies seen from the viewpoint of one specific city is low, then the "significance" of the city in the functional KIE network context is low. With the migration of company subsidiaries from one location to another, the significance of the locations can change, seen from an overarching relational geography perspective.

The results of the present empirical research project allow the evaluation of the connectivity degrees on two different spatial scales: First, on a global scale, by analyzing the companies´ subsidiary distribution on different continents. And second, on a regional scale, by analyzing the companies´ subsidiary distribution in cities on the Arabian Peninsula. It is important to understand the interplay of both, the relational significance of a city on a global as well as a regional scale, since the global and the regional significance of a city can widely differ from each other.

If several cities with a high expected significance fall into one nation state, it even makes sense to introduce the nation-wide examination as a third spatial scale. However, since on the Arabian Peninsula each nation state only has a very limited number of cities, which passed the city pre-selection (see chapter 3.3.1), the nation-wide spatial scale is omitted in the present research project.

Relational geography research can regard two different types of value creation: Value creation via intra-firm connectivities and via extra-firm connectivities. Intra-firm analyses focus on connectivities between different subsidiaries of one and the same company. Extra-firm analyses focus on connectivities between subsidiaries of different companies which divide labor along the value chain of a product. The present research project focuses on intra-firm connectivities. The evaluation of extra-firm connectivities in future research would be welcomed to round up the overarching picture of relational firm networks on the Arabian Peninsula.

Figure 28 shows an overview of the different operational levers of empirical research in the field of relational geography along the dimensions "value creation type", "knowledge economy pillar" and "spatial scale". The coverage of the present research project is highlighted in orange: Intra-firm connectivities of APS and High-Tech firms on a global and a regional scale.
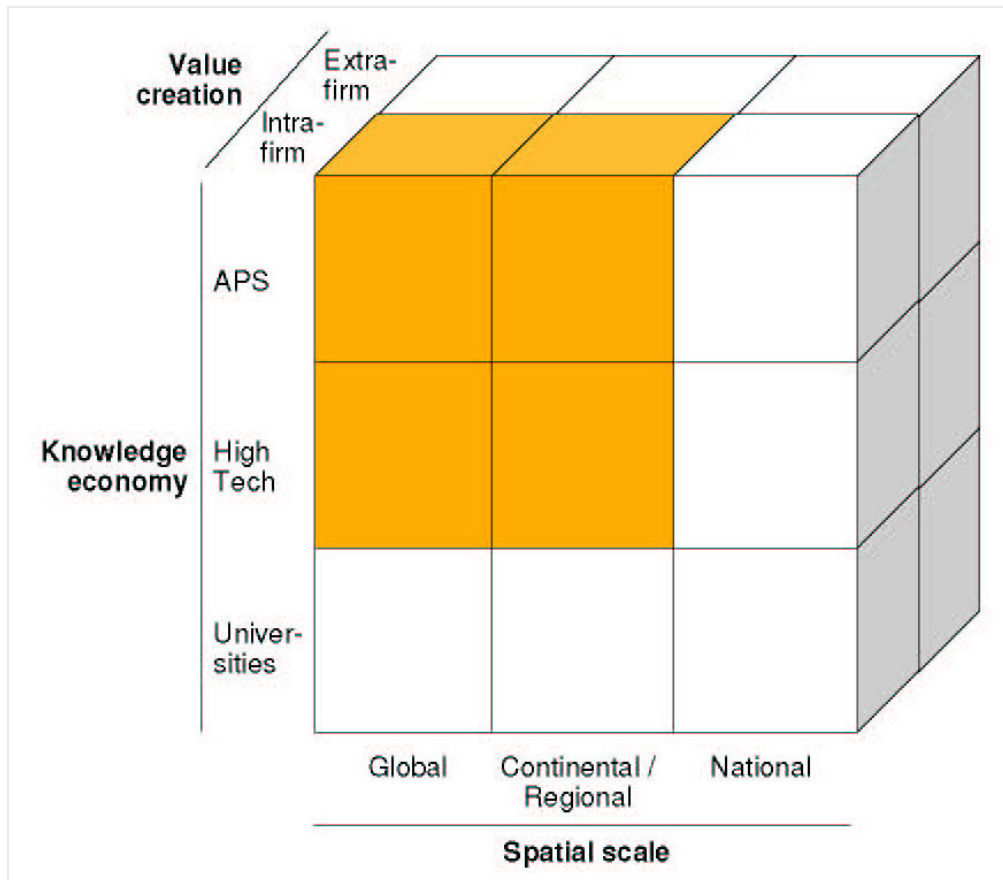
Figure 28: Operational dimensions and levers of empirical research in relational geography, highlighting in orange the coverage of the present research project
Source: Own illustration

The present research project comes to the conclusion, that all case study cities show a high significance within the global as well as the regional KIE network connectivity. Nevertheless a certain hierarchy of cities, especially on a regional level, can be observed which will be outlined in more detail below.

Quantitative research results presented in this chapter, like the global and regional connectivity degrees, are based on the conducted online survey (see appendix 1). The online survey contains replies from 213 knowledge-intensive economy firms (174 APS and 39 High-Tech firms). Out of the 213 data points 106 were collected in Dubai, 55 in Doha and 52 in Manama. The size of Dubai with clearly larger inhabitant numbers explains the difference in the total number of responses. To be able to compare the connectivity characteristics across the Arabian Peninsula, all figures presented in the following have been normalized by the number of survey participants from the respective case-study cities.

Zawya, as one of the most exhaustive company databases in the Middle Eastern region, was used to source firms for the online survey participation. A link to the online survey was sent via e-mail to 846 listed firms, which fell into the defined NACE code classifications of KIE (see chapter 2.1.3). In this way it was possible to reach out to a large amount of firms with relatively low effort. However, the response rate by sending out survey invitations via an anonymous e-mail was very low (around 2%). Therefore, this broad range invitation was combined with personalized e-mail invitations to a total of 876 company managers sourced by online business networks (such as the global business network Xing or smaller local business networks). Personalized invitations via these networks require a rather high effort, since one has to source potential survey participants individually. But the response rate of sending out personalized invitations was around 35%. All in all, 348 online survey responses were handed in. However, only 213 answers (around 60%) were usable. The other responses had to be omitted from the final evaluation, since their answers either were not complete or the respondent`s firm subsidiaries did not belong to one of the defined knowledge economy sectors or case-study cities.

The results from the online survey were discussed on site with managers from knowledge economy firms located in the case-study cities. Thirty qualifying interviews allow an elaboration of the results backed up with quotes.

### 4.2.1  Global connectivity degree of case-study cities

Based on the online survey responses, it is possible to measure the intra-firm network connectivity of Dubai, Doha and Manama to global locations on other continents (see appendix 5). In general, around 80-90% of the responding KIE firms have firm subsidiaries in locations other than the Arabian Peninsula.

Interviews with KIE managers regarding the global significance of cities on the Arabian Peninsula show that the Arabian Peninsula in general is seen as an advantageous geo-strategic location in between Asia, Europe and North America. Taking into account the time difference between the countries, the Arabian Peninsula is a very strategic location to be in: Starting business early in the

morning and finishing late at night, companies on the Arabian Peninsula can capture all capital market activities during one day in all important KIE locations around the world. A manager of an investment bank operating in Dubai in this context points out:

*"Why we put our office in Dubai is also because of this reason: We can follow the different times. If our office is in Europe, when we go to sleep, the Asian market opens. So we cannot deal […]. But here, we start working at 9 o`clock in the morning and finish at 12:30pm. Asia opens at 5:30am, so we can catch up the last section of Asia, doing the whole Europe and also America: From 5:30pm to 11:30pm you can do it […]. Actually, we can see: This is like a big triangle and Dubai is in the middle".*

In general, the geo-strategic location of the Arabian Peninsula is an advantage not only seen from a capital market perspective, but also from a global reachability aspect. From the Arabian Peninsula a six hour flight gets you to Central Europe, a seven hour flight to South-East Asia, and a 13 hour flight to the East coast of the USA.

The case-study cities do not widely differ in their global connectivity characteristics. Nevertheless, there are certain specifics which are outlined in the following along the respective city illustrations.

### *Global connectivity of Dubai*

With 77% the clear majority of the companies from Dubai participating in the online survey of the present research project have globally distributed firm subsidiaries on other continents (see figure 29). Doha presents a similar share like Dubai, while Manama with a total of 87% has an even higher portion of globally connected firms. Nevertheless, if we look at all globally operating companies in our online survey which only have one subsidiary on the Arabian Peninsula, then Dubai is on par with Manama in terms of being the preferred location, while Doha lies a few percentage points behind both cities (see also further below: *Global connectivity of Doha*).
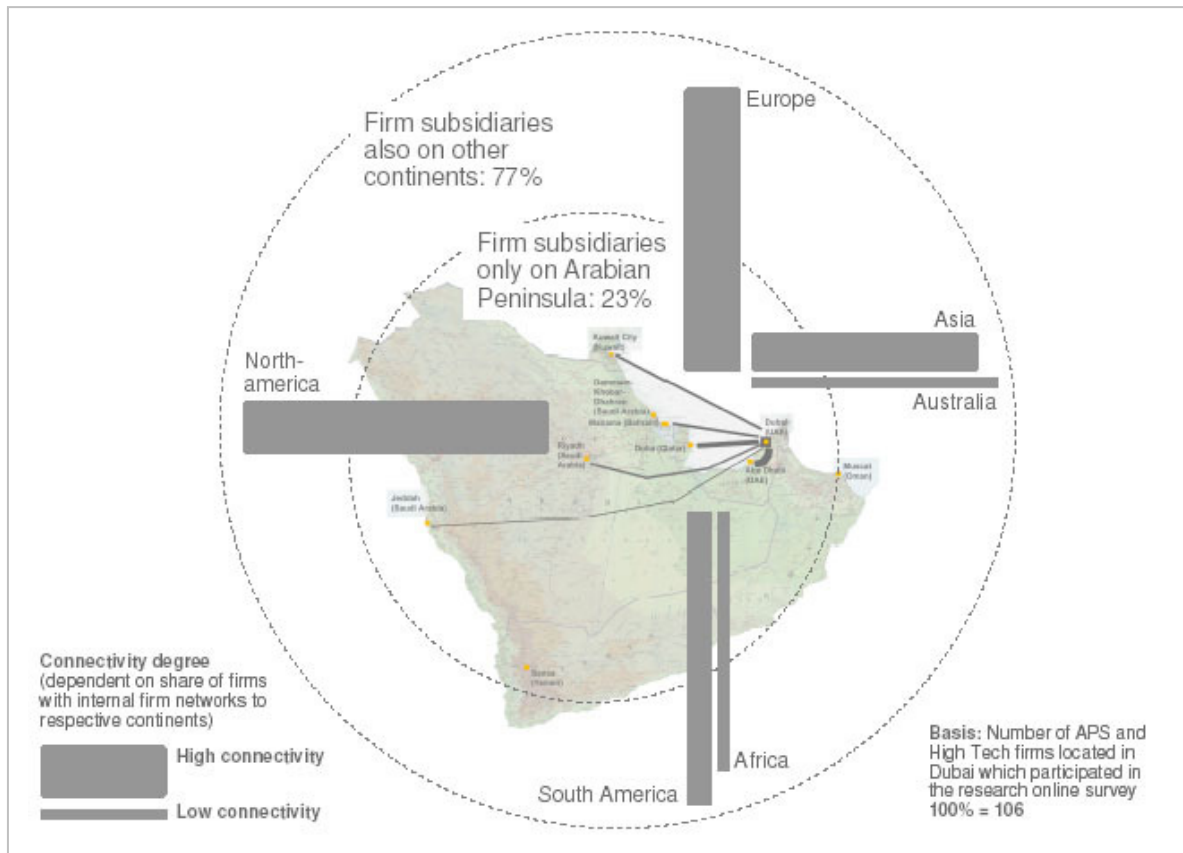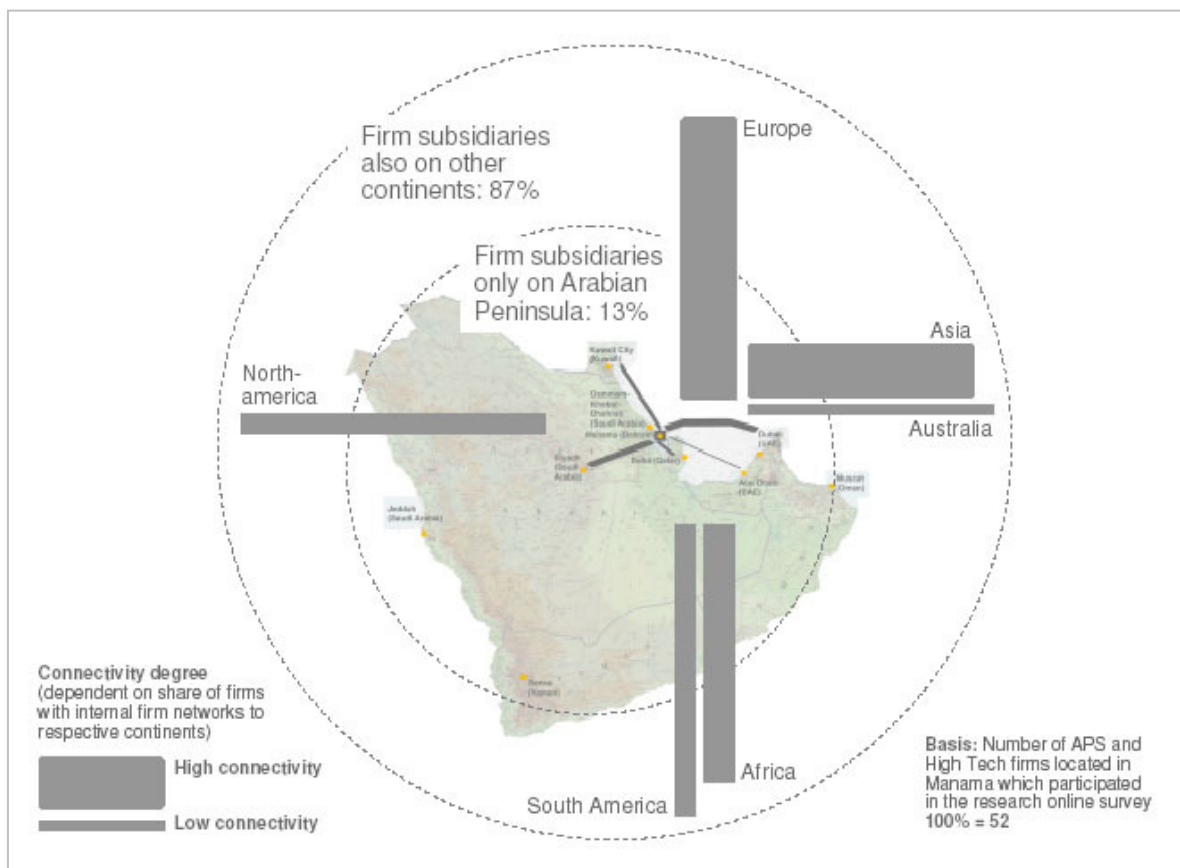
Figure 29: Global, non-physical KIE firm network connectivity of Dubai
Source: Own illustration

While all case-study cities in particular show a high connectivity to Europe, Dubai in addition displays the highest connectivity of all case-study cities to North America (see figure 29). This means that Dubai in general is the best connected location on the Arabian Peninsula to all accumulated Western, developed nations. From a global as well as a regional perspective this certainly has to do with the preeminence, which Dubai has gained on the Arabian Peninsula in terms of economies of scale and scope. Panzar et al. have introduced the terms "economies of scale" and "economies of scope" in a microeconomics context (Panzar et al., 1975). According to their definition, "economies of scale" describe the cost advantages that businesses obtain due to expansion, while "economies of scope" refer to the cost advantages achieved through the offering of a range of products. In the context of the present research project, the terms are applied to spatial development and thus, there definition is adopted accordingly: "Economies of scale" describe the advantages that a location obtains due to a large amount of

offered firms and facilities, while "economies of scope" refer to complementary advantages of one or more locations due to diverse utilizations.

With regards to "economies of scale and scope" in Dubai, a knowledge economy interview partner from a Media company on site expresses himself in the following way:

*"No one can deny the fact that everything is happening in Dubai […], and everybody is coming into Dubai. This is, what the trend currently is. And this exactly tells about economic stability, why Dubai and why not somewhere else."*

### Global connectivity of Doha
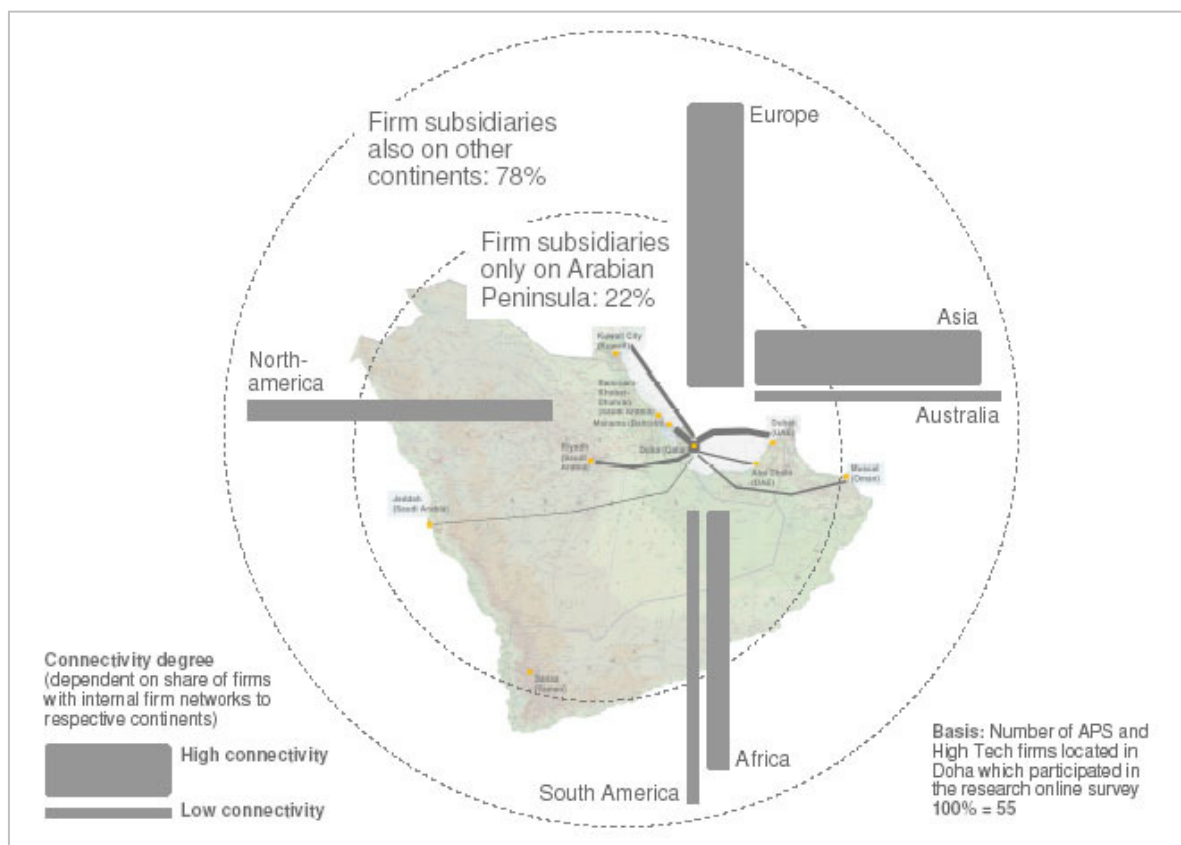


Figure 30: Global, non-physical KIE firm network connectivity of Doha
Source: Own illustration

With 78% the clear majority of the companies from Doha participating in the online survey of the present research project have globally distributed firm subsidiaries on other continents (see figure 30). This share is comparable to the share of globally

operating companies located in Dubai. Nevertheless, if we look at all globally operating companies in our online survey which only have one subsidiary on the Arabian Peninsula, then Doha as a knowledge economy location lies behind Dubai and Manama (see Appendix 5). Around 20% of the total number of globally operating KIE firm survey respondents in Doha indicate that Doha is their single location on the Arabian Peninsula, compared to around 45% in the case of Dubai and 40% in the case of Manama. Thus, on average Doha is obviously not the first-choice location on the Arabian Peninsula, if companies decide to expand to the Arab region with a single location. This seems likely to be due to the fact that Doha´s economy has been mainly driven by oil and gas industries for a long time. The richness in natural oil and gas reserves did release Doha from any pressure, to become a regional market leader in knowledge economy related sectors. The leading director of an advertisement company in Doha describes this fact in the following way:

*"Qatar is very much a pioneer country, because it started later on in the cycle of oil delivery and gas delivery. So what that means is, that it is further behind <than its neighboring countries on the Arabian Peninsula>. Not intellectually, not intelligently, but it is just further behind in the development of its city structures."*

While all case-study cities show a high connectivity to Europe, Doha besides Manama in addition displays also a high connectivity to Asia (see figure 30).

### *Global connectivity of Manama*

With 87% the clear majority of the companies from Manama participating in the online survey of the present research project have globally distributed firm subsidiaries on other continents (see figure 31). Therefore, Manama´s share of globally operating firms is around 10 percentage points higher than Dubai´s and Doha´s share. The lead of Manama in this case is assumed to be a consequence of Manama´s relatively long established significance on the Arabian Peninsula in certain knowledge economy sectors. In the financial institutions area, for example, Manama started to play a leading role in the Gulf region already in the 70s. In an

interview with a manager of one of Manama`s banks, the interviewee describes the meaning of Manama for the financial sector in these times:

*"In 1982, when our company was founded, there was only one place in the Gulf: Bahrain was the emerging center of offshore banking at that time. And that was related to ease of connections with other parts, to having a population that was fairly educated - especially in banking - and the fact, that you are so close to Saudi, where the real money is – so the combination of those factors, but also a pretty good regulatory framework."*



Figure 31: Global, non-physical KIE firm network connectivity of Manama
Source: Own illustration

While all case-study cities show a high connectivity to Europe, Manama besides Doha in addition displays also a high connectivity to Asia (see figure 31). Comparing all case-study cities, Manama has the highest connectivity to Africa. Manama´s long established preeminence in the Islamic banking sector certainly has an influence in the way that it strengthens connections to other Arabian cities

on the African continent. This seems to explain the relatively high connectivity degree to Africa compared to Dubai and Doha.

In general, Manama´s high global connectivity also seems to be partly a result of Manama´s role as a intermediary for Saudi Arabia. The comparably liberal country of Bahrain often works as a filter between the strictly regulated, Islam-oriented country of Saudi Arabia and the western, developed nations. The managing partner of an IT-consulting firm in Bahrain described this phenomenon in an interview:

*"Businesses and deals from the eastern province <of Saudi Arabia> are often made in Bahrain, because the Saudis know how difficult it is for Europeans and Americans to come to Saudi Arabia. This is related to visa problems <in Saudi Arabia>. It leads to the fact that many businesses meet here and project deals are made here <in Manama>."*

### 4.2.2  Regional connectivity degree of case-study cities

123 out of 213 firms participating in the online survey indicate one ore more additional firm subsidiaries on the Arabian Peninsula. All case study cities show quite an extensive KIE connectivity degree to other cities on a regional level (see appendix 5). Nevertheless, there are slight differences between the case-study cities in the way, how strong they are connected regionally as well as to which cities. The overarching picture discloses a certain hierarchy of the case-study cities. Partly they act as competitive and partly as complementary cities on the Arabian Peninsula (see details further below in the subchapter *"Summary of regional connectivity across all case-study cities").* The connectivity specifics of each case-study city on a regional level are presented in the following in detail.

### *Regional connectivity of Dubai*

From the perspective of KIE firms in Dubai, the city playing the largest role in terms of connectivity degree is Abu Dhabi. Abu Dhabi is followed by Doha which is from a Dubai perspective slightly less connected than Abu Dhabi. On a third connectivity

degree level Dubai companies display connections to Manama, Kuwait City and Riyadh. A very weak connectivity is indicated to Jeddah and insignificant to no connectivity is outlined to Muscat and Dammam-Khobar-Dhahran (see figure 32).

It is important to emphasize, that Dubai does not regard Doha and Manama as the most significant cities in terms of KIE connectivity. On the other hand, we will see further below, when it comes to the regional connectivity of Doha and Manama, that Doha and Manama do attach greatest importance to Dubai in terms of the regional KIE connectivity.
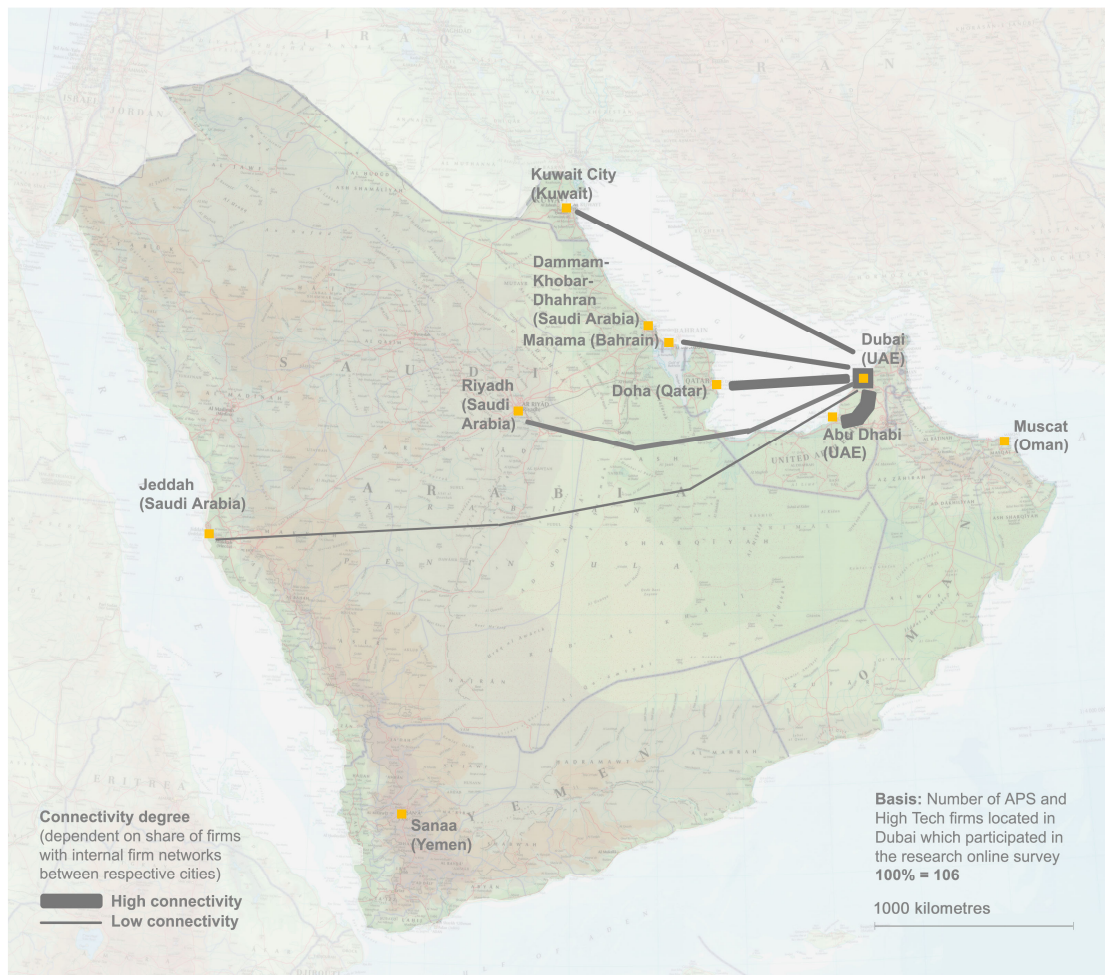


Figure 32: Regional connectivity of Dubai – Source: Own illustration

This fact points out that Dubai currently holds the predominance across the selected case-study cities in terms of the connectivity pattern of knowledge economy firm networks on a regional level. This also coincides with the perception

of several interview partners from KIE companies in Dubai. With regard to the significance and the regional competitiveness and attractiveness of Dubai, the following quotes are of interest:

- *"Dubai is definitely THE hub of the Middle East" (manager of a globally operating insurance company in Dubai)*

- *"Dubai developed inevitably to our largest office, because it was easiest for us, to attract people to this place" (manager of a globally operating advertisement company in Dubai)*

- *"When we looked to set up a more serious onshore office in the Middle East, we chose Dubai. I think, it was in 2002, when we located here. That´s when we looked at the environment and, from my perspective, it was a little more favorable here <than in other locations in the Middle East>" (manager of a globally operating bank in Dubai)*

It might appear as self-evident, that companies located in Dubai advocate their business location. But in interviews with managers especially from Doha, the regional pre-eminence of Dubai in the knowledge economy context is confirmed, while managers from Manama still kind of see the two locations of Dubai and Manama on par (see further below subchapter "*Regional connectivity of Manama*"). At least indirectly the following quote from a British manager of a globally operating advertisement company, talking about his firm subsidiary in Doha, shows the above mentioned acknowledgement of Dubai´s regional and global role:

*"I`d rather be a bigger fish in a smaller pond, than a smaller fish in a big pond."*

The interviewee uses the metaphor of the "smaller pond" for Doha, while the "big pond" refers to Dubai. And he continues:

*"Dubai is saturated with agencies. I could have stayed in London to have that kind of a competition."*

In general, the specific pattern of regional KIE networks between the case-study cities indicates the above described pre-eminence of Dubai. However, there are

two disadvantages, which Dubai faces compared to Doha and Manama on a regional KIE network level.

**First of all**, Dubai has a significantly weaker connection to Riyadh, which is the capital of Saudi Arabia and the financially strongest location on the Arabian Peninsula in terms of total annual GDP. In 2004 the real GDP of Saudi Arabia was 251 billion USD, compared to 32 billion USD in the emirate of Dubai, 29 billion USD in Qatar and 11 billion USD in Bahrain (GCC, 2009; Kingdom of Bahrain Ministry of Finance, 2009; UAE Ministry of Economy, 2009). Furthermore, Saudi Arabia is with approximately 25 million inhabitants the largest sales market on the Arabian Peninsula.

**And secondly**, if we look at the amount of regional connections, companies from Dubai on average have a lower number of additional subsidiaries on the peninsula than companies from Doha and Manama: With a total average of 2.7 subsidiaries per firm on the Arabian Peninsula (compared to 3.0 in Manama and 3.3 in Doha), Dubai underlines the fact, that its firms are rather globally oriented than regionally.

### *Regional connectivity of Doha*

From the perspective of KIE firms in Doha, the cities playing the largest role in terms of connectivity degree are Dubai and Manama. Both are followed by Kuwait City and Riyadh. On a third connectivity degree level Doha´s KIE companies display connections to Abu Dhabi and Muscat. A very weak connectivity is indicated to Jeddah and insignificant to no connectivity is outlined to Muscat and Dammam-Khobar-Dhahran (see figure 33).

Doha does regard Dubai as well as Manama as the most significant cities on the Arabian Peninsula in terms of KIE connectivity. Neither KIE companies from Dubai nor KIE companies from Manama indicate a similar strength of connectivity to Doha, but rather a lower one. This fact correlates to the later independence of Doha from oil and gas revenues compared to Dubai and Manama. Nevertheless, the slightly slower emergence of Doha in the shade of mainly Dubai and also

Manama is expected to bring along certain advantages for the location of Doha in the long run.
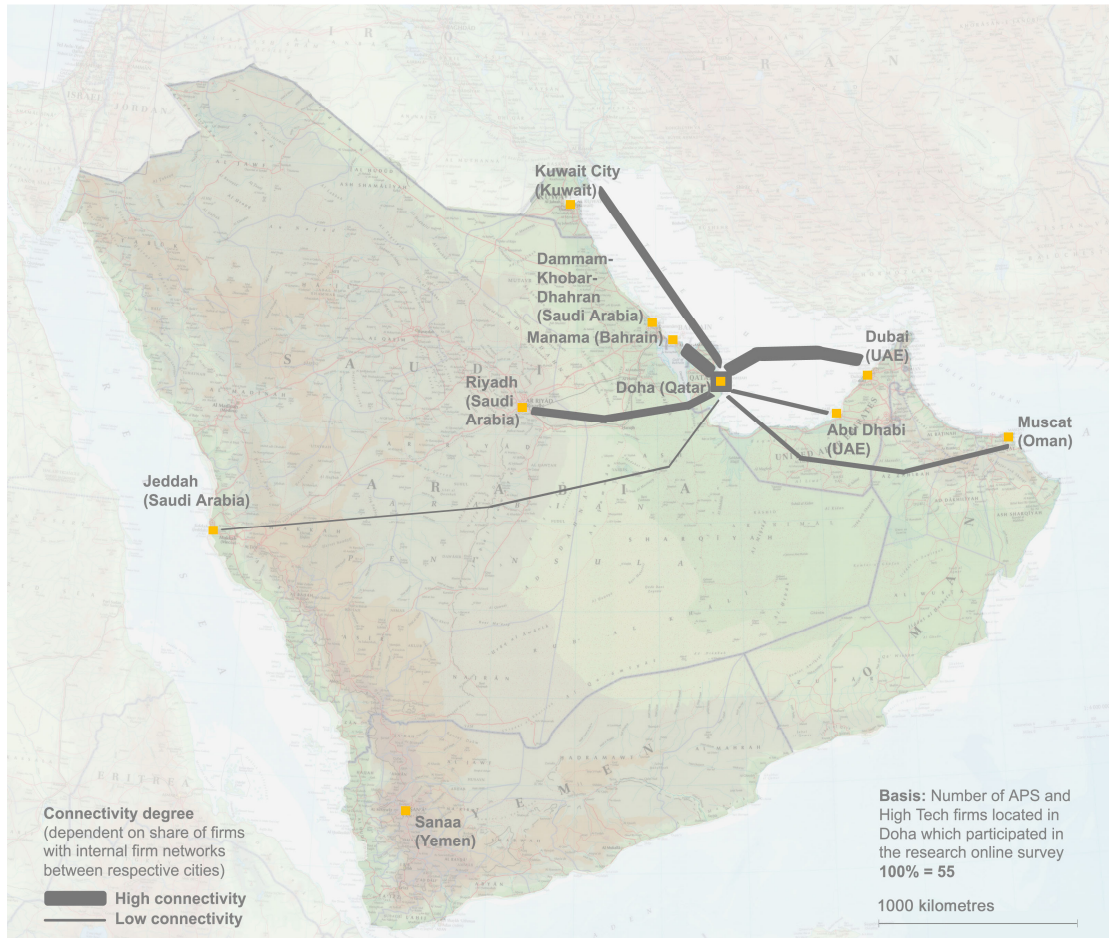


Figure 33: Regional connectivity of Doha – Source: Own illustration

The manager of a telecommunication company in Doha articulates potential chances in the following way:

*"I think businesses look at the opportunities that are available to them, when they come and establish operations […]. And typically the decision has been easy, because there was Dubai. Now Doha is expanding very rapidly and is becoming a good alternative to Dubai in the sense, that there is less traffic, less people, less congestion and maybe a little bit better planning. They are taking a lot of the good stuff from Dubai and applying it here. But not necessarily this "biggest this and biggest that", trying to be everything to everyone, like a big tourist attraction, a big commercial attraction, sports and everything. So, I think, there are some*

*differences and Doha is getting to be more competitive and trying to be able to attract organizations and different companies."*

Or, as another manager in Doha says with regards to the developments in Doha:

*"Doha is building what I perceive to be a phenomenon here, which is not so much mass-market and tourism led, which is much more premiere. Which is much more discrete. Which is – in my opinion – higher value. And that´s where I want to be."*

In general, the specific pattern of regional KIE networks between the case-study cities indicates the above described current inferior position of Doha on a regional level. Nevertheless three factors might be advantageous for Doha on a regional level in the long run:

**Firstly**, Doha in the future might be able to built upon the above mentioned favorable attractiveness through slower, but more considerate growth.

**Secondly**, if we look at the amount of regional connections, companies from Doha on average have a slightly higher number of additional subsidiaries on the peninsula than companies from Dubai and Manama: With a total average of 3.3 subsidiaries per firm on the Arabian Peninsula (compared to 2.7 in Dubai and 3.0 in Manama), from a normalized perspective Doha is the leading location in terms of total amount of KIE network connections on a regional level.

**And thirdly**, Doha on a regional level shows the most diverse connectivity pattern. Doha regionally displays a significant connectivity to seven cities (compared to six cities in the case of Dubai and 5 cities in the case of Manama).

*Regional connectivity of Manama*

From the perspective of KIE firms in Manama, the cities playing the largest role in terms of connectivity degree are Dubai and Ryiadh. Both are followed by Kuwait City. On a third connectivity degree level Manama´s KIE companies display the city of Doha. A very weak connectivity is indicated to Abu Dhabi and insignificant to no connectivity is outlined to Jeddah, Muscat und Dammam-Khobar-Dhahran.

The high connectivity between Manama and Ryiadh has one major reason: The liberal country of Bahrain partly acts as an international intermediary for the restricted country of Saudi Arabia (see figure 34). Business meetings between Saudi Arabian people and partners from western states often take place in Bahrain, where visa regulations and social restrictions do not constrain business relations.

It needs to be emphasized, that Manama as well as Doha have a by far stronger connectivity to Dubai than they do have to Abu Dhabi. Even if Abu Dhabi is the GDP-wise richer city compared to Dubai, it obviously regionally has a clearly lower significance in terms of KIE network connectivity than Dubai.
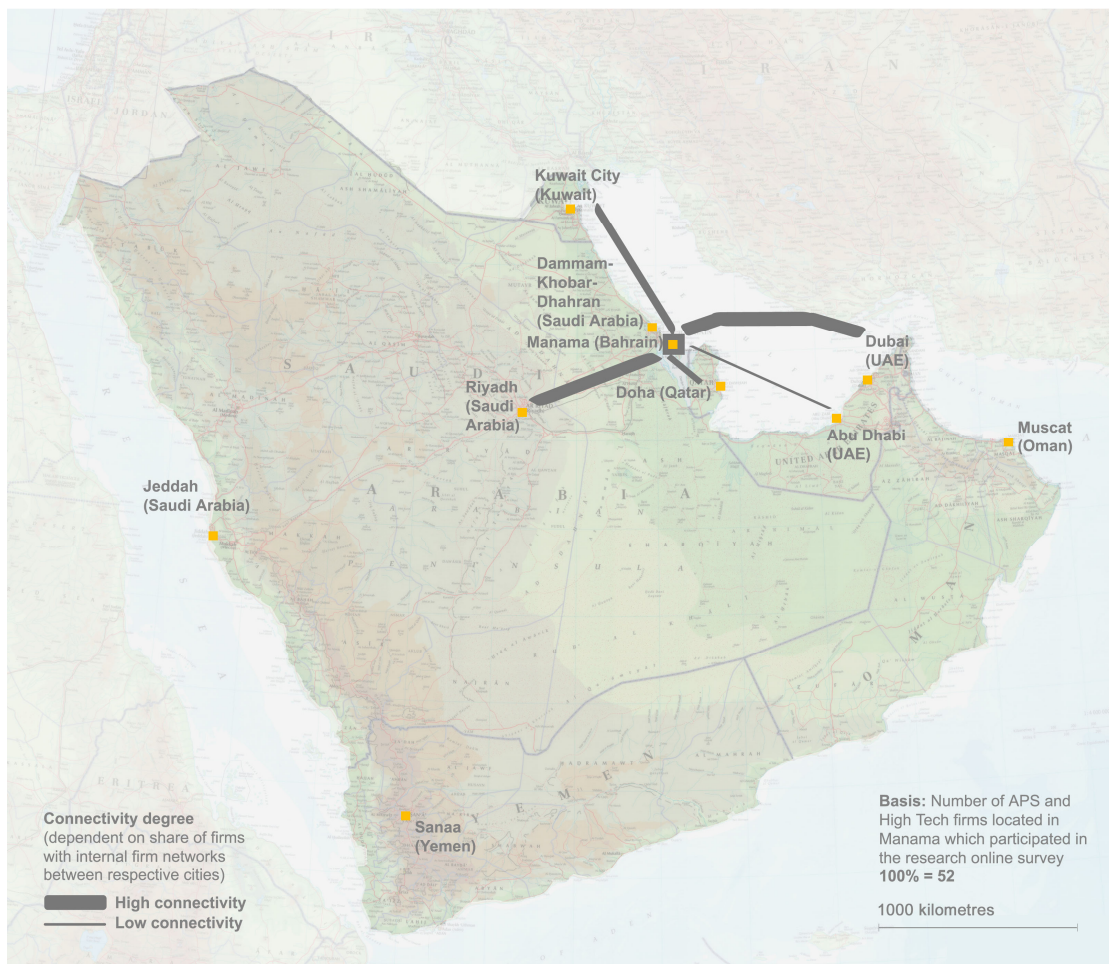


Figure 34: Regional connectivity of Manama – Source: Own illustration

While KIE firms from Manama regard Dubai as a well connected city, Dubai KIE firms do not regard Manama as a city with a exceptionally high connectivity degree.

As mentioned before, this mismatch indicates the pre-eminent role of Dubai on the Arabian Peninsula. However, due to Manama´s longer established knowledge economy role in the Gulf region, KIE managers from Manama (other than KIE managers from Doha) do not always acknowledge the pre-eminence of Dubai on a regional level. As the following interviewees from Manama outline, Manama´s position, especially in the banking sector, is from their point of view only partly rivaled by Dubai:

- *"Clearly, there is still an attraction in Bahrain […]. I still think, in terms of their local population, banking knowledge systems, regulatory environments, it is the strongest place to do banking business in the Middle East. And it is still building on Islamic banking and other areas. <However,> Dubai has a huger draw of all the international banks and the international talent." (manager of a globally operating bank in Manama)*

- *"Really, as much as I have been told, one of the reasons to be in Bahrain is, because it is close and accessible for Kuwait and Saudi, it has got good transport links in terms of flights and it is a lot cheaper than Dubai." (manager of a regionally operating communication firm in Manama)*

With regards to Qatar, KIE firms from Manama regard Doha as a rather weakly connected city, while KIE firms from Doha acknowledge Manama as a city of an exceptionally high connectivity degree. In this case the mismatch indicates the pre-eminence role of Manama over Doha.

The specific pattern of regional KIE networks between the case-study cities shows that Manama is positioned in the middle between Doha and Dubai in terms of the regional connectivity degree. This picture is also confirmed if we look at the amount of regional connections from a normalized perspective. Firms from Manama have a total average of 3.0 company subsidiaries on the Arabian Peninsula. This is higher than the 2.7 average of Dubai firms, but lower than the 3.3 average of Doha firms.

Nevertheless, Manama has quite a weak position compared to Dubai and Doha, when it comes to the city diversity of the regional connectivity pattern: Regionally Manama only displays a significant connectivity to five cities (compared to six cities in the case of Dubai and seven cities in the case of Doha).

### 4.2.3  Summary of global and regional connectivity across all case-study cities

If we look at the overarching pattern of knowledge economy firm networks globally and on the Arabian Peninsula, the picture and the underlying empirical research disclose three major messages: **First**, all case-study cities display a large and diverse connectivity to other cities globally and regionally on the Arabian Peninsula. **Second**, there is a certain hierarchy of cities on the Arabian Peninsula in terms of their connectivity degree. **Third** and finally, cities on the Arabian Peninsula are partly complementary and partly competitive. The three messages are explained in detail in the following.

**1. All case-study cities display a large and diverse connectivity to other cities globally and regionally on the Arabian Peninsula.** In general, from a global perspective, around 80-90% of the responding KIE firms have firm subsidiaries in locations other than the Arabian Peninsula. All three case study cities on the one hand have established a very good connection to Europe (on average each firm respondent has around 16 subsidiaries in Europe) (see figure 35).
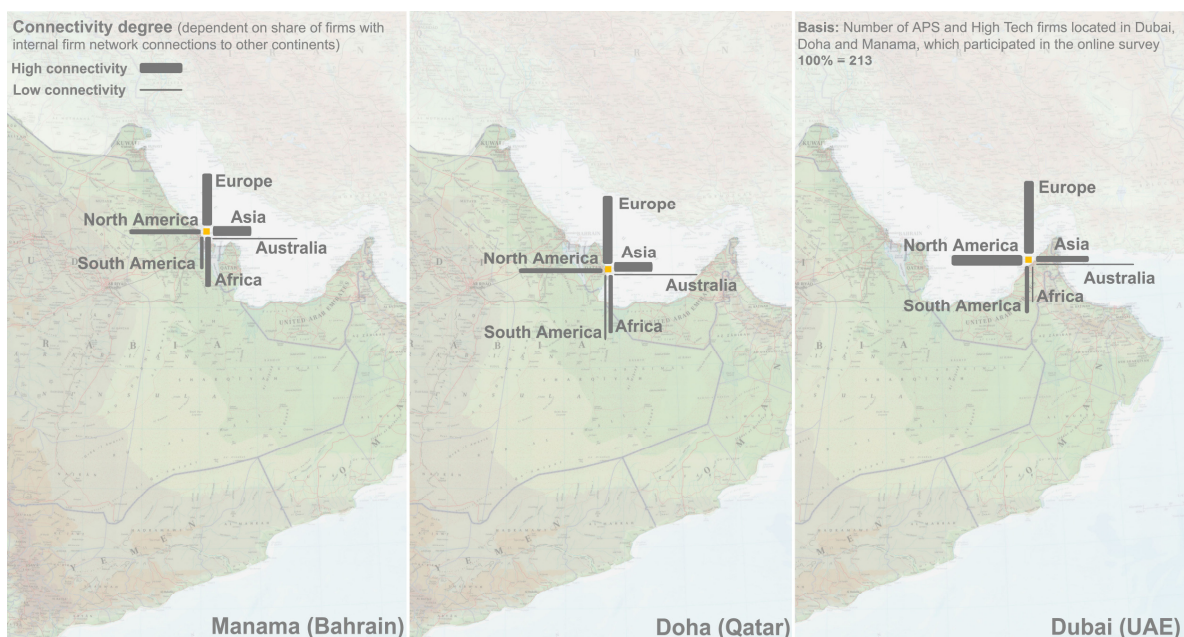


Figure 35: Global, non-physical KIE firm network connectivity of Dubai, Doha and Manama
Source: Own illustration

On the other hand, Australia has a very low degree of connectivity to all three case-study cities (on average each firm respondent has around 2 subsidiaries in Australia). While Dubai has a especially high connectivity to North America, Doha and Manama display larger connections to Asia. Africa and South America show a low to medium significance in terms of knowledge economy connectivity in all case-study cities. (see figure 35).

In the future, the global significance of the case-study cities in the knowledge economy context will therefore strongly depend on the global forces of economy. If the Asian region is continuing to strengthen its position compared to the traditional European and North-American centers of growth, this might be an advantage for the cities Doha and Manama.
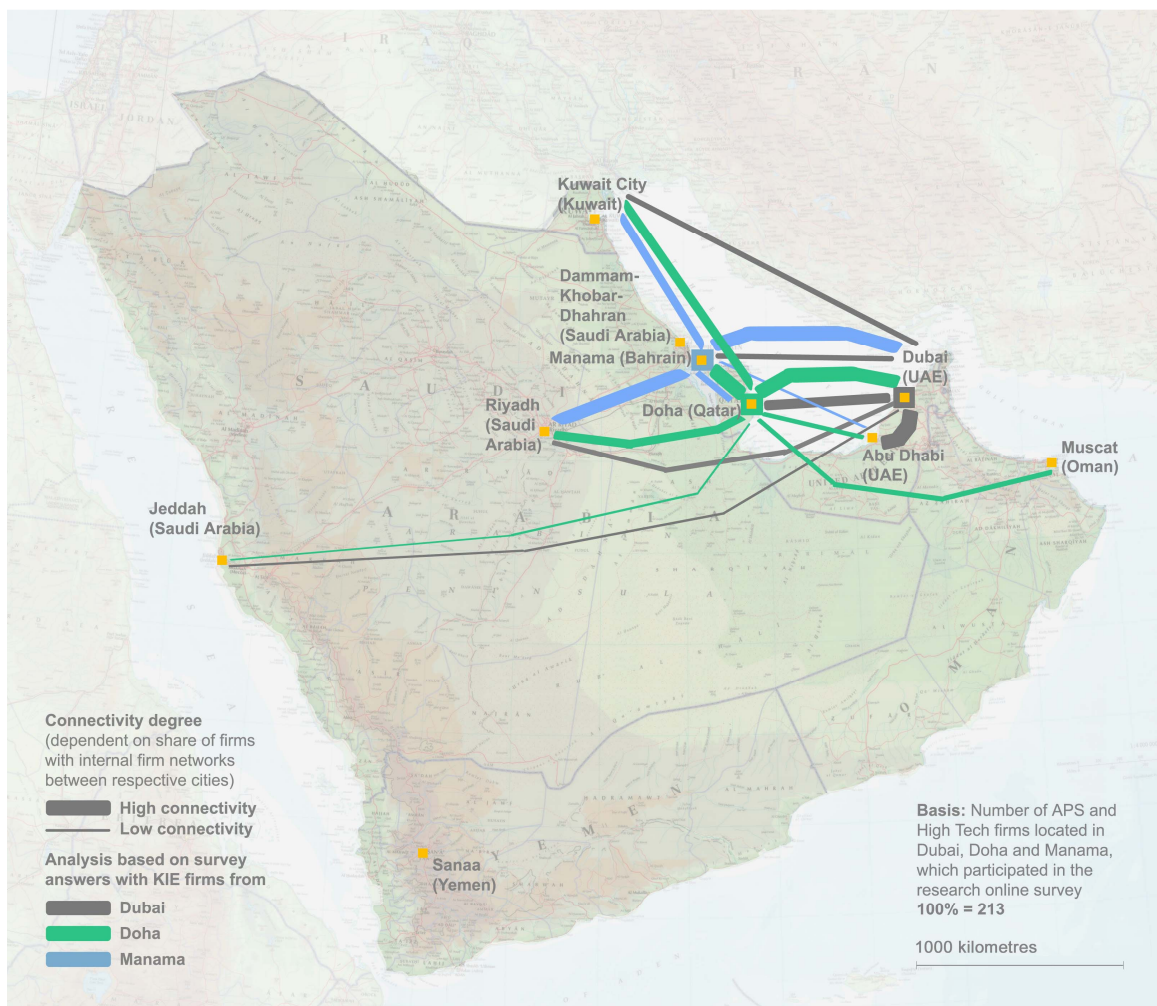


Figure 36: Regional, non physical KIE firm network connectivity of Dubai, Doha and Manama on the Arabian Peninsula

Figure 36 shows the combined view of relational, non-physical company networks of all case-study cities on a regional level. Dubai, Doha and Manama display stong connections to many other cities on the Arabian Peninsula. They especially show a certain degree of connectivity to Riyadh (Saudi Arabia), Abu Dhabi (UAE) and Kuwait City (Kuwait). On the contrary, they have little or no connectivity to locations like Jeddah (Saudi Arabia), Muscat (Oman), Sanaa (Yemen) and Dammam-Khobar-Dhahran (Saudi Arabia).

The rather low connectivity of all case study cities to these locations has mainly the following reasons: Either the locations are geographically quite far apart from the case-study cities (Jeddah), or the locations do not play a major role in the current global and regional knowledge economy context (Muscat, Dammam-Khobar-Dhahran), or a combination of both previously mentioned reasons applies (Sanaa). With regards to Muscat, for example, an interviewee from Dubai explains the city´s economic role on the Arabian Peninsula in the following way:

*"There is not much happening in Muscat. It is very neutral. If you ask any industries, whether they are horizontal industries or vertical industries, they don´t do any sort of big, major business in Oman."*

In general, the qualifying interviews with KIE firm managers give a rationale for the co-existence of several firm subsidiaries on the Arabian Peninsula in around 60% of all survey responses: Even though certain functions of the intra-firm 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 non-central firm locations responding to local market conditions and differing cultural backgrounds in the respective nation states. This has to do with the fact that the seven nation states on the Arabian Peninsula (UAE, Qatar, Bahrain, Saudi Arabia, Kuwait, Oman, Yemen) highly differ in terms of their cultural and social context. The variety ranges from a very conservative, traditionally oriented society in Saudi Arabia to a very liberal, Western-oriented society in countries like Bahrain. Presumably the social mindset is also correlated to the extend of the autocracy in each of the countries.

**2. There is a certain hierarchy of cities on the Arabian Peninsula in terms of their connectivity degree.** Dubai´s preeminence on the Arabian Peninsula in the regional knowledge economy context has been described in the previous chapter. Both Doha as well as Manama regard Dubai as highly significant in terms of the KIE connectivity degree. The fact of Dubai´s significance in terms of regional and also global KIE connectivity is even more striking, if we take into account that Dubai´s history of growth in the knowledge economy sector is the youngest of all case-study cities (for details see later chapter 4.3.). The city of Dubai is followed by the city of Manama in terms of regional connectivity degree. Doha plays a less significant role: It regards Manama and Dubai as strongly connected cities, while neither KIE firms in Dubai nor KIE firms in Manama display Doha as a very significant location in terms of the connectivity degree.

If we look at the cities on the Arabian Peninsula which are not selected as case-study locations, Riyadh (Saudia Arabia) with a medium to very strong connectivity from Doha and Bahrain and week connections from Dubai has quite a remarkable knowledge economy significance within the regional network. Besides Riyadh (Saudi Arabia), we also need to mention Kuwait City (Kuwait) with a medium connectivity degree from the perspective of all case-study cities. Abu Dhabi (UAE) is only regarded as a significant player from the perspective of Dubai, while Doha and Manama display very weak connections to Abu Dhabi. The high connectivity degree between Dubai and Abu Dhabi is to a certain degree a consequence of the geographic closeness and the fact that both cities belong to the same nation state.

**3. Cities on the Arabian Peninsula are partly complementary and partly competitive.** In the following, both the complementarity and the competitiveness drivers of cities on the Arabian Peninsula are described in greater detail:

There are mainly three different types of complementing drivers: *Country-specific product offerings*, *profit-cost trade-offs* and *specific regional connectivities*.

The complementing driver of *country specific product offerings* describes the fact that companies establish various subsidiaries in different cities on the Arabian Peninsula to capture the respective, highly differing local markets. In the interviews

with KIE managers in the case-study cities this fact is mentioned as the major reason for a frequently appearing multi-subsidiary strategy of firms on the Arabian Peninsula. One KIE interview partner describes the fact with reference to his company:

*"I would say, <our office locations> are really complementary, because each of the geographic locations like Kuwait <city>, Doha, Riyadh focus only on the countries which they are located in […]. So the Riyadh office will only cover Saudi Arabia for a certain set of products and Kuwait <city> likewise covers Kuwait for a certain set of products etc. – so, in that sense they complement each other, not compete."*

The complementing driver of *profit-cost trade-offs* outlines the fact, that specific locations can complement primary locations, if these become too expensive for certain companies. This especially pertains to smaller and medium size companies which cannot generate the respective amount of profits to compensate higher cost factors like real estate, labor and other costs. Secondary-choice locations can in this case attract such companies and therefore complement the otherwise first-choice locations. A manager of an advertisement company in Doha argues:

*"If I had started in Dubai, I would have had very high set-up costs, very high competition costs with very established players, international agencies and a very well established marketplace."*

The complementing driver of *specific regional connectivities* takes advantage of the fact that specific cities often display a higher regional connectivity to geographically close locations than they do to the ones geographically further apart. In the case of the Arabian Peninsula, we can underline this driver with a concrete example: If Dubai and Manama cooperate, they can complement each other in the following way: On the one hand, Dubai displays a very strong connectivity to the geographically close location of Abu Dhabi. Manama can profit from that since it currently does not exhibit a strong connectivity to Abu Dhabi. On the other hand, Manama displays a very strong connectivity to the geographically close location of Riyadh. Dubai can profit from that since it currently does not have a strong connectivity to Riyadh. A manager from a globally operating insurance company with its headquarter in Dubai referres to that point in the following way:

*"A lot of our business from Saudi is made in our Bahrain office, since Bahrain is connected with Saudi Arabia via the bridge. Therefore, Bahrain is an extremely important location for us."*

In comparison to the mentioned complementing drivers there are also drivers of competitiveness on the Arabian Peninsula: The first one is related to *economies of scale* and the second is related to *economies of scope*.

As described above, the term *economies of scale* has originally been introduced in microeconomics, describing cost advantage through business expansion (Panzar et al., 1975). Transferred to a relational geography context, it refers to the fact that locations with an already high significance in the non-physical knowledge economy networks are more likely to achieve an even higher position compared to other cities with a relatively low significance. This can be explained on a micro and on a macro level.

On a micro-level, a single knowledge economy company in the first place is rather attracted to a city with an already high knowledge economy significance, since it can expect a larger demand and delivery market there. In case of a higher production the company´s fixed costs per product shrink, which is an advantage for the overall business performance (in the case of knowledge-intensive economy companies, the sold knowledge can be regarded as the "product"). Partly, however, this effect is contradicted by the above mentioned complementing driver of profit-cost trade-offs. Especially in the case of smaller to medium size companies, the entry costs to set up a business in a primary location ("primary" in the sense that the location is theoretically the first choice of companies in the location selection process) can become un-affordably high. If we multiply that effect to a macro-level, this trend has following consequence. Primary locations gain significance in the global and regional knowledge economy networks. On a global level, the significance gain is due to the fact that the above described attraction on a micro level leads to a relatively high accumulation of large, globally operating companies in the primary city. On a regional level the significance gain mainly relates to the fact that the rather locally-oriented smaller to medium size companies from secondary-choice locations regard globally-oriented large companies from

first-choice locations as important business partners which can extend the reach of small companies.

On the Arabian Peninsula all case-study cities currently strongly compete against each other for the largest attraction of knowledge-intensive economies on a global and on a regional level. In this environment, Dubai is often expected to win the competition for the preeminent position with regards to economies of scale. As the manager of a regionally operating media company in Dubai articulates,

*"…the nearest place to go to is Dubai, because all the multi-national companies exist there […]. Manama and Doha are <comparably> small. The opportunities that they have are also small"*

However, economies of scale does not only refer to the available amount of large-scale knowledge economy firms in a location, but also to the availability of a large-size talent pool. This is an extremely important topic, since the value of knowledge economy firms mainly is driven by their employed people who transfer and exchange the knowledge. As previously mentioned, knowledge can only partly be "codified" (see chapter 2.1.2). Since a large part of knowledge is "tacit", it requires the direct communication between people, in order to be transferred. Therefore, knowledge economy firms require specialized people with adequate educational profiles, to be capable of transferring "tacit knowledge". With respect to this, locations on the Arabian Peninsula do not only compete for being the primary location of knowledge economy firms, but also for being the primary location of the respective knowledge economy talent pool. Interview partners from KIE firms in the case-study cities point out, that the competition for qualified personnel in KIE businesses between emerging cities on the Arabian Peninsula is quite noticeable. Within this regional competition for high-skilled labor, again Dubai currently seems to have a better position than other cities. The manager of a large, regionally operating architecture and project management firm in Doha refers to that topic:

*"When we go after <our personnel> we are in competition with other employers – not only locally, but also within the Gulf. And at least at present, among any employees – for whatever reason – Dubai is usually the first choice. We are usually maybe 3rd or 4th, after Abu Dhabi and Bahrain. And that maybe more, because*

*Dubai has a better name recognition than Doha does and because of the international media attention Dubai gets. Especially Western expatriates, <like> someone from the States, are more likely to have heard of Dubai than they would have heard of Doha."*

The competition for high-skilled labor is not only taking place on a regional, but also on a global level. Regarding the latest available numbers, a large share of people living in our case-study cities are expatriates from all over the world: Around 75 percent of the population in Dubai (Bargaeen, 2007: 176), around 70 percent of the population in Qatar (The Economist, 2004 – 2: 29) and around 40 percent of the population in Bahrain (The Economist, 2004 – 3: 15). In general, these numbers show us that nowadays the trans-national flexibility of people is tremendously high. Even though a large share of the above mentioned expatriates are low-skilled labor like construction site workers, the international knowledge economy firms operating in the emerging cities are also highly dependent on expatriates. To tie knowledge economy managers and employees as well as their families to a specific location on a long-term basis, one needs to regard the attractiveness of a location and with it the quality of urban space as an important pre-requisite (see chapter 5). The promotion of a location (as mentioned in the above quoted interview) can only draw people´s attention in the first place. While Dubai seems to be leading in terms of creating that attention in the first place, it is questionable whether the city is able to retain its position of being the first-choice location from a knowledge economy employees` perspective in the long run due to the following reason:

As shown above, Dubai is strongly dependent on expatriates. In our interviews, the expatriate knowledge economy workers articulate a weak sense of alliance with the city of Dubai. In general, the majority of them sooner or later plans to leave Dubai. The following quotes underline this fact:

- *"Nobody ever stays here <on a long-term basis>. They don´t invest in the people to give them a future. And if you don´t invest in the people, fundamentally everything is eventually going wrong."* (British manager of a telecommunication company living in Dubai)

- *"I am planning to leave Dubai by next summer – due to many personal issues here. I prefer to move to a better place where I personally can find more balance […]. Here is not a place where you really can achieve balance in your life."* (Lebanese manager of a pharmaceutical company living in Dubai)

In contrast to interviewees from Dubai, interviewees from Doha and Manama do not explicitly articulate a weak alliance with their cities on a long-term basis. While the share of expatriates in Doha is nearly as high as in Dubai, Manama is far less dependent on expatriate workers. Assuming that the local inhabitants have stronger ties to their home country, this is an advantage for the talent pool on a long-term basis.

*Besides economies of scale, economies of scope* have been the second recognized mean increasing the competitiveness of a location in the global, regional and local knowledge economy networks. As described above, the term *Economies of scope* has originally been introduced in microeconomics, describing cost advantage through offering a range of products (Panzar, 1975). Transferred to a relational geography context, it refers to the complementary advantages of locations due to diverse utilizations. These advantages can be generated within a single city or even between cities or functional urban areas on different spatial scales.

Comparing our case-study cities with regards to *economies of scope*, the cities of Dubai and Manama are currently further developed than Doha. This is due to the fact that their diversity of economic sectors is broader than the one of Doha, since Doha is to a large degree still dependent on its income from natural oil and gas reserves.

On a regional and global spatial scale, *economies of scope* are yet not broadly indicated by knowledge economy interview partners from the Arabian Peninsula. Cooperation strategies between cities on the peninsula through strategic division of labor with reference to certain city specific skills do not really take place. For example, even though cities like Doha and Dubai are not very far apart in terms of distance, companies located in both cities tend to establish separate market-

oriented business functions of the value chain like customer service, distribution and marketing, in order to reply to differing requirements in the respective nation states. The manager of a globally operating investment bank says, referring to that:

*"The product we are promoting in the Middle Eastern region generally is the same, but the way how we serve and how we promote it is completely different."*

As shown above, the customer-related business functions of the value chain are usually locally specified. Nevertheless, the remaining other business functions (research, development, production) and cross-sectoral functions (operations, finance, IT, HR) are usually bundled in one subsidiary on the Arabian Peninsula.

The missing division of labor between emerging cities on the Arabian Peninsula is a clear disadvantage of the region compared to other international regional and global networks, where cooperation strategies can strengthen the role of separate cities within larger non-physical, functional networks. Given the individual geo-strategic, political, economic and social background, every city owns specific industries like logistics, mining or tourism and certain skill clusters. These skill clusters have to do with the local nature of tacit knowledge (Polanyi, 1964; Malecki, 2000). The developed skills in each city or region can be industry-specific or specific to certain functions of the value chain (Product development, Production, Marketing, Distribution). Massey in the publication "Spatial Divisions of Labour" observes that local "skill clusters" as core characteristics of locations are important pull-factors for non-local enterprises, while local industries at the same time are pull factors for a non-local labor force (Massey, 1995). Thus, we can recognize a natural accumulation effect which increases the specialization degree of a city with regards to certain sectors or functions along the value chain. However, cities which are specialized on certain industries and functions strongly require cooperation strategies on a larger spatial scale (e.g., regionally or globally), in order to be able to create value in its full extent and to gain the advantages of economies of scope (Panzar et al., 1975). While Panzar et al. describe "economies of scope" in a microeconomics context as cost advantages achieved through the offering of a range of products, the term in the context of the present research project with

regards to spatial development refers to complementary advantages of one or more locations due to diverse utilizations.

Exemplary, Thierstein et al. have outlined the process of the knowledge economy product development in Switzerland, where successful division of labor between specific regional locations specialized along the value chain has been observed in the authors´ analysis of spatial development (Thierstein et al., 2006).

## 4.3 Rapid growth of knowledge-intensive economies in case-study cities

As outlined in the previous chapter, all case-study cities display a large and diverse connectivity to other cities - globally and regionally on the Arabian Peninsula. This fact is quite striking, if we take into account that the history of growth of KIE firms is still very young in all case study cities. On average the survey firm respondents established their company subsidiaries around 10 years ago. Looking at the individual case-study cities, company subsidiaries on average were founded 8.6 years ago in Dubai, 12.6 years ago in Doha and 11.3 years ago in Manama. Thus, Dubai shows the most rapid development in terms of knowledge economy firm connectivity.

The city selection for firm subsidiary foundation was driven by various geo-strategic, political, economic and social criteria. The online survey has disclosed a detailed evaluation of a pre-defined set of criteria. Figure 37 with accumulated answers from all case-study cities compares the evaluation of the city selection criteria in detail. The score of evaluation goes from -10 for "criterion is not important at all" to 10 for "criterion is very important".

The rating discloses five criteria which got a very high evaluation (six or higher):
- Availability of important international airport hub
- Ease of market entry for foreign companies and people
- Low taxes/duties and high financial subsidies
- Favorable political climate and stability
- Economical stability and growth

**-10:** Not important at all    **10:** Very important

| Geo-strategic position criteria | |
|---|---|
| 1) Favorable climatic conditions | |
| 2) Availability of low-cost natural resources (e.g., water, fuel) | |
| 3) Well functioning car traffic (no traffic jams) | |
| 4) Availability of important international road network intersections | |
| 5) Availability of important international train or bus stations | |
| 6) Availability of important international airport hub | |
| 7) Availability of important international seaport hub | |

| Political criteria | |
|---|---|
| 1) Well developed environmental protection policy | |
| 2) Low degree of environmental obligations for companies | |
| 3) Ease of market entry for foreign companies and people | |
| 4) Low taxes / other duties and high financial subsidies | |
| 5) High quality of utilities (e.g., energy supply, waste disposal) | |
| 6) Employer-friendly labor laws and regulation | |
| 7) Favorable political climate and stability | |

| Economic criteria | |
|---|---|
| 1) Availability of high quality real estate at comparably low cost | |
| 2) Availability of qualified work force at low cost | |
| 3) Favorable size and access to delivery markets | |
| 4) Favorable size and access to supply markets | |
| 5) Low degree of competition and high market transparency | |
| 6) Access to economic associations and company networks | |
| 7) Economical stability and growth | |

| Social criteria | |
|---|---|
| 1) Availability of qualitative and unfiltered communication networks | |
| 2) Closeness to social connections (e.g., family) | |
| 3) Availability of high quality education facilities and education level | |
| 4) Availability of high quality leisure and recreation facilities at low cost | |
| 5) Availability of high quality living and health care facilities at low cost | |
| 6) High prestige of location (good image of location) | |
| 7) Favorable social climate and stability | |

Figure 37: Global city selection criteria from a KIE firm perspective
Source: Online survey with KIE firms in Dubai, Doha and Manama - own illustration

The separate ratings of city selection criteria by companies from the respective case-study cities have not disclosed any major differences However, the discussion of the respective highly important criteria with interview partners of KIE firms have confirmed the previously outlined specific favorability of some case-study cities with respect to specific criteria. Thus, on the one hand, the location selection criteria "availability of an important international airport hub" is currently best fulfilled by the logistics facilities in Dubai. This favorable position of the city of

Dubai will be even increased with the newly built "World Central Airport". Its first construction phase is planned to be finalized in 2010. On the other hand, Bahrain has a very favorable position with regards to the "ease of market entry for foreign companies and people". Ranked as the freest economy in the Middle East by the US-based Heritage Foundation (Heritage Foundation, 2009), Bahrain distinguishes itself through well established financial regulatory standards and an investment-friendly environment. Doha compared to Manama and Dubai currently has the best position with regards to the criterion "economic stability and growth". This is mainly due to its wealth from natural gas and oil income. Even in times of the current economic crisis, Doha´s financial independence has a positive influence on its economic growth. Thus, a GDP growth of 9% is forecasted in Qatar for 2009, which is far above the global average (Gulfbase, 2009).

In general, the rather private life-oriented city selection criteria like "availability of high quality leisure and recreation facilities", "closeness to social connections" and "favorable climatic conditions" are rated as rather weekly important for the city selection of a KIE business locations. Nevertheless, KIE firm managers and workers disclose, that especially these criteria are extremely important, if it comes to the attractiveness of a city from a non-business perspective (see also later chapter 5.1.3). Thus, there is obviously a discrepancy between management selection criteria for a city as a business building location and high-skilled KIE workforce selection criteria for a city as a living location. The criteria relevant for selecting a city as a living location may not be ignored, since the knowledge economy labor force as the intermediator of tacit knowledge is the core capital of knowledge economy companies. Thus, KIE firms are dependent on the availability of a proper work force at the business location. And the availability of a proper workforce is obviously dependent on the favorability of privately relevant city offerings.

Comparing the results of High Tech and APS firms regarding the business-driven location selection criteria, one major difference is recognizable in the rating of the criterion "availability of important international seaport hub". While APS firms rate this criterion as rather unimportant, High Tech firms regarde it as very important.

This certainly has to do with the fact that High Tech firms use the seaports as a major transportation facility for their products and goods, while most APS firms do not display a large requirement of seaport facilities.

## 4.4   Conclusions for Hypothesis one

The following, first research hypothesis can be verified with the input from the empirical research results on the Arabian Peninsula:

*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.*

The global and regional networks of KIE firms as the key drivers of current spatial development have been analyzed in the course of the present research project from the perspective of three case-study cities on the Arabian Peninsula. The research project has focused on the networks of KIE firms, since these companies display a very dynamic multi-branch, multi-location behavior, and thus, mostly constitute the non-physical, functional connectivity between global and regional locations. Through global and regional firm networks, KIE firms take advantage of cooperation strategies between the different, specialized locations and therefore increase their overall value creation.

Thus, the measure of KIE intra-firm network connectivities has been used to determine the current significance of case-study cities on the Arabian Peninsula in the global and regional city networks. Emerging cities on the Arabian Peninsula in this context provide unique case-study examples, since they have managed to gain a large significance within the space of flows very rapidly. The extremely advantageous, geo-strategic location of the Arabian Peninsula in the middle of the rising economic markets in Asia and the developed markets in Europe and North America made it possible that the Gulf region recently has established a new relevance which goes far beyond its traditional and historic global meaning.

The above outlined empirical research results from the Arabian Peninsula have shown that all case-study cities – namely Dubai, Doha and Manama - proved to have a high functional KIE connectivity on a regional as well as on a global level. The significance of emerging cities on the Arabian Peninsula within the global KIE city network is a result of a rapid knowledge-intensive economy growth in the region. On average KIE firm subsidiaries on the Arabian Peninsula were founded only 10 years ago. KIE survey participants from all case-study cities outline, that the decision of launching new firm subsidiaries on the Arabian Peninsula was influenced by various favorable geo-strategic, political, economic and social location-specific development forces (see chapter 4.3).

Firm networks across the Arabian Peninsula are based on various cooperation strategies between firm subsidiaries in different locations (see chapter 4.2.3). However, cooperation between the various locations could still be increase. Current competitive behavior between the case-study cities especially with regards to economies of scope might potentially convert into areas of cooperation. "Division of labor" strategies between company subsidiaries in various urban nodes on the Arabian Peninsula are still missing and might lead to additional ways of value creation through cooperation in the future (see chapter 4.2.3).

Despite all the outlined commonalities of the case-study cities, certain differences and hierarchies between the cities in terms of their compared significance in the world city network have been identified. All in all, Dubai on a global level outlines the strongest connectivity to Western developed nations and underlines its current predominance on the Arabian Peninsula due to economies of scale and scope (see chapter 4.2.1 and 4.2.2). However, compared to the cities of Doha and Manama, Dubai`s largest challenge in the future will be to retain its attractiveness as a mostly expatriate-driven economy. In this context the quality of urban space plays a major role, which will be discussed in detail in the next chapter.

# 5   Urban space of case study cities on the Arabian Peninsula in the context of growing knowledge-intensive economies

Chapter 5 is used for a detailed research review of results related to the second hypothesis:

*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.*

The urban development of the respective case-study cities has been explored on different spatial scales: The overarching city scale, the city district scale and the neighborhood scale (see chapter 2.2.4). While city districts and neighborhoods display a rather high quality of urban development, all case-study cities face certain problems on an overarching city scale.

In order to analyze the above mentioned hypothesis in detail, the empirical research has been conducted in all case-study cities along the previously introduced urban space framework (see chapter 2.2.3). The research results will be discussed in detail in the following sub-chapters. The first three sub-chapters are structured along the social science dimensions of urban space: *Lived*, *perceived* and *conceived* urban space. Within the respective sub-chapters the results from the empirical research are presented. The first sub-chapter on *"Lived urban space"* contains the urban space-related results from the online survey with 213 knowledge-intensive economy firms and from 30 interviews with KIE firm managers. The second sub-chapter on *"perceived urban space"* covers the results from the photographic observation and the behavioral mapping sessions. The third sub-chapter on *"conceived urban space"* deals with the results from the graphical urban structure analysis and 15 interviews with public and private urban planning organizations on site. Each empirical approach has delivered specific pieces of insights about the different elements of urban space: Proximity and availability of urban functions, density, heterogeneity, use of public spaces, urban development over time and agents involved in urban development (see figure 38).

| | | | Dimension 1: Social science definition of urban space | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Lived urban space | | Perceived urban space | | Conceived urban space | |
| | | | Online survey with KIE managers | Interviews with KIE managers | Photographic observation | Behavioral mapping | Graphical urban structure analysis | Interviews with planners |
| Dimension 2: Natural science definition of urban space | Distance | Proximity/ availability of urban functions | X | X | X | | | |
| | | Density of - People - Buildings - Experiences | | X | X | X | | |
| | Function-ality | Heterogenity of - People - Building types - Urban functions | | X | X | X | | |
| | | Use of public spaces | | | X | X | | |
| | Process | Urban development over time | | | | | X | X |
| | | Agents involved in urban development | X | | | | | X |

Figure 38: Empirical research coverage of urban space elements as defined in chapter 2.2.3
Source: Own illustration

The results will be compared across all case-study cities in the fourth sub-chapter and conclusions with respect to the above mentioned second research hypothesis will be drawn in the fifth sub-chapter.

## 5.1 Lived urban space: The requirements of knowledge-intensive economies regarding firm location in cities and urban space

### 5.1.1 Distribution pattern of firm locations within case study cities

The online survey with 213 knowledge-intensive economy firms discloses the distribution pattern of firm locations across the case study cities. In addition, the KIE firm requirements regarding urban space can be articulate. The distribution of

firm locations across the case study cities shows that KIE firms are mainly accumulated around certain city districts.

In the case of Dubai, 70 out of 106 total survey responses (55 APS, 15 High Tech firms) voluntarily provided information about their business building location in Dubai. The survey question with regards to the business building location was consciously set as an optional question in all case-study cities, since the survey respondents should deliberately decide whether they want to disclose their identity, or not. Out of these 70 KIE firms, large firm accumulations are indicated at Dubai International Financial Center (DIFC) with 20 firms, at Internet City with 11 firms and at Media City with 10 firms (see figure 39).
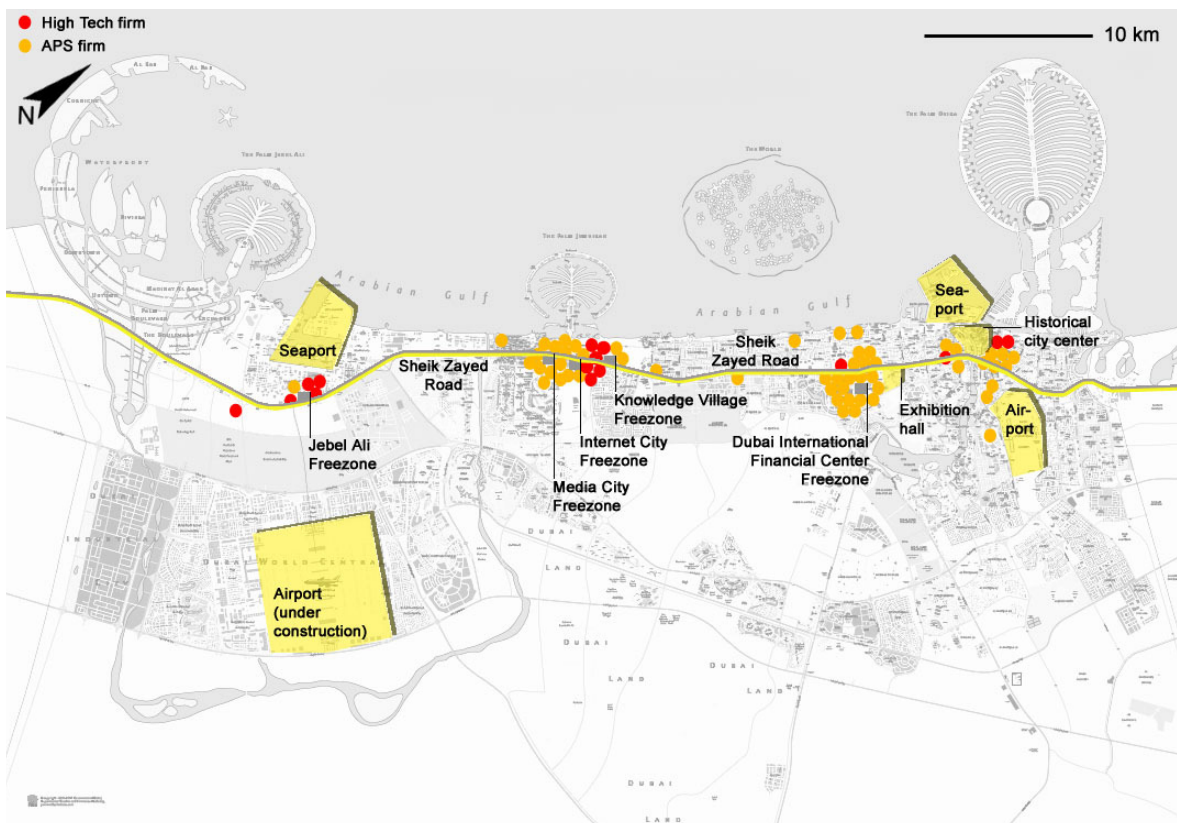


Figure 39: Map of Dubai indicating KIE business building locations.
Source: Own development

DIFC is the district with the largest accumulation of KIE firms. It is strategically located less than 10 kilometer away from the Dubai International Airport, the Port Rashid harbor and the historic city center. In addition, DIFC lies right next to the

international exhibition hall and Sheik Zayed Road, the main inner-city highway of Dubai running from the south to the north end of the city.

Compared to DIFC, Internet city and media city have the disadvantage of being located approximately 25 kilometers away from the Dubai International Airport, Port Rashid and the historic city center. However, they are closer to Jebel Ali seaport and the newly planned airport in Jebel Ali.

In Doha, 30 out of 55 survey responses (26 APS and 4 High Tech firms) provided information about their business building location. Out of these 30 KIE firms the largest firm accumulation is indicated at and around the Qatar Financial Center (QFC) in the Doha West Bay area with 10 firms (see figure 40).
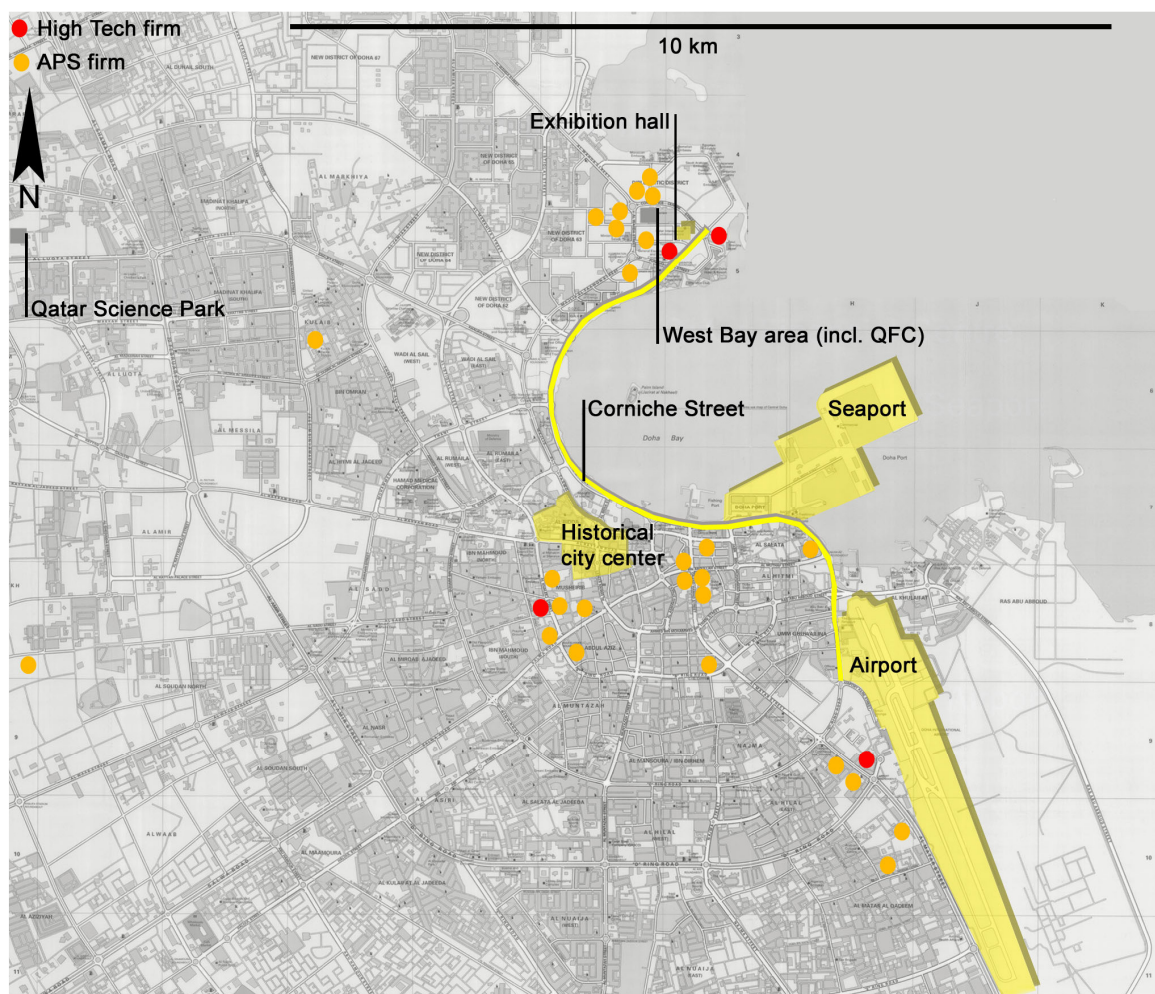


Figure 40: Map of Doha indicating KIE business building locations
Source: Own development

The West Bay area in Doha including the Qatar Financial Center is located on a languet in the northern part of Doha less than 10 kilometers away from the Qatar International Airport, the Doha Seaport and the historic city center of Doha. Furthermore, the QFC is next to the international exhibition hall in Doha and lies directly at the central ring road, the Corniche Street.

In Manama, 26 out of 52 survey responses (20 APS and 6 High Tech firms) provided information about their business building location. Out of these 26 KIE firms the largest firm accumulations are indicated at and around the Bahrain Financial Harbour (BFH) with 10 firms and in the Al Seef district with 9 firms (see figure 41).
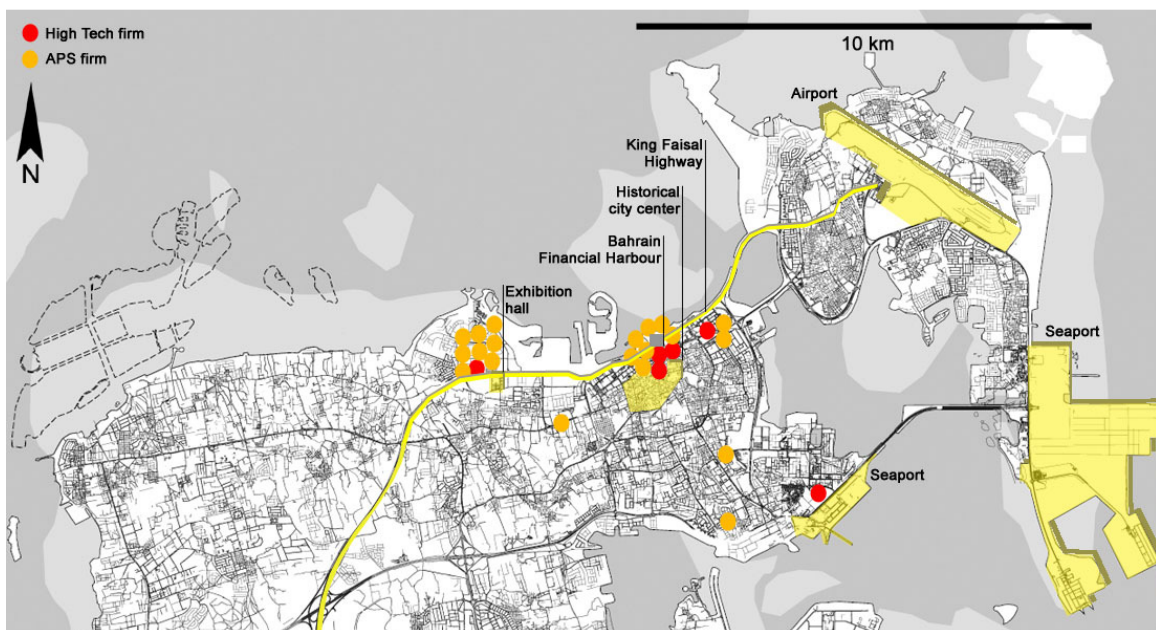


Figure 41: Map of Manama indicating KIE business building locations
Source: Own development

The Bahrain Financial Harbor is located on the Northern shore of Manama less than 10 kilometers away from the Bahrain International Airport, both Bahrain seaports and the exhibition hall. Furthermore, it is adjacent to the historic city center of Manama. The Bahrain Financial Harbor lies directly at the King Faisal Highway which in the East leads to the Bahrain International Airport and in the West to the Saudi Arabian border which is approximately 15 kilometers away.

Compared to the BFH, the Al Seef district is located further away from the Bahrain International Airport, the Bahrain seaports and the historic city center.

In summary, all case-study cities have established city districts with a high accumulation of knowledge-intensive economy firms. The highest accumulations of KIE firms are situated at the Dubai International Financial Center (DIFC), at the Doha West Bay area around the Qatar Financial Center (QFC) and at the Bahrain Financial Harbor (BFH). Thus, these city districts are selected for a deep-dive analysis of their urban development (see figure 42).



Figure 42: Ground plan of city districts in Dubai, Doha and Manama with the highest KIE accumulation
Source: Own illustration

All of the selected city districts are specifically designed to attract firms of certain knowledge economy sectors to Dubai, Doha and Manama. For KIE firms the advantages of being located in these zones are, for example, high facility and maintenance qualities, exemptions from corporate taxes and administrative support for foreign companies. Thus, the ease of market entry which is one major criterion for selecting the cities of Dubai, Doha and Manama as a company location, is increased in these city districts through access and visa support for foreign companies. In addition, all of the districts are strategically located within the overarching city structure: International airports, seaports and exhibition halls are less than 10 kilometers away in each of the case examples. Furthermore, the districts are all situated very close to the historic city centers.

The construction of all selected city districts has started only a few years ago: The West Bay area in Doha was launched in 2000, the DIFC in Dubai in 2002 and the BFH in Manama in 2003. Constructions are in all cases still ongoing. However, large parts of the planned urban development have already been finalized. Comparing the scale of the city districts (see figure 42) we can observe differences. While the Dubai International Financial center as well as the Bahrain Financial harbor both cover a base area of approximately one square kilometer, the West Bay area in Doha nearly comes up to two square kilometers.

The Dubai International Financial Center (DIFC), the Qatar Financial Center (QFC) inside the West Bay area and the Bahrain Financial Harbor (BFH) are internationally visible developments through brand marketing. All developments have established their own corporate identity including brand name, web-page and logo.

Through an early distribution of high-end three-dimensional images of the developments even before their completion, the developments have gained international recognition from early on (see figure 43). DIFC, QFC and BFH as examples illustrate the circumstance, that no longer only the characteristics of the overarching city are relevant for the location selection of knowledge economy companies. In fact, also the attractiveness of selected city spaces which specifically answer the needs of KIE firms influence the location selection of globally operating KIE firms.

Figure 43: Images and logos of DIFC, BFH and QFC
Source: Internet

This underlines the interdependence of non-physical, functional networks and morphological, urban development (see figure 44): The rapidly gained global significance of our case study cities within non-physical, functional knowledge economy networks has enhanced the development of city districts and spaces with a high accumulation of KIE firms and international reputation, like DIFC, QFC, and BFH. These highly prestigious urban developments – dedicated to knowledge-intensive economies – enlarge the attractiveness of emerging cities on the Arabian Peninsula for knowledge economy firms.

Another interdependence of non-physical, functional networks and morphological, urban space results from the global and regional competition for high-skilled labor. KIE locations are dependent on KIE knowledge workers. The quality of morphological, urban space is a highly influential criterion for KIE workers, when selecting a city for living. In addition, the flexibility of KIE workers in terms of moving from one city to another nowadays is quite high. Cities have to fulfill the requirements of KIE workers and their families, to ensure sustainable supply of a qualified work force. As articulated in our interviews, especially in nowadays times

of a global economic crisis, the distinguishing factor of well-established and performing urban spaces is expected to become more and more important for cities.
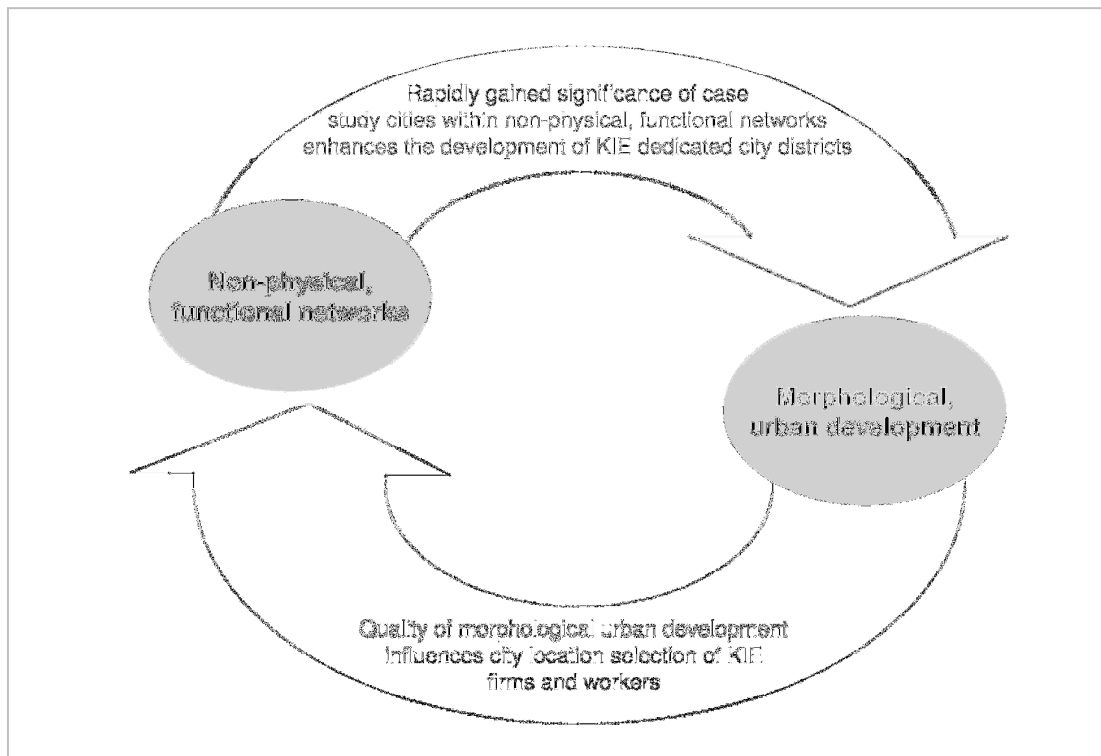


Figure 44: Interdependence of non-physical, functional networks and morphological, urban development
Source: Own development

An interview partner from the governmental planning authorities in Manama outlines:

*"The financial crisis unfortunately will slow <urban development> down. It will not stop it, of course. But definitely I will slow this down […]. In the course of the financial crisis urban qualities even become more important, because the competition will become very hard. So we have to be one step ahead."*

The following chapters will elaborate on the satisfaction degree of KIE managers and their families with urban space – on the one hand at and around their firm locations in our case-study cities and on the other hand in the overarching cities of Dubai, Doha and Manama.

## 5.1.2  KIE satisfaction with urban space at and around firm location

Results from our empirical research with KIE managers disclose quite a high satisfaction with the outline of urban spaces on a city district scale at and around their business location. The results of the online survey and the interviews with KIE managers can be structured along our pre-defined urban space framework (see chapter 2.2.3). Thus, we elaborate on KIE requirements with regards to the elements of "distance", "functionality" and "process" of urban space.

### *Distance*

In the online survey of the present research project 213 KIE managers have articulated their opinion regarding the required proximity of their business building location to certain urban functions. In subsequent interviews with 30 KIE managers the results have been verified. In addition, the KIE requirements regarding density of people, buildings and experiences at and around the business building have been discussed.

To assess the proximity and availability of KIE relevant urban functions it was necessary to define the different urban functions with potential relevance for knowledge intensive economies first. All pre-defined urban functions were structured along the following four categories of urban facilities:

- Logistics and infrastructure
- Living and health care
- Leisure and recreation
- Working and education

An overview of the urban functions within the respective categories with potential relevance for KIE is outlined in table 7.

| Logistics and infrastructure | Living and health care | Leisure and recreation | Working and education |
|---|---|---|---|
| • Historical center of the city | • Doctor`s practices | • Restaurants / bars | • Companies of non-KIE sectors |
| • Car parking facilities | • Hospitals | • Outdoor culture / leisure facilities (e.g., park, beach) | • High Tech companies |
| • Important road network inter-sections / streets | • Hotels / hostels | • Indoor culture / leisure facilities (e.g., museum) | • APS companies |
| • Important train / bus stations | • Housing – One family houses | • Shopping facilities | • Schools |
| • International airport | • Housing – Apartments | • Other | • Exhibition and convention center |
| • International seaport | • Other | • | • Research and higher education facilities |
| • Other | • | | • Other |

Table 7: Overview of urban functions within respective categories of urban space facilities
Source: Own illustration

The closeness of the business building location to certain urban functions which are KIE-related or frequently used by businesses plays a role (see figure 45). Especially the distance to urban functions related to certain logistics, living and working facilities listed in the following has a relevance higher than average:

- Hotels / hostels

- Other KIE companies (High Tech and APS)

- Housing (one family houses and apartments)

- Important road network intersections / streets

- International airport

- Car parking facilities

With the exception of car parking facilities (see elaboration further below in the same chapter), the distance to all of these urban functions within the city districts is described as very satisfactory. In particular, KIE managers articulate in interviews that they in general appreciate the closeness to other KIE firms in KIE dedicated city districts: In this way companies can ensure the exchange of knowledge with similar firms and customers looking for certain businesses are easily served by KIE designated city districts. The following quotes from interviews with KIE managers underline this:

**0%:** No respondent rates proximity to the facility as "important" or "very important"
**100%:** All respondents rate proximity to the facility as "important" or "very important"
More than 45% of respondents rate proximity to facility with "important" or "very important"

| Logistical and infra-structural facilities | | |
| --- | --- | --- |
| Historical center of the city | | |
| Car parking facilities | | |
| Important road network intersections / streets | | |
| Important train / bus stations | | |
| International airport | | |
| International seaport | 43% | |

| Living and health care facilities | | |
| --- | --- | --- |
| Doctor´s practices | | |
| Hospitals | | |
| Hotels / hostels | | |
| Housing – One family houses | | |
| Housing - Apartments | 48% | |

| Leisure and re-creation facilities | | |
| --- | --- | --- |
| Restaurants / bars | | |
| Outdoor culture / leisure facilities | | |
| Indoor culture / leisure facilities, excl. shopping | | |
| Shopping facilities | 33% | |

| Working and education facilities | | |
| --- | --- | --- |
| Companies of non-KIE sectors | | |
| High Tech companies | | |
| APS companies | | |
| Schools | | |
| Exhibition and convention center | | |
| Research and higher education facilities | 40% | |

Figure 45: Relevance of proximity to specific urban functions from a KIE perspective.
Orange colored: Urban functions with a proximity relevance higher than average
(more than 45% of respondents rate proximity to facility with "important" or "very important")
Source: KIE online survey, own illustration

- *"It is easy for a corporate to have meetings with various banks and banks amongst themselves can have meetings without really being bothered about transportation or anything. You can just walk by and have a meeting."* (Manager of a bank in Doha)

- *"This is where people usually come <if they are> looking for banks. So it was a very conscious decision to move <here>. [...] Because we were new to the market we needed to be visible. And to be visible we needed to go to an area where usually people notice that a newcomer has been established."* (Manager of a bank in Doha)

- *"Being there where big players, smaller players and medium-range players are is nice, because whoever comes in for the service will have to discuss with one of these players. So there is always a chance to get clients."* (Manager of a media firm in Dubai)

Distance matters less for rarely used urban functions (e.g., exhibition and convention center). In addition, from a corporate perspective, the close availability of leisure and recreation facilities has a lower relevance. However, for enjoying a city in private life these criteria are highly important. A lack of leisure and recreation facilities has been articulated from an overarching city perspective (see following chapter 5.1.3 on "KIE satisfaction with overarching urban development").

In general, the time and quality of going from the business building to another facility in the city is seen as being more important than the distance. The manager of an IT consulting company refers to that point in the following way:

*"You may have 20 kilometers in no-traffic, so you are just driving 10 minutes. But if you have 10 kilometers all in traffic, it is a nightmare. So it is not really the distance, it is the quality of driving <that matters>. I would not mind driving a lot of kilometers, if it is just fast driving."*

Thus, a comprehensive public transportation system and fast track roads are specified as major requirements for the future (see also following chapter 5.1.3).

The overarching picture of required urban functions in close distance slightly changes if we look at the survey answers of managers from High Tech companies and APS companies separately: For High Tech companies the distance to the seaport is much more relevant than for APS companies. This certainly has to do with the necessity of shipping production goods in the case of a High Tech firm value chain. Furthermore, High Tech firms articulate a clearly lower importance of

the close availability of car parking facilities than APS firms. Thus, the overarching stressed requirement of close car parking facilities needs to be carefully interpreted - especially against the background of the fact that non of our case-study cities currently has a comprehensive public transportation system in place. An explanation for the high relevance of close car parking facilities from an APS perspective might be that APS companies require to be located in rather dense, central locations. As a consequence, APS firms in the case-study cities often face the time-consuming problem of searching for places to park. Especially customer-oriented service sectors regard urban density as highly relevant (e.g., banks). These sectors, in particular, articulated the advantage of a high building and people density for enlarging their customer base on a small area. The following quote of a banking manager in Doha underlines this:

*"If I want to open a branch […] where I need to interact with people and people find me close by, density is important. To me, being within a towers area is more economically feasible than going to an area where only villas are. There I need to cover a larger area to get customers. But in the towers, I have much more population in a limited area compared to the open villas area, for example. It will be easier for us to attract customers. So density is important for us in that respect."*

Thus, the relatively high density of buildings and people in the observed KIE dedicated city districts is seen as an advantage by KIE managers. It also creates many opportunities for knowledge exchange and a faster access to all urban functions by foot. Furthermore, the density of experiences triggered by an available mix of urban function in close distance is perceived to be very satisfying (see also next section on "functionality").

### *Functionality*

This section will cover the KIE managers perspective on the heterogeneity degree of people, building types and urban functions within the selected city districts as well as the use of public spaces.

With regards to the heterogeneity of people, no specific requirements have been articulated by KIE managers neither in the online-survey nor in the interviews. Nevertheless, it needs to be said that the knowledge economy dedicated urban developments are mainly used by a class which is heterogeneous in terms of its international and cultural background, but which is homogenous in terms of its high skill-level. The "dual-city" phenomenon is apparent, presenting a segregated, split society formed by the *"growth of high- and low-wage jobs, along with the destruction of a much larger number of middle-range skilled jobs held by workers in production and commerce"* (Sassen, 2002: 321). In addition, the rapid urban development on the Arabian Peninsula leads to the fact that buildings within one city district are all newly designed and do not vary in age and condition. Thus, they also do not vary in the economic yield they produce and consequentially do not foster the mix of different social income groups. Therefore, the society split described by Sassen goes along with the side-by-side development of urban districts with a specific focus on certain segregated parts of the society in terms of skill-level. We will also elaborate on that point when it comes to the description of the perceived urban space further below (see chapter 5.2).

In terms of the heterogeneity degree of building types, the requirements of KIE firms are well answered within the selected city districts. Vertical building structures creating the above mentioned, required density factors are combined with horizontal building structures which support the exchange of knowledge between businesses. However, the manager of a high tech business in Manama pointed out, that horizontal structures could be even extended, to fully grasp the opportunity for knowledge exchange:

*"We need more horizontal growth. This would give more scope for communities to mingle with each other. A lot of business prospects would happen."*

Out of our selected city districts, DIFC is the best case-example for an exemplary combination of horizontal and vertical building structures. QFC and BFH are rather based on vertical building structures. However, BFH closely borders on the historically grown center of Manama, which hosts very vivid, rather horizontally experienced urban spaces.

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In addition, especially customer-oriented service sectors regard specific building types as highly relevant (e.g., banks). These sectors, in particular, articulate the advantage of stand-alone buildings for creating proper customer attention.

Besides the heterogeneity of building types, the heterogeneity of urban functions in walking distance around the business location has a high relevance for KIE firms. KIE dedicated city districts are generally fulfilling this requirement. Especially DIFC with its shadowy, outdoor shop and restaurant walk-ways is a very good case example of a successful and comprehensive functional mixture in a KIE dedicated city district. When managers of KIE firms at and around our city districts in Dubai, Doha and Manaman are asked to judge on the importance of heterogeneity of urban functions around their business locations, they say:

- *"<Heterogeneity of urban functions> is very important. It is saving my time […]. Everything is here. Even a grocery shop and a laundry."* (Manager of an investment company in Dubai)

- *"You have your business here, you also have related service firms like banks and insurance companies […], you have restaurants here, you have a shopping center where you can also do other things […]. Doctor´s practices are also here. Everything is close. And there even is living spaces here […]. Everything is mixed. And I believe this is a good thing."* (Manager of an insurance company in Manama)

While heterogeneity of building types and urban functions is articulated as an important factor, KIE managers do not emphasize any critical requirements with regards to the availability and quality of public spaces at and around the business location. However, as outlined above, it is important for KIE firms to have certain spatial facilities preferably with a horizontal structure which fit the purpose of exchange and common meeting ground. The available open public spaces used by KIE firm managers and employees fulfill this purpose on site at and around the selected city districts to a certain degree (see chapter 5.2). While KIE managers and employees see these open, public spaces rather as spaces facilitating the exchange of knowledge, the leisure and recreation aspect of public spaces from a

business perspective is rather rated as being irrelevant (see previously described required distance to leisure and recreation facilities in the same chapter).

## *Process*

With around 70%, the majority of the 213 companies, which have participated in the online survey of the present research project, have not been involved in the architectural and urban planning process at and around their business location (see figure 46). This number slightly defers between the respective case-study cities. Thus, with 75% Dubai has the highest rate of KIE firms not involved in planning, followed by Manama with a rate of 67% and Doha with a rate of 55%. Even though the satisfaction degree with urban development on a city district scale is rated rather high, these KIE firms in all case study cities articulate that they would have liked to be more involved in urban planning processes at and around the business building (see figure 46).
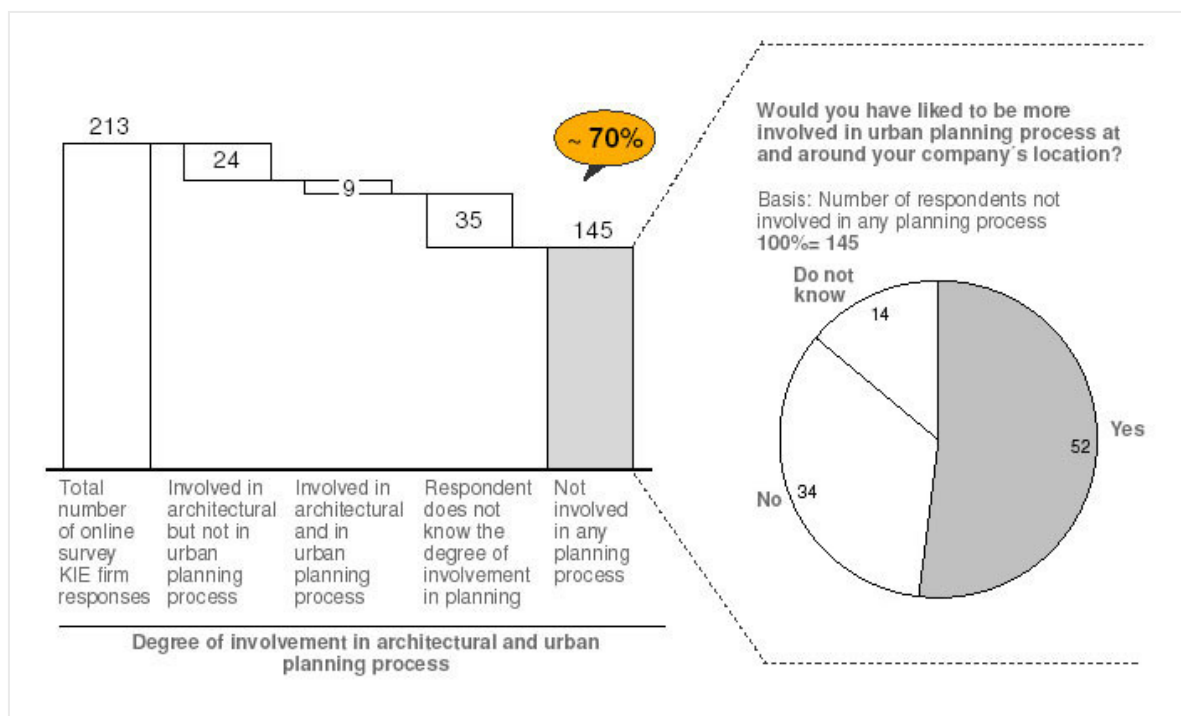


Figure 46: Share of KIE firm managers willing to participate in urban planning process
Source: KIE online survey, own illustration

Potential ways of involvement, as described in interviews with KIE firm managers, could, for example, be surveys released by the planning organizations or bilateral

talks. These means could help to capture the requirements of knowledge-intensive economies more explicitly which would be an improvement to the rather implicit reflections of KIE demands.

### 5.1.3 KIE satisfaction with overarching urban development

Besides the mainly positive perception of KIE dedicated city districts, KIE managers also articulate certain negative aspects about urban space, especially on an overarching case study city scale. These disadvantages will be discussed below, along the elements of urban space.

*Distance*

On an overarching city scale, KIE firms miss the availability and quality of certain urban functions. This is readable from the answers in the online survey, where KIE firm managers were asked to express urban qualities and amenities they would wish to have in the city of their company location. From clustering the answers along our above mentioned urban function categories, one gets to the result that deficits are mainly perceived in the fields of logistics and infrastructure as well as leisure and recreation (see figure 47).

The largest improvement area is seen in the category "logistics and infrastructure". Today all case-study cities face extensive car traffic congestion. None of the cities has a comprehensive public transportation system in place. Doha and Manama are still in the planning phase for a public transportation train system. Dubai has nearly finalized the construction of the first part of a new metro monorail system. However, the stations are rather far apart. This means that the main part of the population cannot reach the stations by foot. This is seen to be a major handicap for the future use of the metro system. In addition, connecting emerging cities physically along the Gulf coast through a high-speed train could compensate the transportation demand resulting from the functional connectivity of the cities. This ongoing requirement is discussed, but so far the idea has not been implemented.

**Selection of answer quotes**   (X) Percentage of answers in respective field from total answers

**Survey question:**
What are the urban qualities and amenities, you would wish to have in the city of your company location? (multiple answers possible)

**Logistics and Infrastructure*** — 32%
- "Good public transport"
- "Train services between cities like Dubai and Abu Dhabi"
- "Good connections"
- "Less traffic"

**Leisure and recreation** — 28%
- "More cultural facilities like museums"
- "Green public parks"
- "Art galleries, café calture, exhibitions"

**Living and health care** — 8%
- "Apartment buildings closer and affordable"
- "Health club"
- "Reasonably priced accomodation"

**Working and education** — 8%
- "More affordable office space"
- "Related services required for the day to day business such as printing facilities, stationary suppliers, etc."
- "A high profile business centre"

**Overarching urban space** — 6%
- "Mixed use office, retail, housing, leisure – the mix of all these that enhance life"
- "Pedestrian friendly streets"
- "Accessable and landscaped surrounding"

**Other** — 18%
- "Green clean environment"
- "Safety"
- "Social stability and growth"
- "Human oriented labor policies"

Figure 47: Logistics and leisure facilities as major improvement areas from a KIE perspective
Source: Online survey with 213 KIE firms located in Dubai, Doha and Manama; own illustration

While leisure and recreation functions do not play a major role from a business perspective on a city district scale (see previous chapter 5.1.2), the picture is different from a personal perspective on an overarching city scale. Providing urban functions for leisure and recreation obviously is key for private satisfaction with the quality of cities. The lack of leisure and recreation facilities is said to be one major reason for expatriate KIE workers to limit their stay in the case study cities to a certain timeframe. The German manager of an insurance company who currently lives with his familiy in Dubai articulates:

*"By no means <we will stay> for longer than five years. Because this is an expat-driven community. And the quality of living is restricted to very few things […]. Things which we know from our home country – to have different leisure opportunities - are to a large degree limited here"*

As a consequence, emerging cities run the danger of a shortage of competent, skilled labor. The articulated leisure and recreation deficits are certainly surprising

since all case-study cities own a large beach front. However, especially in the case of Dubai and Manama, these beaches and seafronts are mostly privatized or not accessible for the public. Doha`s untilled public seafront in the center of the city in this case illustrates a positive exception.

Given the fact that all of our case-study cities are urban developments in the desert, one might want to expect a dense urban structure of the overarching city which helps to safe energy costs by naturally shading and cooling down buildings. Nonetheless, the urban structure of the case-study cities – especially of Dubai – is characterized by urban sprawl, since especially one-family housing plots and gated communities drive the development of less dense urban structures at the city outskirts. *"The high mobility of our society constitutes one of the central driving forces in the design of urban spaces, and since the last century the commuting from job location to the place of residence has formed the development of cities like no other phenomenon"*, as Marco Salvi writes (Salvi, 2007: 155). The described phenomenon is also applicable to our case-study cities. The demographical situation with an above average amount of young families with children in all emerging cities on the Arabian Peninsula fosters the suburban developments. In addition, the low fuel costs in the region do not necessarily lower the use of cars as the main mean of transportation. Thus, especially in Dubai, the linear spread building structure in parallel to the approximately 70 kilometer long coastline leads to large traffic jams during rush hours. As mentioned above, the currently built metro system in Dubai will probably only partly solve the problem, since the metro system is incomprehensive and not serving all parts of the city.

***Functionality***

In addition to the above described deficits, a partly propagated function separating zoning approach in the case study cities leads to the bundling of certain urban functions in specific city districts. Especially in Dubai, the existence of a function separating structural plan has had a highly negative impact on todays overarching urban development (e.g., Dubai structure plan, 2003). KIE managers perceive this fact as a major urban disadvantage:

*"Does it make sense to have a "Sports City" and a "Biotech City" and a "Health Care City"? No, I really don´t think, it does. I don´t think, it helps. I don´t think, that is a productive way to plan a city. Because, if I want to go to the hospital, I have to go to the Health Care district and that might be at the other side of the town for me. Now they are trying to group all the schools in one place. So every morning you got 10.000 parents trying to go into one place to drop their kids of and then come out again. This just does not make a lot of sense to me. And they do not have the infrastructure, they do not have roads, they do not have buses, they do not have trains, to cope with that kind of a flow."*

While you also have single, rather mono-functional urban developments in Doha (e.g., Education City) and Manama (e.g., Sitra Technology Park) as well, the case-study city with most mono-functional developments is Dubai.

In addition, the traffic flow in Dubai is worse given the huge suburban living areas due to recently high real estate prices in the central districts of Dubai. Living areas for employees of Dubai even extend into the neighboring emirate of Sharjah. Lots of people working in Dubai prefer to live in Sharjah where the living costs are a lot lower than in Dubai. Thus the commuting traffic is significant:

*"You have the problems of micro-workers going from Sharjah to Jebel Ali every morning which creates a massive traffic jam through the city and roads in Sharjah and Deira and Bur Dubai are completely blocked, because you got all these workers living in Sharjah where the accommodation costs are much lower trying to get through Dubai down towards all the constructions in the Marina and the businesses in Jebel Ali. It just causes massive problems. There is no public transportation to get them there."*

Slowly, the mentioned negative impacts of the originally propagated function separating zoning approach have lead to a rethinking in the planning of emerging cities (see following chapter 5.3).

***Process***

A major urban disadvantage of all case study cities has been recognized in the configuration of single city districts to the overarching cities. The mentioned function separating zoning approaches, the bundling of affordable housing at the city outskirts, and a lack of public infrastructure in all case study cities are reasons named for high traffic congestion. This is influencing the quality of living and the attractiveness of emerging cities for knowledge workers. In general, time and quality of commuting is rated to be more important than distance (even though distance still matters for urban functions which are used on a daily basis during business life e.g., restaurants, living location). KIE managers at the moment see a large issue in time-consuming traffic.

In addition, KIE managers in emerging cities miss the historic pattern and urbanism resulting from the overlap and mix of different people, building types and urban functions forming heterogeneous urban spaces over a longer period of time. New urban spaces with buildings all planned and built at the same time for a specific pre-defined set of urban functions obviously do not leave enough room for a multitude interpretation of space by its users. Overlapping historic urban traces would help but do not exist since the cities started to develop only a few years ago. The fast, mainly formally planned growth only rarely allows informal interpretation. In this context, a knowledge economy interview partner from Manama expresses himself in the following way:

*"None of the city parts here are naturally grown. They are all plunked down in a relatively short time frame. […] Somehow this is a retort. That does not match with my personal expectations of living."*

It becomes clear that the process of urban development has a large impact on the final perception of urban space by its users. This also will be part of further investigation in a later chapter, which summarizes our experiences from interviews with planners (see chapter 5.3).

## 5.2 Perceived urban space: Actual outline of urban space in KIE dense city districts on site

The last chapter investigated the requirements and satisfaction degree of knowledge economy firm managers with regards to urban space on a city district and an overarching city scale. In general, the results of the underlying empirical analysis show that KIE managers see the largest improvement potential on an overarching city scale, in particular with regards to the integration of the separate city districts. However, on a city district scale at and around the business buildings, the satisfaction degree with the offered spatial qualities is quite high.

In the present chapter, we will analyze these spatial qualities within the city districts a little closer. The objective is to understand what exactly triggers the satisfaction of KIE managers with urban space qualities on a city district scale, and whether the outlined qualities described by KIE managers can be objectively confirmed from an outside-in perspective. In order to elaborate on these points, we will deep-dive into the knowledge economy dedicated urban developments and select one specific open, public space on a neighborhood scale within each case-study city district for closer observation.

Thus, the results from photographic observation and behavioral mapping will especially describe the "use of public spaces" as one characteristic element of urban space (for theoretical background on the different mentioned elements of urban space see chapter 2.2.3).

### 5.2.1 Three city districts and respective public spaces for on site observation

Based on the above described analysis of KIE distribution within our case-study cities, the city districts with the largest accumulation of KIE firms are selected for a closer observation of their public spaces. The results of the systematic observation at DIFC in Dubai, at West Bay area in Doha and at BFH area in Manama will be described in the following chapters. Within the respective city districts, open public spaces are selected for closer observation. The selection of the observation areas is based on several criteria:

**First**, it has been the intention of the author to pick open spaces which are freely accessible for the public. **Second**, the selected public spaces should capture an average flavor of the respective city districts with respect to the available urban functions, the density of people, buildings and experiences and the heterogeneity of people, buildings and urban functions. **Third**, special characteristics of the respective city district should be observable in the selected public spaces (e.g., the walk-able urbanism idea in Dubai International Financial Center). **Fourth**, the selected public spaces should be frequently used by KIE employees as points of exchange outside their closed business buildings. **Fifth** and finally, the selected space should cover an area of approximately 50 square meters in width, in order to be able to compare the results in the end across the three case-study districts

In each city district several potential open public spaces for closer observation were tested in a series of photographs before the finally adequate location for the photographic observation and the behavioral mapping sessions was selected. Exemplarily, figure 48 shows the pictures taken at DIFC in Dubai right before the final selection of an adequate public space and viewing angle for the detailed observation.



Figure 48: Set of photographs at DIFC Dubai for selection of public space for closer observation in respective city district
Source: Own photography

Based on the set of pictures, the scene best fitting the above mentioned selection criteria was selected. The selection process was also based on hints of employees from KIE companies situated in the respective knowledge economy dedicated city districts, in order to allocate the respective public space with a high relevance for knowledge economy workers. These hints usually contained explicit descriptions of favorite outdoor location used e g., during lunchtime or for outdoor chats with colleagues.

The three selected open, public spaces in the respective case-study cities all have approximately the same size (50 square meters), and thus the same level of observable details. Given the relatively limited spatial size, this area can be easily observed by a single person. The photographic observation and behavioral mapping on the selected research sites were all taken from one and the same observation place and perspective on two days: A usual working day during the week and a weekend day. Seven times a day the open public spaces introduced in figure 49 have been observed over a ten minutes time period:

- 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 selected public spaces are all adjacent to a mixed-use environment. In the case of Dubai, the space is located in the center of DIFC. Outdoor restaurants and shopping facilities along shaded walkways are characteristic for the observed area. The immediate surrounding buildings at the location are 7-8 storey high and mainly used by knowledge economy businesses. The Emirates Towers in visible distance are around 55 floors high, mixed use high rises. The observation area is free of any car traffic, since DIFC was consciously designed as a city district with no car usage inside. All functions within the district are in walkable distance.
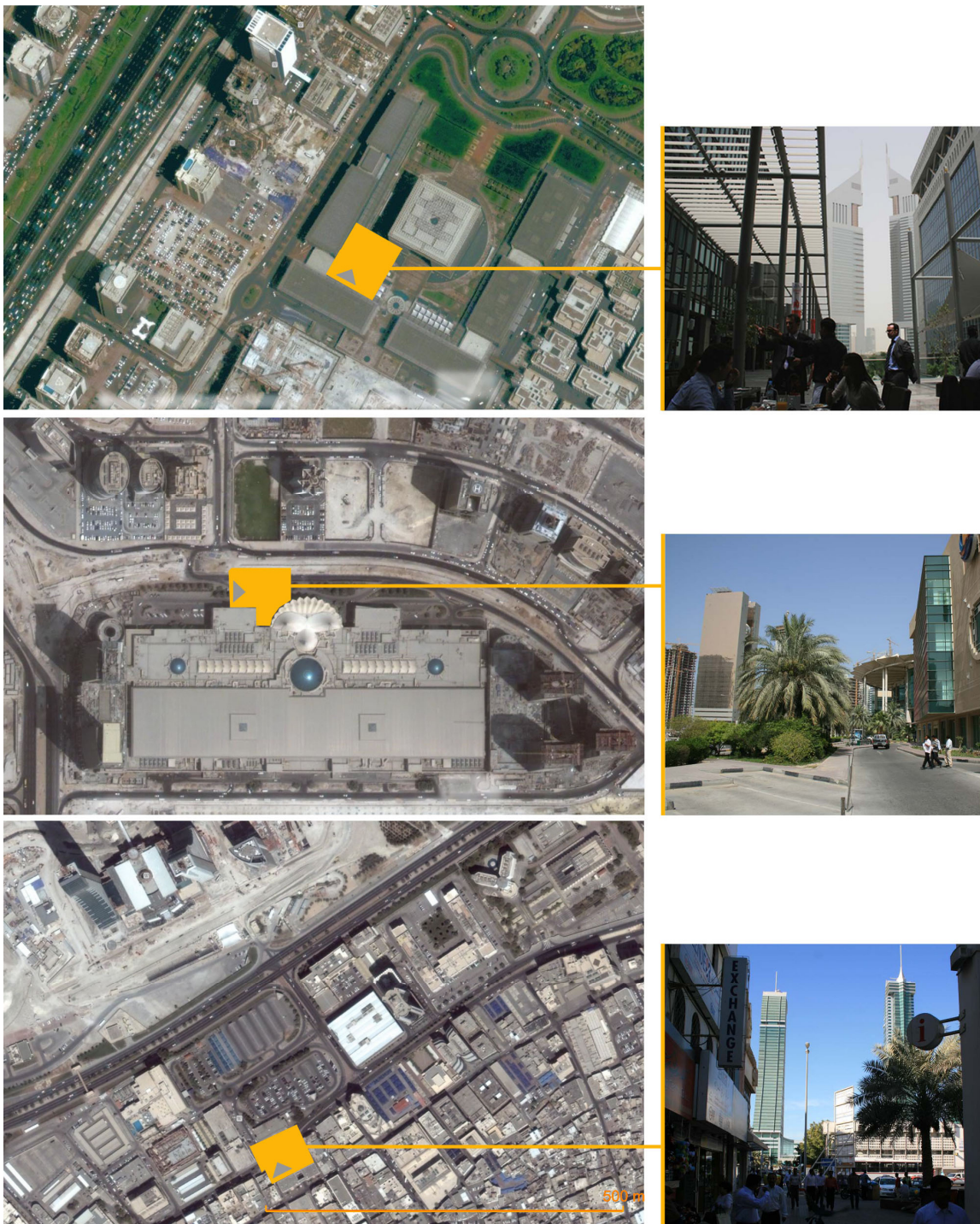
Figure 49: Observed open public spaces at (from top to bottom): DIFC Dubai, West Bay area Doha and BFH Manama
Source: Own illustration and pictures

In the case of Doha, the selected public space is located in the center of the West Bay area in between Qatar Financial Center and the "City Center", which is an inner city shopping mall. In contrast to the DIFC district in Dubai, the West Bay

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area in Doha does not have restaurants and shopping facilities immediately adjacent to open public spaces. This is seen as a disadvantage since open public spaces are less heterogeneously used. In addition, there is no car-restricted zones within West Bay area. While the "Doha City Center" is a four storey high building, all other surrounding buildings at the observed space in West Bay area are rather multi-storey buildings and high rises.

In the case of Manama, the selected public space is located at the edge of the newly developed Bahrain Financial Harbor. Since the BFH development is not finalized yet, the observation of a rather central urban space within the development would not have been useful due to ongoing constructions and limited usability for knowledge economy employees. Thus the selected public space for observation is located on a square in between the newly built Bahrain Financial Harbor towers and the traditional commercial area at "Bab al Bahrain". The selected area is mainly surrounded by up to around ten storey high buildings, besides the BFH towers which both have 53 floors. Shopping facilities and restaurants are directly adjacent to the observed area. Cars are allowed to pass through the observed area.

The observation of the briefly described, observed public spaces has the advantage of capturing objectively the ongoing interactions between people and the usage of urban functions. The degree of heterogeneity of used urban functions in daily life can be perceived and described.

### 5.2.2  Photographic observation of KIE dense city districts

Photographic observation took place in the above described sequencing with a digital reflex camera without any flash use. The shoot pictures are not edited for publication, in order to keep the light and the color according to the reality of the pictured atmosphere. In general, the findings from photographic observation in the above described open, public spaces of the city districts DIFC in Dubai, West Bay area in Doha and BFH in Manama underline the articulated satisfaction of KIE managers with the KIE dedicated city districts.

Picture 50: Photographic observation at DIFC Dubai, West Bay area Doha and BFH in Manama on a workday
Source: Own illustration and pictures

A set of different available urban functions is reachable within walking distance from the observation points at DIFC, West Bay area and BFH. Besides offices and apartments, the functions include restaurants and coffee shops, hotels, shopping

facilities like bookstores and grocery stores and service facilities like laundries and pharmacies.

In the case of DIFC a large part of the facilities is scattered along an outdoor walkway, which is shaded through a large roof construction. In the West Bay area of Doha, the described service and shopping facilities are mainly centralized in the "city center" mall, while the office and apartment facilities are located in solitaire high rises around the mall. In the case of Manama the Bahrain Financial Harbor towers host a new shopping and restaurant area on the lower floors. Besides that, the observed, public space at BFH is surrounded by a variety of buildings which host publically accessibly urban functions with shopping, hospitality and service functions on the ground floors. Thus, in all cases a high mix of urban functions is available in walking distance.

Figure 50 displays the photographic observation of public spaces in Dubai, Doha and Manama at four out of seven observed times of the day: At noon, afternoon, late evening and early morning. The overview shows that the people density in the observed urban spaces differs around the clock. However, the spaces were never observed empty during the ten minutes observation periods around the clock. This adds value to the experience of the public spaces, since it enlivens the spaces and creates a high safety factor.

With regards to the observable people densities, photographic observation displays no major differences between workday and weekday observations in the case of Doha and Manama. However, in Dubai the observed public spaces are a lot emptier during weekends than on weekdays. This is especially observable at noon and in evenings, when restaurants and coffee shops on the DIFC walkway are crowded during the week, but nearly empty on weekends (see figure 51). Thus, the DIFC district is seen to be rather dominated by business people operating mainly on weekdays. For detailed numbers of people densities in DIFC see also the following chapter on behavioral mapping which underline these facts.

Furthermore, photographic observation illustrates a broad set of activities practiced by people within the monitored public spaces. Especially in the case of DIFC in

Dubai the observed public space displays a large set of activities which people are involved in outdoors around the clock.
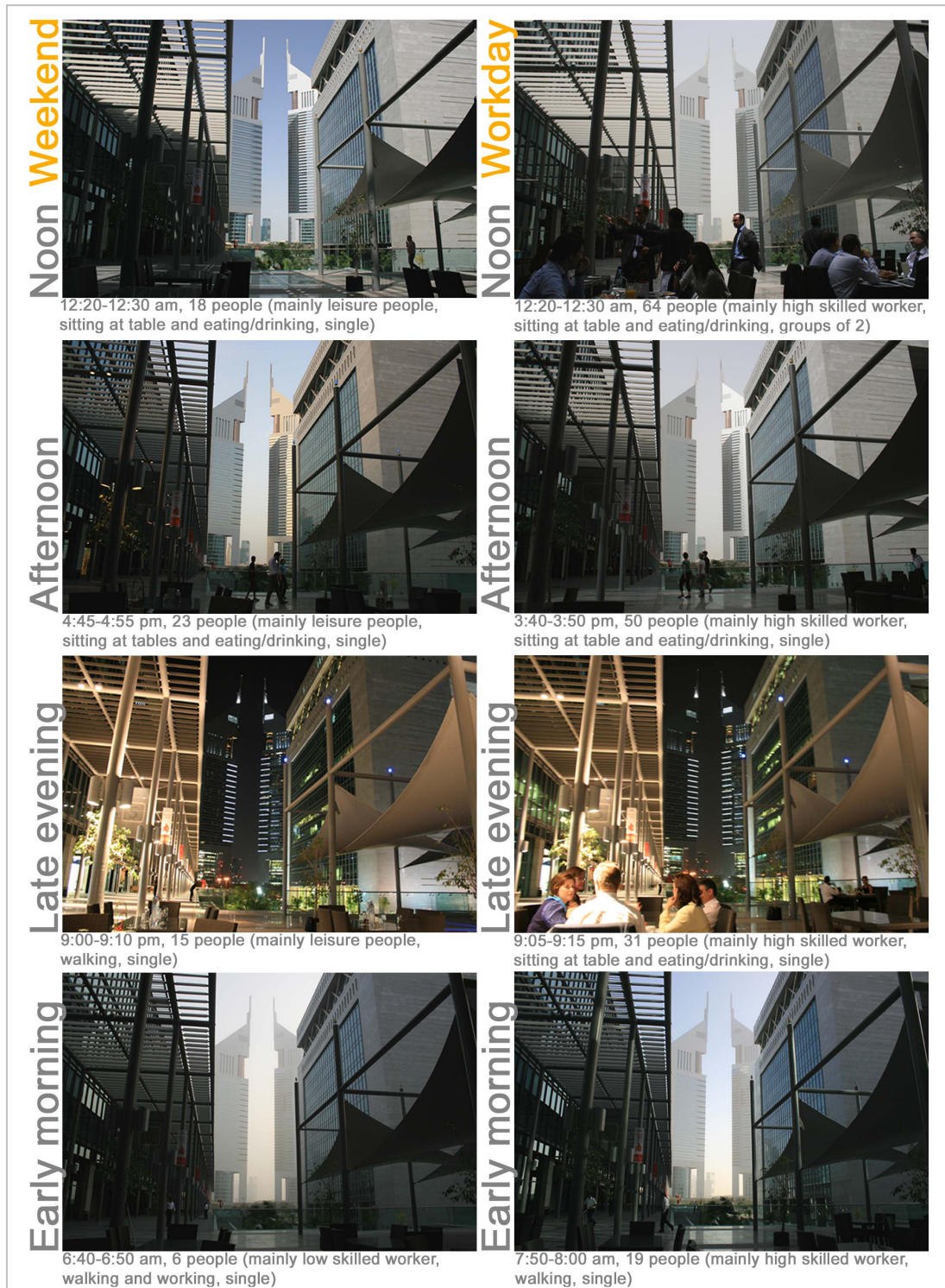


Figure 51: Photographic observation at DIFC in Dubai on the weekend of 18th/19th of April 2008 and on the weekdays of 21st /22nd of April 2008
Source: Own photography

On the contrary, especially the pictures of West Bay area in Doha are rather dominated by people walking by or heading towards one of the neighboring buildings. It can be only rarely perceived that people stay in the open, public location for a longer period of time and actively use specific urban facilities. This certainly has to do with the fact that the surrounding buildings in the West Bay area are rather inwards oriented. Especially the city center mall accumulates a lot of vivid, urban functions in one huge, interior complex. Thus, only rarely any urban functions relevant for KIE (besides the offices and apartments) are scattered along the outdoor movement ways of people in the district. Therefore, a connection between the buildings of West Bay area in form of a public zone in the ground floors is still missing.

One might refer to the climatic conditions on the Arabian Peninsula as a limiting factor for outdoor-oriented, public urban functions. However, the case example of DIFC in Dubai shows, that with the respective density degree of buildings and shading constructions one can easily create outdoor spaces, which are publicly used for resting and communication. In addition, the idea of open, dense and shaded walkways are very near the historical exposure to urban development of publicly used outdoor spaces (Bianca, 2000: 148; Ben-Hamouche, 2008: 196).

### 5.2.3  Behavioral mapping in KIE dense city districts

Behavioral mapping at the respective public spaces in Dubai, Doha and Manama discloses several insights on people densities, applied activities and interactions between people on site. Seven times a day the open public spaces introduced in figure 49 were observed over a ten minutes time period. The amount of people, activities, cars and groups of interacting people were counted. People in the research project are differentiated based on their outer appearance with regards to type and gender. In terms of type the research project distinguishes between high-skilled workers, low-skilled workers, leisure people (e.g., shoppers and tourists) and youngsters. In terms of applied activities the research project lies out the ways of locomotion (walking, biking, standing, sitting, going by car) and if applicable and recognizable also any additionally applied activities (smoking, phoning, working,

talking, eating). Thus, the methodology of behavioral mapping helps to objectively describe the degree of heterogeneity of people and activities in the respective public spaces. Appendix 6 presents the detailed results from behavioral mapping in the respective public spaces in absolute numbers. In the following we will summarize the key insights gained from the observations.

The accumulated density of people recognized in the respective public spaces is highest at BFH in Manama, second highest at DIFC in Dubai and third highest in the West Bay area in Doha (see table 8).

| Number of people observed | Dubai, DIFC | Doha, West Bay | Manama, BFH |
|---|---|---|---|
| **Total** | **324** | **312** | **610** |
| - Weekend | - 95 | - 167 | - 315 |
| - Weekday | - 229 | - 145 | - 295 |

Table 8: Overview of accumulated, observed number of people during seven observation periods of ten minutes each along a weekend day and a weekday
Source: Own illustration

In Doha and Manama behavioral mapping on a weekday displays similar people densities compared to a workday. In contrast, the observed public space in the DIFC district in Dubai shows significantly higher densities of people during weekdays compared to weekends. Thus, the DIFC district is seen to be rather dominated by business people operating mainly on weekdays while the West Bay area in Doha and the area at and around the BFH in Manama obviously manage to attract a more heterogeneous set of people which are not only business related. This increases the quality of urban space.

In general, approximately two thirds of the perceived people in the observed public spaces are of male gender. Two main factors might influence the low share of women in the observed public spaces. On the one hand, the traditional role of women especially in Arabic countries has historically been a family-and household-oriented one. On the other hand, the observed city districts of the present research project focus knowledge economy businesses which assumably have a higher ratio of male employees than female ones. The share of female and male people in knowledge economy focused city districts and its impact on the heterogeneity of

performed activities should be a matter of exploration in different geographies for later research projects.

Looking at the quality of the observed public spaces we have to take into account the set of activities performed in the respective spaces. During behavioral mapping, a bundle of various activities was perceived in all observed public spaces. These are stimulated by the offered broad range of urban functions in walking distance (restaurants, shopping facilities, green spaces, infrastructure).

Nevertheless, there are certain differences observable, if we compare the number of activities performed in the public spaces across all case-study cities (see appendix 6). With regards to the observed activities in the public spaces, we can differentiate between activities which indicate that people pass through the public space (e.g., "walking"; "biking") and activities which indicate that people rather stay in the public space to either rest or communicate with other people (e.g., "standing"; "sitting at table"; "sitting on ground").

While the observed public space at DIFC in Dubai is mainly used by people who stay in the place for a certain time, people in the West Bay area in Doha and at the BFH in Manama mainly pass through the open, public spaces without stopping and resting in the location. Thus, activities indicating resting in the observed public spaces totals 53 percent in the case of DIFC in Dubai. On the contrary, 37 percent at BFH in Manama and only 26 percent in the West Bay area in Doha stay in the observed, public spaces (see appendix 6). These numbers are important indicators for the use of public spaces as places for communication and exchange. DIFC in this case strongly confirms the favorable outline of its open, public space for knowledge-intensive economies. The high mix of outdoor urban functions and shaded walkways for people to sit and communicate foster the perceived activities of communication and resting in the location.

This phenomenon certainly has to do with the fact that in the observed space at the DIFC in Dubai shopping and restaurant facilities are directly adjacent to the observed, public spaces, while in the West Bay area in Doha, for example, these facilities are rather bundled indoors inside the large "city center" shopping mall. In addition, the architectural outlay of the buildings enframes the observed public

space in Dubai which invites people to stay in the places, while buildings in the West Bay area in Doha, for example, are rather scattered across the district and do not allow the feeling of being sheltered in between the tilled space.

The observed public space at West Bay area in Doha is not only the space with the highest share of people simply passing through, but it also displays the highest amount of cars driving past. A number of 966 cars in total was counted during the observation periods, compared to 555 cars in the observed, public space in Manama. On the contrary, the development of DIFC - as mentioned earlier - has abandoned car traffic from inside the district. The degree of car usage within the different districts certainly has an impact on the above described outdoor activities of people in the observed, public spaces. Thus, the high share of people, which rest and stay in the public space at DIFC in Dubai can also be partly explained by the traffic-freeness within the district of DIFC.

The observational mapping research can also be used to display the sizes of interacting groups of people in the observed, public spaces (e.g., single person, group of two people, group of three people etc.). This measure was originally intended to be used for showing potential differences in average group sizes, and thus, to have a proxy for the rate of interaction and exchange between people on site. However, the observed, public spaces do not display major differences in terms of their average group sizes (average group size of 1.5 people at DIFC in Dubai, 2.0 people in the West Bay area in Doha and 2.1 people at BFH in Manama). Thus, the measure does not really allow any interpretations with regards to the interaction degree in the respective locations.

## 5.3  Conceived urban space: The development of emerging cities in the context of knowledge-intensive economies over the last decades

The previous chapters looked at the lived and perceived urban spaces in the three case-study cities: The overarching city structure as well as the outline of the city districts at and around the business building have been evaluated by KIE managers. In a deep-dive analysis of specific public spaces within the districts, we have objectively described the qualities of the respective city districts. In the

remaining chapter on urban space, we would like to complete the picture by looking at the urban developments from a planners perspective. In this case, we again focus on the overarching city structure. KIE managers have declared that all case-study cities face certain challenges and problems, when it comes to the outline of the overarching cities. One of the major emphasized issues was the fact that the separate districts of the cities are not really integrated in the overarching city structure, and a comprehensive transportation system linking the separate districts in a proper way is missing. These facts have been discussed with urban planners from different public and private organizations in the respective case-study cities. In addition, a graphical urban structure analysis over time has helped to understand the pace and major steps of urban development. This is important in order to elaborate on the reasons for the above mentioned issues.

### 5.3.1 Vision of planners and developers on the Arabian Peninsula in the knowledge economy context

Most emerging nations on the Arabian Peninsula have a concrete vision for the future with objectives related to the growth of the knowledge economy. So do the emirate of Dubai and the countries of Qatar and Bahrain. The Dubai Strategic Plan 2015 outlines the objectives of *"turning Dubai into a vibrant science and technology hub"* and *"attracting and retaining highly skilled employees"* (Dubai Strategic Plan 2015, 2007: 22). Bahrain moreover articulates in its Economic Vision 2030 the interdependence of global location significance in the knowledge economy network and local urban space:

*"Many factors combined make a country attractive for investors in high-value-added industries: a high-quality public service, a cutting-edge infrastructure and an appealing living environment are among the vital ingredients. Bahrain will need to offer them all."* (Bahrain Economic Vision, 2008)

The satisfaction of KIE managers with urban space in emerging cities can be seen as one enabler for reaching the above described visions. However, as outlined before, especially on an overarching city scale KIE managers still see a lot of improvement potential. Interviews with major organizations involved in urban

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planning in Dubai, Doha and Manama have helped to elaborate on the comments from knowledge economy firms with regards to urban development.

## 5.3.2 Urban planning processes

Planners give reasons for the KIE perception of well designed city districts, which, however, are described as being disconnected on an overarching city level: Governmental authorities have put semi-governmentally owned and private development companies in charge of designing and developing separate city districts during the last years. Examples for such development companies are Emaar from Dubai, Qatari Diar from Doha and Bahrain Bay Development from Manama (see figures 52-54). The planning and construction of separate city districts thus often happen in parallel. This situation creates a certain competitive behavior between the separate development companies which itself increased the speed of urban development. Interviews with urban planners on site disclose the fact that the increased speed has been intentionally created. An exemplary quote from an urban planning interview partner in Dubai supports this finding:

*"Because Dubai had to sustain a certain level of growth to achieve his highness` vision for 2010 and after for 2015, they had to give the different geographic parts of the city to different developers. Because if you give the city all to one developer you would not be able to achieve the same pace. So that is why these districts were given to several developers, because we wanted to achieve in four to five years what has taken other cities 20 to 30 years through centralized planning system touch. So dividing the public-private partnerships of urban planning development into different parts helped us actually."*

Accordingly, cutting the cities into districts has increased the pace of city development through parallel planning approaches. Based on a formerly propagated function separating zoning approach, some of the city districts focus on specific urban functions (Dubai structure plan, 2003). This has enabled the development companies to brand city areas in a special way and thus, to attract foreign investment for financial support. However, lately the negative impact of zoning approaches have given way to rather mixed-use developments, since the

negative impact of function separating developments is more and more recognized by the respective planning authorities.

Operationally, the above mentioned development companies work like private organizations in a competitive environment. However, mostly the companies have either a direct or an indirect link to the government. Part of the development companies are led by a management board with members from the governmental authorities. Other development companies are publically listed, but a certain part of the shares belongs to governmental bodies. The mentioned development companies are quite autonomously responsible for the design and implementation of city district plans. However, the governmental bodies influence the development firms via their co-determination right through their ownership status. In this way, the government is able to actively influence the urban development in all case-study cities, in order to use urban spaces as a mean for international branding through iconic developments and image-building mega-projects (see case-examples from Dubai described in chapter 4.1.1).

The described phenomenon of parallel city district design and construction by development companies without strong regulations through a centralized planning system is observable in all emerging case-study cities. The major development companies mainly operate locally and thus differ from city to city: Emaar and Nakheel are examples for development companies in Dubai, Qatar Foundation and Qatari Diar operate in Doha and BFH Holding and Tameer have their base in Manama (see figures 52-54). The development companies often cooperate with international private planning and consulting firms from Western developed nations. These firms like Atkings, Halcrow and others support the local urban developments across all case-study cities.

Often one and the same private planning or consulting firm operates in a couple of emerging cities on the Arabian Peninsula at the same time. Thus, the urban and architectural design style often are copied from one place to another.
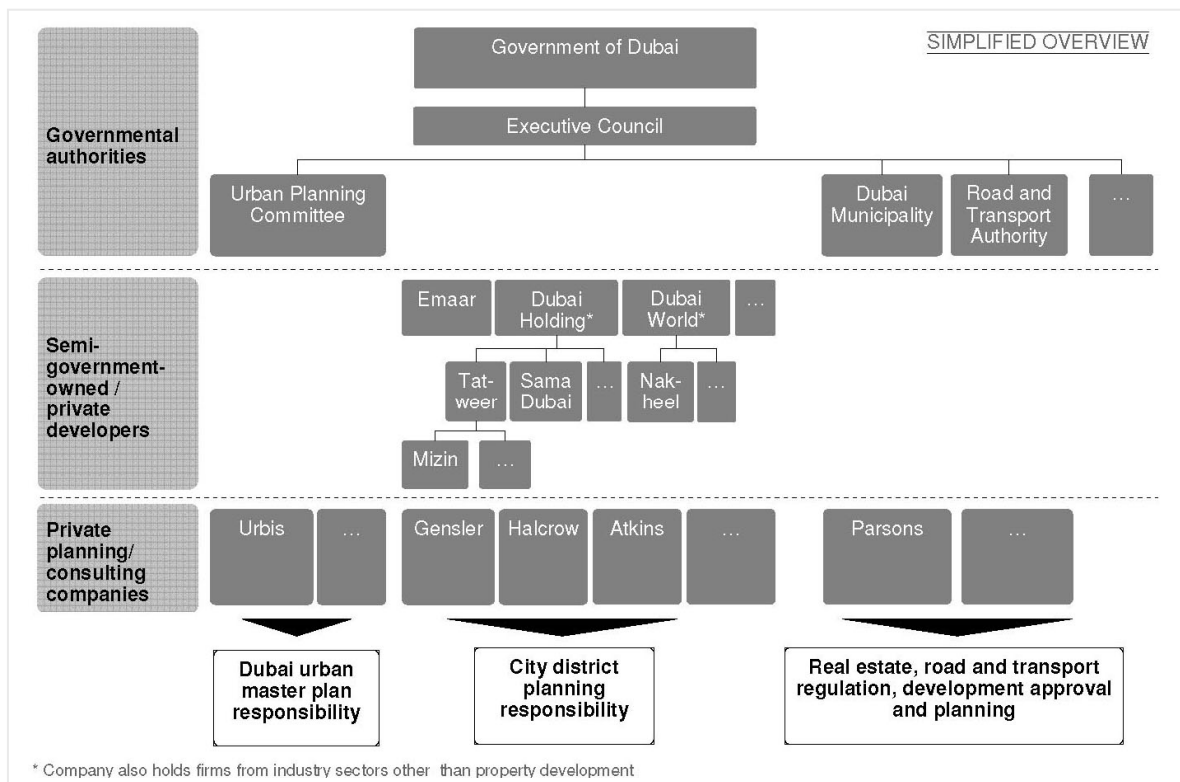
Figure 52: Organisations involved in urban planning in Dubai
Source: Own illustration
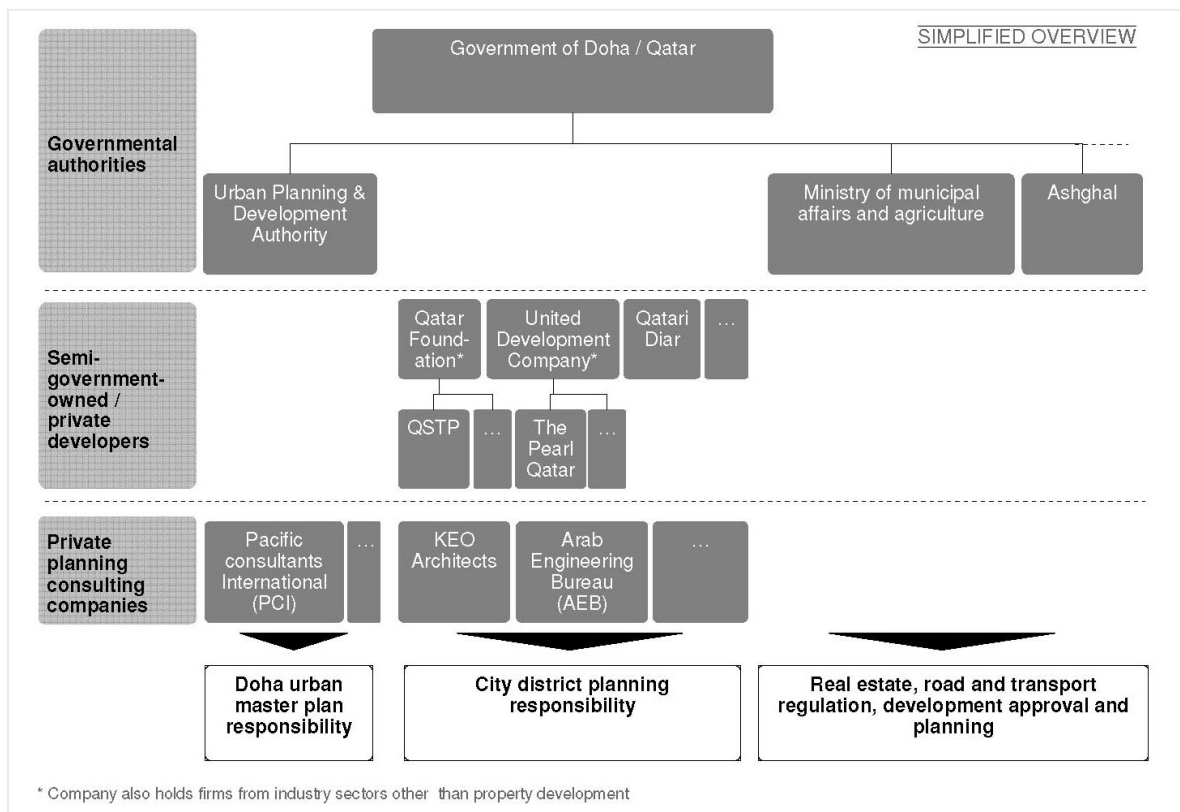


Figure 53: Organisations involved in urban planning in Doha
Source: Own illustration
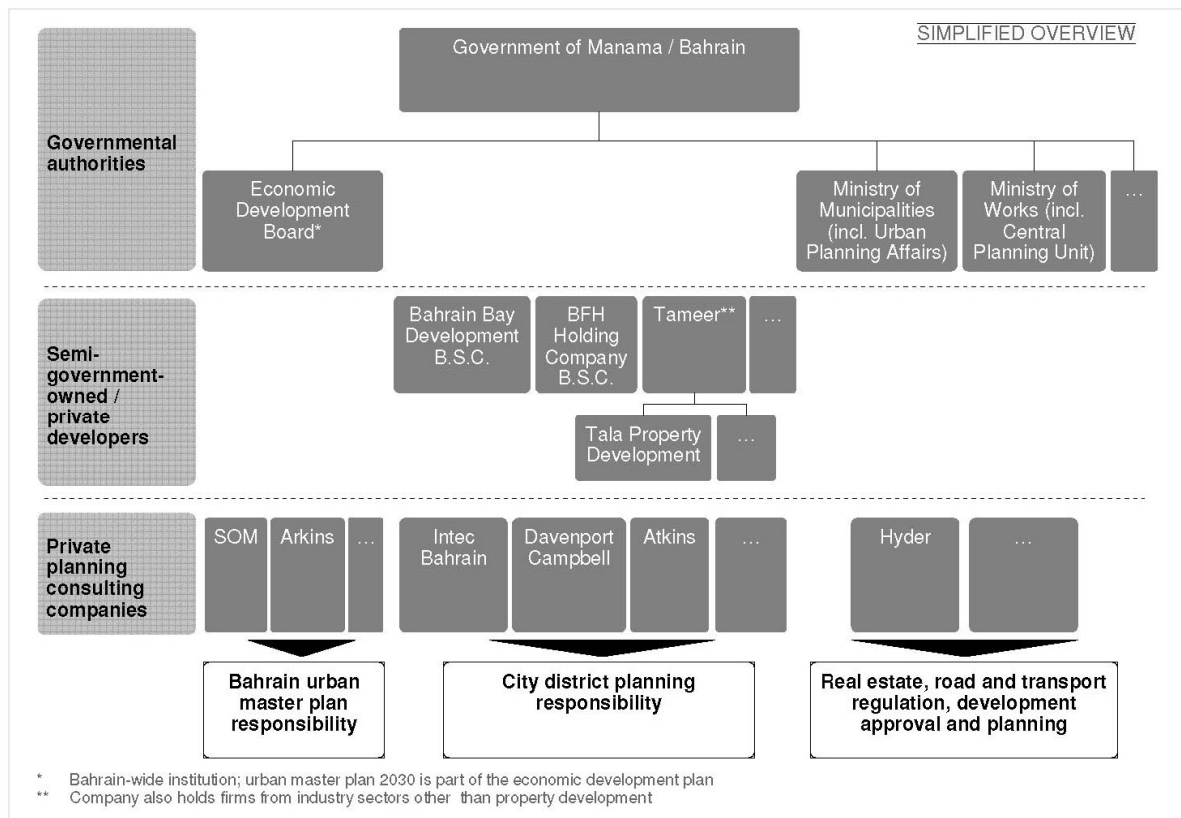
Figure 54: Organisations involved in urban planning in Manama
Source: Own illustration

Only recently, all case-study cities launched "master plan" initiatives, driven by certain urban planning authorities in cooperation with private consulting firms. In the case of Dubai, since 2007 the governmental "Urban Planning Committee" works together with the private, Australian urban planning firm "Urbis" to develop an urban vision for Dubai up to the year 2020 (see figure 52). In the case of Doha the "Urban Planning and Development Authority" has commissioned the Japanese company "Pacific Consultants International" in 2007 to develop an urban vision for Doha up to the year 2032 (see figure 53). And in the case of Manama, the "Economic Development Board Bahrain" in cooperation with the private, American planning firm SOM prepared a "National Plan" including a vision for Manama up to the year 2030 which was finalized in 2006, but not published (see figure 54).

The outlined organization structures of urban development in all case-study cities have several negative consequences.

**First**, the development of city districts in parallel by different, independently operating development companies over the course of many years has abandoned an overarching urban planning concept for the configuration of the districts to the overarching city structure. All case-study cities, until recently, have missed an integrated planning approach on an overarching city scale. City districts have been built without an overarching concept for infrastructural connections between the separate districts. In addition, some of the districts are based on a former function separating zoning approach. All of these factors have a highly negative impact on road and transport traffic which is articulated by KIE managers as the major challenge on an overarching city scale.

**Second**, the parallel development of separate city districts in addition causes the fact that building typologies at the borders from one district to another do not harmonize with each other. One can, for example, find high-density knowledge-economy dedicated city districts with high-rise developments next to inner-city low-density living areas up to two stories high (see figure 55).



Figure 55: Housing facilities next to knowledge economy dedicated city districts
Source: Own photography (18.05.2008)

**Third** and finally, the international planning and consulting companies supporting the local development companies often apply a rather globalized architectural and urban design style which mostly does not match the specific local context. An interview partner from Manama reflects on this issue:

*"Architecture is an industry. So basically, Western people are trying to sell their products to the whole world. Accordingly, they are selling the whole image of Westernized architecture […].There is already some architects <here> copying international architecture. Personally, I do not enjoy living or walking or passing through their architecture, because they do not give me a comfortable feeling. […] For me, there is a feeling behind architecture. This feeling reflects something. This region`s architecture <also> gives you a feeling. It is very important for me as an architect to get this feeling out of the architecture. It is not necessary for me, to build exactly like the old architecture, to get the feeling. An architect is an artist. He needs to be very sensitive to get the feeling of the things."*

The interviewee neither sees the copying of globally applied architecture styles from one city to another nor the copying of local, historic architecture styles as a proper architectural or urban design solution. If we apply this insight to urban planning in a knowledge economy context, than urban planners are asked to reflect the urban requirements of globally operating knowledge economy managers and workers, without missing to adopt the design according to the local context.

The missing link of city districts is also recognized by the government as a disadvantageous consequence of the above-described organization of city planning on the Arabian Peninsula. Therefore, in all case study cities, the urban planning authorities and supporting consulting companies currently work on urban master plans with visions for the upcoming years. One major focus point for all case-study cities in this context is to decrease the mentioned traffic issues. Thus, all case study cities try to implement a public transportation system within the upcoming years. However, especially for Dubai with its wide, linear spread across a large city area (see figure 56) and its large ecological footprint, a successful implementation is a big challenge.

### 5.3.3 Results of historic city plan analysis

Figure 56 visualizes the extremely high pace of city development by showing the city ground plans of Dubai, Doha and Manama in different time spots. The respective colors are adjacent to a certain point in time: Illustrated is the city outline in the 70s in red, in the 90s in orange and in the beginning of the 21st century in yellow. The planned urban developments through 2015 are colored in black. Emerging cities might experience a certain slow down of the outlined future projects through the current global economic crisis. The press has released the news of some postponed or cancelled real estate projects already. However, the overarching impression of rapid urban growth during the last decades remains.
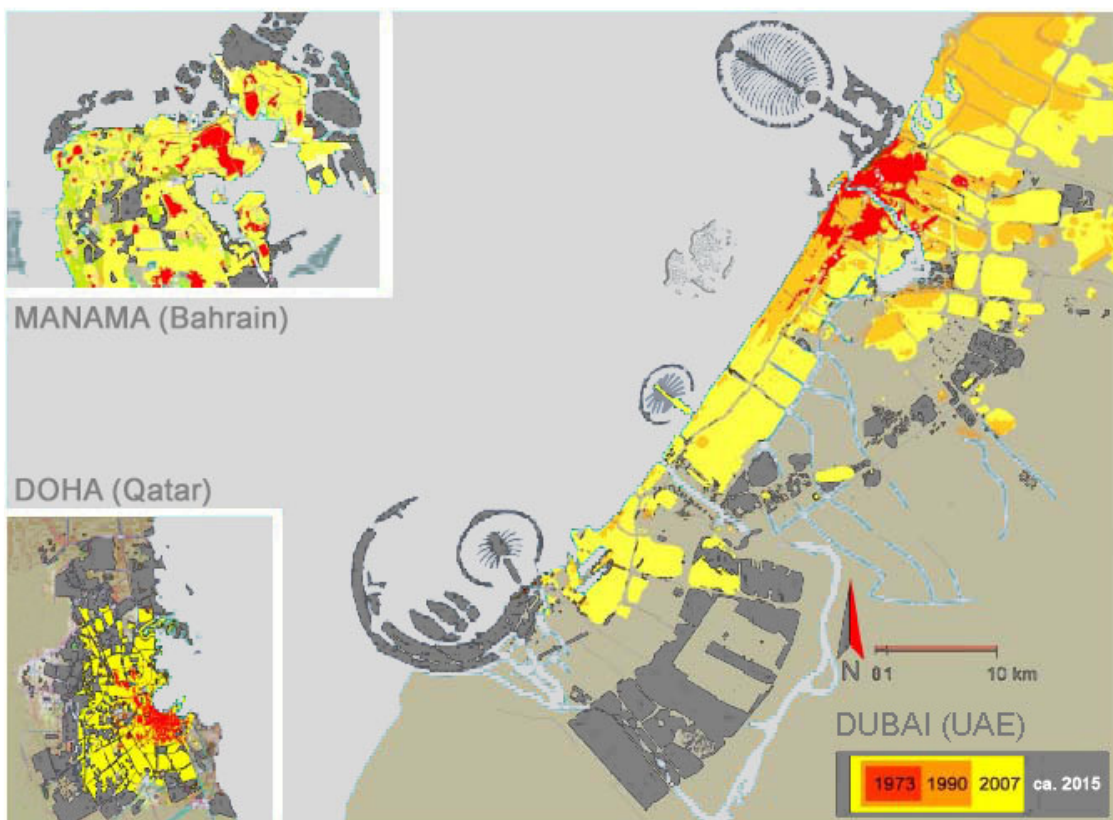


Figure 56: Map of Dubai, Doha and Manama indicating urban development over time
Source: Own development

All ground plans are illustrated in the same scale. The covered urban area of Dubai is around four to five times larger than the one of Manama and Doha. Dubai has grown along the coastline from an extension of around 10 kilometers in length in the 70s to approximately 70 kilometers in length today. The main difference

between the development of Dubai compared to Doha and Manama besides the absolute size of urban extension is the ground form of the urban developments. Dubai has mainly grown in length along the coastline, while Doha and Manama have grown to a rather concentric urban form.

Furthermore, the historical traces of development can be recognized in figure 56. The island of Bahrain originally hosted several urban settlements which have grown together during the last 40 years. Thus, Manama today is directly adjacent to the neighboring settlement of Muharraq and other formerly independent settlements in the center of the main island of Bahrain. On the contrary, the cities of Doha and Dubai developed from only one major settlement. In the case of Dubai, the core of the city was originally a rather concentric one located around the Dubai creek. Over the course of the last 40 years, the original city developed along the coastline and Sheik Zayed Road to a linear urban shape. Doha, like Dubai, was founded at a natural inlet of the sea. However, the inlet is not a Creek as in the case of Dubai, but a half-round shaped corniche. During the last 40 years, Doha favorably grew in concentric circles around the corniche.

The newly planned and constructed developments in the 21$^{st}$ century differ from the previous urban extensions. Especially in the case of Dubai, this is even readable in the ground plan illustrations of figure 56. Iconic mega-projects, mainly on land, reclaimed from former sea areas are planned and partly constructed already. The projects can be seen as the opposite of a demand-driven urban development. Iconic urban development is planned, constructed and offered to global investors, in order to attract people from all over the world. Dubai presents the three palm-shaped islands "Palm Deira", "Palm Jumeirah" and "Palm Jebel-Ali" and the island formation "The World" imitating the globe from a bird´s perspective. Doha introduces "The Pearl" built offshore in the West Bay Lagoon area. And Manama builts the previously described "Bahrain Financial Harbor" as well as the "Bahrain Bay" and "Lulu Island" on reclaimed land right in front of the original inner-city, northern coastline of the main island of Bahrain.

While all case-study cities recently follow the trend of creating global attention through new iconic mega-projects on reclaimed land, Dubai is certainly the most

visible one due to the comparably large size of the new developments. Especially in the case of the already wide-spread city of Dubai the question remains, whether the steady extension of the city borders helps on a long-term basis to solve the previously mentioned issues of disconnected city districts on an overarching city scale.

One has to acknowledge, that the newly planned iconic mega-projects might be able to attract people on a short term basis. However, from a long-term perspective, these new urban developments rather add an additional complex degree to the already problematic overarching city-structures.

In general, addressing the requirements of KIE regarding urban space as outlined in the KIE survey results can be seen as one success factor for strengthening the emerging cities as long-term attractive locations for the knowledge economy. Thus all case-study cities face the challenge of assembling the individually planned and constructed city districts to an attractive overarching city through an integrated urban planning approach. In this context, it is key to establish a well-functioning public transportation system which, especially in the case of Dubai, has to go along with a gradual re-densification process.

Comparing all case-study cities, a comprehensive coverage of a large amount of the city population through a newly installed public transportation system is certainly easiest to implement in the city of Doha. Its strictly concentric growth around the corniche into the inner land of Qatar with a clear outline of the main road axis has certainly advantages for the future development of public transport.

An integrated planning approach is not only important on a city scale. A complementary strategy and governance on a regional level should complement the local, urban development on a larger scale. Thus, collaborative planning approaches of functionally connected emerging cities on the Arabian Peninsula (see chapter 4.2.2) should enrich urban planning from a regional perspective. This might guide emerging cities on the Arabian Peninsula to a complementing and cooperating rather than competing regional spatial development. Complementing strategies can be applicable in a non-physical and a physical sense. While non-physical complementary strategies in the knowledge economy context have been

introduced in chapter 4.2.3, it remains to be explained how emerging cities on the Arabian Peninsula can physically complement each other. First and foremost, we have to think about the transport infrastructure between the respective cities. Two examples might help to understand the requirement for a regional planning strategy and governance:

The **first example** refers to the connectivity between emerging cities along the Arabian Gulf coastline. While these cities (Kuwait City, Manama, Doha, Abu Dhabi and Dubai) are strongly connected in a non-physical, functional sense (see chapter 4.2.2) and are geographically not very far apart from each other, the reachability between these cities through transport infrastructure other than air transport is very limited. By land, the locomotion from one city to the other is restricted (except between Dubai and Abu Dhabi), since the respective nation states of the cities are not directly adjacent to each other. One has to pass Saudi Arabia to exemplary get from UAE to Bahrain, Qatar or Kuwait. However, Saudi Arabia is quite restrictive in terms of visa conditions for foreigners passing through the country. Thus the land way at the moment for many travelers is not an option to flights.

The **second example** refers, in particular, to the cities of Abu Dhabi and Dubai. Both cities have nearly grown together over the course of the last years. While historically the two settlements were 150 kilometers apart, today only an untilled area of approximately 50 kilometers in length separates the city borders of Abu Dhabi and Dubai from each other (see figure 57). Furthermore, Dubai displays a high functional, non-physical connectivity to Abu Dhabi (see chapter 4.2.2). Nevertheless, both cities do not follow a common urban and regional planning approach. On certain dimensions the cities rather seem to compete with each other in terms of their physical, infrastructure developments. Thus, Dubai has announced the development of the largest airport in the world called "World Central" at the outskirts of Dubai close to the city of Abu Dhabi. The construction of the first phase of the new airport in Dubai will be finalized by 2010. At the same time Abu Dhabi has announced the expansion of its currently operational international airport by another terminal which is planned to be completed by 2012.
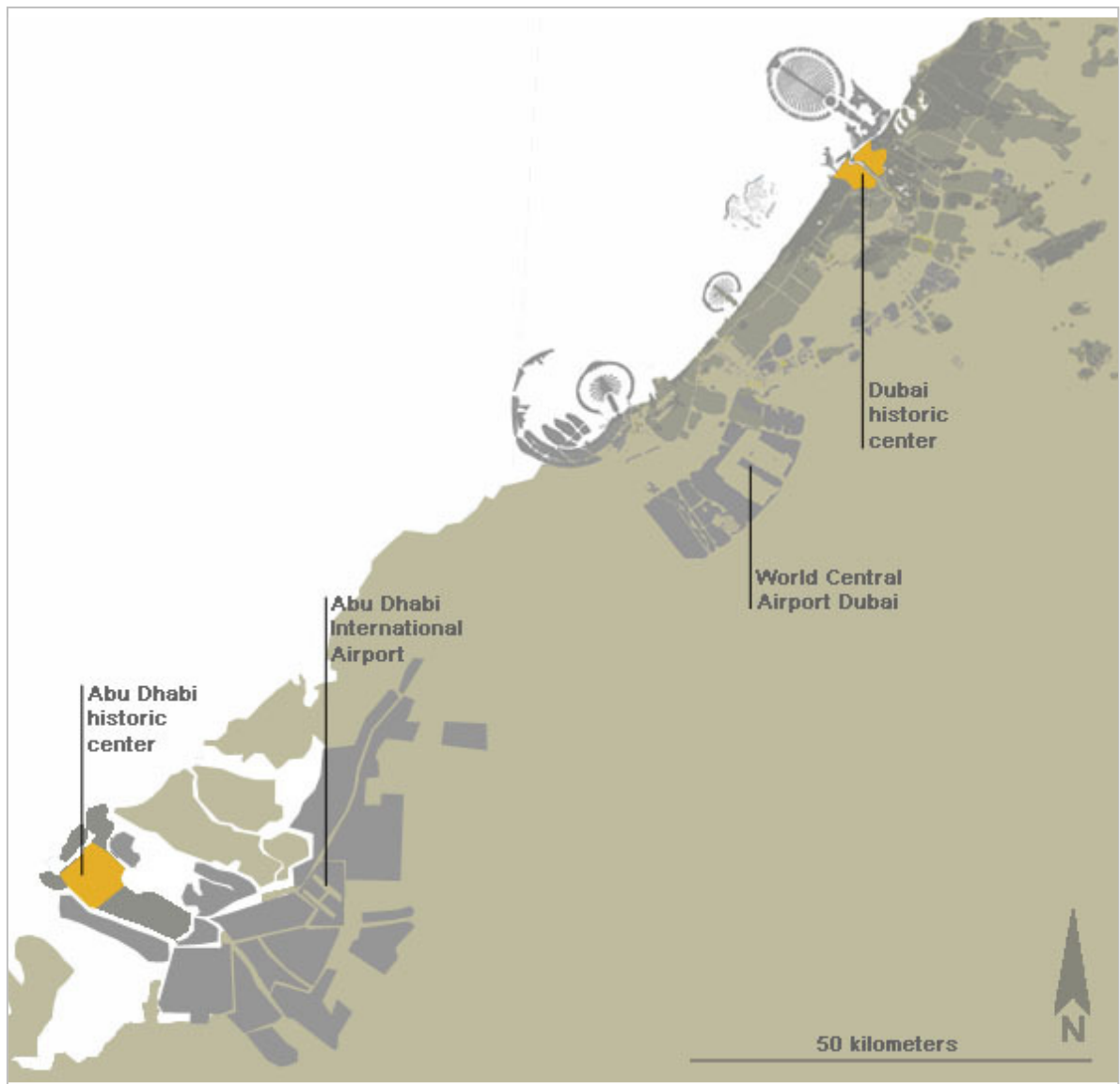
Figure 57: Map of Abu Dhabi and Dubai – Source: Own illustration based on google earth image

A regional development governance would help in both exemplified cases to develop a common strategy for regional and global transportation interfaces rather than to compete for a preeminent role. The target should be to commonly plan physical urban and regional development while taking into consideration the degree of functional, non-physical connectivities on a regional and a global level. The governance body could potentially be related to the international confederation of the Gulf Cooperation Council, in order to overcome the boundaries of national borders.

## 5.4   Comparison of analysis results across case study cities

### *Lived urban space*

In all case-study cities, knowledge economy managers and workers are satisfied with the urban qualities on a city district scale at and around their business building. However, they see large improvement potentials on an overarching city scale. These insights have been gained through an online survey with 213 knowledge economy firms on the Arabian Peninsula and qualifying interviews with KIE firm managers. Dubai faces the largest urban challenges on an overarching city scale due to its wide linear spread along the 70 kilometer long coastline.

### *Perceived urban space*

Summarizing the results from photographic observation and behavioral mapping, we can say that the satisfaction of knowledge economy managers with the outline of urban space on a city district scale is obviously driven by facts which differ from city to city. In the case of Dubai, the highly valuable quality of open, public space with respect to the available mix of urban functions on shaded outdoor walkways is enhancing the satisfaction degree. However, while the heterogeneity of urban functions and thus, activities in the public space is quite high in the district, the heterogeneity with respect to the type of people is rather low and restricted to mainly high-skilled workers using the space. The overarching density of people in DIFC is rather low compared to BFH in Manama. This is potentially a disadvantage, since KIE managers have articulated their need for a large people density degree in order to increase opportunities for the exchange of knowledge. In the case of Doha and Manama, the observe KIE dedicated city districts show a larger variety and density of people which enhances the urban experience. Nevertheless, especially in the case of the West Bay area in Qatar, people do not extensively use the open, public spaces to rest or interact with other people. This is mainly due to the fact that the broad variety of urban functions is not directly adjacent to the public spaces. Thus, open, public spaces are mainly used as movement areas.

*Conceived urban space*

The dissatisfaction of KIE managers with the quality of urban space on an overarching city scale is strongly influenced by the urban planning organization in all case-study cities. Over the course of many years the cities have missed an integrated urban planning approach. Mainly, semi-governmentally owned development companies have been in charge of the design and construction of separate urban districts in parallel, in order to increase the pace of urban development. This has led to a disconnection between the separate urban districts with regards to transport infrastructure and the built morphology. An integrated planning approach is not only missing on an urban level, but also on a regional level.

## 5.5   Conclusions for hypothesis two

The following, second research hypothesis can be partly verified based on the empirical research results from the Arabian Peninsula:

*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.*

Emerging cities on the Arabian Peninsula in recent years have managed to attract many globally operating knowledge-intensive economy firms (see chapter 4.3). Thus, the significance of all case-study cities within the global knowledge economy networks has grown rapidly. This has enhanced the development of knowledge economy dedicated urban districts with a high quality and favorability for KIE firms and workers. The global visibility of these developments like DIFC in Dubai, QFC in Doha and BFH in Manama has an impact on the global image and thus the attractiveness of emerging cities on the Arabian Peninsula from a knowledge economy perspective. Therefore, on a city district scale, the initially introduced second research hypothesis can be verified.

However, on an overarching city scale, the quality of urban space in all case-study cities does not currently fulfill the demand of KIE firms and workers who miss important infrastructural and recreational facilities in the cities. This has been the result of an extensive online survey and qualifying interviews with KIE managers (see chapter 5.1.3). The dissatisfaction relates to the fact that the case-study cities have lacked an integrated planning approach on an overarching city scale. Thus, the second research hypothesis on a first glance does - seen from an overarching city scale - not hold true. Emerging cities on the Arabian Peninsula, in fact, have recently attracted knowledge-intensive economies, even though the overarching urban development does not fulfill the requirements of KIE firms and workers.

Nevertheless, this does not mean that the quality of urban space on an overarching city scale is unimportant for knowledge economy firms, workers and their families. As the empirical research results of the present research project show, KIE managers and workers regard the quality of the overarching urban development as an extremely important factor, especially with reference to their private life. Thus, emerging cities on the Arabian Peninsula currently face the challenge of remaining attractive for knowledge economy managers and workers on a long-term basis. Their success on that dimension obviously strongly depends on the improvements on an overarching city scale.

Summarizing, the general interdependence of non-physical, functional networks and morphological, urban space in the knowledge economy context has become evident (see chapter 5.1.1) – on a city district scale as well as on an overarching city scale.

# 6 Lessons learned from cities on the Arabian Peninsula: Implications for Western European cities

The present chapter will summarize the lessons learned from cities on the Arabian Peninsula and potential implications for Western European cities. The chapter is structured along four consecutive parts. The **first part** will outline potential learning areas for other geographies based on the findings from our case-study cities on the Arabian Peninsula. The **second part** will reflect on the existing theoretical background literature on Western-European urban development in the knowledge economy context. The **third part** will introduce three German case-examples of knowledge economy focused urban development. Interviews with the respective planning authorities of the developments have been conducted, in order to find out about any potentially existing implicit or explicit insights on KIE requirements with regards to city selection criteria and urban space qualities. Since the existing knowledge in theory and praxis on the described KIE requirements has turned out to be rather limited, the **fourth part** of the present chapter proposes a work plan for future research on lessons for Western European cities with regards to local, urban development in a global knowledge economy context.

## 6.1 Potential learning areas

The research project "Built on Sand? - Emerging Cities on the Arabian Peninsula in the Knowledge Economy Context" has generated three main, potential lessons for other global cities as a synthesis from the empirical research results:

- **Coherence of non-physical, functional networks and physical urban space** as a basic underlying principle of relational geography and urban development research

- **Global competitiveness and attractiveness** as major, potentially transferable prerequisites to increase the significance of cities in the World City Network

- **Integrated urban planning approach** as one main lever to create competitiveness and attractiveness of cities

How far these potential lessons learned are really applicable to cities from so called developed nations remains an open question for future research. In particular, it is seen to be important to investigate, whether the findings from case-study cities on the Arabian Peninsula can be transferred to Western-European cities and functional urban areas.

Of course, there are a lot of pheno-typical differences between Arab and Western-European cities. Phenol-typical characteristics in this case refer to the outer appearance of the built, morphological environment including the shape of open and closed spaces and the construction style and materials. Differences are certainly also related to the fact that Western-European cities mainly built upon a historically grown urban context, which is missing or at least less prominent in Arab cities. Thus, I will touch upon a rather general, abstract level of comparable urban development processes and requirements between both regions. This general level is outlined by the above mentioned three high-level findings from the Arabian Peninsula, which will be outlined in greater detail in the following chapters.

### 6.1.1 Coherence of non-physical, functional networks and physical, urban space

The interdependence of non-physical, functional networks and physical, urban space on the Arabian Peninsula has been proven through the results from the KIE online survey and interviews with KIE firm managers on the Arabian Peninsula. A rapidly gained significance of case study cities within non-physical, functional networks enhances the development of KIE dedicated city districts on the one hand, while the quality of morphological, urban space influences the city location selection of KIE firms and workers on the other hand. Using this interdependence circle as a basis, a simplified coherence model has been derived, showing the respective steps from non-physical to physical space in case of an increasing significance of a city within the World City Network (see figure 58).
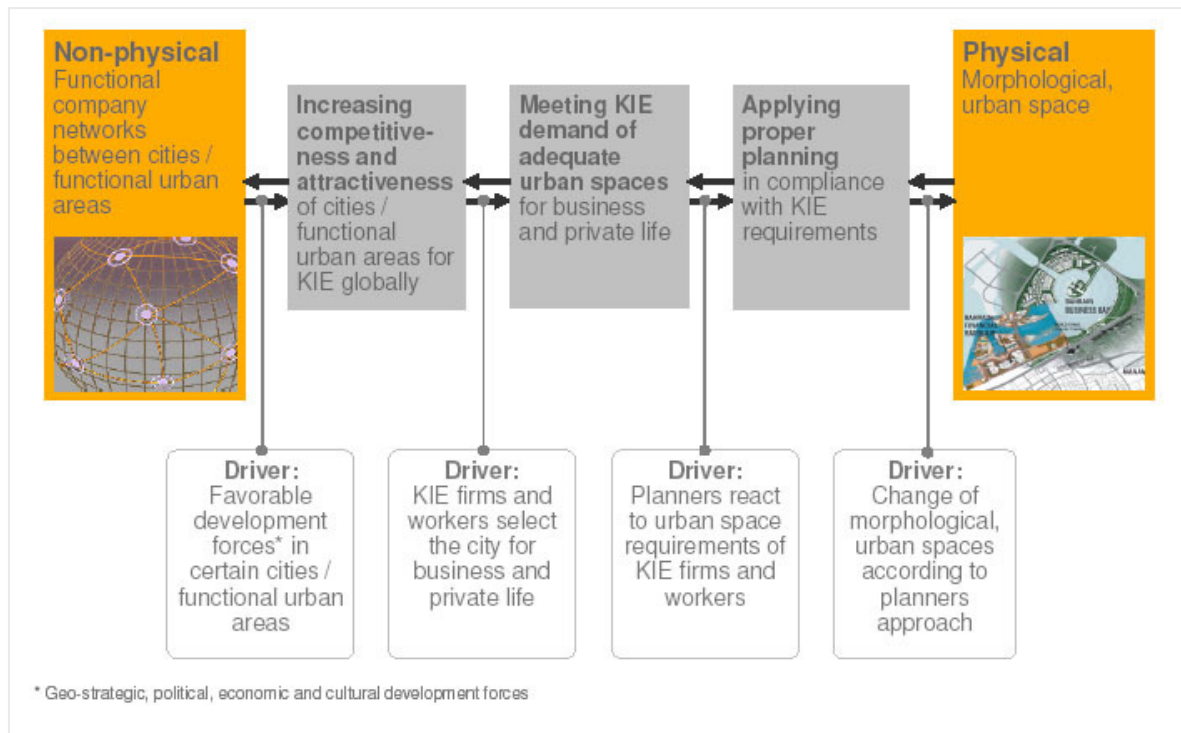
Figure 58: Coherence of non-physical, functional networks and physical, urban space
Source: Own Illustration

Starting from a specific global position of a city within non-physical, functional company networks, certain location-specific development forces can stimulate an increase of competitiveness and attractiveness of a city. Based on the results of the conducted online survey on the Arabian Peninsula, knowledge economy firms have recently entered emerging Arab cities due to different favorable location-specific development forces, like, for example the ease of market entry for globally operating companies, low taxes and duties or the availability of international airport hubs (see chapter 4.3). An increased competitiveness and attractiveness goes along with a growing amount of knowledge-intensive economies in the location. To meet the demand of the knowledge economy with regards to urban space, a proper urban planning in compliance with knowledge economy requirements needs to be in place. All case-study cities of the present research project implicitly reflect the requirements of KIE firms in knowledge economy dedicated urban spaces on a city district scale – with DIFC in Dubai, QFC in Doha and BFH in Manama. The implementation of knowledge economy dedicated urban planning leads to the creation of specific physical, urban spaces.

The coherence of non-physical and physical space also works in the other direction. Starting from a specific status of urban space, investments into urban planning and real estate development can create a new quality of urban space in a city. If the urban space meets the demand of the knowledge economy, this adds value to the attractiveness of a city from a global knowledge economy firm and workers` perspective. In the case of our observed emerging cities on the Arabian Peninsula, the creation of large-scale, knowledge economy dedicated urban development projects with international visibility from the perspective of KIE firms and workers adds value to the attractiveness of the locations. As a consequence, KIE companies open up new subsidiaries in the respective cities. Dependent on the KIE company networks these new firm subsidiaries in the respective city can add value to the overarching connectivity degree and thus the significance of the city in non-physical, functional networks compared to other global locations.

The described coherence model has to do strongly with the demand and supply of knowledge economy dedicated urban space. Governmental institutions of emerging cities on the Arabian Peninsula rather often follow a supply-driven development mentality. Knowledge economy dedicated urban developments (like DIFC, QFC and BFH) are strategically planned, created and promoted like a product with global marketing, to increase the interest of the knowledge economy in these cities. On the contrary, Western-European city district developments are more often planned according to demand-forecasts. The coherence model as illustrated above is outlined for a scenario of a constantly increasing significance of a city in the World City Network along the lines of a balanced supply and demand status.

In general, the applicability of the described coherence model should be verified in Western-European case-study cities and urban developments in the course of the proposed future research project (see later chapter 6.4).

### 6.1.2  Global competitiveness and attractiveness

Competitiveness and attractiveness are both necessary features to increase the significance of cities in the World City Network. This is another result of the present

research project on the Arabian Peninsula which can potentially be transferred to Western-European cities.

Global competitiveness is given, if a city can guarantee economies of scale and scope (see chapter 4.2.3). Panzar et al. have introduced the terms "economies of scale" and "economies of scope" in a microeconomics context (Panzar et al., 1975). According to their definition, "economies of scale" describe the cost advantages that businesses obtain due to expansion, while "economies of scope" refer to the cost advantages achieved through the offering of a range of products. In the context of the present research project, the terms are applied to spatial development and thus, there definition is adopted accordingly: "Economies of scale" describe the advantages that a location obtains due to a large amount of offered firms and facilities, while "economies of scope" refer to complementary advantages of one or more locations due to diverse utilizations. Cities must have cooperation strategies in place in order to fully grasp the advantages of economies of scope also on larger spatial scales going beyond the city-wide viewpoint.

The term "attractiveness" goes beyond the virtually numerically describable "competitiveness" of a location. If a city wants to be and remain globally attractive over a long period of time, the quality of urban spaces plays a major role. Thus, in order to reach attractiveness, a city needs to make sure to meet the requirements regarding urban space of its users, like its knowledge economy firms, and especially their workers (see figure 59). The quality of urban space can be evaluated on different scales: On an overarching city, a city district and a neighborhood scale. Emerging cities in the present research project prove to mainly meet the requirements of knowledge-intensive economies on a city district and a neighborhood scale at and around the business building. However, on an overarching city scale, the KIE firms articulate certain deficits, mainly related to the disconnection of city districts and to certain missed urban functions (related to public transportation infrastructure and recreation facilities). On a long-term basis, answering these requirements on an overarching city scale will be the main challenge for all case-study cities, in order to sustain or even extend their global attractiveness.
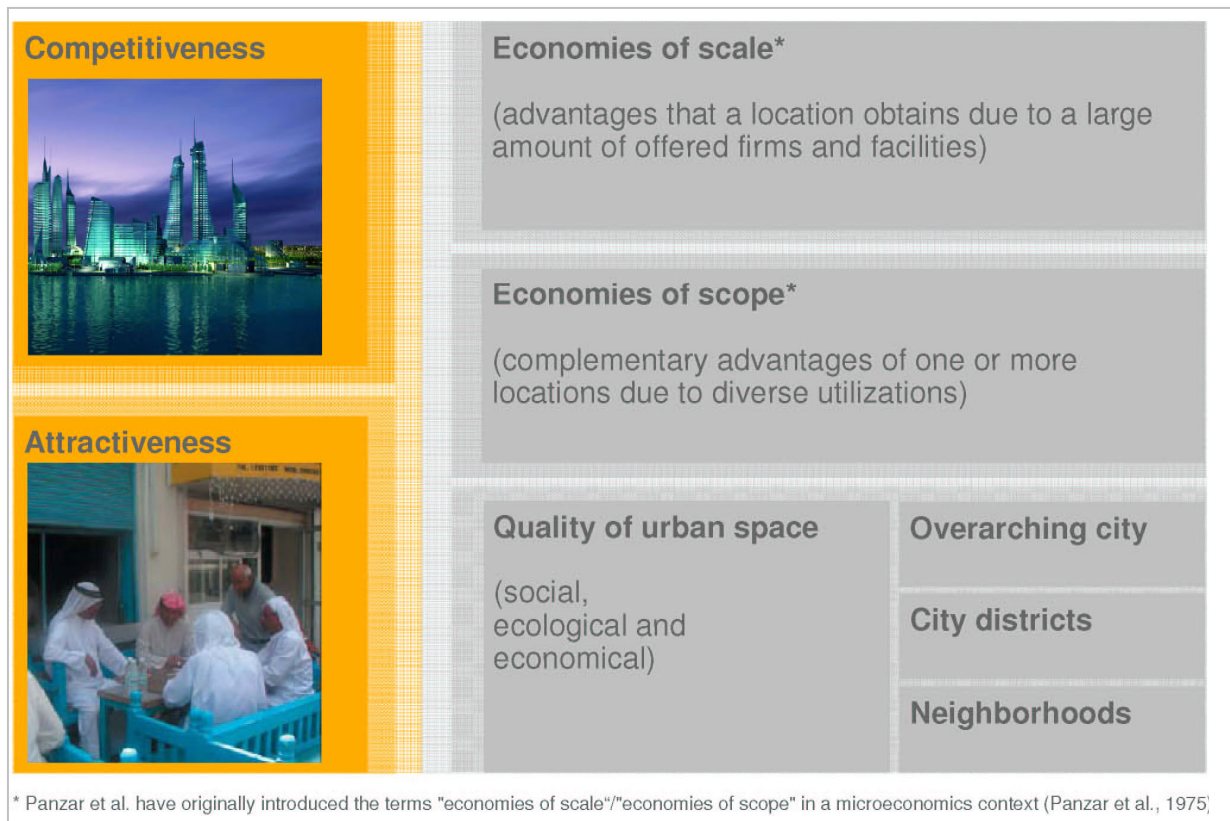
Figure 59: Global competitiveness and attractiveness of cities– Source: Own illustration

Urban space can only fulfill quality requirements to the full extent, if it reflects **economical**, **ecological** and **social** sustainability factors. The present research project has mainly discussed urban space requirements from an economical and partly an ecological perspective.

From an **economical** perspective, it has become obvious that with respect to urban space it is highly important at present to meet the demand of knowledge-intensive economies which have been identified as key spatial development drivers. If cities want to play a role in the global economic competition of geographic locations, they thus have to fulfill the demand of knowledge-intensive economies. The class of high-skilled KIE workers constituting the core capital of KIE firms currently shows a great flexibility in terms of location selection. To win the global competition for high-skilled labor, cities need to not only be attractive for international KIE companies, but also for knowledge workers and their families. Some of the fulfilled qualities of urban space required by knowledge economy firms at their company location in emerging cities on the Arabian Peninsula are, for

example, a high building and people density combined with a fair mix of urban functions. If future research confirms that Western European knowledge economy firms and workers have the same requirements, then urban and regional planning in Europe certainly can conclude learnings from these facts. Knowledge economy dedicated real estate projects should than be focused rather on inner-city redevelopment areas than on new "campus" developments outside the core city area. Furthermore, urban planning strategies should try to encourage divers re-densification methods. As Hofer outlines in the publication "Urban Density" (Lampugnani et al., 2007: 151), different forms of re-densification can be imagined: Horizontal "extension" of a given building structure, vertical "superstructure" on top of a given building structure, "addition" of buildings in an existing complex of buildings or complete demolition and "compensation" of an existing complex of buildings.

Urban density can not only enrich urban quality from an economical viewpoint, but also from an **ecological**, since it decreases land consumption and it increases the reach of public transportation means. In this context, especially the case-example of Dubai with its wide linear spread city structure has disclosed consecutive challenges for the new urban planning era of the city. Thus, from an ecological perspective, re-densification on an overarching city scale is seen as a core success factor for future urban development of widely spread, emerging cities on the Arabian Peninsula. As far as possible, applied re-densification methods should substitute planned additional land consumption beyond the borders of the current city structure. Another issue discussed with regards to the overarching city structure is the partly applied, former function-separating zoning approach in emerging cities on the Arabian Peninsula (see chapter 5.1.3). On an overarching city scale, this has negative implications on traffic consumption, as well. Thus, it is necessary from an ecological point of view to find urban planning strategies, which increase the mix of urban functions on an overarching city level instead of following the traditionally applied zoning principles. The mentioned challenges on an overarching city level have been explored during interviews with KIE firms and planning institutions on the Arabian Peninsula in the course of the present research project. The articulated requirements of re-densification and avoidance of function

separation on an overarching city scale can potentially find application in Western-European city structures, as well, in order to increase the favorability of overarching urban space for the knowledge economy.

The present research project has not extensively focused on the **social** part of sustainable, urban development. Thus, it remains food for thought of future research to deep-dive into the social implications of urban development in a global knowledge economy context. In this context, we rather want to hint at some of our findings from behavioral mapping, where the preeminence of knowledge economy workers as the main users of open, public spaces in knowledge-economy dedicated urban spaces is observable. Saskia Sassen described the issue of an approaching dualism of urban society in her work (Sassen, 2002). The disparity of rich and poor and the consequential separation of urban districts due to the use by uniform, social classes is certainly also observable in emerging cities on the Arabian Peninsula. However, additional follow-up research is required, in order to fully grasp the social implications of knowledge-economy dedicated urban development on different city scales. In this context, one has to holistically think about consequences of social segregation for the society of a city and its potential enhancement by the built environment.

The outlined, potential geographic transferability of competitiveness and attractiveness as major prerequisites to increase the significance of cities in the World City Network needs to be verified in Western-European cities during the proposed future research project.

### 6.1.3  Integrated urban planning approach

As the research project on the Arabian Peninsula has shown, an integrated urban planning approach is a necessary lever to create attractiveness in cities, since the quality of urban space can add a lot of value to transform cities to more attractive places. The three main parts of an integrated urban planning approach – as implicitly identified in interviews with main urban planning representatives and through on-site observations of urban spaces on the Arabian Peninsula – are:

1. An integrated urban development vision and strategy

2. A local planning governance ensuring integrated urban development

3. A complementary strategy and governance on a regional level to integrate local urban developments on a larger scale (see figure 60)
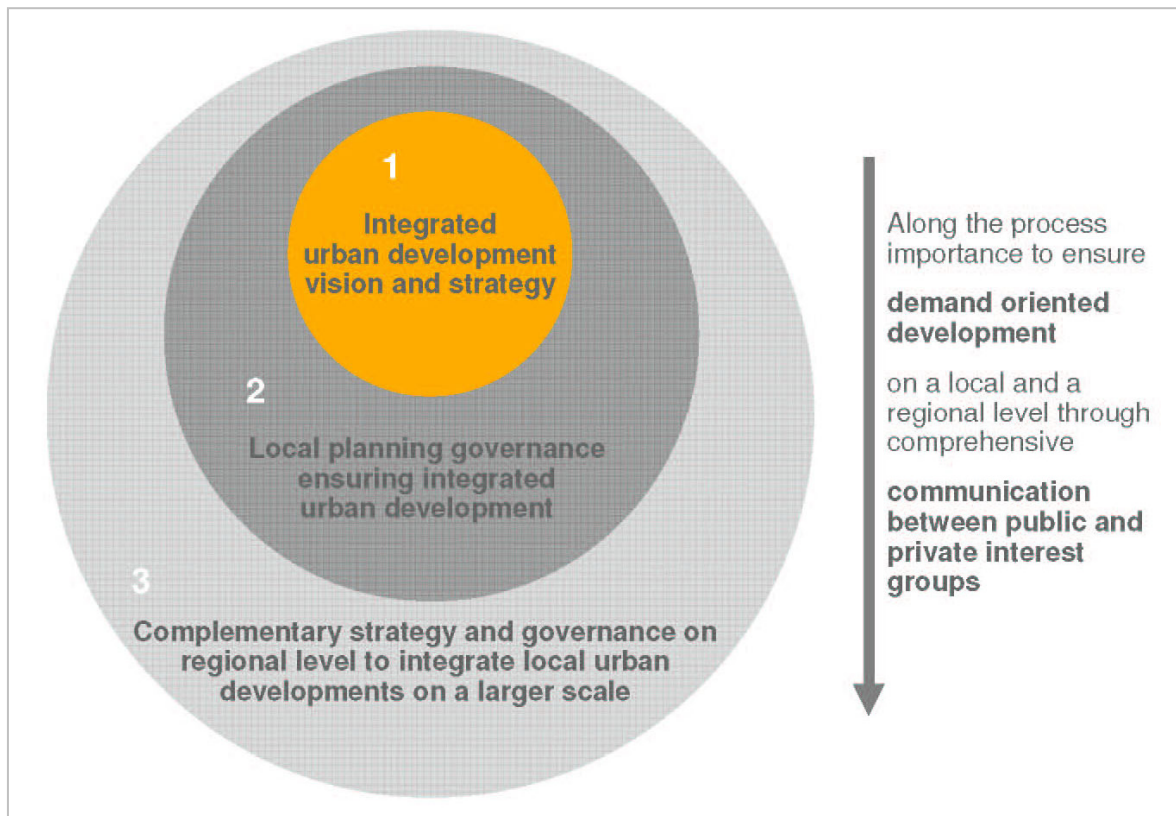


Figure 60: Three steps to an integrated urban planning approach – Source: Own illustration

Referring to point number one, urban planning authorities are asked to pro-actively develop a clear urban vision. Based on that vision the need for a sustainable city development strategy has been observable. As we have seen in the case of emerging cities on the Arabian Peninsula, the missing vision and strategy for urban development on an overarching city scale has contributed to the currently perceived disconnection between city district developments. Challenges on an overarching city scale faced by all case-study cities underline the importance of an upfront urban planning vision and strategy.

As the second point indicates, the local planning governance needs to ensure the implementation of the integrated urban development vision and strategy in order to

guarantee a sustainable urban development. In the case of our observed emerging cities on the Arabian Peninsula, separate independent urban developers are in charge of planning and implementing city district developments in parallel. These development companies in the case of knowledge economy dedicated urban districts implicitly reflect the requirements of KIE firms and workers. Even though this has mainly worked out on a city district scale, the integration of city districts into the overarching city structure is not managed well since an overarching urban vision and strategy is not ensured by a local planning governance. In addition, the main stakeholders for the end-use of the respective city districts are so far not involved in the urban planning process. Thus, the requirement for a local governance in charge of controlling the implementation of an overarching integrated urban development strategy is a strong requirement for future urban development. In addition the local planning governance needs to make sure to explicitly capture the needs of the different stakeholders

With regards to the third point, it is important to recognize that strategy and governance on a regional level needs to integrate local urban developments on a larger scale, while relating to the functional network connectivity between cities. A previously introduced example helps to understand the third point more clearly. The online survey outcome of the research project on the Arabian Peninsula has shown that on a regional level Dubai is strongly connected to Abu Dhabi. Nevertheless, there is no governance body in place, to develop urban and regional planning strategies for both cities commonly. This leads to the peculiar situation that both cities create urban development projects, which often rather compete with each other rather than complement themselves (see also chapter 5.3.3). Island developments, formula one race courses, and airport developments are just some examples of parallel, similar urban developments, which might benefit from a joint planning approach. Even though these projects with similar focus are belonging to the two different emirates of Dubai and Abu Dhabi, they are sometimes only a few miles apart from each other, since both emirates are adjacent to each other.

The potential applicability of the outlined integrated urban planning approach for Western-European cities needs to be verified in a future research project. The

objective of the future research project is to test the applicability of learnings for Western-European cities from the above mentioned findings on the Arabian Peninsula. Therefore, the proposed central research question for the follow-up research project is suggested to be the following:

***Can Western-European cities and functional urban areas learn from local urban spaces in a global knowledge economy context, which have recently been developed in emerging cities on the Arabian Peninsula?***

To answer this central research question we need to first delve into the theoretical background of the topic. A work plan for a potential future research project is sketched out below.

## 6.2 Theoretical background on Western-European urban development in the knowledge economy context

To outline the proposed future research project, it is necessary to understand the theoretical background of research about the local urban development of Western European cities in a global knowledge economy context. In general, one has to admit that literature related to Western-European cities is quite weak in the specific intersection of relational geography and urban development.

In general, the separate research fields of relational geography and urban development in an economic context have been introduced theoretically in chapter 2 for the purpose of the empirical research project on the Arabian Peninsula. However, there is also some literature from Western-European authors, which cover the topic of urban development in a knowledge economy context, exemplifying city developments in a knowledge economy context in Western developed nation states. Some examples for such literature are mentioned below. However, empirical research in this specific field only exists either with a focus on specific knowledge economy locations or specific industry sectors.

Thus, Taylor et al. elaborate on the relevance of geographic proximity factors, exemplified by the financial services cluster in London (Taylor et al., 2003). The continuing importance of clustering despite associated costs in highly centralized

spaces is outlined. Besides other factors, transport and regulation are identified as key policy areas, where businesses see a threat to London. Results of the study are based on 310 postal questionnaire surveys and 39 interviews with managers from selected APS sectors.

König et al. have conducted a comparable study about the "Finance Cluster Frankfurt". Besides outlining the network structures of financial service firms regionally and internationally, the study elaborates on the relevance of locally available urban functions like infrastructural facilities and research institutes for the analyzed financial service sectors (König et. al., 2007).

The previously mentioned publications approach the KIE-dedicated locations from a knowledge-based geographical perspective, without really deep-diving into the morphological urban space qualities of KIE agglomerations in London and Frankfurt. The "perceived" and "planned" elements of urban space are omitted. The latter elements are rather captured by the publication "Campus and the City" which is a collection of 30 short profiles of designed city districts "for the knowledge society" scattered across Western developed nation states (Hoeger et al., 2007).

None of the mentioned publications provide a holistic empirical study to fully unfold the interdependence of both, global, relational geography and local, urban development in a knowledge economy context. In addition the studies do not elaborate on different urban space-scale. However, this is important, if we take into account the experienced differences in urban space quality on an overarching city versus a city district scale in emerging cities on the Arabian Peninsula.

Due to the mentioned gaps in scientific research, it remains an objective for future research to fully grasp, whether any empirical studies related to the above described interdependence have been conducted outside the scientific landscape for practical purpose in Western-Europe. In particular, it needs to be explored, whether any knowledge about KIE city selection criteria and requirements regarding urban space has been gained in the case of Western-European KIE agglomerations. With respect to that, an initial evaluation of three German KIE agglomerations has been undertaken through three interviews with the responsible planning authorities of the respective districts.

## 6.3    Three German case-examples of knowledge economy focused urban development

Interviews with representatives from either the urban planning authorities or the operating companies of the following three German urban development examples with a knowledge economy focus have helped to understand any potential insights gained in praxis about KIE requirements with regards to city selection criteria and urban space qualities:

- "City of Science, Technology and Media" in Berlin-Adlershof

- "Medienhafen" in Düsseldorf

- "Park Up Mediencluster" in Munich-Unterföhring



Figure 61: From left to right: "City of Science, Technology and Media" in Berlin-Adlershof, "Medienhafen" in Düsseldorf, "Park Up Mediencluster" in Munich-Unterföhring
Source: Internet

All described knowledge economy focused urban developments implicitly try to reflect certain requirements of KIE firms with regards to the overarching location selection criteria and local urban space qualities. However, interviews with local planning authorities of the outlined German developments have shown that none of the urban developments have been based on explicit knowledge about these KIE requirements. Thus, the responsible planning authorities and operating companies have not undertaken any surveys or interviews with KIE firms, before the knowledge economy focused urban districts were developed and built.

The selection of the three German case-examples is not based on a scientific set of criteria. Thus, the author is conscious of the limited transferability of the presented evaluation, which certainly only allows limited conclusions. Nevertheless, these urban developments are chosen as quite commonly familiar arising knowledge economy agglomerations in Germany. Their initial analysis

should provide explorative insights. A deep dive analysis of scientifically selected knowledge economy agglomerations in Western-Europe has to follow in the course of the planned, future research project. A series of three interviews with representatives of the respective urban developments in Germany discloses general information about the urban development of all above mentioned KIE-dedicated city districts. In addition, initial hints are gained on the explicit or implicit knowledge about KIE location selection criteria and requirements with regards to urban space qualities (for interview guideline see appendix 4).

All KIE agglomerations are located close to or within the city borders of different major German cities: "City of Science, Technology and Media" in Berlin-Adlershof lies approximately 15 kilometers away from the city center of Berlin and roughly five kilometers away from the international airport in Berlin-Schönefeld. The "Medienhafen" (media harbor) lies directly in the core of the city of Düsseldorf (approximately two kilometers away from the city center) and roughly 10 kilometers away from the international airport in Düsseldorf. The "Park Up Mediencluster" in Munich-Unterföhring is located approximately 10 kilometers away from the Munich city center and 25 kilometers away from the Munich international airport. Due to the overarching, small size of Düsseldorf (approximately 600 thousand inhabitants compared to 3.4 million inhabitants in Berlin and 1.3 million inhabitants in Munich) companies located in the "Medienhafen" have close access to all major inner-city facilities of Düsseldorf. This is different in the case of the KIE agglomerations in Berlin-Adlershof and Munich-Unterföhring, which are situated at the edge of the cities of Berlin and Munich in between the city centers and international airports adjacent to the respective cities.

All three KIE agglomerations differ in size. In terms of total number of hosted firms, the "Medienhafen" in Düsseldorf with around 700 firms is the largest KIE agglomeration. In terms of total number of employees, the "Park Up Mediencluster" in München-Unterföhring is the largest cluster with around 14.000 employees (see table 9).

Both, the "City of Science, Technology and Media" in Berlin-Adlershof as well as the "Medienhafen" in Düsseldorf host a rather large range of KIE firm sectors and

urban functions. Furthermore, both developments have reused and restructured already built up urban spaces with a formerly different use. Berlin-Adlershof was originally an airfield. Later on, it hosted the "German Academy of Science". After the German re-unification in 1991, the district was actively launched and promoted as a "City of Science, Technology and Media", integrating living, working, shopping and leisure facilities. The development was consciously planned to boost the economic development.

| | Berlin - Adlershof | Düsseldorf | Munich - Unterföhring |
|---|---|---|---|
| Name of urban development | City of Science, Technology and Media | Medienhafen | Park up Mediencluster |
| Operating company in place | Yes | Yes | No |
| Name of operating company | WISTA-Management GmbH | Medienbüro Rohland | - |
| Webpage of KE cluster | www.adlershof.de | www.medienhafen.de | - |
| Start of knowledge economy dedicated urban development on site (start of operation) | 1991 | 1982 | 1972 |
| Number of total firms (status April 2008) | 410 (Apr. 2009) | 709 (Dec. 2008) | 450 (May 2009) |
| Number of people working for total number of firms (status April 2008) | 4775 (Apr. 2009) | 8250 (Dec. 2008) | 14.000 (May 2009) |
| Main knowledge economy sectors | Media, Information Technology, Biotechnology, Optical Technologies, Microsystem Technologies | Media, Advertising, Information Technology, Consulting, Architecture, Financial Institutions | Media, Insurance |

Table 9: Exemplary German KIE agglomerations – Source: Interviews

The "Medienhafen" in Düsseldorf is – as the name discloses – a former harbor. In 1974, it was declared as a mixed use area (including business utilizations). Different from the case of Berlin-Adlershof, the development of the "Medienhafen" as a knowledge-economy dedicated city district was based on a demand-driven

process, since many KIE firms have actively sought to establish a business in the advantageous inner-city location.

The "Park Up Mediencluster" in Munich-Unterföhring at the moment only consists of media and insurance companies. Some restaurants and coffee shops are located on site. However no other major urban functions related to living, shopping or leisure and recreation are integrated in the development. Different from the KIE agglomerations in Berlin and Düsseldorf, which reuse already tilled areas, the "Park Up Mediencluster" in Munich-Unterföhring is built upon former farmland. The accumulation of KIE firms on site has been mainly a demand-driven process, fostered by fast urban development processes and building leases by the responsible authorities in Unterföhring and a good local road and transport infrastructure connecting the site to the city and the international airport of Munich.

All described knowledge economy focused urban developments certainly reflect implicitly one or the other requirement of KIE firms with regards to overarching location selection criteria and local urban space qualities. Thus, interviewees have disclosed the intentional implementation of certain facilities and qualities which were thought to attract KIE firms. These include the closeness to the city center or the international airport, the offered mix of urban functions or the architectural design focus on knowledge exchange between people. However, the interviews with local planning authorities of the outlined German developments have shown that none of the urban developments is based on explicit knowledge about these KIE requirements. This means that no surveys or interviews with KIE firms were undertaken before the knowledge economy focused urban districts were developed and built.

Given the outlined gap of empirical insights about KIE requirements with regards to city location selection criteria and urban space qualities in Western-European theory and praxis, it certainly makes sense to proof in detail the transferability of empirically based learnings with regards to KIE focused urban developments from case-study cities on the Arabian Peninsula to Western-Europe and other geographic locations.

## 6.4 Future research on learnings for Western-European cities – a work plan

As outlined above, the research project on the Arabian Peninsula delivered potential learning areas, which should be verified and tested in a future research piece in Western Europe. For this purpose, the following sections will describe a work plan for a potential future research project. The work plan contains four main work steps.

**Work step 1:** Exhaustive inquiry of existing expertise

The preceding chapter 6.2 presented a rough overview of the theoretical background on local urban development in a global knowledge economy context with a geographic focus on Western Europe. In work step 1 this initial rough overview needs to be extended by an exhaustive literature search to fully grasp the existing expertise and background of the topic. In addition, the research question and the objects of investigation need to be clearly set and defined. The available scientific and non-scientific background information and research material need to be collected and screened. Selected Western-European urban developments with a knowledge economy focus require a similar analysis as the above described three German case examples. This is important to fully understand whether any additional non-scientific implicit or explicit insights about the intersection of non-physical and physical spatial development is available.

Besides these content-related investigations of existing material, work step 1 should also define the planned methodological approach for the future research project in Western-Europe. Before we can draw lessons learned for Western Europe, we need to ensure the comparability of empirical research results via applying a similar empirical research in Western European cities as done on the Arabian Peninsula. Since the research triangulation used as methodological approach on the Arabian Peninsula has proven to be a valuable tool for the analysis of local urban space in a global knowledge economy context, the reuse of the research triangulation is highly recommended for future research in Western Europe. In this way data from the Arabian Peninsula and Western Europe can be

directly compared and the global applicability of learnings from the Arabian
Peninsula can be tested.

Work step 1 also contains the definition of criteria for the selection of case-study
cities, city districts and neighborhoods. The reuse of the major selection criteria
which were applied in the research project on the Arabian Peninsula is again
recommended. Table 10 shows the applicable analysis types and the used
selection criteria for the respective location scales.

| Location scale | Applicable analysis | Selection criteria |
|---|---|---|
| City | • Functional connectivity degree (globally and regionally)<br>• Satisfaction of knowledge economy with city<br>• Urban development over time | • Static global city network connectivity<br>• Dynamic global city network connectivity<br>• Favorability of location-specific development forces<br>• Differing institutional context (nation state) |
| City district | • Knowledge economy cluster location and size<br>• Satisfaction of knowledge economy with city district | • Largest knowledge economy accumulation in the respective city |
| Neighborhood | • Photographic observation<br>• Behavioral mapping | • Public, open spaces of a specific size<br>• Selected perspective should capture an average flavor of the respective city district<br>• Special characteristics of the city district should be observable<br>• Frequent use by KIE employees |

Table 10: Applicable analysis types and selection criteria for the respective scales of urban space
Source: Own illustration

Furthermore, the criteria to evaluate the respective urban spaces on different
scales need to be defined in work step 1. Distance, functionality and process
should be used as key defining dimensions of urban space like in the preceding
research project on the Arabian Peninsula. The satisfaction of knowledge economy
firms with urban space can again be defined and qualitatively measured by
comparing the final outcome of knowledge economy requirements regarding urban
space and the actual urban space.

**Work step 2:** Preliminary investigation and declaration of hypotheses

On the basis of an exhaustive investigation on the existing basic material and information in work step 1, the next step covers the selection of the respective case-study cities in Western Europe based on the above mentioned criteria. The case-study cities should have certain characteristics in common (high static and dynamic global city network connectivity and favorable location-specific development forces). However, especially with regards to the institutional context, the selection should cover cities from different Western European nation states, to take into account their broad range of political and constitutional backgrounds. A rough inquisition of all case-study cities can help to create initial portraits of the respective cities including their potential knowledge economy accumulations. This preparatory work will support the final part of work step 2: The declaration of initial research hypotheses.

**Work step 3:** Data gathering and comparison of Arab and Western-European results

In work step 3 the method triangulation is conducted in the selected Western-European case-study cities. Method triangulation part 1 (online survey and interviews with KIE) leads to the identification of knowledge economy agglomerations in the respective case-study cities. Furthermore, the requirements of European knowledge economy firms and workers regarding global location factors and local urban space are assessed. The urban qualities of the knowledge economy agglomerations identified in method triangulation part one and their neighborhoods can be evaluated in part two (photographic on-site observation and behavioral mapping). Method triangulation part three (graphical urban structure analysis over time and urban planner interviews) helps to understand urban planning principles of knowledge economy dedicated urban districts in Europe.

After successful and exhaustive data gathering in all European case-study cities the results of the method triangulation on the Arabian Peninsula and in Western European cities are to be compared. The comparison should focus on the following

three guiding questions related to the initially introduced, potential learnings from emerging cities on the Arabian Peninsula:

- Do Western-European cities and functional urban areas confirm a coherence of non-physical, functional networks and physical, urban development?

- Do knowledge economy firms in Western Europe also consider global competitiveness and attractiveness as major prerequisites to increase the significance of a city in the World City Network? And which qualities of urban space required by the knowledge economy do Western-European cities show in comparison to cities on the Arabian Peninsula?

- What are the key features of an integrated urban and regional planning approach in Western Europe creating long-term attractiveness of cities and functional urban areas?

The questions can be answered by synthesizing the results from the empirical data analysis in Western Europe and comparing them with data points from the method triangulation results of emerging cities on the Arabian Peninsula.


**Work step 4:** Conclusions

In the final work step, the lessons learnt need to be outlined for Western European cities. Western European cities might learn from emerging cities on the Arabian Peninsula, either in the context of positive or negative experiences there. Talking about urban space, emerging cities on the Arabian Peninsula on the positive side have shown a rather high quality of knowledge economy dedicated city districts (e.g., clustering of knowledge economy firms, high density and functional diversity), while on the negative side the quality of the overarching city structure often had certain shortcomings (e.g., disconnected city district developments, missing public transportation system, lack of leisure and recreation facilities). Both of these insights can create certain lessons learned for Western European cities, if the knowledge economy requirements regarding urban space prove to be globally comparable.

# 7  Résumé and research outlook

In today´s context of an international competition between geographic locations, many cities continuously think about ways of how to sustain and extend their attractiveness for globally operating knowledge economies. The present research project has shown that emerging cities on the Arabian Peninsula have recently managed to gain a high global significance in the non-physical, functional knowledge economy networks in a very rapid timeframe. The geo-strategic hub position of these cities in between rising economies in Asia and traditional centers of economic growth in Europe and North-America has influenced this rapid increase of significance. Cities on the Arabian Peninsula display a certain hierarchy with regards to their global and regional position in the knowledge economy context. Currently, Dubai plays a pre-eminent role compared to other cities on the Arabian Peninsula like Manama and Doha.

All observed emerging cities on the Arabian Peninsula have confirmed a general interdependence of non-physical, functional networks and physical, urban space. The grown significance of emerging cities within non-physical, functional networks has a large impact on the development of morphological, urban space and vice versa: Globally visible, KIE-dedicated city districts develop, as the demand for such spaces increases with the relevance of cities in the knowledge economy context. These urban spaces besides economies of scale and scope contribute to the global competitiveness and attractiveness of emerging cities for KIE firms. The observed urban spaces at and around business building locations fulfill the requirements of KIE firms.

However, emerging cities on the Arabian Peninsula also have urban space deficits which are especially visible on an overarching city scale: 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 case study cities on the Arabian Peninsula. As outlined above, Dubai has currently the highest significance in global and regional knowledge economy networks, but at the same time it faces the largest challenge with regards to reshaping its overarching wide-spread city

structure. An integrated urban and regional planning approach is seen to be a key requirement in responding to the deficits in a proper way.

These summarized, high-level results have been gained through the present research project by applying a newly introduced method triangulation: The combination of three methodological categories related to the "lived", "perceived" and "conceived" urban space (Lefebvre, 1991) has proven to be a successful way to test hypotheses from various viewing angles on different spatial scales. Through this multi-layered perspective the research project has been able to describe the complexity of local urban space in a global knowledge economy context.

While this paper has certainly disclosed many insights about urban development from an economical and partly ecological, macro-urban perspective, one should not forget the social aspects within emerging cities on the Arabian Peninsula. Saskia Sassen wrote about the dualism of global cities (Sassen; 2001) : Rich and prosperous knowledge society lives next to the poor working class. Certainly this dualism is also present in emerging cities on the Arabian Peninsula. Our study has not investigated the implications of spatial transformation in the knowledge economy context for social sustainability. This is a necessary field of further exploration for future research projects.

In addition, the present research project has outlined a work plan for future research which should test the geographical transferability of potential learnings gained on the Arabian Peninsula to so-called developed regions like Western Europe. The final outcome of the present, but also the outlined additional research areas are 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 and other parts of the world.

# Appendix 1: KIE online survey – Arabian Peninsula

## Survey with knowledge-intensive economy representatives (1/16)

**Thank you for participating in this survey!**

Background
This survey is launched by the Institute for Spatial and Territorial Development at Munich University of Technology. The objective is to investigate the location requirements and the use of urban space by knowledge-intensive economies in emerging cities of the Arabian Peninsula. These businesses play a major role for the competitiveness of urban and regional economic systems.

Effort
The survey consists of three parts and can be answered in 5-10 minutes.

Reward
Of all the completed surveys one repondent will be chosen at random to win a new iPod. Furthermore you will receive a summary of the survey results, providing you with valuable insights about strategic company decisions.

Confidentiality
Your answers are treated strictly confidential. The survey data will only be published in aggregated form. Therefore inferences to your business or your person are not possible.

Procedure
You can complete this survey directly via the internet. If you would like further information regarding this research project please contact Dipl.-Ing. Elisabeth Schein (schein@raumentwicklung.ar.tum.de).

6%

Next >>

## Survey with knowledge-intensive economy representatives (2/16)

**Survey part I: Company information - 1/5: Company focus**

\* Question I/1: What is the focus of the company you are working for?

- Accounting
- Insurance
- Advertisement and media
- Design and architecture
- Legal advisory
- Banking and financial institutions
- Management- and IT-consulting
- Logistics
- Other (please specify)

- Chemistry, biotechnology and pharma industry
- Mechanical engineering
- Hardware
- Electrical engineering
- Broadcast and communications engineering
- Medical technology, optics and clocks
- Vehicle construction
- Petroleum industry

12%

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## Survey with knowledge-intensive economy representatives (3/16)

**Survey part I: Company information - 2/5: Your company subsidy**

\* Question I/2a: In which city is the company subsidiary you are working for located?

- ◯ Dubai (UAE)
- ◯ Doha (Qatar)
- ◯ Manama (Bahrain)
- ◯ Other (please specify)

\* Question I/2b: How many years ago did your company establish its subsidiary in this city? (Please enter a rounded whole number)

\* Question I/2c: How many people do currently work for this company subsidiary? (Please estimate, if you do not know the exact number)

\* Question I/2d: What is your company´s country of origin?

19%

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## Survey with knowledge-intensive economy representatives (4/16)

**Survey part I: Company information - 3/5: Other locations on the Arabian Peninsula**

\* Question I/3: In which of the following cities on the Arabian Peninsula does your firm have subsidiaries? (please also highlight the firm subsidiary you are working for)

- ☐ Dubai (UAE)
- ☐ Abu Dhabi (UAE)
- ☐ Doha (Qatar)
- ☐ Manama (Bahrain)
- ☐ Ryiadh (Saudi Arabia)
- ☐ Jeddah (Saudi Arabia)
- ☐ Dammam-Khobar-Dhahran (Saudi Arabia)
- ☐ Kuwait City (Kuwait)
- ☐ Sanaa (Yemen)
- ☐ Muscat (Oman)
- ☐ Other cities on the Arabian Peninsula (in UAE, Qatar, Bahrain, Kuwait, Saudi Arabia, Yemen, Oman) like

25%

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175

## Survey with knowledge-intensive economy representatives (5/16)

**Survey part I: Company information - 4/5: Other locations on continents**

✱ Question I/4: In how many other cities does your firm have further subsidiaries on the below mentioned continents? (please do not consider the company subsidiaries on the Arabian Peninsula in your answer and please estimate, if you do not know the exact number)

Europe

Africa

Asia

Australia

North America

South America

31%

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## Survey with knowledge-intensive economy representatives (6/16)

**Survey part I: Company information - 5/5: Involvement in spatial planning process**

✱ Question I/5a: Has your company bought or rented the business building you currently work in?

- Bought
- Rented
- Do not know

Other (please specify)

✱ Question I/5b: Was your company involved in the architectural and urban planning process when your current company location was developed?

- The company was neither involved in the architectural nor in the urban planning process - the company bought/rented the business building after it had been built
- The company was involved in the architectural planning process of the business building, but not in the urban planning process of the company location and surroundings
- The company was involved in the architectural planning process of the business building as well as the urban planning process of the company location and surroundings
- Do not know

Other (please specify)

✱ Question I/5c: Would you have liked to be more involved in urban planning processes at and around your company´s location?

- Yes
- No
- Do not know

38%

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176

## Survey with knowledge-intensive economy representatives (7/16)

**Survey part II: Location selection criteria - 1/4: Geo-strategic position**

✳ Question II/1: When choosing the city for your company subsidiary, how important were the following criteria to you? (Please rate the criteria from "not important at all" to "very important")

| | Not important at all | Not important | Somewhat important | Important | Very important | Do not know |
|---|---|---|---|---|---|---|
| Availability of important international seaport hub | ○ | ○ | ○ | ○ | ○ | ○ |
| Availability of important international airport hub | ○ | ○ | ○ | ○ | ○ | ○ |
| Availability of important international train or bus stations | ○ | ○ | ○ | ○ | ○ | ○ |
| Availability of important international road network intersections | ○ | ○ | ○ | ○ | ○ | ○ |
| Well functioning car traffic (no traffic jams) | ○ | ○ | ○ | ○ | ○ | ○ |
| Availability of low-cost natural resources (e.g., water, fuel) | ○ | ○ | ○ | ○ | ○ | ○ |
| Favorable climatic conditions | ○ | ○ | ○ | ○ | ○ | ○ |

Other (please specify)

44%

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## Survey with knowledge-intensive economy representatives (8/16)

**Survey part II: Location selection criteria - 2/4: Politics, law and regulation**

✳ Question II/2: When choosing the city for your company subsidiary, how important were the following criteria to you? (Please rate the criteria from "not important at all" to "very important")

| | Not important at all | Not important | Somewhat important | Important | Very important | Do not know |
|---|---|---|---|---|---|---|
| Favorable political climate and stability | ○ | ○ | ○ | ○ | ○ | ○ |
| Employer-friendly labor laws and regulation | ○ | ○ | ○ | ○ | ○ | ○ |
| High quality of utilities (e.g., energy supply, waste disposal) | ○ | ○ | ○ | ○ | ○ | ○ |
| Low taxes / other duties and high financial subsidies | ○ | ○ | ○ | ○ | ○ | ○ |
| Ease of market entry for foreign companies and people (e.g., low level of bureaucracy, free-zones / free-hold areas) | ○ | ○ | ○ | ○ | ○ | ○ |
| Low degree of environmental obligations for companies | ○ | ○ | ○ | ○ | ○ | ○ |
| Well developed environmental protection policy | ○ | ○ | ○ | ○ | ○ | ○ |

Other (please specify)

50%

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## Survey with knowledge-intensive economy representatives (9/16)

**Survey part II: Location selection criteria - 3/4: Financial and economic conditions**

✳ Question III/3: When choosing the city for your company subsidiary, how important were the following criteria to you? (Please rate the criteria from "not important at all" to "very important")

| | Not important at all | Not important | Somewhat important | Important | Very important | Do not know |
|---|---|---|---|---|---|---|
| Economical stability and growth | ○ | ○ | ○ | ○ | ○ | ○ |
| Access to economic associations and company networks | ○ | ○ | ○ | ○ | ○ | ○ |
| Low degree of competition and high market transparency | ○ | ○ | ○ | ○ | ○ | ○ |
| Favorable size and access to supply markets | ○ | ○ | ○ | ○ | ○ | ○ |
| Favorable size and access to delivery markets | ○ | ○ | ○ | ○ | ○ | ○ |
| Availability of qualified work force at low cost | ○ | ○ | ○ | ○ | ○ | ○ |
| Availability of high quality real estate at comparably low acquisition/lease cost | ○ | ○ | ○ | ○ | ○ | ○ |

Other (please specify)

56%

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## Survey with knowledge-intensive economy representatives (10/16)

**Survey part II: Location selection criteria - 4/4: Society and culture**

✳ Question III/4: When choosing the city for your company subsidiary, how important were the following criteria to you? (Please rate the criteria from "not important at all" to "very important")

| | Not important at all | Not important | Somewhat important | Important | Very important | Do not know |
|---|---|---|---|---|---|---|
| Favorable social climate and stability | ○ | ○ | ○ | ○ | ○ | ○ |
| High prestige of location (good image of location) | ○ | ○ | ○ | ○ | ○ | ○ |
| Availability of high quality living and health care facilities at comparably low cost | ○ | ○ | ○ | ○ | ○ | ○ |
| Availability of high quality leisure and recreation facilities at comparably low cost | ○ | ○ | ○ | ○ | ○ | ○ |
| Availability of high quality education facilities and education level (incl. English commonly spoken) | ○ | ○ | ○ | ○ | ○ | ○ |
| Closeness to social connections (e.g., family) | ○ | ○ | ○ | ○ | ○ | ○ |
| Availability of qualitative and unfiltered communication networks | ○ | ○ | ○ | ○ | ○ | ○ |

Other (please specify)

62%

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## Survey with knowledge-intensive economy representatives (11/16)

**TECHNISCHE UNIVERSITÄT MÜNCHEN**

**Survey part III: Business building location - 1/5: Importance of proximity to facilities**

\* Question III/1a: When choosing the current business building for your company, how important was proximity to the following logistical facilities for you? (Please rate the answers from "not important at all" to "very important")

| | Not important at all | Not important | Somewhat important | Important | Very important | Do not know |
|---|---|---|---|---|---|---|
| International seaport | ○ | ○ | ○ | ○ | ○ | ○ |
| International airport | ○ | ○ | ○ | ○ | ○ | ○ |
| Important train / bus stations | ○ | ○ | ○ | ○ | ○ | ○ |
| Important city road network intersections / streets | ○ | ○ | ○ | ○ | ○ | ○ |
| Car parking facilities | ○ | ○ | ○ | ○ | ○ | ○ |
| Historical center of the city | ○ | ○ | ○ | ○ | ○ | ○ |

Other (please specify)

\* Question III/1b: When choosing the current business building for your company, how important was proximity to the following living and health care facilities for you? (Please rate the answers from "not important at all" to "very important")

| | Not important at all | Not important | Somewhat important | Important | Very important | Do not know |
|---|---|---|---|---|---|---|
| Housing - Apartment buildings | ○ | ○ | ○ | ○ | ○ | ○ |
| Housing - One family houses | ○ | ○ | ○ | ○ | ○ | ○ |
| Hotels / hostels | ○ | ○ | ○ | ○ | ○ | ○ |
| Hospitals | ○ | ○ | ○ | ○ | ○ | ○ |
| Doctor's practices | ○ | ○ | ○ | ○ | ○ | ○ |

Other (please specify)

69%

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## Survey with knowledge-intensive economy representatives (12/16)

**TECHNISCHE UNIVERSITÄT MÜNCHEN**

**Survey part III: Business building location - 2/5: Importance of proximity to facilities**

\* Question III/2a: When choosing the current business building for your company, how important was proximity to the following leisure and recreation facilities for you? (Please rate the answers from "not important at all" to "very important")

| | Not important at all | Not important | Somewhat important | Important | Very important | Do not know |
|---|---|---|---|---|---|---|
| Shopping facilities | ○ | ○ | ○ | ○ | ○ | ○ |
| Indoor culture / leisure facilities, excluding shopping (e.g., museum) | ○ | ○ | ○ | ○ | ○ | ○ |
| Outdoor culture / leisure facilities (e.g., park, beach) | ○ | ○ | ○ | ○ | ○ | ○ |
| Restaurants / bars | ○ | ○ | ○ | ○ | ○ | ○ |

Other (please specify)

\* Question III/2b: When choosing the current business building for your company, how important was proximity to the following working facilities for you? (Please rate the answers from "not important at all" to "very important")

| | Not important at all | Not important | Somewhat important | Important | Very important | Do not know |
|---|---|---|---|---|---|---|
| Research and higher education facilities | ○ | ○ | ○ | ○ | ○ | ○ |
| Schools | ○ | ○ | ○ | ○ | ○ | ○ |
| Companies of knowledge-intensive service economies | ○ | ○ | ○ | ○ | ○ | ○ |
| Companies of high tech economies | ○ | ○ | ○ | ○ | ○ | ○ |
| Companies of other industry sectors like... | ○ | ○ | ○ | ○ | ○ | ○ |

(Please specify the type of other industry sectors)

75%

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## Survey with knowledge-intensive economy representatives (13/16)

**Survey part III: Business building location - 3/5: Actual proximity to facilities**

Question III/3a: How close are the following facilities to your current business building?
(Please estimate air-line distance in kilometer. If answer choice is not applicable, please leave the respective line empty)

| | |
|---|---|
| International seaport | |
| International airport | |
| Important train or bus stations | |
| Important city road network intersections / streets | |
| Car parking facilities | |
| Historical center of the city | |

Question III/3b: How close are the following facilities to your current business building?
(Please estimate air-line distance in kilometer. If answer choice is not applicable, please leave the respective line empty)

| | |
|---|---|
| Housing - Apartment buildings | |
| Housing - One family houses | |
| Hotels / hostels | |
| Hospitals | |
| Doctor's practices | |

81%

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## Survey with knowledge-intensive economy representatives (14/16)

**Survey part III: Business building location - 4/5: Actual proximity to facilities**

Question III/4a: How close are the following facilities to your current business building?
(Please estimate air-line distance in kilometer. If answer choice is not applicable, please leave the respective line empty)

| | |
|---|---|
| Shopping facilities | |
| Indoor culture / leisure facilities, excluding shopping (e.g., museum) | |
| Outdoor culture / leisure facilities (e.g., park, beach) | |
| Restaurants / bars | |

Question III/4b: How close are the following facilities to your current business building?
(Please estimate air-line distance in kilometer. If answer choice is not applicable, please leave the respective line empty)

| | |
|---|---|
| Research and higher education facilities | |
| Schools | |
| Companies of knowledge-intensive service economies | |
| Companies of high tech economies | |
| Companies of other industry sectors | |

88%

<< Prev     Next >>

## Survey with knowledge-intensive economy representatives (15/16)

Survey part III: Business building location - 5/5: Required urban qualities

✳ Question III/5: What are the urban qualities and amenities, you would wish to have in the city of your company location?

94%

<< Prev    Next >>

## Survey with knowledge-intensive economy representatives (16/16)

Thank you for your participation in this survey!

The survey is now finished. For potential further clarifications we kindly ask you for the following optional information. The information below will also allow us, to take you into account for the raffle of the new iPod and the delivery of a survey summary. As soon as you close this page, your survey information will be saved in our system.

E-mail address

Phone number (incl. country code)

Street/road of business location

Borough/district of business location

Company role of respondent

Nationality of respondent

100%

<< Prev    Done >>

## Appendix 2: KIE interview guideline – Arabian Peninsula

## Introduction

- Thank you for your willingness to participate in this research project!
- Objective of research project: Analyzing the impact of growing knowledge-intensive economies (knowledge-intensive service companies, High-Tech companies) on urban space of emerging cities on the Arabian Peninsula
- Research project is conducted by the Institute for Spatial and Territorial Development (Prof. Dr. Alain Thierstein) at Munich University of Technology and supported by professors of several universities in the Arabian region (UAE University, University of Qatar, University of Bahrain)
- Duration of the interview: Approximately 45min to 1 hour
- Affirming the anonymity of the interview response, approval of agreement for interview tape recording

## Interviewee characteristics (if not yet answered in optional survey section)

- How long are you already working for this company subsidiary?
- What is your position / function within the company subsidiary?
- Where are you originally from? How long are you already in <case-study city>? How long are you currently planning to stay in <case-study city>? (another x years)

## Geostrategic company decisions

- Which role does the company subsidiary, which you are working at, play in comparison to other firm subsidiaries...
  - on the Arabian Peninsula?
  - on other continents of the world? (consider share of employees, type of firm subsidiary)
- Your survey answers show, that you have several subsidiaries on the Arabian Peninsula. Why does your company prefer to have several locations in this region instead of focusing on one mayor location? Would you consider the different subsidiaries on the Arabian Peninsula as being substitutive or complementary? If complementary, how exactly do the different subsidiaries complement each other? *Low specialization degree (each subsidiary fulfils all functions of the company value chain) vs. high specialization degree (each subsidiary fulfils only specific functions within the company value chain like customer service, distribution, marketing, production, research and development + cross sectoral subjects like HR, IT, operations)* OR:
- Your survey answers show, that you currently focus on one company location on the Arabian Peninsula. Is your company planning to expand to other locations on the Arabian Peninsula in the near future? (Please give reasons for your answer) If yes, which locations would that be?

## City location selection criteria

- According to the survey responses political, economical and social criteria in the city location selection process have been rated as slightly more important than geo-strategic criteria. Can you confirm this from your own company's perspective? What are the reasons for this trend from your perspective?
- Some specific sub-criteria of the above mentioned criteria for city location selection are rated as being specifically important compared to other sub-criteria (means: specific sub-criteria on average rated "important" to "very important"). These sub-criteria are...
  - Availability of 'important international airport hub'
  - Ease of market entry for foreign companies and people
  - Low taxes / other duties and high financial subsidies
  - Favorable political climate and stability
  - Economical stability and growth

Can you imagine reasons, why these sub-criteria are rated especially high?

Built on Sand? Emerging cities on the Arabian peninsula in the knowledge economy context
KIE Interview guideline – PhD thesis Elisabeth Schein – Tutor: Prof. Dr. Alain Thierstein, Munich University of Technology

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## Use of urban space - Distance and accessibility of urban functions

- According to the survey results for KIE the proximity of some specific urban functions to the business building location within a city seems to be especially important. Please mark your own business building location as well as these urban functions (if they are regularly used by you) with the respective number (as indicated below) in the map of <case-study city>

| Category | Urban function |
|---|---|
| Company location | - Own business building (0) |
| Housing and health care facilities | - Housing – One family houses (1)<br>- Housing – Apartments (2)<br>- Hotels/hostels (3)<br>- Hospitals (4)<br>- Doctor's practices (5) |
| Working and education facilities | - Companies of non KIE industry sectors (6)<br>- Other companies of knowledge-intensive service economies (e.g., financial institutions, consultants...) (7)<br>- Other companies of High Tech economies (8) |
| Leisure and recreation facilities | - Restaurants / bars (9) |
| Logistical and infrastructure facilities | - International airport (10)<br>- Important city road network intersections / streets (11)<br>- Car parking facilities (12) |

- From your perspective, what is theoretically the max. acceptable distance between your business location and these urban functions? How far is the actual distance?

- From your perspective, what is theoretically the max. acceptable time frame for going from your business building location to these urban functions (and vice versa)? How long does it actually take to go from your business building location to these urban functions?

- Looking at the above mentioned important urban functions do you miss any urban functions in the list, which you regularly visit before or after your stay in your business building location? If yes, which urban functions are these? *(also answer questions above for the newly mentioned urban function!)*

- How do you usually reach the above mentioned urban functions (incl. your business building location)? *(by car, by taxi, by public transportation means...)*

## Use of urban space – Functional diversity, morphology and urban density

*(Please talk about your own concrete experiences with urban space in the next section!)*

- We have talked about urban functions from 4 different categories (incl. its various sub-categories): Logistics and infrastructure, living and healthcare, leisure and entertainment, working and education. How important is for you a mix of the different urban functions...
  - Within walking distance around your business building location/home location?
  - Within <case-study city> as a whole?

- How far would you walk to reach another urban functions? *(in meters and in minutes)*

- How would you rate the actual degree of the mix of urban functions…
  - Within walking distance around your business building location/home location?
  - Within <case-study city> as a whole?

- How important is for you a high quality of urban morphology (sequence of streets and plazas, closed and open spaces)…
  - Within walking distance around your business building location/home location?
  - Within <case-study city> as a whole?

- How would you rate the actual quality of urban morphology…
  - Within walking distance around your business building location/home location?
  - Within <case-study city> as a whole?

- How would you define density in an urban setting?

- How does urban density have to be, to fulfill your quality requirements?

- How important is for you a high quality of urban density (as described by you) regarding buildings / inhabitants / people / experiences…
  - Within walking distance around your business building location/home location?
  - Within <case-study city> as a whole?

- How well does the urban density of buildings / inhabitants / people / experiences fulfil your requirements…
  - Within walking distance around your business building location/home location?
  - Within <case-study city> as a whole?

## Involvement in spatial planning processes

- Do you generally like living and working in <case-study city>? *Please give reasons for your answer!*
- Are there any other city locations on the Arabian Peninsula, which you would prefer for living and working?
- How would you rate the overall urban planning of <case-study city>? *Please rate from "very bad" (-5) to "very good" (5). Please give reasons for your answer!*
- Survey answers indicated, that knowledge economy firms would have liked to be more involved in urban planning processes at and around their company's location. Which parts of the urban planning would you have made differently, if you would have been more involved? Which parts of the urban planning are you generally quite satisfied with?
- Should the urban planning processes in <case-study city> be adjusted from your point of view, to fully reflect the requirements of knowledge-intensive economy firms? If yes, how?

- If you would have one wish, what would you change about the urban space in <case-study city>?

## Conclusions

- Are there any aspects, which we have not covered adequately during the interview from your point of view?
- Do you have any further comments or questions?
- Thank you for participating in this research project!

## Appendix 3: Planner interview guideline – Arabian Peninsula

Emerging cities on the Arabian Peninsula in the knowledge economy context
Planner interview guideline – PhD thesis Elisabeth Schein – Tutor: Prof. Dr. Alain Thierstein, Munich University of Technology

## Introduction

- Thank you for your willingness to participate in this research project!
- Objective of research project: Analyzing the impact of growing knowledge-intensive economies (knowledge-intensive service companies, High-Tech companies) on urban space of emerging cities on the Arabian Peninsula and vice versa.
- Research project is conducted by the Institute for Spatial and Territorial Development (Prof. Dr. Alain Thierstein) at Munich University of Technology and supported by professors of several universities in the Arabian region (UAE University, University of Qatar, University of Bahrain)
- Interviewee participation in the research project will be rewarded with a document showing the aggregated results of the research project from the three case-study cities Dubai, Doha and Manama
- Duration of the interview: Approximately 45min to 1 hour
- Affirming the anonymity of the interview response, approval of agreement for interview tape recording

## Interviewee characteristics

- How long are you already working for this company / institution?
- What is your position / function within the company / planning institution?
- How long are you already in <case-study city>?

## Planning organization and urban development view

- When was the company subsidiary / planning institution you are working for founded in <case-study city>?
- Which role does the company / institution play in the overarching urban development and planning organization in <case-study city>?
- Please elaborate on the planning organization in <case-study city>. What are key institutions on a governmental and private level in the organization structure?
- How satisfied are you with the urban development in <case-study city>?
  o Which effect does urban space in the overarching city of <case-study city> have on you? Please give reasons for your evaluation!
  o In General, what are the key characteristics of a well developed city from your point of view?

## Global attractiveness of city spaces for KIE

- Does attracting global KIE firms play a strategic role in current / future urban planning in <case-study city> on an overarching city scale / on a city district scale (e.g., DIFC, Qatar Financial Centre, Bahrain Financial Harbour)?
- How does <case-study city> differ from other cities on the Arabian Peninsula in this matter? *(please especially elaborate on Dubai/Doha/Manama)*
- What are the objectives of urban planning in the context of attracting and retaining KIE? (e.g., objectives regarding availability of city facilities of infrastructure, living and working facilities, recreation facilities ·· objectives regarding mix of urban functions, urban density, morphology etc.)
- What are the current means to reach these objectives? (regulatory conditions, construction laws, etc.)
- What are other major objectives of urban planning (not KIE related)?

## KIE business building location selection

- According to the survey responses the provision of city districts with economic and urban advantages (free zones) are internationally recognized means for attracting global KIE firms.
  How can the urban qualities of such city districts be described?
  Which effect does urban space in such city districts have on you? *(Please elaborate on DIFC, Qatar Financial Centre, Bahrain Financial Harbour)*

- What are from your point of view the major advantages and disadvantages of such city districts with global attractiveness for KIE?
- Was the accumulation of KIE firms in the outlined city districts originally intended by the urban planning companies and institutions who designed these city districts?

  If yes, why?

  *<Following questions needs to be asked, if urban planning company / institution was involved in urban planning of city districts with a KIE focus>*

- Your company / institution designed the city district <x>. What were the guiding planning objectives, when you designed this city district? (e.g., high facility, infrastructure and maintenance quality, international visibility of city districts through adequate marketing)
- Were KIE companies involved in the urban planning process of this city district? If yes, how?

### KIE requirements regarding urban space and actual urban space

*<The importance urban space criteria for KIE and the actual quality of urban space criteria were compared on a city district and an overarching city scale. The following questions are referring to the research results:>*

- The outcome of our survey with KIE firms in <case-study city> showed a fulfillment of KIE requirements regarding the outline of urban spaces (distance and functionality) on a city district scale.
  **1.** Have the articulated qualities on a city district scale been created intentionally?
  **2.** Can you describe in greater detail the urban planning process of the city districts which your company / institution planned?

- A major urban disadvantage of <case-study city> has been recognized in the connection of single city districts to the overarching city. A relatively low average building density across the city and a lack of public infrastructure connections are some of the articulated reasons. This is influencing the quality of living and the attractiveness of the city for knowledge workers.
  **1.** How did the described disadvantages on a city scale develop over time?
  **2.** Which major historic planning steps are responsible for todays described situation in urban space on a city scale?
  **3.** Are there any means and measures foreseen to eliminate the described disadvantages?

- KIE articulated their requirements regarding urban qualities and amenities in <case-study city>. Improvements of leisure facilities and infrastructure were named as most important areas to work on.
  Please elaborate on the articulated requirements from an urban planning perspective!
  What is done in urban planning, to answer these requirements in the future?

- KIE mostly reach their business building in <case-study city> by car.
  What are measures to minimize the current commuting traffic (e.g., new public transportation system, new road system etc.)?

- A sound mix of urban functions in walking distance around the business location has a high relevance for KIE firms.
  **1.** Is this requirement of KIE firms from your point of view answered by current and future urban developments and planning in <case-study city>?
  **2.** If yes, how?

* 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 building-density as well as the preference for stand-alone buildings of branches.

  1. Are these requirements of certain lines of KIE businesses from your point of view answered by current and future urban developments and planning in <case-study city>?

  2. If yes, how?

* KIE survey answers indicate that most KIE firms would have liked to be more involved in urban planning processes in <case-study city>.

  1. Is it foreseen in the future, to involve KIE in urban planning processes (e.g., by interviews/surveys regarding their urban requirements, sounding boards, workshops) on a city district / overarching city level?

  2. If yes, what are the means of involvement?

## Conclusions

* Are there any aspects, which we have not covered adequately during the interview from your point of view? Do you have any further comments or questions?

* Thank you for participating in this research project!

## Appendix 4: Planner interview guideline – Western Europe

**Guideline for interviews with representatives of recent urban developments with a knowledge economy focus in Germany**

*Urban development project: <insert respective name of urban development>*

0. Does the above mentioned urban development project have an official webpage?

1. When did the construction of the above mentioned urban development project start? And when did the first company move into the finalized buildings of the above mentioned urban development project?

2. How many firms are located in the above mentioned urban development project today (status April 2009)? How many people (full-time equivalents) do these firms employ in the above mentioned urban development project (status April 2009)?

3. How many media firms are located in the above mentioned urban development project (status April 2009)? How many people (full-time equivalents) do these media firms employ in the above mentioned urban development project (status April 2009)?

4. Did you restructure another tilled urban space which was originally differently used for the new use of the above mentioned urban development project?

5. Did you launch and promote the above mentioned urban development project actively as an urban district with a special knowledge economy focus? Or did firms from specific industry sectors by themselves cluster in the respective city district over time?

6. If you actively launched and promoted the above mentioned urban development project as an urban district with a special knowledge economy focus: In general, what were the reasons for launching and promoting an urban district with a special knowledge economy focus?

7. If you actively launched and promoted the above mentioned urban development project as an urban district with a special knowledge economy focus: What were the reasons for the location selection of the above mentioned urban development project?

8. In the planning phase of the above mentioned urban development project, did you try to create urban space which specifically addresses the requirements of knowledge-intensive economies? If yes, which criteria were relevant in this context? And which industry sectors were focused?

9. In current operations of the above mentioned urban development project, do you try to address the requirements of knowledge-intensive economies? If yes, how? And which industry sectors were focused?

10. From the early development phase until now, did anybody conduct a survey or any other empirical data collection with potential or actual knowledge economy firms from the above mentioned urban development project about

a) Firm requirements regarding global location factors

b) Firm requirements regarding urban space criteria

c) Firm satisfaction with urban space quality of the above mentioned urban development project?

If yes, is it possible to get access to the results of these studies?

11. Is there any further information besides the publicly accessible information material in the internet about the above mentioned urban development project?

# Appendix 5: Empirical research results - Global and regional connectivity values

| | Survey respondents Dubai | | Survey respondents Doha | | Survey respondents Manama | |
|---|---|---|---|---|---|---|
| | Amount | Percent | Amount | Percent | Amount | Percent |
| **Total number of KIE firms** | **106** | 100% | **55** | 100% | **52** | 100% |
| Total number of globally operating KIE firms | 82 | 77% | 43 | 78% | 45 | 87% |
| *- Thereof: Total number of globally operating KIE firms with* | | | | | | |
| *only one subsidiary in respective case-study city* | *38* | | *8* | | *18* | |
| Total number of only regionally operating KIE firms | 24 | 23% | 12 | 22% | 7 | 13% |
| | | | | | | |
| **Global connectivity degree** | | | | | | |
| **Total number of indicated global connectivities to respective continents** | | | | | | |
| Europe | 1242 | | 722 | | 730 | |
| North America | 1068 | | 326 | | 471 | |
| Asia | 942 | | 593 | | 679 | |
| South America | 445 | | 134 | | 469 | |
| Africa | 385 | | 246 | | 552 | |
| Australia | 183 | | 90 | | 181 | |
| | | | | | | |
| **Average number of indicated global connectivities to respective continents** | | | | | | |
| (Basis: Total number of globally operating KIE firms) | | | | | | |
| Europe | 15,1 | | 16,8 | | 16,2 | |
| North America | 13,0 | | 7,6 | | 10,5 | |
| Asia | 11,5 | | 13,8 | | 15,1 | |
| South America | 5,4 | | 3,1 | | 10,4 | |
| Africa | 4,7 | | 5,7 | | 12,3 | |
| Australia | 2,2 | | 2,1 | | 4,0 | |
| | | | | | | |
| **Regional connectivity degree** | | | | | | |
| **Total number of indicated regional connectivities to respective cities** | | | | | | |
| Dubai (UAE) | 106 | | 27 | | 19 | |
| Abu Dhabi (UAE) | 37 | | 14 | | 9 | |
| Ryiadh (Saudi Arabia) | 26 | | 15 | | 19 | |
| Doha (Qatar) | 28 | | 55 | | 11 | |
| Kuwait City (Kuwait) | 23 | | 15 | | 14 | |
| Manama (Bahrain) | 22 | | 19 | | 52 | |
| Jeddah (Saudi Arabia) | 18 | | 9 | | 8 | |
| Muscat (Oman) | 14 | | 14 | | 8 | |
| Dammam-Khobar-Dhahran (Saudi Arabia) | 7 | | 7 | | 6 | |
| Sanaa (Yemen) | 5 | | 3 | | 4 | |
| Other cities | 2 | | 2 | | 4 | |
| | | | | | | |
| **Regional connectivity degree to respective cities** | | | | | | |
| (Normalized figures based on total amount of survey responses from respective case-study cities) | | | | | | |
| Dubai (UAE) | 1,000 | | 0,491 | | 0,365 | |
| Abu Dhabi (UAE) | 0,349 | | 0,255 | | 0,173 | |
| Ryiadh (Saudi Arabia) | 0,245 | | 0,273 | | 0,365 | |
| Doha (Qatar) | 0,264 | | 1,000 | | 0,212 | |
| Kuwait City (Kuwait) | 0,217 | | 0,273 | | 0,269 | |
| Manama (Bahrain) | 0,208 | | 0,345 | | 1,000 | |
| Jeddah (Saudi Arabia) | 0,170 | | 0,164 | | 0,154 | |
| Muscat (Oman) | 0,132 | | 0,255 | | 0,154 | |
| Dammam-Khobar-Dhahran (Saudi Arabia) | 0,066 | | 0,127 | | 0,115 | |
| Sanaa (Yemen) | 0,047 | | 0,055 | | 0,077 | |
| Other cities | 0,019 | | 0,036 | | 0,077 | |

## Appendix 6: Empirical research results – Behavioral mapping

| Weekend / Weekday | Total | Weekend Forenoon | Weekend Noon | Weekend Afternoon | Weekend Early Evening | Weekend Late evening | Weekend Night | Weekend Early morning | Total Weekend |
|---|---|---|---|---|---|---|---|---|---|
| Daytime | | Forenoon | Noon | Afternoon | Early Evening | Late evening | Night | Early morning | |
| Date | | 18.04.2008 | 18.04.2008 | 18.04.2008 | 18.04.2008 | 18.04.2008 | 18.04.2008 | 19.04.2008 | |
| Observation time | | 10:50-11:00 | 12:20-12:30 | 16:45-16:55 | 18:50-19:00 | 21:00-21:10 | 23:00-23:10 | 6:40-6:50 | |
| **Total amount people** | 324 | 9 | 18 | 23 | 16 | 15 | 8 | 6 | 95 |
| High-skilled workers | 178 | 2 | 4 | 2 | 6 | 3 | | 1 | 18 |
| Low-skilled workers | 68 | 3 | 5 | 6 | 2 | 4 | 6 | 4 | 30 |
| Leisure people | 73 | 4 | 6 | 15 | 8 | 8 | 2 | 1 | 44 |
| Youngsters | 5 | | 3 | | | | | | 3 |
| **Gender** | 324 | 9 | 18 | 23 | 16 | 15 | 8 | 6 | 95 |
| Male | 202 | 6 | 11 | 14 | 9 | 11 | 5 | 6 | 62 |
| Female | 122 | 3 | 7 | 9 | 7 | 4 | 3 | | 33 |
| **Total amount activities** | 389 | 11 | 25 | 27 | 21 | 21 | 12 | 8 | 125 |
| "Passing through" activities — Walking only | 131 | 7 | 8 | 7 | 14 | 7 | 7 | 2 | 52 |
| Walking and smoking | 1 | | | 1 | | | | | 1 |
| Walking and phoning | 10 | | 1 | 2 | | | | | 4 |
| Walking and working | 40 | 1 | 4 | 2 | | | 1 | 4 | 12 |
| Walking and talking | 0 | | | | | | | | |
| Biking | 0 | | | | | | | | |
| "Resting or staying" activities — Standing only | 8 | | | 1 | 3 | 3 | | | 7 |
| Standing and smoking | 37 | 3 | 1 | 3 | | 4 | 4 | 1 | 16 |
| Standing and phoning | 6 | | | 1 | | | | | 1 |
| Standing and working | 5 | | | | | | | | 0 |
| Standing and talking | 8 | | | | | | | | 0 |
| Sitting at table only | 5 | | | | | 4 | | 1 | 5 |
| Sitting at table and eating | 137 | | 11 | 9 | 4 | 2 | | | 26 |
| Sitting on ground only | 1 | | | 1 | | | | | 1 |
| Sitting on ground and talking | 0 | | | | | | | | 0 |
| **Cars** | 0 | | | | | | | | 0 |
| **Total amount groups** | 211 | 8 | 12 | 17 | 12 | 12 | 6 | 6 | 73 |
| Group size: 1 person | 134 | 7 | 9 | 13 | 8 | 9 | 4 | 6 | 56 |
| Group size: 2 people | 52 | 1 | 1 | 2 | 4 | 3 | 2 | | 13 |
| Group size: 3 people | 18 | | 1 | 2 | | | | | 3 |
| Group size: 4 people | 5 | | 1 | | | | | | 1 |
| Group size: 5 people | 0 | | | | | | | | 0 |
| Group size: 6 people | 2 | | | | | | | | 0 |
| Group size: 7 people | 0 | | | | | | | | 0 |
| Group size: 8 people | 0 | | | | | | | | 0 |
| Group size: 9 people | 0 | | | | | | | | 0 |
| Group size: 10 people | 0 | | | | | | | | 0 |
| Group size: 11 people | 0 | | | | | | | | 0 |
| Group size: 12 people | 0 | | | | | | | | 0 |
| Group size: 13 people | 0 | | | | | | | | 0 |
| Group size: 14 people | 0 | | | | | | | | 0 |
| Group size: 15 people | 0 | | | | | | | | 0 |

| Weekend / Weekday | | Weekday Forenoon | Weekday Noon | Weekday Afternoon | Weekday Early Evening | Weekday Late evening | Weekday Night | Weekday Early morning | Total Weekday |
|---|---|---|---|---|---|---|---|---|---|
| Daytime | | Forenoon | Noon | Afternoon | Early Evening | Late evening | Night | Early morning | |
| Date | | 21.04.2008 | 21.04.2008 | 21.04.2008 | 21.04.2008 | 21.04.2008 | 21.04.2008 | 22.04.2008 | |
| Observation time | | 9:30-9:40 | 12:20-12:30 | 15:40-15:50 | 18:00-18:10 | 21:05-21:15 | 23:00-23:10 | 7:50-8:00 | |
| **Total amount people** | | 28 | 64 | 50 | 27 | 31 | 10 | 19 | 229 |
| High-skilled workers | | 21 | 49 | 40 | 13 | 23 | 2 | 12 | 160 |
| Low-skilled workers | | 3 | 8 | 5 | 3 | 5 | 8 | 6 | 38 |
| Leisure people | | 4 | 7 | 5 | 9 | 3 | 0 | 1 | 29 |
| Youngsters | | | | | 2 | | | | 2 |
| **Gender** | | 28 | 64 | 50 | 27 | 31 | 10 | 19 | 229 |
| Male | | 17 | 37 | 32 | 16 | 19 | 7 | 12 | 140 |
| Female | | 11 | 27 | 18 | 11 | 12 | 3 | 7 | 89 |
| **Total amount activities** | | 32 | 71 | 58 | 34 | 38 | 11 | 20 | 264 |
| "Passing through" activities — Walking only | | 15 | 9 | 18 | 14 | 7 | 7 | 9 | 79 |
| Walking and smoking | | | | | | | | | 0 |
| Walking and phoning | | | 3 | | 3 | | | | 6 |
| Walking and working | | 3 | 6 | 4 | 1 | 5 | 3 | 6 | 28 |
| Walking and talking | | | | | | | | | |
| Biking | | | | | | | | | |
| "Resting or staying" activities — Standing only | | | | 1 | | | | | 1 |
| Standing and smoking | | | 3 | 12 | 1 | 4 | | 1 | 21 |
| Standing and phoning | | 1 | 1 | | 1 | 2 | | | 5 |
| Standing and working | | | 2 | | 2 | | 1 | | 5 |
| Standing and talking | | | 1 | | 3 | 2 | | 2 | 8 |
| Sitting at table only | | | | | | | | | 0 |
| Sitting at table and eating | | 13 | 46 | 23 | 9 | 18 | | 2 | 111 |
| Sitting on ground only | | | | | | | | | 0 |
| Sitting on ground and talking | | | | | | | | | 0 |
| **Cars** | | | | | | | | | 0 |
| **Total amount groups** | | 17 | 31 | 29 | 18 | 20 | 6 | 17 | 138 |
| Group size: 1 person | | 9 | 10 | 15 | 11 | 15 | 3 | 15 | 78 |
| Group size: 2 people | | 6 | 13 | 9 | 5 | 2 | 2 | 2 | 39 |
| Group size: 3 people | | 1 | 6 | 3 | 2 | 2 | 1 | | 15 |
| Group size: 4 people | | 1 | 1 | 2 | | | | | 4 |
| Group size: 5 people | | | | | | | | | 0 |
| Group size: 6 people | | | 1 | | | 1 | | | 2 |
| Group size: 7 people | | | | | | | | | 0 |
| Group size: 8 people | | | | | | | | | 0 |
| Group size: 9 people | | | | | | | | | 0 |
| Group size: 10 people | | | | | | | | | 0 |
| Group size: 11 people | | | | | | | | | 0 |
| Group size: 12 people | | | | | | | | | 0 |
| Group size: 13 people | | | | | | | | | 0 |
| Group size: 14 people | | | | | | | | | 0 |
| Group size: 15 people | | | | | | | | | 0 |

**Amount of people, activities, cars and groups observed at selected public space in Dubai**

| Weekend / Weekday | Total | Weekend Forenoon | Weekend Noon | Weekend Afternoon | Weekend Early Evening | Weekend Late evening | Weekend Night | Weekend Early morning | Total Weekend |
|---|---|---|---|---|---|---|---|---|---|
| Daytime | | Forenoon | Noon | Afternoon | Early Evening | Late evening | Night | Early morning | |
| Date | | 30.05.2008 | 30.05.2008 | 30.05.2008 | 30.05.2008 | 30.05.2008 | 31.05.2008 | 31.05.2008 | |
| Observation time | | 10:15-10:25 | 12:20-12:30 | 16:25-16:35 | 18:20-18:30 | 20:00-20:10 | 4:30-4:40 | 6:50-7:00 | |
| **Total amount people** | 312 | 15 | 18 | 54 | 42 | 30 | 1 | 7 | 167 |
| High-skilled workers | 44 | 2 | 1 | 7 | 5 | 1 | | | 16 |
| Low-skilled workers | 63 | 3 | 5 | 1 | 1 | 1 | 1 | 2 | 14 |
| Leisure people | 199 | 10 | 12 | 45 | 34 | 27 | 0 | 5 | 133 |
| Youngsters | 6 | | | 1 | 2 | 1 | | | 4 |
| **Gender** | 312 | 15 | 18 | 54 | 42 | 30 | 1 | 7 | 167 |
| Male | 198 | 12 | 12 | 31 | 26 | 19 | 1 | 7 | 108 |
| Female | 114 | 3 | 6 | 23 | 16 | 11 | | | 59 |
| **Total amount activities** | 350 | 17 | 18 | 60 | 48 | 34 | 2 | 8 | 187 |
| "Passing through" activities — Walking only | 235 | 12 | 15 | 36 | 29 | 21 | 1 | 7 | 121 |
| Walking and smoking | 3 | | 1 | | | | | | 1 |
| Walking and phoning | 3 | | | | | | | | 0 |
| Walking and working | 9 | 1 | 1 | 1 | | | | | 3 |
| Walking and talking | 0 | | | | | | | | |
| Biking | 0 | | | | | | | | |
| "Resting or staying" activities — Standing only | 78 | 1 | | 23 | 18 | 12 | 1 | | 55 |
| Standing and smoking | 2 | | | | | | | | 0 |
| Standing and phoning | 0 | | | | | | | | 0 |
| Standing and working | 11 | 1 | 1 | | 1 | 1 | | 1 | 5 |
| Standing and talking | 9 | 2 | | | | | | | 2 |
| Sitting at table only | 0 | | | | | | | | 0 |
| Sitting at table and eating | 0 | | | | | | | | 0 |
| Sitting on ground only | 0 | | | | | | | | 0 |
| Sitting on ground and talking | 0 | | | | | | | | 0 |
| **Cars** | 966 | 50 | 58 | 72 | 96 | 84 | 34 | 33 | 427 |
| **Total amount groups** | 154 | 9 | 11 | 15 | 13 | 12 | 1 | 6 | 67 |
| Group size: 1 person | 79 | 5 | 6 | 3 | 3 | 4 | 1 | 5 | 27 |
| Group size: 2 people | 38 | 2 | 3 | 5 | 3 | 4 | | 1 | 18 |
| Group size: 3 people | 20 | 2 | 2 | 1 | 3 | 2 | | | 10 |
| Group size: 4 people | 11 | | | 4 | 3 | 1 | | | 8 |
| Group size: 5 people | 1 | | | | | | | | 0 |
| Group size: 6 people | 1 | | | | | | | | 0 |
| Group size: 7 people | 1 | | | 1 | | | | | 1 |
| Group size: 8 people | 1 | | | | | 1 | | | 1 |
| Group size: 9 people | 0 | | | | | | | | 0 |
| Group size: 10 people | 0 | | | | | | | | 0 |
| Group size: 11 people | 0 | | | | | | | | 0 |
| Group size: 12 people | 1 | | | | 1 | | | | 1 |
| Group size: 13 people | 0 | | | | | | | | 0 |
| Group size: 14 people | 0 | | | | | | | | 0 |
| Group size: 15 people | 1 | | | 1 | | | | | 1 |

| Weekend / Weekday | Total | Weekday Forenoon | Weekday Noon | Weekday Afternoon | Weekday Early Evening | Weekday Late evening | Weekday Night | Weekday Early morning | Total Weekday |
|---|---|---|---|---|---|---|---|---|---|
| Daytime | | Forenoon | Noon | Afternoon | Early Evening | Late evening | Night | Early morning | |
| Date | | 01.06.2008 | 01.06.2008 | 01.06.2008 | 01.06.2008 | 01.06.2008 | 01.06.2008 | 02.06.2008 | |
| Observation time | | 10:35-10:45 | 12:30-12:40 | 14:00-14:10 | 18:30-18:40 | 20:10-20:20 | 23:00-23:10 | 5:30-5:40 | |
| **Total amount people** | | 15 | 26 | 27 | 24 | 23 | 24 | 6 | 145 |
| High-skilled workers | | 4 | 5 | 5 | 7 | 1 | 6 | | 28 |
| Low-skilled workers | | 9 | 13 | 7 | 2 | 10 | 2 | 6 | 49 |
| Leisure people | | 2 | 8 | 15 | 14 | 11 | 16 | 0 | 66 |
| Youngsters | | | | | | 1 | 1 | | 2 |
| **Gender** | | 15 | 26 | 27 | 24 | 23 | 24 | 6 | 145 |
| Male | | 11 | 17 | 16 | 14 | 14 | 13 | 5 | 90 |
| Female | | 4 | 9 | 11 | 10 | 9 | 11 | 1 | 55 |
| **Total amount activities** | | 18 | 30 | 29 | 26 | 27 | 27 | 6 | 163 |
| "Passing through" activities — Walking only | | 13 | 22 | 19 | 20 | 12 | 24 | 4 | 114 |
| Walking and smoking | | | 2 | | | | | | 2 |
| Walking and phoning | | 1 | | | 1 | 1 | | | 3 |
| Walking and working | | | 2 | 1 | | 1 | | 2 | 6 |
| Walking and talking | | | | | | | | | |
| Biking | | | | | | | | | |
| "Resting or staying" activities — Standing only | | 4 | 1 | 8 | 3 | 5 | 2 | | 23 |
| Standing and smoking | | | | | 1 | | 1 | | 2 |
| Standing and phoning | | | | | | | | | 0 |
| Standing and working | | | 3 | 1 | 1 | 1 | | | 6 |
| Standing and talking | | | | | | 7 | | | 7 |
| Sitting at table only | | | | | | | | | 0 |
| Sitting at table and eating | | | | | | | | | 0 |
| Sitting on ground only | | | | | | | | | 0 |
| Sitting on ground and talking | | | | | | | | | 0 |
| **Cars** | | 85 | 100 | 97 | 76 | 77 | 51 | 53 | 539 |
| **Total amount groups** | | 11 | 17 | 17 | 13 | 13 | 11 | 5 | 87 |
| Group size: 1 person | | 7 | 11 | 11 | 7 | 8 | 4 | 4 | 52 |
| Group size: 2 people | | 4 | 4 | 3 | 3 | 1 | 4 | 1 | 20 |
| Group size: 3 people | | | 1 | 2 | 2 | 3 | 2 | | 10 |
| Group size: 4 people | | | 1 | 1 | | 1 | | | 3 |
| Group size: 5 people | | | | | 1 | | | | 1 |
| Group size: 6 people | | | | | | | 1 | | 1 |
| Group size: 7 people | | | | | | | | | 0 |
| Group size: 8 people | | | | | | | | | 0 |
| Group size: 9 people | | | | | | | | | 0 |
| Group size: 10 people | | | | | | | | | 0 |
| Group size: 11 people | | | | | | | | | 0 |
| Group size: 12 people | | | | | | | | | 0 |
| Group size: 13 people | | | | | | | | | 0 |
| Group size: 14 people | | | | | | | | | 0 |
| Group size: 15 people | | | | | | | | | 0 |

**Amount of people, activities, cars and groups observed at selected public space in Doha**

| Weekend / Weekday | Total | Weekend Forenoon | Weekend Noon | Weekend Afternoon | Weekend Early Evening | Weekend Late evening | Weekend Night | Weekend Early morning | Total Weekend |
|---|---|---|---|---|---|---|---|---|---|
| Daytime | | Forenoon | Noon | Afternoon | Early Evening | Late evening | Night | Early morning | |
| Date | | 12.12.2008 | 12.12.2008 | 12.12.2008 | 12.12.2008 | 12.12.2008 | 13.12.2008 | 13.12.2008 | |
| Time | | 8:50-9:00 | 12:50-13:00 | 14:00-14:10 | 17:00-17:10 | 20:20-20:30 | 4:40-4:50 | 6:15-6:25 | |
| **Total amount people** | **610** | **52** | **41** | **44** | **87** | **48** | **14** | **29** | **315** |
| High-skilled workers | 79 | 3 | 3 | 3 | 9 | 2 | | 1 | 21 |
| Low-skilled workers | 113 | 10 | 7 | 4 | 4 | 3 | 6 | 19 | 53 |
| Leisure people | 415 | 39 | 30 | 37 | 74 | 43 | 8 | 9 | 240 |
| Youngsters | 3 | | 1 | | | | | | 1 |
| **Gender** | **610** | **52** | **41** | **44** | **87** | **48** | **14** | **29** | **315** |
| Male | 469 | 40 | 31 | 33 | 61 | 37 | 14 | 27 | 243 |
| Female | 141 | 12 | 10 | 11 | 26 | 11 | | 2 | 72 |
| **Total amount activities** | **707** | **60** | **48** | **77** | **93** | **48** | **17** | **32** | **375** |
| "Passing through" activities — Walking only | 315 | 31 | 22 | 24 | 34 | 20 | 10 | 26 | 167 |
| Walking and smoking | 8 | | 2 | 3 | | | | | 5 |
| Walking and phoning | 4 | | 1 | | 1 | | | | 2 |
| Walking and working | 1 | | | 1 | | | | | 1 |
| Walking and talking | 112 | 6 | 5 | 8 | 26 | 11 | | 2 | 58 |
| Biking | 2 | | | | | | | | 0 |
| "Resting or staying" activities — Standing only | 63 | 11 | 4 | 12 | 3 | | | 2 | 32 |
| Standing and smoking | 4 | | | 2 | 1 | | | | 3 |
| Standing and phoning | 6 | | 2 | 2 | 1 | | | | 5 |
| Standing and working | 2 | 1 | | 1 | | | | | 2 |
| Standing and talking | 88 | 11 | 5 | 14 | 9 | 11 | 5 | 2 | 57 |
| Sitting at table only | 1 | | | | | | 1 | | 1 |
| Sitting at table and eating | 0 | | | | | | | | 0 |
| Sitting on ground only | 37 | | 3 | 5 | 1 | 4 | 1 | | 14 |
| Sitting on ground and talking | 64 | | 4 | 5 | 17 | 2 | | | 28 |
| **Cars** | **555** | **41** | **45** | **61** | **56** | **30** | **15** | **22** | **270** |
| **Total amount groups** | **292** | **23** | **19** | **19** | **32** | **21** | **10** | **16** | **140** |
| Group size: 1 person | 112 | 7 | 7 | 4 | 8 | 5 | 6 | 9 | 46 |
| Group size: 2 people | 88 | 6 | 5 | 7 | 4 | 8 | 4 | 4 | 38 |
| Group size: 3 people | 57 | 7 | 4 | 6 | 12 | 5 | | 1 | 35 |
| Group size: 4 people | 28 | 3 | 3 | 2 | 6 | 3 | | 1 | 18 |
| Group size: 5 people | 4 | | | | 1 | | | 1 | 2 |
| Group size: 6 people | 2 | | | | 1 | | | | 1 |
| Group size: 7 people | 1 | | | | | | | | 0 |
| Group size: 8 people | 0 | | | | | | | | 0 |
| Group size: 9 people | 0 | | | | | | | | 0 |
| Group size: 10 people | 0 | | | | | | | | 0 |
| Group size: 11 people | 0 | | | | | | | | 0 |
| Group size: 12 people | 0 | | | | | | | | 0 |
| Group size: 13 people | 0 | | | | | | | | 0 |
| Group size: 14 people | 0 | | | | | | | | 0 |
| Group size: 15 people | 0 | | | | | | | | 0 |

| Weekend / Weekday | Weekday Forenoon | Weekday Noon | Weekday Afternoon | Weekday Early Evening | Weekday Late evening | Weekday Night | Weekday Early morning | Total Weekday |
|---|---|---|---|---|---|---|---|---|
| Daytime | Forenoon | Noon | Afternoon | Early Evening | Late evening | Night | Early morning | |
| Date | 10.12.2008 | 10.12.2008 | 10.12.2008 | 10.12.2008 | 10.12.2008 | 11.12.2008 | 11.12.2008 | |
| Time | 8:00-8:10 | 13:50-14:00 | 16:50-17:00 | 17:30-17:40 | 20:05-20:15 | 4:50-5:00 | 6:10-6:20 | |
| **Total amount people** | **44** | **42** | **55** | **31** | **69** | **17** | **37** | **295** |
| High-skilled workers | 17 | 13 | 7 | 4 | 10 | 2 | 5 | 58 |
| Low-skilled workers | 8 | 5 | 9 | 3 | 8 | 7 | 20 | 60 |
| Leisure people | 19 | 24 | 39 | 24 | 49 | 8 | 12 | 175 |
| Youngsters | | | | | 2 | | | 2 |
| **Gender** | **44** | **42** | **55** | **31** | **69** | **17** | **37** | **295** |
| Male | 34 | 34 | 38 | 24 | 53 | 15 | 28 | 226 |
| Female | 10 | 8 | 17 | 7 | 16 | 2 | 9 | 69 |
| **Total amount activities** | **56** | **42** | **62** | **33** | **79** | **21** | **39** | **332** |
| "Passing through" activities — Walking only | 27 | 14 | 24 | 13 | 33 | 12 | 25 | 148 |
| Walking and smoking | | | | | 3 | | | 3 |
| Walking and phoning | | | 2 | | | | | 2 |
| Walking and working | | | | | | | | 0 |
| Walking and talking | 12 | 6 | 11 | 6 | 13 | 2 | 4 | 54 |
| Biking | | | | | | 1 | 1 | 2 |
| "Resting or staying" activities — Standing only | 3 | 8 | 14 | 3 | | 1 | 2 | 31 |
| Standing and smoking | | | 1 | | | | | 1 |
| Standing and phoning | | | | | | 1 | | 1 |
| Standing and working | | | | | | | | 0 |
| Standing and talking | 4 | 4 | 8 | | 11 | 4 | | 31 |
| Sitting at table only | | | | | | | | 0 |
| Sitting at table and eating | | | | | | | | 0 |
| Sitting on ground only | 4 | 2 | 2 | 9 | 5 | | 1 | 23 |
| Sitting on ground and talking | 6 | 8 | | 2 | 14 | | 6 | 36 |
| **Cars** | **58** | **42** | **53** | **24** | **48** | **22** | **38** | **285** |
| **Total amount groups** | **23** | **23** | **27** | **14** | **29** | **14** | **22** | **152** |
| Group size: 1 person | 8 | 10 | 9 | 3 | 11 | 11 | 14 | 66 |
| Group size: 2 people | 9 | 9 | 12 | 7 | 5 | 3 | 5 | 50 |
| Group size: 3 people | 6 | 2 | 5 | 2 | 7 | | | 22 |
| Group size: 4 people | | 2 | | 2 | 4 | | 2 | 10 |
| Group size: 5 people | | | | | 1 | | 1 | 2 |
| Group size: 6 people | | | | | 1 | | | 1 |
| Group size: 7 people | | | 1 | | | | | 1 |
| Group size: 8 people | | | | | | | | 0 |
| Group size: 9 people | | | | | | | | 0 |
| Group size: 10 people | | | | | | | | 0 |
| Group size: 11 people | | | | | | | | 0 |
| Group size: 12 people | | | | | | | | 0 |
| Group size: 13 people | | | | | | | | 0 |
| Group size: 14 people | | | | | | | | 0 |
| Group size: 15 people | | | | | | | | 0 |

**Amount of people, activities, cars and groups observed at selected public space in Manama**

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