# Kuwait is the Past, Dubai is the Present, Doha is the Future:
## Informational Cities on the Arabian Gulf

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## ABSTRACT

*Many cities in the world define themselves as 'smart.' Is this term appropriate for cities in the emergent Gulf region? This article investigates seven Gulf cities (Kuwait City, Manama, Doha, Abu Dhabi, Dubai, Sharjah, and Muscat) that have once grown rich due to large reserves of oil and gas. Now, with the threat of ending resources, governments focus on the development towards a knowledge society. The authors analyzed the cities in terms of their 'smartness' or 'informativeness' by a quantitative survey and by in-depth qualitative interviews (N = 34). Especially Doha in Qatar is well on its way towards an informational city, but also Dubai and Sharjah (both in the United Arab Emirates) make good scores.*

*Keywords:* *Arab Cities, GCC Countries, Gulf Cities, Informational City, Informativeness, Knowledge Society, Servqual, Smart City*

## 1. INTRODUCTION

In the heat of the Gulf region 50 years ago, the desert dominates the landscape, the beaches are almost empty, and the few people living there work as pearl divers, fishermen, traders or peasants. Replaced by glittering facades, high-end hotels, artificial islands, huge shopping malls, and the tallest constructions of the world, the region nowadays attracts people from all over the world. The catalyst for this development was the detection of huge amounts of oil and gas resources in the 1960`s leading to prosperity. But oil reserves will be exhausted in the near future. How do the cities of the Gulf region respond to this drastic change? Are they, like so many other cities in the world, trying to reach the status of an informational city? Is it indeed a target of these very wealthy oil-based cities to set up a knowledge society? We are going to look behind the glimmering facades of the Gulf cities and describe and analyze their status as informational cities. This will be done by applying a customized questionnaire and interviews (N = 34) concerning

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questions about aspects of cities of the knowledge society: infrastructures, economy, politics and administration, location factors and (physical and digital) spaces.

## 2. 'SMART' OR 'INFORMATIONAL CITIES?'

What do we refer to when we speak of 'smart cities?' The field of research concerning the smart city concept is still emerging (Nam & Pardo, 2011b). A consistent definition of smart city does not exist due to a variety of conceptual variants (Nam & Pardo, 2011a). Many definitions focus mainly on the technological perspective including the use of ICT. There are two concepts available in the latest literature: (1) the concept of a smart city in a broader sense and (2) the concept of a smart city in a narrower sense (Fietkiewicz & Stock, 2015). The concept in the broader sense is defined by six characteristics including smart economy, smart people, smart governance, smart mobility, smart environment, and smart living (Giffinger et al., 2007). This concept is referring to Castells' (1989) 'informational city' where the flows of money, power and information, summarized as the 'space of flows,' dominates the geographical space of places. The smart city in the narrower sense is an ICT-driven green city which focusses on the environment (Hall et al., 2000). According to Chourabi et al. (2012), the smart city can be seen as a sustainable and at the same time livable city. The concept of a smart city in the narrower sense, which is one of the partial aspects in our research, is included in the concept of a smart city in the broader sense or—as we refer to it—the 'informational city' (Stock, 2011).

## 3. GULF CITIES

The presented results cover all larger Gulf cities of the Gulf Cooperation Council (GCC) states: Kuwait City (Kuwait), Manama (Bahrain), Doha (Qatar), Abu Dhabi, Dubai, Sharjah (all United Arab Emirates) and Muscat (Oman). Since no Saudi Arabian metropolis is located at the Gulf coast, we bracket cities in Saudi Arabia out. The case studies of these cities were conducted on-site, i.e., all cities were visited by the research team.

The states in the Gulf region have grown rapidly due to their large reserves of oil and gas. Being aware of ending resources, the era after the oil is already being planned by the governments in the Gulf region (Höselbarth, 2010). The main goal of Doha is to build on knowledge: "As the Qatar economy diversifies more from its reliance on gas and oil, success will increasingly depend on the ability to compete in a global knowledge economy. Educating and training Qataris to their full potential will be critical to continuing progress" (GSDP, 2011, p. 13). Dubai describes two knowledge-based aims: (1) "Preparing Dubai's workforce for the high-value, knowledge-driven economy, which requires attracting and retaining highly skilled employees, improving Nationals' qualifications and increasing their motivation" and (2) "Turning Dubai into a vibrant science and technology hub in targeted sectors, by supporting the development of existing sectors, and establishing the right environment for nurturing the post 2015 economy" (Dubai Strategic Plan 2015, 2007, p.22). The propositions of the diverse master plans of the Gulf cities are clear: They prepare for the entering into the knowledge society.

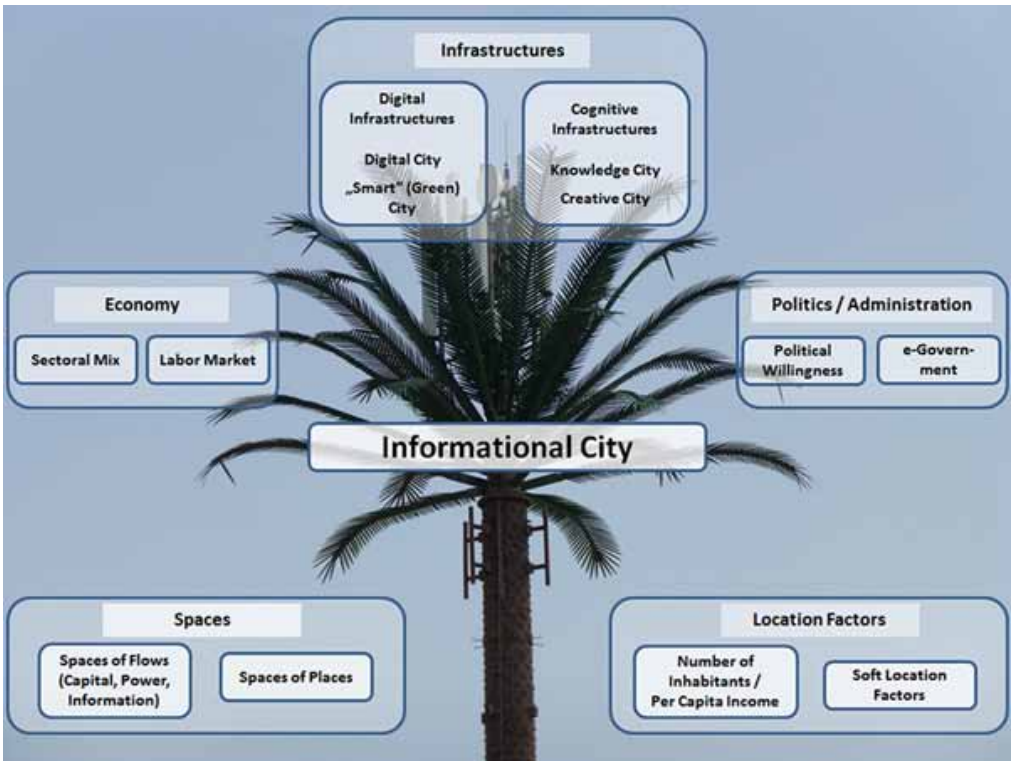
## 4. METHODS

As part of a large research project on informational cities (Fietkiewicz & Pyka, 2014; Fietkiewicz & Stock, 2015; Stock 2011), we analyzed the Gulf cities in terms of informational cities (smart

cities in the broader sense). Our research model is concerned with eight aspects of 'smartness:' digital city, knowledge city, creative city, smart city (in the narrower sense), sectoral mix and labor market, the political willingness to build an informational city and eGovernment, location factors and spaces (Figure 1).

In this article, we will report about our 34 interviews in the seven Gulf cities. We applied a quantitative questionnaire and conducted semi-standardized interviews with inhabitants between the 18th of February and the 6th of March 2013 in Abu Dhabi, Doha, Dubai and Manama and between the 28th of March and the 9th of April 2014 in Kuwait City, Muscat and Sharjah. The duration of the interviews varied between 30 and 120 minutes. We based our questionnaire on the method of ServQual (Parasuraman, Zeithaml, & Berry, 1988) which is the standardized instrument to measure the quality of service in retailing and service organizations, but can be used in different research areas as well. We provided our interviewees with 18 questions that were split into two parts. The left hand side contains questions concerning the *expectation* (E) of the interviewees about an informational city in general and the right hand side contains the same question but refers to the *experience* (P) of the interviewees in the city in question. For each question there is a seven-ary scale where 7 represents the strongest form of agreement and 1 represents the strongest form of disagreement. To get an idea about the *gap* (Q) between the expectation and experience of a given question, the difference value Q = E – P is calculated. For each question and for each city and also for the whole region, we calculate the arithmetic mean to create a ranking later on. We are aware of the fact that naturally Likert-type scales are ordinal and therefore do not allow using the arithmetic mean. However, since Likert (1932) reasons

*Figure 1. Research framework. Background: Palm-faced antenna in Sharjah, UAE.*



that consecutive natural numbers are equidistant, we interpret our scale as an interval scale and point this out to all our survey participants. Consequently we can calculate the arithmetic mean.

Since the original ServQual questions do not fit our needs, we designed our questionnaire with the help of literature. The question *Is the ICT infrastructure in an Informational City more important than automotive traffic infrastructure?*, which belongs to the dimension of digital infrastructure, arose from the theory of the fifth Kondratieff according to which the economic wave of automobiles and petrochemistry is replaced by the wave of information technology (Nefiodow, 1991). The dimension of knowledge infrastructure contains three questions *Does an Informational City have to have knowledge-intensive companies and knowledge institutions, e.g. universities and science parks?* This question was generated by thinking about Sassen's (2001) proposition that the city, where the headquarters of a company that operates on a global scale is located, becomes a center of information. For Mainka et al. (2013), besides the physical library space the offering of digital libraries is important, inducing the questions *Is a fully developed content infrastructure, e.g. supported by digital libraries, a characteristic feature of an Informational City?* and *Are libraries important in an Informational City as a physical place for face-to-face communication?* For the creative infrastructure dimension we thought of the three T's mentioned by Florida (2002) and formulated the question *Does an Informational City have to be a creative city?* The T's refer to the terms *technology*, *talent* and *tolerance*, which are all required components for a city to be creative and economically successful (Murugadas, Vieten, Nikolic, Fietkiewicz, & Stock, 2015). We also included the questions *Are physical places where knowledge workers or creatives can meet each other important for an Informational City?* in this dimension, since an informational city needs creative people who "want to meet and socialize with people unlike themselves, trade views and spare over issues" (Florida, 2002, p. 21). *Does an Informational City have to have an urban structure which is characterized by short distances?* is an interesting question for the dimension of smart infrastructure, since the reduction of traffic causes better quality of life which allures creative people. "The key is to concentrate residences, work areas and amenities so as to produce the shortest possible trip distances, most being possible by bicycle and public transport" (Hall, 1997b, p.15). Two questions belong to the dimensions of sectoral mix and labor market which we include together in one indicator. The first one is: *Does an Informational City have to have companies with information market activities, e.g. telecommunications companies?* According to Stock (2011), especially companies with information market activities should have their headquarters in an informational city. Furthermore, the question *Is the labor market in an Informational City characterized by job polarization (loss of routine middle-class jobs)?* arose when we thought about the automatization of large economic processes and thus the occurrence of the two opposites (1) well-paid analytic tasks and (2) badly-paid manual labor (Goos & Manning, 2007). The dimension of political willingness contains two questions as well. Since the political willingness is an essential aspect to realize the idea of an informational city and to get financial support for the initial period (Stock, 2011), we asked: *Does the political willingness to create a knowledge economy play a significant role for establishing an Informational City?* The second question *Is an Informational City characterized by e-governance (incl. e-government, e-participation, e-democracy)?* combines Moon's (2002) five steps of eGovernment: (1) information dissemination (one-way communication), (2) two-way communication where the user gets a response, (3) service and financial transactions, (4) vertical and horizontal integration, and (5) political participation. The three questions *Does an Informational City have to have many leisure time facilities?*, *Does an Informational City have to have an offer of a variety of shopping malls?* and *Does an Informational City have to have architainment, e.g. spectacular skyline, amazing waterfront, big wheels (is such a city an event in itself)?* deal with soft location factors which comprise the diversity of cultural and

leisure activities. An informational city offers hence a variety of services, which cover different interests of individuals (Van den Berg, van der Meer, & Otgaar, 2007). Further three questions are generated to cover the dimension of spaces. The question *Does an Informational City have to have capital-intensive companies, e.g. banks and insurances?* refers to Castells' (1989) space of flows. By inventing the question *Is an Informational City supposed to be a global city (world city)?* we thought of "The World City Hypothesis" by Friedmann (1986, 1995) where cities are defined economically rather than by administrative borders. Given the fact that free access to information and freedom of communication are basic rights of anyone (Balkin, 2005), we asked: *Is it important for an Informational City that there is a free flow of all kinds of information (incl. mass media information)?* The last question *Do you think that your city is an Informational city?* shall give an impression of our interview partner to which extend the discussed city corresponds to the prototypical informational city.

## 5. RESULTS: INFORMATIONAL GULF CITIES?

Table 1 outlines the results of the ServQual questionnaire for the seven Gulf cities.

### 5.1. Digital City

Renowned as a part of the informational city, digital cities are based on ICT, which build a new kind of infrastructure. Actually, there is no other technology that shapes social, cultural and

*Table 1. Results of the ServQual questionnaires*

| QUESTION/ CITY | KUWAIT CITY | | | MANAMA | | | DOHA | | | ABU DHABI | | | DUBAI | | | SHARJAH | | | MUSCAT | | | GULF CITIES | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n = 5 | | | n = 5 | | | n = 4 | | | n = 5 | | | n = 4 | | | n = 5 | | | n = 6 | | | n = 34 | | |
| | E | P | Q | E | P | Q | E | P | Q | E | P | Q | E | P | Q | E | P | Q | E | P | Q | E | P | Q |
| ICT vs. automobile infrastructure | 4.80 | 3.40 | -1.40 | 5.20 | 4.00 | -1.20 | 4.75 | 4.00 | -0.75 | 5.20 | 4.40 | -0.80 | 5.75 | 4.67[3] | -1.08 | 5.80 | 4.80 | -1.00 | 5.33 | 2.00 | -3.33 | **5.26** | **3.79** | **-1.47** |
| Knowledge-intensive facilities? | 6.00 | 3.80 | -2.20 | 6.60 | 4.80 | -1.80 | 7.00 | 5.00 | -2.00 | 6.80 | 5.80 | -1.00 | 6.75 | 5.83[2] | -0.92 | 6.40 | 5.80 | -0.60 | 6.33 | 4.00 | -2.33 | **6.53** | **4.90** | **-1.63** |
| Digital libraries? | 5.40 | 2.20 | -3.20 | 6.80 | 3.20 | -3.60 | 6.75 | 4.50 | -2.25 | 6.20 | 1.20 | -5.00 | 5.75 | 2.88 | -2.88 | 6.00 | 4.40 | -1.60 | 5.67 | 2.25 | -3.42 | **6.06** | **2.88** | **-3.18** |
| Physical libraries? | 2.60 | 1.80 | -0.80 | 5.40 | 3.60 | -1.80 | 5.00 | 4.50 | -0.50 | 5.00 | 2.20 | -2.80 | 4.63 | 2.75 | -1.88 | 6.00 | 5.40 | -0.60 | 6.33 | 3.17 | -3.16 | **5.04** | **3.32** | **-1.72** |
| Creative city? | 5.60 | 1.80 | -3.80 | 6.25[1] | 4.50 | -1.75 | 6.50 | 5.00 | -1.50 | 6.40 | 3.20 | -3.20 | 6.00 | 4.75 | -1.25 | 6.20 | 4.80 | -1.40 | 6.00 | 3.00 | -3.00 | **6.12** | **3.78** | **-2.34** |
| Meeting places? | 4.60 | 4.20 | -0.40 | 6.80 | 5.60 | -1.20 | 5.75 | 5.00 | -0.75 | 5.80 | 3.00 | -2.80 | 6.50 | 5.25 | -1.25 | 5.40 | 4.60 | -0.80 | 6.67 | 3.50 | -3.17 | **5.94** | **4.38** | **-1.56** |
| Short distances? | 3.60 | 4.00 | 0.40 | 5.00 | 6.00 | 1.00 | 4.33[2] | 4.33[2] | 0.00 | 5.20 | 3.40 | -1.80 | 5.25 | 4.00 | -1.25 | 5.00 | 5.20 | 0.20 | 5.33 | 2.17 | -3.16 | **4.84** | **4.09** | **-0.75** |
| Information market activities? | 5.60 | 5.40 | -0.20 | 6.40 | 6.00 | -0.40 | 6.75 | 5.50 | -1.25 | 6.40 | 4.20 | -2.20 | 6.25 | 4.50 | -1.75 | 5.40 | 3.40 | -2.00 | 4.67 | 5.50 | 0.83 | **5.85** | **4.94** | **-0.91** |
| Job polarization? | 4.20 | 3.00 | -1.20 | 3.20 | 3.20 | 0.00 | 5.00[1] | 5.67[1] | 0.67 | 4.40 | 5.30 | 0.90 | 4.00 | 4.25 | 0.25 | 4.20 | 3.60 | -0.60 | 4.17 | 5.40[4] | 1.23 | **4.09** | **4.27** | **0.18** |
| Political willingness? | 6.00 | 4.80 | -1.20 | 6.40 | 4.20 | -2.20 | 6.25 | 6.25 | 0.00 | 5.80 | 3.75[3] | -2.05 | 6.25 | 5.00[2] | -1.25 | 6.20 | 6.20 | 0.00 | 6.00 | 4.00 | -2.00 | **6.12** | **4.84** | **-1.28** |
| EGovernance? | 6.00 | 2.80 | -3.20 | 5.60 | 5.40 | -0.20 | 6.75 | 5.00 | -1.75 | 6.20 | 4.00[3] | -2.20 | 6.00 | 4.00 | -2.00 | 6.00 | 4.20 | -1.80 | 5.33 | 3.20[4] | -2.13 | **5.94** | **4.06** | **-1.88** |
| Leisure facilities? | 5.20 | 3.40 | -1.80 | 5.40 | 4.40 | -1.00 | 6.25 | 5.00 | -1.25 | 5.80 | 4.80 | -1.00 | 6.50 | 5.75 | -0.75 | 6.00 | 4.80 | -1.20 | 6.17 | 4.17 | -2.00 | **5.88** | **4.56** | **-1.32** |
| Shopping malls? | 4.40 | 5.60 | 1.20 | 5.20 | 6.80 | 1.60 | 4.25 | 5.75 | 1.50 | 5.60 | 6.60 | 1.00 | 6.25 | 6.50 | 0.25 | 5.20 | 4.60 | -0.60 | 4.33 | 6.17 | 1.84 | **5.00** | **6.00** | **1.00** |
| Spectacular buildings? | 4.00 | 2.20 | -1.80 | 5.20 | 4.00 | -1.20 | 4.50 | 6.00 | 1.50 | 5.40 | 6.00 | 0.60 | 5.50 | 6.50 | 1.00 | 5.40 | 5.60 | 0.20 | 4.67 | 2.83 | -1.84 | **4.94** | **4.59** | **-0.35** |
| Capital-intensive companies? | 5.20 | 5.60 | 0.40 | 6.20 | 6.00 | -0.20 | 5.00 | 5.75 | 0.75 | 5.80 | 6.40 | 0.60 | 6.25 | 5.00[2] | -1.25 | 5.20 | 4.80 | -0.40 | 5.67 | 4.50 | -1.17 | **5.62** | **5.42** | **-0.20** |
| Global city? | 3.80 | 2.10 | -1.70 | 4.40 | 3.40 | -1.00 | 6.00 | 5.75 | -0.25 | 6.20 | 4.30 | -1.90 | 6.25 | 5.50 | -0.75 | 5.00 | 3.60 | -1.40 | 3.50 | 1.83 | -1.67 | **4.91** | **3.62** | **-1.29** |
| Free flow of information? | 6.60 | 4.20 | -2.40 | 6.80 | 2.80 | -4.00 | 6.75 | 4.50 | -2.25 | 6.60 | 3.30 | -3.30 | 6.50 | 4.00 | -2.50 | 5.80 | 4.20 | -1.60 | 6.67 | 1.83 | -4.84 | **6.53** | **3.46** | **-3.07** |
| Average for questions 1 to 17 | **4.92** | **3.55** | **-1.37** | **5.70** | **4.58** | **-1.11** | **5.74** | **5.15** | **-0.59** | **5.81** | **4.23** | **-1.58** | **5.90** | **4.77** | **-1.13** | **5.60** | **4.71** | **-0.89** | **5.46** | **3.50** | **-1.96** | *5.57* | *4.29* | *-1.28* |
| Informational city? (q18) | - | **2.00** | - | - | **3.60** | - | - | **4.25** | - | - | **4.00** | - | - | **4.88** | - | - | **4.20** | - | - | **2.67** | - | - | *3.57* | - |

P = Experience; E = Expectation; Q = P – E
n = Number of Interviewees: Fn 1: n = 2; Fn 2: n = 3; Fn3: n = 4; Fn 4: n = 5

economic change as much as ICT. The speed of these changes increases rapidly and transforms the world into an informational village where information and knowledge are provided and accessible for everyone. Place and time become irrelevant in a world where information can be transferred affordably and in a short time (Castells, 1989). In the economic sector well-developed networks play a decisive role: Industry, energy, service and health sectors rely on it and would come to a standstill if they have to work without it. ICT permits them to act and move globally.

The average experience of the importance of ICT and its infrastructure was evaluated with averagely 3.79 points, which is 1.47 points below the expectation. ICT is broached in politics, but is almost unnoticeable implemented (interview partner DO1). The politicians mostly concentrate on road traffic due to the relevance of cars for the inhabitants, and the resulting traffic problems around the city (interview partners DO1, KU5). A life without cars is, particularly in Muscat (experience value: 2.00), almost inconceivable for the natives. Local public transport is—if provided—only used by foreign workers (interview partner AD3). The governments still invest in the expansion of road networks. In the private domain ICT seems to take a central position since otherwise the ways to communicate are limited. Some of the cities, namely Doha and those in the UAE seem to focus more on ICT than the others. On the whole, the internet connections are actually still too slow (interview partners DU3, KU2, MA3) and free WiFi hotspot availability is described as a rarity (interview partner MU3).

## 5.2. Knowledge City

While knowledge has always contributed to economic success, its importance has strikingly increased with the emergence of the information society and the knowledge society (Castells, 1989). Nowadays "cities are taking a leading role as both knowledge-consumption and knowledge-production hubs" (Carrillo, Yigitcanlar, García, & Lönnqvist, 2014, p. xvii). The new awareness of knowledge in all sectors paves the way for the knowledge city (Carrillo, 2006). One basic aspect of knowledge cities conveys "the conglomeration of intense scientific, technological, academic, cultural and innovation activities in urban spaces operating as engines of economic productivity" (Carrillo et al., 2014, p. 3). A second basic aspect of such cities includes well-educated and creative knowledge workers (Florida, 2005) and "creative communities" (Carrillo et al., 2014, p. 4) in order to establish knowledge-based urban development. Furthermore, the number of a city's libraries is an indicator "to assess the initial status of the city" (Ergazakis, Metaxiotis, & Psarras, 2006, p.75) as a knowledge city, since they provide access to information. The term "knowledge cities" includes more than the pure existence of knowledge institutions and of knowledge workers in the city. All of "these elements constitute the cities' core identity, and the way their citizens use knowledge to build their social infrastructure, their institutions and their future" (Carrillo et al., 2014, p. xvii).

People living in the Gulf region see the importance of knowledge-intensive companies and knowledge institutions in an informational city and give an average of 6.53 points. The average experience is with 4.90 still below that score. The region is already working on the establishment of those institutions, but still has a long way to go (interview partner SH5). Knowledge institutions are available, but knowledge-intensive companies are not present in Kuwait (interview partner KU4). Interviewees KU1 and MA3 voice misgivings whether the knowledge-intensity of knowledge institutions, even if they exist, are high enough to refer to them as knowledge-intensive institutions. Many of the interviewees are of the opinion that the institutions and companies are not yet capable of building their own knowledge base. Neither in the institutions (interview partner MU1) nor in the companies (interview partner MU2) is research and development sufficient (Kosior et al., 2015).

There is a huge gap of 3.18 points between the average expectation (6.06) and the average experience (2.88) in case of the existence of digital libraries. Digital libraries include e-resources as well as digital reference services (Mainka et al., 2013). Its content should be freely accessible for all inhabitants. Most of the interviewees are sure about the nonexistence of digital libraries. Some of them however include reference services without the corresponding full texts, which are offered to students by the universities, like Scopus and ACM in the term 'digital library' (interview partners DU1, KU4, SH3). The use of the term therefore differentiates from the intended one.

For our interviewees the existence of physical libraries (5.04) is not as important as that of digital libraries. From the average experience (3.32), it can be deducted that not much libraries are present in the Gulf region. However, for the interviewees the problem lies elsewhere. The culture in the Gulf region is not a knowledge-based one. People do not get encouraged to read as they do not need to acquire knowledge for their jobs. Nearly all of the respondents agree, that citizens do not use the available libraries (interview partners AD1, KU5, MA3). People only visit libraries for entertainment (interview partner KU4) or if they are concerned with education, like teachers and students (interview partner SH5). However, the field research revealed that impressive libraries with great potential to attract visitors are available in the cities. In Muscat, where the number of libraries is especially low, there are other possibilities to exchange books with other citizens (interview partner MU2).

## 5.3. Creative City

In the twenty-first century a transformation of cities is happening. Cities have to find new ways to stabilize their economies for ensuring their economic power. Focusing on creativity seems like a good solution for today's societies (Chatterton, 2002). Also researchers increasingly consider creativity as a huge benefit for cities, raising the concept of the creative city (Landry & Bianchini, 1995). According to Landry (2000, p.4) the concept "describes a new method of strategic urban planning and examines how people can think, plan and act creatively in the city." He thinks that a creative city should offer cultural resources in order to generate and encourage creativity. Nowadays industries focus on knowledge production driven by creativity (Landry & Bianchini, 1995). Thus the existence of creative professionals who work in these knowledge-intensive industries is obligatory. A city should aim at attracting this "creative class" (Florida, 2002) by being tolerant and by offering enough employment opportunities and a high quality of living. In return, they are rewarded with more creative economic outcome, which is beneficial for their economic power.

With an average of 6.12, the interviewees think that in order to become an informational city, the city has to be creative. However, they do not feel positive about the creativity in the Gulf region, resulting in an average score of 3.78. The average value that is given by the Kuwaiti interviewees is with 1.80 even much lower than that. Interviewee KU3 is of the opinion that there is not enough technology in Kuwait. Even though people try to apply it, they still have many problems with it. Since the talent of the citizens in the Gulf region is still undeveloped, the few talents that are available come from abroad (interview partners DU3, MU3). The region takes countermeasures to this problem though by sending citizens to study abroad to expand their knowledge and abilities (interview partner MU3). A high tolerance threshold does not exist at the Gulf. There are many taboo topics like politics and homosexuality and partly also religion. According to interviewee MU1, Muscat is more tolerant than the rest of the region.

The respondents in the Gulf region think with an average score of 5.49 that knowledge workers and creative people must be offered places to communicate. The availability of such places in the Gulf region is rated with an average of 4.38. Especially in Abu Dhabi there seems to be

a lack of meeting places. Here the average experience is only 3.00. The interviewees in Kuwait mentioned that the so called Dewaniya is a traditional meeting place like a tent or a house where people get together to cultivate contacts. Also malls, cafes, and restaurants are favored places to meet, but it is unknown if they are used to share and create knowledge (interview partners DU3, KU4). Interviewee SH3 states that meeting places become less important in advanced cities, but that in Sharjah these physical spaces are important since the city is still in the learning process.

## 5.4. Smart City

The smart city in the narrower sense is a green city including ICT aiming at a sustainable economy and better quality of life (Chourabi et al., 2012; Hall et al., 2000).

With an average of 4.34, the interviewees in the Gulf cities think that short distances should be realized in an informational city. Whether the citizens of the Gulf region can reach their destinations by short routes is estimated with an average score of 4.09. Especially the opinion of the interview partners in Manama stands out. They think with an average of 6.0 that Manama is characterized by short distances. In most of the cities at the Gulf, the offer of public transport is scarce. Due to our field research it can be said, that the investment in public transport has no visible effect in reality. Except for the metro in Dubai, which is accordingly a widely used means of transportation (interview partner DU2), no railway or metro system exists. People resort to using cars which results in high traffic density and people being delayed (interview partner KU2). According to our interview partners in Muscat, a short urban structure does not exist in the capital area. Muscat expanded its urban area in recent years and is nowadays an urban conglomeration stretching 60 km rendering it impossible for Muscat to offer short distances. The long ways from one point of the capital area to another is also what we witnessed during our field research. In the past, Muscat had clusters and consequently short distances, but nowadays the companies and population are spread throughout the whole city (interview partner MU2).

## 5.5. Sectoral Mix and Labor Market

In a knowledge society, knowledge and capital-intensive industries and industries of infonomics are corresponding factors on the labor market (Sassen, 2001; Taylor, 2004; Florida, 2005). In this case, the term 'knowledge-intensive industries' means universities and science parks, 'capital-intensive industries' refers to banks and insurance companies whereas industries of 'infonomics' are telecommunication companies for example. Not least, creative industries, in terms of Florida's (2012) Bohemian Index, which measures the density of artists, writers and performers in a region, are a component of a city's labor market in the knowledge society. The workers, which are employed in the industries of the knowledge society, work rather with their brain, than with their hand.

The inhabitants of the Gulf cities answered the question concerning the necessity of companies with information market activities averagely with 5.85 points on the expectation and 4.94 on the experience side. The difference between the assigned scores of the single cities is conspicuous: Doha—having an own telecommunication company—gets 6.75 points for expectation and 5.50 points for experience and others like, for example, Sharjah—having no own telecommunication companies and depending on the neighboring regions Abu Dhabi and Dubai (interview partner SH4)—get only 3.40 points for the experience part. In this context, also some powerful telecommunication companies like Etisalat located in the UAE, Zain located in Kuwait City and Nawras and Omantel located in Muscat were named (interview partners KU1, MU1). Often, companies are located in centered regions like "Internet City" and "Media City" in Dubai (interview partner AD3). Nevertheless, the telecommunication market is seen as rather

small (interview partner DO1). The interviewees agree with each other that their services are insufficient. Interview partner MU2 mentions that the providers are just specialized in sale and hence non-manufacturing companies. In contrast, a software branch does not exists is the Arab region at all (interview partners DO1, MA4).

Averagely the interview partners answered the question regarding job polarization with 4.27 points on the experience side, which is 0.18 points higher than their expectation. Kuwaitis, Emirati and Omanis speak about a strict separation between high and low paid jobs, but also emphasize the importance of the existing middle class. Many of these jobs are indispensable (interview partners KU4, MU1, SH1). In contrast to most of the other natives, Omanis work beside the expats as common professions (interview partner MU1). The expat population in the Gulf cities—most of them live in the country for work—is almost everywhere above 80 percent except in Muscat, where it is a bit lower. Nationalization programs like 'Qatarization' or 'Emiratization' are in progress to reduce the high number of expats (interview partners DO1, KU1). It is doubtful whether this question is appropriate for the Gulf region since most of the natives work in the public middle class sector (Kosior et al., 2015).

## 5.6. Political Willingness and eGovernment

Political willingness and eGovernment are required conditions to establish an informational city. EGovernment refers to the use of ICT and especially the inclusion of web-based services by the government. This form of government should be established primarily for the citizens since it provides a relief in governmental matters like the access to information, hold available by government (Awan, 2003).

The political willingness to perform changes exists in all of the analyzed cities (average experience rating: 4.84) and their future visions are supported by large sums of money. The willingness seems to be particularly high in Doha (6.25), Sharjah (6.20), and Dubai (5.00), however readiness to cooperate on a regional level only exist to a minor degree (interview partner DO1). The interviewees mention, that the global trend of city development is recognized and that plans to change the future of the Gulf states exist. The interviewees in Dubai confirm that the city "has the willingness of contesting the world" (interview partner DU1) and therefore tries to improve their status. Other Emirati take the prototypical informational city Singapore as an example for their future urban development towards a knowledge society (interview partner AD2). The future plans will be financed by the oil revenues. However, in most cases the implementation proves difficult (interview partners KU3, MU5). Interviewee KU3 predicts that someday, when the oil reserves are empty, the government will be unemployed and the country will be empty since all people will leave.

When asked if Kuwait City, Manama, Doha, Abu Dhabi, Dubai, Sharjah and Muscat are characterized by eGovernance, the interviewees give averagely 4.06 points. Thus, their experience is 1.88 points lower than their expectation of eGovernance in an informational city. This difference is accounted for by the existence of eGovernment and eParticipation, and by the lack of eDemocracy (interview partner SH2). Information is available, but the citizens do not get the chance to participate in governmental matters, since all decisions are already made (interview partner KU1). Only some transactions can be done online, but one thing seems to be possible in all Gulf cities: the payment of parking tickets online (interview partners AD1, DU3, MA1). Interviewee KU3 talks about improvable services, such as the mail service of the government, while in Muscat up to 90 percent of the services can already be done online (interview partner MU3). Even though activity and participation on social media platforms like Facebook and Twitter exists, it is not always sufficient (interview partners SH3, MU2).

## 5.7. Location Factors

In an informational city, another central aspect are soft location factors. The presence of several of these factors contributes to the attractiveness and the increase of the magnetic effect of a city. Soft location factors comprise cultural and leisure time facilities like museums, galleries, libraries, opera houses, symphony halls, theatres, and diverse events, architainment and attractive waterfronts as well as shopping opportunities (Hall, 1997a). In order to attract inhabitants, business companies and visitors, a city needs to offer a variety of those services to cover the different interests of the individual groups (Van den Berg, van der Meer, & Otgaar, 2007).

The presence of leisure time facilities in the Gulf region is rated 4.56 and is therefore not as high as the expectation (5.88). The average experience value of the interviewees in Dubai is quite high. But not only do the residents think highly about the available leisure time facilities in Dubai but also interview partner SH4 confessed that residents of Sharjah go to Dubai for the consumption of leisure facilities.

The question about shopping malls is one of the two questions where the average expectation (5.00) lies below the average experience (6.00). All the interviewees decided unanimously that there are enough or even more than enough shopping malls in the Gulf region. These malls are not only used for the purpose of shopping but they serve as a social place for the people. Due to extremely high temperatures in summer, the climate in the malls is pleasant for the residents (interview partner MU4). Again it holds for Sharjah, that even though the emirate has enough shopping possibilities (interview partner SH3), people go to Dubai or Abu Dhabi instead (interview partner SH4).

The average expectation regarding the existence of architainment in the Gulf cities is 4.94 which is only 0.35 above the average experience. The average experiences in Muscat and especially in Kuwait are very low. Kuwait is accordingly not attractive regarding architainment and waterfronts. The cities' attractiveness is limited to light effects since there is no ancient substance (interview partner KU1). In Muscat the construction of buildings with more than eight floors is forbidden by Oman's building law (interview partner MU1). Other contemporary or sophisticated buildings do not exist, either. Muscat can score with its very nice nature made up of mountains, beaches, wadis (dry riverbeds), and also desert landscapes, however there are only few tourists (interview partner MU2). Unlike Muscat, Dubai attract lots of tourists every year. Some of them even come to visit more than once (interview partner DU2). In Doha and Abu Dhabi the average experience is just a bit lower than in Dubai. Interview partner KU3 summarizes: "Kuwait was yesterday, Dubai is the present, and Doha is the future."

## 5.8. Spaces

First efforts researching world cities were made by "The World City Hypothesis" (Friedmann, 1986), which deals with the city's placement in the world economy. Castells' (1989) city research is also included and defines cities by their placement in the space of flows: flows of money, power, and information compared to the former focus on space of places. According to Taylor (2004) world cities are never isolated but always interconnected. This position in the network of global regions is called "cityness" (Taylor, Hoyler, & Verbruggen, 2010). Sassen (2001) choses the term "global city" as a preferable expression for such significant metropolises in today's globalized world. However, we do not differ between the expressions 'world city' and 'global city' in this article and use the terms synonymously.

The Gulf cities seem to have a sufficient number of capital-intensive companies, since the expectation (5.62) and the experience (5.42) almost achieved the same valuation. Some of the

cities have banking districts (interview partner MU2) where the British finance system prevails. Islamic banking—a system where no interests are charged—also co-exists, but since it is suspicious to many people, some cities, e.g. Muscat, refused to introduce this system for a long a time (interview partner MU3).

Regarding the aspect of informational cities and Gulf cities as global cities, the expectations were averagely higher (4.91) than the experiences (3.62). At it, interviewees in Doha (5.75), Dubai (5.50) and Abu Dhabi (4.30) are most confident of living in a global city. Especially in Dubai it was emphasized that the city is well-connected (interview partner DU2). Others, for instance in Sharjah, mention that their city is trying to become global interview partner (SH4). And still others, living in Kuwait, Manama or Muscat, do not classify their city as global. A global city has to be well connected and needs to attract people (interview partner KU1)—however, Muscat is called a "boring village" (MU1).

In the Gulf states, a strict policy of censorship is pursued (average experience value: 3.46): Voice over IP (VoIP) is officially banned. However, the Skype-website could be opened in all cities, but not in Muscat. The government tries to control every sector to operate their political power (interview partners DU2, MU2). Also, it can be assumed that the telecommunication companies do not want to compete with freely available software and that they want to generate more profit (KU4). However, a virtual private network (VPN) client is widely used to get access to Skype and other censored websites (interview partners MA3, KU4). The interviewees feel restricted in expressing their own opinion (interview partner MU4). The expected necessity of free flow of information in an informational city (average expectation value: 6.53) cannot be confirmed for the Gulf cities.

## 5.9. Ranking of the Gulf Cities

The final point of our research about the Gulf cities' informativeness is an overall ranking of Kuwait City, Manama, Doha, Abu Dhabi, Dubai, Sharjah, and Muscat (Table 2). In case of the interviewees' experiences (P), Doha receives the best score with 0.86 points above the average of the evaluated Gulf cities and is followed by Dubai and Sharjah. Abu Dhabi, Kuwait City and Muscat fall below the average. Regarding the difference (Q) between experience and expectation,

*Table 2. Ranking of the cities by the ServQual results*

| Ranking by P | P-Value | Ranking by Q | Q-Value | Ranking by Q18 | Q18-Value | Ranking by Position | Position Value |
|---|---|---|---|---|---|---|---|
| Doha | 5.15 | Doha | -0.59 | Dubai | 4.88 | Doha | 4 |
| Dubai | 4.77 | Sharjah | -0.89 | Doha | 4.25 | Dubai | 7 |
| Sharjah | 4.71 | Manama | -1.11 | Sharjah | 4.20 | Sharjah | 8 |
| Manama | 4.58 | Dubai | -1.13 | Abu Dhabi | 4.00 | Manama | 12 |
| Abu Dhabi | 4.23 | Kuwait City | -1.37 | Manama | 3.60 | Abu Dhabi | 15 |
| Kuwait City | 3.55 | Abu Dhabi | -1.58 | Muscat | 2.67 | Kuwait City | 18 |
| Muscat | 3.50 | Muscat | -1.96 | Kuwait City | 2.00 | Muscat | 20 |
| Gulf City | 4.29 | Gulf City | -1.28 | Gulf City | 3.57 | | |

Doha—where the interviewees' experiences do not deviate much from their expectations—comes first once more. Also Sharjah achieves again a good rank. The values of Kuwait City, Abu Dhabi and Muscat are once again below the average. Taking the last question on informational cities (Q18) into consideration the huge difference between the best (Dubai: 4.88) and the worst (Kuwait: 2.00) rated city is striking. To receive the final ranking of all cities, the positions of the rankings by P, Q and question 18 are aggregated: Doha is ranked first and hence has the highest informativeness regarding the estimations of our interview partners. It is followed by Dubai and then Sharjah. The fourth and fifth positions are occupied by Manama and Abu Dhabi while Kuwait and Muscat come in last.

## 6. CONCLUSION

For Kuwait City—a city concentrating rather on the development of automotive infrastructure than the development of ICT—an after-oil future with an empty cityscape is predicted. Gone are the times when Kuwait was attractive to foreigners due to its prosperity. Having impressive libraries that are almost not used by the citizens, meeting places where people rather talk about other things than knowledge-intensive topics, and no architainment to attract people from different countries seem to be determining disadvantages in the struggle to become an informational city. It gets of barely better than Muscat where receiving the status of an informational city seems far away. In contrast, Dubai, as the most known of the seven United Arab Emirates, outshining Abu Dhabi and Sharjah in terms of informativeness, focuses its strategy on ICT more than other cities in the region. The construction of an own metro system, the settlement of telecommunication providers and technology parks hint at a huge development during the last few years. But will the city be superseded in the future? According to our ServQual results, the willingness to become an informational city seems to be highest in Doha. The development of an ICT infrastructure is as high as in Dubai and also some telecommunication providers are located in the city. The plan is to educate and train nationals properly to pave the way to a global knowledge society. This proves that the willingness to pursue the status of an informational city definitely exists. The will is also existent in Manama, which is ranked exactly in the middle of all cities, but the success has other than in Doha not occurred. To sum up, we can carefully say that Kuwait is the past, Dubai is the present and Doha is the future.

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Our interview partners were cited by using abbreviations, with KU for Kuwait City, MA for Manama, DO for Doha, AD for Abu Dhabi, DU for Dubai, SH for Sharjah and MU for Muscat and a following number for the interview order in each city.

Two research teams visited the Gulf cities. In 2013, Adriana Kosior, Agnes Mainka, and Wolfgang G. Stock travelled to Dubai, Abu Dhabi, Doha, and Manama; in 2014, Julia Barth, Julia Gremm, Fee Hilbert, and Wolfgang G. Stock visited Kuwait City, Sharjah, and Muscat. We would like to thank all our interview partners for their time and for many valuable hints and suggestions.

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