Digital Libraries as Knowledge Hubs in Informational Cities

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Informational world cities are based on knowledge; and the traditional institutions of knowledge organization, storage and dissemination are libraries. Knowledge institutions, like (digital) libraries, provide societies with worldwide information and establish a culture of lifelong learning. In informational cities, libraries might change into the knowledge hubs of the ubiquitous society. Our hypothesis is: Regarding to the highly developed ICT infrastructure of an informational city, libraries have a huge variety of digital information as well as attractive physical meeting, working and learning spaces. This paper investigates the important role of (digital) libraries in the constitution of informational cities. Based on the relevant literature, we investigated public libraries in informational cities. An international survey was conducted in the period from 26th August to 22nd September 2011. For this purpose, a questionnaire was developed which was sent to 38 public libraries in several major cities of the world. A total of 14 libraries from Europe, North America and Asia-Pacific agreed to take part in this survey. Additionally, we conducted a case study of the library infrastructure of Singapore. The results of the survey illustrate that there is no consistent strategy how libraries handle their physical and digital library. Investments in digital resources or in physical spaces differ on a large scale. But nearly all libraries offer electronic resources (such as e-books or e-journals), digital reference services as well as guides and seminars to enhance the information literacy of their users.

Introduction
With the upcoming of the knowledge society a new era of cities arises. Developed societies in many regions in the world are based on the growing importance of knowledge. Just as there have been typical cities of the industrial society (e.g., Manchester in the 19th and early 20th century) or the service society (e.g., Manhattan of the late 20th century), there exist typical cities of the knowledge society. According to Manuel Castells (1989) we will call them “informational cities” (Yigitcanlar, 2010; Stock, 2011; Mainka, Khveshchanka, & Stock, 2011). Those cities are metropolises of the 21st century and they make its mark in the global economy. Urban development and economic growth is based on infrastructures of information and communication technology (ICT) and on cognitive infrastructures. In an informational city, there exist two spaces: the space of places and the space of flows (Castells, 1994). The space of places (e.g., buildings, streets) is dominated by the space of flows (flows of money, power and information).

The information infrastructures of informational cities can be split into the main categories “ICT infrastructure”, “cognitive infrastructure” and “smart infrastructure” (Hollands, 2008). Several aspects from “networked city” (Craven & Wellman, 1973), “digital city” (Ishida, Ishiguro, & Nakanishi, 2002) or “ubiquitous city” (Shin, 2009) research play a major role in the analyses of the ICT infrastructure. Secondly, there are many indicators from “knowledge city” (Ergazakis, Ergazakis, Metaxiotis, & Charalabidis, 2009) and “creative city” (Carillo, 2006) investigations which are important for the analyses of the cognitive infrastructure. Next to this the terms “world city” (Friedmann, 1995; Taylor, 2004) or “global city” (Sassen, 2001) are often used in the literature. These analyses are very close to the informational world city research but they do not consider all aspects which are important for the whole development of the knowledge society in an informational world city. In our approach, we integrate all aspects into one framework.

Informational cities are based on knowledge, and the traditional institutions of knowledge management are libraries. Knowledge institutions like (digital) libraries support cities with worldwide information and establish a culture of live-long-learning. Our thesis is: In informational cities libraries are the knowledge hubs of the knowledge society.
In advanced to the high developed ICT infrastructure of an informational world city, libraries have a high supply of digital information as well as attractive physical work places. In this paper we investigate in the role of libraries in informational cities and explain their important role in the ICT and cognitive infrastructure (Figure 1). Additional we analyzed Singapore’s libraries as one example of an informational world city’s library.

The Knowledge Society

In a developed city the central aspect of progress and economic growth is knowledge. According to Hack (2006, 109) the knowledge of a society is divided into various states. We will find it as scientific knowledge, as lay and expert knowledge, as the basis of education and training, as a reservoir of patents and licenses, as a knowledge-based organization, as the focus of management strategies and investment decisions of transnational corporations, as the algorithms of search engines, as binding truths and tentative interpretations.

Knowledge is known as the most important resource of economic success (Machlup, 1962; Bell, 1973; Porat, 1977; Hepworth, 1987). It is not on a level with labor, land and capital, but is the resource that has a great influence on the efficiency of these assets (Choo, 2002). The recognition of knowledge as the main incentive of economic growth marked the crucial turning point of the development of the knowledge society (Drucker, 1993). Economic success now depends on the cleverly use of knowledge (Linde & Stock, 2011).

With the upcoming of information and communication technology it has become possible to store and share knowledge in a digital way. The digital transfer of information via the World Wide Web bears new means of (real time) interaction (Castells, 2000; Melzi, 2009). With new possibilities of interaction a new type of information users develops: users are now able not only to retrieve online information but also to create and distribute content in the web (Sutter, 2010).

According to Kuhlen (1995) we define information as transmitter of knowledge. Hence the technical innovation of the knowledge society is based on ICT (e.g., computer, digital networks, software etc.). But technology alone is not enough. The society has to be able to use the resource “knowledge” adequately. The development of an informational world city therefore depends on the ICT infrastructure as well as the use of this infrastructure by libraries, businesses, schools, institutions and households (Curwell, Deakin, Cooper, Paskaleva-Shapira, Ravetz & Babicki, 2005). The adequate use is determined by ICT literacy and the willingness of all people and institutions to use it.

The knowledge of a society developed to a competitive factor for economies (Hack, 2006). Therefore future evaluations of economies will depend on the knowledge capital which a society is able to bind. This knowledge will
be generated by libraries, educational institutions, research and development institutions and the philosophy of lifelong learning. Hence the knowledge is not limited to this, but is spread to all entities of a society (e.g., economy, politics, culture and law).

According to Johnson, Ariunaa and Britz (2005, 217) the foundation of the knowledge society is composed of four pillars:

1. ICT-infrastructure, which guarantees a high speed internet access,
2. knowledge centres, which provide the relevant knowledge in the relevant languages,
3. physical infrastructures, with transportation routes for people and goods and
4. education as well as research and development centres to form a knowledge-intensive population and to provide innovation.

Thus the establishment of an informational world city depends on the political and economic willingness as well as the readiness of the citizens to achieve this goal.

**Libraries in Informational Cities**

Libraries play a fundamental role in the knowledge society. But are they able to become knowledge hubs of an informational world city? Libraries are important for the transfer of explicit knowledge in those cities and they should be accessible for every citizen (Stock, 2011). In informational world cities we can find many different kinds of libraries. According to Ergazakis et al. (2006) public libraries have a particular importance, because they supply all citizens, firms and institutions and aren’t reserved for a small community e.g. university libraries. As shown in Figure 1, libraries are a part of the cognitive infrastructure in an informational world city and are integrated into the knowledge city research. However (public) libraries are knowledge holders and disseminators and this is the consumed daily bread of every citizen in a knowledge society.

Physical libraries are important as meeting and learning places for all citizens (Freemann, 2005, Audunson, Esmat & Aabo, 2011, Dahlkild, 2011). An additional offer is supplied by their digital counterpart. A digital library is an “information service in which all the information resources are available in computerprocessable form and the functions of acquisition, storage, preservation, retrieval, access and display are carried out through the use of digital technologies” (Oppenheim & Smithson, 1999, p. 97). They should be seen as extension and enhancement of the physical library, because they broaden the supplied resources and allow better methods of information retrieval (Borgman et al., 1996; Allard, 2002). Digital libraries do not only include the reference information, but also full-text materials (Stock, 2011) and further documents in non-text format (Oppenheim & Smithson, 1999). Their digital collections comprise e-databases, e-journals (which are often a part of databases), e-magazines, e-newspapers, e-books, e-audios and e-videos. It should be pointed out that not only fiction literature, but also special content, like STM journals, is accessible through digital libraries. Besides the fact that the resources come from the city or the corresponding state, they are purchased from over the world as well. Thus, digital libraries contain both local and global explicit knowledge.

One of the important functions of digital libraries in an informational world city is providing access to the available e-resources to all inhabitants (Tedd & Large, 2005). In an informational world city, this access is mostly free or at least affordable. Furthermore the inhabitants have the possibility to consult the e-resources not only via the library computers during the library opening hours, but also anytime and anywhere via different electronic devices: PC’s, laptops or mobile phones. According to Stock (2011, p. 974) with regard to the 24/7 access, two models can be distinguished on the urban level. The first was tested in Reykjavik (and the entire Iceland) and allows the inhabitants to access all e-resources from anywhere. The second one is applied, for example in Singapore, where some (highly specialized and expensive) e-resources can be accessed only via the library computers in all libraries or in selected libraries, and other allow for a remote access.

Besides the access to the digital library, its usage by the inhabitants of a city is important. To ensure the usage, the libraries undertake active marketing efforts concerning their digital libraries; they also improve the usability of their website, provide different forms of digital reference and publish video tutorials or other additives (e.g. manuals) online. In doing so, libraries contribute to the further shaping of “knowledge citizens” (Martinez, 2006), those inhabitants who have good language skills, technology and information skills (Merrick, 2009). It can be assumed that in the near future more and more digital libraries in informational cities will provide e-learning services in order to facilitate the lifelong learning of knowledge citizens. Because informational cities are often culturally diverse, digital libraries have to be accessible for international visitors and knowledge workers. To ensure the cross-cultural usability (Komlodi, Caidi, & Wheeler, 2005) of the digital library, its website or at least some web pages with relevant information have to be provided in respective languages. A digital library in informational world cities exhibits some of the features of a ubiquitous library (UbiLib (O'Donnell, 2011)). Thus, such a digital library is web-based, multilingual, provides an open, global, 24/7 access and offers documents in different formats (Li, 2006).
Method: Survey about Digital Libraries’ Performance in Informational Cities

How do digital libraries perform nowadays in terms of the discussed aspects in informational cities? To answer this question, an international survey of public libraries was conducted in the period from 26th August to 22nd September 2011. For this propose, a questionnaire was developed, which was sent to 38 libraries in major cities of the world. Totally 14 libraries from European, North America and Asia-Pacific agreed to take part in this survey (Figure 2). These participating libraries are located in potential informational world cities and thus, we get an overview of libraries performance in different cities worldwide.

The questionnaire which was send to the public libraries contained questions with regard to the digital library, its content, accessibility and usage. Many questions require a specification of statistical data that were provided by the participants for the year 2010. It should be pointed out that the respondents were not obliged to answer every question in the survey form.

Questions about content and accessibility of digital libraries were:

1. How many e-resources (e-databases) do city libraries offer?
2. What is the total annual expenditure on all e-resources?
3. In how many languages is the digital library website available?
4. Is the use of e-databases for library users free of charge?
5. Do libraries offer online video tutorials for using the digital library?
6. Do libraries offer guides for using the digital library?
7. Do libraries offer seminars on information literacy?
8. What kind of digital references do libraries offer?
9. Are there any marketing activities for digital libraries?

Results

The first question should give us an overview about the existing offer of e-resources in the digital libraries in the particular city. As Figure 3 shows, there are wide differences between the total numbers of supplied e-databases. New York’s digital libraries offer more than 300 e-databases. Also a very high number of e-databases are offered in Sydney (268) and in Singapore (138). On the other end of the scale we see Barcelona with 12 and Munich with just 5 e-databases.

Next to the supplied offer we were also interested in the accessibility of these e-resources. Have all citizens’ access from home or do they have to visit the physical library? Figure 3 also shows the percentage of accessible e-databases sorted by type of access. The results of the survey illustrate that there is no consistent strategy for access handling at digital libraries. For example in New York’s and Barcelona’s libraries give more than to 70% of all available a-databases just access at the physical library. Seattle’s and Vancouver’s libraries make over 80% of all...
e-databases available at home. Sydney’s, Seattle’s, Ottawa’s, Austin’s, Vancouver’s and Canberra’s libraries make more than 80% of all e-databases access at home and at all libraries. Munich’s libraries with just five e-databases give access to four of these resources in selected libraries and just one e-database is available from home and from all libraries in the city.

The next question was about the total annual expenditure on all e-resources. The results show, that there exist wide differences between the investments in digital resources. It was expected that those cities with the highest expenditure would have the highest supply of e-databases for their e-resources. In Figure 4 we see that Sydney with 268 e-databases spend more than 600,000 Euros in 2010. But Seattle and Ottawa with fewer than 100 e-databases spend more than 800,000 Euros for their digital libraries. Munich with just 5 e-databases spends about 14,000 Euros per e-database where Sydney with 268 e-databases spends less than 3,000 Euros per e-database. This illustrates that there is no interrelation between the annual amount and the supplied number of e-databases. It is possible that public libraries like in Sydney negotiated better conditions with the e-database hosts because they order a higher amount or they acquired cheaper databases. But this has to be proved by a deeper questionnaire.

For libraries in informational cities it is important to serve the needs of the cultural diversified citizens. Employees, students and creative people from all over the world move to those cities and they should have the possibility to use the library. To examine if the respondent libraries consider these people in their concepts, we asked which languages are available on the libraries websites. Apart from Munich all libraries offer their websites in English (Table 1). Five libraries indicated that they just offer their websites in their mother tongue. The most libraries offer English because this language is their mother tongue or the official language in this city. On the other hand Seattle’s, Vancouver’s and Wellington’s libraries...
offer even more than five available languages for their websites.

Digital libraries also have to attend the needs of their users. So the questions 4 to 7 are addressed to other services of the digital libraries. As Table 2 reveals, all responding digital libraries offer their e-resources, charge free. They all make their e-resources accessible for all citizens, but do they also help the users to use the e-resources adequately? To enhance the information literacy of library users the libraries often offer video tutorials, guides or special seminars. All the respondent libraries offer guides for using the digital library. 9 of 14 libraries provide video tutorials and 11 public libraries offer special seminars on information literacy.

<table>
<thead>
<tr>
<th>Num. of available languages</th>
<th>English</th>
<th>Spanish</th>
<th>French</th>
<th>German</th>
<th>Finnish</th>
<th>Swedish</th>
<th>Chinese</th>
<th>Japanese</th>
<th>Others</th>
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<td>New York</td>
<td>1</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Sydney</td>
<td>1</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Singapore</td>
<td>1</td>
<td>+</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seattle</td>
<td>&gt;5</td>
<td>+</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td>+ (Vietnamese, Russian, Somali, Amharic)</td>
</tr>
<tr>
<td>Ottawa</td>
<td>2</td>
<td>+</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
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</tr>
<tr>
<td>Montreal</td>
<td>2</td>
<td>+</td>
<td>+</td>
<td></td>
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<tr>
<td>Austin</td>
<td>2</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Wellington</td>
<td>&gt;5</td>
<td>+</td>
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</tr>
<tr>
<td>Vancouver</td>
<td>&gt;5</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td>+ (Vietnamese, Korean, Hindi (key sections))</td>
</tr>
<tr>
<td>Canberra</td>
<td>1</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Helsinki</td>
<td>3</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td>+ (partially)</td>
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<tr>
<td>Dublin</td>
<td>2</td>
<td>+</td>
<td></td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Barcelona</td>
<td>3</td>
<td>+</td>
<td>+</td>
<td></td>
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<td></td>
<td>+</td>
<td></td>
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<tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>+</td>
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</table>

<table>
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<th>Question:</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<td>Is the use of e-databases for library users free of charge?</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Do libraries offer online video tutorials for using the digital library?</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Do libraries offer guides for using the digital library?</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Do libraries offer seminars on information literacy?</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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</tbody>
</table>
We also want to know how the libraries’ reference service works. Do libraries use additional web applications or only email and web forms? All investigated libraries reported that they supply online reference services. The most popular channels are email and web forms. New York’s, Singapore’s, Seattle’s, Ottawa’s, Austin’s, Vancouver’s and Helsinki’s libraries additionally offer reference services via chat or instant messaging.

The digital libraries in informational cities also need to be recognized by the citizens. For this propose we asked the public libraries if they try to enhance the popularity of the digital library by any marketing activities. 12 of 14 respondent libraries indicated that they promote their digital library actively. How the marketing activities are implemented and whether they are successful have to be analyzed in detail.

**Case Study: National Library of Singapore**

Our case study is based on an answered questionnaire, on relevant publications and on our conducted field survey in Singapore in June 2010. Singapore is a famous example of an informational world city (Khveschanka, Mainka, & Peters, 2011).

Singapore’s libraries are represented by the National Library, 3 regional libraries and 21 public libraries (Heok & Luyt, 2010; Mittermaier, 2006; see Figure 5). All libraries are connected through one network. The use of Radio-Frequency-Identification-Technologie (RFID) helps the libraries to identify, lend and return library materials (Singapore Department of Statistics, 2010).

The National Library Board (NLB) manages Singapore’s libraries. This Board was established in 1995 and its main task is „to provide a trusted, accessible and globally-connected library and information service as to promote a knowledgeable and engaged society“ (NLB, 2010). Actual developments are defined in the „Library 2010 Report“:

“We will focus on building Libraries for Life to support the development of strong social capital in Singapore which will help to weave the fabric of a strong knowledge-based society. We will focus on Knowledge for Success which will create knowledge dividend for Singapore as a competitive, productive and innovative knowledge-based economy.” (NLB, 2005, 24)

To enhance the citizens usage of the libraries the NLB establishes programs like Read!Singapore. This program is adapted from the “One Book, One City” project in the US. Citizens should get a space for community reading, for creative engagement and discussions about common topics. With this initiative the library also will achieve an improvement of citizen’s skills like critical thinking, creativity and imagination (NLB, 2012; Luyt, Chow, Ng, & Lim, 2011). Furthermore many events are organized to increase the attractiveness of libraries. In 2010 for example more than 6,000 events were organized and more than 9,000,000 people have visited them (MICA, 2011).

In terms of the number of users it should be pointed out that in Singapore 540 of 1,000 citizens are library users (Singapore Department of Statistics, 2010). One reason for this high number could be that the basic membership is free.
of charge for all citizens. In comparison, foreigners with a permanent residence in Singapore have to pay a one-time application fee. For a foreign membership additional annual operating costs have to be paid. Additional there are two price models available for users who like to have a higher demand on library materials. The premium and premium plus membership are connected with a yearly charge and allow users to borrow more library materials at once (NLB, 2011).

Another reason for the high number of users is the advanced use of technology. The mentioned RFID-technology allows the users to borrow a book in one library and to give it back in another. Singapore’s libraries also offer online services in so called “e-kiosks”, where users can manage their membership, charges or report a lost book (NLB, 2009).

An important digital service of a library is the supply of e-resources. Singapore’s libraries offer one homepage where all e-resources are available (Figure 6). All services are offered by the National Library or in cooperation with other information service provider (e.g., the “Singapore Memory Project” (Chellapandi, Han, & Boon, 2010). Also licensed products like Factiva or JSTOR are accessible through this website. Following document types are available:

- e-books,
- e-databases,
- e-journals,
- e-magazines,
- e-newspapers and
- other services (e.g., e-comics).

The libraries also specify their services for special user groups. For example children, adolescent, students in the primary or secondary degree have their exclusive online services. A separate website is reserved for digital material about Singapore. If it is useful e-resources are also accessible via mobile units. At present, the NLB developed just an iPhone App called “Mobile Read”, which allows the users to download selected NLB content (other readers, e.g., Over-Drive, can be chosen for android or windows phone users to read online books or else).

Figure 6: National Library of Singapore. Homepage of e-resources
[Screenshot retrieved 08.05.2012].

The e-databases are divided in three different types of access:

1. Access from every household,
2. Access from every library,
3. Access from specialized libraries.

Resources of general interest are available everywhere. The target audience in this case is the “remote users” – users who access the library content outside the library building (Chellapandi, Han, & Boon, 2010). According to the high costs of e-resources high quality services have a limited access (Chellapandi, Han, & Boon, 2010). For example the “Bloomberg Professional Service” is just accessible in the Lee Kong Chian Reference Library.
The libraries also offer reference services for remote users (Han & Seng, 2007). Reference services are available via email, web form, chat (instant messaging) and SMS. Singapore’s reference service aims to be at a high quality. If an answer via SMS might be too long, the user will get an URL where the relevant information is retrievable on a website. Or if a question could be answered by scientific literature the user will receive the relevant publication as well. Thus the online reference services of Singapore’s libraries are directly connected with the digital delivery of documents (Boon, 2010).

It should be stressed that all e-resources offered by the National Library are free of charge for all members. The e-resources of the NLB consist of 138 e-databases of third-party, 600 e-journals and 1,100 e-newspapers in 39 languages. Special marketing activities promote the digital resources of the NLB and also provide help guides to the users (Dresel & Kaur, 2010). It should be emphasized that the NLB has counted 7.86 million unique users and 47.7 million page impressions in 2010. The main user access was counted from remote users (85%). Just 15% of the users access the websites from any library computer.

According to Wah and Choh (2008) (Choh is director of the National Library) there are lots of more possibilities to enhance the use of libraries for the citizens. They are pursuing three strategies: (1.) The „restaurant model“: Users visit the physical or digital library (restaurant), check the catalogue (menu) and decide what they like to have and consume it. (2.) The “fishing model”: Users forage for information (as a fisherman fishing in the sea). The users keep this information which is of its interest and ignores other information (as a fisherman throws fish back into the sea, if it is too small). If a library chooses this strategy the library has to be present on platforms where the user searches for information. For example search engines like Google, social networks like Facebook or other data sharing services like Flickr or YouTube should be used to share the libraries’ content. An additional benefit could be that users generate and index own content, for example photos from Singapore on Flickr, and thus increase the available data for other users. (3.) The “franchise model” (this idea is not realized yet): This strategy refers to scientists, universities, science parks and other businesses or institutions of research and development. This audience is familiar with their specialized information services such as university or corporate libraries. The National Library provides (via an API) the required content to these libraries. Wah and Choh (2008) describe this model as follows:

“Since this collaboration happens „behind the scenes“, the marketing of the services and content is fronted by the research institutes to their customers. Similar to the second model, the research institutes have their own vested interest to make the portal attractive to their own customers. The originating library only needs to market their delivery service (via API) to these research institutes or communities.”

The National Library of Singapore supports the growing knowledge society. “Changing consumer lifestyles and technology innovations bring with it new possibilities for libraries” (Han & Seng, 2007).

Discussion

The aim of this paper was to point out which services libraries offer in informational cities and whether they are able to act as knowledge hubs in the knowledge society. For this propose 14 public libraries filled out our questionnaire. Of course this is just a first listing of existing library services but it has given us an idea about the actual development in proposed informational cities. As expected the results show that the digital libraries have a variety of services which are important for an emerging knowledge society. The available e-resources consist of e-journals, e-books, audio-books, music, e-magazines, videos, newspapers and bibliographic databases. E-resources seem to be basic services in informational cities’ digital libraries. But there is a huge difference in the available amount and accessibility of these resources. This amount depends on the investments which a public library is willing (or is able) to spend for their e-databases. As we found out, digital libraries with a high amount of e-resources have a high spending. It should be analyzed which databases are very popular so that other public libraries could decide which databases they also should offer. But this should not decrease the variety of information provider. Depending on the high spending some libraries will possibly not be able to expand their offer yet.

The use of the digital resources is free of charge in all analyzed libraries. There are also different guides which help the users to deal with the available e-resources. 9 libraries offer video tutorials for this propose. Additionally many libraries offer seminars on information literacy. Thus, we can expect that those libraries recognize the need that informational literacy should belong to the skills of citizens in a knowledge society. It is also important to make the library services available in English or other main languages to ensure that all citizens are able to use these services. It should be stressed that all investigated libraries offer some kind of online reference services: People can get their needed information fast and without being forced to go to the public library.

Regarding to the libraries in Singapore we presented a famous example of a library network in an informational world city. The library offers an excellent network by using new technologies and a high supply of e-resources for the citizens. Besides Singapore’s National Library Board is running many diverse marketing activities and try to reach
the users where they are – this could be in a shopping mall or on Facebook.

Outlook

The conducted survey has provided some key data that demonstrate the contribution of digital libraries in cities of the knowledge society. Not only digital, but also physical libraries play a major role in this regard. The role of libraries as places of knowledge sharing will be discussed in future publications. In addition, we want to find out what role libraries will play in informational cities at all, to what extent they are incorporated into the city-wide knowledge management and what services they provide in connection with other institutions (e.g., schools). Will libraries really make their mark as knowledge hubs in informational world cities?

REFERENCES


