



Proceedings
of the
13th European Conference
on
e-Government
University of Insubria
Varese, Italy
13-14 June 2013



VOLUME ONE

Edited by
**Professor Elena Ferrari and
Professor Walter Castelnovo**
University of Insubria,
Varese, Italy

acpi

A conference managed by ACPI
www.academic-conferences.org

Proceedings of the 13th European Conference on eGovernment

**Department of Theoretical
and
Applied Sciences
University of Insubria
Como, Italy**

13-14 June 2013

Edited by
Professor Walter Castelnovo and Professor Elena Ferrari
Department of Theoretical and Applied Sciences,
University of Insubria
Como, Italy

Volume One

Copyright The Authors, 2013. All Rights Reserved.

No reproduction, copy or transmission may be made without written permission from the individual authors.

Papers have been double-blind peer reviewed before final submission to the conference. Initially, paper abstracts were read and selected by the conference panel for submission as possible papers for the conference.

Many thanks to the reviewers who helped ensure the quality of the full papers.

These Conference Proceedings have been submitted to Thomson ISI for indexing. Please note that the process of indexing can take up to a year to complete.

Further copies of this book and previous year's proceedings can be purchased from <http://academic-bookshop.com>

E-Book ISBN: 978-1-909507-24-1

E-Book ISSN: 2049-1034

Book version ISBN: 978-1-909507-22-7

Book Version ISSN: 2049-1026

The Electronic version of the Proceedings is available to download at ISSUU.com. You will need to sign up to become an ISSUU user (no cost involved) and follow the link to <http://issuu/acpil>

Published by Academic Conferences and Publishing International Limited

Reading

UK

44-118-972-4148

www.academic-publishing.org

Maturity and Usability of e-Government in Informational World Cities

Agnes Mainka, Kaja Fietkiewicz, Adriana Kosior, Sandra Pyka and Wolfgang Stock
Department of Information Science, Heinrich-Heine-University Düsseldorf, Germany

Agnes.Mainka@hhu.de

Kaja.Fietkiewicz@hhu.de

Adriana.Kosior@hhu.de

Sandra.Pyka@hhu.de

Stock@phil.hhu.de

Abstract: In view of the increased popularity of e-Government in the development of Informational World Cities, i.e. prototypical cities of the knowledge society (such as Singapore, Seoul or Hong Kong), we present two research questions: What is the state of maturity of e-Government in Informational World Cities? How high (or low) is their degree of usability? In order to deal with these issues, we formulate an extended criterion model for the quantification of e-Government maturity, and analyse the average quality of the navigation systems of 31 identified Informational World Cities' official websites. .

Keywords: e-government, knowledge society, informational world city, maturity, usability

1. Introduction

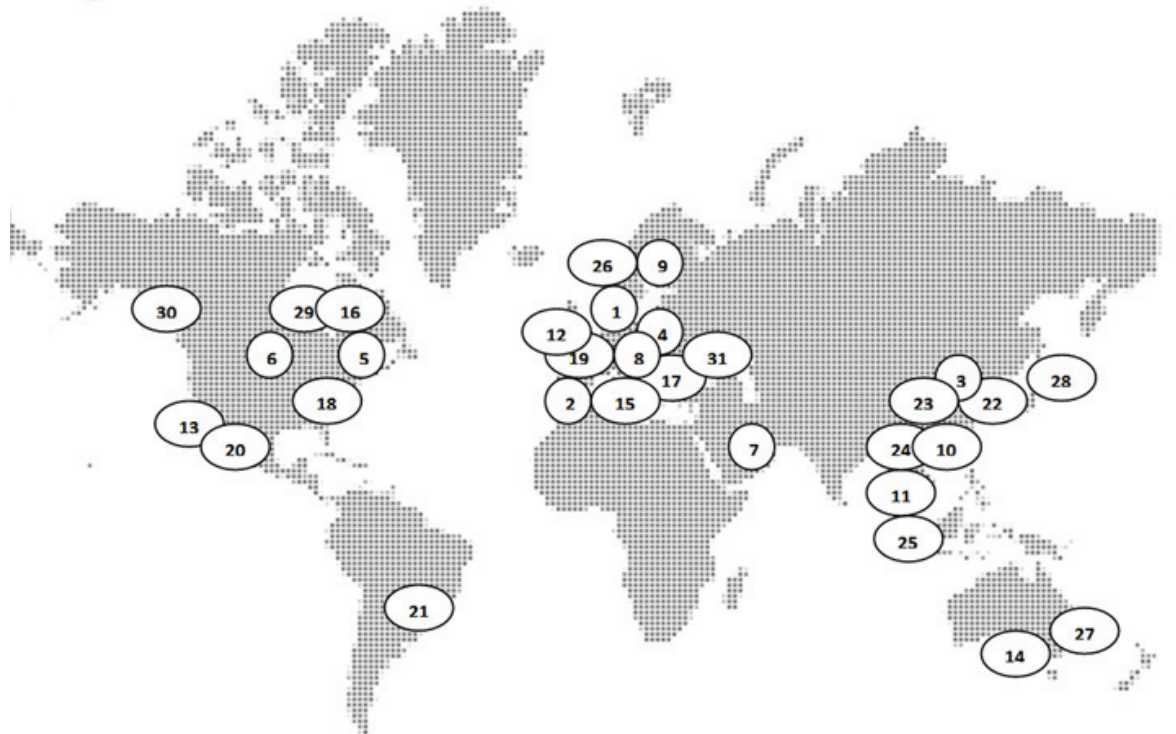
With the advent of the knowledge society begins a new era for cities. Developed societies in many regions throughout the world depend upon the growing importance of knowledge. Just as there have been typical cities of industrial society (e.g., Manchester in the 19th and early 20th century) or the service society (e.g., Manhattan in 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). These cities are metropolises of the 21st century and they make their mark in the global economy. Urban development and economic growth are 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).

In the early phases of Informational City research, it was necessary to identify potential Informational World Cities. An Informational City combines different aspects of modern cities in the knowledge society. In the present project phase, we will investigate world cities. Above all, an Informational World City must be a world city based on the groundwork laid out by Friedmann (1995), Taylor (2004), or Sassen (2001), who define such a place by its degree of "cityness". The number of residents by itself does not make a world city. There also has to be important infrastructure, as given in a digital city (Yigitcanlar & Han, 2010), which some authors call a "ubiquitous city" (Hwang, 2009), a smart city (Shapiro, 2006; Hollands, 2008), a knowledge city (Ergazakis, Metaxiotis, & Psarras, 2004), or a creative city (Landry, 2000; Florida, 2005). The economic success of a world city correlates with emerging human capital (Glaeser, Scheinkman, & Shleifer, 1995). Hence it is necessary for such a city to meet the needs of the knowledge society and to contain important infrastructures in order to be able to compete with other world cities.

How should a real Informational World City be defined? Two conditions must be met. First of all, a city must be referred to as a world city in the literature, and secondly, the city should be referred to also as a digital, smart, knowledge, or creative city (at least one precondition must be fulfilled). All in all, we analysed 126 references. We found information that identified 31 cities in the literature that can be recognised as Informational World Cities (Figure 1). These cities reflect global centres distributed all over the world.

In an Informational World City, eGovernance is the basis of innovation (Yigitcanlar, 2010). Here we looked beyond the aspects of e-Government and eCommerce, taking into account other important characteristics of a city, such as the improvement of living standards for citizens and the increase of economic growth via better cooperation between authorities and citizens and businesses. Thus, the term *eGovernance* should be understood as a generic term for planning, innovation and funding at city level (Sharma & Palvia, 2010, 3).

Increased use of ICT and knowledge management between authorities and citizens or businesses optimises services in e-Government and imposes an obligation to actively engage in political debate and decision-making processes on citizens and companies (Gisler, 2001; Kettl, 2002; Sriramesh & Rivera-Sanchez, 2006; Sharma & Palvia, 2010, 2). In this paper, we analyse this phenomenon and take a closer look at e-Government as the fundamental pillar of eGovernance. According to Moon (2002), e-Government sees an interaction between the levels of information, communication, transaction, integration and participation. We thus conducted an empirical survey of the government websites of 31 Informational World Cities, adapting Moon's five-stage model (2002) in order to find quantitative indicators for these phases of e-Government.



- | | | |
|---------------|-------------------|---------------|
| 1. Amsterdam | 11. Kuala Lumpur | 21. Sao Paulo |
| 2. Barcelona | 12. London | 22. Shenzhen |
| 3. Beijing | 13. Los Angeles | 23. Seoul |
| 4. Berlin | 14. Melbourne | 24. Shanghai |
| 5. Boston | 15. Milan | 25. Singapore |
| 6. Chicago | 16. Montreal | 26. Stockholm |
| 7. Dubai | 17. Munich | 27. Sydney |
| 8. Frankfurt | 18. New York | 28. Tokyo |
| 9. Helsinki | 19. Paris | 29. Toronto |
| 10. Hong Kong | 20. San Francisco | 30. Vancouver |
| | | 31. Vienna |

Figure 1: Informational world cities

Our research questions are: (1) What is the state of maturity of e-Government in Informational World Cities? (2) How high (or how low) is the usability of navigation systems on Informational World Cities' government websites?

Our study is one of the first quantitative empirical analyses of maturity at a city level. Our comparative usability analysis is consequently based upon task-based user tests of the governmental websites' navigation systems. Both studies are globally oriented and focussed on cities of the knowledge society.

2. E-Government according to Moon's five-stage model

The fundamental research we based our own work on refers to a definition of e-Government and to theoretical models trying to describe its development. Hiller and Bélanger (2001) address privacy strategies for e-Government. They provide a detailed definition, background and a framework of e-Government. Contrary to the proposed four-stage model by Layne & Lee (2001), they present an extended five-stage model. The additional stage is participation (i.e. voting, registration or posting comments online). This could be seen as a sub-set of the previous stage named "two-way communication," but the authors see these features as so significant as to warrant naming a separate category for them. In terms of privacy concerns, too, their unique sensitivity makes it useful to see these functions as distinct. Great care for authentication and security is needed for this stage. Moon (2002) adopted the e-Government stage model by Hiller and Bélanger (2001) in order to map the e-Government framework and examine the rhetoric and reality of e-Government at a municipal level. In his model he lists practices, effectiveness data and barriers for the stages. The study shows that many municipal governments are still at either stage 1 or 2 of their development and merely post and disseminate information or provide channels for two-way communication (public service request). Moon examines the state of municipal e-Government implementation and assesses its effectiveness. He explores two institutional factors that contribute to the adoption of e-Government, namely the size and type of government.

Many (theoretical) models or stage models have been introduced in order to determine the development of e-Government. Coursey and Norris (2008) investigate some of these normative models with reference to control; to see whether they are accurate or useful in understanding the actual development of e-Government. Criticism is based on empirical evidence from 3 surveys of local e-Government in the United States. These outcomes show that the local governments were mainly informational, with few transactional functions, but no high-level functions were predicted in the models. Therefore, the authors point out that the models investigated, by Layne and Lee (2001) and Hiller and Bélanger (2001), do not describe the development process accurately, at least not among American local governments. According to Coursey and Norris, these models are purely speculative and have been developed without any link to the literature about government. The examined e-Government offerings are limited, primarily involving information and non-transactional services. Only few governments provided non-financial transactions, and even fewer provided financial transactions. Referring to these results, the authors question the models because their predictions that governments will move stepwise towards the adoption of more sophisticated e-Government offerings approaching integration and transaction was not seen to be confirmed. This purported movement is either not happening, or proceeding at a glacial pace. The models have serious limitations because they miss or ignore the possibility of existing barriers to e-Government adoption. Finally, there are no recognizable steps or stages in e-Government. Rather, governments adopt e-Government slowly and incrementally after an initial e-Government presence, so that organisational and political factors are likely to significantly affect the development, performance and adoption of e-Government application.

In a nutshell, these are Moon's five stages (2002):

Stage 1: *Information dissemination.* At this point not only the content of the information is important, but also such aspects as usability and accessibility (Al-Khalifa, 2010; Chen, Chen & Shao, 2006; Hyun, Choi & Kim, 2007; Shi, 2007; U.K. Cabinet Office, 2005).

Stage 2: *Communication.* The next stage is that of (two-way) communication, which nowadays oscillates more and more around social media. In matters of so-called Government 2.0, there is an increased interest in social media and its correlation to e-Government (Bonsón et al., 2012; Nam, 2011).

Stage 3: *Transaction.* This stage consists of financial and non-financial transactional e-Government services such as renewing a driver's licence, voter registration, state park information and reservation, paying taxes and penalties etc. (Cook, 2000). A critical success factor for all transactional services is the users' trust (Kumar et al., 2007; OECD, 2009).

Stage 4: *Interoperability (Integration).* Pardo, Nam & Burke (2011) claim that the key component of these initiatives is the ability of multiple governmental and non-governmental organizations to share and integrate information across their organisational boundaries.

Stage 5: *Participation*. eParticipation enhances democracy and includes services like political surveys, political discussion forums or voting (Medaglia, 2012; Saebo, Rose, & Molka-Danielsen; 2009; Susha & Grönlund, 2012). Our instrument for evaluating Informational World Cities' government websites has two components: (1) Maturity and (2) Usability. For both of these components, two different methods are considered, which are explained in the following paragraphs.

3. Maturity of e-Government

3.1 Method

To quantify the maturity of e-Government based on Moon's (2002) five-stage model, we formulate an extended criterion model. The goal is to define a descending ranking order of e-Government with regard to maturity.

Each stage is divided into several sections based on Moon's model, and on several surveys which analyse the users' information needs of e-Government (Friedrichs, Hart, & Schmid, 2002; Cook, 2000; gfs.bern, 2011; Institut für Informationswissenschaft Bremen GmbH, 2003; Stadt Münster, 2009). Each stage is valued with 100 points. Maturity was evaluated from the official websites of each of these 31 Informational World Cities, either in their native language or in English, courtesy of Google Translate. The websites were evaluated between December 2012 and January 2013.

The first stage (information dissemination) refers to the one-way communication in which information is transmitted only from e-Government to its users. This stage is divided into information types and user types. For the first (information) type, the government websites should offer basic data (8.3 points, which is the sum of such sub-aspects as contact information, current affairs, emergency number, and city map). Other aspects include transportation, health care, politics, mGovernment, push services and other services. Additionally, the website should be available in English as well as three further languages for the main immigrant groups. For the second (user) type, their informativeness for such groups of users as residents, tourists, students and businessmen was monitored (8.3 points for each aspect).

The second stage is two-way communication. This stage is divided into five parts: (1) social media services, like Facebook and Twitter, (2) fixing appointments online, (3) email response, (4) official email instead of snail letter mail, (5) option of giving feedback (20 points for each aspect).

The third stage (transaction) includes financial and non-financial transactions via the government website. This stage is divided into six parts: (1) online forms for filling in, (2,3,4) taxes, penalties and online payment for other fees, (5) library services (extending books or requesting loan cards), (6) a personalised portal for the residents (16.7 points for each aspect).

The next stage includes horizontal and vertical integration. Firstly, vertical integration is obtained when it is possible to reach information and services from other agencies, departments or offices from just one website, as in the integration of libraries or museums. Secondly, horizontal integration is obtained when there is one database or intranet for all departments and when all departments use standardised software. Information about integration is not available online. We were thus unable to analyse this stage without the help of personal information and will study this aspect in further research.

The last stage (participation) offers citizens the opportunity to leave feedback, make a complaint or participate in an opinion survey. This stage is divided into four parts: (1) online surveys, (2) forums and electronic voting platform, (3) participating in local government meetings online, and (4) online elections (25 points for each aspect).

3.2 Results

Our results indicate that New York (USA), Singapore and Milan (Italy) are the top-ranked Informational World Cities in terms of e-Government maturity. New York took first place with 277 out of 400 potential points. Singapore follows in second with 273 points. Milan is ranked third with 272 points. Boston (USA, 143), Dubai (United Arab Emirates, 141) and Kuala Lumpur (Malaysia, 94) occupy the bottom three positions. Figure 2 summarises the maturity results for all specified Informational World Cities.

Maturity of 31 eGovernments

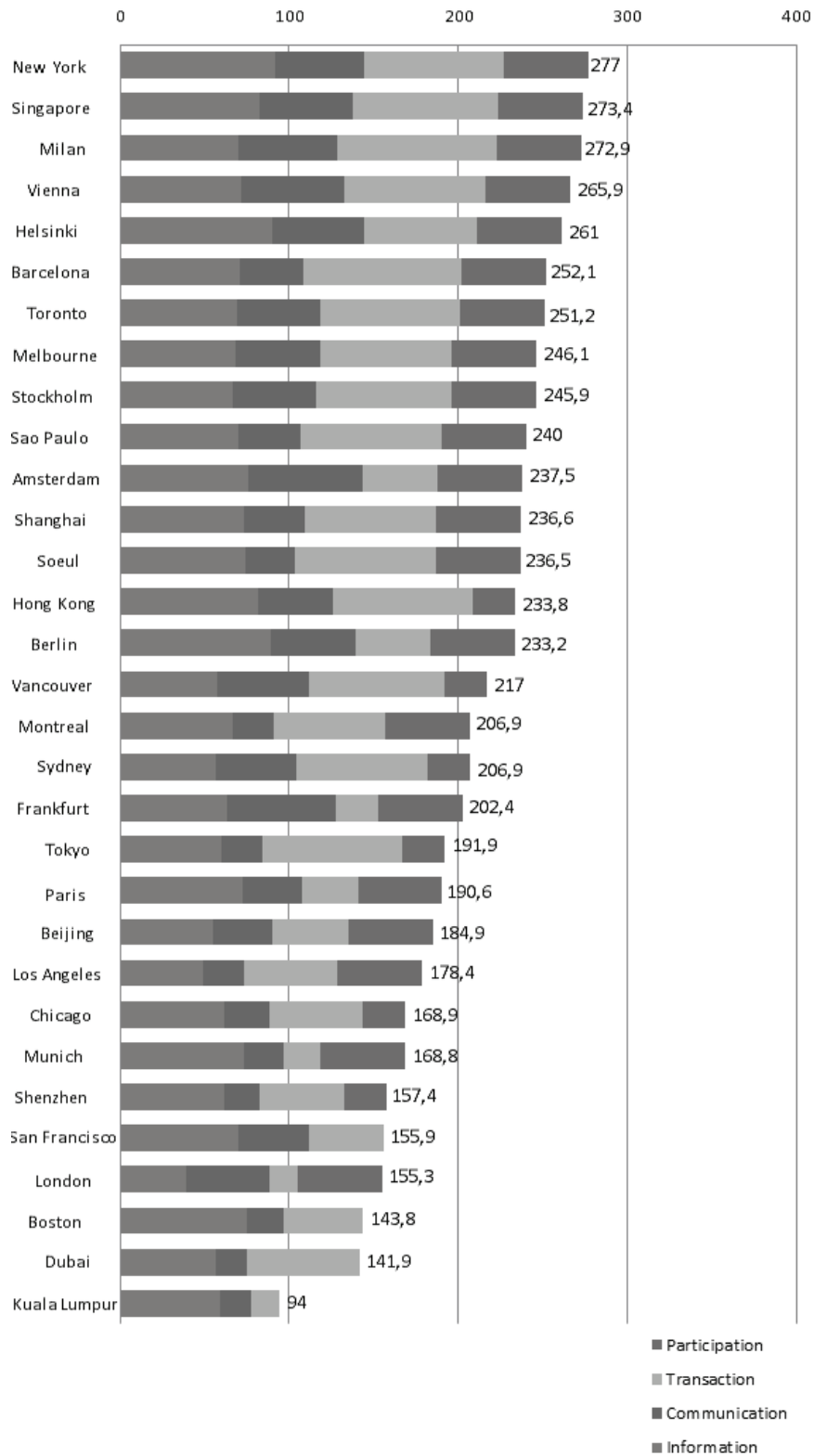


Figure 2: Maturity scores of informational world cities’ government websites divided into four stages

Figure 2 shows the maturity scores of Informational Word Cities’ e-Governments divided into the four stages: information, communication, transaction and participation. As seen in Figure 2, all Informational Word Cities’ e-Governments, except London, reached a score of about 50 points in the first stage. This shows that most e-

Governments provide their residents with basic data about the city, such as contact information, current affairs, emergency numbers, city maps or transportation. In the second stage, defined in terms of two-way communication, where the e-Government communicates in order to negotiate with the public, scores are very different. Amsterdam's, Frankfurt's and Vienna's e-Governments topped the rankings with about 60 points, whereas Dubai and Kuala Lumpur acquired less than 20 points. For the third-stage transaction, where financial and non-financial transactions were analysed, the allocation is similar to that for the second stage. Barcelona's and Milan's e-Governments exceeded 90 points, London and Kuala Lumpur less than 20 points. For the participation stage, which provides opportunity for citizens to leave feedback, make a complaint or participate in an opinion survey, the distribution is greater than in the other stages. Some e-Governments (Kuala Lumpur, Boston and Dubai) scored zero points compared to Beijing's, Paris' and Melbourne's 50 points.

These results show that the e-Governments of our specified Informational World Cities met different requirements in different stages. Most e-Governments perform well in providing their residents with basic data, while others could provide more data for aspects like transaction and participation.

4. Usability of e-Government

4.1 Method

To evaluate the usability of the 31 governmental websites in Informational World Cities, we performed a usability test. In the literature, many methods can be found for testing the usability of a website. Nielsen (2012) claims that the most basic and effective method is a user test containing three components: representative users, representative tasks and an examiner who observes users while they perform a task.

For our evaluation, we chose the method introduced by Röttger & Stock (2003), where the average quality of navigation systems serves as the indicator for a comparative analysis of websites. The quality measure is based upon click rates and break-off rates in task-based user tests. The goal of this usability test was to gather a quantitative measurement of the difference between the usability of Informational World Cities' government websites, as well as to define a ranking of the results in descending order. We thus formulated 10 tasks to check whether users could easily access core information or services on the websites. We designed 10 typical tasks, e.g. "Who is the head of government?" or "Find information about the Public Library", and presented them to our test users. All in all, 44 test users took part in this study. Each website was evaluated by ten to 16 users, except for the Chinese websites, which were evaluated by four native speakers. Additionally a pre-test with five test users was conducted. These test users were students in the first or third term of their Information Science and Language Technology studies at Heinrich-Heine-University in Düsseldorf. Starting from the home page, the test users had to record the required number of clicks in order to arrive at the target page. For each task, the target page was specified by the examiner. A maximum time of three minutes was set for solving one task. After exceeding the maximum time, a "break-off" had to be recorded. The websites were either tested in their native language or translated into English by Google Translate. The usability tests were performed between November 2012 and December 2012. Via users' click numbers, the average quality of navigation systems could be calculated for each government website, with the highest possible value being 1000 points (Röttger & Stock, 2003). The obtained value, the average quality of navigation systems, can be easily applied to a comparison of different websites.

4.2 Results

The results indicate that Vienna (Austria), Seoul (South Korea) and Shanghai (China) are the top-ranked Informational World Cities in terms of the usability of their government websites. Vienna took first place with 927 out of 1,000 potential points. Seoul follows in second with 876 points. Shanghai is ranked third with 860 points. Singapore with 587 points, Tokyo (Japan) with 580 points and Kuala Lumpur (Malaysia) with 504 points are at the bottom of the ranking. Table 1 summarises the results of the usability test for the analysed Informational World Cities.

The ranking shows distinct differences between the websites. Levels of usability differ significantly between top-ranked websites and those at the bottom of the ranking. The e-Governments occupying the last places should rework their usability concept to make their websites more user-friendly.

Table 1: Usability scores of informational world cities' government websites

Ranking	Informational World City	Points
1.	Vienna	927
2.	Seoul	876
3.	Shanghai	860
4.	Stockholm	822
5.	Munich	811
6.	Berlin	809
7.	Boston	783
8.	Helsinki	781
9.	Frankfurt	779
10.	San Francisco	775
11.	Vancouver	762
12.	Los Angeles	759
13.	Toronto	745
14.	Chicago	726
15.	Montreal	723
16.	New York	715
17.	Melbourne	706
18.	Amsterdam	700
19.	Paris	696
20.	Shenzhen	687,5
21.	Barcelona	687
22.	Beijing	680
23.	Milan	669
24.	Sydney	668
25.	Hong Kong	662,5
26.	Dubai	631
27.	London	629
28.	Sao Paulo	600
29.	Singapore	587
30.	Tokyo (English Version)	580
31.	Kuala Lumpur	504

Vienna's e-Government is very user-friendly because all important aspects are accessible on the homepage (Figure 3). The good mixture of text and images gives the website a simple but comprehensible design. Basic tasks can be easily accomplished even when visiting the website for the first time. At any given moment, the elaborate and reasonable navigation system and the breadcrumb trail show the users where they are, where they have been and where they can go from there.



Figure 3: Vienna's e-Government website (Retrieved January 05, 2012 from <http://www.wien.gov.at>)

Seoul's e-Government has been ranked #2 in this usability test. The site is clearly arranged and important information is easily accessible on the homepage. The navigation system is worded in a clear and understandable manner. A lot of information can be found on the website, and yet the site is not overloaded. In addition, it is very attractively designed.

Shanghai's government website took third place in this usability ranking. Test users indicated that information on the website is easily accessible and the navigation system is well-structured.

5. Discussion

In conclusion, the maturity of the 31 analysed e-Governments is more or less sub-optimal. Even the top-ranked website, New York's, only scored 70% for all scrutinised aspects. The arithmetic mean of all maturity values is 210 points (out of 400). This means that about half of the described aspects are missing. There is a huge potential for optimising the maturity of e-Governments.

Similarly, there is a grave fluctuation in the usability of e-Governments' navigation systems. The mean average of all usability values is 720 points (out of 1,000), which is quite a good result. The top-ranked Informational World City, Vienna, has scored 927 out of 1,000 potential points, meaning that all information could be retrieved almost immediately.

The correlation (Pearson) between the values for maturity and usability is +0.30, which indicates a weak (positive) link between both values.

Acknowledgements

We would like to thank Dr. Chang Kaiser for her support in analysing the Chinese websites. Furthermore, we are grateful to our test users for spending a working day on our experiment.

References

- Al-Khalifa, H. S. (2010). The accessibility of Saudi Arabia government Web sites: an exploratory study. *Universal Access in the Information Society*, 11(2), 201-210.
- Bonsón, E., Torres, L., Royo, S., and Flores, F. (2012). Local e-government 2.0: Social media and corporate transparency in municipalities. *Government Information Quarterly*, 29(2), 123-132.
- Cabinet Office (2005). *eAccessibility of Public Sector Services in the European Union*. Retrieved from www.rnib.org.uk
- Castells, M. (1989). *The Informational City. Information Technology, Economic Restructuring, and the Urban-Regional Process*. Oxford, United Kingdom, Cambridge, MA: Basil Blackwell.
- Castells, M. (1994). European cities, the Informational society, and the global economy. *New Left Review*, 204, 18-32.
- Chen, Y., Chen, Y., and Shao, M. (2006). 2005 accessibility diagnosis on the government web sites in Taiwan. In *Proceedings of the 2006 International Cross-Disciplinary Workshop on Web Accessibility (W4A)*. Retrieved from www.w4a.info/.
- Cook, M. E. (2000). *What Citizens Want from E-Government*. Albany, NY: Center for Technology in Government.
- Coursey, D., and Norris, D. (2008). Models of e-government: Are they correct? An empirical assesment. *Public Administration Review*, 68(3), 523-536.
- Ergazakis, K., Metaxiotis, K., and Psarras, J. (2004). Towards knowledge cities: Conceptual analysis and success stories. *Journal of Knowledge Management*, 8(5), 5-15.
- Friedmann, J. (1995). Where we stand. A decade of world city research. In P. Knox, & P. Taylor (Eds.), *World Cities in a World-System* (pp. 21-47). Cambridge, UK, New York, NY: Cambridge University Press.
- Friedrichs, S., Hart, T., and Schmidt, O. (Eds.) (2002). *E-Government*. Gütersloh: Bertelsmann.
- Florida, R. L. (2005). *Cities and the Creative Class*. NewYork, NY: Routledge.
- Gfs.bern. (2011). *E-Government Initiativen müssen breite Bevölkerung erfassen*. Retrieved 29 November, 2012 from <http://www.news.admin.ch/NSBSubscriber/message/attachments/24572.pdf>.
- Gisler, M. (2001). Electronic government – mehr als eine Website. *DISP*, 144, 32-38.
- Glaeser, E. L., Scheinkman, J., and Shleifer, A. (1995). Economic growth in a cross-section of cities. *Journal of Monetary Economics*, 36(1), 117-143.
- Hiller, J., and Bélanger, F. (2001). *Privacy Strategies for Electronic Government*. Retrieved 02 January, 2012 from www.businessofgovernment.org.
- Hollands, R. G. (2008). Will the real smart city please stand up? *City*, 12(3), 303-320.
- Holzer, M., and Kim, S. (2008). *Digital Governance in Municipalities Worldwide (2007) – A Longitudinal Assessment of Municipal Websites Throughout the World*. National Center for Public Performance: United States of America.
- Hwang, J. S. (2009). U-City. The next paradigm of urban development. In M. Foth (Ed.), *Handbook of Research on Urban Informatics. The Practice and Promise of the Real-Time City* (pp. 367-378). Hershey, PA: Information Science Reference.

- Hyun, J., Choi, D., and Kim, S. (2007). Web accessibility compliance of government web sites in Korea. In *UAHCI'07 Proceedings of the 4th International Conference on Universal Access in Human-Computer Interaction: Applications and Services* (pp. 55-63).
- Institut für Informationswissenschaft Bremen GmbH. (2003). *E-Government in Kommunen*. Retrieved 29 November, 2012 from www.gesis.org.
- Jaeger, P. T., Greene, N. N., Bertot, J. C., Perkins, N., and Wahl, E. E. (2012). The co-evolution of e-government and public libraries: Technologies, access, education, and partnerships. *Library and Information Science Research*, 34(4), 271–281.
- Kettl, T. (2002). *The Transformation of Governance*. Baltimore, MD: Johns Hopkins Press.
- Kumar, V., Mukerji, B., Butt, I., and Persaud, A. (2007). Factors for successful e-Government adoption: a conceptual framework. *Electronic Journal of e-Government* 5(1), 63-76.
- Landry, C. (2000) *The Creative City: A Toolkit for Urban Innovators*. London, UK: Earthscan.
- Layne, K., & Lee, J. (2001). Developing fully functional E-government: A four stage model. *Government Information Quarterly*, 18, 122-136.
- Mainka, A., Khveshchanka, S., and Stock, W. G. (2011). Dimensions of Informational city research. In *Digital Cities 7 – Real World Experiences*. International Workshop at C&T 2011, 30 June 2011, Brisbane, Australia.
- Medaglia, R. (2012). eParticipation research: Moving characterization forward (2006–2011). *Government Information Quarterly*, 29(3), 346–360.
- Moon, M. (2002). The evolution of e-Government among municipalities: rhetoric or reality? *Public Administration Review* 62(4), 424-433.
- Nam, T. (2011). *Toward the New Phase of e-Government: An Empirical Study on Citizens' Attitude about Open Government and Government 2.0*. Retrieved 02 January, 2012 from <http://www.maxwell.syr.edu>.
- Nielsen, J. (2012). *Usability 101: Introduction to Usability*. Retrieved 29 December, 2012 from <http://www.nngroup.com/articles/usability-101-introduction-to-usability/>.
- OECD. (2009). *Rethinking e-Government Services. User-Centred Approaches*. Retrieved from <http://www.oecd.org>.
- Pardo, T. A., Nam, T., and Burke, G. B. (2011). E-Government interoperability: Interaction of policy, management, and technology dimensions. *Social Science Computer Review*, 30(1), 7–23.
- Röttger, M., and Stock, W. G. (2003). Die mittlere Güte von Navigationssystemen. Ein Kennwert für comparative Analysen von Websites bei Usability-Nutzertests. *Information – Wissenschaft und Praxis*, 54, 401-404.
- Sassen, S. (2001). *The Global City. New York, London, Tokyo*. 2nd Ed. Princeton, NJ: Princeton Univ. Press.
- Saebo, O., Rose, J., and Molka-Danielsen, J. (2009). eParticipation: Designing and managing political discussion forums. *Social Science Computer Review*, 28(4), 403-426.
- Shapiro, J. M. (2006). Smart cities: Quality of life, productivity, and the growth effects of human capital. *Review of Economics and Statistics*, 88(2), 324-335.
- Sharma, S., and Palvia, S. (2010). E-government and e-governance. Definitions/domain framework and status around the world. In *5th International Conference on EGovernance* (pp. 1-12). New York, NY: Foundations of E-Government.
- Shi, Y. (2007). The accessibility of Chinese local government Web sites: An exploratory study. *Government Information Quarterly*, 24(2), 377-403.
- Sriramesh, K., and Rivera-Sánchez, M. (2006). E-government in a corporatist, communitarian society. The case of Singapore. *New Media & Society*, 8(5), 707-730.
- Stadt Münster. (2009). *Ergebnisse der Online-Umfrage zum Thema e-Government*. Retrieved 29 November, 2012 from <http://www.muenster.de>.
- Stock, W. G. (2011). Informational cities: Analysis and construction of cities in the knowledge society. *Journal of the American Society for Information Science and Technology*, 62(5), 963-986.
- Susha, I., and Grönlund, Å. (2012). eParticipation research: Systematizing the field. *Government Information Quarterly*, 29(3), 373-382.
- Taylor, P. J. (2004). *World City Network. A Global Urban Analysis*. London, UK: Routledge.
- Yigitcanlar, T. (2010). Informational city. In R. Hutchison (Ed.), *Encyclopedia of Urban Studies* (Vol. 1, pp. 392-395). New York, NY: Sage.
- Yigitcanlar, T., and Han, H. J. (2010). Urban telecommunications network. Technology convergence and urban infrastructure. In T. Yigitcanlar (Ed.), *Sustainable Urban and Regional Infrastructure Development. Technologies, Applications and Management* (pp. 77-90). Hershey, PA: Information Science Reference.