Digital Governance in Municipalities Worldwide (2011-12)

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Fifth Global E-Governance Survey: A Longitudinal Assessment of Municipal Websites Throughout the World

Marc Holzer
Aroon Manoharan

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School of Public Affairs and Administration | Newark

The E-Governance Institute
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and

KENT STATE UNIVERSITY

Department of Political Science
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CONTENTS

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2011-12 Digital Governance Evaluators

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EXECUTIVE SUMMARY

The Digital Governance in Municipalities Worldwide Survey assessed the practice of digital governance in large municipalities worldwide in 2011. This continuing research, replicating our surveys in 2003, 2005, 2007 and 2009, evaluated the websites of municipalities in terms of digital governance and ranked them on a global scale. Simply stated, digital governance is comprised of both digital government (delivery of public services) and digital democracy (citizen participation in governance). Specifically, we analyzed privacy/security, usability, and content of websites, the type of online services currently being offered, and citizen response and participation through websites established by municipal governments (Holzer & Kim, 2009).

The methodology of the 2011 survey of municipal websites throughout the world mirrors our previous research in 2003, 2005, 2007 and 2009. This research focused on global cities based on their population size and the total number of individuals using the Internet in each nation. The top 100 most wired nations were identified using data from the International Telecommunication Union (ITU), an organization affiliated with the United Nations (UN). The largest city by population in each of these 100 nations was then selected for the study and used as a surrogate for all cities in each respective country.

To examine how local populations perceive their governments online, the study evaluated the official websites of each of these largest cities in their native languages. Of the 100 cities selected, 92 cities were found to have official municipal websites, and these were evaluated between August and December of 2011.

For the 2005 survey, 81 of the 100 cities had official websites, which increased to 86 for the 2007 survey, 87 for the 2009 survey, and 92 for the 2011 survey. This represents a significant increase in the adoption of e-governance among municipalities across the world.

Our instrument for evaluating city and municipal websites consisted of five components: 1. Privacy and Security; 2. Usability; 3. Content; 4. Services; and 5. Citizen and Social Engagement. For each of these five components, our research applied 18 to 26 measures, and each measure was coded on a scale of four points (0, 1, 2, 3) or a dichotomy of two points (0, 3 or 0, 1). Additionally, in developing an overall score for each municipality, we have equally weighted each of the five categories to avoid skewing the research in favor of a particular category (regardless of the number of questions in each category). This reflects the same methods utilized in the previous studies. To ensure reliability, each municipal website was assessed in the native language by two evaluators, and in cases where significant variation (+ or – 10%) existed on the adjusted score between evaluators, websites were analyzed a third time.

Based on the 2011 evaluation of 92 cities, Seoul, Toronto, Madrid, Prague, and Hong Kong have the highest evaluation scores. There were noticeable changes in the top five cities when compared to the 2009 study. Seoul remained the highest-ranked city, and the gap between first and second had considerably increased. In some cases, the scores may have slightly declined from the previous study. Table 1 lists the top 20 municipalities in digital governance from 2007 through 2011, and Table 2 lists the 20 municipalities from the 2011 study, along with their scores in individual categories. Tables 3 to 7 show the top-ranking municipalities in each of the five categories.

[Table 1] Top Cities in Digital Governance 2007 - 2011

	2007		2009		2011	
Rank	**City**	**Score**	**City**	**Score**	**City**	**Score**
1	Seoul	87.74	Seoul	84.74	Seoul	82.23
2	Hong Kong	71.24	Prague	72.84	Toronto	64.31
3	Helsinki	71.01	Hong Kong	62.83	Madrid	63.63
4	Singapore	68.56	New York	61.10	Prague	61.72
5	Madrid	67.98	Singapore	58.81	Hong Kong	60.81
6	London	65.79	Shanghai	57.41	New York	60.49
7	Tokyo	59.89	Madrid	55.59	Stockholm	60.26
8	Bangkok	59.01	Vienna	55.48	Bratislava	56.74
9	New York	56.54	Auckland	55.28	London	56.19
10	Vienna	53.99	Toronto	52.87	Shanghai	55.49
11	Dublin	53.38	Paris	52.65	Vilnius	55.35
12	Toronto	51.99	Bratislava	52.51	Vienna	54.79
13	Berlin	51.36	London	51.96	Helsinki	54.22
14	Zurich	51.02	Jerusalem	50.64	Auckland	53.19
15	Prague	50.34	Tokyo	50.59	Dubai	53.18
16	Buenos Aires	49.89	Zagreb	50.16	Singapore	52.21
17	Bratislava	49.82	Ljubljana	49.39	Moscow	51.77
18	Sydney	48.60	Lisbon	48.82	Copenhagen	50.06
19	Amsterdam	47.72	Brussels	48.01	Yerevan	49.97
20	Rome	46.98	Johannesburg	47.68	Paris	48.65

[Table 2] Top 20 Cities in Digital Governance (2011)

Rank	City	Overall	Privacy	Usability	Content	Services	CS Engagement
1	Seoul	82.23	13.33	18.44	16.67	17.55	16.25
2	Toronto	64.31	10.74	16.88	16.83	12.79	7.09
3	Madrid	63.63	12.22	16.88	15.08	12.79	6.67
4	Prague	61.72	12.59	16.25	13.02	8.20	11.67
5	Hong Kong	60.81	11.11	17.82	13.65	13.44	4.80
6	New York	60.49	11.11	15.94	13.81	12.13	7.50
7	Stockholm	60.26	17.41	13.13	12.54	11.15	6.04
8	Bratislava	56.74	13.33	16.26	10.64	9.02	7.50
9	London	56.19	12.22	15.63	11.75	11.81	4.79
10	Shanghai	55.49	7.78	13.44	12.07	12.62	9.58
11	Vilnius	55.35	10.74	16.57	11.59	10.00	6.46
12	Vienna	54.79	11.11	13.44	12.38	8.69	9.17
13	Helsinki	54.22	13.33	13.75	11.11	8.52	7.50
14	Auckland	53.19	12.22	13.13	13.18	12.79	1.88
15	Dubai	53.18	12.60	15.32	7.94	12.13	5.21
16	Singapore	52.21	4.82	15.00	12.70	13.45	6.25
17	Moscow	51.77	3.34	16.57	11.27	11.64	8.96
18	Copenhagen	50.06	11.11	14.69	10.80	7.21	6.25
19	Yerevan	49.97	4.45	16.26	12.38	13.77	3.13
20	Paris	48.65	9.26	11.88	12.54	6.23	8.75

Table 3] Top 10 Cities in Privacy and Security (2011)

Rank	City	Country	Privacy
1	Stockholm	Sweden	17.41
2	Berlin	Germany	14.08
3	Seoul	Korea (Rep.)	13.33
3	Bratislava	Slovak Republic	13.33
3	Helsinki	Finland	13.33
6	Dubai	United Arab Emirates	12.60
7	Prague	Czech Republic	12.59
8	Auckland	New Zealand	12.22
8	Madrid	Spain	12.22
8	London	United Kingdom	12.22

[Table 4] Top 10 Cities in Usability (2011)

Rank	City	Country	Usability
1	Seoul	Korea (Rep.)	18.44
2	Hong Kong	Hong Kong, China	17.82
3	Toronto	Canada	16.88
3	Madrid	Spain	16.88
5	Vilnius	Lithuania	16.57
5	Moscow	Russia	16.57
7	Bratislava	Slovak Republic	16.26
7	Yerevan	Armenia	16.26
9	Prague	Czech Republic	16.25
9	Zagreb	Croatia	16.25

[Table 5] Top 10 Cities in Content (2011)

Rank	City	Country	Content
1	Toronto	Canada	16.83
2	Seoul	Korea (Rep.)	16.67
3	Madrid	Spain	15.08
4	Ljubljana	Slovenia	14.61
5	Tallinn	Estonia	14.13
6	New York	United States	13.81
7	Hong Kong	Hong Kong, China	13.65
8	Auckland	New Zealand	13.18
9	Prague	Czech Republic	13.02
10	Singapore	Singapore	12.70

[Table 6] Top 10 Cities in Service Delivery (2011)

Rank	City	Country	Services
1	Seoul	Korea (Rep.)	17.55
2	Yerevan	Armenia	13.77
3	Singapore	Singapore	13.45
4	Hong Kong	Hong Kong, China	13.44
5	Toronto	Canada	12.79
5	Madrid	Spain	12.79
5	Auckland	New Zealand	12.79
8	Shanghai	China	12.62
9	New York	United States	12.13
9	Dubai	United Arab Emirates	12.13

[Table 7] Top 10 Cities in Citizen and Social Engagement (2011)

Rank	City	Country	CS Engagement
1	Seoul	Korea (Rep.)	16.25
2	Prague	Czech Republic	11.67
3	Shanghai	China	9.58
4	Vienna	Austria	9.17
5	Moscow	Russia	8.96
6	Paris	France	8.75
7	Lisbon	Portugal	8.13
8	New York	United States	7.50
8	Bratislava	Slovak Republic	7.50
8	Helsinki	Finland	7.50

The average score for digital governance in municipalities throughout the world is 33.76, a decrease from 35.93, but an increase from 33.37 in 2007, 33.11 in 2005 and 28.49 in 2003. The average score for municipalities in OECD countries is 45.45, while the average score in non-OECD countries is 27.52. Because it is important to evaluate digital governance in large municipalities throughout the world, the continued study of municipalities worldwide, with the next Worldwide Survey planned in 2013, will further provide insights into the direction and performance of e-governance throughout regions of the world.

1

INTRODUCTION

This research replicates surveys completed in 2003, 2005, 2007 and 2009, and evaluates the practice of digital governance in large municipalities worldwide in 2011. The following chapters represent the overall findings of the research. Chapter 2 outlines the methodology utilized in determining the websites evaluated, as well as the instrument used in the evaluations. Our survey instrument uses 104 measures and we follow a rigorous approach for conducting the evaluations. Chapter 3 presents the overall findings for the 2011 evaluation. The overall results are also broken down into results by continents, and by OECD and non-OECD member countries.

Chapter 4 provides a longitudinal assessment of the 2009 and 2011 evaluations, with comparisons among continents, e-governance categories and OECD and non-OECD member countries. Chapters 5 through 9 take a closer look at the results for each of the five e-governance categories. Chapter 5 focuses on the results of privacy and security with regard to municipal websites. Chapter 6 looks at the usability of municipal websites throughout the world. Chapter 7 presents the findings for content, while Chapter 8 addresses services. Chapter 9 concludes the focus of specific e-governance categories by presenting the findings of citizen and social engagement online.

Chapter 10 takes a closer look at best practices, and the report concludes with Chapter 11, providing recommendations and discussion of significant findings.

2

METHODOLOGY

The methodological steps taken by the 2011 survey of municipal websites throughout the world mirror our previous research in 2009, 2007, 2005, and 2003. The following review of our methodology borrows from our Digital Governance (2009) report based on the 2009 data. This research focused on cities throughout the world based on their population size and the total number of individuals using the Internet in each nation. These cities were identified using data from the International Telecommunication Union (ITU), an organization affiliated with the United Nations (UN). The top 100 most wired nations were identified using information on the total number of online users as obtained from the ITU-UN. The largest city by population in each of these 100 countries was then selected for the study as a surrogate for all cities in a particular country.

The rationale for selecting the largest municipalities stems from the e-governance literature, which suggests a positive relationship between population and e-governance capacity at the local level (Moon, 2002; Moon & deLeon, 2001; Musso, et. al., 2000; Weare, et. al. 1999). The study evaluated the official websites of each of these largest cities in their native languages. Of the 100 cities selected, 92 were found to have official websites, and these were evaluated from July of 2011 to December of 2011. For the 2009 survey, 87 of the 100 cities had official websites, which increased from 86 in the 2007 survey and 81 in the 2005 survey. This represents a significant increase in the adoption of e-governance among municipalities across the world. Table 2-1 is a list of the 100 cities selected.

[Table 2-1] 100 Cities Selected by Continent (2011)

Africa (12)	
Accra (Ghana)	Dar es Salaam (Tanzania) *
Algiers (Algeria)*	Kampala (Uganda) *
Cairo (Egypt)	Omdurman (Sudan)*
Cape Town (South Africa)	Lagos (Nigeria)
Casablanca (Morocco)	Nairobi (Kenya)
Dakar (Senegal)	Tunis (Tunisia)
Asia (31)	
Aleppo(Syria)*	Kathmandu (Nepal)
Almaty (Kazakhstan)	Kuala Lumpur (Malaysia)
Amman (Jordan)	Kuwait City (Kuwait)
Baku (Azerbaijan)	Mumbai (India)
Bangkok (Thailand)	Muscat (Oman)
Bishkek (Kyrgyzstan)*	Quezon City (Philippines)
Dhaka (Bangladesh)	Riyadh (Saudi Arabia)
Colombo (Sri Lanka)	Sana'a (Yemen))*
Dubai (United Arab Emirates)	Seoul (Republic of Korea)
Tbilisi (Georgia)	Shanghai (China)
Ho Chi Minh City (Vietnam)	Singapore (Singapore)
Hong Kong (Hong Kong)	Tashkent (Uzbekistan)
Baghdad (Iraq)	Tehran (Iran)
Jakarta (Indonesia)	Tokyo (Japan)
Jerusalem (Israel)	Yerevan (Armenia)
Karachi (Pakistan)	
Europe (35)	
Amsterdam (Netherlands)	Minsk (Belarus)
Athens (Greece)	Moscow (Russian Federation)
Belgrade (Serbia and Montenegro)	Oslo (Norway)
Berlin (Germany)	Paris (France)
Bratislava (Slovak Republic)	Prague (Czech Republic)
Brussels (Belgium)	Riga (Latvia)
Bucharest (Romania)	Rome (Italy)
Budapest (Hungary)	Sarajevo (Bosnia and Herzegovina)
Chisinau (Moldova)	Sofia (Bulgaria)
Copenhagen (Denmark)	Stockholm (Sweden)
Dublin (Ireland)	Tallinn (Estonia)
Helsinki (Finland)	Tirane (Albania)
Istanbul (Turkey)	Vienna (Austria)
Kiev (Ukraine)	Vilnius (Lithuania)
Lisbon (Portugal)	Warsaw (Poland)
Ljubljana (Slovenia)	Zagreb (Croatia)
London (United Kingdom)	Zurich (Switzerland)
Madrid (Spain)	

[Table 2-1] 100 Cities Selected by Continent (Cont. 2011)

North America (10)	
Guatemala City (Guatemala) Havana (Cuba)* Mexico City (Mexico) New York (United States) Panama City (Panama)	Saint Joseph (Costa Rica) San Juan (Puerto Rico) San Salvador (El Salvador) Santo Domingo (Dominican Republic) Toronto (Canada)
South America (10)	
Asuncion (Paraguay) Buenos Aires (Argentina) Caracas (Venezuela) Guayaquil (Ecuador) La Paz (Bolivia)	Lima (Peru) Montevideo (Uruguay) Santa Fe De Bogota (Colombia) Santiago (Chile) Sao Paulo (Brazil)
Oceania (2)	
Auckland (New Zealand)	Sydney (Australia)

* Official city websites unavailable

WEBSITE SURVEY

The focus of this research is the main city homepage, which is defined as the official website where information about city administration and online services are provided by the city. Municipalities in the United States and globally are increasingly developing websites to provide information and services online; however, e-government is more than simply establishing a website. The emphasis should be on using information technologies to effectively provide government services. According to Pardo (2000), some of the initiatives in this direction are: 1) providing 24/7 access to government information and public meetings 2) providing mechanisms to enable citizens to comply with state and federal rules regarding drivers licenses, business licenses, etc. 3) providing access to special benefits like welfare funds and pensions 4) providing a network across various government agencies to enable collaborative approaches to serving citizens, and 5) providing various channels for digital democracy and citizen participation initiatives.

An official municipal website includes information on the city council, mayor and executive branch. If there are separate homepages for agencies, departments, or the city council, evaluators

examined whether these sites were linked to the menu on the main city homepage. If the website was not linked, it was excluded from the evaluation.

E-GOVERNANCE SURVEY INSTRUMENT

The Rutgers E-Governance Survey Instrument is the most comprehensive index in practice for e-governance research today, with 104 measures and five distinct categorical areas of e-governance research. These five components are: 1. Privacy and Security 2. Usability 3. Content 4. Services and 5. Citizen and Social Engagement. Table 2-2 summarizes the 2011 survey instrument, and Appendix A presents an overview of the criteria.

[Table 2-2] E-Governance Performance Measures

E-governance Category	Key Concepts	Raw Score	Weighted Score	Keywords
Privacy/ Security	19	27	20	Privacy policies, authentication, encryption, data management, cookies
Usability	20	32	20	User-friendly design, branding, length of homepage, targeted audience links or channels, and site search capabilities
Content	26	63	20	Access to current accurate information, public documents, reports, publications, and multimedia materials
Services	21	61	20	Transactional services - purchase or register, interaction between citizens, businesses and government
Citizen and Social Engagement	18	48	20	Online civic engagement/ policy deliberation, social media applications, citizen based performance measurement
Total	104	231	100	

The following section highlights the specific design of our survey instrument, which consists of 104 measures, of which 44 are dichotomous. For each of the five e-governance components, our research applies 18 to 26 measures, and for the non-dichotomous questions, each measure was coded on a four-point scale (0, 1, 2, 3; see Table 2-3 below). Furthermore, to avoid skewing the research in favor of a particular category while developing an overall score for each municipality, we have equally weighted each of the five categories, regardless of the number of questions in each category. The dichotomous measures in the "service" and "citizen participation" categories correspond with values on a four-point scale of "0" or "3"; dichotomous measures in "privacy" or "usability" correspond to ratings of "0" or "1" on the scale.

[Table 2-3] E-Governance Scale

Scale	Description
0	Information about a given topic does not exist on the website
1	Information about a given topic exists on the website (including links to other information and e-mail addresses)
2	Downloadable items are available on the website (forms, audio, video, and other one-way transactions, popup boxes)
3	Services, transactions, or interactions can take place completely online (credit card transactions, applications for permits, searchable databases, use of cookies, digital signatures, restricted access)

Our instrument placed a higher value on some dichotomous measures, due to the relative value of the different e-government services being evaluated. For example, evaluators using our instrument in the "service" category were given the option of scoring websites as either a "0" or "3" when assessing whether a site allowed users to access private information online (e.g., educational records, medical records, point total of driving violations, lost property). "No access" equated to a rating of "0". Allowing residents or employees to access private information online was a higher-order task that required more technical competence and was clearly

an online service, or "3," as defined in Table 2-3.

However, when assessing a site as to whether or not it had a privacy statement or policy, evaluators were given the choice of scoring the site as "0" or "1". The presence or absence of a privacy policy was clearly a content issue that emphasized placing information online and corresponded with a value of "1" on the scale outlined in Table 2-3. The differential values assigned to dichotomous categories were useful in comparing the different components of municipal websites with one another.

To ensure reliability, each municipal website was assessed by two evaluators, and in cases where significant variation (+ or – 10%) existed on the weighted score between evaluators, websites were analyzed a third time. Furthermore, an example for each measure indicated how to score the variable. Evaluators were also given comprehensive written instructions for assessing websites.

E-GOVERNANCE CATEGORIES

This section details the five e-governance categories and discusses specific measures that were used to evaluate websites. The discussion of security and privacy examines privacy policies and issues related to authentication. Discussion of the usability category involves traditional web pages, forms, and search tools. The content category is addressed in terms of access to contact information, access to public documents, and disability access, as well as access to multimedia and time-sensitive information. The section on services examines interactive services, services that allow users to purchase or pay for services, and the ability of users to apply or register for municipal events or services online. Finally, the measures for citizen participation involve examining how local governments are engaging citizens and providing mechanisms for citizens to participate in government online.

SECURITY/PRIVACY

Our analysis began with the examination of the security and

privacy of municipal websites in two key areas, privacy policies and authentication of users. With regard to municipal privacy policies, we determined the presence of such a policy on every page that accepted data, as well as the usage of the word "privacy" in the link to such a statement. Then, we checked for privacy policies on every page that required or accepted data. We also examined whether privacy policies identified the agencies collecting the information and what data was being collected on the site.

Our analysis determined if the intended use of the data was explicitly stated on the website — specifically, if the privacy policy addressed the use or sale of data collected on the website by outside or third party organizations. Our research also determined whether there was an option to decline the disclosure of personal information to third parties, which includes other municipal agencies, other state and local government offices, or businesses in the private sector. Furthermore, we examined privacy policies to check if third-party agencies or organizations were governed by the same privacy policies as the municipal website. We also determined whether users had the ability to review personal data records and contest inaccurate or incomplete information.

In examining factors affecting the security and privacy of local government websites, we addressed managerial measures that limit access of data and ensure that it is not used for unauthorized purposes. We also looked for the use of encryption in the transmission of data, as well as the storage of personal information on secure servers. In assessing how or whether municipalities used their websites to authenticate users, we checked if public or private information was accessible through a restricted area that required a password and/or registration.

A growing e-governance trend at the local level is for municipalities to offer their website users access to public, and in some cases private, information online. We underscore our own concerns about the impact of the digital divide if public records are available only through the Internet or if municipalities insist on charging a fee for access to public records. Our analysis specifically addressed online access to public databases by determining if public

information such as property tax assessments is available to users of municipal websites. In addition, there were concerns that public agencies will use their websites to monitor citizens or create profiles based on the information they access online. For example, although many websites use "cookies" or "web beacons"[1] to customize their websites for users, that technology can also be used to monitor Internet habits and profile visitors to websites. So our analysis examined municipal privacy policies to determine whether they addressed the use of cookies or web beacons.

USABILITY

The second component of our evaluation examined the usability of municipal websites. Simply stated, we wanted to know if sites were "user-friendly." To address usability concerns, we adopted several best practices and measures from other public and private sector research (Giga, 2000). Our analysis of usability examined three types of website features: traditional web pages, forms, and search tools.

To evaluate traditional web pages written using hypertext markup language (html), we examined issues such as branding and structure (e.g., consistent color, font, graphics, page length, etc.). For example, we looked to see if all pages used consistent color, formatting, "default colors" (e.g., blue links and purple visited links), and underlined text to indicate links. Other items examined included whether system hardware and software requirements were clearly stated on the website.

[1] The New York City privacy policy (www.nyc.gov/privacy) gives the following definitions of cookies and web bugs or beacons: "Persistent cookies are cookie files that remain upon a user's hard drive until affirmatively removed, or until expired as provided for by a pre-set expiration date. Temporary or "Session Cookies" are cookie files that last or are valid only during an active communications connection, measured from beginning to end, between computer or applications (or some combination thereof) over a network. A web bug (or beacon) is a clear, camouflaged or otherwise invisible graphics image format ("GIF") file placed upon a web page or in hypertext markup language ("HTML") e-mail and used to monitor who is reading a web page or the relevant email. Web bugs can also be used for other monitoring purposes such as profiling of the affected party."

In addition, our research examined each municipality's homepage to determine if it was too long (two or more screen lengths) or if alternative versions of long documents, such as .pdf or .doc files, were available. The use of targeted audience links or "channels" to customize the website for specific groups such as citizens, businesses, or other public agencies was also examined. We looked for the consistent use of navigation bars and links to the homepage on every page. The availability of a "sitemap" or hyperlinked outline of the entire website was examined. Our assessment also examined whether duplicated link names connect to the same content.

Our research examined online forms to determine their usability in submitting data or conducting searches of municipal websites. We looked at issues such as whether field labels aligned appropriately with each field, whether fields were accessible by keystrokes (e.g., tabs), or whether the cursor was automatically placed in the first field. We also examined whether required fields were noted explicitly and whether the tab order of fields was logical. For example, after a user filled out his or her first name and pressed the "tab" key, did the cursor automatically go to the surname field? Or, did the page skip to another field such as zip code, only to return to the surname later?

We also checked to see if form pages provided additional information about how to fix errors if they were submitted. For example, did users have to reenter information if errors were submitted, or did the site flag incomplete or erroneous forms before accepting them? Also, did the site give a confirmation page after a form was submitted, or did it return users to the homepage?

Our analysis also addressed the use of search tools on municipal websites. We examined sites to determine if help was available for searching a municipality's website or if the scope of searches could be limited to specific areas of the site. Were users able to search only in "public works" or "the mayor's office," for example, or did the search tool always search the entire site? We also looked for advanced search features such as exact phrase searching, the ability to match all/any words, and Boolean searching capabilities (e.g., the ability to use AND/OR/NOT operators). Our analysis also addressed a site's ability to sort search results by relevance or other criteria.

CONTENT

The third component of our evaluation pertains to content, which is a critical component of any website. If the content of a website is not current, if it is difficult to navigate, or if the information provided is not correct, then it is not fulfilling its purpose, no matter how technologically advanced a website's features. We examined website content in five key areas: access to contact information, public documents, disability access, multimedia materials, and time-sensitive information. When addressing contact information, we looked for information about each agency represented on the website.

In addition, we looked for the availability of office hours or a schedule of when agency offices are open. As we assessed the availability of public documents, we also checked for the availability of the municipal code or charter online. We also looked for content items, such as agency mission statements, minutes of public meetings, and access to budget information and publications. Our assessment also examined whether websites provided access to disabled users through either "bobby compliance" (disability access for the blind, http://www.cast.org/bobby) or disability access for deaf users via a TDD phone service. We also checked to see if sites offered content in more than one language.

Time-sensitive information that was examined included the use of a municipal website for emergency management and the use of a website as an alert mechanism (e.g., terrorism alert or severe weather alert). We also checked for time-sensitive information such as the posting of job vacancies or a calendar of community events. In addressing the use of multimedia, we examined each site to determine whether audio or video files of public events, speeches or meetings were available.

SERVICES

An important aspect of e-governance is the provision of public services online. Our analysis examined two different types of services: 1. those that enable citizens to interact with the

municipality and 2. those that allow users to register for events or services online. Municipalities are increasingly developing the capacity to accept payment online for municipal services and taxes. The first type of service examined, which emphasizes interactivity, includes forms that enable users to request information or file complaints. Local governments across the world use advanced interactive services to allow users to report crimes or violations, customize municipal homepages based on their needs (e.g., portal customization), and access private information online, such as court records, education records, or medical records. Our analysis also determined the presence of such interactive services.

The second type of service examined looked for municipal capacity to allow citizens to register for services online. For example, many cities now allow citizens to apply for permits and licenses online. Online permitting can be used for services that vary from building permits to dog licenses. In addition, we examined the use of e-procurement features among cities that allow potential contractors to access requests for proposals or even bid for municipal contracts online. In other cases, local governments are chronicling the procurement process by listing the total number of bidders for a contract online and, in some cases, listing contact information for bidders.

Our research also examined municipal websites to determine if they developed the capacity to allow users to purchase or pay for municipal services and fees online. Some of these transactional services include the payment of public utility bills and parking tickets online. In many cases, municipalities allow online users to file or pay local taxes, pay fines such as traffic tickets, and register or purchase tickets to events in city halls or arenas online.

CITIZEN AND SOCIAL ENGAGEMENT

The fifth component of our instrument pertains to online citizen participation in government, a recent area of e-governance study. As noted in the previous surveys, the Internet is a convenient mechanism for citizen-users to engage their governments and to decentralize decision-making. We have strengthened our survey instrument in the

area of citizen and social engagement and once again found that the potential for online participation is still in its early stages of development. Very few public agencies offer online opportunities for online civic engagement. Our analysis looked at several ways public agencies at the local level were involving citizens. For example, do municipal websites allow users to provide online comments or feedback to individual agencies or elected officials?

Our analysis examined whether local governments offer current information about municipal governance online or through an online newsletter or e-mail listserv. Our analysis also examined the use of Internet-based polls about specific local issues. In addition, we examined whether communities allow users to participate and view the results of citizen satisfaction surveys online. For example, some municipalities used their websites to measure performance and published the results of performance measurement activities online.

Still other municipalities used online bulletin boards or other chat capabilities for gathering input on public issues. Online bulletin boards offer citizens the opportunity to post ideas, comments, or opinions without specific discussion topics. In some cases, agencies attempt to structure online discussions around policy issues or specific agencies. Our research looked for municipal use of the Internet to foster civic engagement and citizen participation in government. In terms of social networks and social media, we attempted to capture important elements of e-governance that facilitate innovative methods of communication not previously assessed in our earlier surveys on digital governance. To capture society's increased use of social networks along with the public sector's burgeoning interest to facilitate effective G2C communication, our survey assessed the current manner in which government websites are designed.

3

OVERALL RESULTS

The following chapter presents the results for all the evaluated municipal websites during 2011. Table 3-1 provides the rankings for the 92 municipal websites and their overall scores. The overall scores reflect the combined scores of each municipality's score in the five e-governance component categories. The highest possible score for any one city website is 100. Seoul received a score of 82.23, making it the highest-ranked city website for 2011. Seoul's website was also the highest-ranked in 2009, 2007, 2005, and 2003, with scores of 84.74, 87.74, 81.70, and 73.48. Toronto had the second-highest-ranked municipal website, with a score 64.31, moving up significantly from its tenth place ranking in 2009. Madrid ranked third with a score of 63.63 in 2011, and Prague and Hong Kong complete the top five ranked municipal websites, with scores of 61.72 and 60.81, respectively. The results of the overall rankings are separated by continent in Tables 3-2 through 3-7. The top-ranked cities for each continent are Johannesburg (Africa), Seoul (Asia), Madrid (Europe), Toronto (North America), Auckland (Oceania), and Sao Paolo (South America). Madrid replaced Prague as the highest-ranked city for European municipalities, and Toronto switched places with New York City as the highest-ranked city in North America. Also included in the rankings by continent are the scores for each of the five e-governance component categories.

[Table 3-1] Overall E-Governance Rankings (2011)

Rank	City	Country	Score
1	Seoul	Korea (Rep.)	82.23
2	Toronto	Canada	64.31
3	Madrid	Spain	63.63
4	Prague	Czech Republic	61.72
5	Hong Kong	Hong Kong, China	60.81
6	New York	United States	60.49
7	Stockholm	Sweden	60.26
8	Bratislava	Slovak Republic	56.74
9	London	United Kingdom	56.19
10	Shanghai	China	55.49
11	Vilnius	Lithuania	55.35
12	Vienna	Austria	54.79
13	Helsinki	Finland	54.22
14	Auckland	New Zealand	53.19
15	Dubai	United Arab Emirates	53.18
16	Singapore	Singapore	52.21
17	Moscow	Russia	51.77
18	Copenhagen	Denmark	50.06
19	Yerevan	Armenia	49.97
20	Paris	France	48.65
21	Berlin	Germany	47.16
22	Ljubljana	Slovenia	46.25
23	Tokyo	Japan	45.35
24	Zagreb	Croatia	44.43
25	Sao Paulo	Brazil	44.22
26	Dublin	Ireland	43.76
27	Oslo	Norway	42.60
28	Tallinn	Estonia	41.69
29	Amsterdam	Netherlands	40.73
30	Zurich	Switzerland	39.90
31	Bogota	Colombia	39.88
32	Almaty	Kazakhstan	37.76
33	La Paz	Bolivia	37.16
34	Kuala Lumpur	Malaysia	37.09

[Table 3-1] Overall E-Governance Rankings (Cont. 2011)

35	Mexico City	Mexico	36.98
36	Brussels	Belgium	36.78
37	Lisbon	Portugal	36.49
38	Rome	Italy	35.06
39	Johannesburg	South Africa	34.03
40	Tehran	Iran (I.R.)	33.09
41	Ho Chi Minh	Viet Nam	32.95
42	Jerusalem	Israel	32.83
43	Minsk	Belarus	32.11
44	Buenos Aires	Argentina	31.15
45	Riyadh	Saudi Arabia	30.66
46	Sydney	Australia	30.52
47	Santiago	Chile	29.26
48	Athens	Greece	29.20
49	Mumbai	India	28.99
50	Riga	Latvia	28.85
51	Muscat	Oman	28.72
52	Bucharest	Romania	28.12
53	Lima	Peru	27.80
54	Jakarta	Indonesia	27.07
55	Montevideo	Uruguay	26.98
56	Tunis	Tunisia	26.65
57	Sofia	Bulgaria	26.35
58	Istanbul	Turkey	25.81
59	Guatemala City	Guatemala	25.43
60	Kiev	Ukraine	25.01
61	Warsaw	Poland	24.94
62	Cairo	Egypt	24.64
63	Chisinau	Moldova	24.55
64	Amman	Jordan	23.70
65	Santo Domingo	Dominican Rep.	23.27
66	Colombo	Sri Lanka	22.93
67	Budapest	Hungary	22.67
68	Quezon City	Philippines	22.48
69	Tirane	Albania	22.18

[Table 3-1] Overall E-Governance Rankings (Cont. 2011)

70	Belgrade	Serbia	22.04
71	San Juan	Puerto Rico	21.42
72	Guayaquil	Ecuador	19.69
73	Accra	Ghana	19.41
74	Bangkok	Thailand	18.53
75	Sarajevo	Bosnia and Herzegovina	18.31
76	Dakar	Senegal	18.20
77	Caracas	Venezuela	17.50
78	Kathmandu	Nepal	16.81
79	Dhaka	Bangladesh	16.79
80	Casablanca	Morocco	16.77
81	Panama City	Panama	16.33
82	Karachi	Pakistan	16.25
83	Tbilisi	Georgia	15.78
84	Saint Joseph	Costa Rica	15.69
85	Baku	Azerbaijan	15.05
86	San Salvador	El Salvador	15.04
87	Nairobi	Kenya	14.48
88	Lagos	Nigeria	14.29
89	Kuwait City	Kuwait	14.22
90	Baghdad	Iraq	14.11
91	Asuncion	Paraguay	10.76
92	Tashkent	Uzbekistan	6.76

[Table 3-2] Results of Evaluation in African Cities (2011)

Rank	City	Score	Privacy	Usability	Content	Services	CS Engagement
1	Johannesburg	34.03	3.33	11.25	9.21	6.07	4.17
2	Tunis	26.65	1.11	13.13	5.72	2.95	3.75
3	Cairo	24.64	7.04	12.50	2.06	2.63	0.42
4	Accra	19.41	1.85	10.63	3.18	2.30	1.46
5	Dakar	18.20	0.37	11.57	2.38	1.81	2.09
6	Casablanca	16.77	0.00	11.88	3.49	0.98	0.42
7	Nairobi	14.48	0.37	9.69	1.43	2.79	0.21
8	Lagos	14.29	2.22	7.51	3.50	0.66	0.42

[Table 3-3] Results of Evaluation in Asian Cities (2011)

Rank	City	Score	Privacy	Usability	Content	Services	CS Engagement
1	Seoul	82.23	13.33	18.44	16.67	17.55	16.25
2	Hong Kong	60.81	11.11	17.82	13.65	13.44	4.80
3	Shanghai	55.49	7.78	13.44	12.07	12.62	9.58
4	Dubai	53.18	12.60	15.32	7.94	12.13	5.21
5	Singapore	52.21	4.82	15.00	12.70	13.45	6.25
6	Yerevan	49.97	4.45	16.26	12.38	13.77	3.13
7	Tokyo	45.35	7.04	14.38	11.59	9.02	3.33
8	Almaty	37.76	5.56	13.76	5.56	6.23	6.67
9	Kuala Lumpur	37.09	6.30	14.07	7.46	6.56	2.70
10	Tehran	33.09	7.78	10.32	6.03	6.89	2.09
11	Ho Chi Minh	32.95	5.93	11.88	4.76	7.05	3.34
12	Jerusalem	32.83	0.00	12.82	8.89	7.38	3.75
13	Riyadh	30.66	7.78	14.07	5.40	1.97	1.46
14	Mumbai	28.99	8.15	11.25	3.81	5.57	0.21
15	Muscat	28.72	4.45	11.25	4.45	2.96	5.63
16	Jakarta	27.07	3.71	11.88	5.87	3.12	2.50
17	Amman	23.70	1.11	11.26	4.45	3.77	3.13
18	Colombo	22.93	0.00	13.75	2.70	3.77	2.71
19	Quezon City	22.48	0.00	14.38	4.76	2.30	1.04
20	Bangkok	18.53	1.48	6.25	3.65	3.61	3.54
21	Kathmandu	16.81	0.00	8.13	4.29	3.77	0.63
22	Dhaka	16.79	2.22	9.69	1.59	2.46	0.84
23	Karachi	16.25	0.00	11.26	2.06	1.48	1.46
24	Tbilisi	15.78	0.00	7.82	4.76	2.79	0.42
25	Baku	15.05	3.70	6.25	4.44	0.66	0.00
26	Kuwait City	14.22	1.11	9.07	2.07	1.15	0.84
27	Baghdad	14.11	1.11	9.07	1.91	0.99	1.04
28	Tashkent	6.76	0.00	5.32	0.96	0.49	0.00

[Table 3-4] Results of Evaluation in European Cities (2011)

Rank	City	Score	Privacy	Usability	Content	Services	CS Engagement
1	Madrid	63.63	12.22	16.88	15.08	12.79	6.67
2	Prague	61.72	12.59	16.25	13.02	8.20	11.67
3	Stockholm	60.26	17.41	13.13	12.54	11.15	6.04
4	Bratislava	56.74	13.33	16.26	10.64	9.02	7.50
5	London	56.19	12.22	15.63	11.75	11.81	4.79
6	Vilnius	55.35	10.74	16.57	11.59	10.00	6.46
7	Vienna	54.79	11.11	13.44	12.38	8.69	9.17
8	Helsinki	54.22	13.33	13.75	11.11	8.52	7.50
9	Moscow	51.77	3.34	16.57	11.27	11.64	8.96
10	Copenhagen	50.06	11.11	14.69	10.80	7.21	6.25
11	Paris	48.65	9.26	11.88	12.54	6.23	8.75
12	Berlin	47.16	14.08	12.82	9.21	6.07	5.00
13	Ljubljana	46.25	6.30	14.38	14.61	6.39	4.59
14	Zagreb	44.43	5.93	16.25	8.25	7.54	6.46
15	Dublin	43.76	9.63	14.69	6.51	9.18	3.75
16	Oslo	42.60	5.19	15.01	10.64	8.04	3.75
17	Tallinn	41.69	2.22	12.19	14.13	10.66	2.50
18	Amsterdam	40.73	4.45	15.63	8.89	6.56	5.21
19	Zurich	39.90	9.63	13.44	9.53	3.78	3.54
20	Brussels	36.78	4.45	13.44	12.22	4.59	2.09
21	Lisbon	36.49	2.96	11.88	7.46	6.07	8.13
22	Rome	35.06	8.89	11.26	7.15	5.90	1.88
23	Minsk	32.11	1.11	14.38	6.35	3.61	6.67
24	Athens	29.20	8.52	12.19	4.45	1.97	2.09
25	Riga	28.85	2.60	10.94	7.15	4.43	3.75
26	Bucharest	28.12	4.82	12.19	5.56	1.81	3.75
27	Sofia	26.35	7.41	8.13	6.35	1.97	2.50
28	Istanbul	25.81	1.85	5.63	6.83	9.84	2.03
29	Kiev	25.01	0.00	12.19	7.14	4.43	1.25
30	Warsaw	24.94	7.04	10.94	4.44	1.48	1.04
31	Chisinau	24.55	1.11	8.76	7.30	4.27	3.13

32	Budapest	22.67	1.11	8.75	6.98	3.12	2.71
33	Tirane	22.18	0.00	9.07	6.35	4.26	2.50
34	Belgrade	22.04	0.00	11.26	4.92	2.95	2.92
35	Sarajevo	18.31	0.00	10.00	5.24	0.99	2.09

[Table 3-5] Results of Evaluation in North American Cities (2011)

Rank	City	Score	Privacy	Usability	Content	Services	CS Engagement
1	Toronto	64.31	10.74	16.88	16.83	12.79	7.09
2	New York	60.49	11.11	15.94	13.81	12.13	7.50
3	Mexico City	36.98	5.74	12.51	6.19	7.54	5.00
4	Guatemala City	25.43	1.11	12.51	5.08	5.90	0.84
5	Santo Domingo	23.27	4.07	9.69	4.76	2.46	2.29
6	San Juan	21.42	9.26	3.13	4.92	3.28	0.83
7	Panama City	16.33	0.00	9.38	3.33	2.79	0.83
8	Saint Joseph	15.69	1.11	7.51	4.29	2.79	0.00
9	San Salvador	15.04	1.11	6.57	4.29	2.46	0.63

[Table 3-6] Overall Results of Evaluation in Oceanic Cities (2011)

Rank	City	Score	Privacy	Usability	Content	Services	CS Engagement
1	Auckland	53.19	12.22	13.13	13.18	12.79	1.88
2	Sydney	30.52	7.04	13.44	6.99	1.81	1.25

[Table 3-7] Results of Evaluation in South American Cities (2011)

Rank	City	Score	Privacy	Usability	Content	Services	CS Engagement
1	Sao Paulo	44.22	4.82	15.32	9.05	9.84	5.21
2	Bogota	39.88	5.93	15.63	7.15	6.40	4.80
3	La Paz	37.16	2.59	14.07	7.78	9.18	3.54
4	Buenos Aires	31.15	1.85	13.75	7.46	4.76	3.33
5	Santiago	29.26	1.11	11.25	7.62	8.04	1.25
6	Lima	27.80	1.11	11.57	7.46	5.58	2.09

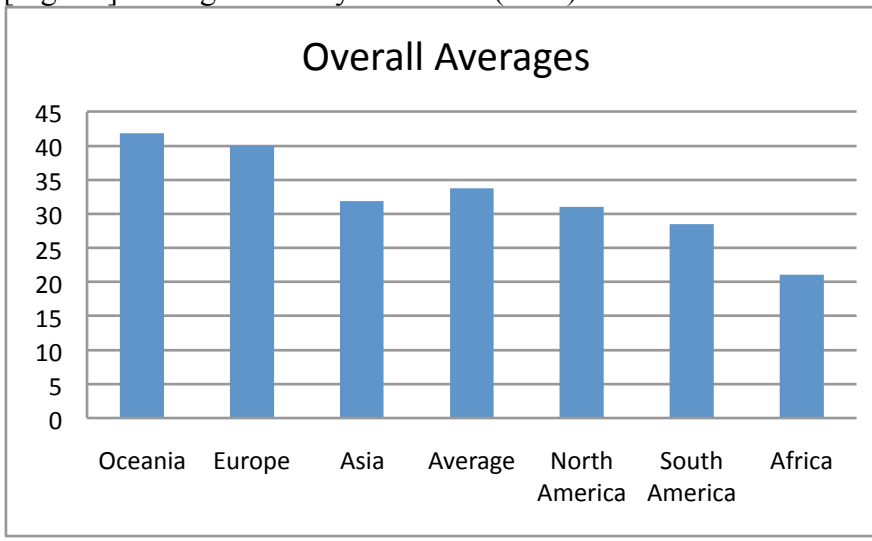
7	Montevideo	26.98	2.59	12.19	7.46	3.28	1.46
8	Guayaquil	19.69	0.37	9.07	5.40	3.61	1.25
9	Caracas	17.50	0.37	9.69	4.92	1.48	1.04
10	Asuncion	10.76	0.74	6.26	2.70	0.66	0.42

The average scores for each continent are presented in Figure 3-1. Oceania was once again the highest-ranked continent, with an average score of 41.85, and Europe, with a score of 39.95, retained the second-highest rank, followed closely by Asia and North America. The overall average score for all municipalities is 33.76, a decrease from 35.93 in 2009, 33.37 in 2007, 33.11 in 2005, and 28.49 in 2003.

[Table 3-8] Average Score by Continent (2011)

	Oceania	Europe	Asia	Average	North America	South America	Africa
Overall Averages	41.85	39.95	31.85	**33.76**	30.99	28.44	21.06

[Fig 3-1] Average Score by Continent (2011)



OECD MEMBER DATA

Seoul was the highest-ranked OECD municipality, and Hong Kong was the highest-ranked non-OECD in 2011. Tables 3-9 and 3-10 present the overall score for each municipality grouped into OECD member countries and non-OECD member countries.

[Table 3-9] Results for OECD Member Countries (2011)

Rank	City	Country	Score
1	Seoul	Korea (Rep.)	82.23
2	Toronto	Canada	64.31
3	Madrid	Spain	63.63
4	Prague	Czech Republic	61.72
5	New York	United States	60.49
6	Stockholm	Sweden	60.26
7	Bratislava	Slovak Republic	56.74
8	London	United Kingdom	56.19
9	Vienna	Austria	54.79
10	Helsinki	Finland	54.22
11	Auckland	New Zealand	53.19
12	Copenhagen	Denmark	50.06
13	Paris	France	48.65
14	Berlin	Germany	47.16
15	Ljubljana	Slovenia	46.25
16	Tokyo	Japan	45.35
17	Dublin	Ireland	43.76
18	Oslo	Norway	42.60
19	Tallinn	Estonia	41.69
20	Amsterdam	Netherlands	40.73
21	Zurich	Switzerland	39.90
22	Mexico City	Mexico	36.98
23	Brussels	Belgium	36.78

24	Lisbon	Portugal	36.49
25	Rome	Italy	35.06
26	Jerusalem	Israel	32.83
27	Sydney	Australia	30.52
28	Santiago	Chile	29.26
29	Athens	Greece	29.20
30	Istanbul	Turkey	25.81
31	Warsaw	Poland	24.94
32	Budapest	Hungary	22.67

[Table 3-10] Results for OECD Non-Member Countries (2011)

Rank	City	Country	Score
1	Hong Kong	Hong Kong, China	60.81
2	Shanghai	China	55.49
3	Vilnius	Lithuania	55.35
4	Dubai	United Arab Emirates	53.18
5	Singapore	Singapore	52.21
6	Moscow	Russia	51.77
7	Yerevan	Armenia	49.97
8	Zagreb	Croatia	44.43
9	Sao Paulo	Brazil	44.22
10	Bogota	Colombia	39.88
11	Almaty	Kazakhstan	37.76
12	La Paz	Bolivia	37.16
13	Kuala Lumpur	Malaysia	37.09
14	Johannesburg	South Africa	34.03
15	Tehran	Iran (I.R.)	33.09
16	Ho Chi Minh	Viet Nam	32.95
17	Minsk	Belarus	32.11
18	Buenos Aires	Argentina	31.15
19	Riyadh	Saudi Arabia	30.66
20	Mumbai	India	28.99

21	Riga	Latvia	28.85
22	Muscat	Oman	28.72
23	Bucharest	Romania	28.12
24	Lima	Peru	27.80
25	Jakarta	Indonesia	27.07
26	Montevideo	Uruguay	26.98
27	Tunis	Tunisia	26.65
28	Sofia	Bulgaria	26.35
29	Guatemala City	Guatemala	25.43

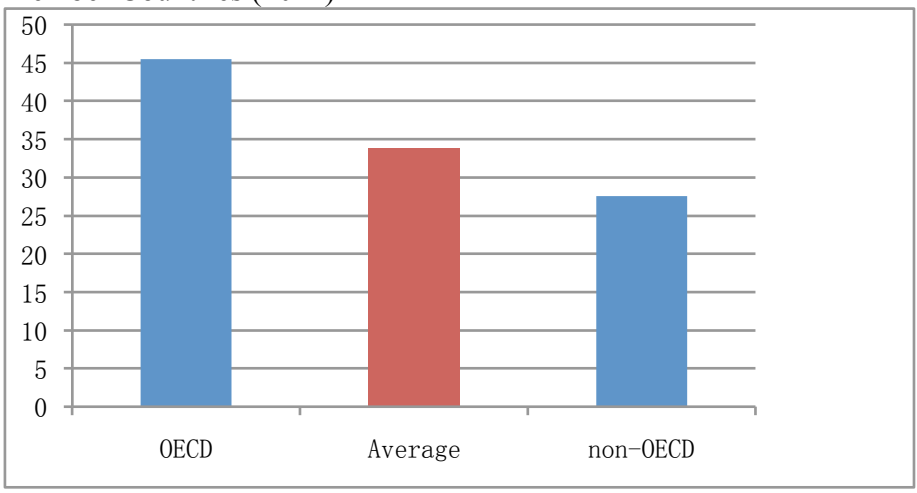
[Table 3-10] Results for OECD Non-Member Countries (Cont. 2011)

30	Kiev	Ukraine	25.01
31	Cairo	Egypt	24.64
32	Chisinau	Moldova	24.55
33	Amman	Jordan	23.70
34	Santo Domingo	Dominican Rep.	23.27
35	Colombo	Sri Lanka	22.93
36	Quezon City	Philippines	22.48
37	Tirane	Albania	22.18
38	Belgrade	Serbia	22.04
39	San Juan	Puerto Rico	21.42
40	Guayaquil	Ecuador	19.69
41	Accra	Ghana	19.41
42	Bangkok	Thailand	18.53
43	Sarajevo	Bosnia and Herzegovina	18.31
44	Dakar	Senegal	18.20
45	Caracas	Venezuela	17.50
46	Kathmandu	Nepal	16.81
47	Dhaka	Bangladesh	16.79
48	Casablanca	Morocco	16.77
49	Panama City	Panama	16.33
50	Karachi	Pakistan	16.25
51	Tbilisi	Georgia	15.78

52	Saint Joseph	Costa Rica	15.69
53	Baku	Azerbaijan	15.05
54	San Salvador	El Salvador	15.04
55	Nairobi	Kenya	14.48
56	Lagos	Nigeria	14.29
57	Kuwait City	Kuwait	14.22
58	Baghdad	Iraq	14.11
59	Asuncion	Paraguay	10.76
60	Tashkent	Uzbekistan	6.76

The results above are further analyzed (below) through grouped averages. Figure 3-2 highlights how the OECD member countries have a combined average of 45.45, well above the overall average for all municipalities (33.76). Non-OECD member countries have an overall average of 27.52. To further highlight the results between OECD and non-OECD member countries, the results presented below distinguish results by the five e-governance categories. Table 3-11 presents the scores for OECD member countries, non-OECD member countries, and overall average scores for each of the e-governance categories. As would be expected, the average score for OECD member countries in each e-governance category is higher than the overall average score for each category. For non-OECD member countries, the average scores in each category are lower than the overall averages for each category. The results of the evaluation will be discussed in further detail in the following chapters.

[Figure 3-2] Average Score of Cities in OECD Member and Non-Member Countries (2011)



[Table 3-11] Average Score of E-governance Categories in OECD Member and Non-Member Countries (2011)

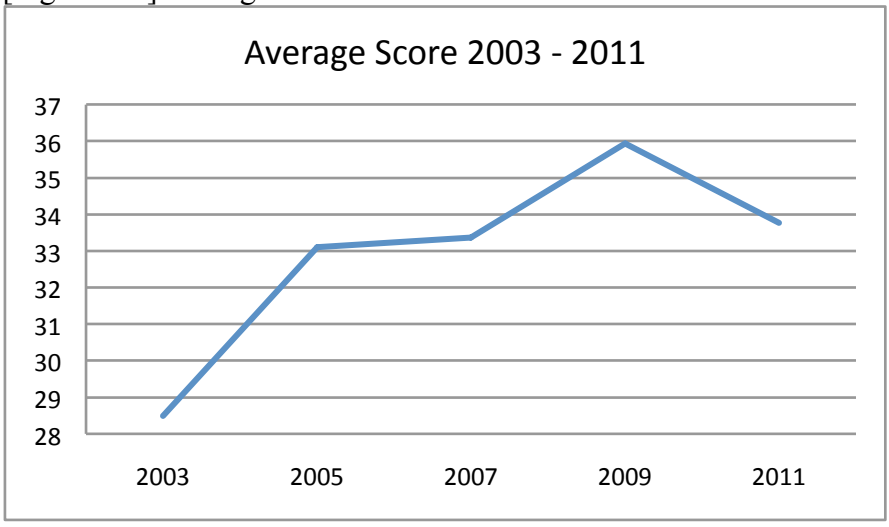
	Privacy/ Security	Usability	Content	Service	Citizen and Social Engagement
OECD	8.35	13.53	10.46	8.01	5.12
Overall Average	**4.99**	**12.09**	**7.38**	**5.78**	**3.53**
Non-OECD	3.19	11.32	5.73	4.59	2.68

4

LONGITUDINAL ASSESSMENT

This chapter outlines the comparison between the findings from the 2003, 2005, 2007, and 2009 evaluations and the findings of the 2011 evaluation. The overall average score for municipalities surveyed was 33.76, a decrease from 35.93 in 2009, but higher than 33.37 in 2007, 33.11 in 2005, and 28.49 in 2003 (Figure 4-1). Compared to 2009, Usability and Citizen & Social Engagement in 2011 slightly increased. However, Privacy/Security, Content, and Service all dropped down substantially. So, the average score in 2011 was lower than 2009. Table 4-1 and Figure 4-2 highlight the differences and changes by continent.

[Figure 4-1] Average E-Governance Score 2003 - 2011

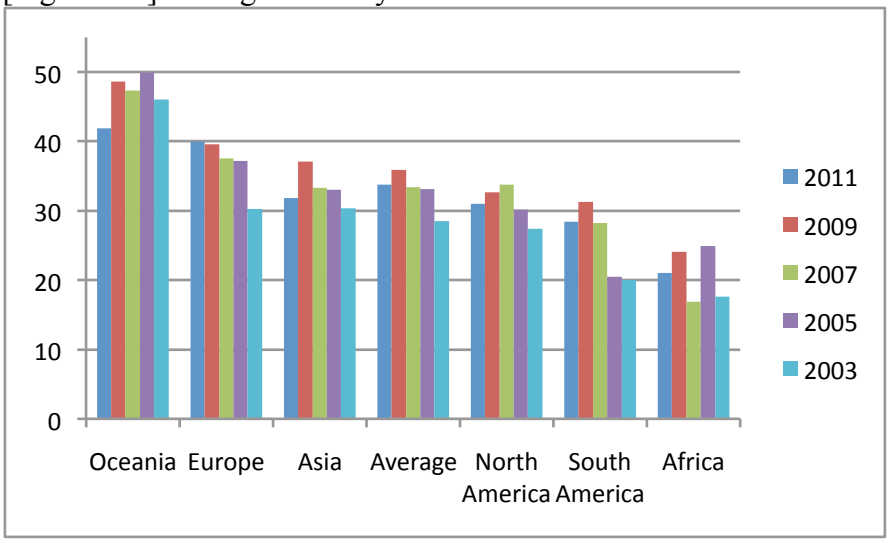


[Table 4-1] Average Score by Continent 2003 - 2011

	Oceania	Europe	Asia	Average	North America	South America	Africa
2011 Overall Averages	41.85	39.95	31.85	**33.76**	30.99	28.44	21.06
2009 Overall Averages	48.59	39.54	37.13	**35.93**	32.65	31.23	24.06
2007 Overall Averages	47.37	37.55	33.26	**33.37**	33.77	28.2	16.87
2005 Overall Averages	49.94	37.17	33.05	**33.11**	30.21	20.45	24.87
2003 Overall Averages	46.01	30.23	30.38	**28.49**	27.42	20.25	17.66

Oceania was the highest ranked continent, with an average score of 41.85, decreasing from a score of 48.59 in 2009. Europe, with a score of 39.95, retained the second highest rank, followed by Asia and North America, with scores of 31.85 and 30.99 respectively.

[Figure 4-2] Average Score by Continent for 2003 - 2011



Our survey results indicate that the number of cities with official websites has increased to 92%, compared to 87% in 2009. The changes in scores from 2003 to 2011, represented by both OECD and non-OECD member countries, are shown below.

[Table 4-2] Average Scores by OECD Member and Non-Member Countries 2003 - 2011

	OECD	Average	Non-OECD
2011 Overall Averages	45.45	**33.76**	27.52
2009 Overall Averages	46.69	**35.93**	30.83
2007 Overall Averages	45.0	**33.37**	27.46
2005 Overall Averages	44.35	**33.11**	26.50
2003 Overall Averages	36.34	**28.49**	24.36

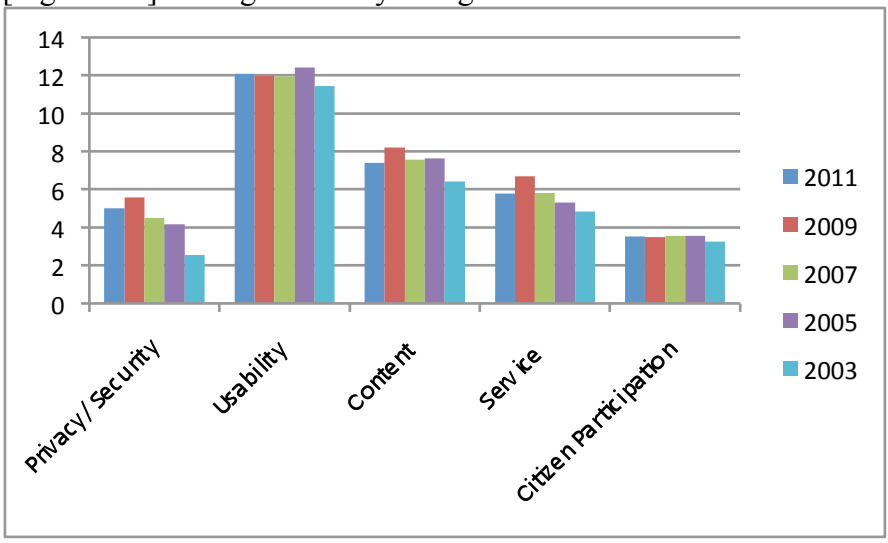
Municipalities surveyed from OECD member countries

decreased in average score from 46.69 to 45.45. Municipalities surveyed from non-OECD member countries decreased in average score from 30.83 to 27.52. Among the five categories, Usability and Citizen and Social Engagement have improved since their performance in 2009, while the average scores decreased in Privacy/Security, Content and Services. The category of Usability also recorded the highest average score, while Citizen and Social Engagement continues as the category with the lowest average score. Cities are yet to recognize the importance of involving and supporting citizen participation online. Specific increases in the five e-governance categories are discussed in the following chapters. Table 4-3 and Figure 4-4 highlight these findings.

[Table 4-3] Average Score by E-Governance Categories 2003 - 2011

	Privacy/ Security	**Usability**	**Content**	**Service**	**Citizen and Social Engagement**
2011 Average Scores	**4.99**	**12.09**	**7.38**	**5.78**	**3.53**
2009 Average Scores	5.57	11.96	8.21	6.68	3.50
2007 Average Scores	4.49	11.95	7.58	5.8	3.55
2005 Average Scores	4.17	12.42	7.63	5.32	3.57
2003 Average Scores	2.53	11.45	6.43	4.82	3.26

[Figure 4-4] Average Score by Categories 2003 - 2011



5

PRIVACY AND SECURITY

Privacy and security results indicate that the top-ranked cities are Stockholm, Berlin, Seoul, Bratislava, and Helsinki. Stockholm was ranked 35th in 2009 but has significantly improved to the 1st position in overall ranking, with a score of 17.41 in 2011, out of a maximum score of 20. Berlin was ranked 2nd, with a score of 14.08, compared to its 8th position in 2009. The third position was shared by Seoul, Bratislava, and Helsinki, with a score 13.33. Table 5-1 summarizes the results for all the municipalities evaluated in this category.

The average score in this category is 4.99, a decrease from a score of 5.57 in 2009, but up from 4.49 in 2007. Thirteen cities evaluated earned 0 points in this category, a decrease in the total number of municipalities that earned 0 points in 2009 (18), 2007 (26), 2005 (31), and 2003 (36). Cities have gradually come to understand the importance of privacy and security policy, an important element in the process of the development of digital governance.

[Table 5-1] Results in Privacy and Security (2011)

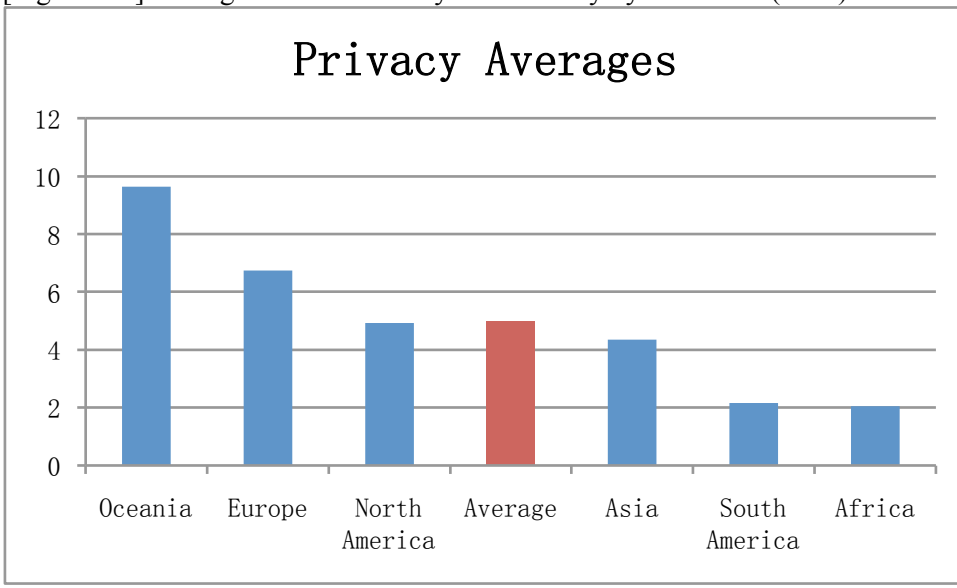
Rank	City	Country	Privacy
1	Stockholm	Sweden	17.41
2	Berlin	Germany	14.08
3	Seoul	Korea (Rep.)	13.33
3	Bratislava	Slovak Republic	13.33
3	Helsinki	Finland	13.33
6	Dubai	United Arab Emirates	12.60
7	Prague	Czech Republic	12.59
8	Auckland	New Zealand	12.22
8	Madrid	Spain	12.22
8	London	United Kingdom	12.22
11	New York	United States	11.11
11	Vienna	Austria	11.11
11	Copenhagen	Denmark	11.11
11	Hong Kong	Hong Kong, China	11.11
15	Toronto	Canada	10.74
15	Vilnius	Lithuania	10.74
17	Dublin	Ireland	9.63
17	Zurich	Switzerland	9.63
19	Paris	France	9.26
19	San Juan	Puerto Rico	9.26
21	Rome	Italy	8.89
22	Athens	Greece	8.52
23	Mumbai	India	8.15
24	Tehran	Iran (I.R.)	7.78
24	Riyadh	Saudi Arabia	7.78
24	Shanghai	China	7.78
27	Sofia	Bulgaria	7.41
28	Tokyo	Japan	7.04
28	Sydney	Australia	7.04
28	Warsaw	Poland	7.04

28	Cairo	Egypt	7.04
32	Ljubljana	Slovenia	6.30
32	Kuala Lumpur	Malaysia	6.30
34	Zagreb	Croatia	5.93
34	Bogota	Colombia	5.93
34	Ho Chi Minh	Viet Nam	5.93
37	Mexico City	Mexico	5.74
38	Almaty	Kazakhstan	5.56
39	Oslo	Norway	5.19
40	Sao Paulo	Brazil	4.82
40	Bucharest	Romania	4.82
40	Singapore	Singapore	4.82
43	Amsterdam	Netherlands	4.45
43	Brussels	Belgium	4.45
43	Yerevan	Armenia	4.45
43	Muscat	Oman	4.45
47	Santo Domingo	Dominican Rep.	4.07
48	Jakarta	Indonesia	3.71
49	Baku	Azerbaijan	3.70
50	Moscow	Russia	3.34
51	Johannesburg	South Africa	3.33
52	Lisbon	Portugal	2.96
53	Riga	Latvia	2.60
54	La Paz	Bolivia	2.59
54	Montevideo	Uruguay	2.59
56	Tallinn	Estonia	2.22
56	Dhaka	Bangladesh	2.22
56	Lagos	Nigeria	2.22
59	Istanbul	Turkey	1.85
59	Buenos Aires	Argentina	1.85
59	Accra	Ghana	1.85
62	Thailand	Bangkok	1.48

63	Chile	Santiago	1.11
63	Hungary	Budapest	1.11
63	Belarus	Minsk	1.11
63	Peru	Lima	1.11
63	Tunisia	Tunis	1.11
63	Guatemala	Guatemala City	1.11
63	Moldova	Chisinau	1.11
63	Jordan	Amman	1.11
63	Costa Rica	Saint Joseph	1.11
63	El Salvador	San Salvador	1.11
63	Kuwait	Kuwait City	1.11
63	Iraq	Baghdad	1.11
75	Paraguay	Asuncion	0.74
76	Ecuador	Guayaquil	0.37
76	Senegal	Dakar	0.37
76	Venezuela	Caracas	0.37
76	Kenya	Nairobi	0.37
80	Israel	Jerusalem	0.00
80	Ukraine	Kiev	0.00
80	Sri Lanka	Colombo	0.00
80	Philippines	Quezon City	0.00
80	Albania	Tirane	0.00
80	Serbia	Belgrade	0.00
80	Bosnia and Herzegovina	Sarajevo	0.00
80	Nepal	Kathmandu	0.00
80	Morocco	Casablanca	0.00
80	Panama	Panama City	0.00
80	Pakistan	Karachi	0.00
80	Georgia	Tbilisi	0.00
80	Uzbekistan	Tashkent	0.00

Table 5-2 represents the average scores of nations in privacy and security by continent. Oceania remained as the continent with the highest average scores, with 9.63 points, followed by Europe, with 6.74 points. Africa replaced South America as the continent with the lowest average score. Cities in OECD countries scored an average of 8.35, while cities in non-member countries scored only 3.19 in this category. These results indicate that cities in economically advanced countries continue to have more emphasis on privacy and security policy than do cities in less developed countries. Figures 5-1 and 5-2 illustrate the data presented in Table 5-2.

[Figure 5-1] Average Score in Privacy and Security by Continent (2011)



[Table 5-2] Average Score in Privacy/Security by Continent (2011)

	Oceania	Europe	North America	Average	Asia	South America	Africa
Privacy Averages	9.63	6.74	4.92	**4.99**	4.34	2.15	2.04

[Figure 5-2] Average Score in Privacy and Security by OECD Member and Non-Member Countries (2011)

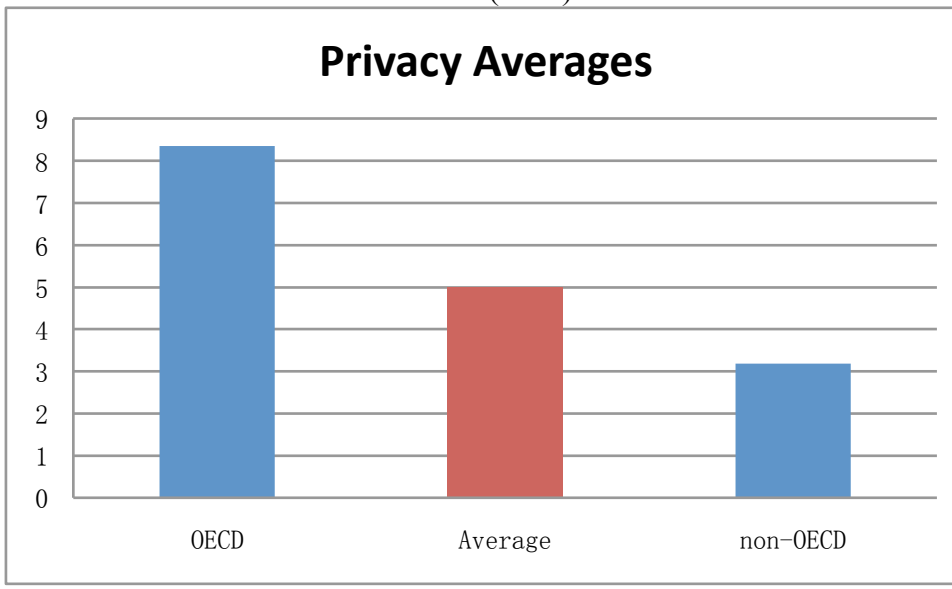


Table 5-3 lists the results of the evaluation of key aspects in the category of privacy and security by continent. Overall, cities around the world were placing more emphasis on privacy and security issues on their websites, based on the comparison between the 2011 and previous surveys. All cities evaluated in Oceania, 71% of cities in Europe, 50% of cities in Africa, 45% of cities in Asia, and 61% of cities in North America have developed a privacy or security statement/policy. However, only 35% of cities in South America had developed a privacy policy for their websites. The overall percentage for cities that have a privacy or security policy online is 57%, a slight increase from 55% in 2009, 47% in 2007, 37% in 2005, and 22.5% in 2003.

With regard to the use of encryption in the transmission of data, 17% of all cities globally have addressed this issue, with Oceania leading at 50%. This is followed by 28% of the cities in North America, 21% of the cities in Europe, and 16% of the cities in Asia that have a policy addressing the use of encryption on their

websites. The overall percentage for cities that provide the option of digital signatures is 8%, compared to 27% of all cities that address the use of "cookies" or "web beacons" to track users. All cities evaluated in Oceania, 39% of cities in Europe, 33% of cities in North America, and 23% of cities in Asia have a policy addressing the use of "cookies" or "web beacons". There were no cities worldwide in the 2003 evaluation that had a privacy policy addressing the use of digital signatures to authenticate users.

[Table 5-3] Results for Privacy and Security by Continent (2011)

	Oceania	Europe	Asia	Average	North America	South America	Africa
Privacy or Security Policy	100%	71%	45%	**57%**	61%	35%	50%
Use of Encryption	50%	21%	16%	**17%**	28%	0%	6%
Use of Cookies	100%	39%	23%	**27%**	33%	5%	0%
Digital Signature	0%	17%	4%	**8%**	0%	0%	0%

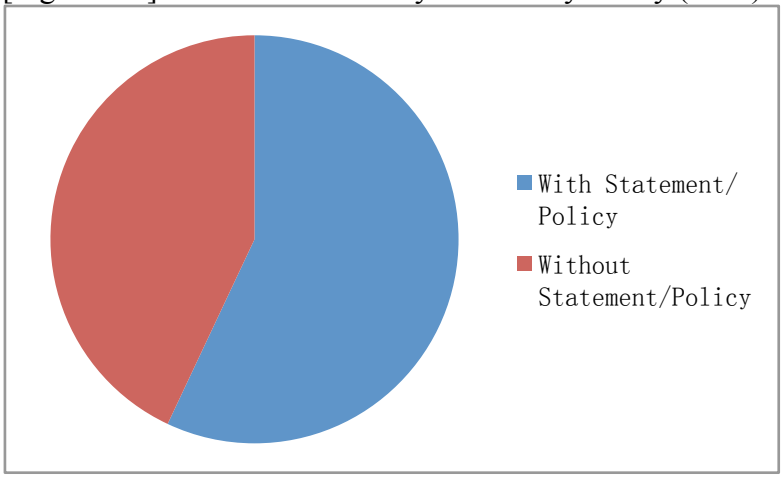
Table 5-4 lists the results of the evaluation of key aspects in the category of privacy and security by OECD and non-OECD member countries. Overall, cities in OECD countries continue to pay more attention to privacy and security matters on their websites than cities in non-OECD countries. About 86% of cities evaluated in OECD countries have developed a privacy or security statement/ policy, while about 42% of cities in non-OECD countries have a privacy statement on their websites. With regard to the use of encryption in the transmission of data, about 33% of cities evaluated in OECD countries have a privacy policy addressing the use of encryption, compared to 8% of cities in non-OECD countries. In addition, 53% of cities evaluated in OECD countries have a privacy policy addressing the use of "cookies" or "web beacons" to track users, while only 13% of cities in non-OECD countries have statements as to the use of "cookies". Overall, cities in OECD countries score above average throughout the world.

[Table 5 4] Results for Privacy and Security by OECD Member and Non-Member Countries (2011)

	OECD	Average	Non-OECD
Privacy or Security Policy	86%	**57%**	42%
Use of encryption	33%	**17%**	8%
Use of cookies	53%	**27%**	13%
Digital Signature	17%	**8%**	3%

In terms of queries and whether the site has a privacy or security statement/policy, in 2011 about 57% of cities had privacy and security policies, compared to 55% in 2009. More than a third of the cities, however, have not yet provided citizens with a privacy and security statement (Figure 5-3). Stockholm, Berlin, Seoul, Bratislava, and Helsinki have clear privacy or security statements/policies, as reflected by their rankings in the category.

[Figure 5-3] Existence of Privacy or Security Policy (2011)



6

USABILITY

The following chapter highlights the results for the category of usability. Results indicate that Seoul, Hong Kong, Toronto, Madrid, Vilnius, and Moscow are the top-ranked cities in the category of usability. Except for Seoul, the other cities are new to the top-five rankings. Seoul ranks first, with a score of 18.44 out of a maximum score of 20, followed by Hong Kong, with a score of 17.82. The third position is shared by Toronto and Madrid, with scores of 16.88. Vilnius and Moscow are ranked fifth, with scores of 16.57. Table 6-1 summarizes the results for all the municipalities evaluated in this category.

The average score in this category is 12.09, an increase from a score of 11.96 in 2009. Overall, cities in Oceania scored the highest average of 13.29, followed by cities in Europe, with an average score of 12.87 in the category of usability.

[Table 6-1] Results in Usability (2011)

Rank	City	Country	Usability
1	Seoul	Korea (Rep.)	18.44
2	Hong Kong	Hong Kong, China	17.82
3	Toronto	Canada	16.88
3	Madrid	Spain	16.88
5	Vilnius	Lithuania	16.57
5	Moscow	Russia	16.57
7	Bratislava	Slovak Republic	16.26
7	Yerevan	Armenia	16.26
9	Prague	Czech Republic	16.25
9	Zagreb	Croatia	16.25
11	New York	United States	15.94
12	Bogota	Colombia	15.63
12	London	United Kingdom	15.63
12	Amsterdam	Netherlands	15.63
15	Dubai	United Arab Emirates	15.32
15	Sao Paulo	Brazil	15.32
17	Oslo	Norway	15.01
18	Singapore	Singapore	15.00
19	Copenhagen	Denmark	14.69
19	Dublin	Ireland	14.69
21	Quezon City	Philippines	14.38
21	Tokyo	Japan	14.38
21	Ljubljana	Slovenia	14.38
21	Minsk	Belarus	14.38
25	Riyadh	Saudi Arabia	14.07
25	Kuala Lumpur	Malaysia	14.07
25	La Paz	Bolivia	14.07
28	Almaty	Kazakhstan	13.76
29	Helsinki	Finland	13.75
29	Buenos Aires	Argentina	13.75

29	Colombo	Sri Lanka	13.75
32	Vienna	Austria	13.44
32	Shanghai	China	13.44
32	Sydney	Australia	13.44
32	Brussels	Belgium	13.44
32	Zurich	Switzerland	13.44
37	Auckland	New Zealand	13.13
37	Tunis	Tunisia	13.13
37	Stockholm	Sweden	13.13
40	Berlin	Germany	12.82
40	Jerusalem	Israel	12.82
42	Mexico City	Mexico	12.51
42	Guatemala City	Guatemala	12.51
44	Cairo	Egypt	12.50
45	Athens	Greece	12.19
45	Bucharest	Romania	12.19
45	Montevideo	Uruguay	12.19
45	Tallinn	Estonia	12.19
45	Kiev	Ukraine	12.19
50	Paris	France	11.88
50	Ho Chi Minh	Viet Nam	11.88
50	Casablanca	Morocco	11.88
50	Jakarta	Indonesia	11.88
50	Lisbon	Portugal	11.88
55	Lima	Peru	11.57
55	Dakar	Senegal	11.57
57	Rome	Italy	11.26
57	Amman	Jordan	11.26
57	Belgrade	Serbia	11.26
57	Karachi	Pakistan	11.26
61	Mumbai	India	11.25
61	Muscat	Oman	11.25

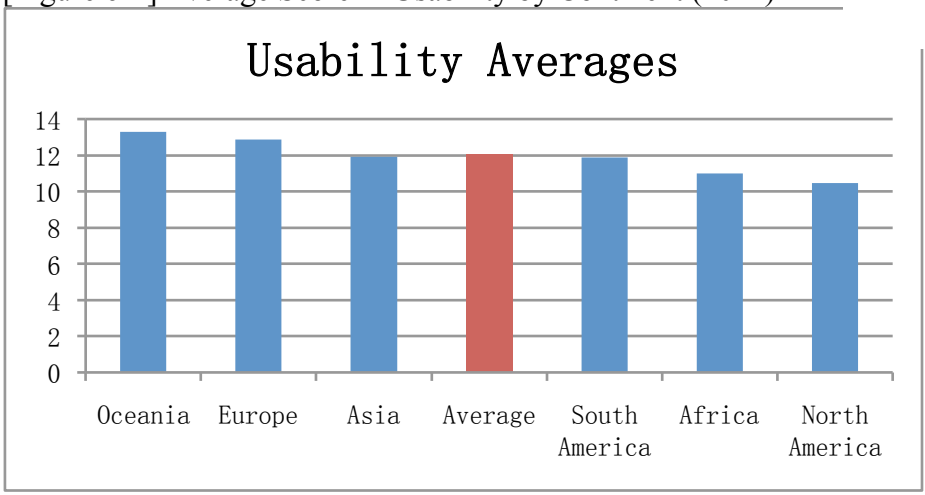
61	Johannesburg	South Africa	11.25
61	Santiago	Chile	11.25
65	Warsaw	Poland	10.94
65	Riga	Latvia	10.94
67	Accra	Ghana	10.63
68	Tehran	Iran (I.R.)	10.32
69	Sarajevo	Bosnia and Herzegovina	10.00
70	Santo Domingo	Dominican Rep.	9.69
70	Dhaka	Bangladesh	9.69
70	Caracas	Venezuela	9.69
70	Nairobi	Kenya	9.69
74	Panama City	Panama	9.38
75	Kuwait City	Kuwait	9.07
75	Baghdad	Iraq	9.07
75	Tirane	Albania	9.07
75	Guayaquil	Ecuador	9.07
79	Chisinau	Moldova	8.76
80	Budapest	Hungary	8.75
81	Sofia	Bulgaria	8.13
81	Kathmandu	Nepal	8.13
83	Tbilisi	Georgia	7.82
84	Lagos	Nigeria	7.51
84	Saint Joseph	Costa Rica	7.51
86	San Salvador	El Salvador	6.57
87	Asuncion	Paraguay	6.26
88	Baku	Azerbaijan	6.25
88	Bangkok	Thailand	6.25
90	Istanbul	Turkey	5.63
91	Tashkent	Uzbekistan	5.32
92	San Juan	Puerto Rico	3.13

Table 6-2 represents the average scores in usability. Overall, cities in Oceania scored the highest average of 13.29, while cities in North America scored the lowest average of 10.46 in this category. Table 6-4 presents the data separated by OECD and non-OECD member countries for the category of usability. Cities in OECD countries scored an average of 13.53, while cities in non-member countries scored only 11.32 in this category. This result indicates that cities in economically advanced countries continue to have more emphasis on usability than do cities in less developed countries; however, the gap seems to be closing compared to the previous surveys. Figure 6-1 illustrates the data presented in Table 6-2.

[Table 6-2] Average Score in Usability by Continent and OECD Member and Non-Member Countries (2011)

	Oceania	Europe	Asia	Average	South America	Africa	North America
Usability Averages	13.29	12.87	11.93	**12.09**	11.88	11.02	10.46

[Figure 6-1] Average Score in Usability by Continent (2011)



[Figure 6-2] Average Score in Usability by OECD Member and Non-Member Countries (2011)

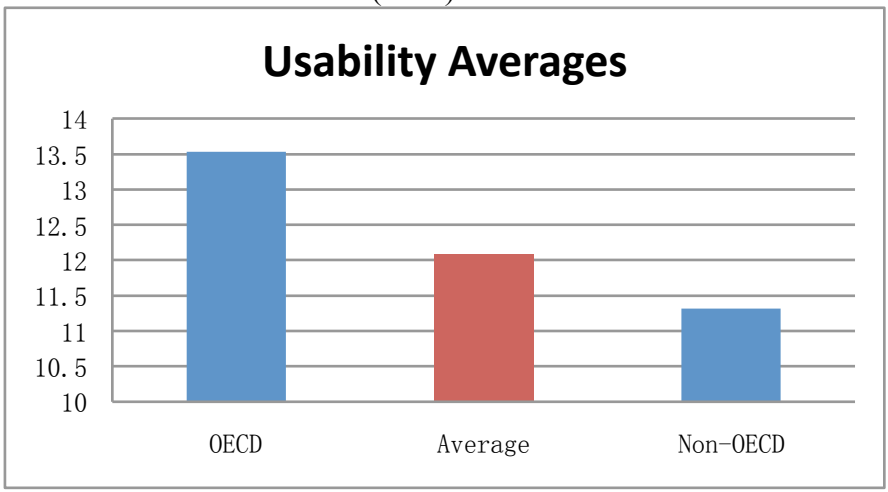


Table 6-3 lists the results of the evaluation of key aspects in the category of usability by continent. In terms of homepage length, with text size set to “medium” on the “view” menu in Internet Explorer on a 17-inch monitor, cities in Europe, South America, Asia, and Oceania scored above average. Under the conditions above, many cities in Europe, South America, Asia, and Oceania required two screens or less to view the main city homepage.

With respect to targeted audience links, 66% of cities in Europe, 55% of cities in South America, and 75% of cities in Africa have the targeted audience links divided into more than three categories (e.g., general citizens, youth, the elderly, women, family, citizens in need of social welfare services, businesses, industry, small businesses, public employees, etc.), while, on average, 63% of all cities have such links. Also, as to a site map, 69% in Europe and 45% in South America have a sitemap containing active links and are less than two screens in length. Conversely, 75% of cities in Oceania and 44% of cities in Africa provide sitemaps online. In terms of online search tools, all cities in Oceania, about 96% of cities in Europe, and 86% of cities in Asia were found to provide online search tools.

[Table 6-3] Results for Usability by Continent (2011)

	Europe	South America	Africa	Average	Asia	Oceania	North America
Targeted Audience	66%	55%	75%	**63%**	63%	25%	56%
Site map	69%	45%	44%	**62%**	68%	75%	50%
Search tool	96%	85%	88%	**89%**	86%	100%	72%

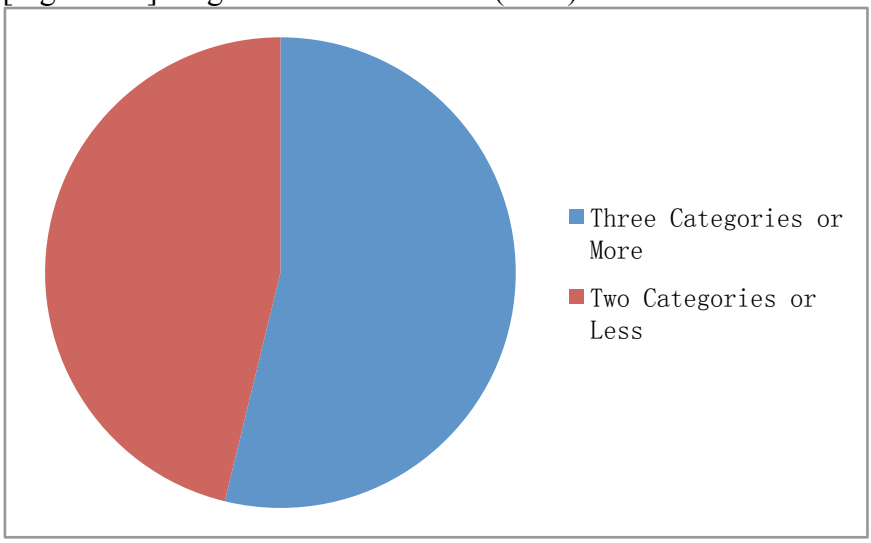
Table 6-4 indicates the results of assessments of usability among OECD and non-OECD countries. In terms of targeted audience links, about 73% of cities in OECD countries have links divided into more than three categories, while only 57% of non-OECD countries have such links. As to sitemaps, about 73% of cities throughout the world have a sitemap containing active links and are less than two screens in length. Also, all cities in OECD countries and 83% in non-OECD countries provide online search tools.

[Table 6-4] Results for Usability by OECD Member and Non-Member Countries (2011)

	OECD	Average	Non-OECD
Targeted Audience	73%	**63%**	57%
Site map	73%	**62%**	56%
Search tool	100%	**89%**	83%

With regard to the topic of “Targeted audience links: Are targeted audience links available on the homepage?” (e.g., general citizens, youth, the elderly, women, citizens in need of social welfare services, businesses, industry, public employees, etc.), 63% of municipal websites are divided into more than three categories (Figure 6-3).

[Figure 6-3] Targeted Audience Links (2011)



7

CONTENT

Results for the category of content indicate that Toronto, Seoul, Madrid, Ljubljana, and Tallinn are the top-ranked cities in this category. New to the top five are Toronto, Madrid, and Ljubljana. Toronto was ranked 14th in 2009, with a score of 12.40, but it has improved to take the first position, with a score of 16.83 in 2011, followed by Seoul, with a score of 16.67. Madrid was ranked 7th in 2009, but it has improved to third overall, with a score of 15.08 in 2011. Ljubljana was ranked 18th in 2009, with a score of 11.6, but it is now ranked fourth, with a score of 14.61. Table 7-1 summarizes the results for all the municipalities evaluated in the content category.

The average score for the top-five-ranked cities in 2011 is 15.46, while the overall average score for this category has decreased from 7.63 in 2009 to a score of 7.38 in 2011.

[Table 7-1] Results in Content (2011)

Rank	City	Country	Content
1	Toronto	Canada	16.83
2	Seoul	Korea (Rep.)	16.67
3	Madrid	Spain	15.08
4	Ljubljana	Slovenia	14.61
5	Tallinn	Estonia	14.13
6	New York	United States	13.81
7	Hong Kong	Hong Kong, China	13.65
7	Auckland	New Zealand	13.18
9	Prague	Czech Republic	13.02
10	Singapore	Singapore	12.70
11	Stockholm	Sweden	12.54
11	Paris	France	12.54
13	Yerevan	Armenia	12.38
13	Vienna	Austria	12.38
15	Brussels	Belgium	12.22
16	Shanghai	China	12.07
17	London	United Kingdom	11.75
18	Tokyo	Japan	11.59
18	Vilnius	Lithuania	11.59
20	Moscow	Russia	11.27
21	Helsinki	Finland	11.11
22	Copenhagen	Denmark	10.80
23	Bratislava	Slovak Republic	10.64
23	Oslo	Norway	10.64
25	Zurich	Switzerland	9.53
26	Berlin	Germany	9.21
26	Johannesburg	South Africa	9.21
28	Sao Paulo	Brazil	9.05
29	Jerusalem	Israel	8.89
29	Amsterdam	Netherlands	8.89

[Table 7-1] Results in Content (Cont. 2011)

31	Zagreb	Croatia	8.25
32	Dubai	United Arab Emirates	7.94
33	La Paz	Bolivia	7.78
34	Santiago	Chile	7.62
35	Buenos Aires	Argentina	7.46
35	Kuala Lumpur	Malaysia	7.46
35	Montevideo	Uruguay	7.46
35	Lisbon	Portugal	7.46
35	Lima	Peru	7.46
40	Chisinau	Moldova	7.30
41	Rome	Italy	7.15
41	Riga	Latvia	7.15
41	Bogota	Colombia	7.15
44	Kiev	Ukraine	7.14
45	Sydney	Australia	6.99
46	Budapest	Hungary	6.98
47	Istanbul	Turkey	6.83
48	Dublin	Ireland	6.51
49	Minsk	Belarus	6.35
49	Tirane	Albania	6.35
49	Sofia	Bulgaria	6.35
52	Mexico City	Mexico	6.19
53	Tehran	Iran (I.R.)	6.03
54	Jakarta	Indonesia	5.87
55	Tunis	Tunisia	5.72
56	Almaty	Kazakhstan	5.56
56	Bucharest	Romania	5.56
58	Riyadh	Saudi Arabia	5.40
58	Guayaquil	Ecuador	5.40
60	Sarajevo	Bosnia and Herzegovina	5.24
61	Guatemala City	Guatemala	5.08

[Table 7-1] Results in Content (Cont. 2011)

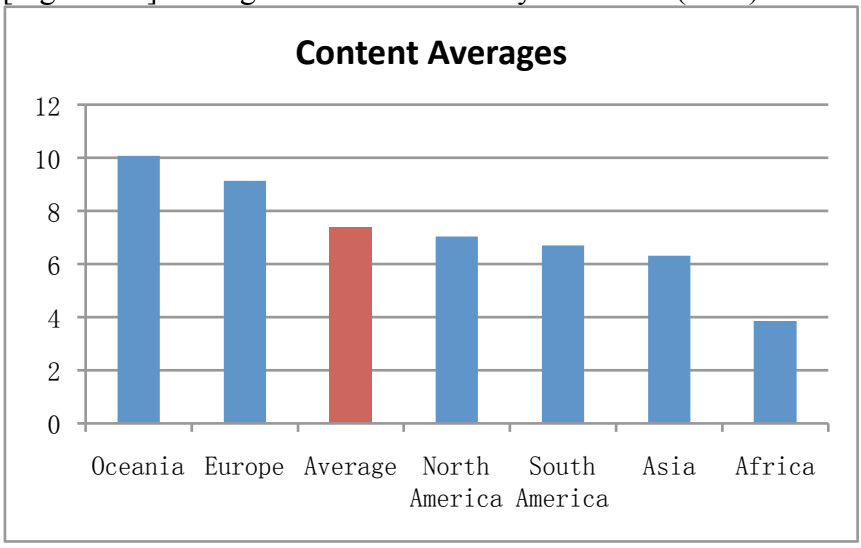
62	Belgrade	Serbia	4.92
62	Caracas	Venezuela	4.92
62	San Juan	Puerto Rico	4.92
65	Quezon City	Philippines	4.76
65	Ho Chi Minh	Viet Nam	4.76
65	Santo Domingo	Dominican Rep.	4.76
65	Tbilisi	Georgia	4.76
69	Athens	Greece	4.45
69	Amman	Jordan	4.45
69	Muscat	Oman	4.45
72	Warsaw	Poland	4.44
72	Baku	Azerbaijan	4.44
74	Kathmandu	Nepal	4.29
74	Saint Joseph	Costa Rica	4.29
74	San Salvador	El Salvador	4.29
77	Mumbai	India	3.81
78	Bangkok	Thailand	3.65
79	Lagos	Nigeria	3.50
80	Casablanca	Morocco	3.49
81	Panama City	Panama	3.33
82	Accra	Ghana	3.18
83	Colombo	Sri Lanka	2.70
83	Asuncion	Paraguay	2.70
85	Dakar	Senegal	2.38
86	Kuwait City	Kuwait	2.07
87	Cairo	Egypt	2.06
87	Karachi	Pakistan	2.06
89	Baghdad	Iraq	1.91
90	Dhaka	Bangladesh	1.59
91	Nairobi	Kenya	1.43
92	Tashkent	Uzbekistan	0.96

Table 7-2 represents the average score in content by continent. Overall, cities in Oceania scored 10.08, the highest average score, while Africa remained the continent with the lowest average score, with a score of 3.87. Table 7-2 also presents the data separated by OECD and non-OECD member countries for the category of content. Cities in OECD countries scored an average of 10.46, while cities in non-member countries scored only 5.73 in this category. Cities in economically advanced countries continue to have more emphasis on website content than do cities in less developed countries. Figures 7-1 and 7-2 illustrate the data presented in Table 7-2.

[Table 7-2] Average Score in Content by Continent and OECD Member and Non-Member Countries (2011)

	Oceania	Europe	Average	North America	South America	Asia	Africa
Content Averages	10.08	9.15	**7.38**	7.05	6.70	6.32	3.87

[Figure 7-1] Average Score in Content by Continent (2011)



[Figure 7-2] Average Score in Content by OECD Member and Non-Member Countries (2011)

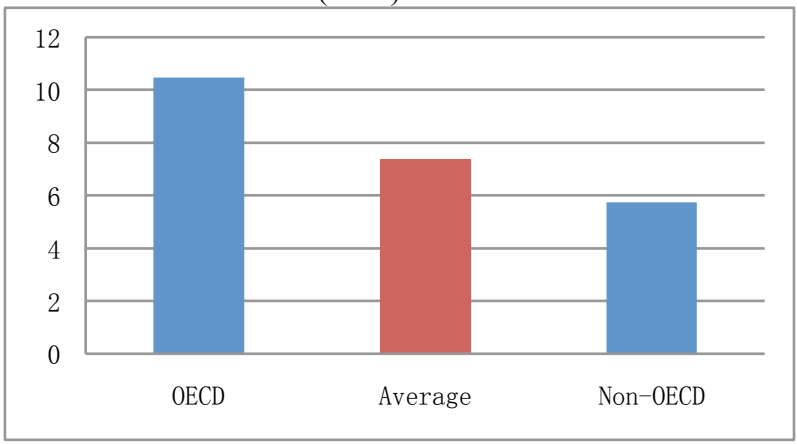


Table 7-3 indicates the results of the evaluation of content by continent. More than 30% of cities evaluated in Europe and North America have websites with mechanisms in the area of emergency management or alert mechanisms (severe weather, etc.). Also, with regard to disability access for the blind, only about 20% of cites have websites providing such access (e.g., Bobby compliant: http://www.cast.org/bobby). European cities continue to have the highest percentage of municipal websites with that feature. In addition, about 8% of cities have websites providing disability access for the deaf (TDD phone service). Cities in Oceania and Africa have no websites providing disability access for the blind.

With respect to the use of wireless technology, 19% of cities in Europe and 25% in Asia have websites using wireless technology, such as messages to a mobile phone or PDA (Personal Digital Assis tant) to update applications, events, etc. No cities in Oceania or Afri ca have websites using this technology. Also, more than two-thirds of cities in Asia and Europe have websites offering access in more than one language.

[Table 7-3] Results for Content by Continent (2011)

	Oceania	Europe	Average	Asia	North America	South America	Africa
Emergency Management	25%	37%	**30%**	29%	33%	25%	13%
Access for the Blind	0%	33%	**20%**	14%	22%	5%	0%
Access for the deaf	25%	11%	**8%**	2%	17%	10%	0%
Wireless technology	0%	19%	**16%**	25%	6%	10%	0%
More than one language	50%	81%	**60%**	71%	33%	10%	25%
Performance Measurement	75%	43%	**32%**	29%	22%	15%	19%

Table 7-4 indicates the results of the assessments of content among OECD and non-OECD countries. Like the other categories discussed above, cities in OECD countries have more advanced websites in terms of content than do cities in non-OECD countries. As to an emergency management or an alert mechanism, 36% of cities in OECD countries have such websites, with only 28% of cities in non-OECD member countries having such capacities.

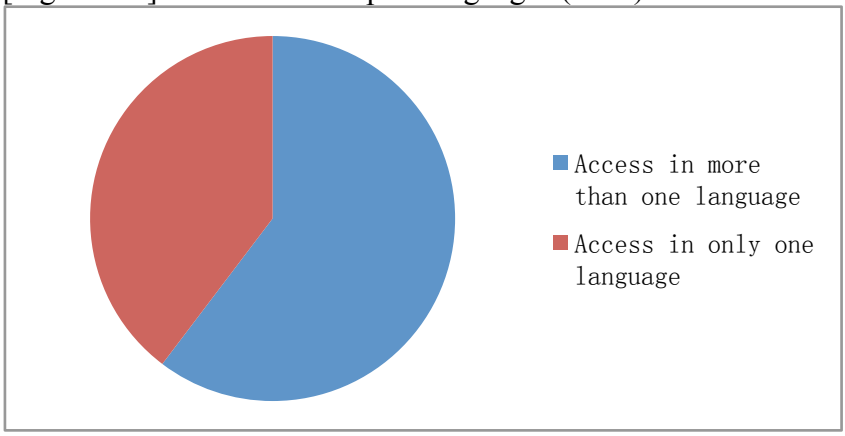
With regard to disability access for the blind, about 39% of cites in OECD countries have websites providing such access, whereas only 9% of cities in non-OECD countries have that capacity. In addition, about 17% of cities in OECD countries have websites providing disability access for the deaf, while only 3% of cities in non-OECD countries offer it. With respect to the use of wireless technology, about 28% of cities in OECD countries have websites using wireless technology to update applications, events, etc., while only 10% of cities in non-OECD countries have websites using that technology. In addition, about 80% of cities in OECD countries have websites offering access in more than one language, while 50% in non-OECD countries offer multilingual access.

[Table 7-4] Results for Content by OECD Member and Non-Member Countries (2011)

	OECD	Average	Non-OECD
Emergency Management	36%	**30%**	28%
Access for the blind	39%	**20%**	9%
Access for the deaf	17%	**8%**	3%
Use of wireless technology	28%	**16%**	10%
More than one language	80%	**60%**	50%
Performance Measurement	48%	**32%**	23%

Furthermore, with respect to the question, "Does the site offer access in more than one language?" 60% cities of those evaluated have a website that offers access in more than one language, while about 40% of cities have access in only one language. Figure 7-3 represents these findings in terms of overall percentages.

[Figure 7-3] Access in Multiple Languages (2011)



8

SERVICES

The following chapter highlights the results for the category of online services. Results indicate that Seoul, Yerevan, Singapore, Hong Kong, Toronto, Madrid, and Auckland are the top-ranked cities in the category of online services. Seoul ranks first, with a score of 17.55 out of a maximum score of 20, followed by Yerevan in second place, with a score of 13.77. Singapore is ranked third, with a score of 13.45, followed by Hong Kong in fourth, with a score of 13.44. The fifth position is shared by Toronto, Madrid, and Auckland, with scores of 12.79. Table 8-1 summarizes the results for all the municipalities evaluated in this category.

The average score in this category is 5.78, and the average score for the top-five-ranked cities in 2011 is 13.79. Cities in OECD countries scored an average of 8.01, while cities in non-member countries scored only 4.59 in this category.

[Table 8 -1] Results in Services (2011)

Rank	City	Country	Services
1	Seoul	Korea (Rep.)	17.55
2	Yerevan	Armenia	13.77
3	Singapore	Singapore	13.45
4	Hong Kong	Hong Kong, China	13.44
5	Toronto	Canada	12.79
5	Madrid	Spain	12.79
5	Auckland	New Zealand	12.79
8	Shanghai	China	12.62
9	New York	United States	12.13
9	Dubai	United Arab Emirates	12.13
11	London	United Kingdom	11.81
12	Moscow	Russia	11.64
13	Stockholm	Sweden	11.15
14	Tallinn	Estonia	10.66
15	Vilnius	Lithuania	10.00
16	Sao Paulo	Brazil	9.84
16	Istanbul	Turkey	9.84
18	La Paz	Bolivia	9.18
18	Dublin	Ireland	9.18
20	Tokyo	Japan	9.02
20	Bratislava	Slovak Republic	9.02
22	Vienna	Austria	8.69
23	Helsinki	Finland	8.52
24	Prague	Czech Republic	8.20
25	Oslo	Norway	8.04
25	Santiago	Chile	8.04
27	Zagreb	Croatia	7.54
27	Mexico City	Mexico	7.54
29	Jerusalem	Israel	7.38
30	Copenhagen	Denmark	7.21

[Table 8-1] Results in Services (Cont. 2011)

31	Ho Chi Minh	Viet Nam	7.05
32	Tehran	Iran (I.R.)	6.89
33	Amsterdam	Netherlands	6.56
33	Kuala Lumpur	Malaysia	6.56
35	Bogota	Colombia	6.40
36	Ljubljana	Slovenia	6.39
37	Paris	France	6.23
37	Almaty	Kazakhstan	6.23
39	Berlin	Germany	6.07
39	Johannesburg	South Africa	6.07
39	Lisbon	Portugal	6.07
42	Rome	Italy	5.90
42	Guatemala City	Guatemala	5.90
44	Lima	Peru	5.58
45	Mumbai	India	5.57
46	Buenos Aires	Argentina	4.76
47	Brussels	Belgium	4.59
48	Riga	Latvia	4.43
48	Kiev	Ukraine	4.43
50	Chisinau	Moldova	4.27
51	Tirane	Albania	4.26
52	Zurich	Switzerland	3.78
53	Amman	Jordan	3.77
53	Kathmandu	Nepal	3.77
53	Colombo	Sri Lanka	3.77
56	Minsk	Belarus	3.61
56	Guayaquil	Ecuador	3.61
56	Bangkok	Thailand	3.61
59	San Juan	Puerto Rico	3.28
59	Montevideo	Uruguay	3.28
61	Budapest	Hungary	3.12

[Table 8 -1] Results in Services (Cont. 2011)

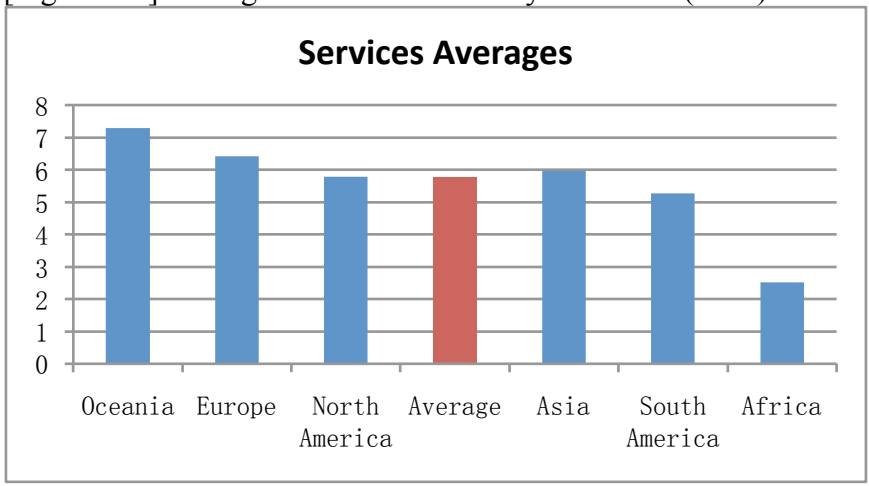
61	Jakarta	Indonesia	3.12
63	Muscat	Oman	2.96
64	Tunis	Tunisia	2.95
64	Belgrade	Serbia	2.95
66	Tbilisi	Georgia	2.79
66	Panama City	Panama	2.79
66	Nairobi	Kenya	2.79
66	Saint Joseph	Costa Rica	2.79
70	Cairo	Egypt	2.63
71	Santo Domingo	Dominican Rep.	2.46
71	Dhaka	Bangladesh	2.46
71	San Salvador	El Salvador	2.46
74	Quezon City	Philippines	2.30
74	Accra	Ghana	2.30
76	Sofia	Bulgaria	1.97
76	Athens	Greece	1.97
76	Riyadh	Saudi Arabia	1.97
79	Bucharest	Romania	1.81
79	Sydney	Australia	1.81
79	Dakar	Senegal	1.81
82	Caracas	Venezuela	1.48
82	Warsaw	Poland	1.48
82	Karachi	Pakistan	1.48
85	Kuwait City	Kuwait	1.15
86	Baghdad	Iraq	0.99
86	Sarajevo	Bosnia and Herzegovina	0.99
88	Casablanca	Morocco	0.98
89	Baku	Azerbaijan	0.66
89	Asuncion	Paraguay	0.66
89	Lagos	Nigeria	0.66
92	Tashkent	Uzbekistan	0.49

Table 8-2 represents the average score of online services by continent. Overall, cities in Oceania ranked highest, with a score of 7.30, followed closely by European cities, with a score of 6.43. Asian cities ranked third, with a score of 5.96, while cities in North America ranked fourth, with a score of 5.79. Table 8-2 also presents the data separated by OECD and non-OECD member countries for the category of online services. Cities in OECD countries scored an average of 8.01 in 2011, while cities in non-member countries recorded an average of 4.59 in this category. This result indicates that cities in developed countries have provided citizens with more online services than cities in less developed countries. Figures 8-1 and 8-2 illustrate the data in Table 8-2.

[Table 8-2] Average Score in Services by Continent and OECD Member and Non-Member Countries (2011)

	Oceania	Europe	North America	Average	Asia	South America	Africa
Services Averages	7.30	6.43	5.79	**5.78**	5.96	5.28	2.52

[Figure 8-1] Average Score in Services by Continent (2011)



[Figure 8-2] Average Score in Services by OECD Member and Non-Member Countries (2011)

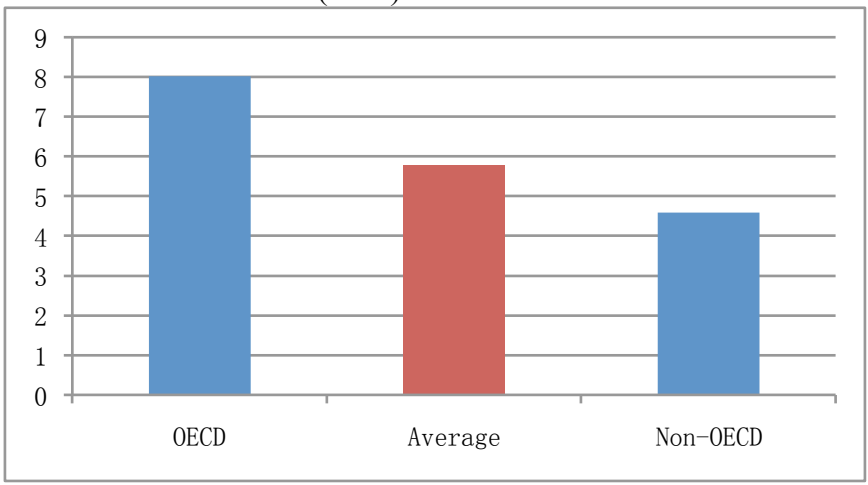


Table 8-3 indicates the results of key aspects selected in the category of service delivery by continent. With regard to searchable databases, more than 50% of cities in Oceania, Europe, and Asia have websites offering a searchable database, while less than 30% of cities evaluated in North America and Africa have sites offering that capacity. In terms of portal customization, 18% of cities in Asia and about 11% in Europe and North America allow users to customize the main city homepage, depending on their needs. In addition, with respect to access to private information online (e.g., educational records, medical records, point total of driving violations, lost pet dogs, lost property), more than 30% of cities in Europe allow users to access private information online.

[Table 8-3] Results for Services by Continent (2011)

	Oceania	Europe	Asia	Average	North America	South America	Africa
Searchable Database	50%	64%	54%	**50%**	28%	45%	6%
Portal Customization	0%	11%	18%	**11%**	11%	0%	0%
Access to Private Info	25%	30%	16%	**21%**	11%	20%	6%

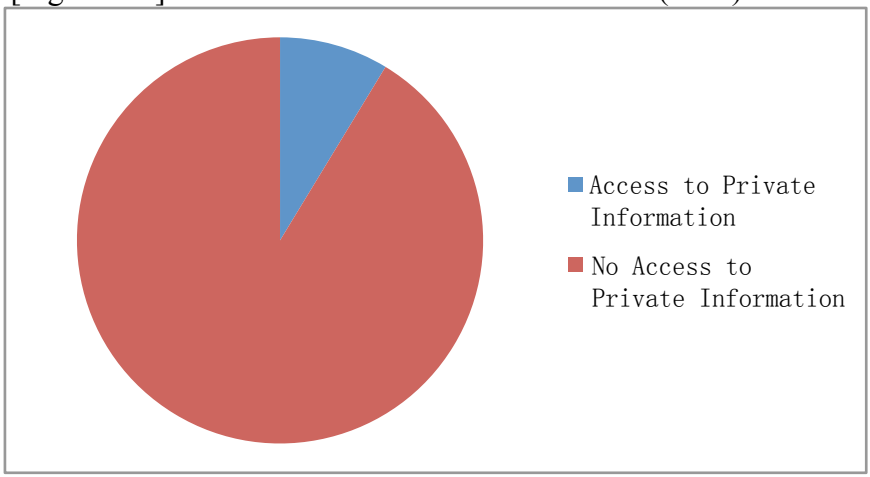
Table 8-4 represents the results of key aspects selected in the category of service delivery by OECD membership. With regard to searchable databases, about 64% of cities in OECD countries have websites offering a searchable database, and about 43% in non-OECD countries have sites offering that capacity. In terms of portal customization, about 17% of cities in OECD countries allow users to customize the main city homepage depending on their needs, and about 8% in non-OECD countries allow citizens to do so. In addition, with respect to access to private information online, 34% of cities in OECD countries allow users to access such information, while 13% of cities in non-OECD countries allow citizens to do so.

[Table 8-4] Results for Services by OECD Member and Non-Member Countries (2011)

	OECD	Average	Non-OECD
Searchable Database	64%	**50%**	43%
Portal Customization	17%	**11%**	8%
Access Private Info	34%	**21%**	13%

Overall, 21% of all cities allow access to private information online in response to the question, “Does the site allow access to private information online?” (e.g., educational records, medical records, point total of driving violations, lost pet dogs, lost property). Over 75% of cities do not allow such access. Figure 8-3 illustrates this finding.

[Figure 8-3] Access to Private Information Online (2011)



9

CITIZEN AND SOCIAL ENGAGEMENT

The following chapter highlights the results for the category of citizen and social engagement. Results indicate that Seoul, Prague, Shanghai, Vienna, and Moscow are the top-ranked cities in the category of citizen participation. New to the top five are Shanghai, Vienna, and Moscow. Seoul ranked first, with a score of 16.25, compared to its fourth position in 2009, with a score of 11.09. Prague retained its second-place ranking, with a score 11.67, followed by Shanghai, with a score of 9.58. Vienna was ranked 8th in 2009, with a score of 8.36, but it has improved to fourth overall, with a score of 9.17 in 2011. Moscow, which was ranked 13th in 2009, with a score of 6.55, has achieved a fifth-place overall ranking, with a score of 8.96 in 2011. Table 9-1 summarizes the results for all the municipalities evaluated in this category.

The average score in this category is 3.53, a slight increase from a score of 3.50 in 2009. This can be attributed to the lack of support for such online citizen participation practices among municipalities across the world.

[Table 9-1] Results in Citizen and Social Engagement (2011)

Rank	City	Country	CS Engagement
1	Seoul	Korea (Rep.)	16.25
2	Prague	Czech Republic	11.67
3	Shanghai	China	9.58
4	Vienna	Austria	9.17
5	Moscow	Russia	8.96
6	Paris	France	8.75
7	Lisbon	Portugal	8.13
8	New York	United States	7.50
8	Bratislava	Slovak Republic	7.50
8	Helsinki	Finland	7.50
11	Toronto	Canada	7.09
12	Madrid	Spain	6.67
12	Almaty	Kazakhstan	6.67
12	Minsk	Belarus	6.67
15	Vilnius	Lithuania	6.46
15	Zagreb	Croatia	6.46
17	Singapore	Singapore	6.25
17	Copenhagen	Denmark	6.25
19	Stockholm	Sweden	6.04
20	Muscat	Oman	5.63
21	Dubai	United Arab Emirates	5.21
21	Sao Paulo	Brazil	5.21
21	Amsterdam	Netherlands	5.21
24	Mexico City	Mexico	5.00
24	Berlin	Germany	5.00
26	Hong Kong	Hong Kong, China	4.80
26	Bogota	Colombia	4.80
28	London	United Kingdom	4.79
29	Ljubljana	Slovenia	4.59

30	Johannesburg	South Africa	4.17
31	Dublin	Ireland	3.75
31	Oslo	Norway	3.75
31	Jerusalem	Israel	3.75
31	Riga	Latvia	3.75
31	Tunis	Tunisia	3.75
31	Bucharest	Romania	3.75
37	La Paz	Bolivia	3.54
37	Zurich	Switzerland	3.54
37	Bangkok	Thailand	3.54
40	Ho Chi Minh	Viet Nam	3.34
41	Tokyo	Japan	3.33
41	Buenos Aires	Argentina	3.33
43	Yerevan	Armenia	3.13
43	Chisinau	Moldova	3.13
43	Amman	Jordan	3.13
46	Belgrade	Serbia	2.92
47	Budapest	Hungary	2.71
47	Colombo	Sri Lanka	2.71
49	Kuala Lumpur	Malaysia	2.70
50	Tallinn	Estonia	2.50
50	Tirane	Albania	2.50
50	Jakarta	Indonesia	2.50
50	Sofia	Bulgaria	2.50
54	Santo Domingo	Dominican Rep.	2.29
55	Tehran	Iran (I.R.)	2.09
55	Lima	Peru	2.09
55	Brussels	Belgium	2.09
55	Athens	Greece	2.09
55	Dakar	Senegal	2.09
55	Sarajevo	Bosnia and Herzegovina	2.09
61	Istanbul	Turkey	2.03

[Table 9-1] Results in Citizen and Social Engagement (Cont. 2011)

62	Auckland	New Zealand	1.88
62	Rome	Italy	1.88
64	Montevideo	Uruguay	1.46
64	Accra	Ghana	1.46
64	Riyadh	Saudi Arabia	1.46
64	Karachi	Pakistan	1.46
68	Santiago	Chile	1.25
68	Kiev	Ukraine	1.25
68	Guayaquil	Ecuador	1.25
68	Sydney	Australia	1.25
72	Quezon City	Philippines	1.04
72	Caracas	Venezuela	1.04
72	Warsaw	Poland	1.04
72	Baghdad	Iraq	1.04
76	Guatemala City	Guatemala	0.84
76	Dhaka	Bangladesh	0.84
76	Kuwait City	Kuwait	0.84
79	San Juan	Puerto Rico	0.83
79	Panama City	Panama	0.83
81	Kathmandu	Nepal	0.63
81	San Salvador	El Salvador	0.63
83	Tbilisi	Georgia	0.42
83	Casablanca	Morocco	0.42
83	Asuncion	Paraguay	0.42
83	Cairo	Egypt	0.42
83	Lagos	Nigeria	0.42
88	Mumbai	India	0.21
88	Nairobi	Kenya	0.21
90	Saint Joseph	Costa Rica	0.00
90	Baku	Azerbaijan	0.00

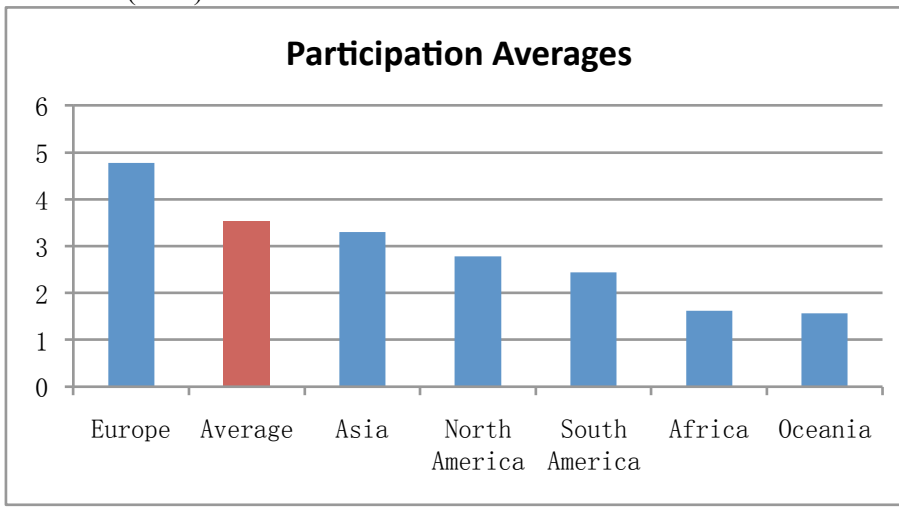
90	Tashkent	Uzbekistan	0.00

Table 9-2 represents the average score in citizen and social engagement by continent. Overall, cities in Europe ranked the highest among the continents, with a score of 4.77, replacing Oceania. Table 9-2 also presents the data separated by OECD and non-OECD member countries for the category of citizen and social engagement. Cities in OECD countries scored an average of 5.12, while cities in non-member countries scored only 2.68 in this category. This result indicates that cities in economically advanced countries continue to place more emphasis on citizen participation than do cities in less developed countries. Figures 9-1 and 9-2 illustrate the data presented in Table 9-2.

[Table 9-2] Average Score in Citizen and Social Engagement by Continent (2011)

	Europe	Average	Asia	North America	South America	Africa	Oceania
CSE Averages	4.77	**3.53**	3.30	2.78	2.44	1.62	1.56

[Figure 9-1] Average Score in Citizen and Social Engagement by Continent (2011)



[Figure 9-2] Average Score in Citizen and Social Engagement by OECD Member and Non-Member Countries (2011)

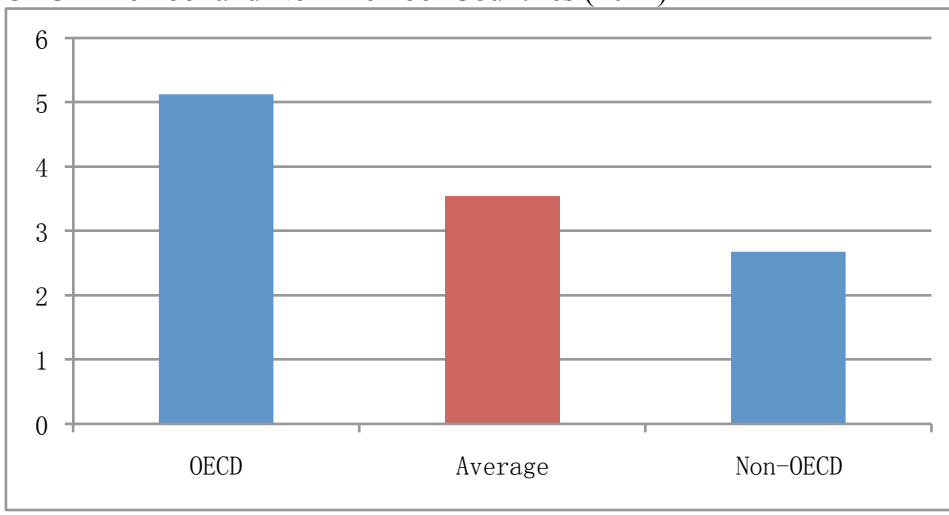


Table 9-3 indicates the results of key aspects selected for the category of citizen and social engagement by continent. In terms of the evaluation of the question, “Does the website allow users to provide comments or feedback to individual departments/agencies through online forms?” 64% of municipalities provide a mechanism allowing comments or feedback through online forms. Fifty percent of cities in Oceania and North America, along with much more in Europe, and Asia, provide such an online feedback form. With respect to online bulletin board or chat capabilities for gathering citizen input on public issues (“online bulletin board” or “chat capabilities” means the city website where any citizens can post ideas, comments, or opinions without specific discussion topics), about 23% have these capabilities. With regard to online discussion forums on policy issues (“online discussion forum” means the city websites where the city arranges public consultation on policy issues, and citizens participate in discussing those specific topics), 27% of the municipalities evaluated have a site containing an online discussion forum, which increased from 21% in 2007.

[Table 9-3] Results for Citizen and Social Engagement by Continent (2011)

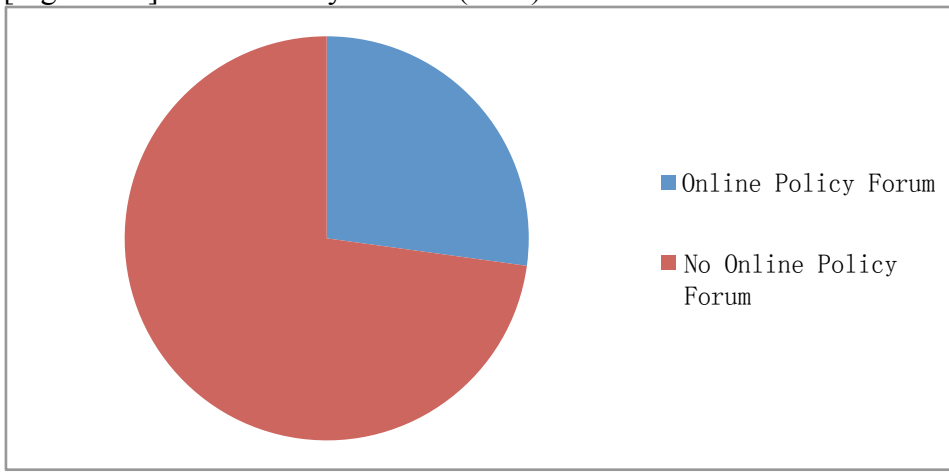
	Oceania	Europe	Average	Asia	North America	South America	Africa
Feedback Form	50%	73%	**64%**	63%	50%	55%	56%
Bulletin Board	0%	33%	**23%**	18%	17%	25%	6%
Policy Forum	0%	37%	**27%**	29%	17%	15%	13%

Table 9-4 represents the results of key aspects selected in the category of citizen and social engagement by OECD membership. In terms of the evaluation of the question, “Does the website allow users to provide comments or feedback to individual departments/agencies through online forms?” 75% of municipalities in OECD countries provide a mechanism allowing comments or feedback through online forms. About 58% of municipalities in non-OECD countries provide a mechanism allowing comments or feedback through online forms. With respect to online bulletin board or chat capabilities for gathering citizen input on public issues, 33% of municipalities in OECD countries provide online bulletin board or chat capabilities. Only 18% of municipalities in non-OECD countries provide online bulletin board or chat capabilities. With regard to online discussion forums on policy issues, 36% of municipalities in OECD countries have a site containing an online discussion forum. Only 23% of municipalities in non-OECD countries, however, have a site containing an online discussion forum.

[Table 9-4] Results for Citizen and Social Engagement by OECD Member and Non-Member Countries (2011)

	OECD	Average	Non-OECD
Feedback Form	75%	**64%**	58%
Bulletin Board	33%	**23%**	18%
Policy Forum	36%	**27%**	23%

[Figure 9-3] Online Policy Forums (2011)



10

BEST PRACTICES

SEOUL

Seoul ranked #1 again in the Fifth Global E-Governance Survey. The website of Seoul scored high in all five categories, including #1 in usability, services, and citizen and social engagement. It ranked #2 in content and #3 in privacy and security.

Seoul's website is user-friendly. The homepage is relatively short; the sitemap is excellent; and the navigation bar, font color, and formatting are consistent, making it easy to use. The advanced search tool and targeted audience links help visitors to conveniently access the information and services they need.

As an important function of e-governance, the website of Seoul provides well-developed online services, aiming at improving its efficiency and effectiveness. Citizens can pay their utilities, taxes, and tickets online; apply for permits and licenses through the website; and request information and services directly.

With regard to citizen participation, residents can give comments or feedback to departments and public officials directly; an online bulletin board is designed for citizens to raise questions or report their concerns; and well-organized forums are available for discussions. Additionally, surveys are conducted to collect public opinion on specific events or topics. Seoul's website also serves as a leading example in the area of content and privacy. Documents such as budgets, meeting minutes, performance measures, and evaluation results are open to the public. Also, systematic measures are taken to protect the privacy of visitors.

TORONTO

Comparing 2011 to 2007 (in which it ranked #12) and 2009 (in which it ranked #10), Toronto made great progress and ranked #2 in the Fifth Global E-Governance Survey. The ranking reflects Toronto's efforts to improve its e-governance, particularly in content (#1), usability (#3), and services (#5).

Regarding its content, comprehensive contact information (such as location, phone numbers, and email addresses of government offices) is provided. Updates can be received directly via email, for citizens to better follow events. Also, mission statements, minutes of meetings, and related documents, such as budgets and human resource management materials, are open to the public, along with performance measurement and evaluation results. The website of Toronto also provides disability access for the deaf and blind. All of these aspects make the city's website more transparent and efficient.

For usability and services, it provides a consistent navigation bar system, font color, and formatting. Clear forms and advanced search tools have made it easier to use; related information online helps residents pay taxes, tickets, and utilities; and guidance is available for users to apply for permits and licenses. Additionally, users can submit their feedback or complaints by email or phone to further improve the performance of government. These improvements make the usability and services areas of Toronto's website more convenient and comprehensive.

MADRID

Madrid ranked #3 in the Fifth Global E-Governance Survey. It continually ranked in the Top 10 in the 2007, 2009, and 2011 surveys. Separately, it ranked #3 in usability and content, #5 in services, #8 in privacy and security, and #12 in citizen and social engagement.

On the website of Madrid, alternative versions are available

for long documents. Targeted audiences are divided into different categories for visitors to quickly locate the information and services they need. Madrid's website provides an outstanding site search tool on the homepage, with advanced functions for limiting the scope of a search, narrowing a set of returned search results, and sorting search results. As to its content, a searchable database containing budget information, reports, and other related documents is available online. The website also offers Dynamic GIS capabilities, provides disability access for the deaf and blind, uses wireless technology to update applications, events, etc, and has a mobile version.

PRAGUE

Prague ranked #4 in this Survey. It is the second time Prague has ranked as a top 5 city in the survey. (#2 in the 2009 survey) In the different categories, it ranked #2 in citizen and social engagement, #7 in privacy and security, #9 in usability and content, and #24 in services.

The website of Prague was excellent in citizen participation by enabling citizens to follow events and express their opinions. It allows users to provide comments or feedback directly to individual departments and elected officials. Users can subscribe to a newsletter to learn about recent events in Prague. Also, online discussion forums are provided for users to discuss public issues and raise concerns. Furthermore, surveys are conducted online to collect opinions from citizens. Live videos of public events are offered, and users can provide comments or questions about them. Users are also encouraged to post information, photos, and videos.

HONG KONG

Hong Kong ranked #5 in the 2011 survey. It has continually ranked in the top 5 in the past three surveys. In the specific categories, it ranked #2 in usability, #4 in services, #7 in content, #11 in privacy and security, and #26 in citizen and social engagement.

Hong Kong provides a leading example in the area of usability. Similarly to Seoul, Hong Kong divides the targeted audience links into several categories and provides corresponding information and services. It has an excellent sitemap, containing active links, and it is available on the homepage and navigation bar. The font color and formatting are consistent throughout the whole website. Also, there are user-friendly forms providing additional information when users make mistakes. Visitors do not need to re-enter all their information, and explicitly labeled fields show visitors where to make changes. Additionally, an advanced search tool on the homepage provides visitors with a fast and convenient way to find the information they need.

NEW YORK

The city of New York ranked #6 in the Fifth Global E-Governance Survey, slightly dropping from 2009, when it ranked #4. Still, New York has continually ranked very high in the past four global surveys. In the categories, it ranked #6 in content, #8 in citizen and social engagement, #9 in services, and #11 in privacy and security and usability.

Locations, phone numbers, and email addresses of government departments and public officials are presented on the website for the public to submit comments, report concerns, and request information or services. The website of New York produces a newsletter and updates distributed directly via email, by which residents can better follow events. Additionally, a searchable database of city codes, budget information, and other documents makes the content of the website comprehensive and easy to use. A performance measurement system published online helps citizens to supervise their government. With regard to online services, users can directly access multiple services, such as paying their utilities, taxes, and fines. The website also reflects the philosophy of enabling public participation by conducting online surveys to collect public opinion and encouraging the posting of information, photos, and videos.

11

CONCLUSION

The study of municipal e-governance practices throughout the world is an area that clearly requires ongoing research. Our research represents a continued effort to evaluate digital governance in large municipalities throughout the world. Previous research on government websites has focused primarily on e-governance at the federal, state, and local levels in the United States. Only a few studies have produced comparative analyses of e-governance in national governments throughout the world. Our studies in 2003, 2005, 2007, 2009 and 2011 have produced findings that contribute to the e-governance literature, in particular in the areas of website privacy/security, usability, content, services, and citizen and social engagement. The 2011 study highlights the increased attention spent on usability and content, and the need for further attention in the area of privacy and security, services and citizen and social engagement via municipal websites. Similar to our previous findings, citizen participation has recorded the lowest score among the five categories. Cities have not yet fully recognized the importance of involving and supporting citizen participation online.

In addition, the digital gap between OECD and non-OECD member countries in average scores that decreased in 2007 and 2009 had increased in 2011. It is very important for international organizations such as the UN and cities in advanced countries to help continue bridging the digital divide. In many nations, especially those belonging to the non-OECD category, the digital divide may imply more than access to the internet alone; this divide refers to access to basic infrastructure such telephones, electricity, communications, etc. We therefore recommend developing a

comprehensive policy for bridging that divide. That comprehensive policy should include capacity building for municipalities, including information infrastructure, content, applications and access for individuals and educating the residents with appropriate computer education.

The continued study of municipalities worldwide, with a sixth evaluation planned in 2013, will further provide insights into the direction of e-governance and the performance of e-governance throughout regions of the world. Every region has examples of best practices for overall performance and in each specific e-governance category. As municipalities seek to increase their municipal website performance, searching for models within their region is an opportunity to identify e-governance benchmarks. Those municipalities that serve as top performers in their respective regions can then look to the top ranked cities in municipalities throughout the world. Although the 2011 study highlights increases in e-governance performance throughout the world, continuous improvement should be the norm for every municipality.

Comparison between UN Survey and Rutgers Survey

Beginning from 2003 and aimed at measuring municipality capacity to provide public services with information technology, the UN E-Government Survey and Rutgers Global E-Governance Survey both share a lot in common and have differences with each other. The discussion below provides a comparison between the two in Methodology and Evaluation Results.

Methodology

Similarity

Table 1

	UN Survey	**Rutgers Survey**
Similarity		
Worldwide Focus	√	√

Citizen-centric Approach	√	√
Reflect Four-stage E-government Development	√	√
Timely Updates	√	√

Table 1 shows the similarities in the two surveys. To begin with, they both evaluate e-governance worldwide instead of only focusing on a particular nation or region. Besides, both surveys adopt a citizen-centric approach. The UN survey measures the extent to which national governments use information technology to provide citizens with services in a timesaving manner. Similarly, the Rutgers e-governance survey uses 104 measures to evaluate the ability of city level governments in providing effective and efficient services to citizens. The Rutgers survey also evaluates the measures taken by governments to protect the privacy and security of users and whether opportunities are provided online for citizen engagement and participation. So, both surveys pay attention to the "demand side" of citizens and use the citizen-centric approach.

Thirdly, both of their assessment questionnaires reflect the four stages of e-government development: Presence, Interaction, Transaction, and Transformation. The Rutgers e-governance survey uses a five-category index to measure the availability of useful information, documents, records and so on; whether citizens can apply licenses or permit online; whether citizens can give opinions or feedbacks to government through the websites; whether they can pay their tickets, fines and tax online; whether business can bid online; whether citizens has opportunities of participation and interaction; and so on. So, the measurement can comprehensively reflect the stage of e-governance in that municipality.

Additionally, the two surveys divide data into categories for further comparison and analysis. For example, the UN survey divided the data based on their regional groupings and the economy (developed and developing countries). The Rutgers survey divided the data based on their continent and OECD or non-OECD status. Also, they both vary from one edition to the next one, trying to fit their index and evaluation system to the e-government and technology changes.

Differences

Although sharing a lot in common, the UN E-Government Survey and the Rutgers Global E-Governance Survey still have considerable differences between them, incl uding Research Level, Coverage, Survey Instrument, Evaluation Pro cess, Languages, and so on. The Table 2 summarizes the differences between the two surveys.

Table 2

	UN Survey	**Rutgers Survey**
Differences		
Research Level	Country Level	City Level
Coverage	193 Member States	Largest city of Top 100 Most Wired Nations
Survey Instrument	Three Component Indexes	Five Categories
	Most Questions Use Binary Response	Combination of Different Scales Based on Needs
Evaluation Process	Evaluated by Original Reviewer, and then Senior Researcher Re-verifies	Evaluated by Two Evaluators and The Third Evaluators Will Be Needed If The Difference Is Larger Than 10%
	Team Members Justify The URLs	Researchers Justify the URLs and Evaluators Double Check

To begin with, the two surveys focus on different municipality levels. The UN Survey 2012 is based on a comprehensive survey of all the 193 Member States; while the Rutgers E-Governance Survey selected the largest city by population

in the top 100 most wired nations identified by using information on total number of online users from International Telecommunication Union (ITU) of United Nations (UN). And, the rationale for selecting the largest municipalities stems from the e-governance literature, which suggests a positive relationship between population and e-governance capacity at the local level (Moon, 2002; Moon & deLeon, 2001; Musso, et. al., 2000; Weare, et. al. 1999). So, one evaluates the national level and the other researchers at the local level.

Besides, differences exist in their survey instrument. The UN E-Government Survey score is a weighted average of three equally component indexes, including scope and quality of online services, development status of telecommunication infrastructure, and inherent human capital. And, the assessment rates are relative. However, the Rutgers E-Governance Survey Instrument uses 104 measures in five distinct categorical areas of e-governance research: 1. Privacy and Security; 2. Usability; 3. Content; 4. Services; and 5. Citizen and Social Engagement. Each category take 20% weighted score and the score is absolute instead of relative.

Regarding the e-government scale, except a small number of questions that use a 4-point scale, almost all questions in UN survey use a binary response of yes (1 point) or no (0 points). However, the Rutgers E-Governance Survey uses different scales in different categories based on their needs. The dichotomous measures in the "service" and "citizen participation" categories correspond with values on a four-point scale of "0" or "3"; dichotomous measures in "privacy" or "usability" correspond to ratings of "0" or "1" on the scale.

Additionally, the evaluation process is also different in both sur veys. Researchers of UN survey were trained to assume the mind-set as an average citizen user. And, after the evaluation is finished by the original reviewer, the senior researcher would review it again to re-verify all the answers. To ensure reliability, Rutgers E-governance Survey makes each municipal website be assessed by tw o evaluators, and in cases where significant variation (+ or − 10%) existed on the weighted score between evaluators, websites w

ere analyzed a third time. Furthermore, an example for each measure indicated how to score the variable. Evaluators were also given com prehensive written instructions for assessing websites.

In the UN survey, all Member States were invited to supply the addresses of their own top-level national and e-services/ministerial websites, and researchers generally take those URLs as the starting p oint (UN E-Government Survey 2012, P.121). To the countries whic h did not provide appropriate URLs, some discretion is exerted whe n deciding whether to use the country-provided websites (UN E-Gov ernment Survey 2012, P.121). Rutgers survey uses a different method, with the researchers first identifying the official websites for these 100 cities. And then, the evaluators were asked to find the official websites by themselves. Comparison can be made and the problem should be reported to the researchers at Rutgers if the URLs found by evaluators did not match the URLs provided. And then, the researchers and evaluators would work together to identify the right website link.

Results

Since the two surveys focus on different levels of government (one is country level and the other is city level) and they have differences in methodology, survey instruments, and so on, the results are different from each other. However, their results are strongly related to each other because they both evaluate the e-governance capacity of the municipality and the level of the largest city is reflective of the capacity of the country to some extent. The Table 3 below makes a comparison of the results between Rutgers Survey and UN Survey. The comparison shows that among the top 30 rankings, the two surveys have 23 in common (76.67%); among the top 60, they have 39 in common (65%); among all the 92 cities, they have 54 in common (58.70%).

Table 3

City	Country	Rutgers Rank	UN Rank	Rutgers Score	UN Score
Seoul	Korea (Rep.)	1	1	82.23	0.9283
Toronto	Canada	2	11	64.31	0.8430
Madrid	Spain	3	23	63.63	0.7770
Prague	Czech Republic	4	46	61.72	0.6491
Hong Kong	Hong Kong, China	5	78	60.81	0.5359
New York	United States	6	5	60.49	0.8687
Stockholm	Sweden	7	7	60.26	0.8599
Bratislava	Slovak Republic	8	53	56.74	0.6292
London	United Kingdom	9	3	56.19	0.8960
Shanghai	China	10	78	55.49	0.5359
Vilnius	Lithuania	11	29	55.35	0.7333
Vienna	Austria	12	21	54.79	0.7840
Helsinki	Finland	13	9	54.22	0.8505
Auckland	New Zealand	14	13	53.19	0.8381
Dubai	United Arab Emirates	15	28	53.18	0.7344
Singapore	Singapore	16	10	52.21	0.8474
Moscow	Russia	17	27	51.77	0.7345
Copenhagen	Denmark	18	4	50.06	0.8889
Yerevan	Armenia	19	94	49.97	0.4997
Paris	France	20	6	48.65	0.8635
Berlin	Germany	21	17	47.16	0.8079
Ljubljana	Slovenia	22	25	46.25	0.7492
Tokyo	Japan	23	18	45.35	0.8019
Zagreb	Croatia	24	30	44.43	0.7328
Sao Paulo	Brazil	25	59	44.22	0.6167
Dublin	Ireland	26	34	43.76	0.7149
Oslo	Norway	27	8	42.60	0.8593
Tallinn	Estonia	28	20	41.69	0.7987
Amsterdam	Netherlands	29	2	40.73	0.9125
Zurich	Switzerland	30	15	39.90	0.8134
Bogota	Colombia	31	43	39.88	0.6572
Almaty	Kazakhstan	32	38	37.76	0.6844
La Paz	Bolivia	33	106	37.16	0.4658
Kuala Lumpur	Malaysia	34	40	37.09	0.6703

Mexico City	Mexico	35	55	36.98	0.6240
Brussels	Belgium	36	24	36.78	0.7718
Lisbon	Portugal	37	33	36.49	0.7165
Rome	Italy	38	32	35.06	0.7190
Johannesburg	South Africa	39	101	34.03	0.4869
Tehran	Iran (I.R.)	40	100	33.09	0.4876
Ho Chi Minh	Viet Nam	41	83	32.95	0.5217
Jerusalem	Israel	42	16	32.83	0.8100
Minsk	Belarus	43	61	32.11	0.6090
Buenos Aires	Argentina	44	56	31.15	0.6228
Riyadh	Saudi Arabia	45	41	30.66	0.6658
Sydney	Australia	46	12	30.52	0.8390
Santiago	Chile	47	39	29.26	0.6769
Athens	Greece	48	37	29.20	0.6872
Mumbai	India	49	124	28.99	0.3829
Riga	Latvia	50	42	28.85	0.6604
Muscat	Oman	51	64	28.72	0.5944
Bucharest	Romania	52	62	28.12	0.6060
Lima	Peru	53	82	27.80	0.5230
Jakarta	Indonesia	54	97	27.07	0.4949
Montevideo	Uruguay	55	50	26.98	0.6315
Tunis	Tunisia	56	103	26.65	0.4833
Sofia	Bulgaria	57	60	26.35	0.6132
Istanbul	Turkey	58	80	25.81	0.5281
Guatemala City	Guatemala	59	112	25.43	0.4390
Kiev	Ukraine	60	68	25.01	0.5653
Warsaw	Poland	61	47	24.94	0.6441
Cairo	Egypt	62	107	24.64	0.4611
Chisinau	Moldova	63	69	24.55	0.5626
Amman	Jordan	64	98	23.70	0.4884
Santo Domingo	Dominican Rep.	65	89	23.27	0.5130
Colombo	Sri Lanka	66	115	22.93	0.4357
Budapest	Hungary	67	31	22.67	0.7201
Quezon City	Philippines	68	88	22.48	0.5130
Tirane	Albania	69	86	22.18	0.5161

Belgrade	Serbia	70	51	22.04	0.6312
San Juan	Puerto Rico	71	N/A	21.42	N/A
Guayaquil	Ecuador	72	102	19.69	0.4869
Accra	Ghana	73	145	19.41	0.3159
Bangkok	Thailand	74	92	18.53	0.5093
Sarajevo	Bosnia and Herzegovina	75	79	18.31	0.5328
Dakar	Senegal	76	163	18.20	0.2673
Caracas	Venezuela	77	71	17.50	0.5585
Kathmandu	Nepal	78	164	16.81	0.2664
Dhaka	Bangladesh	79	150	16.79	0.2991
Casablanca	Morocco	80	120	16.77	0.4209
Panama City	Panama	81	66	16.33	0.5733
Karachi	Pakistan	82	156	16.25	0.2923
Tbilisi	Georgia	83	72	15.78	0.5563
Saint Joseph	Costa Rica	84	77	15.69	0.5397
Baku	Azerbaijan	85	96	15.05	0.4984
San Salvador	El Salvador	86	74	15.04	0.5513
Nairobi	Kenya	87	119	14.48	0.4212
Lagos	Nigeria	88	162	14.29	0.2676
Kuwait City	Kuwait	89	63	14.22	0.5960
Baghdad	Iraq	90	136	14.11	0.3409
Asuncion	Paraguay	91	104	10.76	0.4802
Tashkent	Uzbekistan	92	91	6.76	0.5099

Figure 1 and Figure 2 below provide another comparison between Rutgers Survey and UN Survey in both rank and score. The analysis shows that the correlation between the Rutgers rank and UN ranks is 0.7129 and the correlation between the Rutgers score and UN score is 0.7127. So, the analysis reflects the strong relationship between the two surveys and confirms the validity and reliability of them.

Figure 1

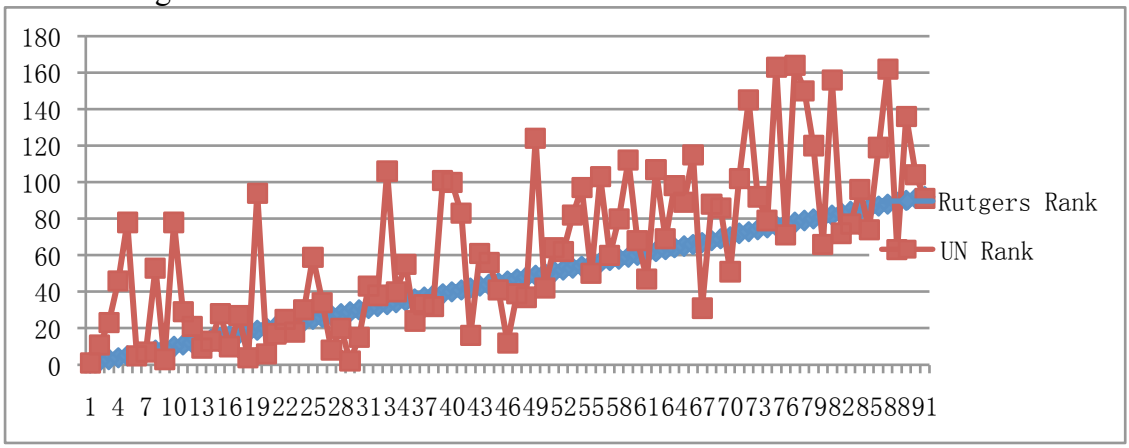
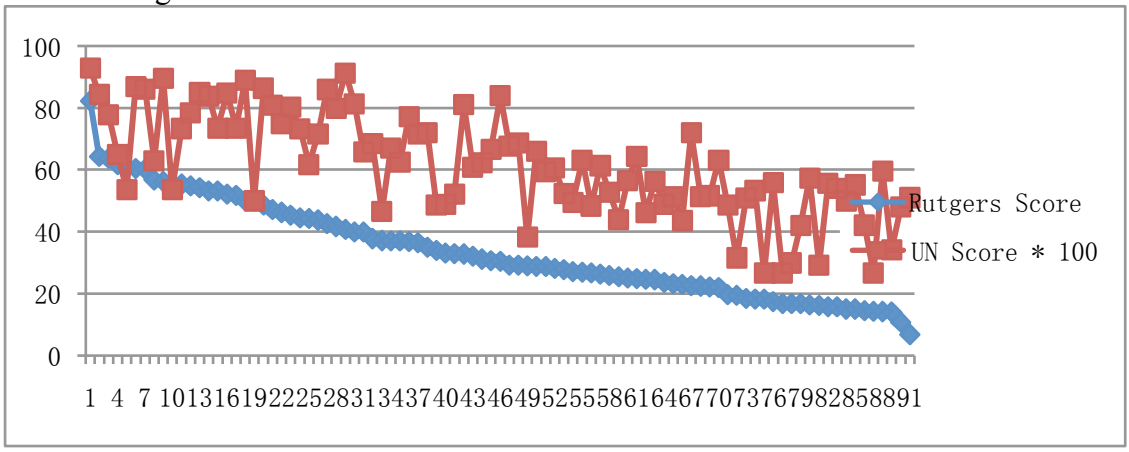


Figure 2



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APPENDIX

APPENDIX A

Privacy/ Security	
1-2. A privacy or security statement/policy 3-6. Data collection 7. Option to have personal information used 8. Third party disclosures 9. Ability to review personal data records 10. Managerial measures 11. Use of encryption	12. Secure server 13. Use of “cookies” or “Web Beacons” 14. Notification of privacy policy 15. Contact or e-mail address for inquiries 16. Public information through a restricted area 17. Access to nonpublic information for employees 18. Use of digital signatures
Usability	
19-20. Homepage, page length. 21. Targeted audience 22-23. Navigation Bar 24. Site map	25-27. Font Color 30-31. Forms 32-37. Search tool 38. Update of website
Content	
39. Information about the location of offices 40. Listing of external links 41. Contact information 42. Minutes of public 43. City code and regulations 44. City charter and policy priority 45. Mission statements 46. Budget information 47-48. Documents, reports, or books (publications)	49. GIS capabilities 50. Emergency management or alert mechanism 51-52. Disability access 53. Wireless technology 54. Access in more than one language 55-56. Human resources information 57. Calendar of events 58. Downloadable documents

Service	
59-61. Pay utilities, taxes, fines 62. Apply for permits 63. Online tracking system 64-65. Apply for licenses 66. E-procurement 67. Property assessments 68. Searchable databases 69. Complaints 70-71. Bulletin board about civil applications	72. FAQ 73. Request information 74. Customize the main city homepage 75. Access private information online 76. Purchase tickets 77. Webmaster response 78. Report violations of administrative laws and regulations
Citizen and Social Engagement	
79-80. Comments or feedback 81-83. Newsletter 84. Online bulletin board or chat capabilities 85-87. Online discussion forum on policy issues 88-89. Scheduled e-meetings for discussion	90-91. Online survey/ polls 92. Synchronous video 93-94. Citizen satisfaction survey 95. Online decision-making 96-104. Performance measures, standards, or benchmarks